

-
- **Installation**
 - **Operation**
 - **Repair**
 - **Parts**

HD Magnum Series

**Hydraulically Driven
Centrifugal Pumps**



Advanced Sprayer Pumps with:

- *Exclusive Front & Rear Wear Rings*
- *Oversized Bearings*
- *Two Piece Pump & Motor Design with HD Splined Coupling, Nylon Impeller, & Viton/Ceramic Seals.*

HD Magnum Series

Model Number Designations

| Pump Size | Port Size - FNPT (inches) | |
|-----------|---------------------------|---------|
| | Inlet: | Outlet: |
| M125 | 1-1/4 | 1 |
| M150 | 1-1/2 | 1-1/4 |
| M200 | 2 | 1-1/2 |

Material

| | |
|----------|---|
| C | Cast iron with nylon impeller and Viton/ceramic seal (standard) |
| S | Stainless steel with nylon impeller and Viton/silicon carbide seal (standard) |

Hydraulic Motor*

| | |
|--------------|---|
| PM21 | 5-7 GPM, rear ports (for M125 only) |
| PM37 | 7-10 GPM, rear ports (for M125 & M150 only) |
| PM45 | 11-13 GPM, rear ports |
| PM58 | 13-15 GPM, rear ports |
| PM58B | 13-15 GPM, side ports |
| PM70B | 15-17 GPM, side ports |



Optional Adders

| | |
|------------|--|
| -VS | Viton/silicon carbide seal (optional for cast iron models) |
| -PI | Polypropylene impeller |
| -NS | Nylon impeller with stainless steel insert |
| -PS | Polypropylene impeller with stainless steel insert |

* All hydraulic motors are designed for open and closed center systems. Consult factory for other motor options.

Performance

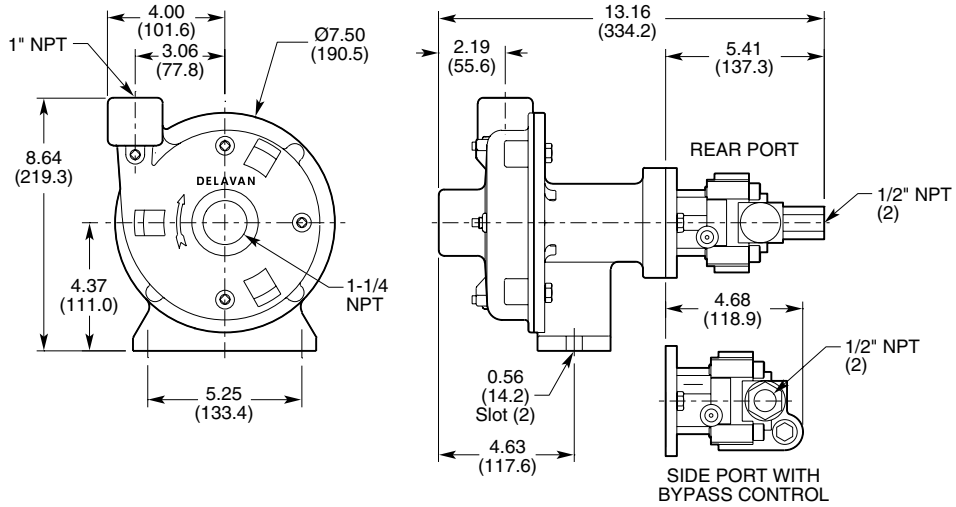
| Pump Size | Hydraulic Motor Size | Hydraulic Oil Flow (GPM) | Pump Flow GPM @ Rated PSIG | | | | | | | | | | | | | | | | |
|-----------|----------------------|--------------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|
| | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | | | |
| M125 | PM21* | 5 | 58 | 55 | 51 | 38 | 31 | 17 | | | | | | | | | | | |
| | | 6 | 65 | 64 | 63 | 59 | 54 | 49 | 42 | 34 | 26 | 15 | | | | | | | |
| | | 7 | 73 | 72 | 70 | 69 | 68 | 64 | 59 | 53 | 45 | 38 | 30 | 22 | | | | | |
| | PM37 | 7 | 69 | 68 | 66 | 63 | 55 | 44 | 25 | 16 | | | | | | | | | |
| | | 8 | 78 | 76 | 75 | 71 | 69 | 61 | 52 | 34 | 15 | | | | | | | | |
| | | 9 | 79 | 77 | 76 | 73 | 70 | 63 | 59 | 46 | 30 | 8 | | | | | | | |
| | | M150 | PM37* | 7 | 155 | 144 | 127 | 105 | 65 | 21 | | | | | | | | | |
| | | | | 8 | 175 | 170 | 161 | 145 | 126 | 104 | 78 | 43 | | | | | | | |
| | | | | 9 | 180 | 172 | 163 | 151 | 138 | 115 | 88 | 64 | 39 | | | | | | |
| PM45 | 11 | 180 | 173 | 165 | 152 | 136 | 123 | 101 | 82 | 61 | 32 | 8 | | | | | | | |
| | 12 | 185 | 177 | 169 | 160 | 151 | 138 | 121 | 103 | 82 | 63 | 45 | 11 | | | | | | |
| | 13 | 191 | 182 | 174 | 168 | 159 | 145 | 133 | 117 | 101 | 86 | 60 | 36 | | | | | | |
| PM58 | 13 | 172 | 165 | 159 | 148 | 136 | 124 | 106 | 86 | 66 | 37 | 12 | | | | | | | |
| | PM58B | 14 | 180 | 172 | 164 | 156 | 147 | 135 | 120 | 104 | 86 | 69 | 51 | 15 | | | | | |
| 15 | | 185 | 174 | 165 | 159 | 150 | 141 | 131 | 118 | 101 | 88 | 63 | 38 | | | | | | |
| PM70B | 15 | 163 | 157 | 152 | 149 | 145 | 128 | 100 | 64 | 10 | | | | | | | | | |
| | 16 | 171 | 164 | 156 | 153 | 149 | 144 | 135 | 117 | 79 | 51 | | | | | | | | |
| | 17 | 176 | 167 | 159 | 155 | 150 | 146 | 139 | 121 | 82 | 53 | | | | | | | | |
| M200 | PM45* | 11 | 229 | 221 | 217 | 193 | 180 | 149 | 128 | 111 | 75 | 42 | 29 | | | | | | |
| | | 12 | 240 | 236 | 230 | 220 | 205 | 194 | 151 | 137 | 123 | 93 | 81 | 41 | 14 | | | | |
| | | 13 | 245 | 238 | 229 | 216 | 199 | 186 | 167 | 146 | 122 | 108 | 76 | 55 | 17 | | | | |
| | PM58 | 13 | 232 | 226 | 214 | 200 | 184 | 161 | 139 | 110 | 79 | 36 | | | | | | | |
| | | PM58B | 14 | 235 | 229 | 222 | 204 | 190 | 169 | 145 | 124 | 100 | 70 | 44 | 12 | 10 | | | |
| | 15 | | 240 | 232 | 226 | 209 | 195 | 179 | 156 | 135 | 110 | 84 | 53 | 32 | 20 | 10 | | | |
| | PM70B | 15 | 163 | 157 | 152 | 149 | 145 | 128 | 100 | 64 | 10 | | | | | | | | |
| | | 16 | 171 | 164 | 156 | 153 | 149 | 144 | 135 | 117 | 79 | 51 | | | | | | | |
| | | 17 | 176 | 167 | 159 | 155 | 150 | 146 | 139 | 121 | 82 | 53 | | | | | | | |

*Note: Smaller displacement motors on larger pumps can cause pressures on hydraulic motor to exceed recommended manufacturer's specifications. Consult factory for details.

Hydraulically Driven Centrifugal Pumps

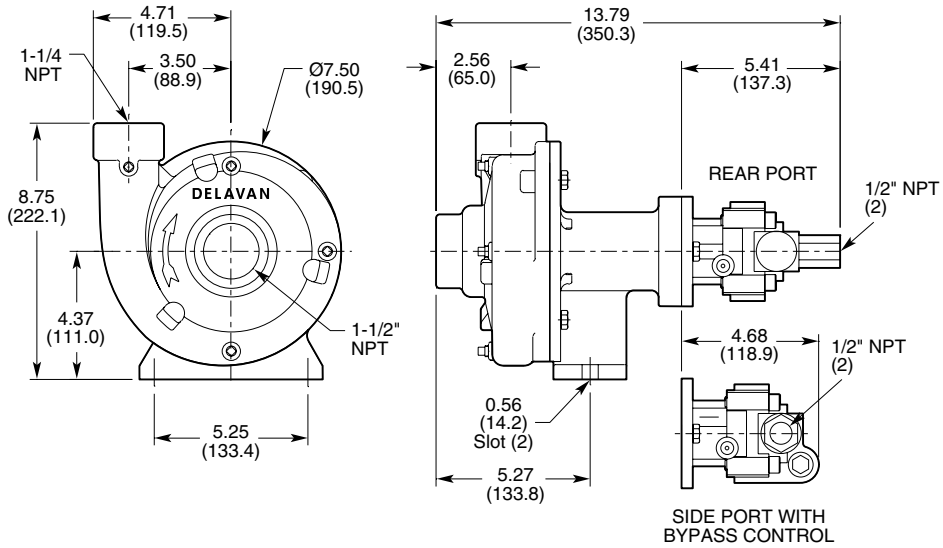
Size M125

Inches (mm)



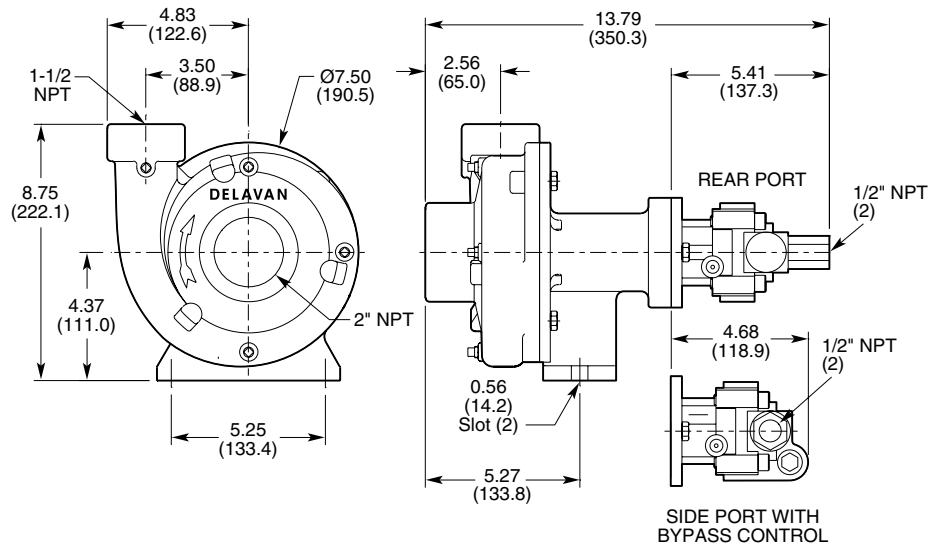
Size M150

Inches (mm)



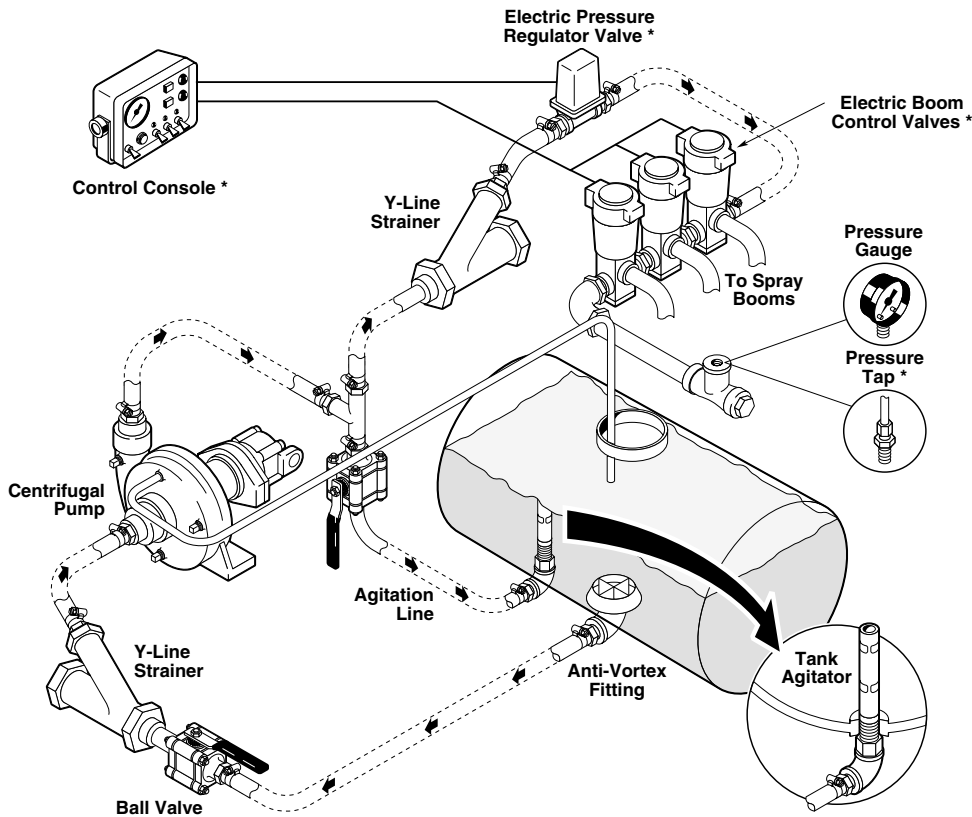
Size M200

Inches (mm)



HD Magnum Series

Plumbing Recommendations



***Note:** An electronic control console, pressure regulating valve, boom valves and pressure gauge feedback loop can be used with the HD Magnum centrifugal pump to make a complete spray system. To regulate pressure to the boom, simply adjust the pressure setting at the control console. The pressure gauge feedback loop indicates the desired spraying pressure. Open the bypass or agitation line and set the desired agitation flow. If the desired spraying pressure decreases, adjust the pressure at the control console as needed.

Pump Installation Guidelines

1. Mount the pump below the liquid level in the tank to ease priming. Install a 20 mesh suction filter and tank shutoff on the pump inlet.
2. The volute casing can be rotated to have the discharge in any of four positions. The top position is best to aid in pump priming by eliminating air from the pump.
3. Pump ratings are based on using adequate size hose. We recommend using hose size that is equal to the port size or larger. Smaller hose can be used but will affect the pump performance.
4. Four 1/8" NPT plug vent lines are located on the front of the pump. Remove the 1/8" NPT plug positioned at the highest point on the pump. Install a small diameter hose or tube (typically 1/8") back to the tank to allow air to be vented from the pump. This allows the pump to prime properly and decreases potential pressure fluctuations.

Caution:

Do not run the pump dry! Make sure pump is filled with liquid when starting. Shut off the pump when the tank is empty. Running the pump dry will damage the seals!

Motor Installation Guidelines

1. Refer to the Pump/Tractor Selection Guide to determine the correct installation section to follow.
2. For all models, remove the cap plugs from the motor ports. When assembling the hydraulic hoses to the motor, make sure to keep the hydraulic connections clean. Do not allow paint, dirt or metal particles to fall into the ports.
3. Make sure the hydraulic quick disconnects are clean and completely engage when coupled to the tractor hydraulics.
4. Make sure that the hydraulic connections are to the correct port. The ports are clearly marked IN and OUT.

Caution:

Do not run the pump at deadhead (pump primed but no outlet flow) for more than two minutes. Pump seals will overheat and may be damaged due to heat buildup.

Hydraulically Driven Centrifugal Pumps

Typical Flow Control for Closed Center (LS) Systems



Closed and Load Sensing Operation

1. With the pump installed on the sprayer (as shown in the Plumbing Recommendations illustration on the facing page), fill the pump with liquid by opening the inlet ball valve.
2. Connect the hydraulic hoses to the remote outlet on the tractor. Use the motor remote outlet if your tractor has one.
3. Adjust the flow control on the tractor remote outlet to the lowest flow position. Failure to start in the lowest flow position could damage the pump and void the warranty.
4. Open the agitation line all the way open and open the boom control valves. Start the tractor and increase the engine speed to the desired speed used when spraying. Engage the hydraulic remote to start the pump. At this time, make sure the pump is primed.
5. Adjust the sprayer pressure. Turn off the agitation line and with the boom control valves open, adjust the flow control to get the desired spraying pressure. Do not exceed the sprayer pump pressure rating.
6. Open the agitation line until the desired agitation is achieved.
7. Readjust the spray pressure by adjusting the hydraulic flow control on the tractor.

Open Center Operation

1. With the pump installed on the sprayer (as shown in the Plumbing Recommendations illustration on the facing page), fill the pump with liquid by opening the inlet ball valve.
2. Connect the hydraulic hoses to the remote outlet on the tractor.
3. If the pump is model M200-39070-2 being used with a large open center system with a flow rate over 15 GPM, then open the bypass screw on the side of the motor two turns.
4. Open the agitation line all the way, and open the boom control valves. This will assist the pump in priming.
5. Start the tractor and let the engine run at idle.
6. Increase the engine speed to the desired speed for spraying.
7. Close the agitation line until the desired agitation is achieved.
8. Adjust the spray pressure with the boom control valve.
9. If using the bypass screw on the motor, close the bypass as much as possible without exceeding the desired maximum spraying pressure or the rating of the pump.

On some open center systems, operation of the sprayer pump will lower the system pressure to a point where the attempted operation of additional hydraulic implements at the same time results in poor operation of both. In this case, one of the functions will have to be turned off to make the other one work correctly.

HD Magnum Series

Troubleshooting Guide

| Problem | Causes and Remedies |
|---|---|
| Pump Doesn't Deliver Flow | Suction strainer is clogged <ul style="list-style-type: none">• Clean strainer <hr/> Loss of prime <ul style="list-style-type: none">• Make sure pump is below the liquid level• Install anti-vortex fitting in tank• Open vent line from the top-most plug on the pump volute to bleed off air• Check suction line for leaks <hr/> Collapsed suction hose <ul style="list-style-type: none">• Replace with wire reinforced hose• Use larger diameter hose <hr/> Impeller clogged <ul style="list-style-type: none">• Remove volute casing and check for foreign material |
| Leakage Between Centrifugal Pump and Hydraulic Motor | Pump seal is leaking <ul style="list-style-type: none">• Disassemble volute and impeller and replace seal <hr/> Hydraulic motor seal is leaking <ul style="list-style-type: none">• Remove from centrifugal pump and replace seal on the motor |
| Lack of Pressure from Centrifugal Pump | Insufficient Motor Speed <ul style="list-style-type: none">• Adjust hydraulic flow control <hr/> Make sure pump is fully primed <ul style="list-style-type: none">• See "Loss of prime" above <hr/> Check for clogged strainers |
| | Excessive restriction on inlet hoses <ul style="list-style-type: none">• Use larger size hose, ball valves and strainers <hr/> Bypass screw is turned out too far (open center systems) <ul style="list-style-type: none">• Re-adjust bypass screw setting by turning it in |
| Cannot Reduce Spraying Pressure to Desired Range | Excessive motor speed <ul style="list-style-type: none">• Adjust hydraulic oil flow to motor, using flow control <hr/> Motor on open center systems is too small <ul style="list-style-type: none">• Check selection guide for correct motor |
| Hydraulic Fluid Becomes Too Hot | Check hydraulic fluid levels |
| | Check hydraulic filters and replace if clogged |
| | Incorrect motor application <ul style="list-style-type: none">• Check selection guide for correct motor application |
| | Check hydraulic hose sizes <ul style="list-style-type: none">• Hoses should be at least 1/2"• Use 3/4" for hose runs over 15 ft. or flow rates higher than 15 GPM |
| | Check temperature with gauge <ul style="list-style-type: none">• Make sure temperature is 160° or less |
| Hydraulic Motor Operates Erratically | Liquid pressure varies <ul style="list-style-type: none">• Check for air leaks in inlet of pump• Check for proper fluid levels in tractor• Check for hydraulic motor wear• Make sure tractor hydraulic system has clean filters |

Repair Information

Replacing Pump Mechanical Seal

1. Remove the four bolts on the volute using a 9/16" wrench. Fig. 1.
2. Remove the impeller nut using a 3/4" socket. Hold the impeller from turning by using a screwdriver in vanes of the impeller. Fig. 2.
3. Remove the impeller key using pliers and screwdriver. Fig. 3.
4. Remove the spring assembly from the shaft by pulling it off with your hand. Fig. 4.
5. Work the outer seal half off the shaft carefully with a screwdriver. Fig. 5.
6. Work the inner seal half off out of the housing carefully with a small flat bladed screwdriver. Break the ceramic with a hammer and screwdriver if necessary to remove. Fig. 6.
7. Reassemble with a new seal kit. Install new ceramic seal half in the bearing housing with the ceramic facing out.
8. Carefully slide the carbon seal half over the shaft so that the carbon and ceramic are facing each other.
9. Complete the seal assembly in the reverse order shown. Install a new o-ring on the frame housing for the volute.



Fig. 1

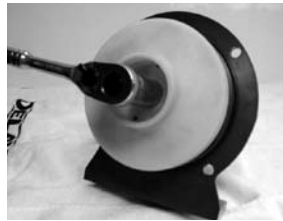


Fig. 2



Fig. 3



Fig. 4

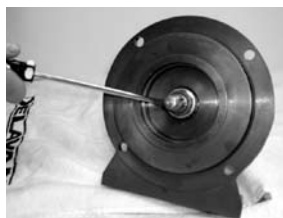


Fig. 5



Fig. 6

Replacing Hydraulic Motor Shaft Seal

1. Remove motor from the pump using a 9/16" wrench. Fig. 7.
2. Using an allen wrench, unscrew the four allen bolts and remove the front flange. Fig. 8.
3. Remove the mechanical seal half and o-ring from the flange. Fig. 9.
4. Remove the mechanical seal half, o-ring, spacer and spring from the motor.
5. Reassemble with a new seal kit in the reverse order. Fig. 10.



Fig. 7



Fig. 8

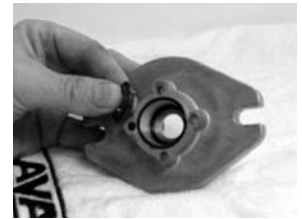
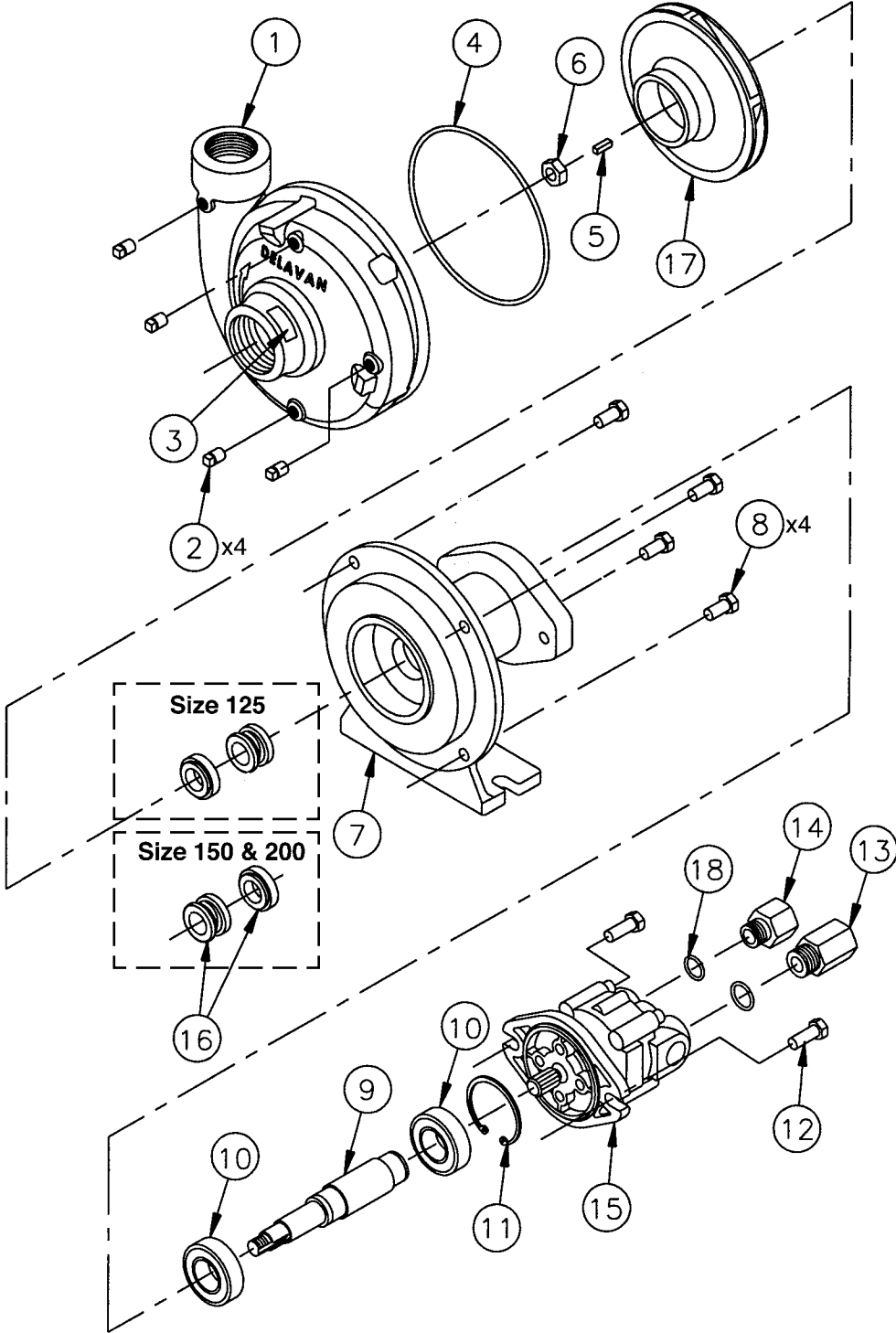


Fig. 9



Fig. 10

HD Magnum Series



Hydraulically Driven Centrifugal Pumps

| Item # | Description | Part Number | Qty |
|--------|---|-------------|-----|
| 1 | Volute Casing | | 1 |
| | Size M125: 1-1/4"..... | I34-001 | |
| | Size M150: 1-1/2"..... | I37-025 | |
| | Size M200: 2"..... | I39-025 | |
| 2 | 1/8" NPT Pipe Plug | 25785 | 4 |
| 3 | Caution Label | 35276 | 1 |
| 4 | Frame O-ring Seal | I34-003 | 1 |
| 5 | 3/16" Square Key..... | I34-005 | 1 |
| 6 | Hex Nut | | 1 |
| | Size M125: 3/8-24..... | I34-007 | |
| | Size M150 & M200: 1/2-13 | I37-005 | |
| 7 | Frame | I34-012 | 1 |
| 8 | 3/8-16 X 3/4" Hex Head Screw | 34916 | 4 |
| 9 | Shaft..... | | 1 |
| | Size M125 | I34-014 | |
| | Size M150 & M200: | I37-014 | |
| 10 | Sealed Ball Bearing..... | 16228 | 2 |
| 11 | Internal Retaining Ring..... | 26548 | 1 |
| 12 | 3/8-16 X 1" Hex Head Screw..... | I34-017 | 2 |
| 13 | Outlet NPT Adapter Assembly with Check Valve 7/8-14 X 1/2" ... | I34-060 | 1 |
| 14 | Inlet NPT Adapter 3/4-16 X 1/2" ... | I34-050 | 1 |

| Item # | Description | Part Number | Qty |
|--------|---|-------------|-----|
| 15 | Hydraulic Motor | | 1 |
| | With Rear Ports: | | |
| | 5-7 GPM PM21 Motor..... | I34-029 | |
| | 7-10 GPM PM37 Motor..... | I34-030 | |
| | 10-13 GPM PM45 Motor..... | I34-031 | |
| | 12-15 GPM PM58 Motor..... | I34-032 | |
| | With Side Ports: | | |
| | 12-15 GPM PM58B Motor | I34-033 | |
| | 13-18 GPM PM70B Motor | I34-034 | |
| 16 | Seal Assembly..... | | 1 |
| | Size M125: Viton/Silicon Carbide .. | I34-010 | |
| | Size M125: Viton/Ceramic | I34-011 | |
| | Size M150 & M200: Viton/Silicon Carbide..... | I37-010 | |
| | Size M150 & M200: Viton/ Ceramic | I37-011 | |
| 17 | Impeller Assembly..... | | 1 |
| | Size M125: 1-1/4" Nylon | I34-040 | |
| | Size M125: 1-1/4" Polypropylene.. | I34-043 | |
| | Size M150: 1-1/2" Nylon | I37-040 | |
| | Size M150: 1-1/2" Polypropylene with SS Support Insert | I37-043 | |
| | Size M150: 1-1/2" Polypropylene.. | I37-047 | |
| | Size M200: 2" Nylon..... | I39-040 | |
| | Size M200: 2" Polypropylene with SS Support Insert | I39-043 | |
| | Size M200: 2" Polypropylene | I39-049 | |
| 18 | Adapter O-ring Seal | | 1 |
| | 3/4" | 31351-15 | |
| | 7/8" | 31351-16 | |

Repair Kits

| Part Number | Description |
|-------------|--|
| RK-M125VC | Repair Kit with Viton/Ceramic Seals for M125 |
| RK-M125VS | Repair Kit with Viton/Silicon Carbide Seals for M125 |
| RK-M215VC | Repair Kit with Viton/Ceramic Seals for M150 & M200 |
| RK-M215VS | Repair Kit with Viton/Silicon Carbide Seals for M150 & M200 |
| 904003 | Hydraulic Motor Bypass Valve Assembly |
| 904804 | Hydraulic Motor Seal Kit |
| 904824 | Hydraulic Motor Bearing Kit (includes bearings and seal kit) |

HD Magnum Series

Returns

All Delavan products are warranted against manufacturing defects (see warranty, below). In the event you feel you have a warranty-covered, returnable item, return the pump to your dealer, who will replace a warrantable pump for you. Delavan's "No Hassle Warranty" puts you back in the field sooner!

Important Instructions for Returning Pumps

When you return your pump for warranty or for repair, you must always do the following:

1. Flush chemical residue from the pump (best done in the field).
2. Tag pump with type of chemicals having been sprayed.
3. Include complete description of operation problem, such as how pump was used, symptoms of malfunction, etc.

Since pumps can contain residues of toxic chemicals these steps are necessary to protect all the people who handle return shipments, and to help pinpoint the reason for the breakdown.

Hydraulically Driven Centrifugal Pumps

Standard Warranty

Delavan warrants all Roller Pumps, Turbo-90™ Turbine Pumps, HD Magnum™ Centrifugal Pumps, and PowerFLO™ Diaphragm Pumps for a period of one year from date of manufacture.

All products sold by Delavan are warranted only to purchasers from Delavan for resale or for use in purchasers' own business or original equipment manufacture, against defects in workmanship or materials under normal use, maintenance and service (rental use excluded).

The sole and exclusive obligation of Delavan under this or any implied warranty shall be to replace or, at its option, to repair, without charge, any product which is determined by Delavan to be defective in workmanship or materials after the product is returned to the Delavan factory*, shipping costs prepaid.

In no event shall Delavan be liable to any person for indirect or consequential damages or for injury or commercial loss resulting from any use or inability to use any Delavan product. Delavan expressly negates any other warranty, express or implied, including any warranty of merchantability or fitness for a particular purpose, or arising from any course of dealing or custom or usage of trade.

No person, including any dealer or representative of Delavan, is authorized to make any representation or warranty on behalf of Delavan in addition to or inconsistent with these provisions. Purchasers to whom these provisions apply agree to hold Delavan harmless from claims by their customers in excess of the obligations of Delavan expressly set forth herein.

Delavan Exclusive “No-Hassle” Warranty

- **Delavan’s “No Hassle Warranty” gives you longer warranty coverage!**

Register your Delavan pump on our website with proof of purchase and your warranty on all Roller Pumps, Turbo-90™ Turbine Pumps, HD Magnum™ Centrifugal Pumps, and PowerFLO™ Diaphragm Pumps is **extended to one year from date of purchase** (instead of from date of manufacture as provided in our standard warranty. No Hassle Warranty not to exceed two years in any event).

- **Delavan’s “No Hassle Warranty” puts you back in the field sooner!**

If your Delavan pump fails during the No Hassle Warranty period, you have an easy, simple remedy:

Return the pump to your dealer who will contact the factory and determine warranty replacement.