

GENERAL PUMP PRODUCTS

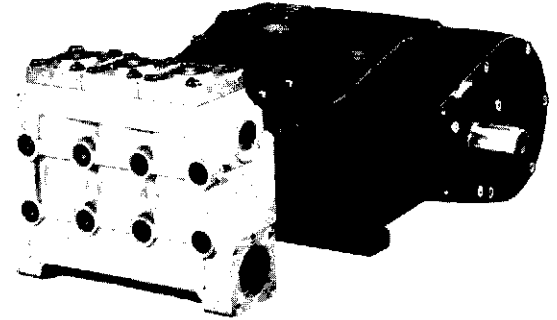
MS SERIES PUMPS WITH GEAR BOX (2.4 Ratio)

APPLICATIONS

MS Series pumps with built-in gear reducer are designed for a wide range of industrial applications which include high pressure cleaning systems, hydrostatic test equipment, pipe and sewer cleaning equipment, water purification systems and other high flow, high pressure multiple nozzle systems for factories and foundries.

FEATURES

- Built-in gear reducer (2.4 ratio)
- Heavy cast iron crankcase
- Nickel-treated nodular cast iron manifold
- Optional stainless steel manifold
- Self-adjusting shaft bearings with double roller rim
- Double projection, gas-nitride, hardened steel crankshaft
- Anti-fiction bronze connecting rods
- Stainless steel valves
- Ceramic-coated stainless steel plungers



PERFORMANCE DATA

RPM	MS 36	MS 40	MS 45	MS 50	MS 55	FLOW
1200	23.9	29.9	37.5	46.4	55.9	GPM
1400	27.8	34.4	43.7	54.0	65.1	GPM
1600	31.7	39.3	49.8	61.6	74.2	GPM
1800	35.6	44.1	56.0	69.2	83.4	GPM
MAX PSI	4350	3500	2900	2250	1800	
HORSEPOWER FORMULA			RPM FORMULA			
$\frac{\text{GPM} \times \text{PSI}}{1460} = \text{REQUIRED BRAKE H.P.}$			$\frac{\text{RATED RPM} \times \text{DESIRED GPM}}{\text{RATED GPM}} = \text{PUMP RPM}$			

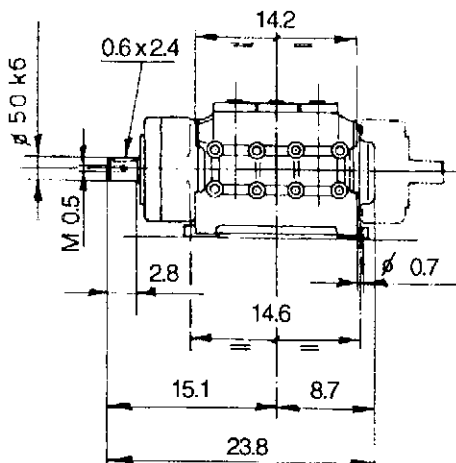
Performance data stated at 100% volumetric efficiency. Based on inlet water conditions, pump volumetric efficiency is 95% or greater.

SPECIFICATIONS

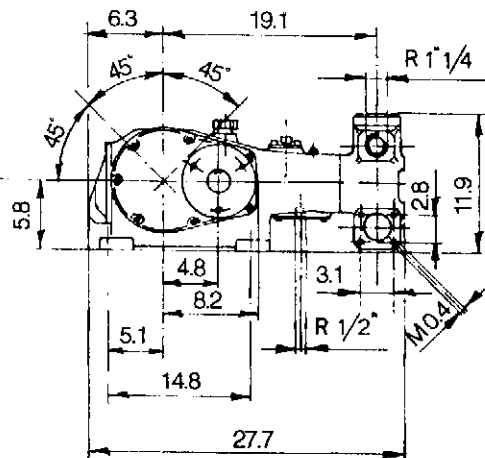
Volumes	35.6 - 83.4 GPM
Discharge Pressure	1800 - 4350 PSI
Max. Inlet Pressure	Flooded to 45 PSI Max.*
Fluid Temperature	150°F Max.*
Crankcase Capacity	132 oz.
Inlet	Hosebarb for 3 in. ID Hose
Discharge Port	1-1/4 in. BGT
Discharge Fitting	1-1/4 in. NPT M
Shaft Diameter	50 mm
Weight	520 lbs.
Dimensions	27.7 in. L x 19.5 in. W x 11.9 in. H

*See Fluid Temperature Section

SIDE VIEW



END VIEW





DESIGN CRITERIA

General Industrial MS Series Triplex Plunger Pumps with gear box are designed and manufactured to pump water and other liquids of similar viscosity compatible with the construction materials used in the pump.

Durable by design, MS Series Pumps with gear box are ideal for a wide variety of high-pressure applications including intermittent or continuous duty high-pressure cleaning and water sandblasting.

Optimum pump performance can only be achieved if the entire fluid system is designed and built using properly sized plumbing and accessories. General MS Industrial Pumps with gear box are positive displacement pumps and require the use of a properly designed pressure relief mechanism in the discharge plumbing of any system using these pumps.

Failure to install a relief mechanism could result in personal injury or damage to the system.

General Pump, Inc. does not assume any liability or responsibility for the design and operation of a customer's high-pressure system.

PUMP SELECTION - NORMAL DUTY

The General Industrial MS Series Pumps with gear box offers a wide range of flow, pressure and drive options. Pump performances indicated for the MS Series Pumps with gear box (RPM, GPM, PSI, fluid temperature) are the designed maximum for pumps operated on a **normal intermittent duty cycle**.

PUMP SELECTION - CONTINUOUS DUTY

Most MS pumps with gear box can be re-rated for continuous duty by reducing the pump RPM by 25% minimum and by installing a feed pump capable of delivering two times the operating flow rate at 45 PSI maximum. In selecting a pump for continuous duty, optimal performance is accomplished by using the largest plunger diameter practical and reducing the RPM to deliver the desired flow. **Do not exceed the maximum rated discharge pressure of this pump.**

Example: Customer requirement is 35.6 GPM @ 3500 PSI. According to the catalogue, the MS 36 operated at 1500 RPM would be the proper pump for intermittent duty. For continuous duty select the MS Series pump with gear box that allows for the most reduction in crankshaft speed. The MS 40 operated at 1200 RPM will deliver the desired performance on a continuous duty basis. The MS 40 was selected instead of the MS 50, because the MS 50 would have to be operated at 770 RPM to produce the desired flow. Through the gear reducer this would result in a crankshaft speed of 385 RPM (too slow for proper lubrication).

Proper splash lubrication requires a 500 RPM minimum internal crankshaft speed.

PUMP INSTALLATION

When designing a system, **keep the inlet plumbing as simple as possible using a minimum amount of fittings or elbows with no elbows within 12" of pump inlet.**

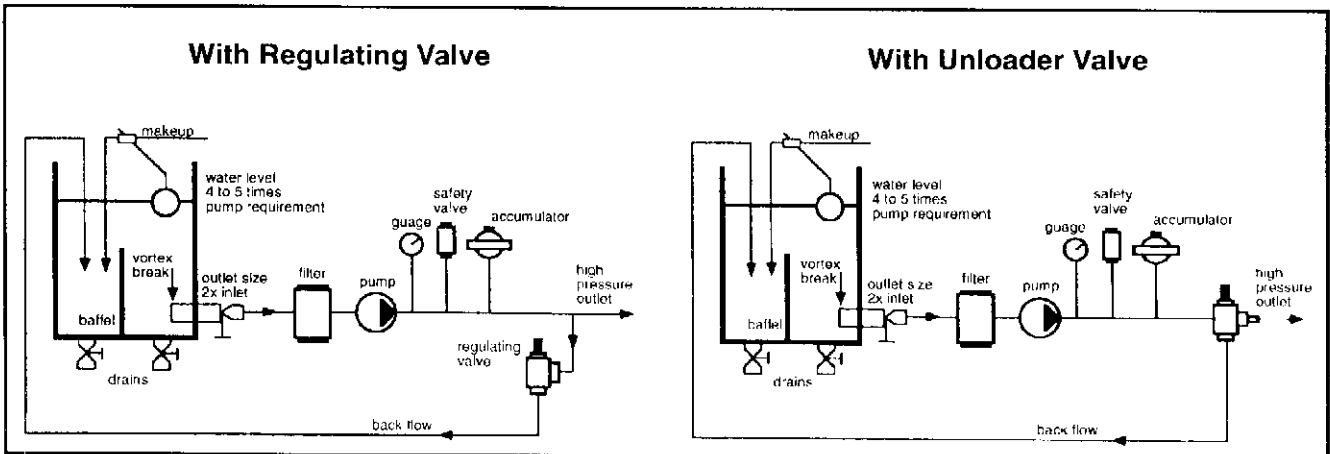
Pump life is considerably influenced by the condition of the fluid supplied to the inlet of the pump. **Inlet plumbing should be flexible reinforced hose, 1.5 to 2 times larger than the specified inlet port size.** Inlet and discharge fittings are furnished with each pump.

It is critical to provide airtight inlet plumbing sized to deliver an adequate volume of settled fluid to the pump **(minimum 2 times the operating flow rate)**. This is best accomplished with a pressurized feed at 30-45 PSI or a flooded inlet.

Do not let pump self prime.

When using an inlet holding tank (float tank), size it according to the maximum rated output of the pump. Provide a **minimum of 5 times the operating flow rate (a 10 GPM pump requires a 50 GPM tank)**. The feed tank should contain sufficient baffling to eliminate air bubbles and turbulence. Feed tanks should be mounted so the water level in the tank is always higher than the feed lines and the inlet port of the pump (flooded inlet). Diffusers should be installed on all return lines to the tank. (See diagram.)

Typical Installation diagram:



FLUID TEMPERATURE

MS Series Pumps with gear box are rated for 150°F maximum fluid temperature. However, **when operating with fluid temperatures exceeding 110°F, a pressurized inlet is required.** Install a feed pump capable of delivering two times the operating flow rate at 45 PSI maximum, and follow continuous duty parameters.

FILTERS

Install an inlet filter on all systems. The filter should be positioned as close as possible to the inlet of the pump. **The inlet filter capacity must be a minimum of three times the rated output of the pump.** Filter media of 50 to 80 microns is recommended for most systems.

PUMP MOUNTING

The pump must be mounted in a horizontal position on a rigid base in a manner to permit drainage of crankcase oil. The pump should be flat with no more than a 5 degree incline. Pumps can be operated using pulley or direct drive. **Observe the specified pump rotation indicated by the arrows on the crankcase.** General Industrial Pumps are splash lubricated. By observing the proper rotation and crankshaft speed (500 RPM minimum), the crank mechanism puts oil in circulation through internal crankcase grooves so the connecting rods, bearings, piston guides and other surfaces requiring lubrication receive proper coverage.

Crankcase oil should be checked frequently and changed as follows: Initial oil change between the first 50 and 100 hours of operation; then after each successive 500 hours of operation. Use General Pump Oil P/N 100217, Pennzoil RO 220 or equivalent.

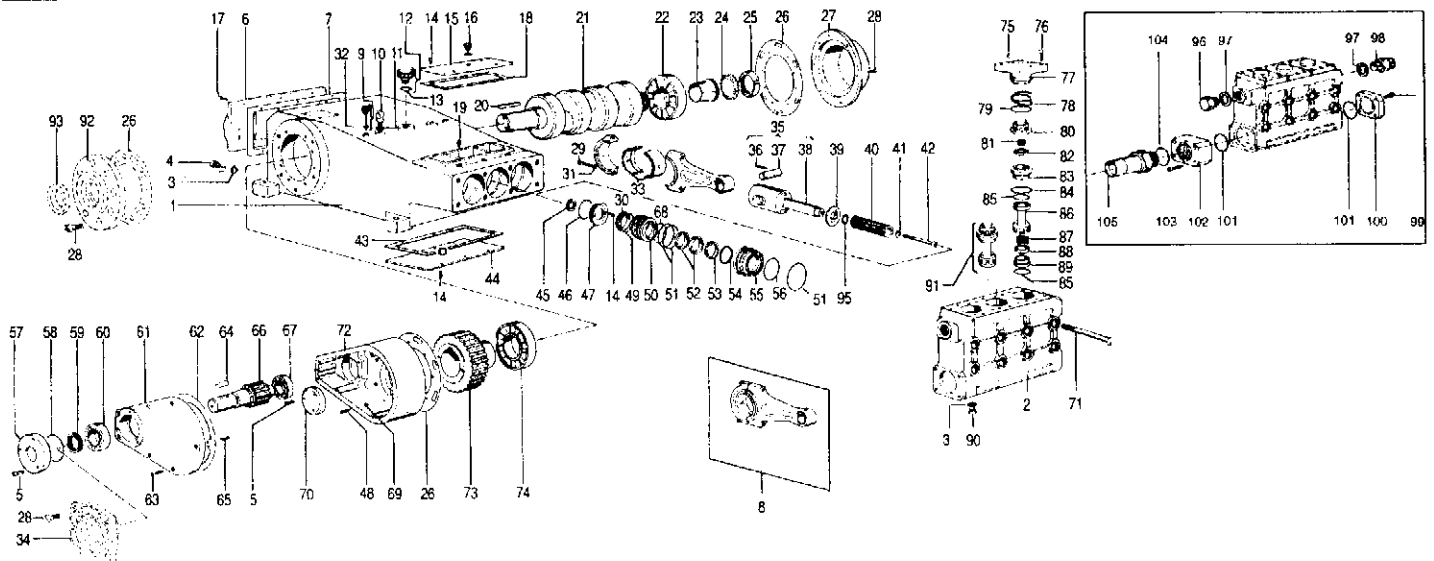
MS Series Pumps with gear box are equipped with grease fittings (Position 29). Greasing should be done prior to initial start-up and after every 100 hours of operation. Using a hand grease gun, apply a high grade silicon grease with a penetration coefficient of 290 (General Pump Silicon Grease P/N 100278). **Caution — Do Not Overlubricate — Stop At The First Sign Of Back Pressure To Avoid Damage To Packings.**

START-UP

Check oil prior to start-up, and open all inlet and discharge valves. **Always start the pump in a zero pressure condition. Never let pump run dry.**

WARRANTY

General Pump products are warranted by the manufacturer to be free from defects in material and workmanship. Period of warranty shall be 1 year from date product is received by original buyer. Liability of manufacturer under the foregoing warranty is limited to **repair or replacement** at the option of manufacturer of that product which according to the manufacturer's investigation was deemed defective at time of shipment. Damage resulting from neglect, abuse, tampering or misapplication voids the warranty. This warranty is in lieu of all other warranties, expressed or implied, including any warranty of merchantability and or any and all other obligations or liabilities on the part of the manufacturer.



MS SERIES PARTS

Pos.	Code	Description	Qty.	Pos.	Code	Description	Qty.	Pos.	Code	Description	Qty.
1	F060100220	Crankcase	1	F024200370	Plunger MS50	3	64	F872097009	Key	1	
2	F064100260	Manifold	1	F024200380	Plunger MS55	3	65	F872126004	Pin	2	
3	F872043002	Washer	4	F872040004	Washer	3	66	F052000110	Pinion Shaft, 1500 RPM (Z=27)	1	
4	F801057002	Magnetic Plug	1	F871135516	Cap Screw MS36-40-45	3	F052000130	Pinion Shaft, 1800 RPM (Z=24)	1		
5	F871125105	Cap Screw	6	F871135510	Cap Screw MS50-55	3	F811101008	Bearing	1		
6	F063400540	Rear Cover	1	F080600130	Bottom Gasket	1	F881011161	O-Ring MS36-40	3		
7	F080600100	Rear Cover Gasket	1	F040000070	Bottom Cover	1	F881011163	O-Ring MS45	3		
8	F250000020	Complete Connecting Rod	3	F881081000	Oil Seal	3	F881011165	O-Ring MS50	3		
9	F001000010	Oil Dipstick	2	F881010127	O-Ring	3	F881011167	O-Ring MS55	3		
10	F872026003	Eye Bolt	2	F063400560	Cover	3	69	F872047005	Washer	8	
11	F030000030	Spacer	2	F871125108	Cap Screw	8	70	F030000090	Gear Retainer	1	
12	F801054027	Oil Fill Plug	1	F881010127	O-Ring MS36-40-45-50	3	71	F871145120	Cap Screw	8	
13	F881010116	O-Ring	1	F881010014	O-Ring MS55	3	72	F060100020	Gear Housing	1	
14	F871115102	Cap Screw	16	F022300340	Packing Support MS36	3	73	F052000100	Gear, 1500 RPM (Z=55)	1	
15	F040000050	Top Cover	1	F022300350	Packing Support MS40	3	F052000120	Gear, 1800 RPM (Z=58)	1		
16	F801056002	Breather	1	F022300360	Packing Support MS45	3	74	F811100116	Bearing	1	
17	F871121103	Cap Screw	6	F022300370	Packing Support MS50	3	75	F871245358	Screw	6	
18	F080600120	Top Gasket	1	F022300380	Packing Support MS55	3	76	F871135103	Cap Screw	12	
19	F801077003	Grease Fitting	3	F881011052	O-Ring	9	77	F063100011	O Valve Cover	3	
20	F872100005	Key	1	F881020010	Packing MS36	6	78	F881112002	Plastic Ring	3	
21	F050000100	Crankshaft	1	F881020011	Packing MS40	6	79	F881010219	O-Ring	3	
22	F811111008	Bearing	1	F881020012	Packing MS45	6	80	F021300110	Discharge Valve Guide	3	
23	F811920004	Bearing Bushing	1	F881020014	Packing MS50	6	81	F090200090	Discharge Valve Spring	3	
24	F872069012	Tab Washer	1	F881020015	Packing MS55	6	82	F082200110	Discharge Valve Disc	3	
25	F872020012	Ring Nut	1	53	F031200090	Packing Ring MS36	3	83	F081200130	Discharge Valve Seat	3
26	F080600110	Cover Gasket	2	F031200100	Packing Ring MS40	3	84	F881011166	O-Ring	3	
27	F063400580	Side Cover	1	F031200110	Packing Ring MS45	3	85	F881011159	O-Ring	6	
28	F871125106	Cap Screw	8	F031200210	Packing Ring MS50	3	86	F021300090	Suction Valve Guide	3	
29	F871350001	Connecting Rod Screw	6	F031200220	Packing Ring MS55	3	87	F090200080	Suction Valve Spring	3	
30	F881061014	Scraper Ring MS36	3	54	F031300100	Spacer MS36-40	3	88	F082200100	Suction Valve Disc	3
	F881061015	Scraper Ring MS40	3	F031300120	Spacer MS45	3	89	F081200120	Suction Valve Seat	3	
	F881061017	Scraper Ring MS45	3	F031300130	Spacer MS50	3	90	F084000010	Plug	3	
	F881061018	Scraper Ring MS50	3	F031300140	Spacer MS55	3	91	F206005040	Suction/Discharge Valve Assembly	3	
	F881061019	Scraper Ring MS55	3	55	F062200220	Cylinder MS36-40	3	95	F881012115	O-Ring	3
31	F872046006	Tab Washer	6	F062200230	Cylinder MS45	3	96	F821201057	Plug	1	
32	F872041501	Washer	2	F062200240	Cylinder MS50	3	97	F881110104	Washer	2	
33	F812000001	Brass Bushing	3	F062200250	Cylinder MS55	3	98	F821020017	Nipple - PN3 G1" - 1/4 - 1" 1/2	1	
35	F250001060	Complete Piston	3	56	F881011164	O-Ring	3	F821020022	Nipple - RV3 G1" 1/4	1	
36	F872142016	Retainer Pin	3	57	F063100190	Flange	1	99	F871125106	Cap Screw	4
37	F071000060	Wrist Pin	3	58	F881010131	O-Ring	1	100	F063100130	Flange Cover Plate	1
38	F020100070	Plunger Rod	3	59	F881080026	Crankshaft Oil Seal	1	101	F881011253	O-Ring	2
39	F041500010	Wiper	3	60	F811100101	Bearing	1	102	F073100030	Inlet Manifold Adapter Plate	1
40	F024200340	Plunger MS36	3	61	F063100150	Gear Box Cover	1	103	F871125112	Cap Screw	4
	F024200350	Plunger MS40	3	62	F080600140	Cover Gasket	1	104	F881011170	O-Ring	1
	F024200360	Plunger MS45	3	63	F871125110	Cap Screw	7	105	F073000020	Inlet Hose Fitting	1

REPAIR KITS

POSITIONS INCLUDED	N.PCS.	MS 36	MS 40	MS 45	MS 50	MS 55
30 49 52 68	3-6	KIT 483	KIT 484	KIT 485	KIT 486	KIT 487
50 51	3-6	KIT 489	KIT 490	KIT 491	KIT 492	KIT 493
53	3	KIT 456	KIT 457	KIT 458	KIT 495	KIT 496
30 49 50 51 52 53 54 68	1-2	KIT 498	KIT 499	KIT 500	KIT 501	KIT 502
80 81 82 83 84 85 86	1-2	KIT 504				
87 88 89 (91)		KIT 504				
45	3	KIT 505				
3 13 32 41 46 51 56 58	3-20	KIT 507				
78 79 84 85 95		KIT 507				

TORQUE SPECS

Position	Ft./lbs.
29	50
42	65
71	180
76	87

