

**PARTS MANUAL**  
**F20-991-2402A**

# **Hydra-Cell®**

## **INDUSTRIAL PUMPS**

**IMPORTANT**

Record your pump model number and serial number here for easy reference:

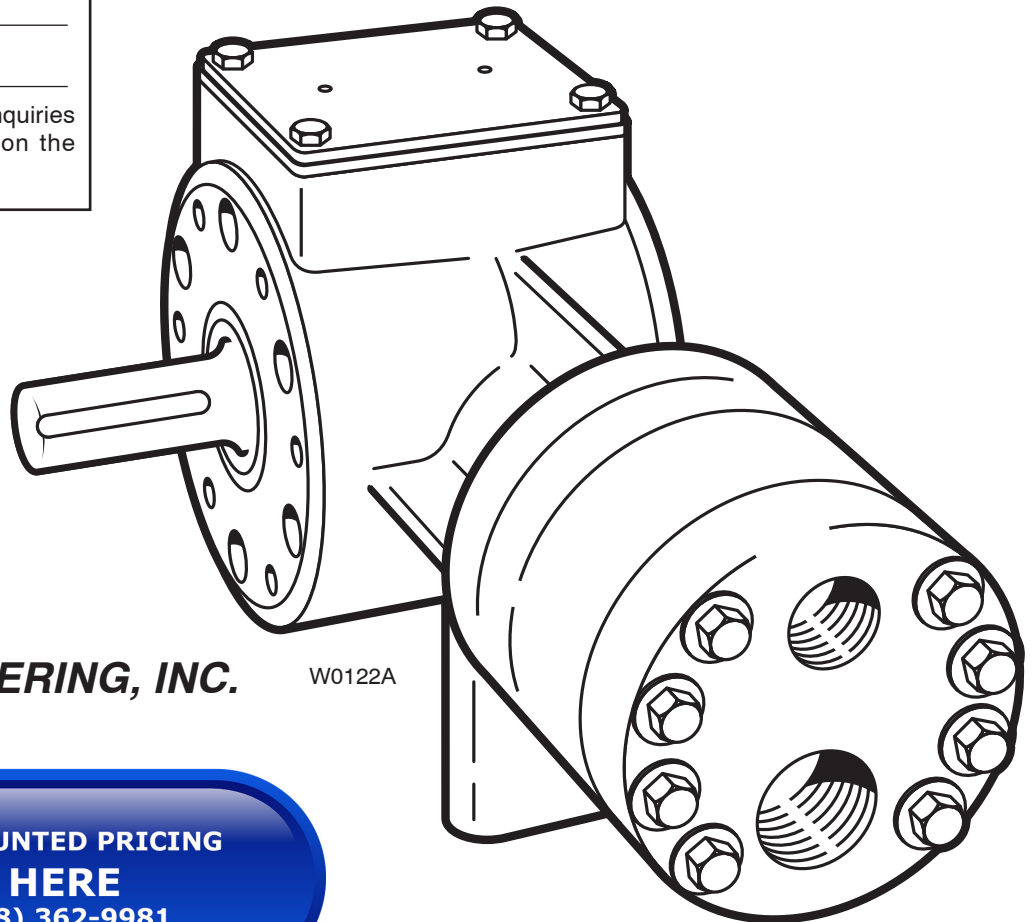
Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Date of Purchase \_\_\_\_\_

When ordering parts or making inquiries about this pump, please mention the model and serial numbers.

**MODELS:**  
**F-20, F-21, F-22**

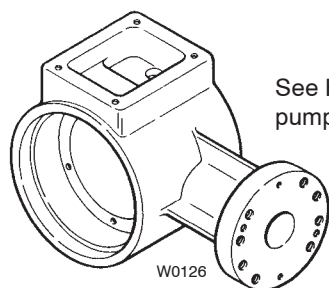


**WANNER ENGINEERING, INC.**

W0122A

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# F-20/F-21/F-22 Fluid End



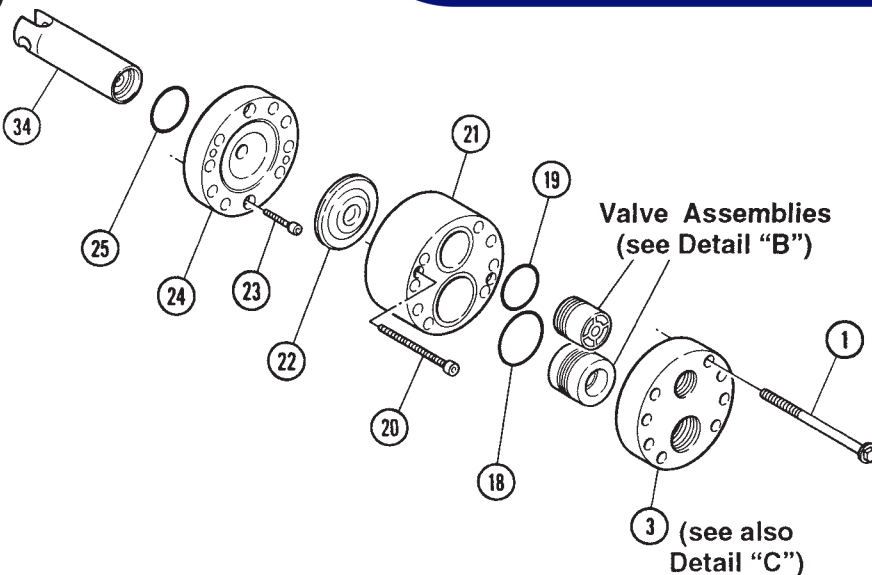
See Hydraulic End for  
pump housings

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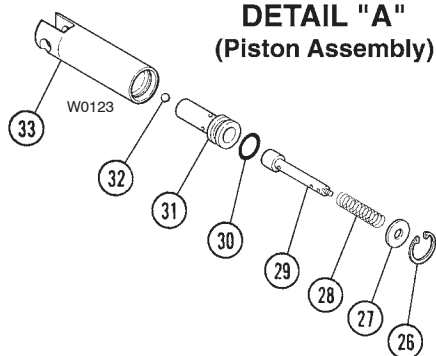
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**Piston Assembly**  
(see Detail "A")



**DETAIL "A"**  
(Piston Assembly)

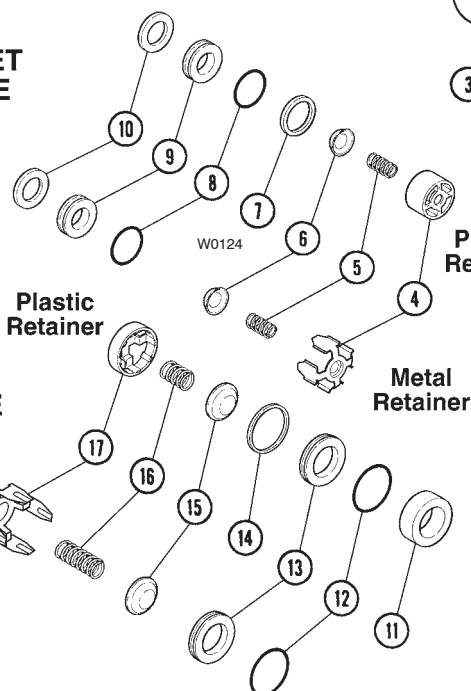


**DETAIL "B"**  
(Valve Assemblies)

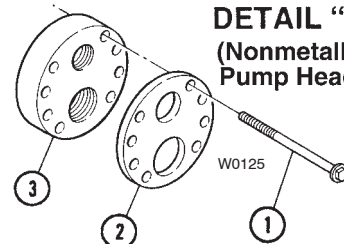
**OUTLET VALVE**

**INLET VALVE**

**Metal Retainer**



**DETAIL "C"**  
(Nonmetallic  
Pump Head)



## Bolt Torque Specifications

| Ref. # | Assembly Torque |
|--------|-----------------|
| 1      | 90 in-lbs       |
| 20     | 14 in-lbs       |
| 22     | 10 in-lbs       |
| 23     | 14 in-lbs       |

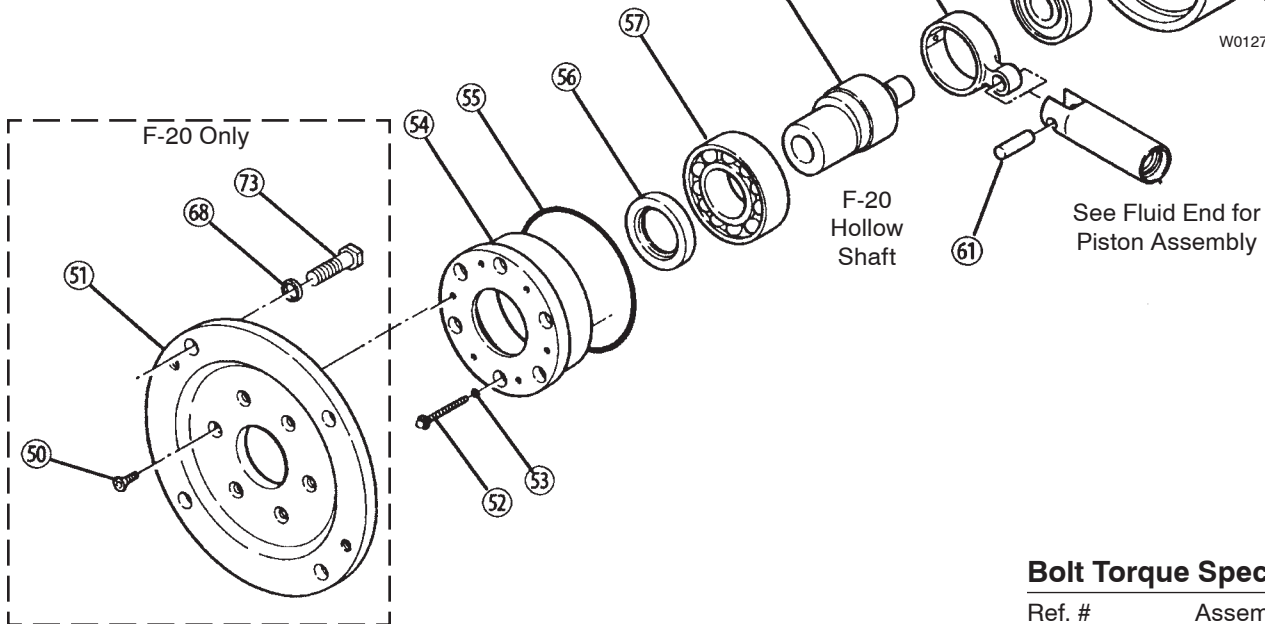
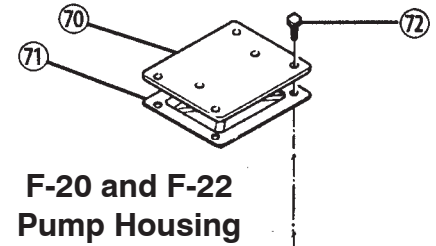
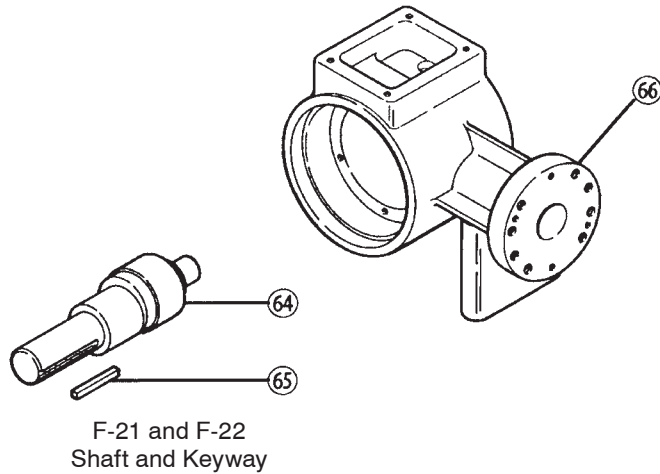
# F-20/F-21/F-22 Fluid End

| Ref.<br>No. | Part Number  | Description                                                   | Quantity/<br>Pump |
|-------------|--------------|---------------------------------------------------------------|-------------------|
| 1           | G20-024-2010 | Bolt, hex-head .....                                          | 8                 |
| 2           | F20-100-1010 | Plate, manifold support<br>(nonmetallic heads) .....          | 1                 |
|             | F20-100-1011 | Plate, manifold support, painted<br>(nonmetallic heads) ..... | 1                 |
| 3           | F20-004-1010 | Manifold, brass, NPT .....                                    | 1                 |
|             | F20-004-1012 | Manifold, 316 SST, NPT .....                                  | 1                 |
|             | F20-004-1017 | Manifold, Hastelloy C, NPT .....                              | 1                 |
|             | F20-004-1050 | Manifold, polypropylene, NPT .....                            | 1                 |
|             | F20-004-1053 | Manifold, Kynar, NPT .....                                    | 1                 |
| 4           | D03-023-1010 | Retainer, outlet valve spring,<br>17-7 SST .....              | 1                 |
|             | D03-023-1017 | Retainer, outlet valve spring,<br>Hastelloy C .....           | 1                 |
|             | D03-023-2310 | Retainer, outlet valve spring, Celcon .....                   | 1                 |
|             | D03-023-2316 | Retainer, outlet valve spring, Nylon .....                    | 1                 |
|             | D03-023-2317 | Retainer, outlet valve spring,<br>polypropylene .....         | 1                 |
|             | D03-023-2318 | Retainer, outlet valve spring, Kynar .....                    | 1                 |
| 5           | D03-022-3113 | Valve Spring, outlet, Hastelloy C .....                       | 1                 |
|             | D03-022-3114 | Valve Spring, outlet, Elgiloy .....                           | 1                 |
| 6           | D03-021-1002 | Outlet Valve, 17-7 SST .....                                  | 1                 |
|             | D03-021-1011 | Outlet Valve, Nitronic .....                                  | 1                 |
|             | D03-021-1016 | Outlet Valve, Tungsten Carbide .....                          | 1                 |
|             | D03-021-1017 | Outlet Valve, Hastelloy C .....                               | 1                 |
|             | D03-021-3300 | Outlet Valve, ceramic .....                                   | 1                 |
| 7           | D03-092-2110 | Tetra Seal, outlet, Buna .....                                | 1                 |
|             | D03-092-2111 | Tetra Seal, outlet, Viton .....                               | 1                 |
|             | D03-092-2112 | Tetra Seal, outlet, Neoprene .....                            | 1                 |
|             | D03-092-2113 | Tetra Seal, outlet, EPDM .....                                | 1                 |
|             | D03-035-2118 | Tetra Seal, outlet, PTFE .....                                | 1                 |
| 8           | D03-035-2112 | O-ring, outlet valve seat, Neoprene .....                     | 1                 |
|             | D03-035-2113 | O-ring, outlet valve seat, EPDM .....                         | 1                 |
|             | D03-035-2118 | O-ring, outlet valve seat, PTFE .....                         | 1                 |
|             | D25-046-2110 | O-ring, outlet valve seat, Buna .....                         | 1                 |
|             | D25-046-2111 | O-ring, outlet valve seat, Viton .....                        | 1                 |
| 9           | D03-020-1001 | Valve Seat, outlet, 316 SST .....                             | 1                 |
|             | D03-020-1002 | Valve Seat, outlet, 17-4 SST .....                            | 1                 |
|             | D15-020-1016 | Valve Seat, outlet, Tungsten Carbide .....                    | 1                 |
|             | D03-020-1017 | Valve Seat, outlet, Hastelloy C .....                         | 1                 |
|             | D03-020-3300 | Valve Seat, outlet, ceramic .....                             | 1                 |
| 10          | D03-125-2310 | Washer, outlet dampening, Celcon .....                        | 1                 |
|             | D03-125-2316 | Washer, outlet dampening, Nylon .....                         | 1                 |
|             | D03-125-2317 | Washer, outlet dampening,<br>polypropylene .....              | 1                 |
|             | D03-125-2318 | Washer, outlet dampening, Kynar .....                         | 1                 |
| 11          | D10-125-2310 | Washer, inlet dampening, Celcon .....                         | 1                 |
|             | D10-125-2316 | Washer, inlet dampening, Nylon .....                          | 1                 |
|             | D10-125-2317 | Washer, inlet dampening,<br>polypropylene .....               | 1                 |
|             | D10-125-2318 | Washer, inlet dampening, Kynar .....                          | 1                 |
| 12          | D10-035-2110 | O-ring, inlet valve seat, Buna .....                          | 1                 |
|             | D10-035-2111 | O-ring, inlet valve seat, Viton .....                         | 1                 |
|             | D10-035-2112 | O-ring, inlet valve seat, Neoprene .....                      | 1                 |
|             | D10-035-2113 | O-ring, inlet valve seat, EPDM .....                          | 1                 |
|             | D10-035-2118 | O-ring, inlet valve seat, PTFE .....                          | 1                 |
| 13          | D10-020-1010 | Valve Seat, inlet, 17-4 SST, HT .....                         | 1                 |
|             | D10-020-1011 | Valve Seat, inlet, 316 SST .....                              | 1                 |
|             | D10-020-1016 | Valve Seat, inlet, Tungsten Carbide .....                     | 1                 |
|             | D10-020-1017 | Valve Seat, inlet, Hastelloy C .....                          | 1                 |
|             | D10-020-3300 | Valve Seat, inlet, ceramic .....                              | 1                 |

| Ref.<br>No. | Part Number  | Description                                                   | Quantity/<br>Pump |
|-------------|--------------|---------------------------------------------------------------|-------------------|
| 14          | D10-092-2110 | Tetra Seal, inlet, Buna .....                                 | 1                 |
|             | D10-092-2111 | Tetra Seal, inlet, Viton .....                                | 1                 |
|             | D10-092-2112 | Tetra Seal, inlet, Neoprene .....                             | 1                 |
|             | D10-092-2113 | Tetra Seal, inlet, EPDM .....                                 | 1                 |
|             | D10-092-2118 | Tetra Seal, inlet, PTFE .....                                 | 1                 |
| 15          | D10-021-1010 | Inlet Valve, 17-7 SST, stamped HT .....                       | 1                 |
|             | D10-021-1011 | Inlet Valve, Nitronic .....                                   | 1                 |
|             | D10-021-1016 | Inlet Valve, Tungsten Carbide .....                           | 1                 |
|             | D10-021-1017 | Inlet Valve, Hastelloy C .....                                | 1                 |
|             | D10-021-3300 | Inlet Valve, ceramic .....                                    | 1                 |
| 16          | D10-022-3113 | Valve Spring, inlet, Hastelloy C<br>(plastic retainers) ..... | 1                 |
|             | D10-022-3114 | Valve Spring, inlet, Elgiloy<br>(plastic retainers) .....     | 1                 |
|             | D10-022-3117 | Valve Spring, inlet, Elgiloy<br>(metal retainers) .....       | 1                 |
|             | D10-022-3123 | Valve Spring, inlet, Hastelloy C<br>(metal retainers) .....   | 1                 |
| 17          | D10-023-1010 | Retainer, inlet valve spring,<br>17-7 SST .....               | 1                 |
|             | D10-023-1017 | Retainer, inlet valve spring,<br>Hastelloy C .....            | 1                 |
|             | D10-023-2314 | Retainer, inlet valve spring, Celcon .....                    | 1                 |
|             | D10-023-2316 | Retainer, inlet valve spring, Nylon .....                     | 1                 |
|             | D10-023-2317 | Retainer, inlet valve spring,<br>polypropylene .....          | 1                 |
|             | D10-023-2319 | Retainer, inlet valve spring, Kynar .....                     | 1                 |
| 18          | F20-074-2110 | O-ring, inlet manifold, Buna .....                            | 1                 |
|             | F20-074-2111 | O-ring, inlet manifold, Viton .....                           | 1                 |
|             | F20-074-2112 | O-ring, inlet manifold, Neoprene .....                        | 1                 |
|             | F20-074-2113 | O-ring, inlet manifold, EPDM .....                            | 1                 |
|             | F20-074-2118 | O-ring, inlet manifold, PTFE .....                            | 1                 |
| 19          | F20-073-2110 | O-ring, outlet manifold, Buna .....                           | 1                 |
|             | F20-073-2111 | O-ring, outlet manifold, Viton .....                          | 1                 |
|             | F20-073-2112 | O-ring, outlet manifold, Neoprene .....                       | 1                 |
|             | F20-073-2113 | O-ring, outlet manifold, EPDM .....                           | 1                 |
|             | F20-073-2118 | O-ring, outlet manifold, PTFE .....                           | 1                 |
| 20          | G20-029-2010 | Cap Screw, socket-head .....                                  | 2                 |
| 21          | F20-003-1010 | Valve Plate, brass .....                                      | 1                 |
|             | F20-003-1012 | Valve Plate, 316 SST .....                                    | 1                 |
|             | F20-003-1017 | Valve Plate, Hastelloy C .....                                | 1                 |
|             | F20-003-1050 | Valve Plate, polypropylene .....                              | 1                 |
|             | F20-003-1053 | Valve Plate, Kynar .....                                      | 1                 |
| 22          | D03-018-1212 | Diaphragm, Neoprene .....                                     | 1                 |
|             | D03-018-1213 | Diaphragm, EPDM .....                                         | 1                 |
|             | D03-018-1215 | Diaphragm, Viton-XT .....                                     | 1                 |
|             | D03-018-1218 | Diaphragm, PTFE .....                                         | 1                 |
|             | D03-018-1220 | Diaphragm, Buna-N-XS .....                                    | 1                 |
| 23          | G20-088-2010 | Cap-Screw, socket-head .....                                  | 2                 |
| 24          | F20-002-1010 | Diaphragm Plate .....                                         | 1                 |
| 25          | D03-075-2110 | O-ring, diaphragm plate, Buna .....                           | 1                 |
| 26          | D03-048-2210 | Snap Ring .....                                               | 1                 |
| 27          | D03-049-1000 | Washer .....                                                  | 1                 |
| 28          | D03-045-3110 | Spring, sleeve valve .....                                    | 1                 |
|             | D03-045-3111 | Spring, sleeve valve for PTFE<br>diaphragm .....              | 1                 |
| 29          | D03-044-1000 | Valve Plunger .....                                           | 1                 |
| 30          | D03-034-2110 | O-ring, valve cylinder, Buna .....                            | 1                 |
| 31          | D03-043-1000 | Valve Cylinder .....                                          | 1                 |
| 32          | D10-015-3010 | Ball .....                                                    | 1                 |
| 33          | D03-014-1004 | Piston .....                                                  | 1                 |
| 34          | D03-014-1210 | Piston Assembly .....                                         | 1                 |

# F-20/F-21/F-22 Hydraulic End

## F-21 Pump Housing



## Bolt Torque Specifications

| Ref. # | Assembly Torque |
|--------|-----------------|
| 50     | 35 in-lbs       |
| 52     | 14 in-lbs       |
| 72     | 10 in-lbs       |
| 75     | 35 in-lbs       |

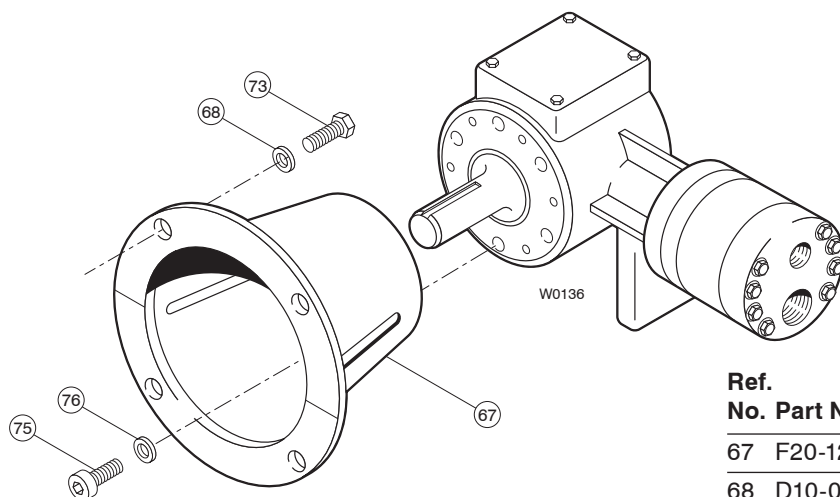
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# F-20/F-21/F-22 Hydraulic End

| Ref. No. | Part Number  | Description                                                                                           | Quantity/<br>Pump |
|----------|--------------|-------------------------------------------------------------------------------------------------------|-------------------|
| 50       | G20-089-2010 | Screw, flat-head .....                                                                                | 6                 |
| 51       | F20-120-1010 | Flange .....                                                                                          | 1                 |
| 52       | G20-086-2010 | Cap Screw, hex-flange-head .....                                                                      | 6                 |
| 53       | F20-036-2110 | O-ring, back cover screws, Buna.....                                                                  | 6                 |
| 54       | G20-131-1010 | Cover .....                                                                                           | 1                 |
| 55       | F20-037-2110 | O-ring, cover, Buna .....                                                                             | 1                 |
| 56       | F20-031-2110 | Seal, Buna.....                                                                                       | 1                 |
| 57       | D03-010-2910 | Back Bearing.....                                                                                     | 1                 |
| 58       | F20-009-1002 | (E) Hollow Shaft, NEMA 56C direct .....<br>drive, 5/8" ID, close-coupled,<br>0.73 GPM @ 1750 RPM..... | 1                 |
|          | F20-009-1003 | (X) Hollow Shaft, NEMA 56C direct .....<br>drive, 5/8" ID, close-coupled,<br>0.96 GPM @ 1750 RPM..... | 1                 |
|          | F20-009-1011 | (B) Hollow Shaft, NEMA 56C direct .....<br>drive, 5/8" ID, close-coupled,<br>0.33 GPM @ 1750 RPM..... | 1                 |
|          | F20-009-1018 | (S) Hollow Shaft, NEMA 56C direct .....<br>drive, 5/8" ID, close-coupled,<br>0.55 GPM @ 1750 RPM..... | 1                 |
|          | F20-009-1067 | (G) Hollow Shaft, NEMA 56C direct .....<br>drive, 5/8" ID, close-coupled,<br>0.20 GPM @ 1750 RPM..... | 1                 |
| 59       | D03-132-1000 | Connecting Rod .....                                                                                  | 1                 |
| 60       | F20-010-2910 | Front Bearing .....                                                                                   | 1                 |
| 61       | D03-133-1000 | Pin .....                                                                                             | 1                 |

| Ref. No. | Part Number  | Description                                                        | Quantity/<br>Pump |
|----------|--------------|--------------------------------------------------------------------|-------------------|
| 62       | G20-001-1010 | Pump Housing .....                                                 | 1                 |
| 64       | F21-009-1002 | (E) Crank Shaft, shaft-driven, 5/8" OD<br>0.73 GPM @ 1750 RPM..... | 1                 |
|          | F21-009-1003 | (X) Crank Shaft, shaft-driven, 5/8" OD<br>0.96 GPM @ 1750 RPM..... | 1                 |
|          | F21-009-1011 | (B) Crank Shaft, shaft-driven, 5/8" OD<br>0.33 GPM @ 1750 RPM..... | 1                 |
|          | F21-009-1018 | (S) Crank Shaft, shaft-driven, 5/8" OD<br>0.55 GPM @ 1750 RPM..... | 1                 |
|          | F21-009-1067 | (G) Crank Shaft, shaft-driven, 5/8" OD<br>0.20 GPM @ 1750 RPM..... | 1                 |
| 65       | D10-085-2210 | Key, shaft .....                                                   | 1                 |
| 66       | G21-001-1010 | Pump Housing .....                                                 | 1                 |
| 68       | D10-048-2010 | Lockwasher, 3/8".....                                              | 4                 |
| 69       | D10-038-2210 | Plug, drain .....                                                  | 1                 |
| 70       | F20-105-1010 | Cover, oil reservoir .....                                         | 1                 |
| 71       | F20-091-1010 | Diaphragm, oil reservoir.....                                      | 1                 |
| 72       | G20-090-2010 | Cap Screw, hex-head.....                                           | 4                 |
| 73       | D10-029-2010 | Cap Screw, hex-head, 3/8-16 x 1".....                              | 4                 |

## F-21/F-22 Pump/Motor Adapter Kit for NEMA 56C-145TC Frame Motors (Complete Kit: Part No. A04-005-1200)



| Ref. No. | Part Number  | Description                 | Quantity/<br>Kit |
|----------|--------------|-----------------------------|------------------|
| 67       | F20-121-1010 | Pump/Motor Adapter .....    | 1                |
| 68       | D10-048-2010 | Lockwasher, split .....     | 4                |
| 73       | D10-029-2010 | Cap Screw, hex-head.....    | 4                |
| 75       | G20-101-2010 | Cap Screw, socket-head..... | 6                |
| 76       | G20-050-2010 | Lockwasher, split .....     | 6                |

# F-20/F-21/F-22 Replacement Parts Kits

TO ORDER REPLACEMENT PARTS KIT: A Replacement Parts Kit contains 11 digits corresponding to customer-specified design options.

|   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|----|----|

| Digit | Order Code | Description                                            |
|-------|------------|--------------------------------------------------------|
| 1-3   | F20        | Pump Configuration<br>For all F-20, F-21 and F22 Pumps |
| 4     | K          | Kit Designator<br>Complete Fluid End Kit               |
|       | D          | Diaphragm Kit                                          |
|       | V          | Valve Kit (diaphragm not included)                     |
| 5-6   | 52         | Pump Head Version<br>Pump Head Version                 |
| 7     | E          | Diaphragm & O-ring Material<br>EPDM                    |
|       | G          | Viton <sup>®</sup> -XT                                 |
|       | J          | PTFE                                                   |
|       | P          | Neoprene                                               |
|       | T          | Buna-N-XS                                              |
| 8     | C          | Valve Seat Material<br>Ceramic                         |
|       | D          | Tungsten Carbide                                       |
|       | H          | 17-4 PH Stainless Steel                                |
|       | S          | 316 Stainless Steel                                    |
|       | T          | Hastelloy <sup>®</sup> C                               |
|       | X          | Not included in Diaphragm Kit                          |
| 9     | C          | Valve Material<br>Ceramic                              |
|       | D          | Tungsten Carbide                                       |
|       | H          | 17-7 PH Stainless Steel                                |
|       | N          | Nitronic 50                                            |
|       | T          | Hastelloy <sup>®</sup> C                               |
|       | X          | Not included in Diaphragm Kit                          |
| 10    | E          | Valve Springs<br>Elgiloy <sup>®</sup>                  |
|       | T          | Hastelloy <sup>®</sup> C                               |
|       | X          | Not included in Diaphragm Kit                          |
| 11    | C          | Valve Spring Retainers<br>Celcon                       |
|       | H          | 17-7 PH Stainless Steel                                |
|       | M          | Kynar <sup>®</sup>                                     |
|       | P          | Polypropylene                                          |
|       | T          | Hastelloy <sup>®</sup> C                               |
|       | Y          | Nylon                                                  |
|       | X          | Not included in Diaphragm Kit                          |

## Kit Contents

| Part Number*   | Description                   | Qty | Kit Designator |   |   |
|----------------|-------------------------------|-----|----------------|---|---|
|                |                               |     | K              | D | V |
| D03-018-____   | Diaphragm                     | 1   | .              | . |   |
| F20-073-____   | O-ring, outlet manifold       | 1   | .              | . |   |
| F20-074-____   | O-ring, inlet manifold        | 1   | .              | . |   |
| D03-035-____   | O-ring, outlet valve seat     | 1   | .              | . |   |
| D03-020-____   | Valve seat, outlet            | 1   | .              | . |   |
| D03-021-____   | Valve, outlet                 | 1   | .              | . |   |
| D03-022-____   | Valve spring, outlet          | 1   | .              | . |   |
| **D03-092-____ | Tetra seal, outlet            | 1   | .              | . |   |
| D03-023-____   | Retainer, outlet valve spring | 1   | .              | . |   |
| D03-125-____   | Washer, outlet dampening      | 1   | .              | . |   |
| D11-035-____   | O-ring, inlet valve seat      | 1   | .              | . |   |
| D10-020-____   | Valve seat, inlet             | 1   | .              | . |   |
| D10-021-____   | Valve, inlet                  | 1   | .              | . |   |
| D10-022-____   | Valve spring, inlet           | 1   | .              | . |   |
| **D10-092-____ | Tetra seal, inlet             | 1   | .              | . |   |
| D10-023-____   | Retainer, inlet valve spring  | 1   | .              | . |   |
| **D10-125-____ | Washer, inlet dampening       | 1   | .              | . |   |
| A01-113-3400   | Threadlocker                  | 1   | .              | . | . |

\* Last four digits of part numbers with \_\_\_\_ refer to specific material of construction.

\*\* Not included with metal spring retainers.

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