

PUMP SALES CATALOG



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INTRODUCTION

The PARMA WATER LIFTER has been manufactured since 1907. This means you can have confidence in our products based on the many years of reliable performance from PARMA PUMPS. Our engineers are continually seeking improvements and new ideas to make today's PARMA PUMP the most modern and practical pump in the industry. Their simplicity of design and quality construction make them virtually trouble-free pumps that are adaptable to almost any job in agriculture or industry where liquids and semi-liquids need to be moved.

The PARMA PUMP is a submerged type of centrifugal pump which stands in the liquid it is pumping. This fact makes it possible to completely eliminate the suction pipe, foot valve, strainer and packing gland found in most pumps of this type. Since the PARMA PUMP does not require a vacuum inside the bowl, all of these troublesome parts have been left out of its design. It also produces more reliable operation, as weeds, trash, sewage wastes, manufacturing wastes, etc., can pass right through the pump without causing damage or obstructing the flow.

CONDITION OF SALES

1. PRICES -NOTICE

The list prices of all items in this price book cover PARMA COMPANY's standard design and the various parts are constructed of standard materials. All prices are FOB Parma, Idaho and subject to change without notice. Prices charged shall be prices in effect at the time of shipment regardless of date of order.

2. TAXES

These prices do not include sales, use, excise or similar taxes. Consequently, in addition to the price specified herein, the amount of any present or future sales, use excise or other similar tax applicable to the sale of the equipment hereunder shall be paid by the Purchaser, or in lieu thereof, the Purchaser shall provide PARMA COMPANY with a tax exemption certificate acceptable to the taxing authorities.

3. PACKING

Prices include packing for rail or commercial truck shipment only. Any special packing required for export or other means of transportation must be referred to the factory for special pricing.

4. WEIGHTS

Weights given are approximate shipping weights.

5. SHIPMENTS

All promises of shipment are estimates contingent upon strikes, fires or other elements beyond our control. The time of shipment shall be computed from the date when PARMA COMPANY has received, from the Purchaser, a formal order with all and complete details pertaining to the construction of the pump and/or accessories.

6. DESIGN

All designs covered by this catalog are subject to minor modifications by PARMA COMPANY at the time of manufacture to meet the latest price and most efficient operation. If the pumps to be installed are to be used with an existing installation, PARMA COMPANY shall furnish pumps to be interchangeable as near as may be feasible. However, PARMA COMPANY reserves the right to substitute the latest materials and designs.

7. RESPONSIBILITY

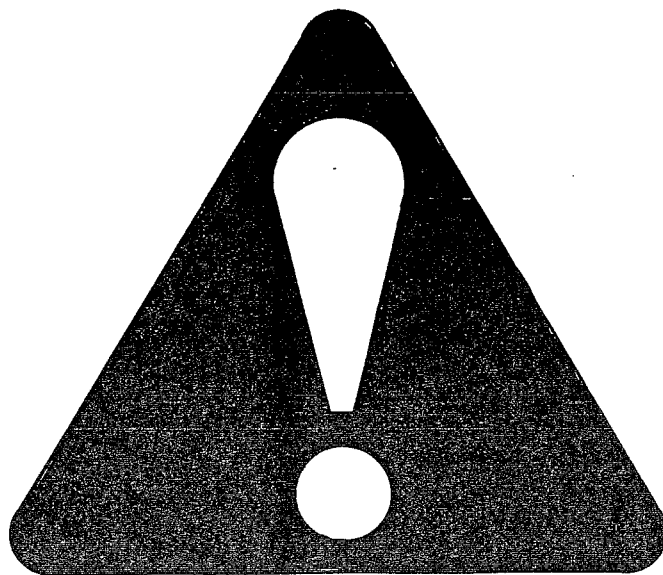
PARMA COMPANY will not be responsible for defects in parts or equipment not manufactured by it, beyond the guarantee of the outside manufacturer or such parts.



DANGER



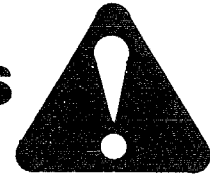
1. KEEP ALL SHIELDS, HOODS AND COVERS IN PLACE.
2. DISCONNECT POWER SOURCE TO ADJUST OR SERVICE.
3. MAKE CERTAIN EVERYONE IS CLEAR OF EQUIPMENT BEFORE APPLYING POWER.
4. DISCONNECT POWER BEFORE RESETTING MOTOR OVERLOAD.
5. KEEP HANDS, FEET, AND CLOTHING AWAY FROM POWER DRIVEN PARTS IN MOTION.
6. KEEP ALL PIT OPENINGS COVERED WHEN NOT IN USE.
7. **WARNING!** BEWARE OF MANURE GAS IN PIT. DO NOT ENTER. GAS CAN BE **FATAL**.





CAUTION

Liquid Manure Produces DANGEROUS GASES



1. Do not attempt to agitate liquid manure unless the ventilation system is in full operation and/or windows and doors are all open. Gases are more apt to be disseminated during the agitation than during the pumping period.
2. Do not enter a liquid manure tank of any type unless you have a special breathing apparatus. In addition, a rope should be tied around the waist and held by a person outside the danger area so that if the person is overcome by the poisonous gases or from the lack of oxygen, he may be pulled to safety without his rescuers also being overcome.
3. If an operator does feel faint, get him out into the fresh air and give him artificial respiration if required.
4. Use portable fans to expel gases and replace them with fresh air.
5. Reduce possible danger to livestock by using a two-fan system of ventilation. The small fan should operate continuously while the large one is controlled by a thermostat.

CONCLUSION:

We recommend that all operators of liquid manure equipment familiarize themselves with gas problems.

SELECTING YOUR PARMA PUMP

There are two basic types of PARMA PUMPS suited for a wide variety of applications. All pumps are available with electric or PTO drive.

Parma Multi-Service (M-S) Pump

MODELS: 11, 12, 13, 14, 15, 16 & 18

HEADS: to 50 feet

CAPACITY: to 4,500 GPM

- Low lift irrigation
- Manure transfer and agitation, particularly hog manure
- General pumping of materials with moderate sized solids

Parma Chopper Pumps

MODELS: 33, 34, & 35

HEADS: to 50 feet

CAPACITY: to 1,200 GPM

- Pumping of stringy, fibrous materials
- Particularly suited for dairy, beef and poultry manure
- Pumping of processing plant wastes

The following pages provide the method used to select and order the PARMA PUMP best suited for the requirements.

For each type of pump, a typical example is developed and solved to better show the selection process. A proper order entry is also included with each example.

Part I

SELECTION OF PUMP FOR TYPICAL LOW LIFT IRRIGATION SYSTEMS
Pages 1-5 and 1-6.

Part II

SELECTION OF PUMP FOR MANURE HANDLING
Pages 1-6 and 1-7.

Part I

Selection of pumps for typical lift irrigation systems

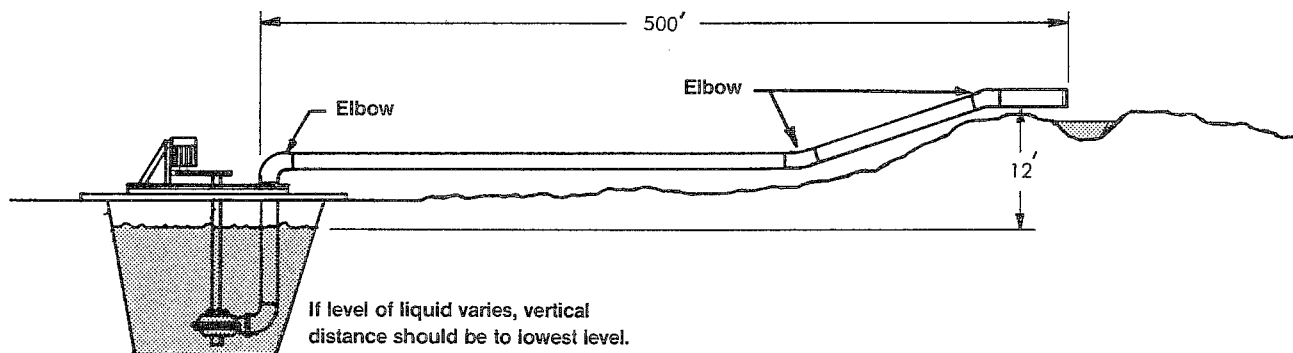
The selection of a pump for low lift flood irrigation or general liquid transfer is best accomplished by first determining the volume of liquid to be moved in gallons per minute.

The next step is to determine the amount of vertical lift that the liquid will be moved. If the liquid will be pumped through pipe for any distance, the friction loss through the pipe and pipe fittings should be calculated and added to the lift to give the total dynamic head (TDH).

Next, study the various performance curves found in "Performance Curves" section. Select the PARMA pump which requires the lowest horsepower. Record the pump model number, RPM, and horsepower required. A reference chart on page 2-3 may also be used to select the required pump.

Next, determine if electric or PTO drive is needed and select the components required.

PUMP NEEDED TO PROVIDE 700 GPM OF WATER FROM A CANAL TO A FIELD 500 FEET AWAY. The installation may look like:



Find:

- A. Size of Piping Recommended
- B. TDH at Pump
- C. Model, Speed, and HP of PARMA Pump Best Suited
- D. Proper Order Entry

Solution:

A. Determine size of pipe from tables (steel page 2-1, plastic page 2-2) noting that liquid velocity should not be over 5 ft./sec. The correct size for steel pipe for 700 GPM would be 8" diameter.

B. TDH (total dynamic head) at pump = vertical lift + friction loss.
VERTICAL LIFT from example = 12 feet.

FRICITION LOSS for steel pipe are shown on page 2-1. Friction loss for plastic pipe are shown on page 2-2. Friction loss for fittings are approximately the same for steel or plastic and such losses are shown on page 2-1. Assume for this example that steel pipe is used. THEREFORE:

1. Determine friction loss in fittings (from table on page 2-1). Three 8" elbows at 20.2 equivalent feet of pipe each = 60.6 equivalent feet. This amount must be added to the 500 ft. of pipe making a total of 560.6 feet.

1. Total friction loss in the system (from table on page 2-1) = 560.6×1.54 divided by 100 = 8.6 feet TDH (total dynamic head) = 12 ft + 8.6 ft. = 20.6 ft.

C. Find pump model, speed, HP using the performance curves in section 2 for 21 ft. and 700 GPM.

<u>MODEL</u>	<u>SPEED</u>	<u>HP</u>
13	1180 rpm	11
14	800 rpm	9½
15	610 rpm	7½

In checking the Models 13, 14 and 15, it is readily seen that the Model 15 pump is best suited in that it requires the least horsepower. A 7½ HP motor would be used. (Lower RPM as well, will lengthen bearing life of the pump.)

For the electric drive a sheave/belt selection would then be necessary to produce 610 RPM pump speed. Find instructions for find the following required items on page 7-2.

- 1- 2B6.4 QD sheave and SDS 1 3/8" bushing (for motor)
- 1- 2B18.4 QD sheave and SK 2 1/4" bushing (for pump)
- 2- B85 V-belts

From pages 8-1 through 8-3 the following items would be required for electrical components assuming three phase power will be used.

- 1 - 7½ HP 3 Phase electric motor
- 1 - Size 1, 240 volt 3 phase magnetic starter

D. Assuming a setting length of 8' is required, the proper order entry would be: (refer to "Pump Ordering")

<u>QTY</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	815001	Model 15 M-S Pump Unit
1	804007-8	8' Pump Setting Assembly
1	805008-8	8' Discharge Assembly
1	801006	Mounting Frame Unit
1	892064	2B6.4 QD Sheave
1	980284	SDS 1 3/8 Bushing
1	892184	2B18.4 QD Sheave
1	980323	SK 2 1/4 Bushing
2	895085	B-85 V-Belts
1	890375	7½ HP 3 Phase Motor
1	890123	Size 1, 240 Volt 3 Phase Starter

Part II Selection of a pump for manure

NOTICE: Due to various types and consistencies of manure slurry, the horsepower and head capabilities referred to in this catalog are only approximate and are to be used as such.

In selecting pumps for the handling of liquid manure, special methods are needed to properly size the pump.

Gallons per minute is not directly the most important requirement of the pump. Typical manure pump installations utilize a pump placed in a pit (commonly called "reception pit") where the manure has been contained. The manure arrives in the pit by use of barn cleaners, scraping with a loader, or sometimes by gravity drain flush systems. Still other pits are directly filled by having a slotted floor with the pit underneath. In any case, the contents of the pit will need agitation to provide a pumpable and storable slurry. Therefore, in selecting the pump, adequate HP must

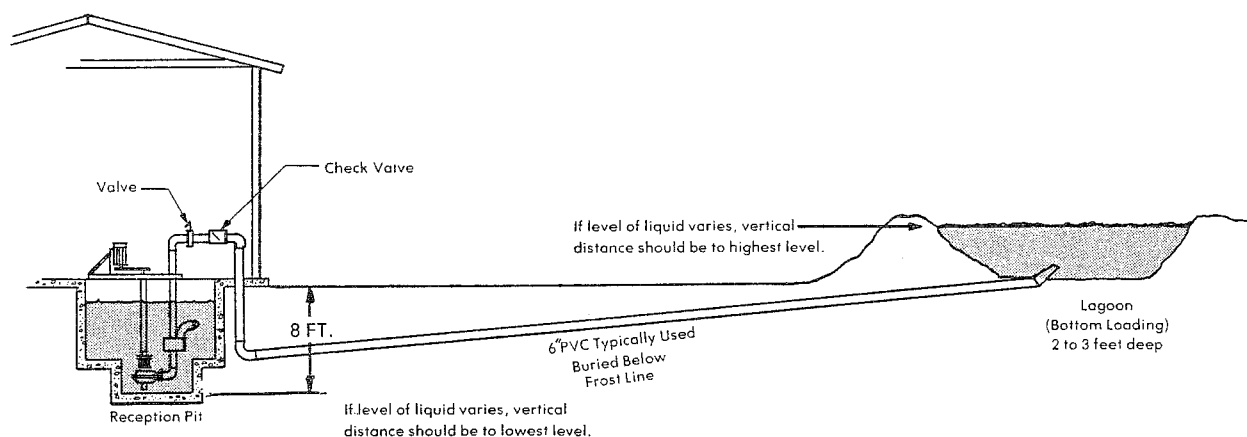
be provided to produce agitation. Generally, the following recommendations have proven to be useful: pits to 15,000 gallons - 15 HP and pits over 15,000 gallons - 25 HP. However, this general rule does not always apply. For instance, a reception pit of a very long length, narrow width, may fall under 15,000 gallons, but due to the distance the pump is from the far corners of the pit, a 25 HP pump would be a better choice.

Another problem to consider is the amount of electric horsepower allowed in many areas. In some cases the use of smaller than recommended pumps may be satisfactory with longer agitation periods. Another alternative is to use the PTO drive models to achieve the horsepower required.

Horsepower required during load out and agitation modes must also be considered. When the pump is re-circulating manure through the agitator, the effective head (or back pressure) against the pump is low and the horsepower demand is generally greater than during "loadout". Since head conditions during agitation are difficult to measure, approximate horsepower requirements during agitation are given for different pump speeds on page 2-15. For example the Model 34 Chopper Pump operating at 975 RPM requires 15 HP when agitating.

EXAMPLE:

Consider a dairy operation with 8' deep x 20' x 20' reception pit. Select a proper pump to agitate and load out manure to a nearby lagoon.



Find:

- A. Gallonage of pit and agitation horsepower.
- B. Pump Selection
- C. Order Entry

Solution:

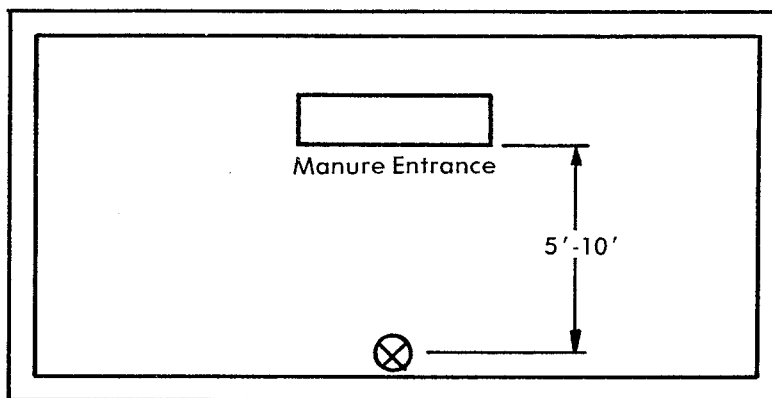
A. Gallonage of pit, $8 \times 20 \times 20 \times 7.4 \text{ gallons/ft}^3 = 23,680$ gallons. Agitation HP required = approximately 25. (see first paragraph this page)

B. Pump selection from the previously stated guidelines indicates a 25 HP chopper pump would be most desirable. The Model 35 Chopper Pump, page 5-2, would be selected. From page 2-13, the maximum head to 840 RPM is approximately 39' which is acceptable for this example.

NOTE: If the above example were for swine manure, without any bedding, the Model #15 M-S Pump with an 8' setting and agitator would be a good choice. (Refer to "Pump Ordering - Steps 1, 2, 3, 4, 5, and 6.)

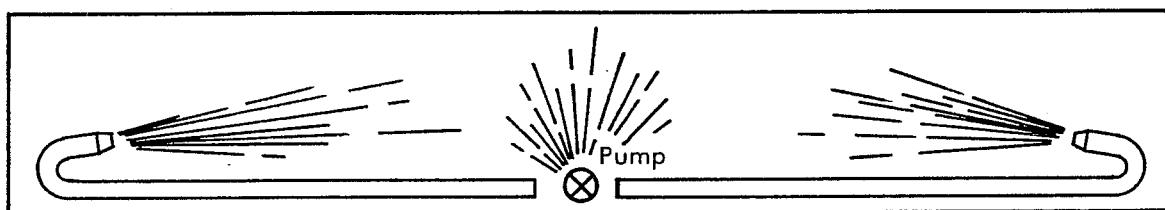
Some Tips on manure pump placement in pit:

- Position the pump as close to the center of the pit as possible, particularly in large pits.
- Use an 18 to 24 inch sump in the pit floor beneath the pump to allow complete clean out and increase the effective storage of the pit. (optional)
- On very long, narrow pits, place the pump in the center. Use remote agitation lines running to each end to provide circulation.
- Manure that is scraped or delivered to the pit by a barn cleaner should be deposited 5 to 10 feet from the pump.

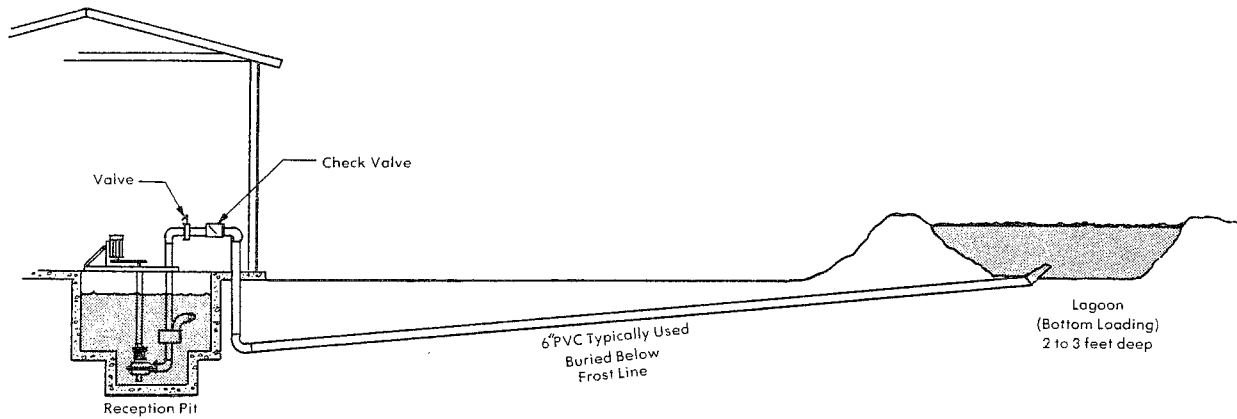


Recommended Pump Placement

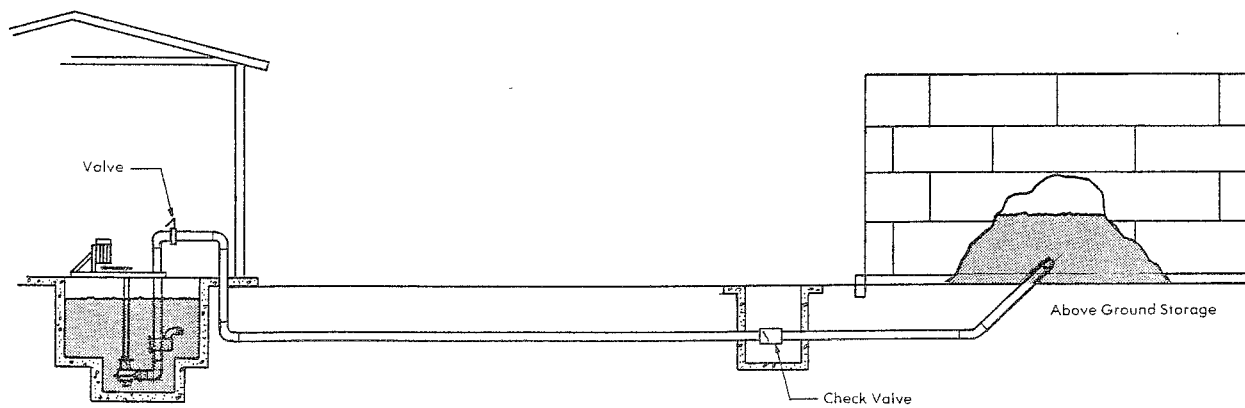
Suggested installations in very long pits.
NOTE: Remote lines not provided.



TYPICAL MANURE PUMP INSTALLATIONS WITH LAGOON AND ABOVE GROUND STORAGES



Manure Pump - Lagoon



Manure Pump — Above Ground Storage

**FRICITION LOSS OF WATER IN FEET PER 100 FEET LENGTH OF PIPE.
BASED ON WILLIAMS & HAZEN FORMULA USING CONSTANT 100 SIZES OF
STANDARD STEEL SCHEDULE 40 PIPE IN INCHES**

	4"Pipe		5"Pipe		6"Pipe		8"Pipe		10"Pipe		12"Pipe		14"Pipe		16"Pipe	
U.S. Gals. per min.	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet	Vel. ft. per Sec.	Loss in Feet
20	.51	.06														
25	.64	.09														
30	.77	.13	.49	.04												
35	.89	.17	.57	.06												
40	1.02	.22	.65	.08												
45	1.15	.28	.73	.09												
50	1.28	.34	.82	.11	.57	.04										
55	1.41	.41	.90	.14	.62	.05										
60	1.53	.47	.98	.16	.68	.06										
65	1.66	.53	1.06	.19	.74	.076										
70	1.79	.63	1.14	.21	.79	.08										
75	1.91	.73	1.22	.24	.85	.10										
80	2.04	.81	1.31	.27	.91	.11										
85	2.17	.91	1.39	.31	.96	.12										
90	2.30	1.00	1.47	.34	1.02	.14										
95	2.42	1.12	1.55	.38	1.08	.15										
100	2.55	1.22	1.63	.41	1.13	.17										
110	2.81	1.46	1.79	.49	1.25	.21										
120	3.06	1.17	1.96	.58	1.36	.24										
130	3.31	1.97	2.12	.67	1.47	.27										
140	3.57	2.28	2.29	.76	1.59	.32	.90	.08								
150	3.82	2.62	2.45	.88	1.70	.36	.96	.09								
160	4.08	2.91	2.61	.98	1.82	.40	1.02	.10								
170	4.33	3.26	2.77	1.08	1.92	.45	1.08	.11								
180	4.60	3.61	2.94	1.22	2.04	.50	1.15	.13								
190	4.84	4.01	3.10	1.35	2.16	.55	1.21	.14								
200	5.11	4.4	3.27	1.18	2.27	.62	1.28	.15								
220	5.62	5.2	3.59	1.77	2.50	.73	1.40	.18	.90	.06						
240	6.13	6.2	3.92	2.08	2.72	.87	1.53	.22	.98	.07						
260	6.64	7.2	4.25	2.41	2.95	1.00	1.66	.25	1.06	.08						
280	7.15	8.2	4.58	2.77	3.13	1.14	1.79	.28	1.15	.09						
300	7.66	9.3	4.90	3.14	3.40	1.32	1.91	.32	1.22	.11						
320	8.17	10.5	5.25	3.54	3.64	1.47	2.05	.37	1.31	.12						
340	8.68	11.7	5.54	3.97	3.84	1.62	2.18	.41	1.39	.14						
360	9.19	13.1	5.87	4.41	4.08	1.83	2.30	.45	1.47	.15						
380	9.69	14.0	6.19	4.86	4.31	2.00	2.43	.50	1.55	.17	1.03	.069				
400	10.21	16.0	6.54	5.4	4.55	2.20	2.60	.54	1.63	.19	1.14	.075				
450	11.49	19.8	7.35	6.7	5.11	2.71	2.92	.68	1.84	.23	1.28	.095				
500	12.77	24.0	8.17	8.1	5.68	2.90	3.19	.82	2.04	.28	1.42	.113	1.04	.06		
550	14.04	28.7	8.99	9.6	6.25	3.95	3.52	.97	2.24	.33	1.56	.135	1.15	.07		
600	15.32	33.7	9.80	11.3	6.81	4.65	3.84	1.14	2.45	.39	1.70	.159	1.25	.08		
650	16.59	39.0	10.62	13.2	7.38	5.40	4.16	1.34	2.65	.45	1.84	.19	1.37	.09		
700	17.87	44.9	11.44	15.1	7.95	6.21	4.46	1.54	2.86	.52	1.99	.22	1.46	.10		
750	19.15	51.0	12.26	17.2	8.50	7.12	4.80	1.74	3.06	.59	2.13	.24	1.58	.11		
800	20.42	57.0	13.07	19.4	9.08	7.96	5.10	1.90	3.26	.66	2.27	.27	1.67	.13		
850	21.70	64.0	13.89	21.7	9.65	8.95	5.48	2.20	3.47	.75	2.41	.31	1.79	.14	1.36	.08
900	22.98	71.0	14.71	24.0	10.20	10.11	5.75	2.46	3.67	.83	2.56	.34	1.88	.16	1.44	.084
950			15.52	26.7	10.77	11.20	6.06	2.87	3.83	.91	2.70	.38	2.00	.18	1.52	.095
1000			16.34	29.2	11.34	12.04	6.38	2.97	4.08	1.03	2.84	.41	2.10	.19	1.60	.10
1100			17.97	34.9	12.48	14.55	7.03	3.52	4.49	1.19	3.13	.49	2.31	.23	1.76	.12
1200			19.61	40.9	13.61	17.10	7.66	4.17	4.90	1.40	3.41	.58	2.52	.27	1.92	.14
1300					14.72	18.4	8.30	4.85	5.31	1.62	3.69	.67	2.71	.32	2.08	.17
1400					15.90	22.60	8.95	5.50	5.71	1.87	3.98	.78	2.92	.36	2.24	.19
1500					17.02	25.60	9.58	6.24	6.12	2.13	4.26	.89	3.15	.41	2.39	.21
1600					18.10	26.9	10.21	7.00	6.53	2.39	4.55	.98	3.34	.47	2.56	.24
1800							11.50	8.78	7.35	2.95	5.11	1.21	3.75	.58	2.87	.30
2000							12.78	10.71	8.16	3.59	5.68	1.49	4.17	.71	3.19	.37
2200							14.05	12.78	8.98	4.24	6.25	1.81	4.59	.84	3.51	.44
2400							15.32	14.2	9.80	5.04	6.81	2.08	5.00	.99	3.83	.52
2600									10.61	6.81	7.38	2.43	5.47	1.17	4.15	.60
2800									11.41	6.70	7.95	2.75	5.84	1.32	4.47	.68
3000									12.24	7.62	8.52	3.15	6.01	1.49	4.79	.78
3200									13.05	7.8	9.10	3.51	6.68	1.67	5.12	.88
3500									14.30	10.08	9.95	4.16	7.30	1.97	5.59	1.04
3800									15.51	13.4	10.80	4.90	7.98	2.36	6.07	1.20
4200											11.92	5.88	8.76	2.77	6.70	1.44
4500											12.78	6.90	9.45	3.22	7.18	1.64
5000											14.20	8.40	10.50	3.92	8.01	2.03
5500													11.55	4.65	8.78	2.39
6000													12.60	5.50	9.58	2.79
6500													13.65	6.45	10.39	3.32
7000													14.60	7.08	11.18	3.70
8000															12.78	4.74
9000															14.37	5.90
10000															15.96	7.19
12000																

**FRICITION LOSS IN PIPE FITTINGS
IN EQUIVALENT FEET OF PIPE**

PIPE SIZE	ELBOW	TEE	CHECK VALVE	GATE VALVE
4	10.2	20.3	26	2.1
5	12.7	25.4	33	2.9
6	15.3	31	39	3.2
8	20.2	40	52	4.3
10	25.3	51	65	5.3
12	30	61	77	6.4
14	35	71	90	7.5
16	40	81	104	8.5

NOTE: Velocities over 5 feet per second not recommended.

CARRYING CAPACITY AND FRICTION LOSS FOR 200 PSI AND SDR 21 THERMOPLASTIC PIPE

(Independent variables: Gallons per minute and nominal pipe size O.D.)

Dependent variables: Velocity, friction head and pressure drop per 100 feet of pipe, interior smooth.)

GALLONS PER MINUTE	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET	VELOCITY FEET PER SECOND	FRICTION LOSS POUNDS PER SQUARE INCH	FRICTION HEAD FEET
		1/2 in.			3/4 in.			1 in.			1 1/4 in.			1 1/2 in.			2 in.			2 1/2 in.				3 in.						
1	0.84	1.00	0.44	0.50	0.28	0.12																								
2	1.67	2.00	0.87	0.99	0.56	0.24																								
5	4.17	11.25	4.87	2.47	3.14	1.36																								
7	5.84	20.66	8.95	3.46	5.76	2.49																								
10	8.34	39.34	17.03	4.94	10.96	4.75																								
15		4 in.		7.40	23.23	10.06																								
20	0.50	0.03	0.013	9.87	39.57	17.13																								
25	0.62	0.04	0.017		5 in.																									
30	0.75	0.06	0.026	0.49	0.02	0.009																								
35	0.87	0.08	0.035	0.57	0.03	0.013																								
40	1.00	0.10	0.043	0.65	0.04	0.017																								
45	1.12	0.12	0.052	0.74	0.04	0.017																								
50	1.25	0.15	0.065	0.82	0.05	0.022																								
60	1.50	0.21	0.091	0.98	0.08	0.035																								
70	1.75	0.28	0.12	1.14	0.10	0.043																								
75	1.87	0.32	0.14	1.23	0.11	0.048																								
80	2.00	0.36	0.16	1.31	0.13	0.056																								
90	2.25	0.45	0.19	1.47	0.16	0.069																								
100	2.50	0.54	0.23	1.63	0.19	0.082																								
125	3.13	0.82	0.36	2.04	0.30	0.13																								
150	3.75	1.15	0.50	2.45	0.41	0.18																								
175	4.37	1.54	0.67	2.86	0.55	0.24																								
200	4.99	1.96	0.85	3.27	0.70	0.30																								
250	6.24	2.97	1.29	4.09	1.06	0.46																								
300	7.49	4.16	1.80	4.90	1.48	0.64																								
350	8.74	5.54	2.40	5.72	1.98	0.86																								
400	9.99	7.09	3.07	6.54	2.53	1.10																								
450	11.24	8.82	3.82	7.35	3.14	1.36																								
500	12.48	10.72	4.64	8.17	3.82	1.65																								
750				12.26	8.09	3.50																								
1000																														
1250																														
1500																														
2000																														
2500																														
3000																														
3500																														
4000																														
4500																														

FOR PLASTIC IRRIGATION PIPE

To find friction head loss in PVC or ABS pipe having a standard dimension ratio other than 21, the values in the table should be multiplied by the appropriate factor shown below.

SDR No.

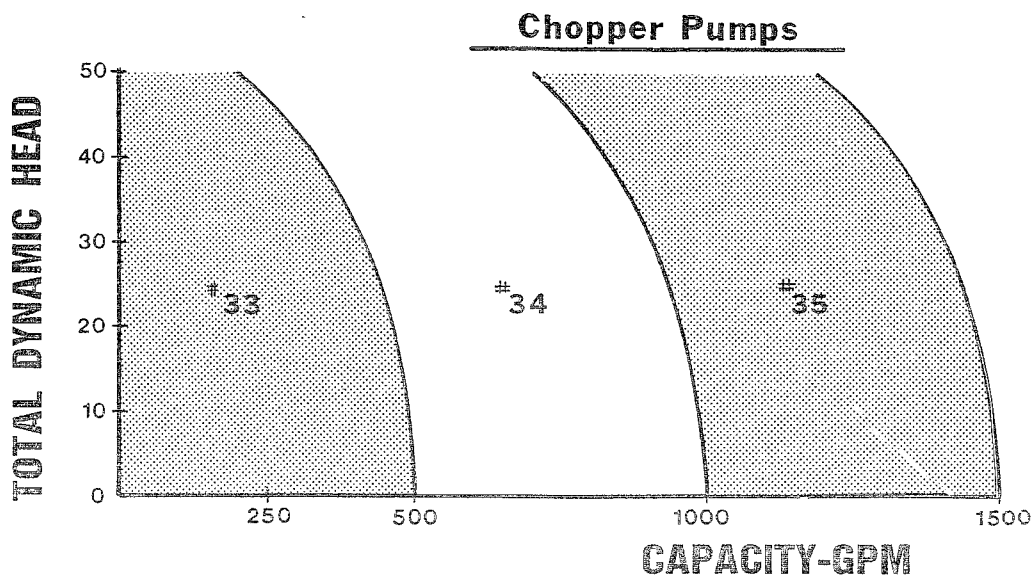
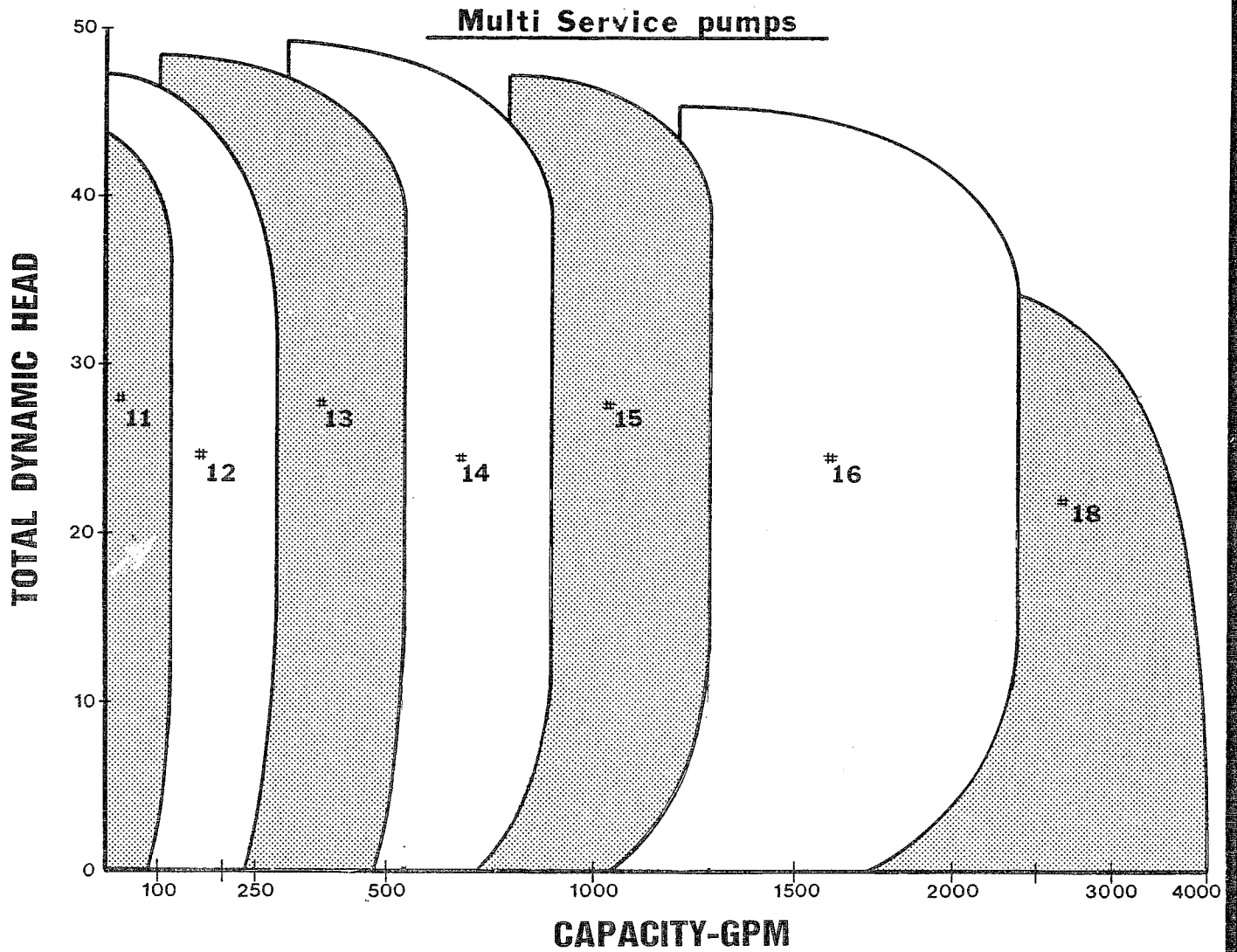
Conversion Factor

13 5
17
21
26
32 5
41
51

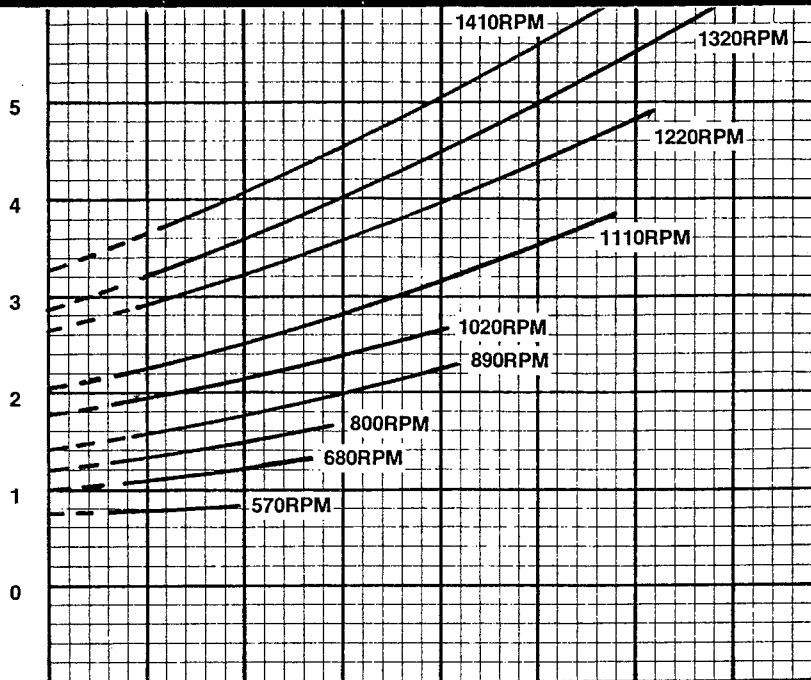
1 34
1 13
1 00
91
84
785
75

SELECTION GUIDE

(see actual pump curves for final selection. page 2-4 -2-13)



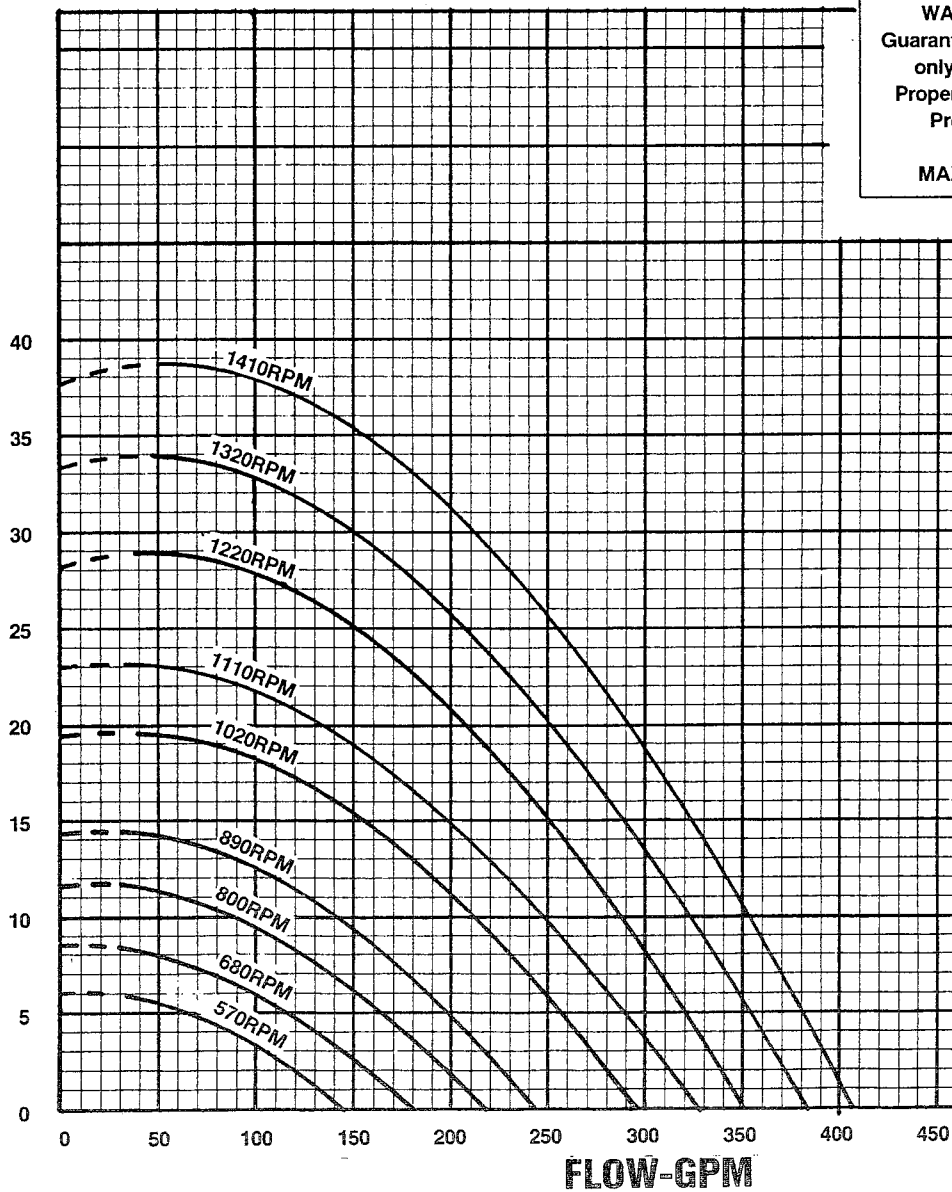
HORSEPOWER



**MODEL 11 PARMA
MULTI-SERVICE PUMP
PERFORMANCE
CURVES**

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 7.5
MAX. SPEED 1410RPM

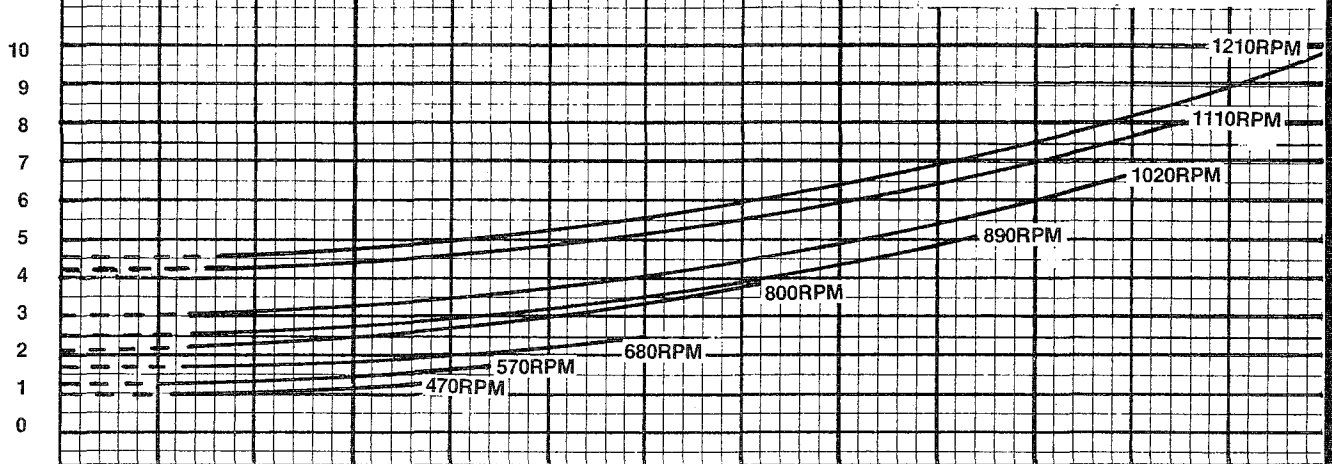
TOTAL HEAD FEET



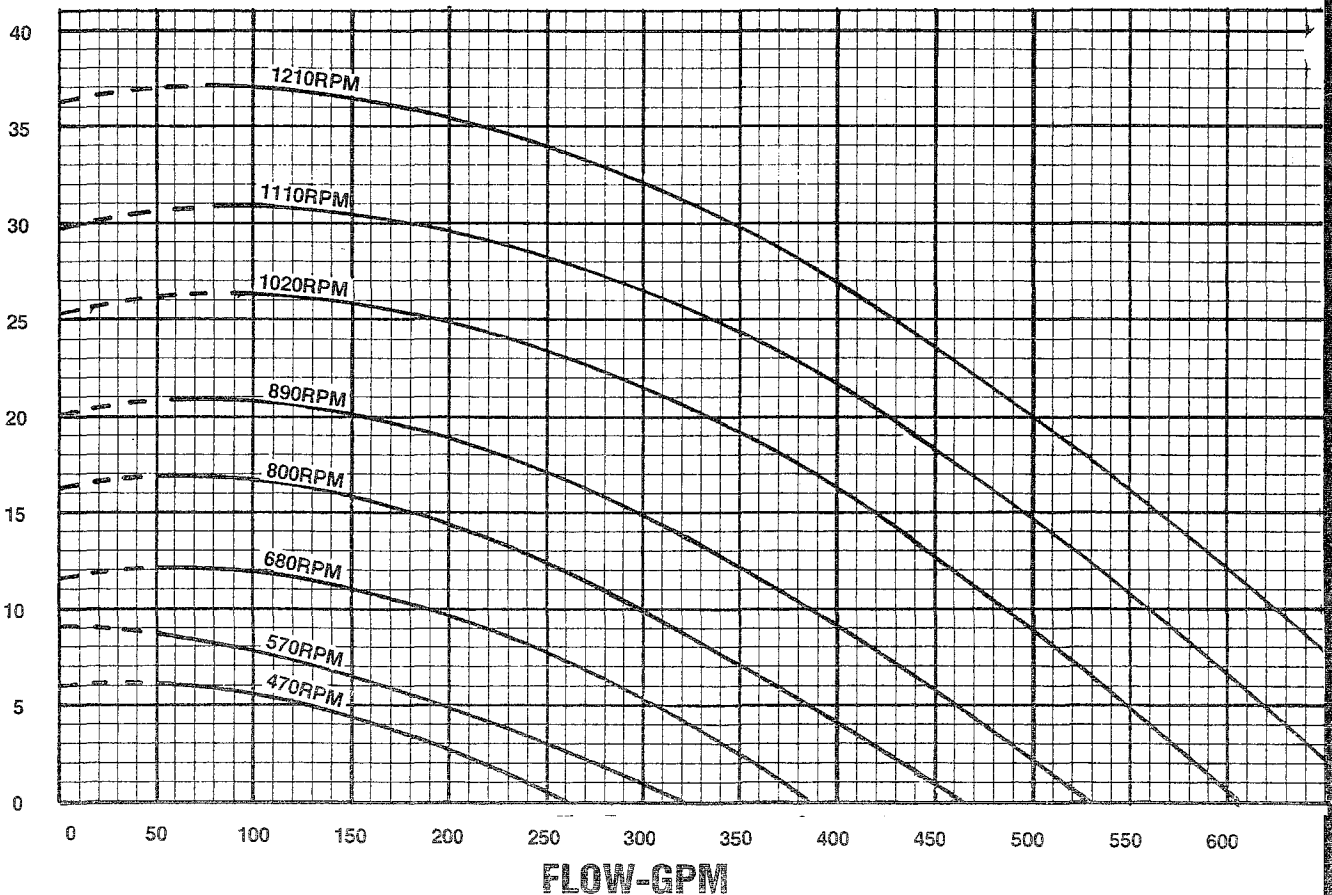
MODEL 12 PARMA MULTI-SERVICE PUMP PERFORMANCE CURVES

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 10
MAX. SPEED 1210RPM

HORSEPOWER

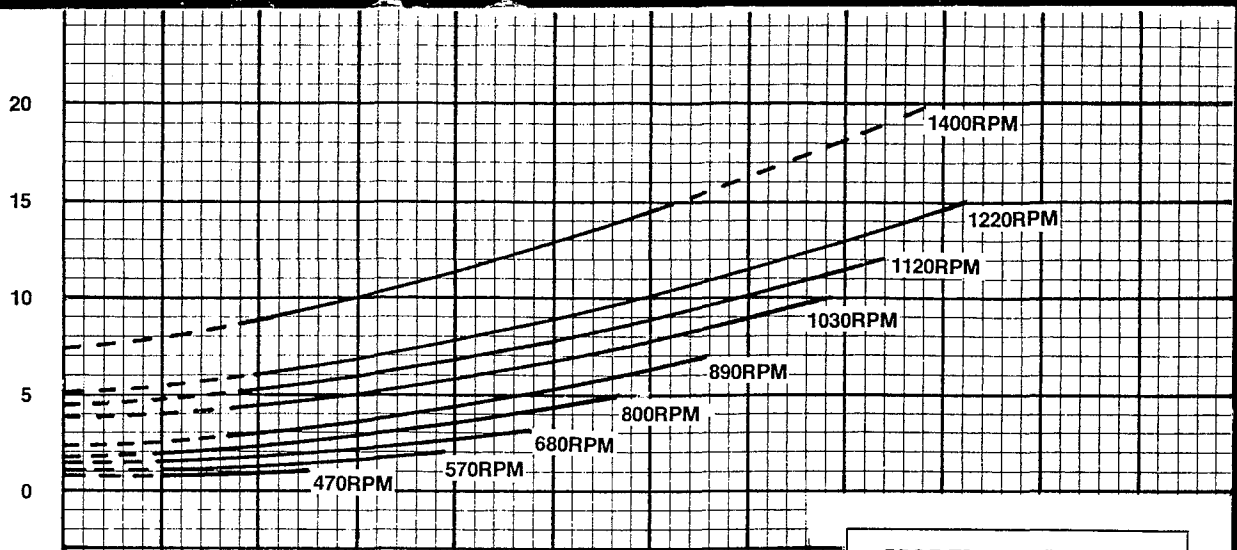


TOTAL HEAD FEET



--- Pump is not to operate continuously in this area.

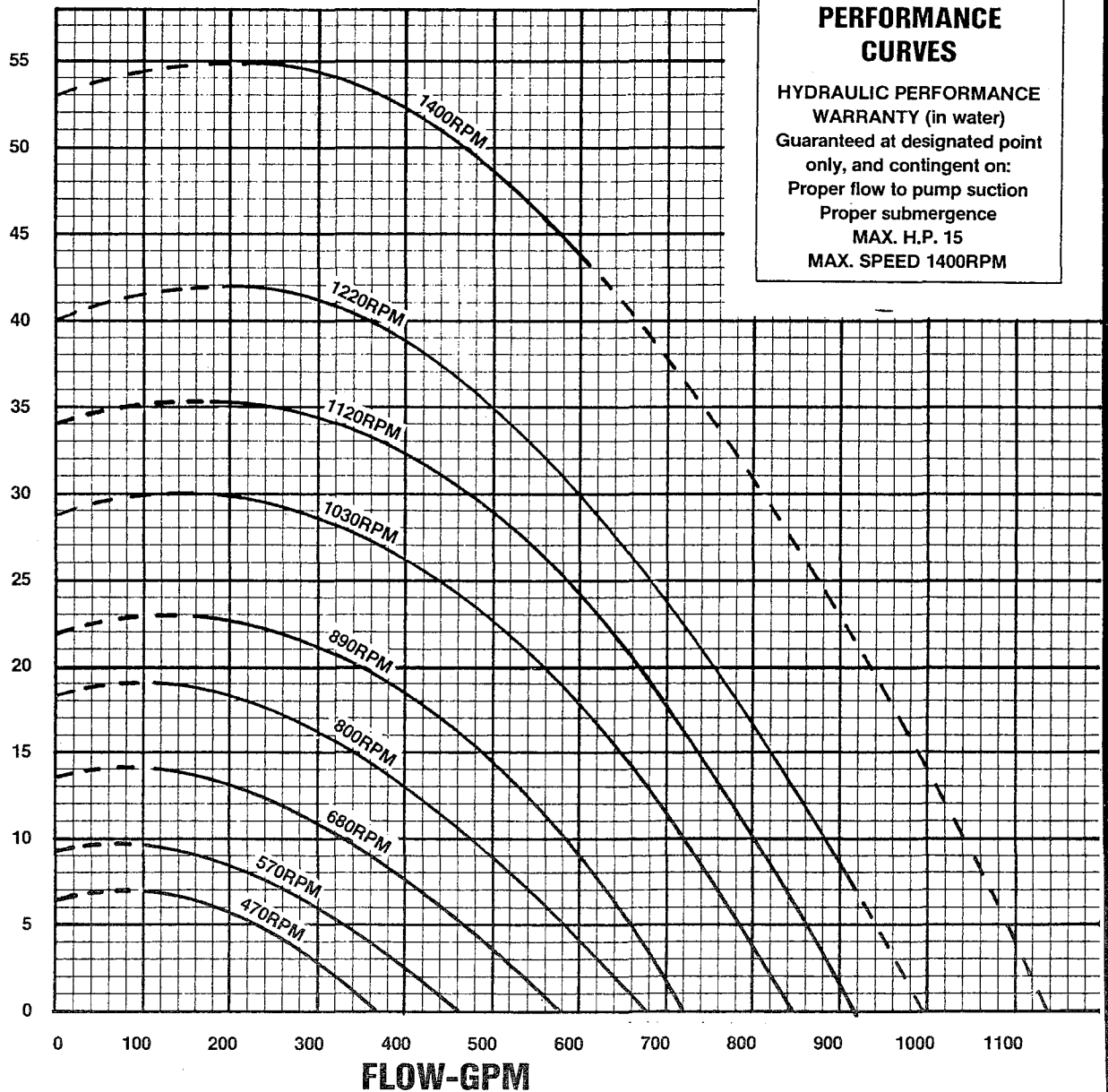
HORSEPOWER



**MODEL 13 PARMA
MULTI-SERVICE PUMP
PERFORMANCE
CURVES**

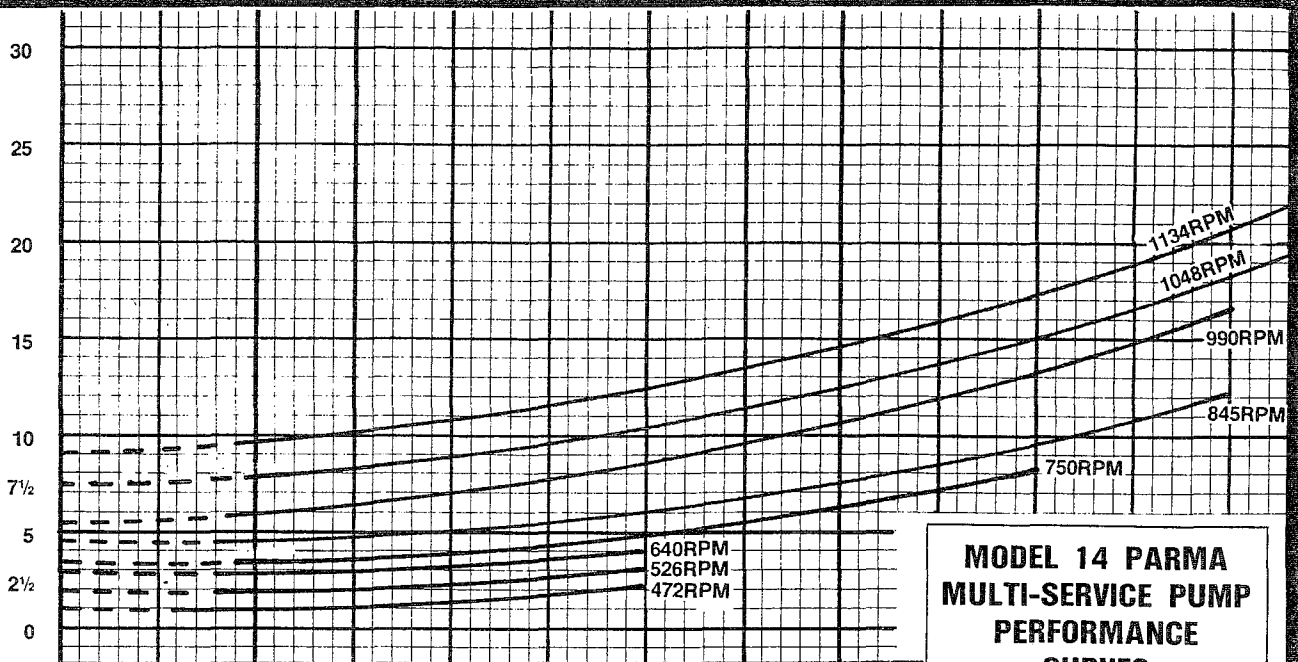
HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 15
MAX. SPEED 1400RPM

TOTAL HEAD FEET



--- Pump is not to operate continuously in this area.

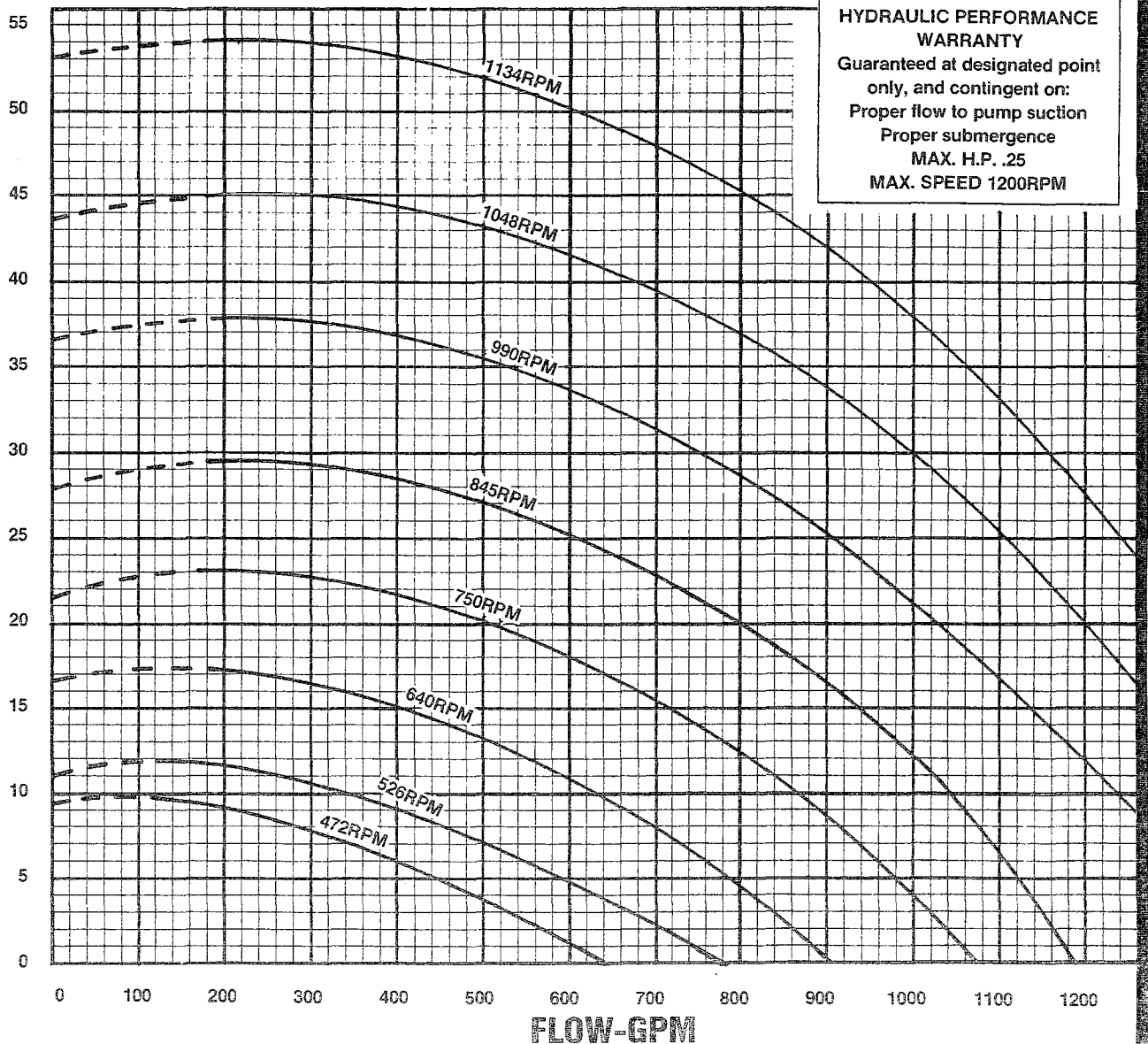
HORSEPOWER



**MODEL 14 PARMA
MULTI-SERVICE PUMP
PERFORMANCE
CURVES**

**HYDRAULIC PERFORMANCE
WARRANTY**
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. .25
MAX. SPEED 1200RPM

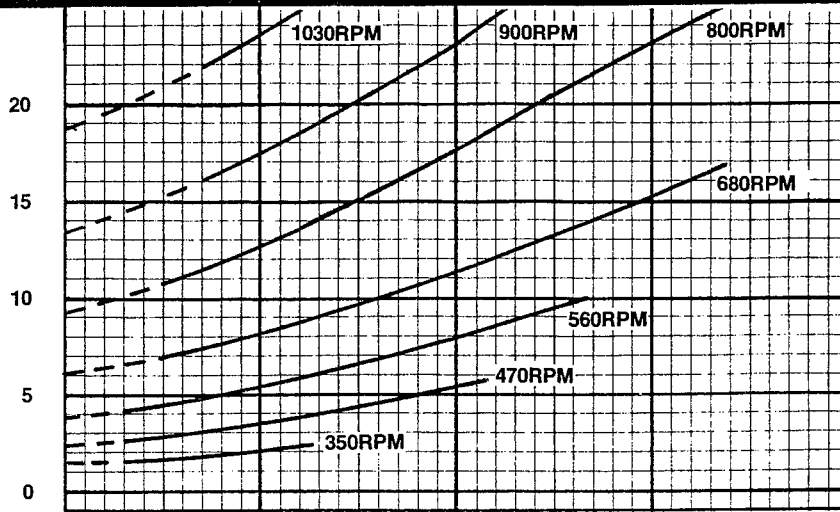
TOTAL HEAD FEET



FLOW-GPM

--- Pump is not to operate continuously in this area.

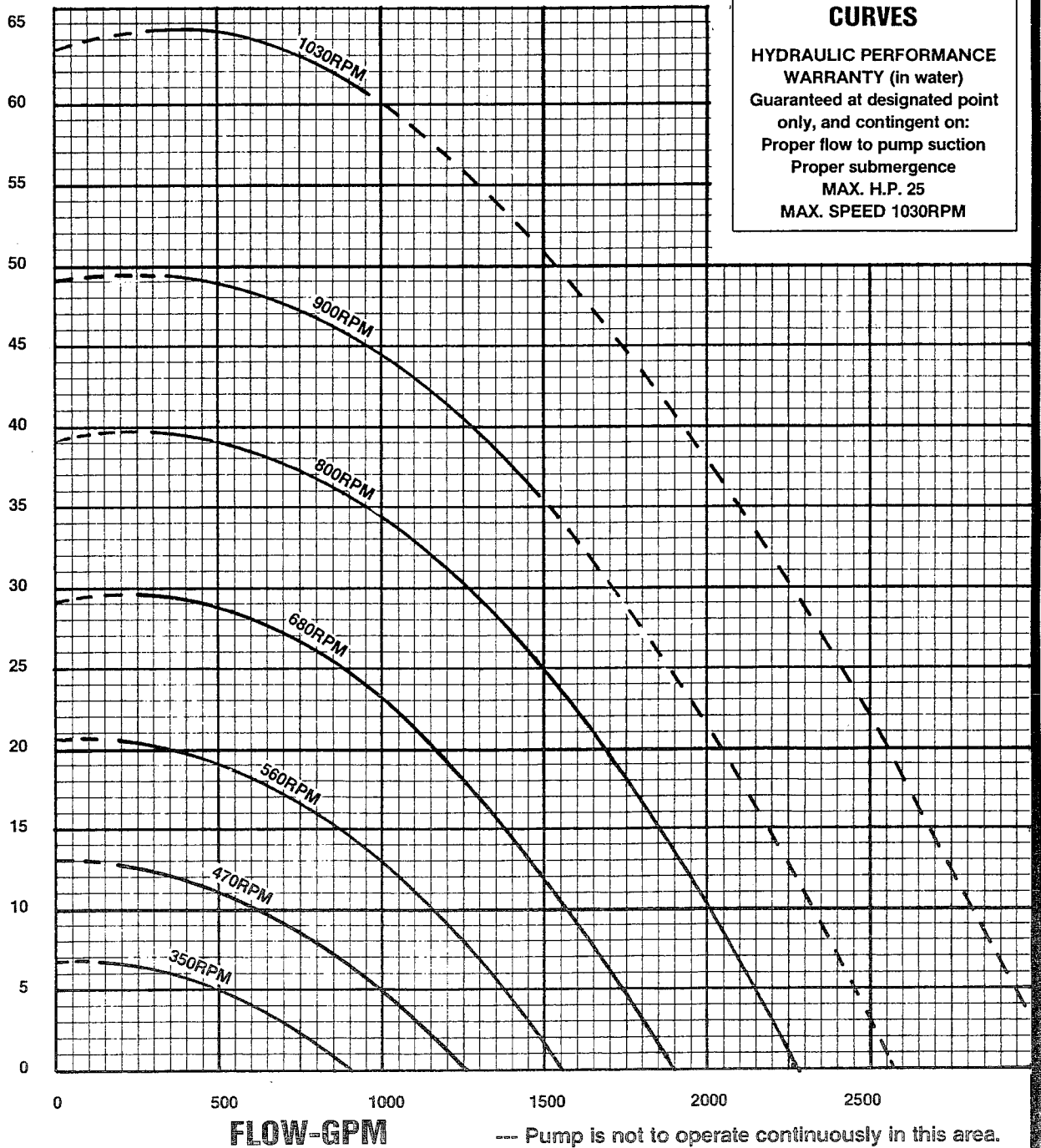
HORSEPOWER



**MODEL 15 PARMA
MULTI-SERVICE PUMP
PERFORMANCE
CURVES**

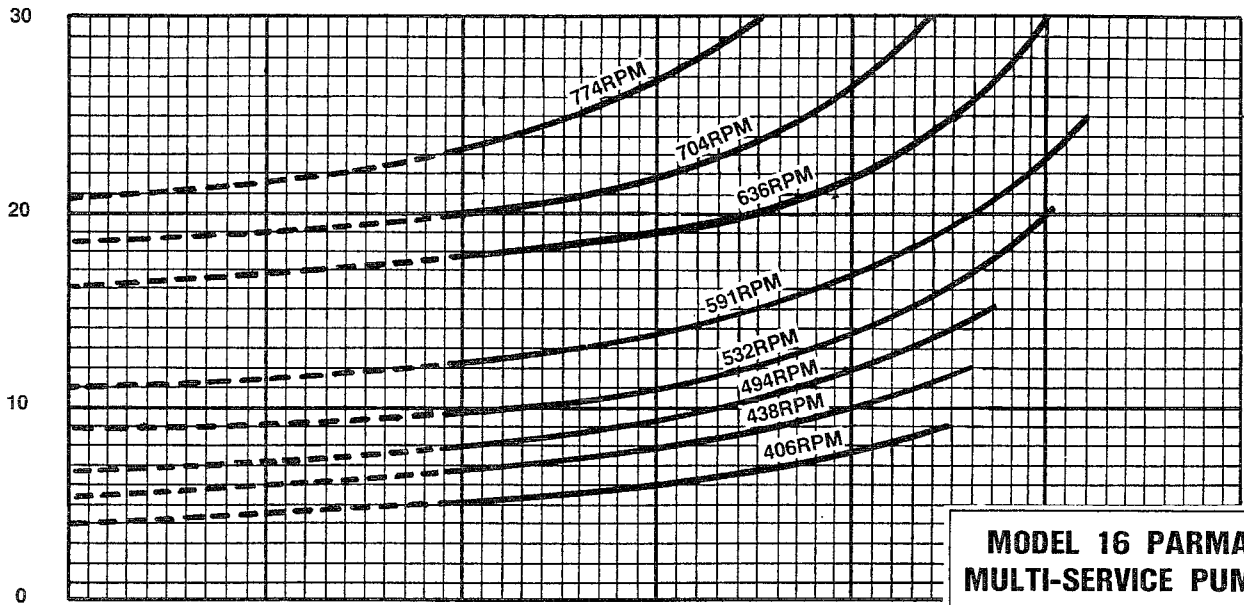
HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 25
MAX. SPEED 1030RPM

TOTAL HEAD FEET



--- Pump is not to operate continuously in this area.

HORSEPOWER

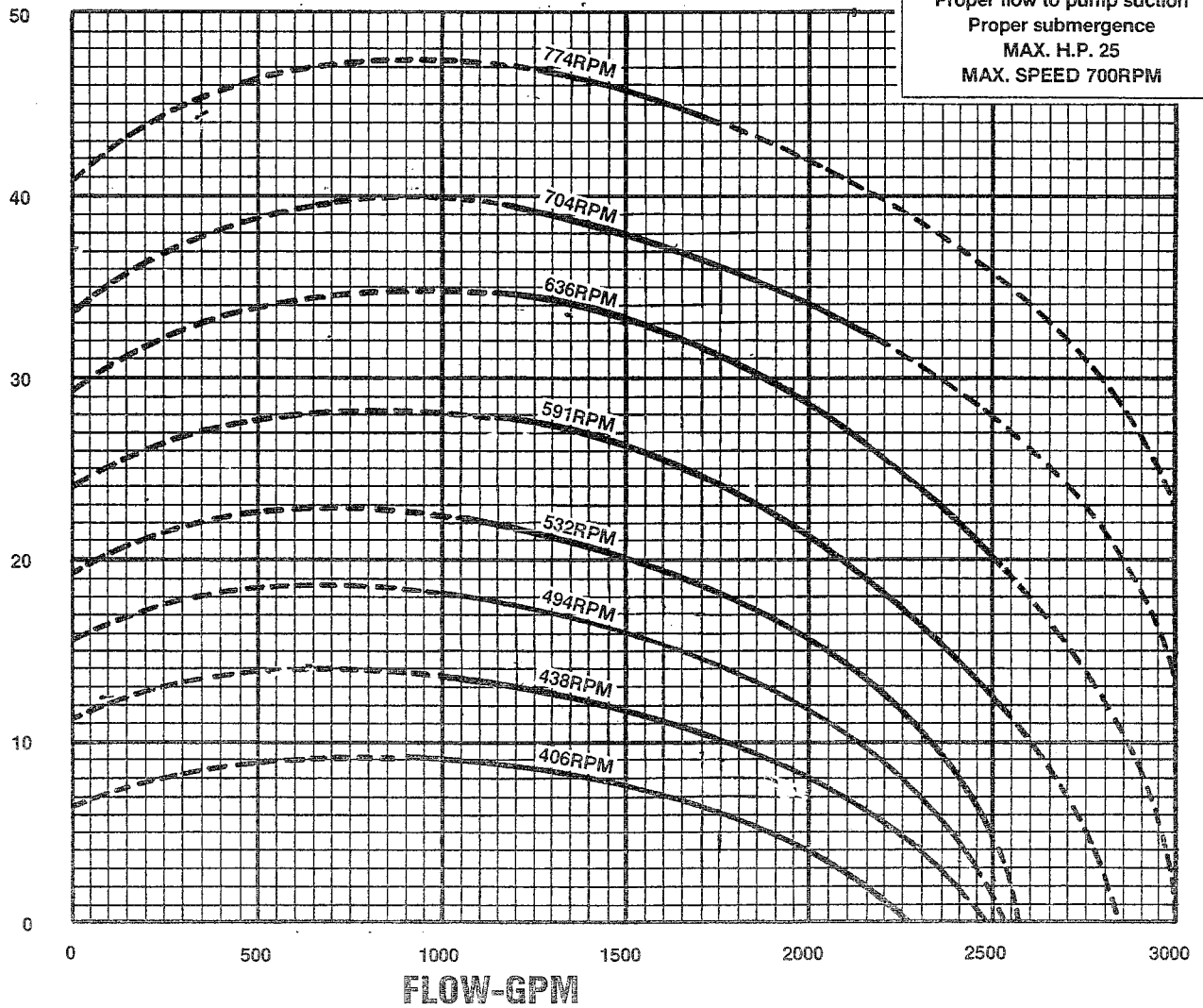


--- Pump is not to operate continuously in this area.

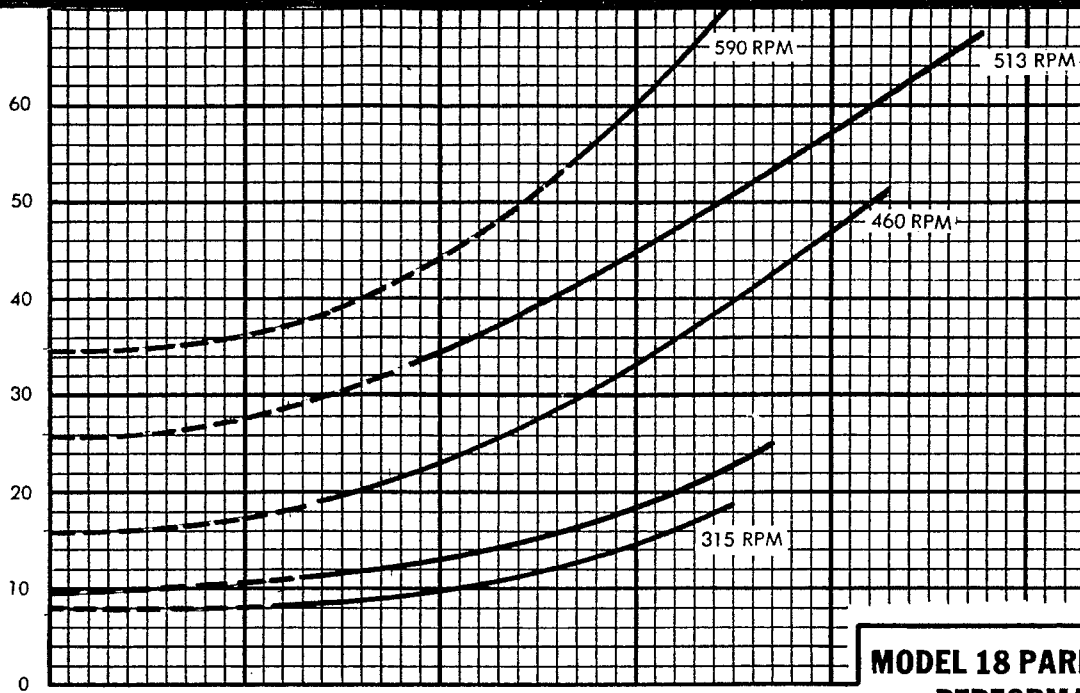
MODEL 16 PARMA MULTI-SERVICE PUMP PERFORMANCE CURVES

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 25
MAX. SPEED 700RPM

TOTAL HEAD FEET



HORSEPOWER

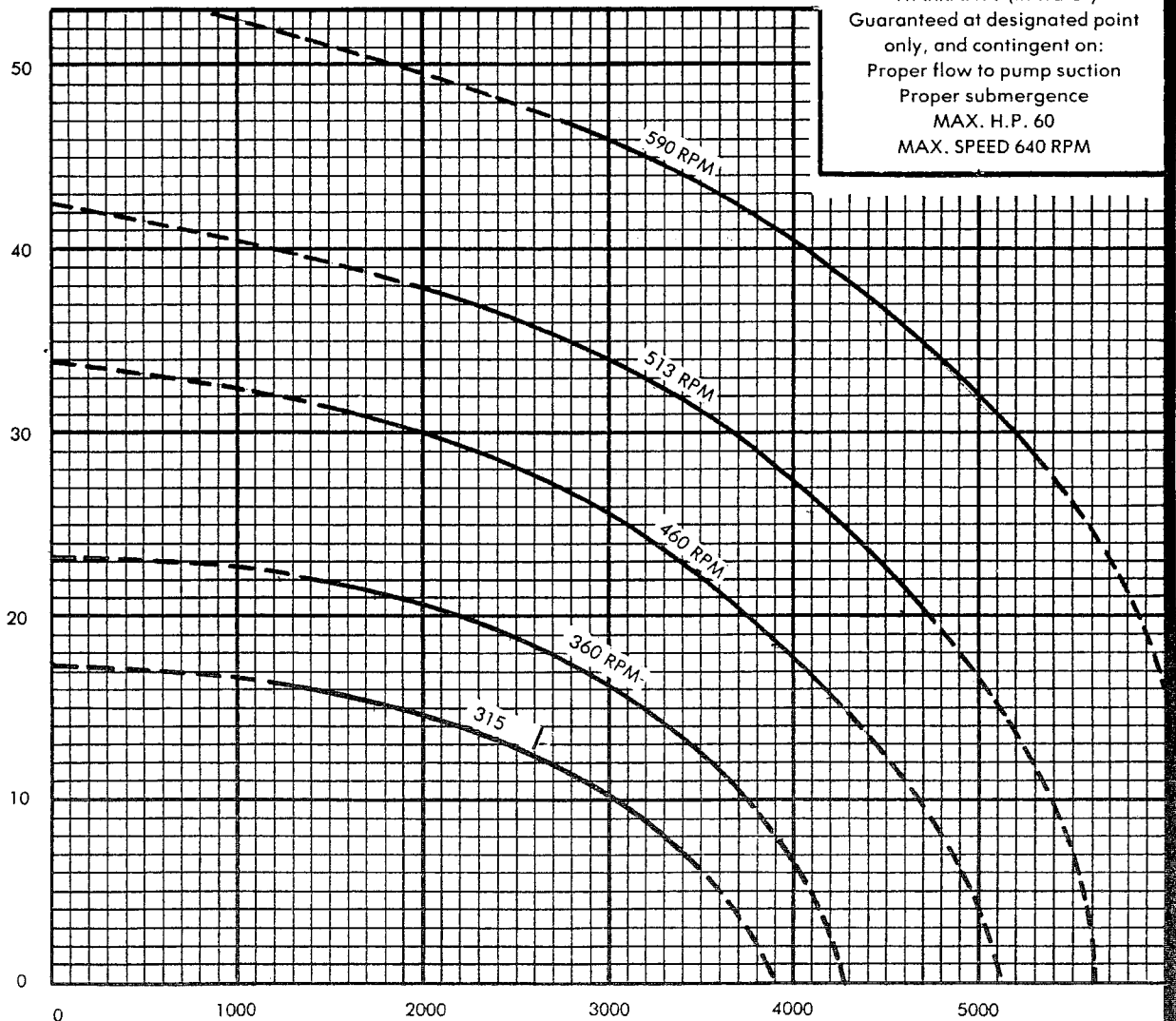


--- Pump is not to operate continuously in this area.

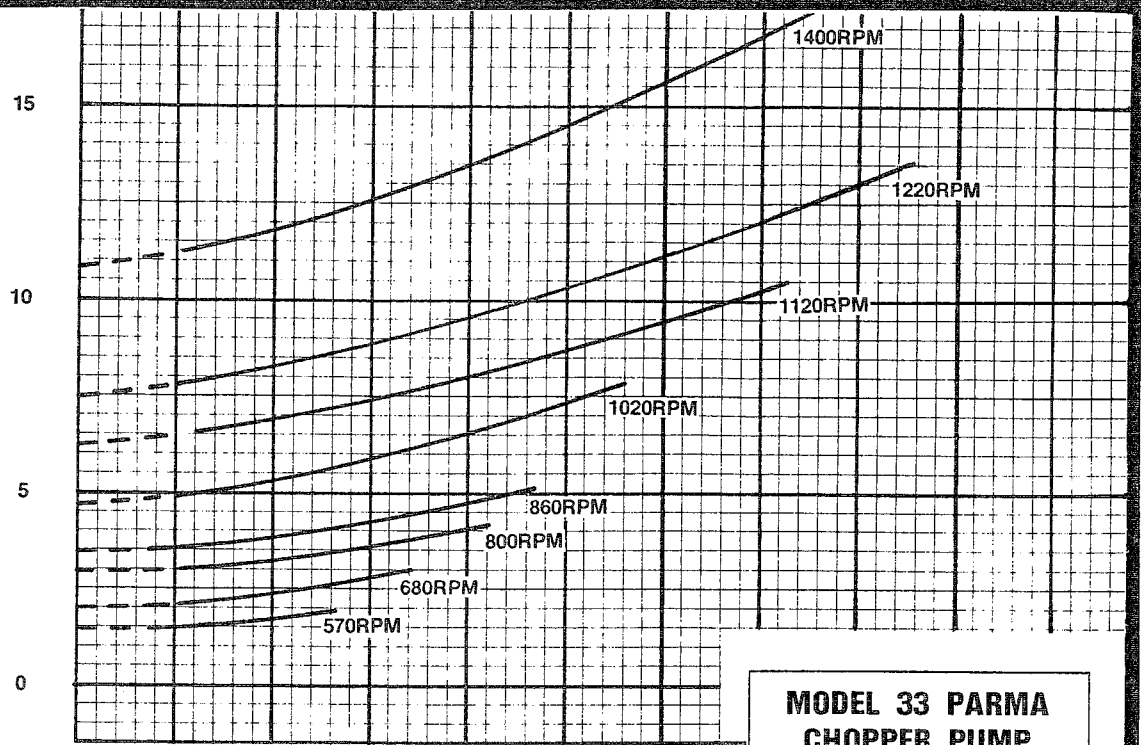
MODEL 18 PARMA PUMP PERFORMANCE CURVES

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 60
MAX. SPEED 640 RPM

TOTAL HEAD FEET



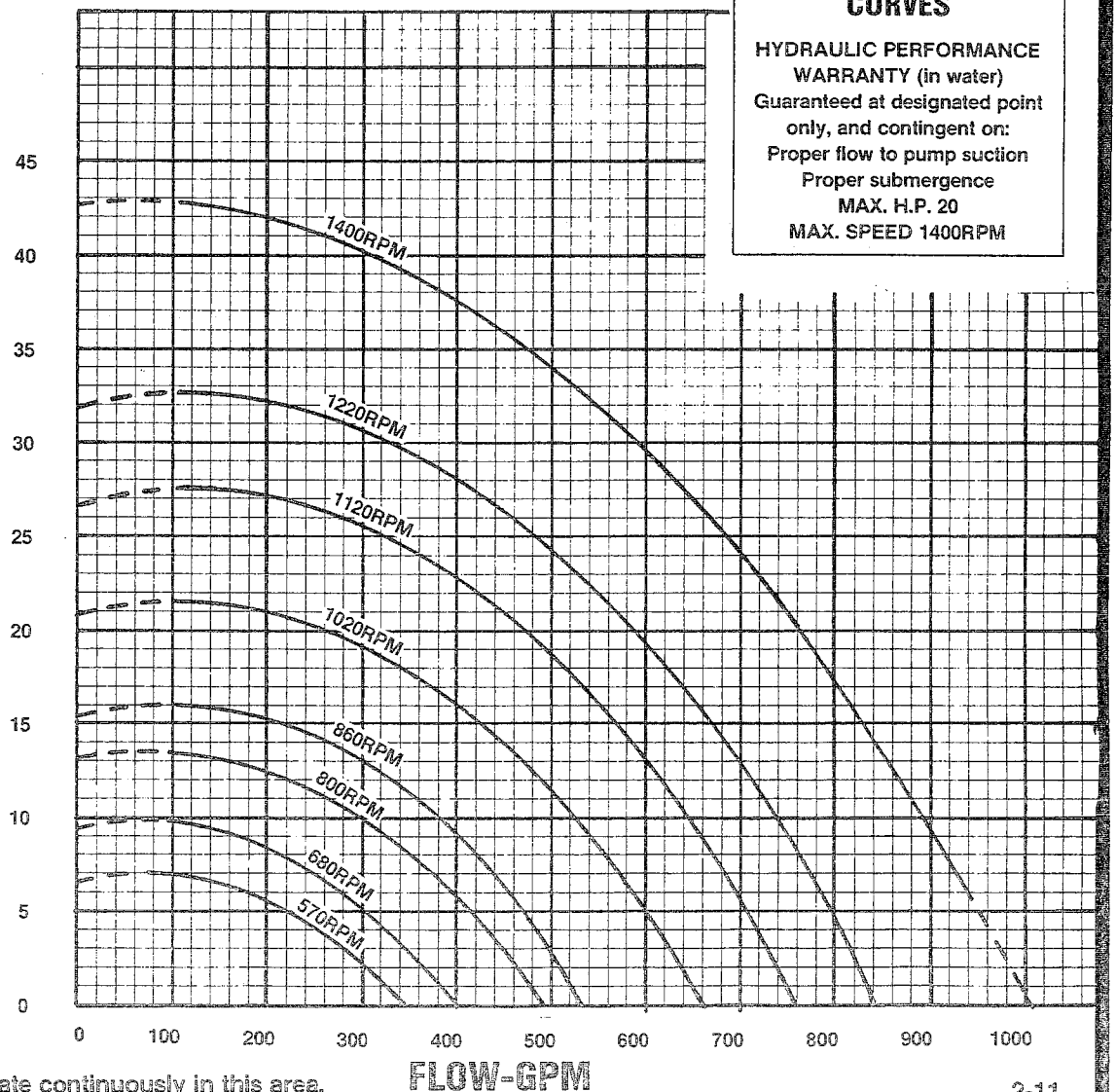
HORSEPOWER



**MODEL 33 PARMA
CHOPPER PUMP
PERFORMANCE
CURVES**

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 20
MAX. SPEED 1400RPM

TOTAL HEAD FEET



-- Pump is not to operate continuously in this area.

FLOW-GPM

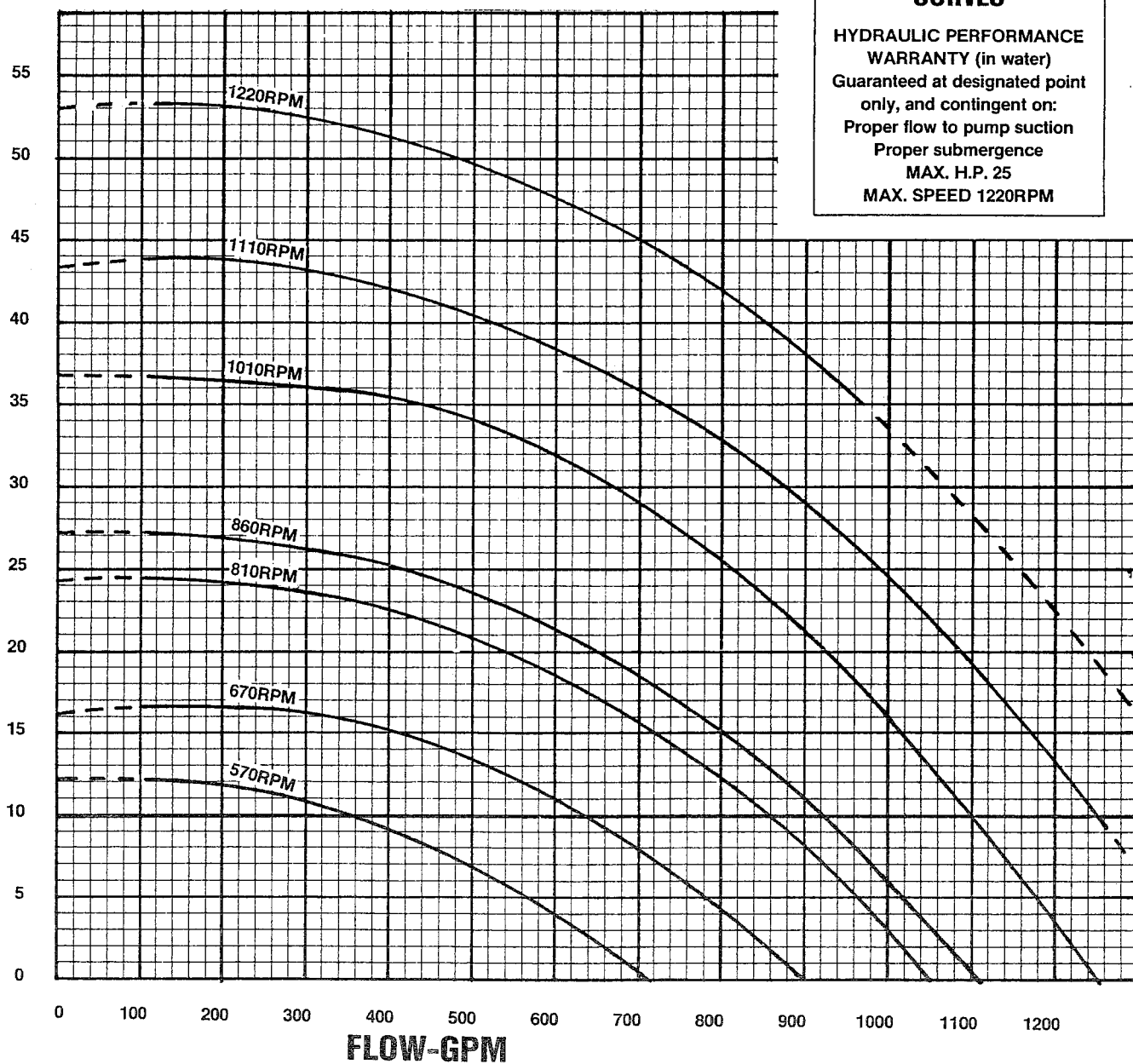
HORSEPOWER



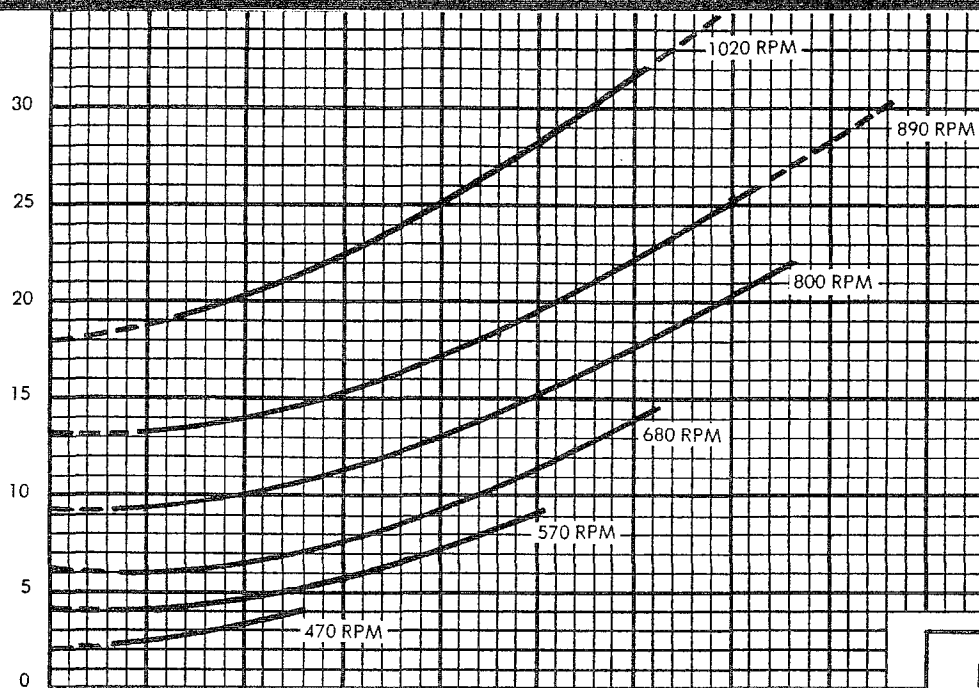
**MODEL 34 PARMA
CHOPPER PUMP
PERFORMANCE
CURVES**

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 25
MAX. SPEED 1220RPM

TOTAL HEAD FEET



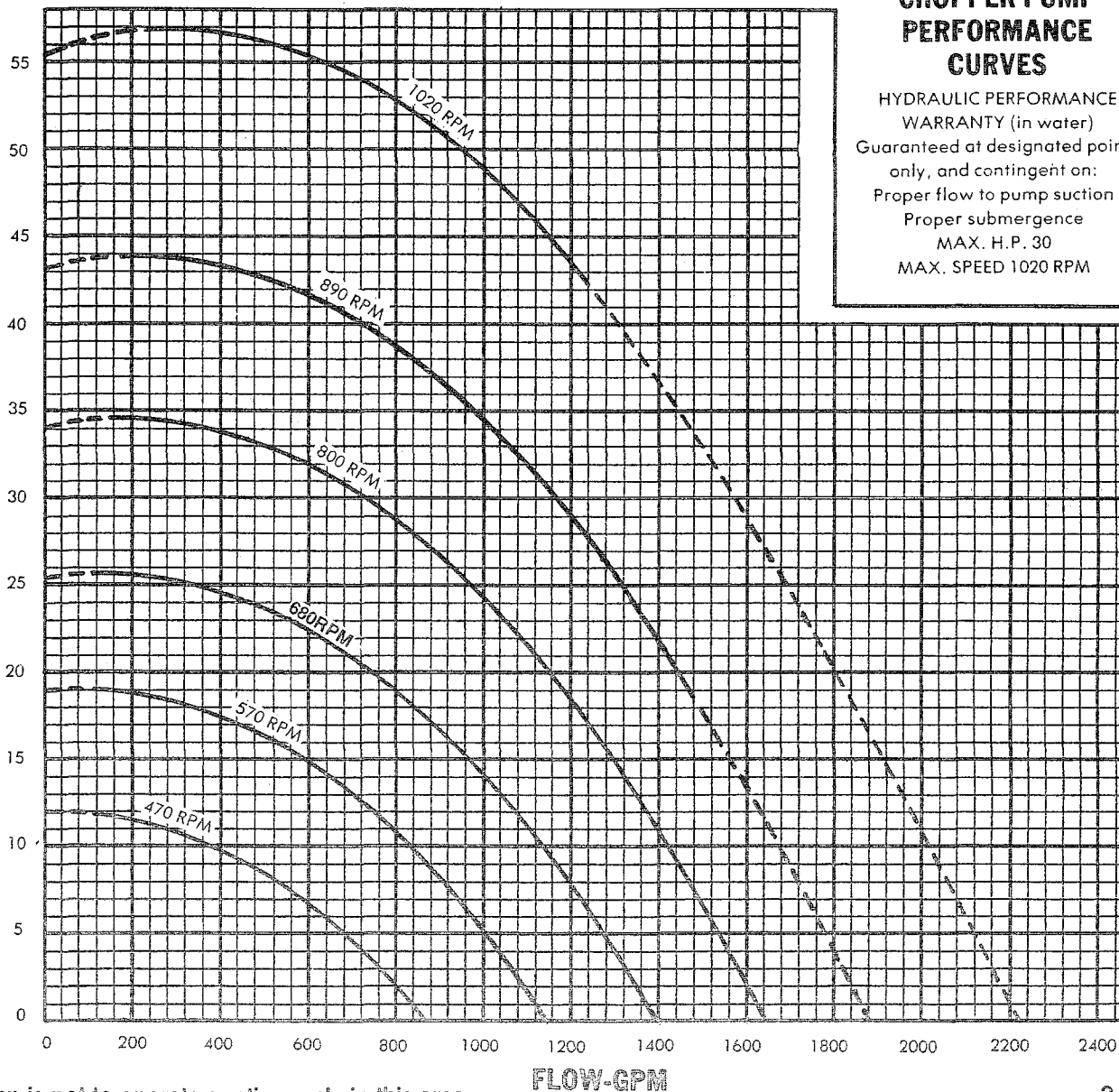
HORSEPOWER



MODEL 35 PARMA CHOPPER PUMP PERFORMANCE CURVES

HYDRAULIC PERFORMANCE
WARRANTY (in water)
Guaranteed at designated point
only, and contingent on:
Proper flow to pump suction
Proper submergence
MAX. H.P. 30
MAX. SPEED 1020 RPM

TOTAL HEAD FEET

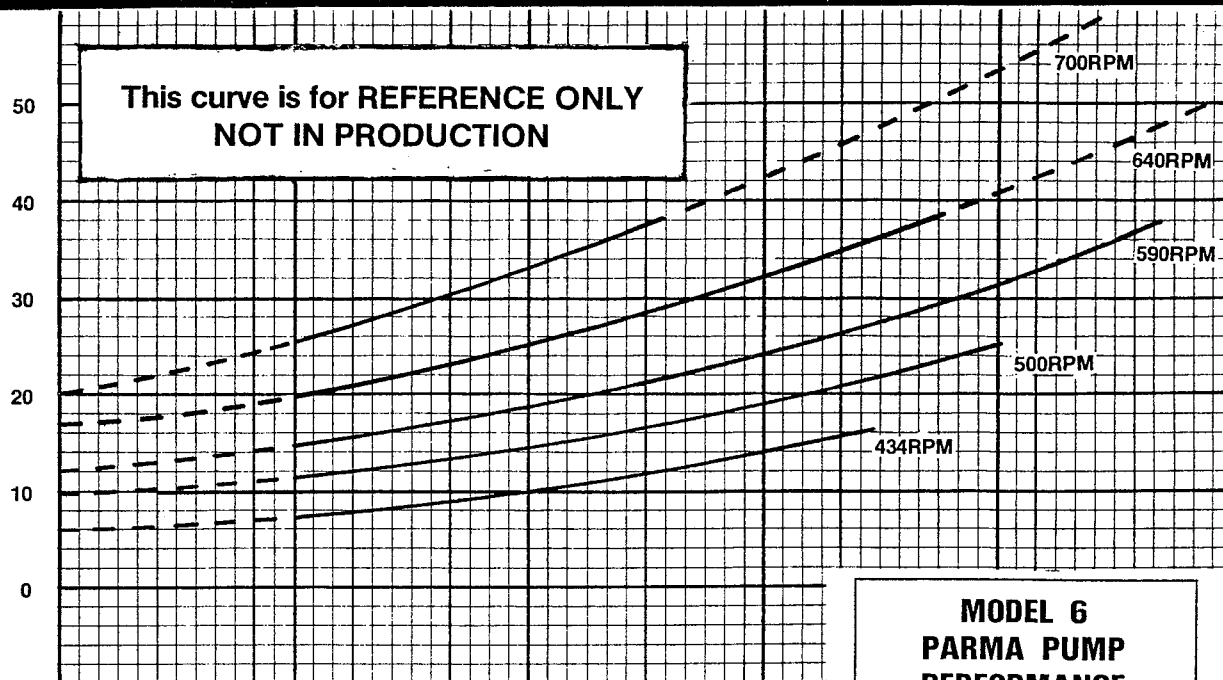


--- Pump is not to operate continuously in this area.

FLOW-GPM

--- Pump is not to operate continuously in this area.
 NOTICE: The Model 6 Parma Pump is no longer available after April 1, 1980.

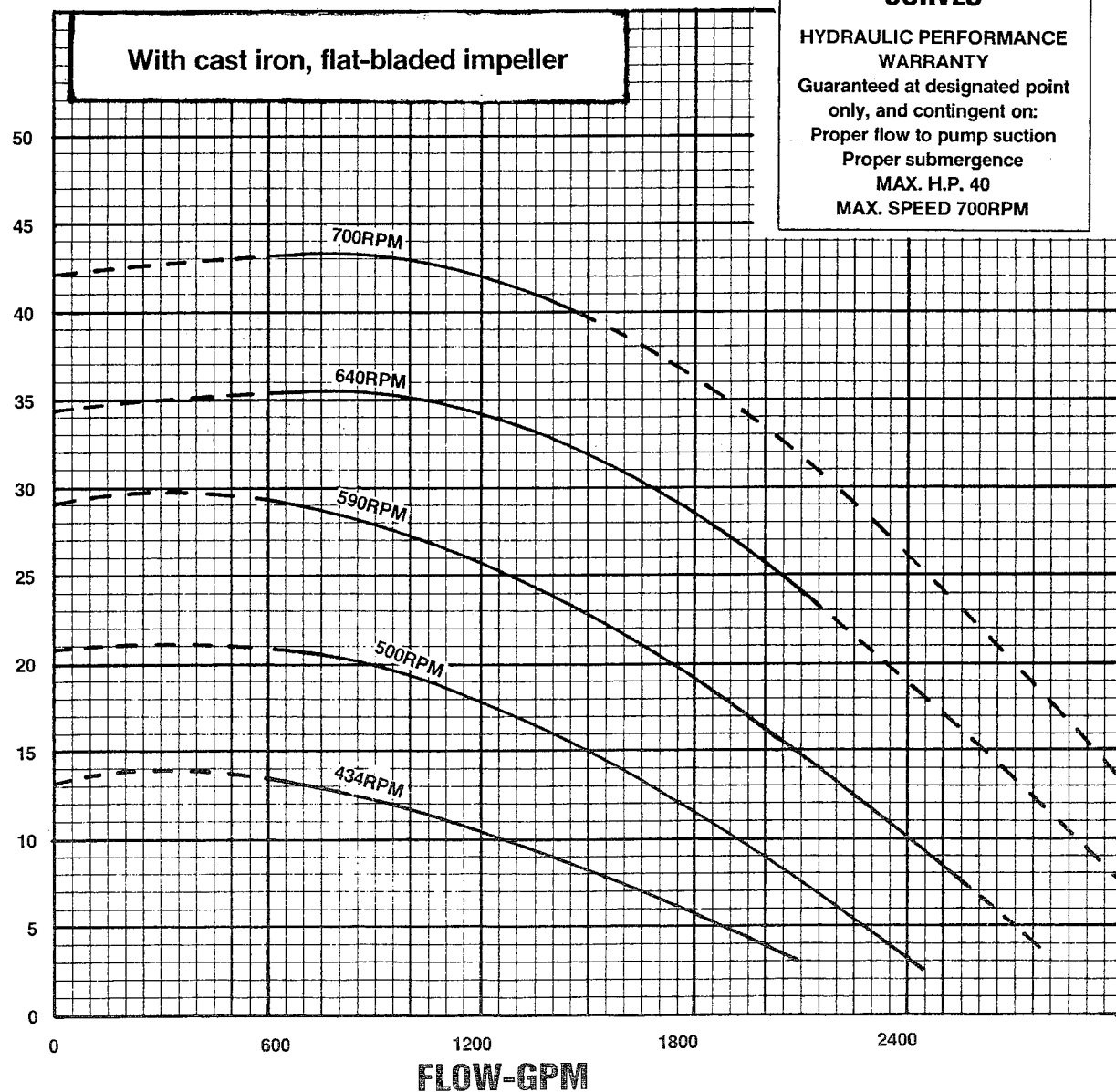
HORSEPOWER



**MODEL 6
 PARMA PUMP
 PERFORMANCE
 CURVES**

**HYDRAULIC PERFORMANCE
 WARRANTY**
 Guaranteed at designated point
 only, and contingent on:
 Proper flow to pump suction
 Proper submergence
 MAX. H.P. 40
 MAX. SPEED 700RPM

TOTAL HEAD FEET



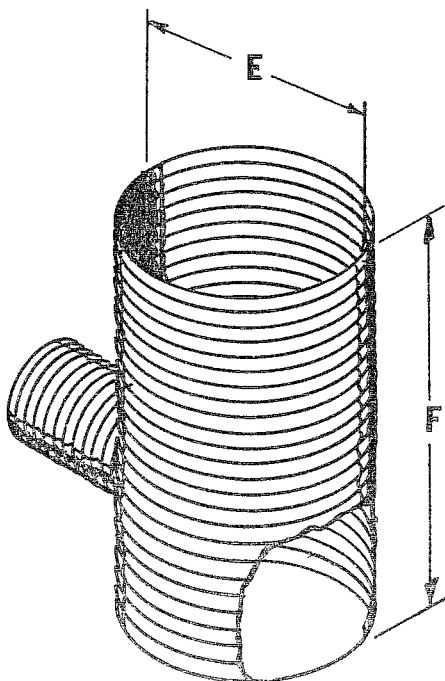
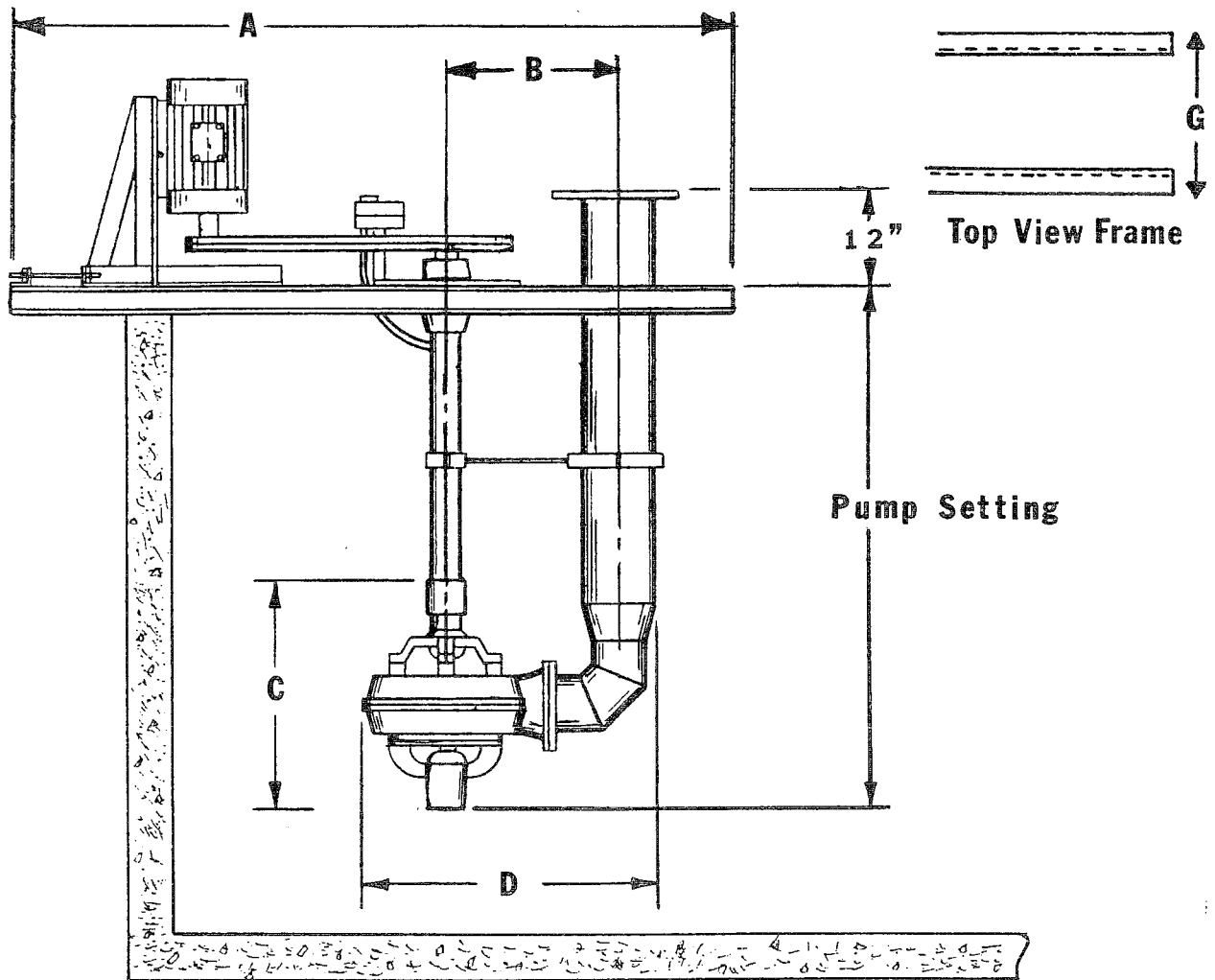
AGITATION HORSEPOWER

In the use of agitator assemblies with Parma Pumps, it is necessary to find the horsepower required during agitation once a pump speed (rpm) has been determined.

In most installations the pump will demand more horsepower during the agitation mode than during load-out. Once a pump model, speed, and motor are selected it is necessary to check the chart below to find the agitation horsepower. If the agitation horsepower shown is greater than that of the motor selected use a larger motor or slow the pump down to the speed required so that the motor will not overload.

MODEL	PUMP SPEED	AGITATION HP
34 Pump	1200 RPM	25
	1130 RPM	20
	1000 RPM	15
	875 RPM	10
35 Pump	975 RPM	30
	925 RPM	25
	890 RPM	20

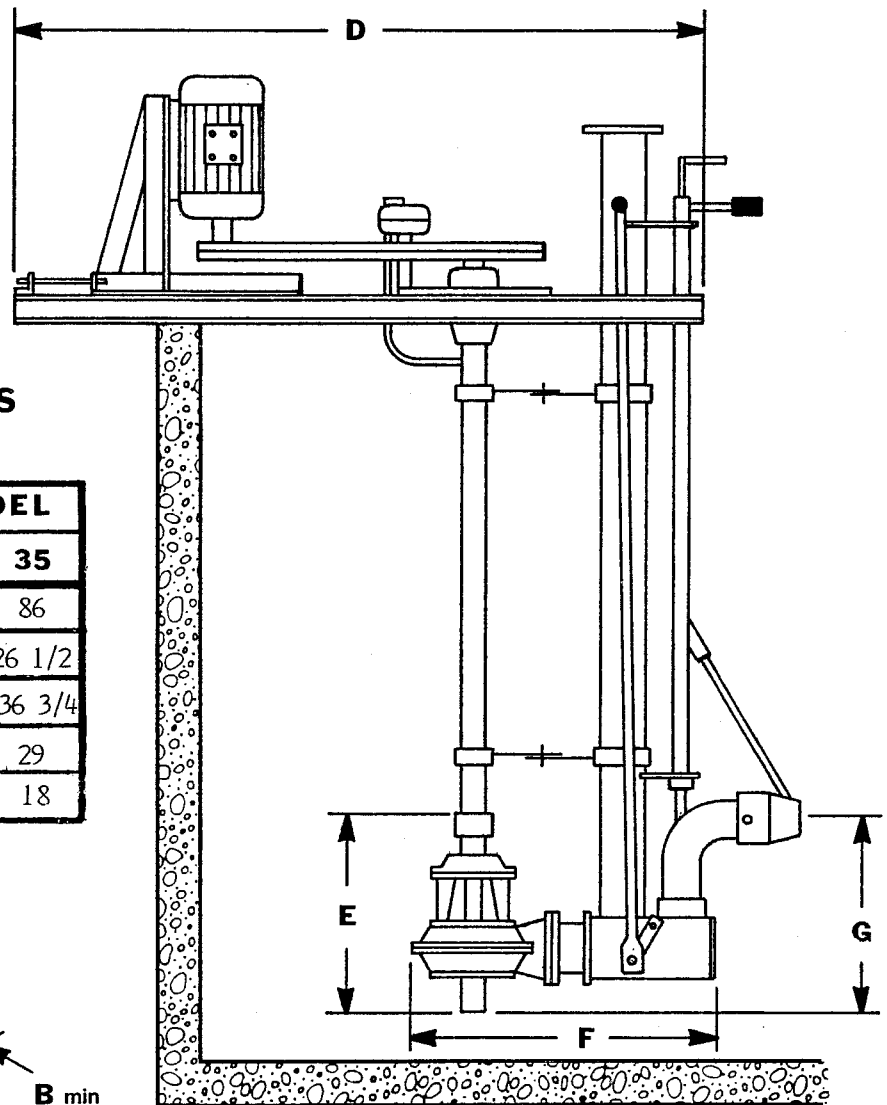
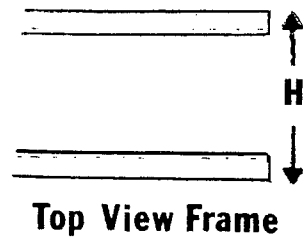
DIMENSIONAL DATA - Typical Water



	PUMP MODEL						
	11	12	13	14	15	16	18
A	86	86	86	86	86	86	98
B	11	12	13	17	19	24	32
C	15 1/2	16 1/2	17 1/2	20	20	21 1/2	21
D	18	22	23	28 1/2	33 1/2	41	51 1/2
E	24	24	24	30	36	42	60
F	+12	+12	+12	+12	+12	+12	+12
G	18	18	18	18	18	18	25

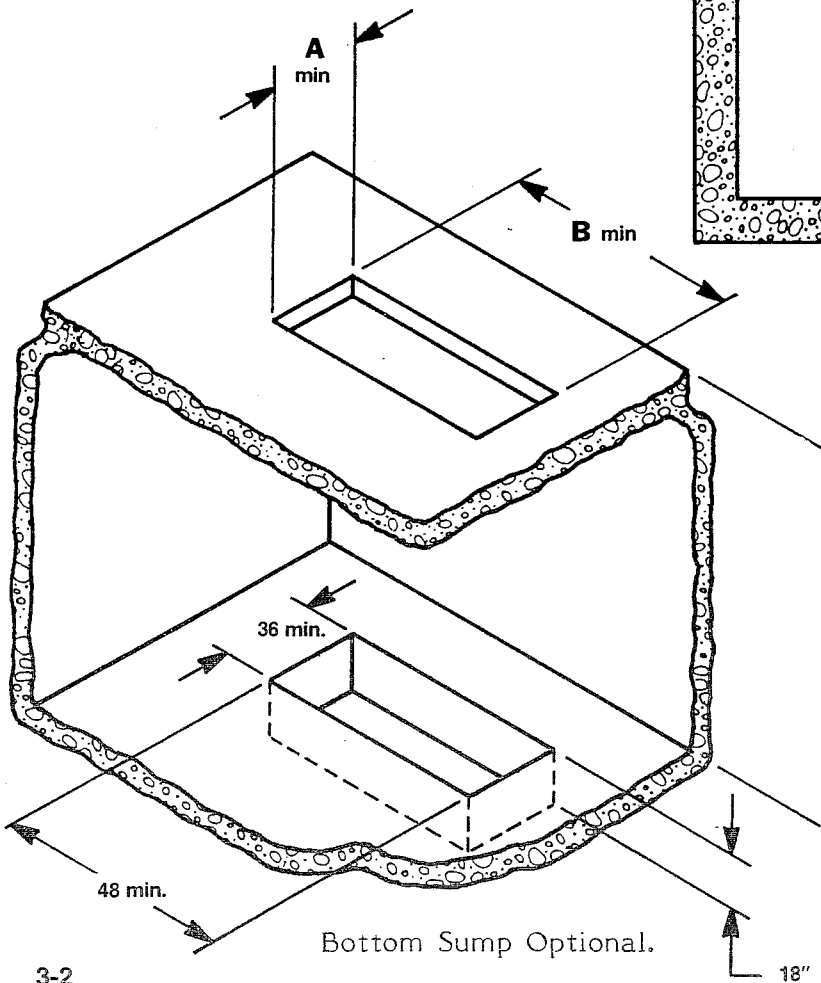
*F to be 12" more than setting length.

DIMENSIONAL DATA Typical Manure



PUMP DIMENSIONS

PUMP MODEL			
	33	34	35
D	86	86	86
E	23 1/2	26	26 1/2
F	32 1/2	34 1/2	36 3/4
G	29	29	29
H	18	18	18



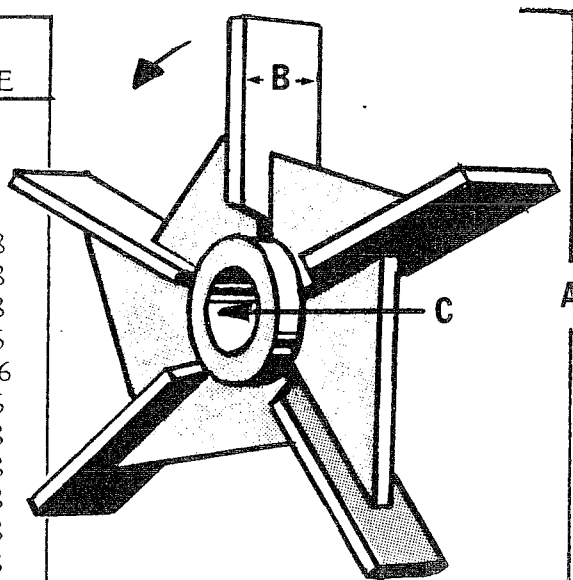
PIT DIMENSIONS

PUMP MODEL			
	33	34	35
A	18	24	24
B	33	35	37

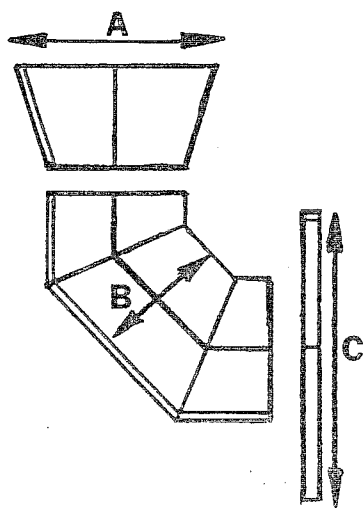
DIMENSIONAL DATA

IMPELLER

MODEL	PART #	A DIA	B	C BORE
1, 11	801251	7 1/4	1 1/8	1
2, 12	802251	8	1 7/8	1
3, 13	803251	8 1/2	2 7/8	1
4, 14	804251	10 1/2	3 7/8	1 3/8
4S, 5, 15	805251	12	4 1/8	1 3/8
6, 16	806251	15 1/2	5 7/8	1 3/8
16(1982)	816251*	15 1/2	5 7/8	1 15/16
8	807251	23 1/2	7 3/8	1 15/16
8S, 18	808251*	19 5/8	6 15/16	1 15/16
32	832251	8	1 7/8	1 3/8
33	833251	8 1/2	2 7/8	1 3/8
34	834251	10 1/2	3 1/2	1 3/8
35	835251	12	3 3/4	1 3/8
36	836251	15 1/2	5 1/2	1 3/8



*Curved vanes.



Discharge Elbows

MODEL	PART #	A	B	C
1, 11	801350	4	3	5 3/8
2, 12	802350	6	4	6 1/4
3, 13	802350	6	4	6 1/4
4, 14	804350	8	5	8 7/8
5, 15	805350	10	6	10 1/2
6, 16	806350	12	8	11 1/4
8	807350	14	10	13 7/8
8S, 18	808350	16	10	13 7/8

DIMENSIONAL DATA

Pump Shafts, Column Tubes, & Couplers

	11, 12, 13	14, 15	16-Pre 82	16 - 1982 & After	8, 8S, 18	32	33, 34, 35	36
Bowl Shaft	<u>801252</u> 1 x 19 1/2	<u>804252</u> 1 3/8x22 1/2	<u>806252</u> 1 3/8x23 1/2	<u>816252</u> 1 15/16 x 25 1/2	<u>808252</u> 1 15/16 x 24 1/16	<u>832252</u> 1 3/8x28 3/4	<u>833252</u> 1 3/8x28 3/4	<u>836252</u> 1 3/8x29 3/4
Short Drive Shaft	<u>801441</u> 1 x 34 3/8	<u>804441</u> 1 3/8x31 1/4	<u>804441</u> 1 3/8x31 1/4	<u>804441</u> 1 3/8x 31 1/4	<u>807449</u> 1 15/16x29	<u>832441</u> 1 x 31 1/4	<u>823441</u> 1 3/8x 31 1/4	<u>823441</u> 1 3/8x 31 1/4
Long Drive Shaft	<u>801461</u> 1 x 58 3/8	<u>804461</u> 1 3/8x55 1/4	<u>804461</u> 1 3/8x55 1/4	<u>804461</u> 1 3/8x55 1/4	<u>807469</u> 1 15/16x53	<u>832461</u> 1 x 55	<u>823461</u> 1 3/8 x 55	<u>823461</u> 1 3/8 x 55
Intermediate Shaft 4'	<u>801446</u> 1 x 48	<u>804446</u> 1 3/8 x 48	<u>804446</u> 1 3/8 x 48	<u>804446</u> 1 3/8 x 48	<u>807446</u> 1 15/16 x 48	<u>801446</u> 1 x 48	<u>804446</u> 1 3/8 x 48	<u>804446</u> 1 3/8 x 48
Intermediate Shaft 8'	<u>801481</u> 1 x 96	<u>804481</u> 1 3/8 x 96	<u>804481</u> 1 3/8 x 96	<u>804481</u> 1 3/8 x 96	NA	<u>801481</u> 1 x 96	<u>804481</u> 1 3/8 x 96	<u>804481</u> 1 3/8 x 96
Short Drive Column	<u>801442</u> 2 x 31 1/8	<u>804442</u> 2 1/2 x 25 3/4	<u>804442</u> 2 1/2x25 3/4	<u>804442</u> 2 1/2x25 3/4	<u>807442</u> 4 x 24	<u>801442</u> 2 x 33 1/8	<u>804442</u> 2 1/2 x 25 3/4	<u>804442</u> 2 1/2 x 25 3/4
Long Drive Column	<u>801462</u> 2 x 57 1/8	<u>804462</u> 2 1/2x49 3/4	<u>804462</u> 2 1/2x49 3/4	<u>804462</u> 2 1/2x49 3/4	<u>807463</u> 4 x 47 9/16	<u>801462</u> 2 x 57 1/8	<u>804462</u> 2 1/2x49 3/4	<u>804462</u> 2 1/2x49 3/4
Intermediate Column	<u>801447</u> 2 x 48	<u>804447</u> 2 1/4 x 48	<u>804447</u> 2 1/4 x 48	<u>804447</u> 2 1/4 x 48	<u>807447</u> 4 x 47 1/2	<u>801447</u> 2 x 48	<u>804447</u> 2 1/2 x 48	<u>804447</u> 2 1/2 x 48
Shaft Coupling (Bore x Length)	<u>890250</u> 1 x 2 3/4	<u>890251</u> 1 3/8 x 3	<u>890251</u> 1 3/8 x 3	<u>890251</u> 1 3/8 x 3	<u>890252</u> 1 15/16 x 3	<u>890250</u> 1 x 2 3/4	<u>890251</u> 1 3/8 x 3	<u>890251</u> 1 3/8 x 3
Column Coupling (Bore x Length)	890201 2 x 2 1/4	890202 2 1/2 x 3	890202 2 1/2 x 3	890202 2 1/2 x 3	890205 4 x 3 1/2	890201 2 x 2 1/4	890202 2 1/2 x 3	890202 2 1/2 x 3



Parma Company

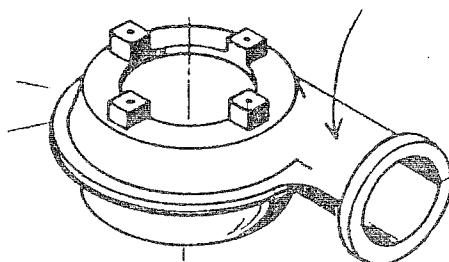
Water & Waste Pumps
Sugar Beet Harvesters
Curl Onion & Potato Equipment

P.O. Box 190 • 101 Main St. • Parma, Idaho 83660 • (208) 722-5116

PARMA PUMP MODEL IDENTIFICATION

New Model #	Old Model #	Casting # Located on top of Bowl	Impeller Diameter	Impeller Fin Width	Discharge Pipe Size
11 M-S	1	1	7 1/4	1 1/8	4"
12 M-S	2	2	8	1 7/8	6"
13 M-S	3	3	8 1/2	2 7/8	6"
14 M-S	4	4	10 1/2	3 7/8	8"
15 M-S	5, 4S	4S	12	4 1/8	10"
16 M-S	6	6	15 1/2	5 7/8	12"
None	8	None	23 1/2	7 3/8	14"
18 M-S	8S	None	19 5/8	6 15/16	16"
33 Chopper	23	3	8 1/2	2 7/8	Varies
34 Chopper	24	4	10 1/2	3 1/2	Varies
35 Chopper	25	4S	12	3 3/4	Varies
36 Chopper	26	6	15 1/2	5 1/2	Varies

Casting # located here



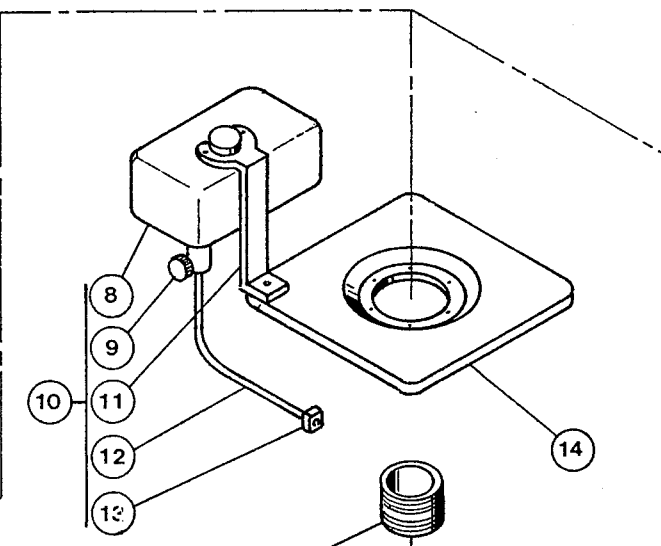
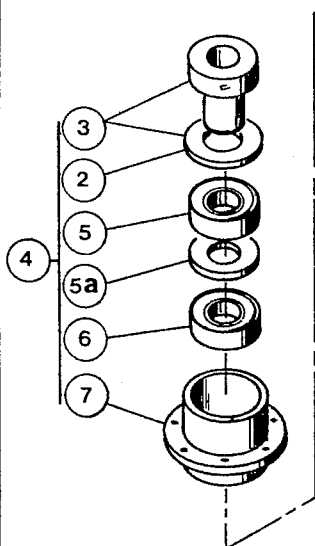
REPAIR PARTS LISTINGS

PARMA PUMP PRODUCTS

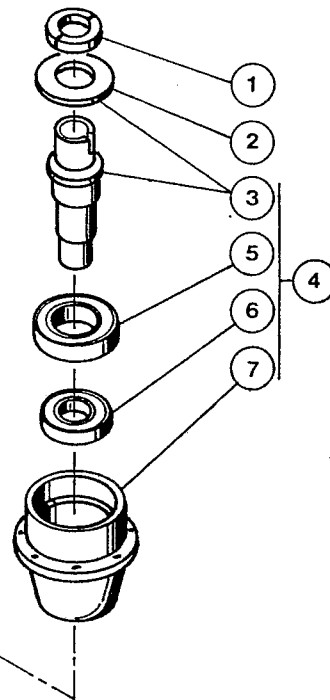
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COLUMN & SHAFT ASSEMBLIES	4 - 10
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AGITATOR ASSEMBLY	4 - 13
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ACCESSORIES	
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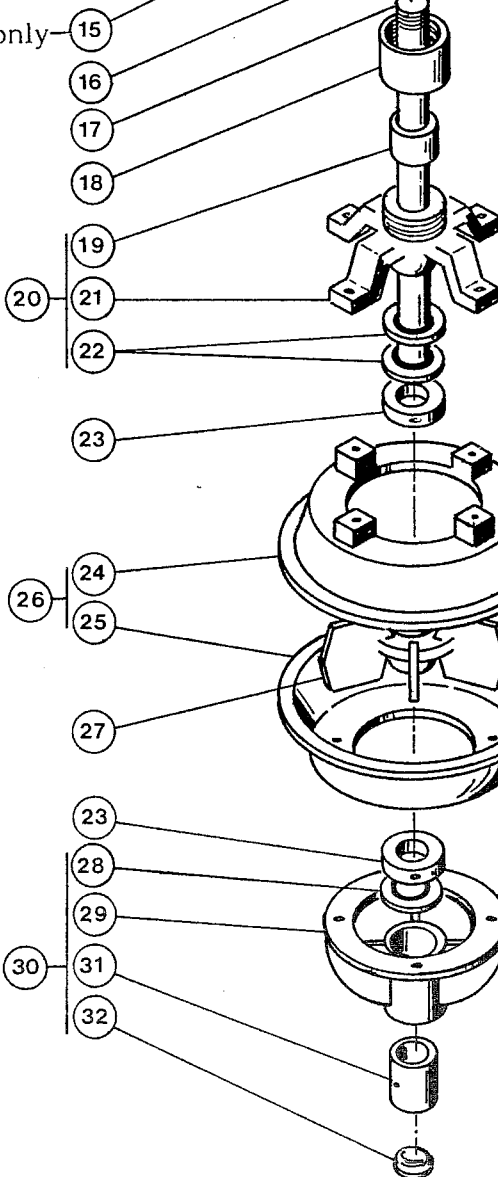
Pumps #11, #12, #13



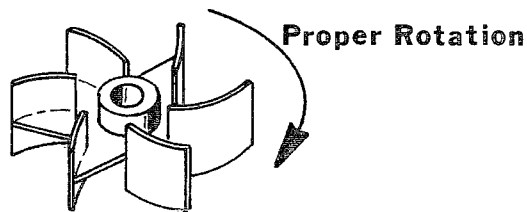
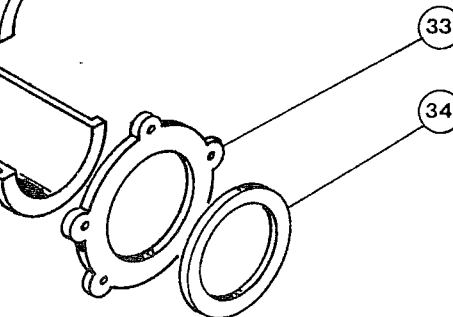
Pumps #14, #15, #16



Used on #11 Pump only



PARMA M-S PUMP UNIT



NOTE: Greaseline kit available for 1982 Model 16.
4-2 Specify setting length.

This impeller is standard
in #16 after 2-1-82.

PARMA M-S PUMP UNIT

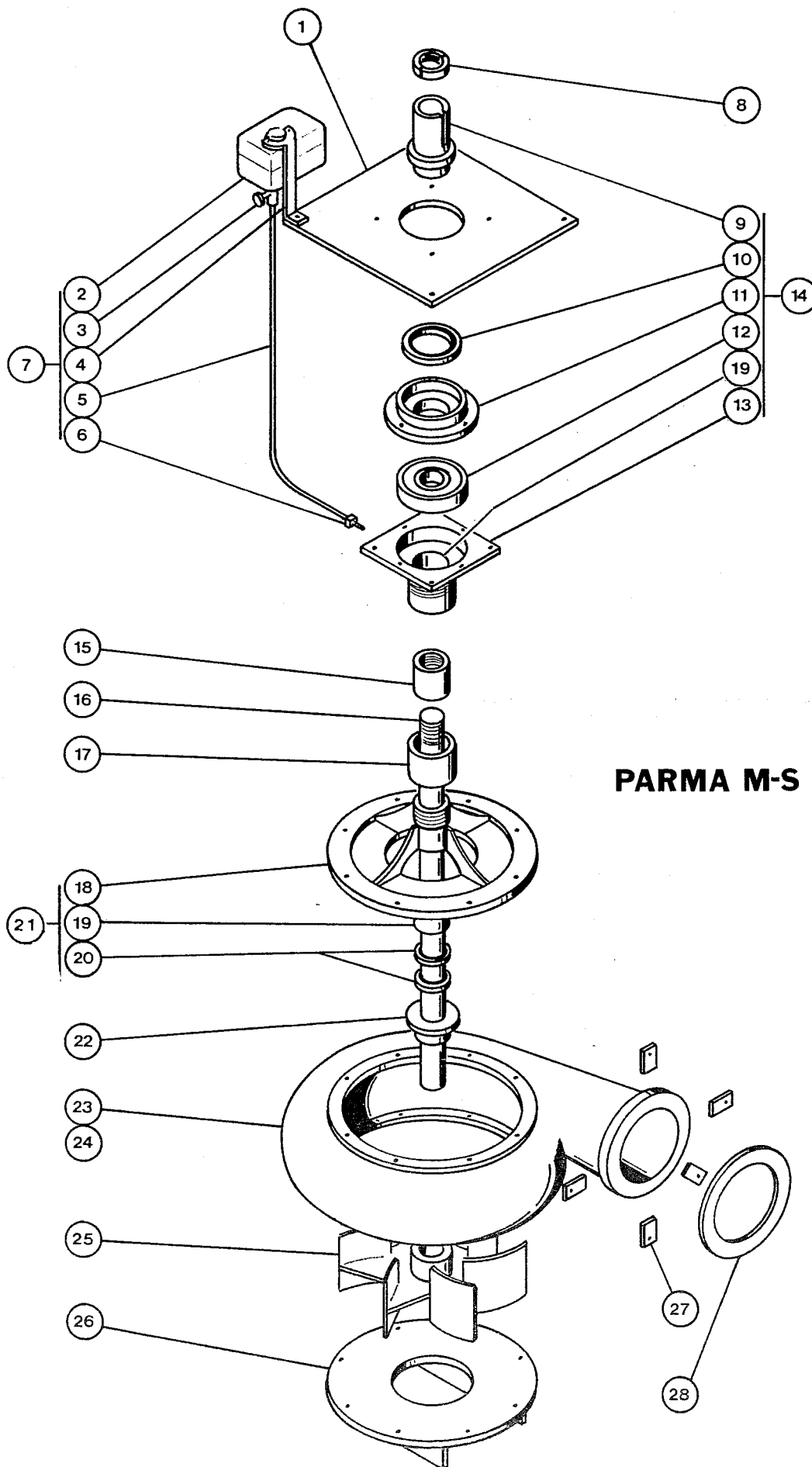
PRE 82 1-3/8" shaft	1982 1-15/16" shaft
-------------------------------	-------------------------------

Itm	Description	MODEL 11	MODEL 12	MODEL 13	MODEL 14	MODEL 15	MODEL 6	MODEL 16	Q t
1	Set Collar	-----	-----	-----	804054	804054	804054	804054	1
2	Dust Cover	801049	801049	801049	804055	804055	804055	804055	1
3	Bearing Quill	802051	802051	802051	804056	804056	804056	804056	1
4	Drive Bearing Assy.	802050	802050	802050	804050	804050	804050	804050	1
5	Ball Bearing	890030	890030	890030	890031	890031	890031	890031	1
5a	Spacer (5-83)	890021	890021	890021	-----	-----	-----	-----	1
6	Ball Bearing (5-83)	890030	890030	890030	890032	890032	890032	890032	1
7	Drive Bearing Hsg.	802052	802052	802052	804052	804052	804052	804052	1
8	Oil Reservoir	890301	890301	890301	890301	890301	890301	890301	1
9	Sight Valve	890302	890302	890302	890302	890302	890302	890302	1
10	Oiler Assembly	801400	801400	801400	801400	801400	801400	801400	1
11	Oil Reservoir Brkt	801402	801402	801402	801402	801402	801402	801402	1
12	Tubing	801401	801401	801401	801401	801401	801401	801401	1
13	Male Pipe Connector	890303	890303	890303	890303	890303	890303	890303	1
14	Drive Base	801070	801070	801070	801070	801070	801070	801070	1
15	Column Adaptor	801090	-----	-----	-----	-----	-----	-----	1
16	Shaft Coupling	890250	890250	890250	890251	890251	890251	890251	1
17	Bowl Shaft	801252	801252	801252	804252	804252	806252	816252	1
18	Column Coupling	890201	890201	890201	890202	890202	890202	890202	1
19	Sleeve Brg (Pre 5-92)	890024	890024	890024	890025	890025	890025	890023	1
	Sleeve Brg (5-92)	-----	-----	-----	890046	890046	-----	-----	2
20	Top Brg Assy(Pre5-92)	801150	801150	801150	804150	804150	806150	816150	1
	Top Brg Assy (5-92)	-----	-----	-----	834150	834150	-----	-----	1
22	Seal (Pre 5-92)	890098	890098	890098	890097	890097	890097	890096	2
	Seal (5-92)	-----	-----	-----	890045	890045	-----	-----	2
23	Bearing Collar	801152	801152	801152	804152	804152	804152	807152	2
24	Top Bowl Half	811201	812201	813201	814201	815201	816201	816201	1
25	Bottom Bowl Half	811202	812202	813202	814202	815202	816202	816202	1
26	Bowl Set	811200	812200	813200	814200	815200	816200	816200	1
27	Impeller	801251	802251	803251	804251	805251	806251	816251	1
28	Seal (#16 Only)	-----	-----	-----	-----	-----	-----	890096	1
30	Bottom Bearing Assy.	-----	802300	802300	804300	804300	804300	816310	1
31	Sleeve Brg (Pre 7-91)	-----	890026	890026	890027	890027	890027	890023	1
	Sleeve Brg (7-91)	-----	-----	-----	890047	890047	-----	-----	1
32	Expansion Plug(Pre91)	-----	890350	890350	890351	890351	890351	880007	1
	Expansion Plug (7-91)	-----	-----	-----	890352	890352	-----	-----	1
33	Discharge Clamp	801354	802354	802354	804354	805354	806354	806354	1
34	Gasket	801355	802355	802355	804355	805355	806355	806355	1

Note: (See bold above) Some early Model 16 bottom bearing assemblies used 1-890305 seal (2 1/4" O.D.) and 1-890034 sleeve bearing (2 7/16" O.D.) Requires a 998911 retaining ring.

Items #21 & #29 (Housing only) are replaced by Items #20 & #30 (Assembly) respectively.

(rev.) 4-3



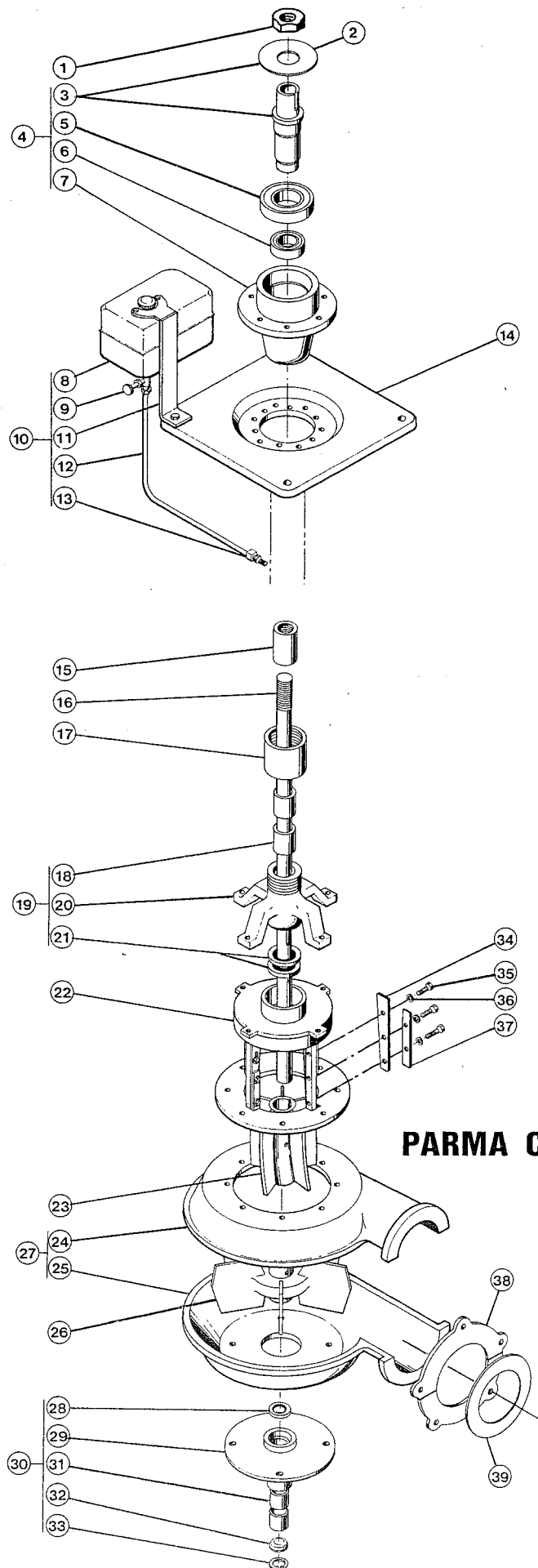
PARMA M-S PUMP UNIT

PARMA M-S PUMP UNIT

ITEM	DESCRIPTION	MODEL 8	MODEL 18	QTY.
1	Drive Base	807075	807075	1
2	Oil Reservoir	890301	890301	1
3	Sight Valve	890302	890302	1
4	Oil Reservoir Bracket	801402	801402	1
5	Tubing	801401	801401	1
6	Male Pipe Connector	890303	890303	1
7	Oiler Assembly	801400	801400	1
8	Adjusting Nut	807055	807055	1
9	Bearing Quill	807057	807057	1
10	Seal	-----	807043	1
11	Seal Holder	-----	807042	1
12	Ball Bearing	890035	890035	1
13	Drive Bearing Housing	807058	807058	1
14	Drive Bearing Assembly	807041	807041	1
15	Shaft Coupling	890252	890252	1
16	Bowl Shaft	808252	*808252	1
17	Column Coupling	890205	890205	1
18	Top Bearing Housing	807155	808155	1
19	Sleeve Bearing	890034	890034	2
20	Seal	890096	890096	2
21	Top Bearing Assembly	807154	808154	1
22	Bearing Collar	807152	807152	1
23	Top Bowl	807201	**808201	1
24	Bottom Bowl	807202	**-----	1
25	Impeller	807251	808251	1
26	Bowl Flange Pad	-----	808362	1
27	Discharge Clamp	807354	807354	5
28	Gasket	807355	808355	1

*One piece shaft 1980 and after -	<u>Part No.</u>	<u>Description</u>
	100373	Pump Shaft - 6'
	100374	Pump Shaft - 8'
	100375	Pump Shaft - 10'
	100376	Pump Shaft - 12'

**One piece bowl.



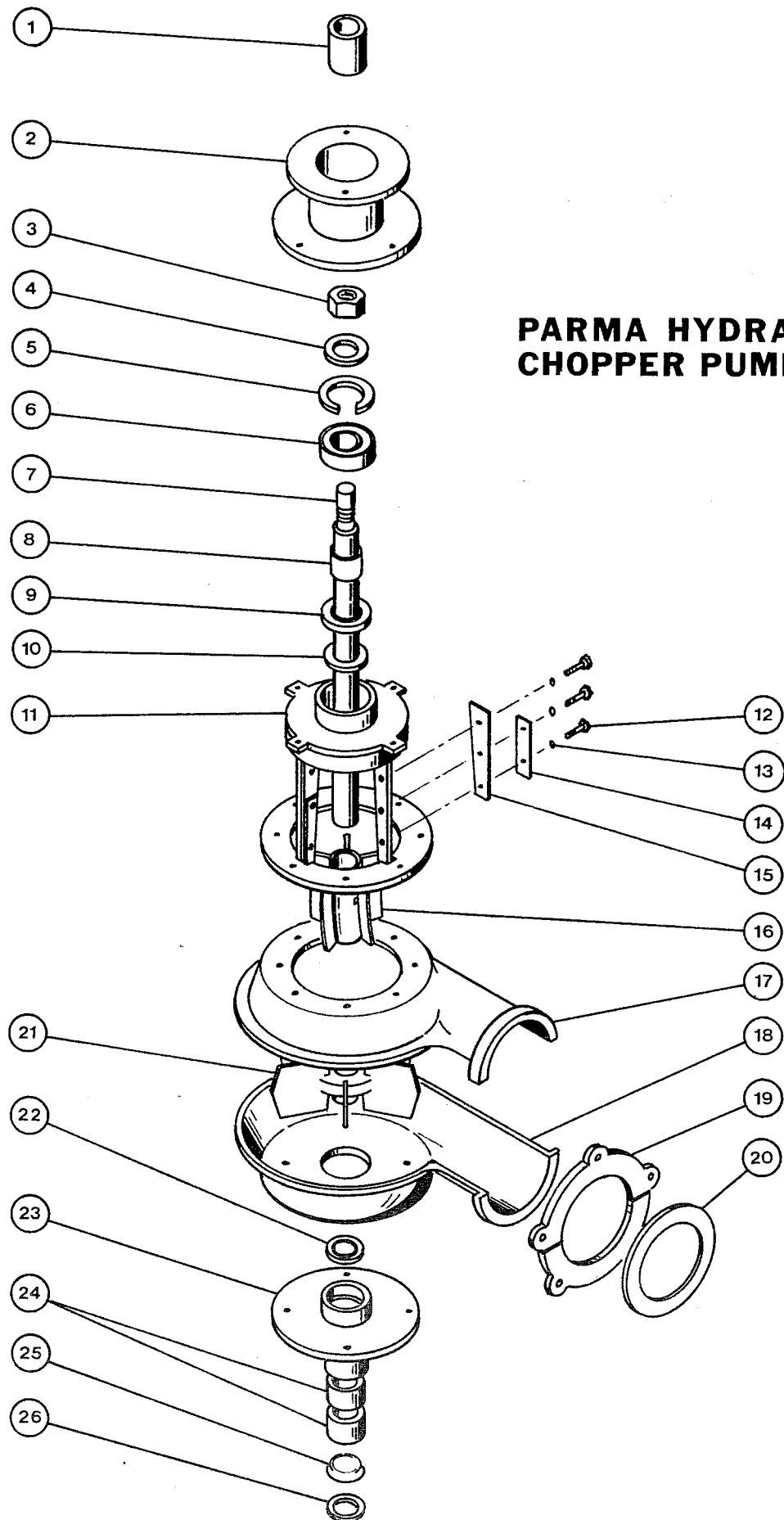
PARMA CHOPPER PUMP UNIT

PARMA CHOPPER PUMP UNIT

1982 & older 1-3/8" shaft
1983 & newer 1-15/16" shaft

ITEM	DESCRIPTION	MODEL 33	MODEL 34	MODEL 35	MODEL 36	MODEL 36	QTY
1	Adjusting Nut	833810	833810	833810	833810	833810	1
2	Dust Cover	804055	804055	804055	804055	804055	1
3	Brg. Quill	804056	804056	804056	804056	804056	1
4	Drive Brg. Assy.	804050	804050	804050	804050	804050	1
5	Ball Bearing	890031	890031	890031	890031	890031	1
6	Ball Bearing	890032	890032	890032	890032	890032	1
7	Drive Brg. Hsg.	804052	804052	804052	804052	804052	1
8	Oil Reservoir	890301	890301	890301	890301	890301	1
9	Sight Valve	890302	890302	890302	890302	890302	1
10	Oiler Assembly	801400	801400	801400	801400	801400	1
11	Oil Reservoir Bkt.	801402	801402	801402	801402	801402	1
12	Tubing	801401	801401	801401	801401	801401	1
13	Male Pipe Conn.	890303	890303	890303	890303	890303	1
14	Drive Base	801070	801070	801070	801070	801070	1
15	Shaft Coupling	890251	890251	890251	890251	890251	1
16	Bowl Shaft	833252*	833252*	833252*	836252*	836253	1
17	Column Coupling	890202	890202	890202	890202	890202	1
18	Sleeve Bearing	890046	890046	890046	890046	(890023)	2 (1)
19	Top Brg. Assy.	834150	834150	834150	834150	816150	1
20	Top Brg. Housing	834151	834151	834151	834151	816151	1
21	Seal	890045	890045	890045	890045	890096	2
22	Shear Housing	833801	833801	833801	833801	836254	1
23	Shear Hub	833805	833805	833805	833805	836255	1
24	Top Bowl	823201	824201	825201	826201	826201	1
25	Bottom Bowl	813202	814202	815202	816202	816202	1
26	Impeller	833251	834251	835251	836251	836250	1
27	Bowl Set	823200	824200	825200	826200	826200	1
28	Seal	890044	890044	890044	890044	890096	1
29	Bottom Brg. Hsg.	833301	834301	834301	834301	816301	1
30	Bottom Brg. Assy.	833300	834300	834300	834300	816310	1
31	Sleeve Bearing	890046	890046	890046	890046	(890023)	2 (1)
32	Expansion Plug	890352	890352	890352	890352	-----	1
33	Retaining Ring	998917	998917	998917	998917	880007	1
34	Shear Blade	833806	833806	833806	833806	833806	4
35	Locking Bolt	890001	890001	890001	890001	890001	12
36	Flat Washer	890002	890002	890002	890002	890002	12
37	Shear Bar	833809	833809	833809	833809	833809	4
38	Discharge Clamp	802354	804354	805354	806354	806354	1
39	Gasket	802355	804355	805355	806355	806355	1

*One piece shaft on certain models - see page 4-10



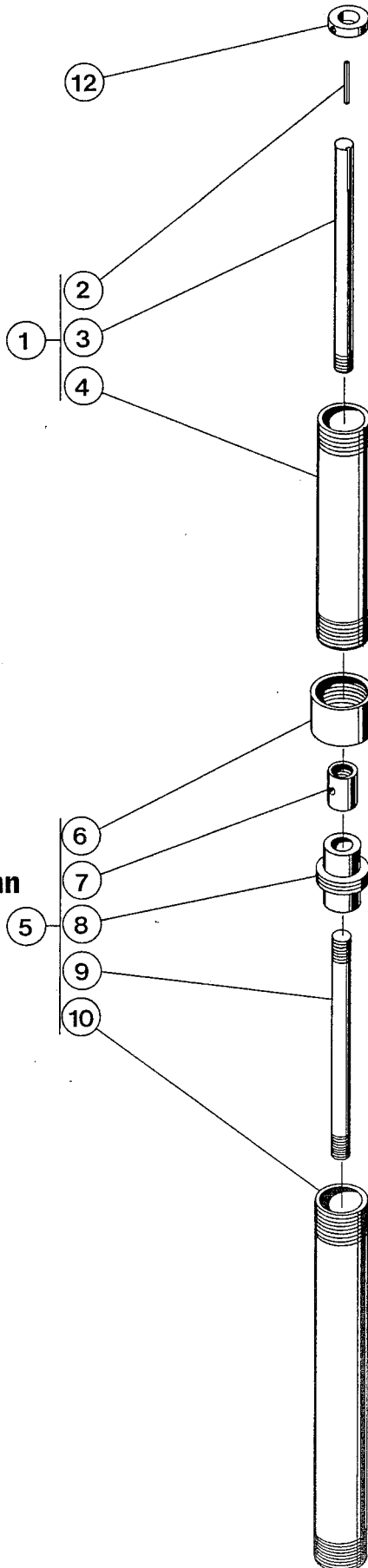
PARMA HYDRAULIC CHOPPER PUMP UNIT

PARMA HYDRAULIC CHOPPER PUMP UNIT

ITEM	PART NO.	DESCRIPTION	QTY
1	100190	Coupling	1
2	100179	Adaptor	1
3	100254	Bearing Locknut	1
4	100235	Bearing Lockwasher	1
5	998914	Retaining Ring	1
6	818058	Ball Bearing	1
7	100178	Bowl Shaft	1
8	818075	Speedi-Sleeve	1
9	890045	Seal	1
10	818060	Wiper Ring	1
11	818051	Shear Housing	1
12	890001	Locking Cap Screw	12
13	890002	Hardened Flatwasher	12
14	833809	Shear Bar	4
15	833806	Shear Blade	4
16	833805	Shear Hub	1
17	824201	Top Bowl	1
18	804202	Bottom Bowl	1
19	804354	Discharge Clamp	1
20	804355	Gasket	1
21	834251	Impeller	1
22	890044	Seal	1
23	834301	Bottom Bearing Plate	1
24	890046	Sleeve Bearing	2
25	890352	Expansion Plug	1
26	998917	Retaining Ring	1

COLUMN & SHAFT ASSEMBLY

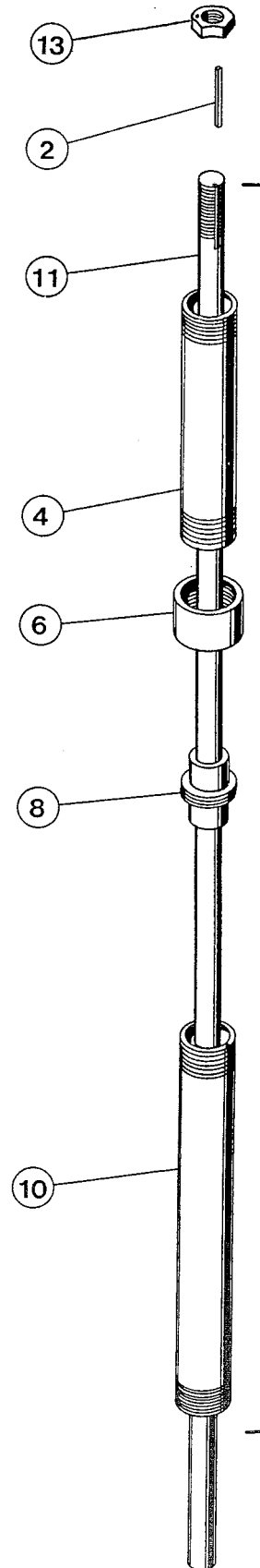
Drive Column & Shaft Assembly



Intermediate Column & Shaft Assembly

One Piece Shaft & Column

One piece shaft
after 1980
on certain Models



COLUMN & SHAFT ASSEMBLIES

Multi-Piece Shafts

ITEM	DESCRIPTION	MODEL 11, 12, 13	MODEL 14, 15, 16	MODEL 18	MODEL 33,34,35,36
1	Short Drive Column & Shaft Assembly	801440	804440	807440	823440
1	Long Drive Column & Shaft Assembly	801460	804460	807460	823460
2	Keystock	801053	804053	807401	804053
3	Short Drive Shaft	801441	804441	807449	823441
3	Long Drive Shaft	801461	804461	807469	823461
4	Short Drive Column	801442	804442	807442	804442
4	Long Drive Column	801462	804462	807463	804462
5	Intermediate Column & Shaft Assembly	801445	804445	807445	804445
6	Column Coupling	890201	890202	890205	890202
7	Shaft Coupling	890250	890251	890252	890251
8	Column Bearing	890028	890029	808091**	890029
9	Intermediate Shaft - 4'	801446	804446	807446	804446
9	Intermediate Shaft - 8'	801481	804481	*-----	804481
10	Intermediate Column	801447	804447	807447	804447
12	Set Collar	-----	804054	-----	-----
13	Adjusting Nut	-----	-----	807055	833810

*Model #18 M-S standard with a one-piece shaft, effective January 1981.

COLUMN & SHAFT ASSEMBLIES

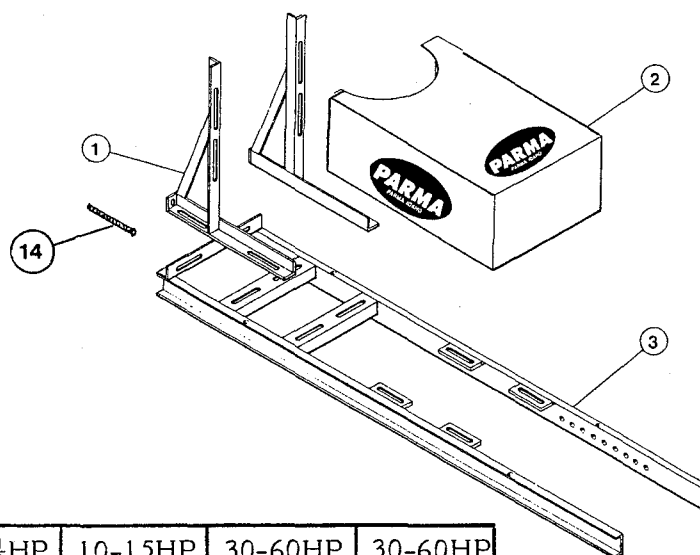
One Piece Shafts

		MODEL 16	MODEL 18	MODEL 34, 35
2	Keystock	804053	807401	804053
4	Short Drive Column	804442	807442	804442
4	Long Drive Column	804462	807463	804462
6	Column Coupling	890202	890205	890202
8	Column Bearing	890029	808091**	890029
10	Intermediate Column	804447	807447	804447
11	Pump Shaft - 6' One Piece	100377	100373	100702
11	Pump Shaft - 8' One Piece	100378	100374	834308
11	Pump Shaft - 10' One Piece	100379	100375	834310
11	Pump Shaft - 12' One Piece	100380	100376	100387
12	Set Collar	804054	-----	-----
13	Adjusting Nut	-----	807055	833810

**Consists of 808090 Housing and 890034 Sleeve Bearing.

MOUNTING FRAME UNIT

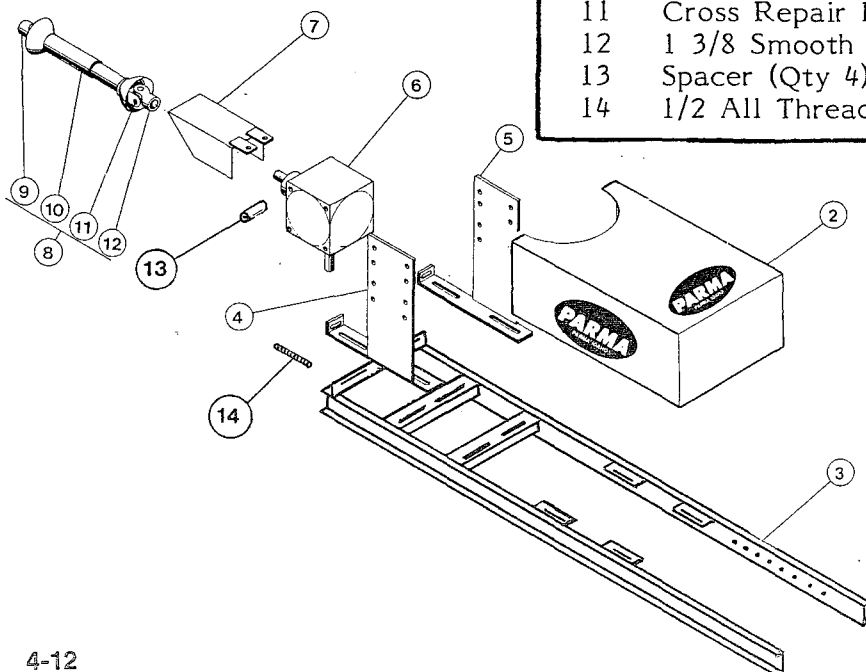
Electric Drive



ITEM	DESCRIPTION	1-7½HP 100724	1-7½HP 801006	10-15HP 802006	30-60HP 803006	30-60HP 804006 *
1	Vertical Motor Base	801700	801700	804700	807700	807700
2	Belt Guard Assembly	801860	801860	801860	801860	807740
3	Pump Mounting Frame	801600	804600	804600	804600	807600
14	1/2 All Thread	11"	11"	11"	11"	15"

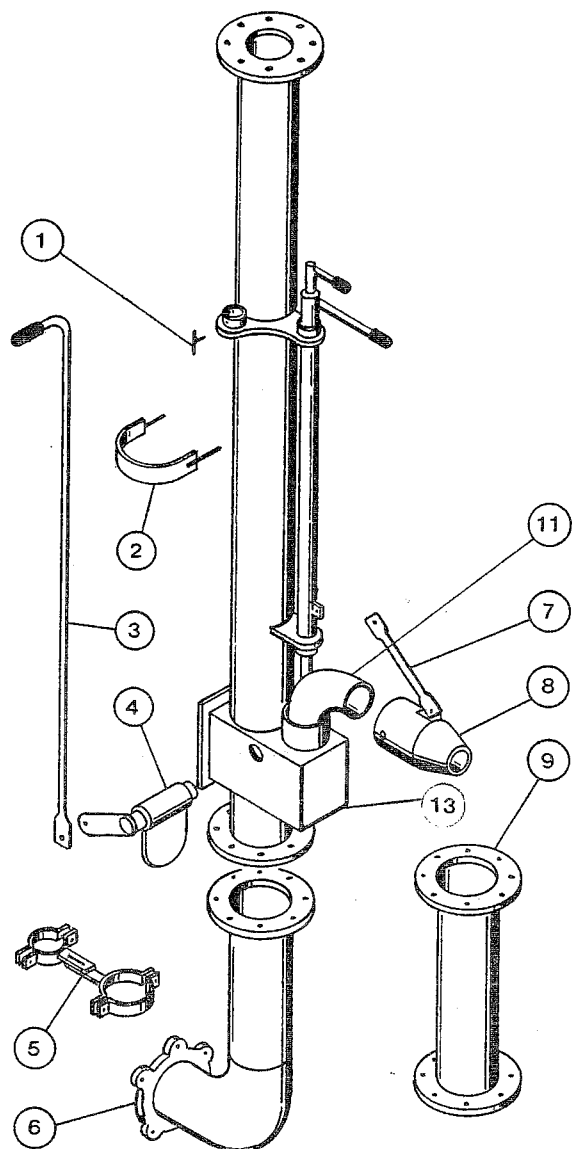
*Model #18 only.

FRAME & PTO DRIVE UNIT

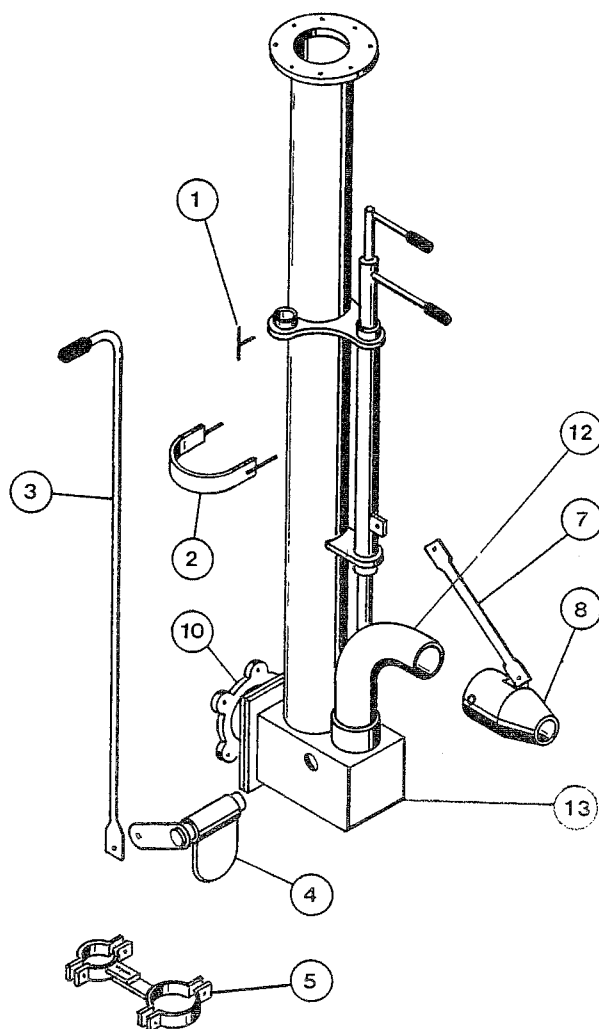


ITEM	DESCRIPTION	540 RPM	1000RPM
2	Belt Guard Assembly	801860	801860
3	Pump Mounting Frame	804600	804600
4	Gearbox Adaptor-Left	804030	804030
5	Gearbox Adaptor-Right	804031	804031
6	Model 88 Gearbox (1:1)	804643	804643
7	PTO Guard	804036	804036
8	PTO Driveline Assembly	990795	990796
9	Splined Yoke	990614	990622
10	Drive Shaft Assembly	990788	990788
11	Cross Repair Kit	990660	990660
12	1 3/8 Smooth Bore Yoke	990623	990623
13	Spacer (Qty 4)	804032	804032
14	1/2 All Thread x 11"	-----	-----

UPPER AGITATOR ASSEMBLY (PRE 1982)

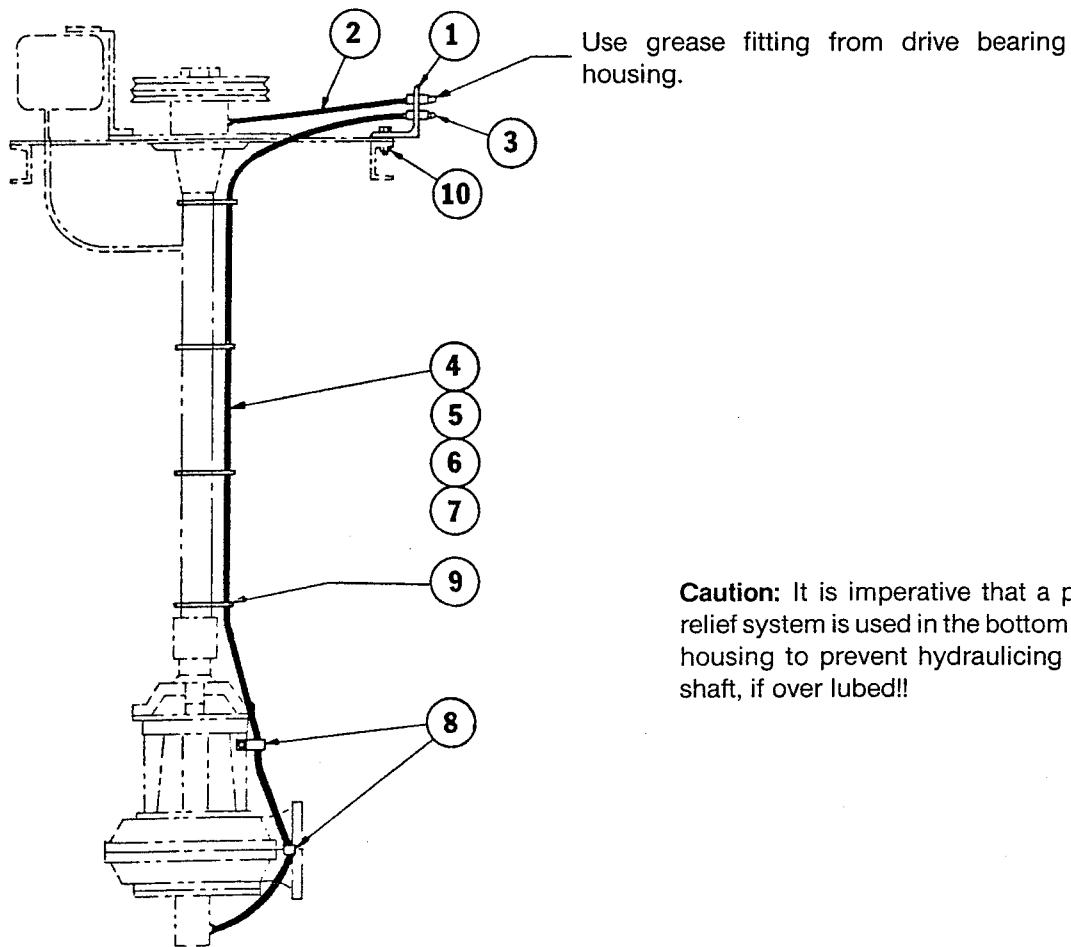


AGITATOR ASSEMBLY (1982)



ITEM	DESCRIPTION	PRE 1982	1982
		PART NO.	PART NO.
1	Tee Handle	815308	815308
2	U-Bolt	802360	802360
3	Control Rod	814453	814453
4	Flapper Assembly	814447	814447
5	6" x 2 1/2" Spreader Bracket	814466	814466
6	Discharge Elbow - #34 - 8'	814473	-----
	Discharge Elbow - #34 - 10'	814474	-----
	Discharge Elbow - #35 - 10'	814475	-----
	Discharge Elbow - #35 - 8'	814476	-----
7	Linkage Arm	814457	814457
8	Discharge Nozzle	814456	814458
9	Extension Kit 9(Optional)	814500	-----
10	Discharge Flange Weldment - #34	-----	814463
	Discharge Flange Weldment - #35	-----	814462
11	Discharge Elbow	814439	-----
12	Discharge Elbow	-----	814429
13	Agitator Box Weldment	814431	814431
	(Specify year)		

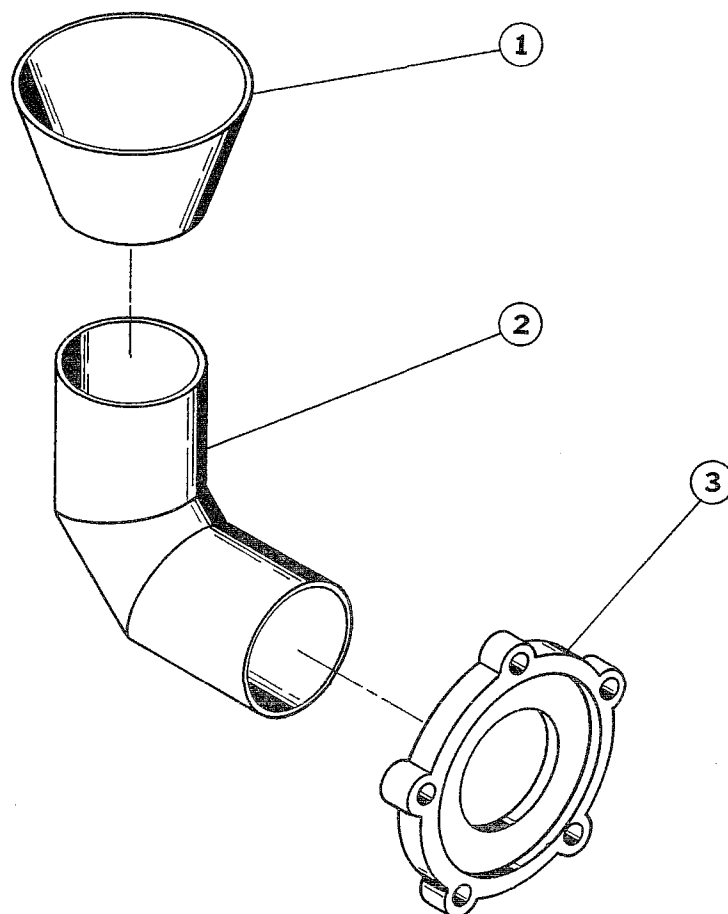
GREASE LINE KIT



Caution: It is imperative that a pressure relief system is used in the bottom bearing housing to prevent hydraulicing of drive shaft, if over lubed!!

ITEM	DESCRIPTION	6'-100717	8'-100718	10'-100719	12'-100720	QTY
1	Grease Fitting Brkt	100707	100707	100707	100707	1
2	1/4 × 24" Hyd Hose	902201	902201	902201	902201	1
3	1/8 NPT Grease FTL	100578	100578	100578	100578	1
4	1/4 × 102 Hyd Hose	100709				1
5	1/4 × 126 Hyd Hose		100710			1
6	1/4 × 150 Hyd Hose			100711		1
7	1/4 × 174 Hyd Hose				100712	1
8	Hose Clamp	100708	100708	100708	100708	2
9	Tie Down Strap	998925	998925	998925	998925	4
10	Hex Bolt 5/8 × 1 W/1w & Nut	1	1	1	1	1

DISCHARGE ELBOW

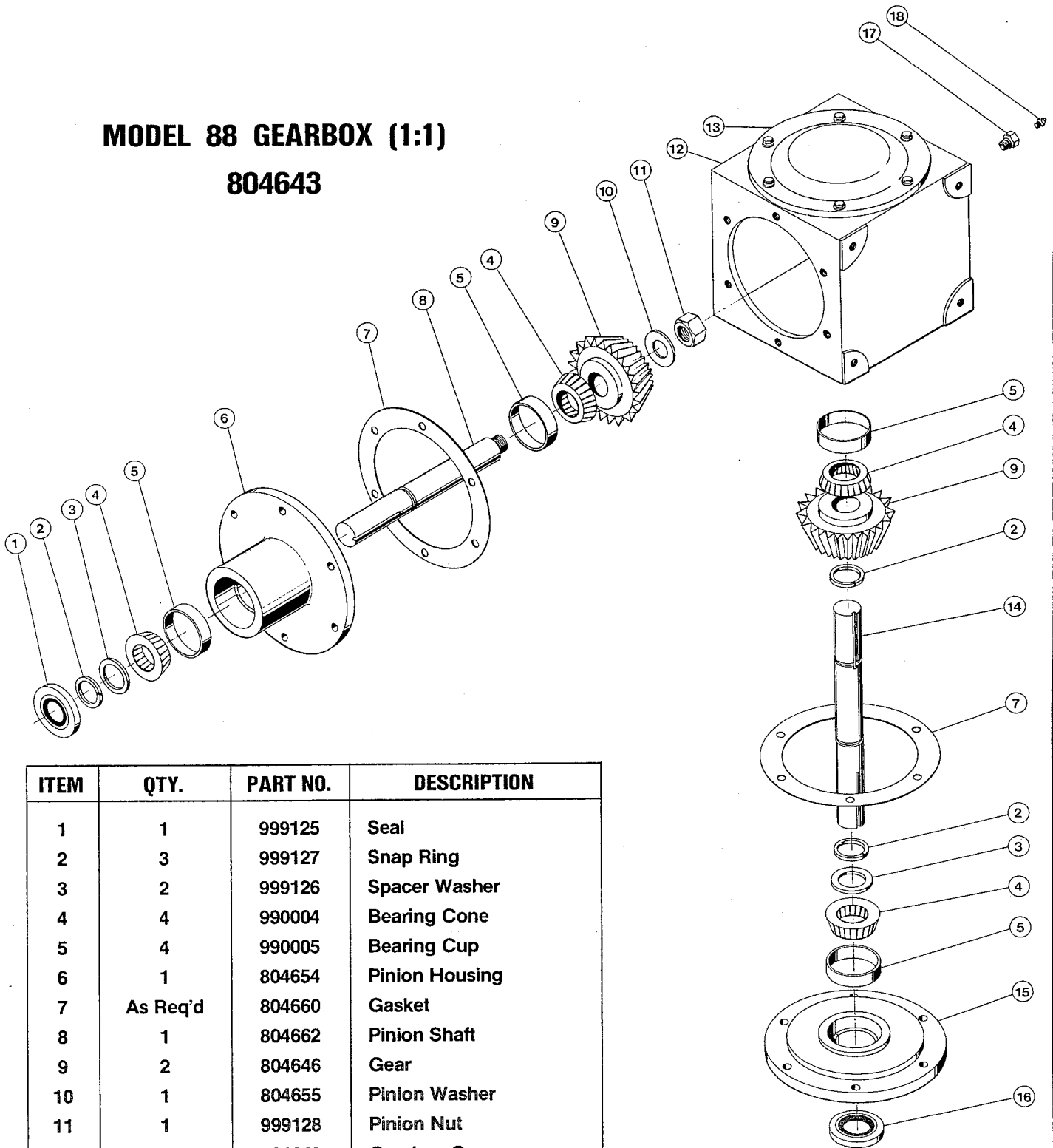


ITEM	DESCRIPTION	MODEL 1,11	MODEL 2,3,12 13,33	MODEL 4,14,34	MODEL 5,15,35	MODEL 6,16,36	MODEL 8	MODEL 8S,18	QTY
	Discharge Elbow	801350	802350	804350	805350	806350	807350	808350	
1	Welding Cone	891334	891346	891358	891361	891393	891392	891310	1
		3" x 4"	4" x 6"	5" x 8"	6"x10"	8"x12"	10"x14"	10"x16"	
2	90° Elbow	801351*	802351*	801905	801906	804908	804910	804910	1
				5"	6"	8"	10"	10"	
3	Nose Flange	801352*	802352*	804351	805351	806351	807351	808351	1

*Elbow and nose flange are cast together as one piece.

MODEL 88 GEARBOX (1:1)

804643



ITEM	QTY.	PART NO.	DESCRIPTION
1	1	999125	Seal
2	3	999127	Snap Ring
3	2	999126	Spacer Washer
4	4	990004	Bearing Cone
5	4	990005	Bearing Cup
6	1	804654	Pinion Housing
7	As Req'd	804660	Gasket
8	1	804662	Pinion Shaft
9	2	804646	Gear
10	1	804655	Pinion Washer
11	1	999128	Pinion Nut
12	1	804649	Gearbox Case
13	1	804659	Closed End Cap
14	1	804665	Output Shaft
15	1	804653	Open End Cap
16	1	999124	Seal
17	1	—	1/2 x 1/8 Bushing
18	1	999117	Pressure Relief Vent

NEW—EASY PUMP ORDERING INSTRUCTIONS

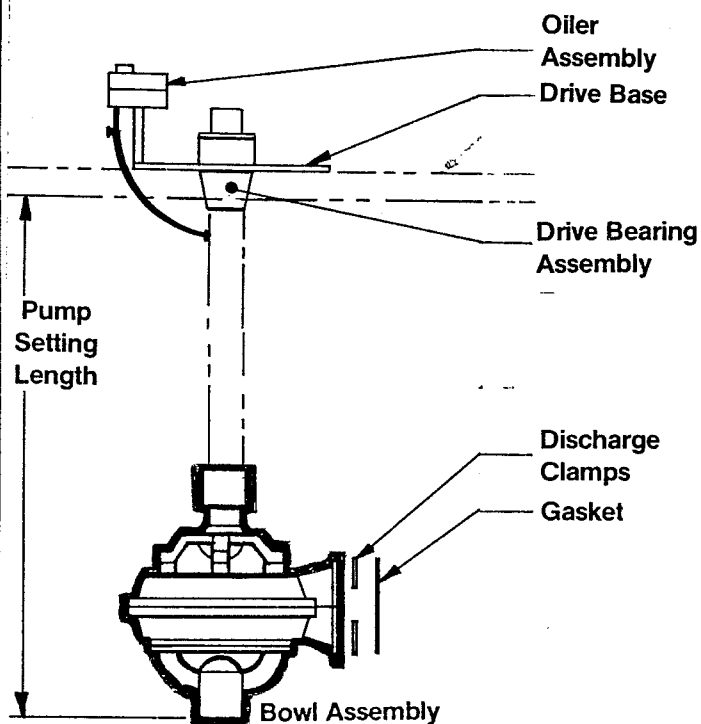
TO ORDER YOUR PUMP UNIT, SIMPLY FOLLOW STEPS 1 - 6.

PAGE NO.

- 5 - 2 Step 1 Pump Selection
- 5 - 3 Step 2 Pump Setting Assembly
- 5 - 4 Step 3A Discharge Assembly
or
- 5 - 5 Step 3B Agitator Assembly
- 5 - 6 Step 4 Mounting Frame Unit
- 5 - 7 Step 5 V-Belts, Sheaves & Bushings
(See appropriate section)
- 5 - 7 Step 6 Electrical Components
(See appropriate section)
- 5 - 8 Model A Trailer Pump
- 5 - 9 Hydraulic Chopper Pump

STEP 1

PARMA M-S PUMP UNIT



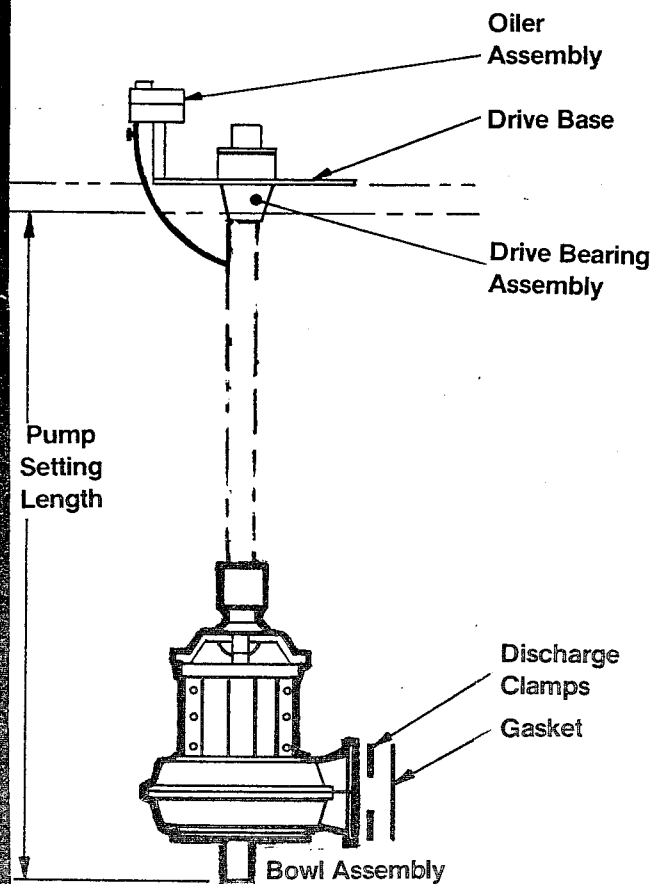
MODEL	PART #	SHAFT SIZE	SHIP WT.
11	811001	1"	108#
12	812001	1"	138#
13	813001	1"	156#
14	814001	1-3/8"	227#
15	815001	1-3/8"	254#
16	816001	1-15/16"	300#
18	818001	1-15/16"	680#

Bowl Assemblies - for Replacement Only

11	811100	1"	57#
12	812100	1"	88#
13	813100	1"	106#
14	814100	1-3/8"	150#
15	815100	1-3/8"	177#
16	816100	1-15/16"	240#
18	818100	1-15/16"	550#

NOTE: #18 Pump is standard with a one-piece shaft.

PARMA CHOPPER PUMP UNIT



MODEL	PART #	SHAFT SIZE	SHIP WT.
33	833001	1-3/8"	
34	834001	1-3/8"	
35	835001	1-3/8"	
36	836001	1-15/16"	

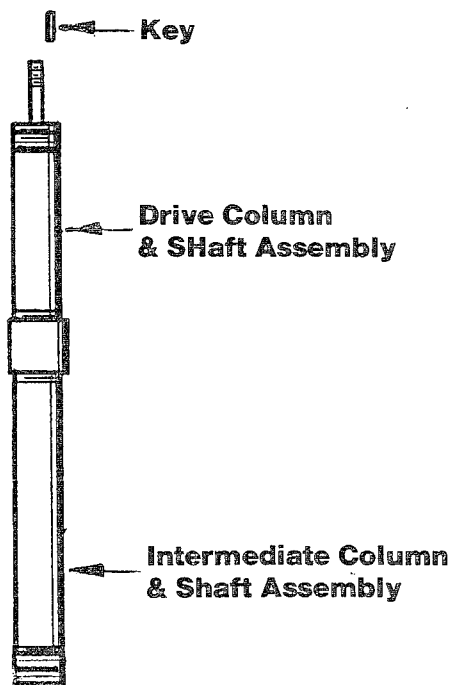
Bowl Assemblies - for Replacement Only

33	833100	1-3/8"	
34	834100	1-3/8"	
35	835100	1-3/8"	
36	836100	1-15/16"	

To Select Setting Assembly, See STEP 2

PUMP SETTING ASSEMBLY

STEP 2



MODEL #	11, 12, 13	14, 15, 16
SETTING	PART #	PART #
4'	801007-4	*804007-4
6'	801007-6	804007-6
8'	801007-8	804007-8
10'	801007-10	804007-10
12'	801007-12	804007-12
14'	801007-14	804007-14
16'	801007-16	804007-16
18'	801007-18	804007-18
20'	801007-20	804007-20

MODEL #	18	33, 34, 35, 36
SETTING	PART #	PART #
4'	807007-4**	833007-4
6'	807007-6**	833007-6
8'	807007-8	833007-8
10'	807007-10	833007-10
12'	807007-12	833007-12
14'	807007-14	833007-14
16'	807007-16	833007-16
18'	807007-18	833007-18
20'	807007-20	833007-20

*4' Setting not recommended on Model #16

** 4' and 6' Setting not recommended on Model #18

NOTE: #18 Pump is standard with a one piece shaft.

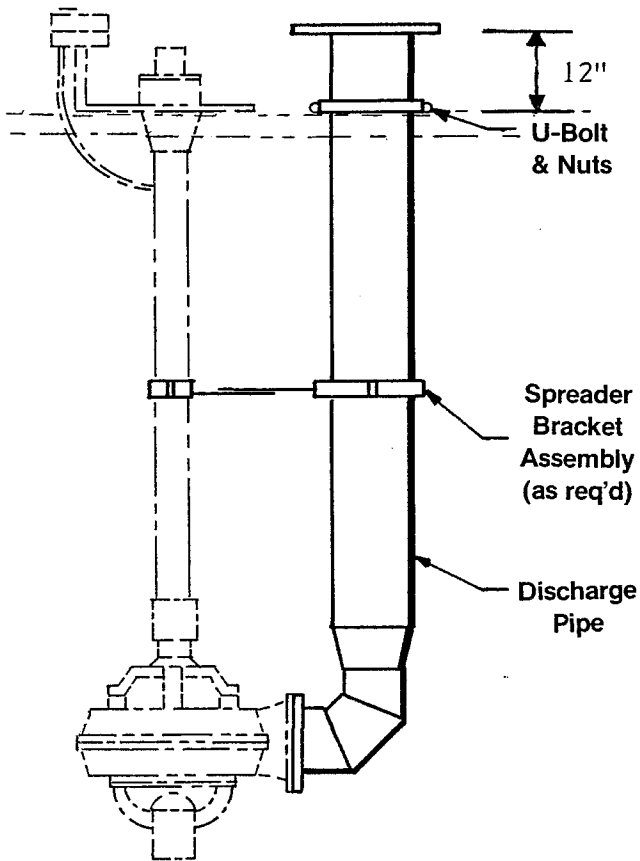
To Select Discharge or Agitator Assembly, See STEP 3

STEP 3A

DISCHARGE ASSEMBLY

Designate Plain end or Flanged end on discharge pipe when ordering.

Standard Flange
(May be deleted)



*Will Also Fit Model #33 Chopper Pump.

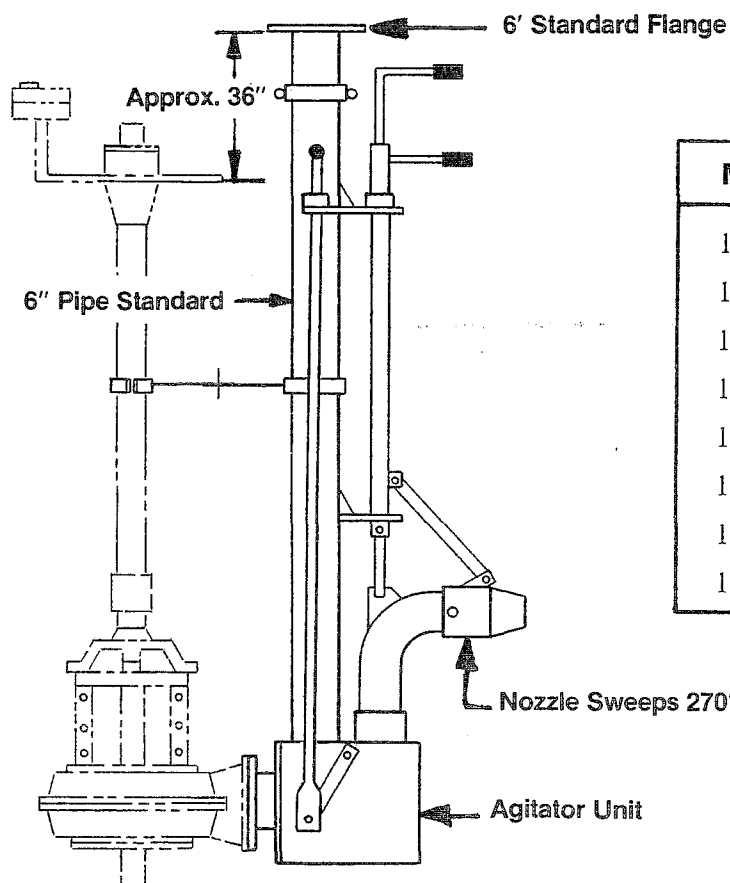
To Select Mounting Frame
See STEP 4

NOTE: All shipping weights are approximate

MODEL	PART NO.	SETTING	DIA.	SHIPPING WT.
11	801008-4	4'	4"	45#
11	801008-6	6'	4"	52#
11	801008-8	8'	4"	66#
11	801008-10	10'	4"	73#
11	801008-12	12'	4"	87#
11	801008-14	14'	4"	94#
11	801008-16	16'	4"	109#
11	801008-18	18'	4"	116#
11	801008-20	20'	4"	130#
12,13*	802008-4	4'	6"	64#
12,13*	802008-6	6'	6"	75#
12,13*	802008-8	8'	6"	94#
12,13*	802008-10	10'	6"	105#
12,13*	802008-12	12'	6"	124#
12,13*	802008-14	14'	6"	134#
12,13*	802008-16	16'	6"	153#
12,13*	802008-18	18'	6"	164#
12,13*	802008-20	20'	6"	183#
14,34	804008-4	4'	8"	90#
14,34	804008-6	6'	8"	108#
14,34	804008-8	8'	8"	138#
14,34	804008-10	10'	8"	156#
14,34	804008-12	12'	8"	187#
14,34	804008-14	14'	8"	205#
14,34	804008-16	16'	8"	235#
14,34	804008-18	18'	8"	253#
14,34	804008-20	20'	8"	283#
15,35	805008-4	4'	10"	122#
15,35	805008-6	6'	10"	145#
15,35	805008-8	8'	10"	179#
15,35	805008-10	10'	10"	201#
15,35	805008-12	12'	10"	235#
15,35	805008-14	14'	10"	258#
15,35	805008-16	16'	10"	291#
15,35	805008-18	18'	10"	314#
15,35	805008-20	20'	10"	348#
16,36	806008-4	4'	12"	171# 209# 237# 276#
16,36	806008-6	6'	12"	
16,36	806008-8	8'	12"	
16,36	806008-10	10'	12"	
16,36	806008-12	12'	12"	
16,36	806008-14	14'	12"	
16,36	806008-16	16'	12"	
16,36	806008-18	18'	12"	
16,36	806008-20	20'	12"	
18	808008-4	4'	16"	224# 259# 313# 366#
18	808008-6	6'	16"	
18	808008-8	8'	16"	
18	808008-10	10'	16"	
18	808008-12	12'	16"	
18	808008-14	14'	16"	
18	808008-16	16'	16"	
18	808008-18	18'	16"	
18	808008-20	20'	16"	

AGITATOR ASSEMBLY

STEP 3B



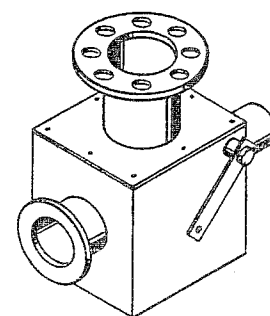
MODEL	PART NO.	SETTING	SHIPPING WT.
14,34	814434-6	6'	190#
14,34	814434-8	8'	200#
14,34	814434-10	10'	211#
14,34	814434-12	12'	240#
15,35	814435-6	6'	190#
15,35	814435-8	8'	200#
15,35	814435-10	10'	211#
15,35	814435-12	12'	240#

NOTE: For setting lengths other than shown, Consult Factory.

SMALL PIT AGITATOR

FITS MODELS 12, 13 & 33

MODEL	PART NO.	SETTING	SHIPPING WT.
12,13,33	814400	NA	40#

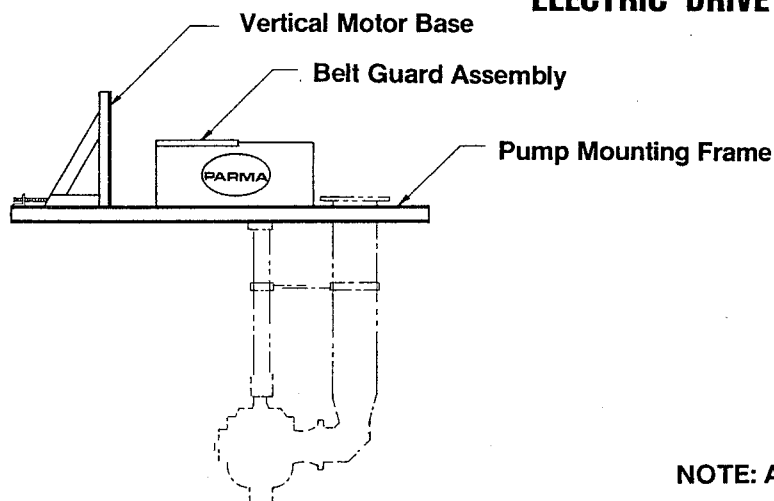


To Select Mounting Frame See STEP 4

STEP 4

MOUNTING FRAME UNIT

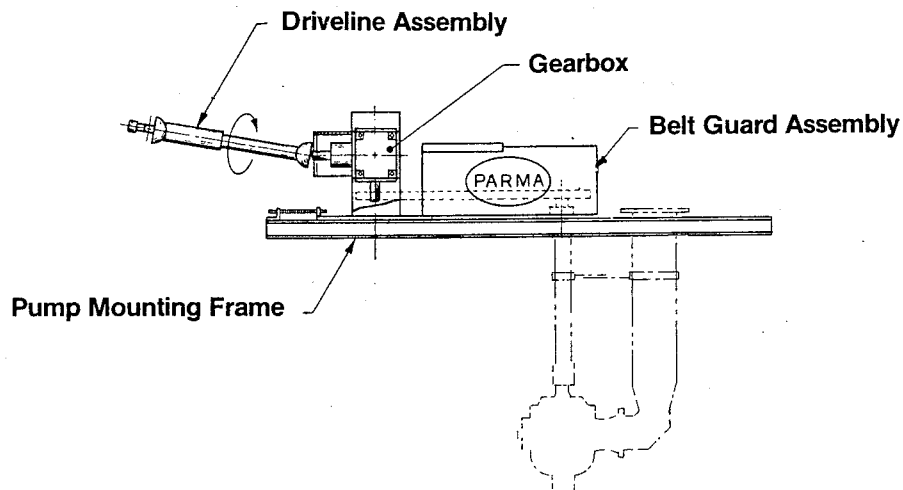
ELECTRIC DRIVE



NOTE: All shipping weights are approximate

PART NO.	DESCRIPTION	MOTOR SIZE	SHIPPING WT.
801006	Mounting Frame Unit	1-7½ HP	151 lbs.
802006	Mounting Frame Unit	10-25 HP	183 lbs.
803006	Mounting Frame Unit (Except Model 18)	30-60 HP	244 lbs.
804006	Mounting Frame Unit (Model 18 Only)	30-60 HP	291 lbs.

FRAME AND PTO DRIVE UNIT



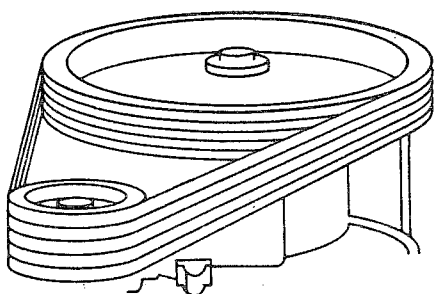
PART NO.	DESCRIPTION	SHIPPING WT.
804035	Frame and PTO Drive Unit	130 lbs.
	SPECIFY	
990795	PTO Driveline Assembly - 540 RPM	45 lbs.
990796	PTO Driveline Assembly - 1000 RPM	45 lbs.

To Select V-Belts, Sheaves, & Bushings See STEP 5

V-BELTS, SHEAVES & BUSHINGS

STEP 5

Refer to V-Belts, Sheaves & Bushings for part selection.

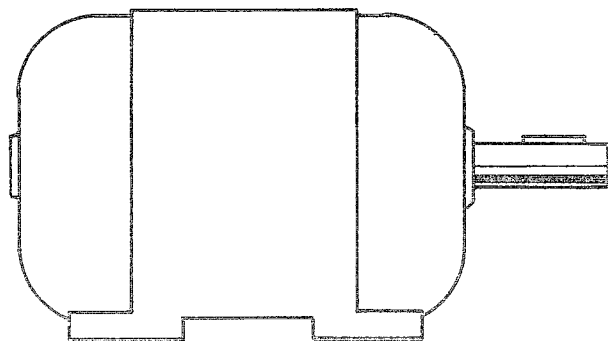


To Select Electric Motor & Components See STEP 6

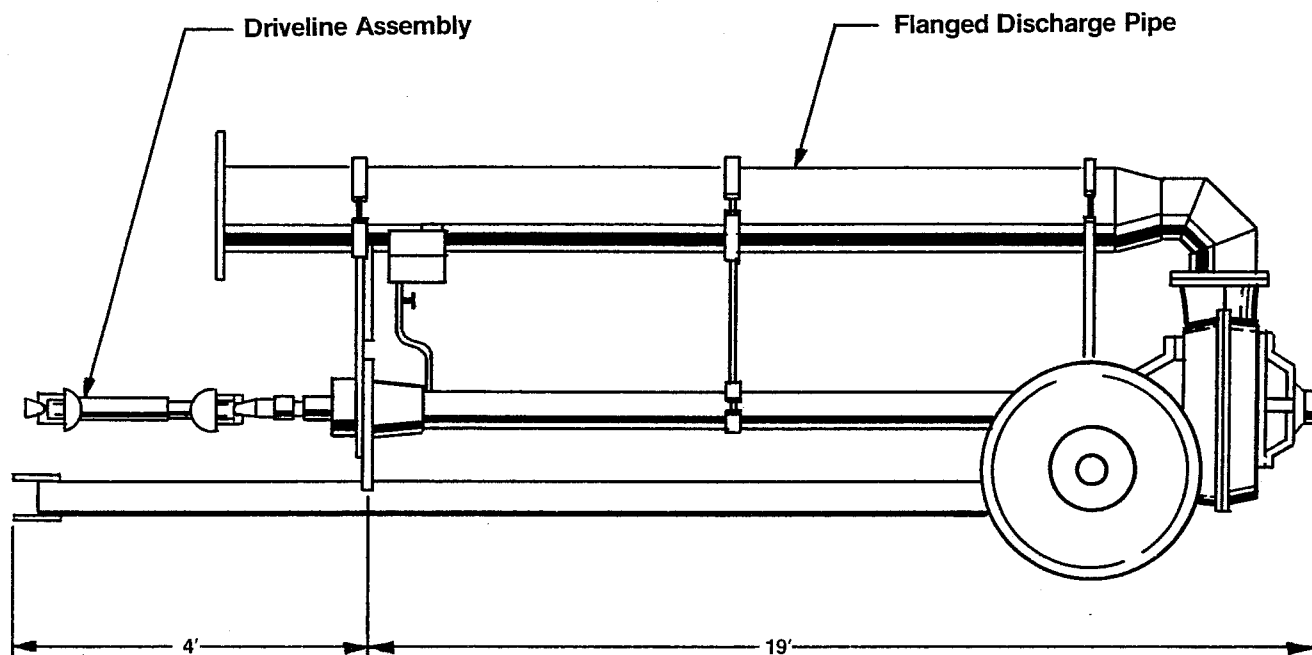
ELECTRIC MOTOR & COMPONENTS

STEP 6

Refer to Electrical Components for part selection.



PARMA MODEL A TRAILER PUMP



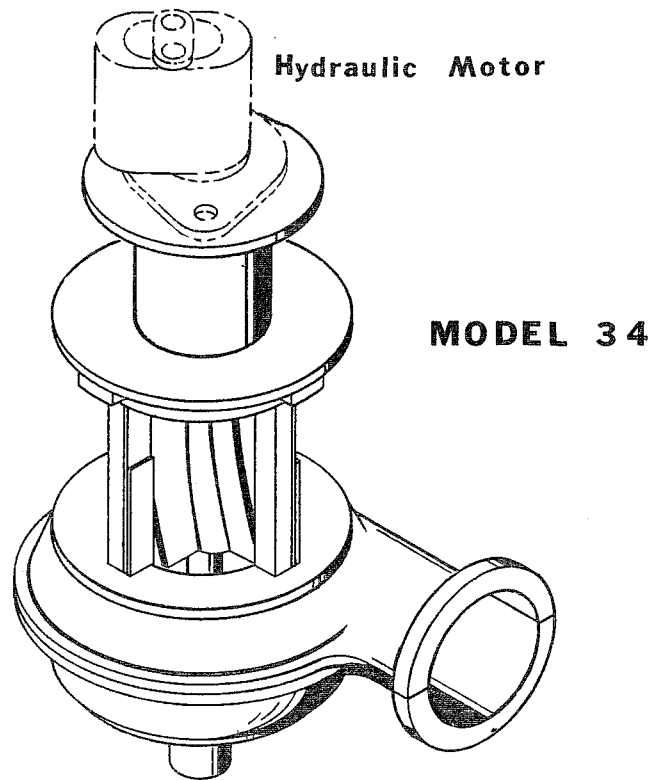
STANDARD FEATURES

Rugged cast iron impeller and volute
 Enclosed driveshaft operating in oil bath
 540 or 1000 RPM drive

NOTE: All shipping weights are approximate.

PART NO.	DESCRIPTION	DISCHARGE	SHIPPING WT.
880400	Parma Model 4A Trailer Pump	8"	
880500	Parma Model 5A Trailer Pump	10"	
880600	Parma Model 6A Trailer Pump	12"	
880800	Parma Model 8A Trailer Pump	16"	
	SPECIFY		
990795	PTO Driveline Assembly - 540 RPM		
990976	PTO Driveline Assembly - 1,000 RPM		

PARMA HYDRAULIC CHOPPER PUMP UNIT



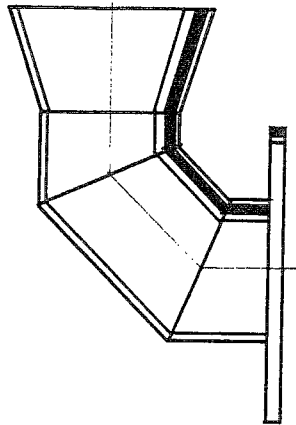
See Performance Curve - Page 2-12.

Pump Speed - 875 RPM @ 16 GPM Hydraulic Input, with Hydraulic Motor Listed.
Any SAE B, 2-Bolt, Hydraulic Motor - 7/8" shaft may be used.

PART NO.	DESCRIPTION	SHIPPING WT.
100217	Portable Hydraulic Chopper Pump	207 lbs.
100191	Hydraulic Motor (for above)	20 lbs.

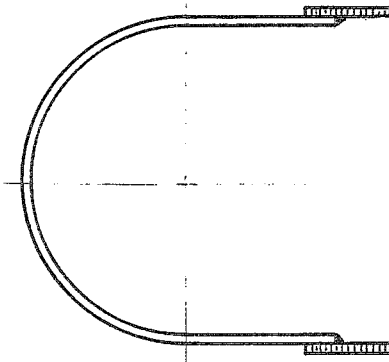
NOTE: Other size pumps available with hydraulic drive, consult factory.

All Shipping Weights are Approximate.



DISCHARGE ELBOW

Part No.	Description	Pump Model	Approx. Wt.
801350	4" Discharge Elbow	1,11	14.0
802350	6" Discharge Elbow	2,3,12,13,33	24.0
804350	8" Discharge Elbow	4,14,34	30.0
805350	10" Discharge Elbow	5,15,35	48.0
806350	12" Discharge Elbow	6,16,36	52.0
807350	14" Discharge Elbow	8	63.0
808350	16" Discharge Elbow	8S, 18	74.0

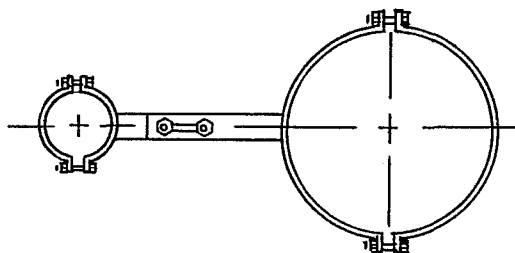


U-BOLT

Part No.	Description	Pump Model	Approx. Wt.
801360	4" U-Bolt	1,11	1.0
802360	6" U-Bolt	*	1.5
804360	8" U-Bolt	4,14	1.5
805360	10" U-Bolt	5,15	2.0
806360	12" U-Bolt	6,16	2.0
807360	14" U-Bolt	8	3.0
808360	16" U-Bolt	8S, 18	3.5

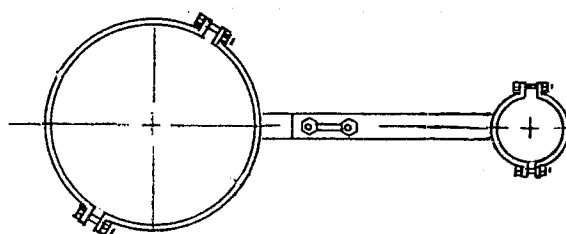
*802360 used on Models No. 2, 3, 12, 13, 34, 35

SPREADER BRACKET



NOTE: Used on discharge assembly

PART #	DESCRIPTION	PUMP MODEL	APPROX WEIGHT
801504	4" x 2" Spreader Bracket Assy.	1, 11	7.5
802506	6" x 2" Spreader Bracket Assy.	2,3,12,13	8.5
804508	8" x 2½" Spreader Bracket Assy.	4,14,4A	12.0
805510	10" x 2½" Spreader Bracket Assy.	5,15,35,5A	11.0
806512	12" x 2½" Spreader Bracket Assy.	6,16,6A	11.5
808516	16" x 4" Spreader Bracket Assy.	8S,8, 18	18.0



NOTE: Used on agitator assembly

PART #	DESCRIPTION	PUMP MODEL	APPROX WEIGHT
814466	6" x 2½" Spreader Bracket Assy.	34,35	8.5

DRIVE COLUMN & SHAFT ASSEMBLY



PART NO.	DESCRIPTION	USE WITH MODEL NO.	APPROX WEIGHT
801440	Short Drive Column & Shaft Assembly	11,12,13	
801460	Long Drive Column & Shaft Assembly	11,12,13	
804440	Short Drive Column & Shaft Assembly	14,15,16	
804460	Long Drive Column & Shaft Assembly	14,15,16	
*807440	Short Drive Column & Shaft Assembly	18	
*807460	Long Drive Column & Shaft Assembly	18	
823440	Short Drive Column & Shaft Assembly	33, 34 35, 36	
823460	Long Drive Column & Shaft Assembly	33, 34 35, 36	

*For Mult-Piece shaft unit only.

INTERMEDIATE COLUMN & SHAFT ASSEMBLY

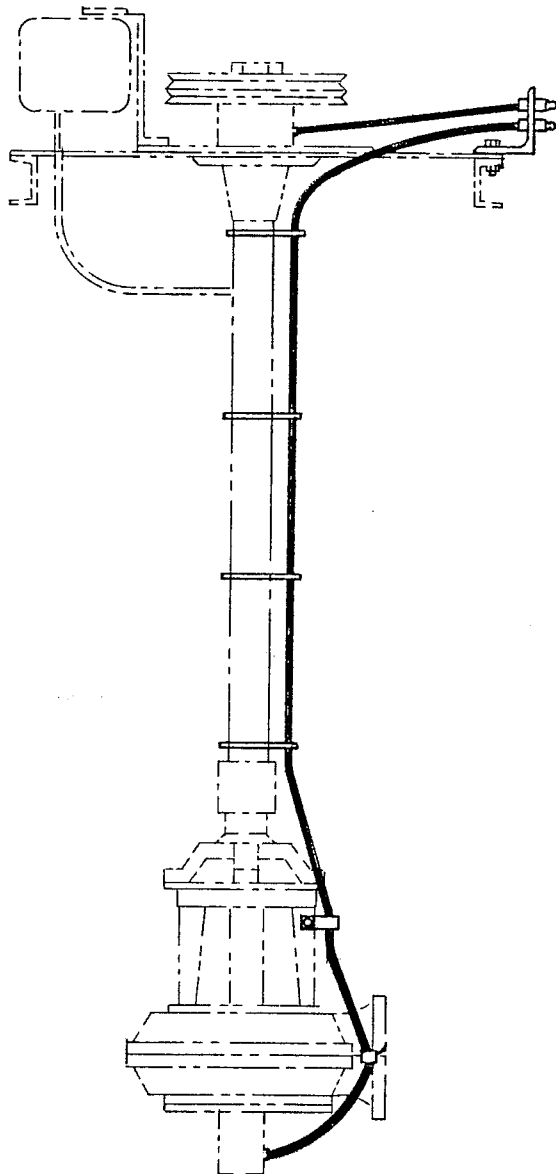
(Increases pump setting by four feet)



PART NO.	DESCRIPTION	USE WITH MODEL NO.	APPROX WEIGHT
801445	Intermediate Column & Shaft Assembly	11,12,13	
804445	Intermediate Column & Shaft Assembly	14,15,16,33 34,35,36	
*807445	Intermediate Column & Shaft Assembly	18	

*For Multi-Piece units only.

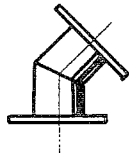
GREASE LINE KIT



CAUTION: It is imperative that a pressure relief system is used in the bottom bearing housing to prevent the hydraulicing of the drive shaft, if over lubed!!

PART NO.	DESCRIPTION	APPROX. WT.
100717	Greaseline Kit 6' Setting	
100718	Greaseline Kit 8' Setting	
100719	Greaseline Kit 10' Setting	
100720	Greaseline Kit 12' Setting	
100751	Greaseline Kit 14' Setting	
100752	Greaseline Kit 16' Setting	
100753	Greaseline Kit 18' Setting	

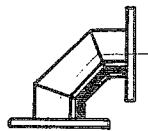
FLANGED FITTINGS



45° FLANGED ELBOW

(50 P.S.I. Rating)

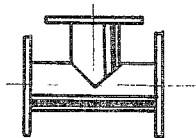
Part No.	Description	Approx. Wt.
804813	4" 45 ^o Flanged Elbow	
804814	5" 45 ^o Flanged Elbow	
804815	6" 45 ^o Flanged Elbow	
804816	8" 45 ^o Flanged Elbow	
804817	10" 45 ^o Flanged Elbow	
804818	12" 45 ^o Flanged Elbow	
804819	14" 45 ^o Flanged Elbow	
804820	16" 45 ^o Flanged Elbow	



90° FLANGED ELBOW

(50 P.S.I. Rating)

Part No.	Description	Approx. Wt.
804913	4" 90 ^o Flanged Elbow	
804914	5" 90 ^o Flanged Elbow	
804915	6" 90 ^o Flanged Elbow	
804916	8" 90 ^o Flanged Elbow	
804917	10" 90 ^o Flanged Elbow	
804918	12" 90 ^o Flanged Elbow	
804919	14" 90 ^o Flanged Elbow	
804920	16" 90 ^o Flanged Elbow	



FLANGED TEE

(50 P.S.I. Rating)

Part No.	Description	Approx. Wt.
891315	4" Flanged Tee	
891311	5" Flanged Tee	
891317	6" Flanged Tee	
891318	8" Flanged Tee	
891319	10" Flanged Tee	
891320	12" Flanged Tee	
891321	14" Flanged Tee	
891322	16" Flanged Tee	

WELDING FITTINGS



45° WELDING ELBOW *

Part No.	Description	Approx. Wt.
801804	4" 45° Welding Elbow	
801805	5" 45° Welding Elbow	
801806	6" 45° Welding Elbow	
804808	8" 45° Welding Elbow	
804810	10" 45° Welding Elbow	
804812	12" 45° Welding Elbow	
807814	14" 45° Welding Elbow	
807816	16" 45° Welding Elbow	



90° WELDING ELBOW *

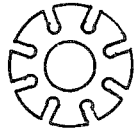
Part No.	Description	Approx. Wt.
801904	4" 90° Welding Elbow	
801905	5" 90° Welding Elbow	
801906	6" 90° Welding Elbow	
804908	8" 90° Welding Elbow	
804910	10" 90° Welding Elbow	
804912	12" 90° Welding Elbow	
807914	14" 90° Welding Elbow	
807916	16" 90° Welding Elbow	



WELDING TEE *

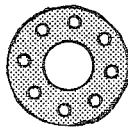
Part No.	Description	Approx. Wt.
891304	4" Welding Tee	
891305	5" Welding Tee	
891306	6" Welding Tee	
891308	8" Welding Tee	
891309	10" Welding Tee	
891313	12" Welding Tee	
891314	14" Welding Tee	
891316	16" Welding Tee	

WELDING FITTINGS



WELDING FLANGE

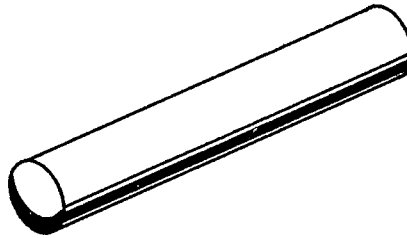
Part No.	Description	Approx. Wt.
891403	3" Welding Flange	
891404	4" Welding Flange	
891405	5" Welding Flange	
891406	6" Welding Flange	
891408	8" Welding Flange	
891410	10" Welding Flange	
891412	12" Welding Flange	
891414	14" Welding Flange	
891416	16" Welding Flange	



GASKET

Part No.	Description	Approx. Wt.
891423	3" Gasket	
891424	4" Gasket	
891425	5" Gasket	
891426	6" Gasket	
891428	8" Gasket	
891430	10" Gasket	
891432	12" Gasket	
891434	14" Gasket	
891436	16" Gasket	

PIPE



Part No.	Description	Approx. Wt.*
891504	4" O.D. x 12 Gauge Tubing	
891505	5" O.D. x 12 Gauge Tubing	
Special	6" O.D. x 10 Gauge Tubing	
891506	6" O.D. x 12 Gauge Tubing	
891508	8" O.D. x 12 Gauge Tubing	
891510	10" O.D. x 12 Gauge Tubing	
891512	12" O.D. x 12 Gauge Tubing	
891514	14" O.D. x 12 Gauge Tubing	
891516	16" O.D. x 12 Gauge Tubing	

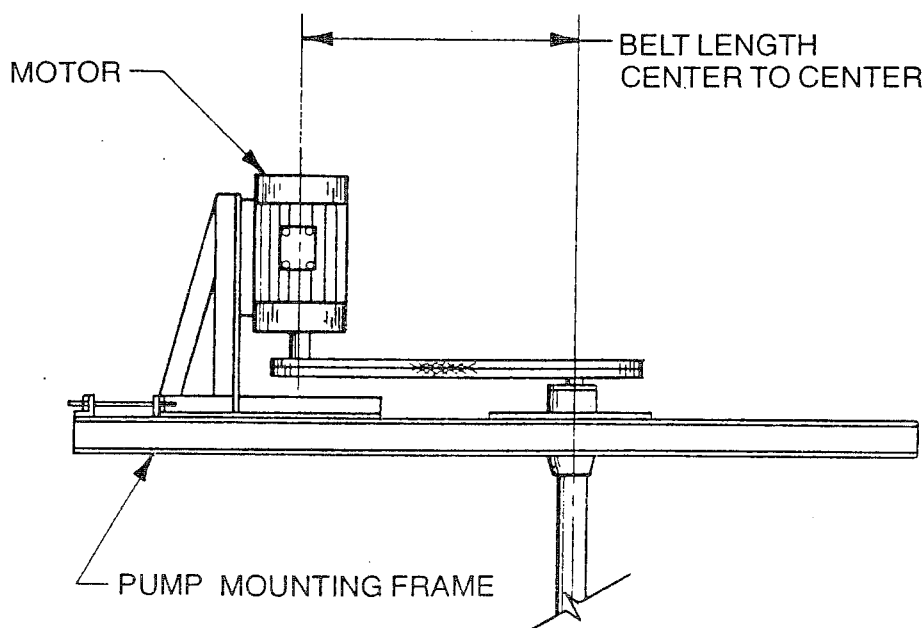
*Weight per foot



WELDING CONE

Part No.	Description	Approx. Wt.
891323	2" x 3" Welding Cone	
891324	2" x 4" Welding Cone	
891334	3" x 4" Welding Cone	
891335	3" x 5" Welding Cone	
891336	3" x 6" Welding Cone	
891345	4" x 5" Welding Cone	
891346	4" x 6" Welding Cone	
891348	4" x 8" Welding Cone	
891356	5" x 6" Welding Cone	
891358	5" x 8" Welding Cone	
891368	6" x 8" Welding Cone	
891361	6" x 10" Welding Cone	
891381	8" x 10" Welding Cone	
891393	8" x 12" Welding Cone	
891301	10" x 12" Welding Cone	
891392	10" x 14" Welding Cone	
891310	10" x 16" Welding Cone	
891303	12" x 14" Welding Cone	

CHART FOR SELECTING BELT LENGTH



Mounting Frame Unit	Motor HP	Belt Length Center To Center	
		Min.	Max.
100724	1, 1½, 2*	19	23
	3, 5*	18	22
	7½	16 ¾	20
801006	1, 1½, 2*	25	29
	3, 5*	24	28
	7½	22¾	26
802006	10	23½	29½
	15, 20	22½	28½
	25	21¾	27¾
803006	30	14	25
	40, 50	13	24
	60	11	23
804006	30	46	57
	40, 50	45	56
	60	44	55

BELT CENTER FOR PTO DRIVE SHOWN ON PAGE 7-5.

*For single phase 2 and 5 HP subtract 1".

NOTE: Instructions for use of charts on page 7-2.

INSTRUCTIONS FOR USE OF BELT, SHEAVE AND BUSHING CHARTS

1. Locate the speed in the pump RPM column, which is closest to the RPM previously determined for the pump.
2. Record the sheave pitch diameters shown in the second column.
3. Utilizing information provided on the chart on Page 7-1 indicating the belt length center to center, select an appropriate belt which will fall between the minimum and maximum lengths. The belt number is designated at the top of the column.
4. Follow the horizontal line over to the column indicating the rated HP per belt. Divide the HP rating into the HP required. The answer, rounded to the next highest number, is the number of grooves for the sheaves and the number of V-Belts required.
5. Locate the proper sheave diameter in the bushing chart in the column marked "Sheave Diameter".
6. Follow the chart horizontally to a point intersecting the number of grooves indicated at the top of the chart and record the letters indicated in the chart.
7. The bushing bore for the small sheave is the same as the shaft size of the motor and is shown in the electrical components section in the "Shaft Size" column adjacent to the HP rating of the motor.
8. The sheave bushing bore for the large sheave can be located in the chart on this page - "Pump Sheave Bore" next to the appropriate model number.
9. Record the appropriate bushing number and bore size.
10. The appropriate sheaves are located on page 7-6. The appropriate bushings are located on page 7-7. The appropriate belts are located on page 7-8.

EXAMPLE:

Desired pump RPM - 978. Utilizing mounting frame unit 802006 for 15 HP motor with Model #14:

1. Locate 978 RPM on page 7-3.
2. Sheave diameters are 8.6 and 15.4.
3. Belt length center to center, minimum is $22\frac{1}{2}$ " to maximum $28\frac{1}{2}$ ". There are two belts which fall between the minimum and maximum, those being a B-85 at 24.3" and B-90 at 26.8". Either belt would be satisfactory.
4. The rated HP per belt is 10.7 and the HP utilized is 15. Fifteen divided by 10.7 equals 1.4 which when rounded to the next highest number indicates the need for two belts and also indicates the requirement of two groove sheaves.
5. In the sheave diameter column in the bushing chart on page 7-4, the 8.6 diameter intersects the two groove column within the SK area.
6. The 15.4 sheave intersects the two groove column within the SK area.
7. The shaft size of a 15 HP motor is shown to be $1\frac{5}{8}$ " in the shaft size column on Page 8-1.
8. For a Model #14 pump, the sheave bushing bore shown in the chart below is $2\frac{1}{4}$ ".
9. One SK $1\frac{5}{8}$ " QD Bushing and one SK $2\frac{1}{4}$ " QD Bushing are required.

PUMP SHEAVE BORE	
Models 11, 12, 13	1"
Models 14, 15, 16, 33, 34, 35	$2\frac{1}{4}$ "
Model 18	$2\frac{3}{16}$ "

"B" WIDTH BELT DRIVES

FOR MOTOR SPEEDS OF 1750 RPM

PUMP RPM	Sheave Pitch Diameters		Speed Ratio	V-Belt Number and Center Distance										Rated HP Per Belt (Including Allowance for Speed Ratio) Small Speed Sheave 1750 RPM
	Small Sheave	Large Sheave		B-60	B-68	B-75	B-81	B-85	B-90	B-97	B-105	B-112	B-120	
1683	5.40	5.60	1.04	22.3	26.3	29.8	32.8	34.8	37.3	40.8	44.8	48.3	—	5.08
1651	6.40	6.80	1.06	20.5	24.5	28.0	31.0	33.0	35.5	39.0	43.0	46.5	50.5	6.86
1636	5.60	6.00	1.07	21.8	25.8	29.3	32.3	34.3	36.8	40.3	44.3	47.8	—	5.52
1636	6.00	6.40	1.07	21.2	25.2	28.7	31.7	33.7	36.2	39.7	43.7	47.2	—	6.20
1620	5.00	5.40	1.08	22.7	26.7	30.2	33.2	35.2	37.7	41.2	45.2	48.7	—	4.47
1620	5.20	5.60	1.08	22.4	26.4	29.9	32.9	34.9	37.4	40.9	44.9	48.4	—	4.82
1606	4.60	5.00	1.09	23.4	27.4	30.9	33.9	35.9	38.4	41.9	45.9	49.2	—	3.82
1606	6.80	7.40	1.09	19.8	23.8	27.3	30.3	32.3	34.8	38.3	42.3	45.8	49.8	7.59
1606	8.60	9.40	1.09	—	20.8	24.3	27.3	29.3	31.8	35.3	39.3	42.8	46.8	10.3
1577	5.40	6.00	1.11	21.9	25.9	29.4	32.4	34.4	36.9	40.4	44.4	48.0	—	5.25
1563	5.00	5.60	1.12	22.6	26.6	30.1	33.1	35.1	37.6	41.1	45.1	48.6	—	4.55
1549	4.60	5.20	1.13	23.2	27.2	30.7	33.7	35.7	38.2	41.7	45.7	49.2	—	3.90
1549	6.00	6.80	1.13	20.8	24.8	28.3	31.3	33.3	35.8	39.3	43.4	46.9	—	6.36
1535	5.60	6.40	1.14	21.5	25.5	29.0	32.0	34.0	36.5	40.0	44.0	47.5	—	5.68
1522	5.20	6.00	1.15	22.1	26.1	29.6	32.6	34.6	37.1	40.6	44.6	48.1	—	4.96
1509	6.40	7.40	1.16	20.1	24.1	27.6	30.6	32.6	35.1	38.6	42.6	46.1	—	7.02
1509	7.40	8.60	1.16	—	22.3	25.8	28.8	30.8	33.3	36.8	40.8	44.3	48.3	8.60
1496	4.60	5.40	1.17	23.0	27.0	30.5	33.5	35.5	38.0	41.5	45.5	49.0	44.9	3.90
1496	9.40	11.00	1.17	—	—	22.4	25.4	27.4	29.9	33.4	37.4	40.9	40.9	11.3
1471	5.40	6.40	1.19	21.6	25.6	29.1	32.1	34.1	36.6	40.1	44.1	47.6	—	5.41
1458	5.00	6.00	1.20	22.3	26.3	29.8	32.8	34.8	37.3	40.8	44.8	48.3	—	4.71
1446	5.60	6.80	1.21	21.2	25.2	28.7	31.7	33.7	36.2	39.7	43.7	47.2	—	5.76
1434	4.60	5.60	1.22	22.9	26.9	30.4	33.4	35.4	37.9	41.4	45.4	48.9	—	3.96
1423	5.20	6.40	1.23	21.8	25.8	29.3	32.3	34.3	36.8	40.3	44.3	47.8	—	5.06
1423	6.00	7.40	1.23	20.4	24.4	27.9	30.9	32.9	35.4	38.9	42.9	46.4	—	6.44
1389	5.40	6.80	1.26	21.3	25.3	28.8	31.8	33.8	36.3	39.8	43.8	47.3	—	5.50
1389	6.80	8.60	1.26	—	22.8	26.3	29.3	31.3	33.8	37.3	41.3	44.8	48.8	7.84
1378	7.40	9.40	1.27	—	21.7	25.2	28.2	30.2	32.7	36.2	40.2	43.7	47.7	8.77
1367	5.00	6.40	1.28	21.9	25.9	29.4	32.4	34.4	36.9	40.4	44.4	47.9	—	4.80
1367	8.60	11.00	1.28	—	—	23.0	26.0	28.0	30.5	34.0	38.0	41.5	45.5	10.5
1346	4.60	6.00	1.30	22.6	26.6	30.1	33.1	35.1	37.6	41.1	45.1	48.6	—	4.07
1336	5.20	6.80	1.31	21.5	25.5	29.0	32.0	34.0	36.5	40.0	44.0	47.5	—	5.15
1326	5.60	7.40	1.32	20.7	24.7	28.2	31.2	33.2	35.7	39.2	43.2	46.7	—	5.85
1326	9.40	12.40	1.32	—	—	21.2	24.2	26.2	28.7	32.3	36.3	39.8	43.8	11.5
1306	6.40	8.60	1.34	19.1	23.1	26.6	29.6	31.6	34.1	37.6	41.6	45.1	49.1	7.19
1287	5.00	6.80	1.36	21.6	25.6	29.1	32.1	34.1	36.6	40.1	44.1	47.6	—	4.88
1277	5.40	7.40	1.37	20.8	24.8	28.3	31.3	33.3	35.8	39.3	43.3	46.8	—	5.58
1268	6.80	9.40	1.38	—	22.1	25.7	28.7	30.7	33.2	36.7	40.7	44.2	48.2	7.92
1259	4.60	6.40	1.39	22.2	26.2	29.8	32.8	34.8	37.3	40.8	44.8	48.3	—	4.15
1232	5.20	7.40	1.42	21.0	25.0	28.5	31.5	33.5	36.0	39.5	43.5	47.0	—	5.23
1224	6.00	8.60	1.43	19.4	23.4	26.9	29.9	31.9	34.4	37.9	41.9	45.4	49.4	6.61
1215	8.60	12.40	1.44	—	—	21.8	24.8	26.8	29.4	32.9	36.9	40.4	44.4	10.6
1190	6.40	9.40	1.47	—	22.4	26.0	29.0	31.0	33.5	37.0	41.0	44.5	48.5	7.27
1182	4.60	6.80	1.48	21.9	25.9	29.4	32.4	34.4	36.9	40.4	44.4	47.9	—	4.15
1182	5.00	7.40	1.48	21.1	25.1	28.6	31.6	33.6	36.1	39.6	43.6	47.2	—	—
1174	7.40	11.00	1.49	—	20.4	23.9	26.9	28.9	31.4	34.9	39.9	42.4	46.4	8.85
1136	5.60	8.60	1.54	19.7	23.7	27.2	30.2	32.2	34.7	38.2	42.2	45.7	49.7	6.01
1115	6.00	9.40	1.57	—	22.7	26.3	29.3	31.3	33.8	37.3	41.3	44.8	48.8	6.69
1101	5.40	8.60	1.59	19.8	23.9	27.4	30.4	32.4	34.9	38.4	42.4	45.9	49.9	5.66
1087	4.60	7.40	1.61	21.4	25.4	28.9	31.9	34.0	36.5	40.0	44.0	—	—	4.23
1080	6.80	11.00	1.62	—	20.8	24.3	27.3	29.4	31.9	35.4	39.4	42.9	46.9	8.00
1067	9.40	15.40	1.64	—	—	—	21.7	23.7	26.3	29.8	33.8	37.3	41.3	11.7
1061	5.20	8.60	1.65	20.0	24.0	27.5	30.5	32.5	35.0	38.5	42.5	46.0	—	5.31
1042	5.60	9.40	1.68	—	23.0	26.6	29.6	31.6	34.1	37.6	41.6	45.1	49.1	6.01
1042	7.40	12.40	1.68	—	—	22.7	25.7	27.7	30.3	33.8	37.8	41.3	45.3	8.93
1017	5.00	8.60	1.72	20.1	24.2	27.7	30.7	32.7	35.2	38.7	42.7	46.2	—	4.96
1017	6.40	11.00	1.72	—	21.1	24.6	27.6	29.7	32.2	35.7	39.7	43.2	47.2	7.35
1006	5.40	9.40	1.74	19.2	23.2	26.7	29.7	31.7	34.2	37.7	41.7	45.2	49.2	5.66
978	8.60	15.40	1.79	—	—	—	22.3	24.3	26.8	30.4	34.4	37.9	41.9	10.7

"B" WIDTH BELT DRIVES (continued)

FOR MOTOR SPEEDS OF 1750 RPM

Rated HP Per Belt
(Including
Allowance for
Speed Ratio)
Small Speed
Sheave
1750 RPM

PUMP RPM	Sheave Pitch Diameters		Speed Ratio	V-Belt Number and Center Distance										
	Small Sheave	Large Sheave		B-60	B-68	B-75	B-81	B-85	B-90	B-97	B-105	B-112	B-120	
967	5.20	9.40	1.81	19.3	23.3	26.9	29.9	31.9	34.4	37.9	41.9	45.4	49.4	5.31
962	6.80	12.40	1.82	—	19.6	23.2	26.2	28.2	30.7	34.2	38.2	41.7	45.7	8.00
956	6.00	11.00	1.83	—	21.4	24.9	27.9	30.0	32.5	36.0	40.0	43.5	47.5	6.69
936	4.60	8.60	1.87	20.4	24.5	28.0	31.0	33.0	35.5	39.0	43.0	46.5	—	4.23
931	5.00	9.40	1.88	19.5	23.5	27.0	30.0	32.0	34.5	38.0	42.0	45.5	—	4.96
902	6.40	12.40	1.94	—	19.9	23.5	26.5	28.5	31.0	34.5	38.5	42.0	46.0	7.35
893	5.60	11.00	1.96	—	21.7	25.2	28.2	30.2	32.8	36.3	40.3	43.8	47.8	6.01
893	9.40	18.40	1.96	—	—	—	—	21.1	23.6	27.2	31.3	34.8	38.8	11.7
858	4.60	9.40	2.04	19.8	23.8	27.3	30.3	32.3	34.8	38.3	42.3	45.8	49.9	4.31
858	5.40	11.00	2.04	—	21.8	25.4	28.4	30.4	32.9	36.4	40.4	43.9	47.9	5.74
845	6.00	12.40	2.07	—	20.2	23.7	26.8	28.8	31.3	34.8	38.8	42.3	46.3	6.77
841	7.40	15.40	2.08	—	—	20.1	23.2	25.2	27.7	31.2	35.3	38.8	42.8	9.01
825	5.20	11.00	2.12	—	22.0	25.5	28.5	30.5	33.1	36.6	40.6	44.1	48.1	5.39
818	8.60	18.40	2.14	—	—	—	—	21.7	24.2	27.8	31.8	35.4	39.4	10.7
795	5.00	11.00	2.20	—	22.1	25.7	28.7	30.7	33.2	36.7	40.7	44.2	48.2	5.04
792	5.60	12.40	2.21	—	20.5	24.0	27.1	29.1	31.6	35.1	39.1	42.6	46.6	6.09
774	6.80	15.40	2.26	—	—	—	20.5	25.6	28.1	31.7	35.7	39.2	43.3	8.08
761	5.40	12.40	2.30	—	20.6	24.2	27.2	29.2	31.7	35.3	39.3	42.8	46.8	5.74
735	5.20	12.40	2.38	—	20.8	24.3	27.3	29.4	31.9	35.4	39.4	42.9	46.9	5.39
732	4.60	11.00	2.39	—	22.4	26.0	29.0	31.0	33.5	37.0	42.0	44.5	48.5	4.31
726	6.40	15.40	2.41	—	—	20.8	23.9	25.9	28.4	32.0	36.0	39.5	43.6	7.43
706	5.00	12.40	2.48	—	20.9	24.5	27.5	29.5	32.0	35.5	39.6	43.1	47.1	5.04
703	7.40	18.40	2.49	—	—	—	—	22.5	25.0	28.6	32.7	36.2	40.3	9.01
681	6.00	15.40	2.57	—	—	21.1	24.1	26.2	28.7	32.3	36.3	39.8	43.8	6.77
648	4.60	12.40	2.70	—	21.2	24.7	27.8	29.8	32.3	35.8	39.9	43.4	47.4	4.31
646	6.80	18.40	2.71	—	—	—	—	22.9	25.5	29.0	33.1	36.7	40.7	8.08
636	5.60	15.40	2.75	—	—	21.4	24.4	26.5	29.0	32.5	36.6	40.1	44.1	6.09
614	5.40	15.40	2.85	—	—	21.5	24.6	26.6	29.1	32.7	36.7	40.3	44.3	5.74
610	6.40	18.40	2.87	—	—	—	21.1	23.2	25.7	29.3	33.4	36.9	41.0	7.43
591	5.20	15.40	2.96	—	—	21.6	24.7	26.7	29.3	32.8	36.9	40.4	44.4	5.39
570	6.00	18.40	3.07	—	—	—	21.3	23.4	26.0	29.6	33.7	37.2	41.3	6.77
568	5.00	15.40	3.08	—	—	21.8	24.8	26.9	29.4	33.0	37.0	40.6	44.6	5.04
532	5.60	18.40	3.29	—	—	—	21.6	23.7	26.3	29.9	34.0	37.5	41.6	6.09
522	4.60	15.40	3.35	—	—	22.0	25.1	27.2	29.7	33.3	37.3	40.8	44.9	4.31
513	5.40	18.40	3.41	—	—	—	21.7	23.8	26.4	30.0	34.1	37.7	41.7	5.74
494	5.20	18.40	3.54	—	—	—	21.9	24.0	26.6	30.2	34.2	37.8	41.9	5.39
476	5.00	18.40	3.68	—	—	—	22.0	24.1	26.7	30.3	34.4	37.9	42.0	5.04
438	4.60	18.40	4.00	—	—	—	22.3	24.4	27.0	30.6	34.7	38.2	42.3	4.31

SHEAVE DIA.	NUMBER OF GROOVES					
	1	2	3	4	5	6
4.6	SDS 1/2" to 1-15/16" BORE		SD 1/2" to 1-15/16" BORE			
5.0						
5.2						
5.4						
5.6						
6.0			SK 1/2" to 2 1/2" BORE			
6.4						
6.8						
7.4						
8.6						
9.4	SK 1/2" to 2 1/2" BORE		SF 1/2" to 2-15/16" BORE			
11.0						
12.4						
15.4						
18.4						

BUSHINGS
FOR
A/B
SHEAVES

SHEAVES - QD BUSHINGS - V- BELTS

FOR USE ON TRACTOR PTO DRIVE ASSEMBLY

NOTE: PTO Belt Center to Center is 26½" Minimum - 34½" Maximum

DIRECTIONS FOR ORDERING

1. Determine required pump speed.
2. Determine tractor PTO speed.
3. Select components which best fit the ratio desired from one of the following groups.

GROUP A - SHEAVE RATIO 1 : 1

For pump speeds up to 540 RPM (540 PTO) or 1,000 RPM (1,000 PTO)

<u>QTY</u>	<u>PART #</u>	<u>DESCRIPTION</u>
2	894086	4B 8.6 QD Sheave
1	980309	SK 1 3/8 QD Bushing
1	980323	SK 2 1/4 QD Bushing
4	895085	B-85 V-Belt

GROUP B - SHEAVE RATIO 1.5 : 1 (Overdrive)

For pump speeds up to 810 RPM (540 PTO) or 1500 RPM (1000 PTO)

<u>QTY</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	894110	4B 11.0 QD Sheave
1	894074	4B 7.4 QD Sheave
1	980309	SK 1 3/8 QD Bushing
1	980323	SK 2 1/4 QD Bushing
4	895085	B-85 V-Belt

GROUP C - SHEAVE RATIO 2 : 1 (Overdrive)

For pump speeds up to 1080 RPM (540 PTO)*

<u>QTY</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	894110	4B 11.0 QD Sheave
1	897560	5B 5.6 QD Sheave
1	980309	SK 1 3/8 QD Bushing
1	980323	SK 2 1/4 QD Bushing
4	895085	B-85 V-Belt

*This group not recommended for 1,000 RPM.

NOTE: Drives limited to 20 HP @ 540 RPM PTO
35 HP @ 1,000 RPM PTO

All Sheaves used on PARMA Pumps are Quick Disconnect Sheaves

Part # Description

2 GROOVE SHEAVES

892046	2B4.6 Sheave
892050	2B5.0 Sheave
892052	2B5.2 Sheave
892054	2B5.4 Sheave
892056	2B5.6 Sheave
892060	2B6.0 Sheave
892064	2B 6.4 Sheave
892068	2B6.8 Sheave
892074	2B7.4 Sheave
892086	2B8.6 Sheave
892094	2B9.4 Sheave
892110	2B11.0 Sheave
892124	2B12.4 Sheave
892154	2B15.4 Sheave
892184	2B18.4 Sheave

3 GROOVE SHEAVES

893046	3B4.6 Sheave
893050	3B5.0 Sheave
893052	3B5.2 Sheave
893054	3B5.4 Sheave
893056	3B5.6 Sheave
893060	3B6.0 Sheave
893064	3B6.4 Sheave
893068	3B6.8 Sheave
893074	3B7.4 Sheave
893086	3B8.6 Sheave
893094	3B9.4 Sheave
893110	3B11.0 Sheave
893124	3B12.4 Sheave
893154	3B15.4 Sheave
893184	3B18.4 Sheave

Part # Description

4 GROOVE SHEAVES

894046	4B4.6 Sheave
894050	4B5.0 Sheave
894052	4B5.2 Sheave
894054	4B5.4 Sheave
894056	4B5.6 Sheave
894060	4B6.0 Sheave
894064	4B6.4 Sheave
894068	4B6.8 Sheave
894074	4B7.4 Sheave
894086	4B8.6 Sheave
894094	4B9.4 Sheave
894110	4B11.0 Sheave
894124	4B12.4 Sheave
894154	4B15.4 Sheave
894184	4B18.4 Sheave
894200	4B20.0 Sheave

6 GROOVE SHEAVES

896046	6B4.6 Sheave
896050	6B5.0 Sheave
896052	6B5.2 Sheave
896054	6B5.4 Sheave
896056	6B5.6 Sheave
896060	6B6.0 Sheave
896064	6B6.4 Sheave
896068	6B6.8 Sheave
896074	6B7.4 Sheave
896086	6B8.6 Sheave
896094	6B9.4 Sheave
896110	6B11.0 Sheave
896124	6B12.4 Sheave
896154	6B15.4 Sheave
896184	6B18.4 Sheave
896200	6B20.0 Sheave

All Bushings Used on PARMA Pumps Are Quick Disconnect Bushings

Part # Description

SDS BUSHING

980276	SDS 7/8" Bushing
980278	SDS 1" Bushing
980280	SDS 1 1/8" Bushing
980284	SDS 1 3/8" Bushing
980288	SDS 1 5/8" Bushing
980292	SDS 1 7/8" Bushing
980293	SDS 1 15/16" Bushing

SD BUSHING

980419	SD 7/8" Bushing
980421	SD 1" Bushing
980423	SD 1 1/8" Bushing
980427	SD 1 3/8" Bushing
980431	SD 1 5/8" Bushing
980435	SD 1 7/8" Bushing
980436	SD 1 15/16" Bushing

SK BUSHING

980301	SK 7/8" Bushing
980303	SK 1" Bushing
980305	SK 1 1/8" Bushing
980309	SK 1 3/8" Bushing
980313	SK 1 5/8" Bushing
980317	SK 1 7/8" Bushing
980318	SK 1 15/16" Bushing
980321	SK 2 1/8" Bushing
980323	SK 2 1/4" Bushing
980325	SK 2 3/8" Bushing

Part # Description

SF BUSHING

980336	SF 7/8" Bushing
980338	SF 1" Bushing
980340	SF 1 1/8" Bushing
980344	SF 1 3/8" Bushing
980348	SF 1 5/8" Bushing
980353	SF 1 15/16" Bushing
980356	SF 2 1/8" Bushing
980358	SF 2 1/4" Bushing
980360	SF 2 3/8" Bushing
980365	SF 2 11/16" Bushing

E BUSHING

980386	E 1 7/8" Bushing
980390	E 2 1/8" Bushing
980394	E 2 3/8" Bushing

F BUSHING

980452	F 1 7/8" Bushing
980453	F 1 15/16" Bushing
980456	F 2 1/8" Bushing
980460	F 2 3/8" Bushing

J BUSHING

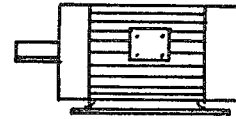
980471	J 1 15/16" Bushing
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Factory Recommendation is Use of 2 or More Belts

V - BELTS - B SIZE

<u>Part #</u>	<u>Description</u>
895060	B-60 V-Belt
895068	B-68 V-Belt
895075	B-75 V-Belt
895081	B-81 V-Belt
895085	B-85 V-Belt
895090	B-90 V-Belt
895097	B-97 V-Belt
895105	B-105 V-Belt
895112	B-112 V-Belt
895120	B-120 V-Belt

MOTORS



OPEN DRIP PROOF

Single Phase 230 V - 1750 RPM

PART NO.	DESCRIPTION	SHAFT SIZE	WEIGHT
890110	1 HP Single Phase 230V Motor	7/8	36#
890115	1.5 HP Single Phase 230V Motor	7/8	43#
890120	2 HP Single Phase 230V Motor	7/8	43#
890130	3 HP Single Phase 230V Motor	1 1/8	61#
890150	5 HP Single Phase 230V Motor	1 1/8	81#
890175	7.5 HP Single Phase 230V Motor	1 3/8	137#
890200	10 HP Single Phase 230V Motor	1 3/8	----

NOTE: Open drip proof motors are not protected from weather and should be covered if used outside.

TOTALLY ENCLOSED FAN COOLED

Three Phase 230/460V - 1750 RPM

PART NO.	DESCRIPTION	FRAME SIZE	SHAFT SIZE	WEIGHT
890820	2 HP 3 Phase 230/460 V Motor	145T	7/8	45#
890830	3 HP 3 Phase 230/460 V Motor	182T	1 1/8	63#
890850	5 HP 3 Phase 230/460 V Motor	184T	1 1/8	76#
890875	7.5 HP 3 Phase 230/460 V Motor	213T	1 3/8	128#
890910	10 HP 3 Phase 230/460 V Motor	215T	1 3/8	140#
890915	15 HP 3 Phase 230/460 V Motor	254T	1 5/8	165#
890920	20 HP 3 Phase 230/460 V Motor	256T	1 5/8	187#
890925	25 HP 3 Phase 230/460 V Motor	284T	1 7/8	263#
890930	30 HP 3 Phase 230/460 V Motor	286T	1 7/8	300#
890940	40 HP 3 Phase 230/460 V Motor	324T	2 1/8	409#
890950	50 HP 3 Phase 230/460 V Motor	326T	2 1/8	460#
890960	60 HP 3 Phase 230/460 V Motor	364T	2 3/8	560#

MOTORS

SOFT START SINGLE PHASE 1750 RPM

OPEN DRIP PROOF

(For operation from 230 Volt 60 Hertz Single Phase Low Starting Current)

This type of motor gives reliable electric horsepower on single phase lines. Available in standard sizes 7.5 HP through 60 HP.

The motor operates on single phase through a control panel which includes matched starter and overload protection. The motor is a highly reliable polyphase induction motor with a unique winding which allows it to be operated on either single or three phase. The motor DOES NOT have to be rewound. To do this, simply reconnect the leads in the junction box.

All drip proof motors are rodent screened.

The Panel control is in a drip proof enclosure which incorporates the motor starter, motor control, and overload protection.

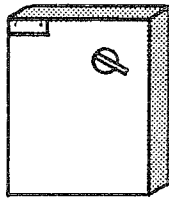
The design of this unit has been field proven. It has been in use since 1958. This system provides the answer to many power problems when only single phase service is available.

(NOTE: All motors listed below are 1750 RPM - Soft Start Motors)

Part No.	Description	Frame	Shaft	Start Amps	Full Load Amps	Approx. Wt.
890207	7.5 HP Single Phase Soft Start Motor	205TZ	1 3/8	90	30	103
890210	10 HP Single Phase Soft Start Motor	254TZ	1 5/8	120	40	117
890215	15 HP Single Phase Soft Start Motor	256TZ	1 5/8	175	58	163
890220	20 HP Single Phase Soft Start Motor	284TZ	1 7/8	210	77	196
890225	25 HP Single Phase Soft Start Motor	286TZ	1 7/8	260	95	285
890230	30 HP Single Phase Soft Start Motor	324TZ	2 1/8	300	100	334
890240	40 HP Single Phase Soft Start Motor	326TZ	2 1/8	410	140	392
890249	50 HP Single Phase Soft Start Motor	364TZ	2 3/8	520	180	429
890260	60 HP Single Phase Soft Start Motor	365TZ	2 3/8	590	205	592

Delivery Time: 4 to 6 Weeks

ELECTRICAL ACCESSORIES



PUMPING PLANT STARTER

MAGNETIC STARTERS - With Heaters and Disconnect

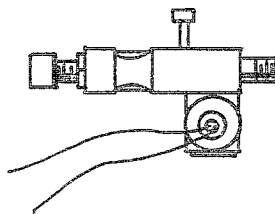
PART #	DESCRIPTION	MAX HP	APPROX WEIGHT
890123 *	Size 1 - 3 Phase 230V Magnetic Starter	7 1/2	57#
890146	Size 1 - 3 Phase 460 V Magnetic Starter	10	57#
890223**	Size 2 - 3 Phase 230V Magnetic Starter	15	70 #
890246	Size 2 - 3 Phase 460V Magnetic Starter	25	70 #
890323	Size 3 - 3 Phase 230V Magnetic Starter	30	100 #
890346	Size 3 - 3 Phase 460V Magnetic Starter	50	100#

Brands - Square D and Toshiba

* Part Number 890123 Magnetic Starter, Size a, also used for Single Phase motors up to 3 HP.

**Part Number 890223 Magnetic Starter, Size 2, also used for Single Phase motors up to 7 1/2 HP by simple internal wiring change.

SOLENOID OILER



Part No.	Description	Approx. Wt.
891823	230V Solenoid Oiler	
891824	Coil for 230 V Oiler	
891846	460V Solenoid Oiler	
891847	Coil for 460 V Oiler	

