

BEARCAT ***PUMPS***

DELTA SERIES

Delta Pump Manual

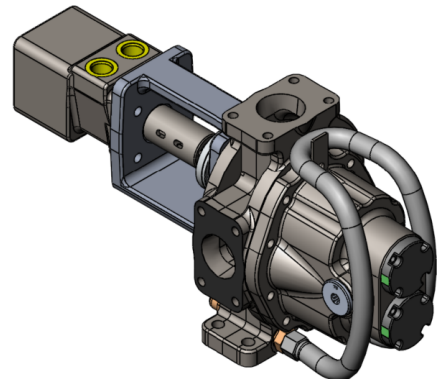
Installation, operation and maintenance | Hydraulic drive

TECHNICAL MANUAL

Rev E | 2026.09.20

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Released | Bushing-style field units



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EQUIPMENT APPLICABILITY

This manual supports the legacy bushing-style Delta pump. The new Bearing Delta is a different product and is not covered here.

Revision history

Rev	Date	Change
A	2026.09.20	Initial manual rebuild.
B	2026.09.20	Hydraulic-drive scope; updated relief guidance and drawings.
C	2026.09.20	Aligned curve style; added D120 flow and ideal-power reference.
D	2026.09.20	Simplified title, step numbering and status wording.
E	2026.09.20	Rebuilt T7-family layout; restored text, table values and section numbering.

Models and applicability

This manual covers the bushing-style Delta positive-displacement pump already in service. Use it to identify and support existing equipment. It is not a new-build specification.

NEW BEARING DELTA IS EXCLUDED

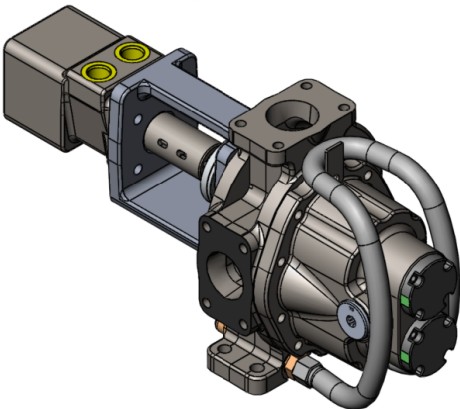
BearCat is developing a new Bearing Delta. Do not apply the model coding, parts, dimensions, rebuild information or performance data in this manual to the new bearing design.

Manual scope	What is covered
Product	Delta bushing-style pump and related field-service references.
Displacement	D90 and D120 nominal displacement data and performance curves.
Drive arrangement	Hydraulic-drive configurations. The detailed mount drawing shows the M mount and four-bolt 4F-17 motor-face arrangement.
Installation	General mounting, startup, pressure-protection and shutdown guidance consistent with current BearCat pump manuals.
Edition boundary	Only hydraulic-drive configurations are covered.

Match the complete build

- Record the complete model number, configuration and mount before ordering parts or applying a drawing.
- The installed product, seal, heat arrangement, hydraulic motor, relief configuration and machine-specific engineering govern.
- A shared dimension or similar appearance does not establish part interchangeability.

4-Bolt, 4F-17 Motor Face



Safety boundary

Only trained personnel should install, operate or service this equipment. Follow the equipment owner's procedures and the requirements for the material being handled.

BEFORE INSPECTION OR SERVICE

Stop the process, isolate and lock out all drive and heating energy, relieve trapped pressure, control hot product and verify zero hazardous energy. A stop button, HMI or hydraulic control valve is not an energy-isolation device.

Protect people and the installation

- **Hot product:** Any pump that is heated or pumping hot liquid should be operated with Safety Blankets properly installed. Keep the protection maintained and use the required face, hand and body protection.
- **Pressure:** Provide suitable pressure protection for the pump, piping and accessories. Confirm the discharge and relief paths before starting; a positive-displacement pump must not run against a blocked outlet.
- **Moving parts:** Fit all coupling, shaft and hydraulic-drive guards before operation. Keep hands, clothing and tools clear of the drive.
- **Opening the system:** Do not loosen a plug, hose, cover or fastener to check for pressure. Isolate, depressurize and drain by the established procedure first.
- **Hydraulic energy:** Isolate supply and return pressure, secure the prime mover and discharge stored accumulator or trapped hose pressure before service.
- **Lifting and support:** Use lifting equipment suited to the complete assembly. Support the pump and piping so the ports do not carry unsupported pipe loads.

STOP FOR AN UNSAFE CONDITION

Stop for uncontrolled leakage, loss of flow, abnormal noise or vibration, hydraulic-drive distress, or pressure outside the approved operating range. Find the cause before restarting.

- 1

Prepare the system

Confirm the pump, seals, heat arrangement and hydraulic drive suit the product and duty. Clean the suction piping and screen box; remove installation debris.
- 2

Support, align and connect

Secure the assembly, support piping and verify the hydraulic motor, shaft interface and coupling arrangement. Keep the suction path open and airtight.
- 3

Establish a safe flow path

Check valve positions, discharge routing and pressure protection. Confirm the relief return path is available in the intended flow direction.
- 4

Prepare to prime slowly

Where practical, add compatible pumped liquid to wet the pump before first startup. Bring heat-traced equipment to the required operating temperature before turning it.

Installation checks

Item	Confirm before startup
Identity	Complete Delta model and configuration match the installation.
Hydraulic drive	Motor face, shaft, displacement, rotation, speed capability, pressure rating and circuit requirements are correct.
Liquid path	Intake and discharge are correct; piping is supported; valves provide an open path.
Pressure protection	Suitable system protection and the intended internal-relief return path are available.
Heat and guarding	Required heat is established; Safety Blankets and all drive guards are installed.

DRAWING CONTROL

The drawings in this manual are service references, not fabrication-release drawings. Verify the applicable machine drawing before making or modifying parts.

Start, operate and shut down

Begin at low speed. Increasing speed does not correct an empty pump or a restricted suction line.

1**Check free movement with energy isolated**

Use the approved method to confirm the pump turns freely.

2**Verify heat, valves and liquid supply**

Confirm required product temperature, an open suction and discharge path, and material available to the pump.

3**Check rotation with a brief controlled jog**

Verify actual rotation and the intended inlet and discharge before sustained operation.

4**Start slowly and confirm delivery**

Watch discharge pressure, suction condition, hydraulic-drive behavior, leakage and flow.

5**Increase speed only as conditions allow**

Stay within the verified pump and motor limits. Stop for an unexpected response.

Normal shutdown and reversal

Reduce speed and stop the drive before changing flow direction. Verify valves, destination and pressure protection for reverse operation before restarting slowly. For service, isolate and lock out all energy, relieve pressure, drain by the approved procedure and control hot product.

STOP EARLY

If the pump does not prime, loses flow, leaks, becomes noisy or pressure rises unexpectedly, stop. More speed is not a diagnostic tool.

Relief valve and pressure protection

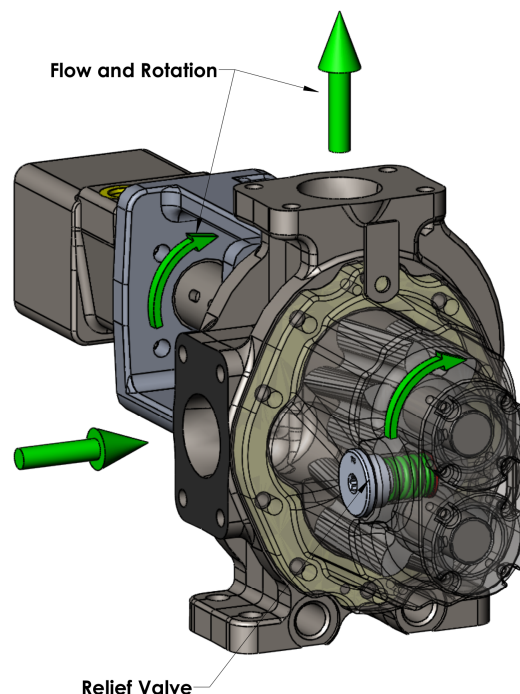
PRESSURE PROTECTION IS REQUIRED

Provide pressure protection sized for the actual flow, speed, viscosity and piping arrangement. An internal relief valve is a bypass device, not a pressure regulator or a substitute for a properly designed relief system.

The optional end-housing relief valve returns flow toward the suction side when differential pressure forces the poppet open. The relief path must match the installed flow direction.

What a relief setting means

- The listed pressure is where the valve starts to open. Pressure normally continues to rise as more flow is forced through the bypass.
- A stated test condition describes that test only. It does not establish the same pressure at every flow or guarantee a maximum system pressure.
- Bypass capacity and resulting pressure depend on pump speed, flow, viscosity, temperature, line restriction and the installed valve condition.
- Do not use the internal valve for continuous control. Verify the setting and capacity for the actual duty with suitable gauges and a safe discharge path.



Flow-and-rotation illustration. Confirm the actual inlet, discharge and relief path before startup.

Maintenance and service preparation

Identify the installed Delta before opening it. Record leakage, temperature, pressure, speed, hydraulic-drive behavior and recent work before disturbing the assembly.

Task	Check and action
Before operation	Check support, piping, hoses, guards, valve positions, leakage and free movement by the approved method.
Before opening	Isolate and lock out all drive and heating energy; relieve process and hydraulic pressure; cool, drain and clean the equipment.
Leakage	Locate the leak before disassembly. Record whether it starts at the shaft seal, joint, relief cap, hose or fitting.
Hydraulic drive	Record supply and return pressure, motor behavior, hose condition, leaks, filtration condition and any prime-mover fault.
Internal service	Match the complete pump model to the correct kit and service information before removing parts. Record orientation during disassembly.

SERVICE INFORMATION

The source manual does not specify a universal lubrication interval, wear limit, torque set or complete overhaul procedure. Confirm the correct service information for the complete pump model before proceeding.

SEND PHOTOS BEFORE CALLING

Send wide, well-lit, high-resolution photographs of the complete installation from several angles, including the pump, hydraulic drive, piping, valve positions, controls and surrounding context. Close-ups may supplement the wide views. BearCat can zoom in; it cannot zoom out.

Include the complete pump and machine identity, operating readings, what happens and when, what still works, hydraulic-drive indicators, and recent work or replacements. For equipped controls, include the exact HMI and PLC software revisions.

Record the complete model number before ordering parts or requesting service.

D

90

D

I

C

RH

M

model

displacement

shaft seal

bushing

style

configuration

mount

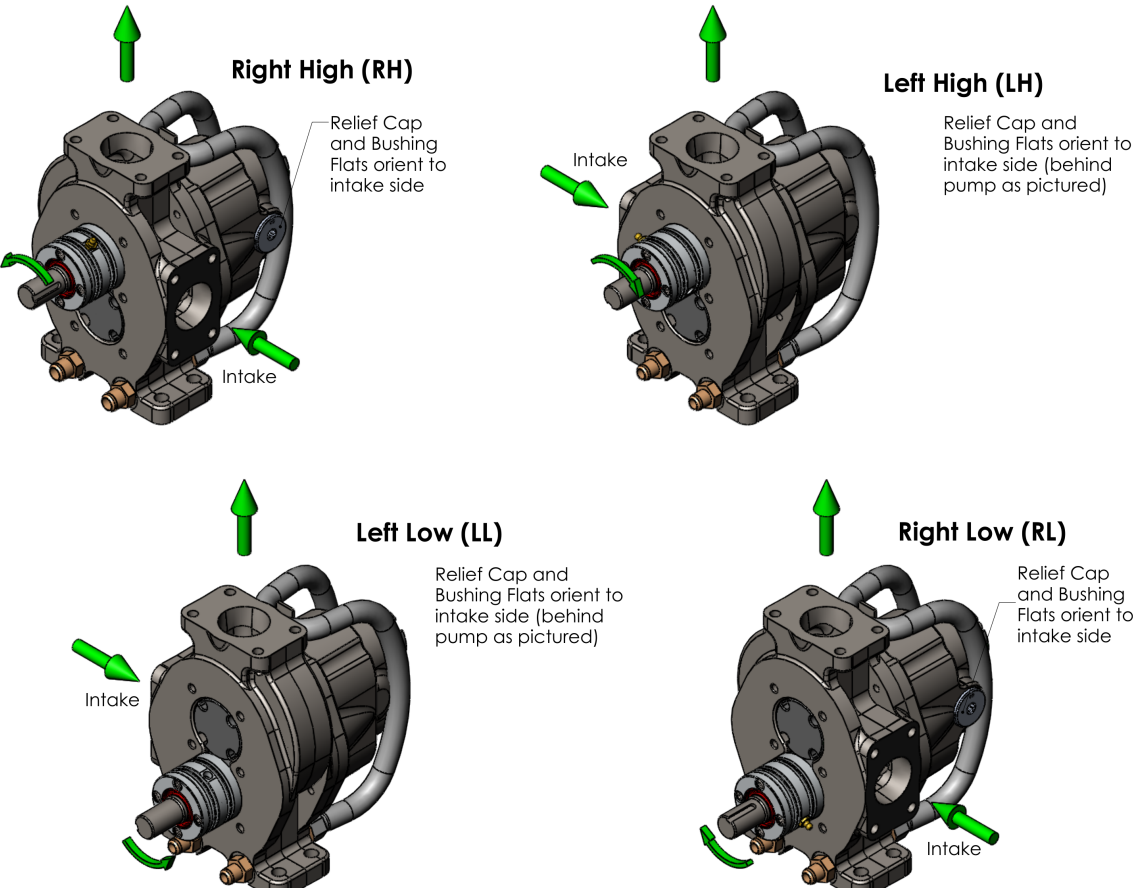
Field	Codes	Meaning
Model	D / R	Complete pump / rebuild kit
Displacement	90 / 120	0.09 / 0.12 gal/rev
Shaft seal	M / D	Single Seal Modified / Double Seal Bearing
Bushing style	I / H	Iron bushing, through hardened / extended drive bushing
Style option	A / B / C	Non-heated, no relief / non-heated, #70 relief / heated, #70 relief
Configuration	RH / LH / LL / RL	Right High / Left High / Left Low / Right Low
Mount option	M / N	Hydraulic 4F-17 / hydraulic SAE-AA

MODEL-CODE NOTE

The source code uses "Double Seal Bearing" for shaft-seal option D. That wording does not identify the new Bearing Delta platform.

Configuration and flow

Use the arrangement image, relief-cap position, bushing flats, installed piping and machine drawing together. Do not infer the intake from port height alone.



Code	Configuration	Field check
RH	Right High	Confirm the intake and actual direction before connecting piping.
LH	Left High	Relief cap and bushing flats orient toward the intake side shown.
LL	Left Low	Relief cap and bushing flats orient toward the intake side shown.
RL	Right Low	Confirm the intake and actual direction before connecting piping.

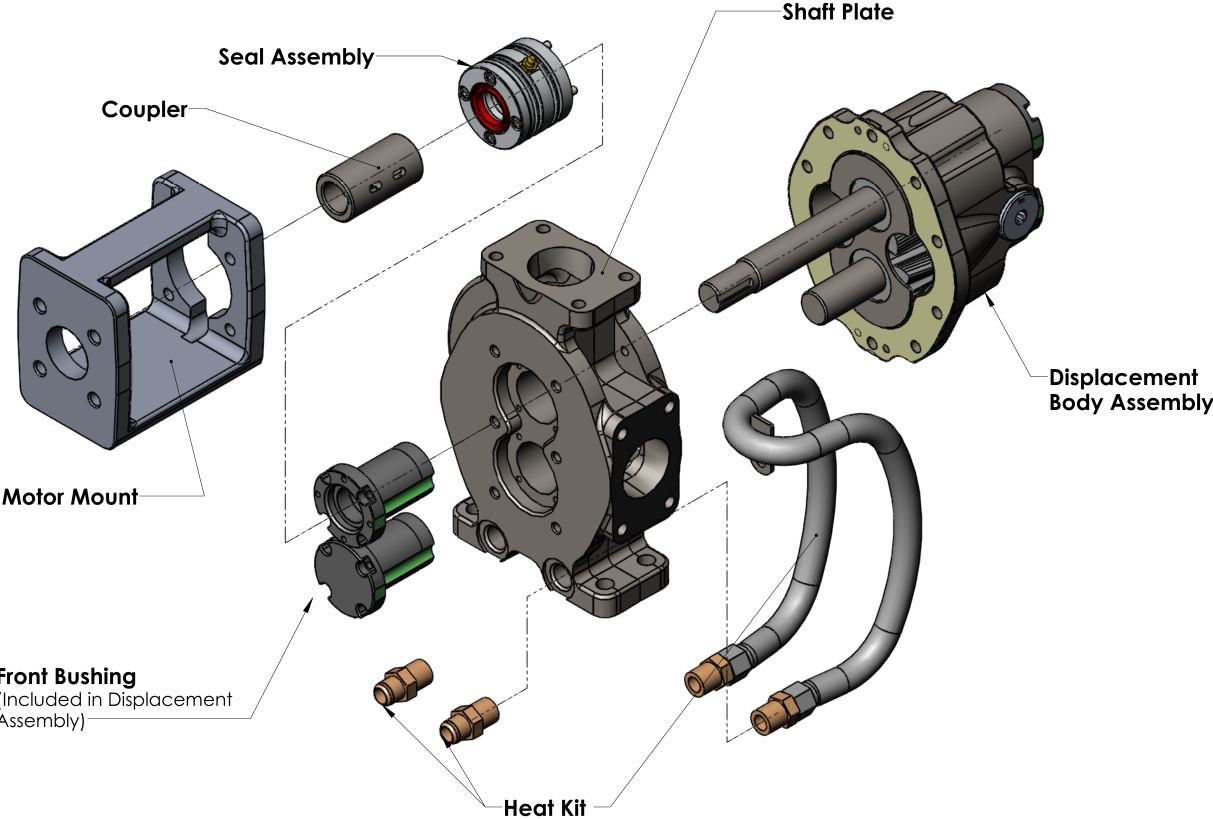
ROTATION CHECK

Momentarily jog the drive before full startup. Stop and correct any mismatch before increasing speed.

ORDERING PARTS

Provide the complete model number. Similar-looking Delta assemblies may use different seals, bushings, mounts, heat components or relief configurations.

Please provide the complete model number when ordering parts.

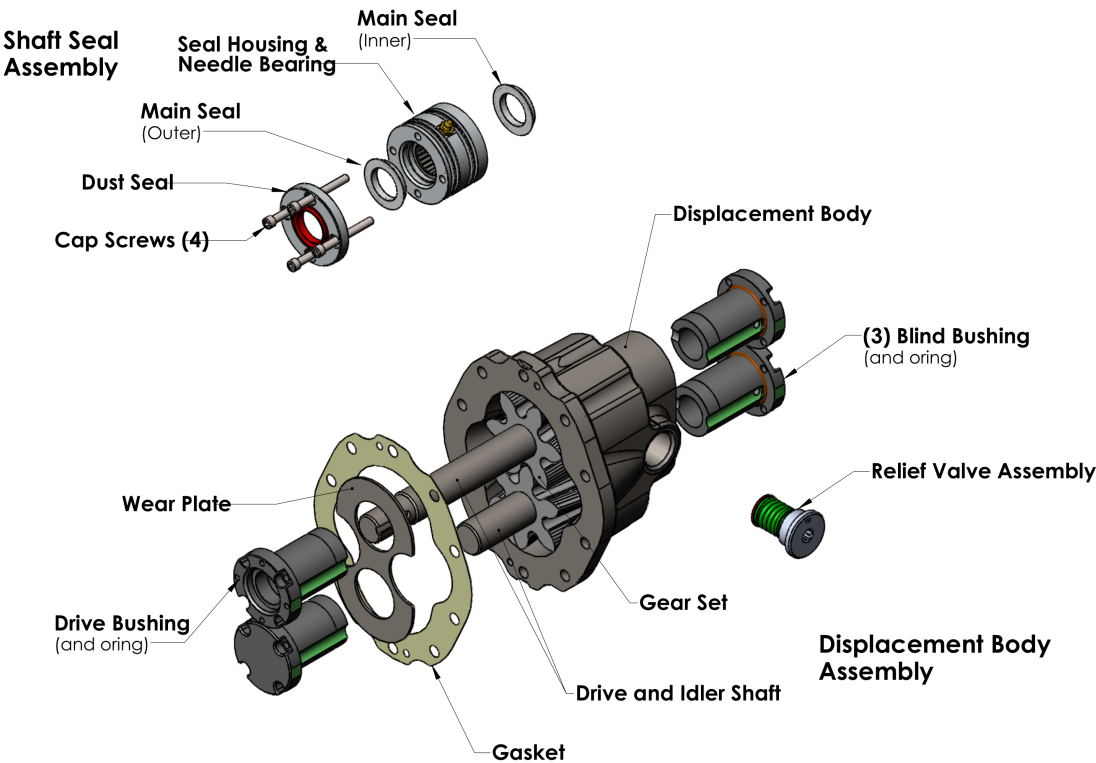


Delta pump assemblies. Illustration is a reference, not a disassembly sequence.

Area	Components shown
Drive side	Motor mount, coupler, seal assembly and shaft plate.
Pump body	Front bushing and displacement body assembly.
Heat option	Heat kit.

Rebuild-kit reference

The source manual identifies the assemblies below but does not provide a complete disassembly sequence, torque values, acceptance limits or a universal kit part number.



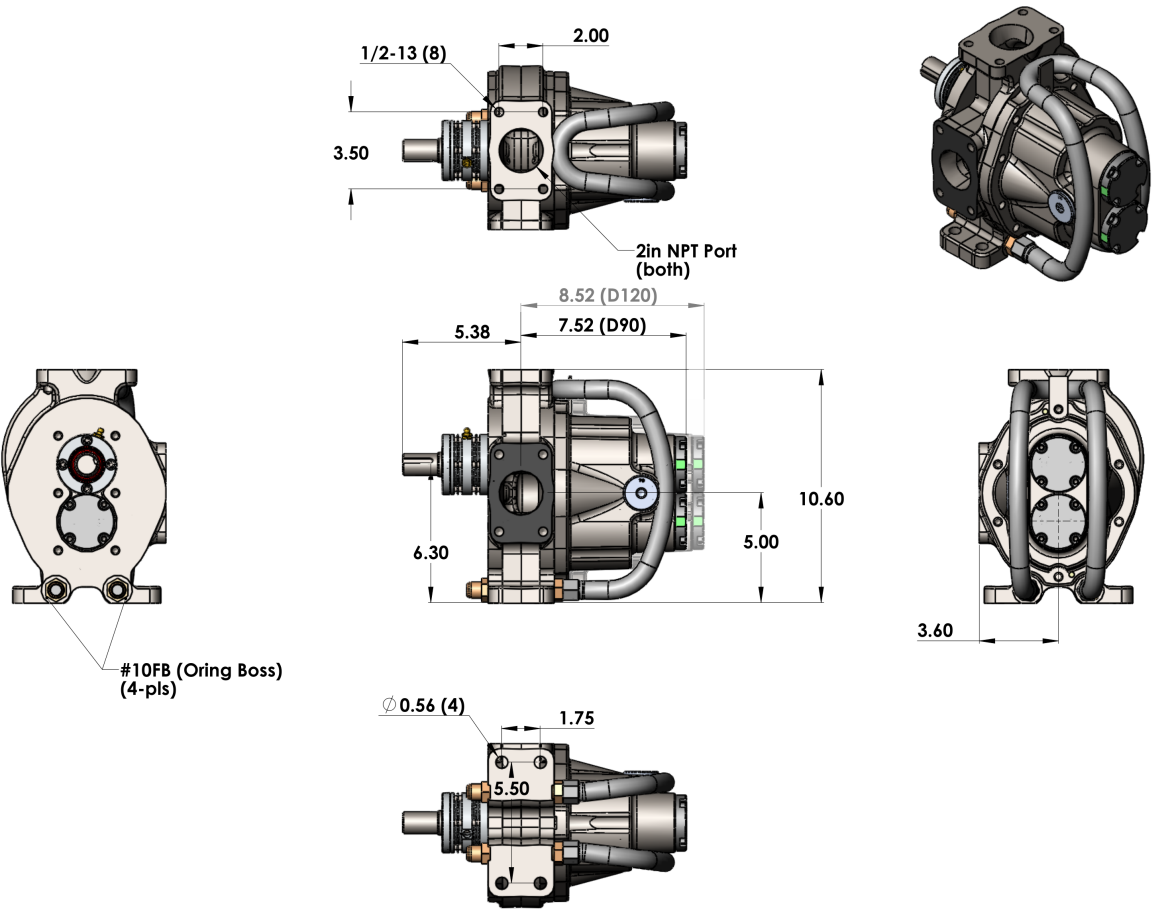
Area	Source components
Shaft seal	Dust seal; four cap screws; seal housing and needle bearing; inner and outer main seals.
Displacement body	Drive bushing and O-ring; wear plate; gasket; gear set; drive and idler shaft; three blind bushings and O-rings; relief valve assembly when equipped.

SERVICE LIMIT

Rebuild only with parts and service information verified for the complete model. Record orientation during disassembly and do not invent missing torque values or fits.

DIMENSIONAL REFERENCE

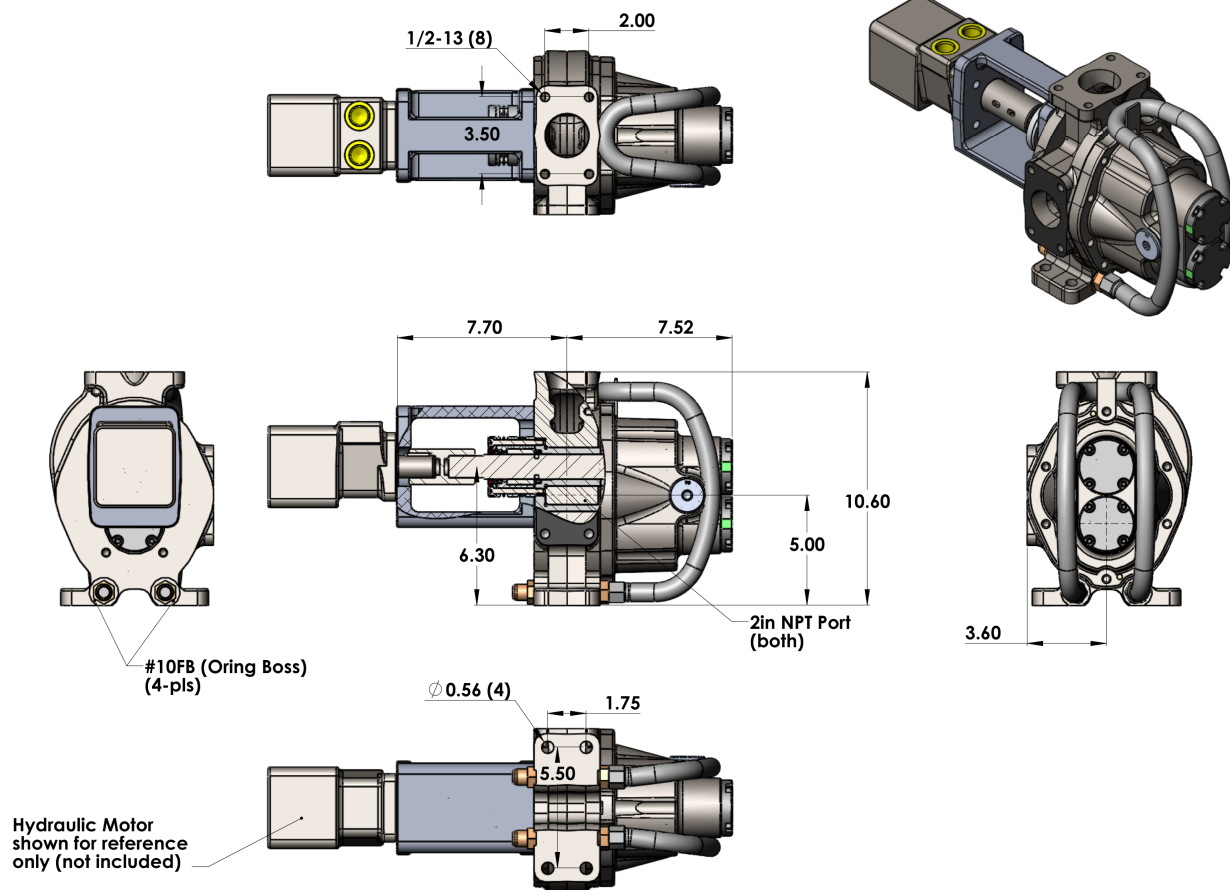
Dimensions are in inches unless noted. Confirm the applicable engineering drawing before fabrication, replacement or piping changes.



Item	Source value
Ports	2 in NPT, both ports
Body length	D90: 7.52 D120: 8.52
Auxiliary connections	#10FB O-ring boss, 4 places
Fastener interface	1/2-13, 8 places

M-mount dimensions

Face-mount arrangement. The hydraulic motor is shown only as a mounting reference and is not included.



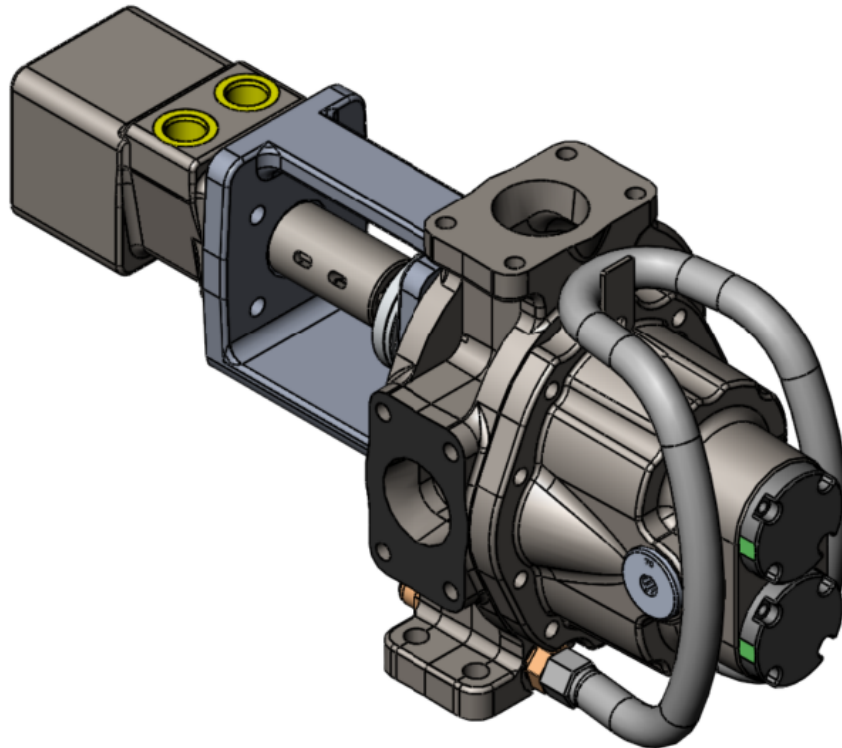
VERIFY THE MOTOR

Confirm the motor face, shaft interface, displacement, rotation, permitted speed, pressure rating and hydraulic circuit requirements for the machine. This drawing does not select a motor.

Hydraulic drive system

The Delta was built in hydraulic-drive configurations. This illustration identifies the four-bolt 4F-17 motor-face arrangement; it does not select the motor or circuit.

4-Bolt, 4F-17 Motor Face



Verify for the actual machine

- Motor face, shaft interface, displacement, direction, permitted speed and pressure rating.
- Hydraulic supply, return, case-drain requirements, filtration, cooling and circuit protection specified for the selected motor.
- Pump rotation, liquid-path configuration, guarding and process pressure protection before startup.
- Hose and fitting ratings, routing, support, leak-free condition and the zero-energy service procedure.

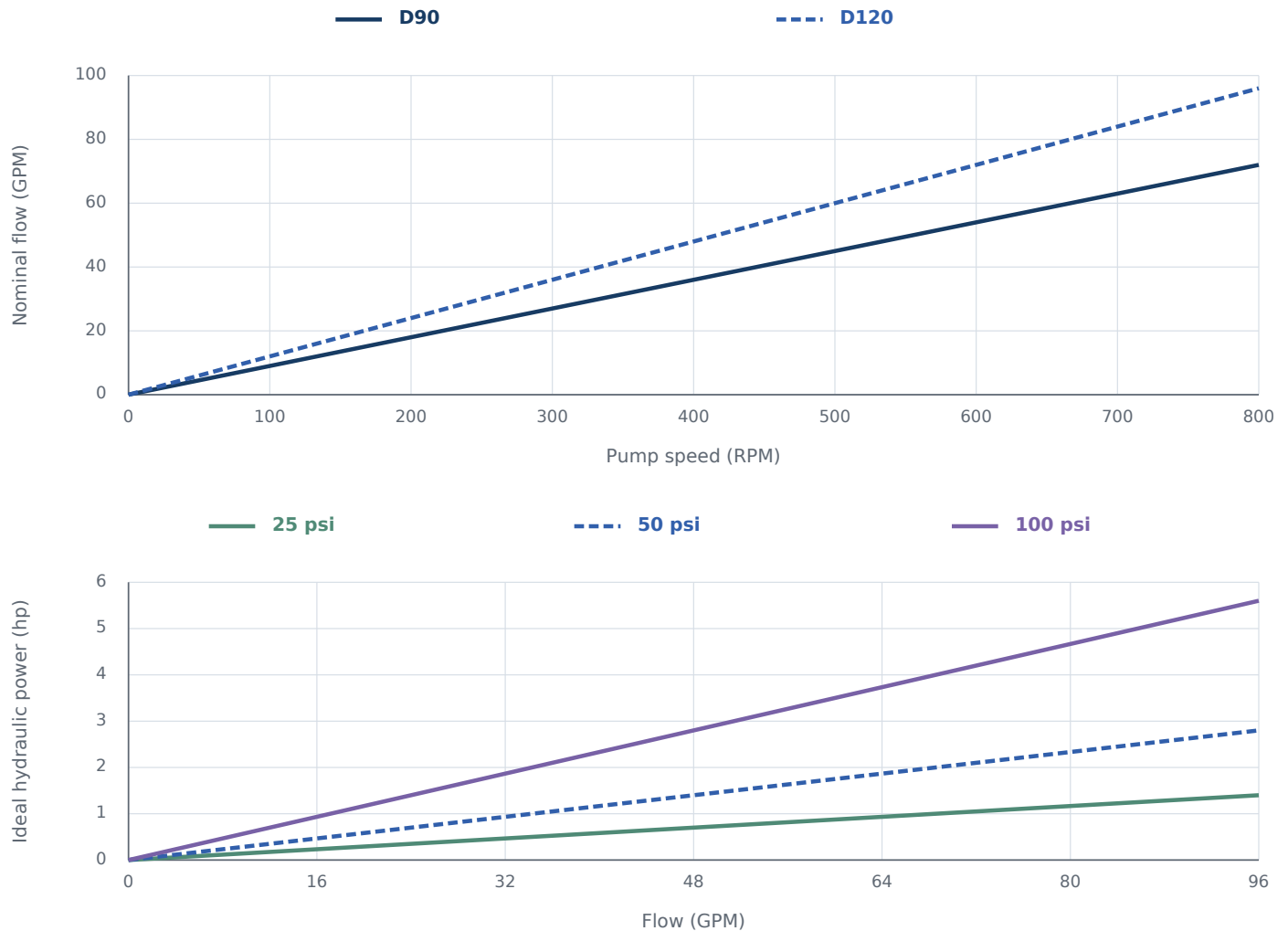
DO NOT SELECT BY APPEARANCE

A motor that fits the face may still have the wrong shaft, displacement, direction, speed capability or hydraulic requirements. Verify the complete selection.

D90 / D120 performance reference

Series	Nominal gal/rev	Reference RPM	Nominal GPM at 800 RPM
D90	0.09	800	72
D120	0.12	800	96

Reference flows use nominal displacement. Actual delivery and usable speed depend on product, temperature, inlet conditions, differential pressure, pump condition, hydraulic drive and installed equipment.



Nominal flow = gal/rev x RPM.

Ideal hydraulic hp = GPM x differential psi / 1714. Power curves neglect viscosity and use a 1.0 service factor. They are a reference, not a hydraulic-motor sizing calculation; mechanical and viscous losses increase required shaft power.

Use hydraulic speed control for a slow start and rate adjustment. Verify the permitted speed, available torque and hydraulic motor selection for the installed D90 or D120; a reference curve is not a startup target.

Engineering basis: D90 = 0.09 gal/rev; D120 = 0.12 gal/rev. Flow lines are nominal displacement math through 800 RPM. Actual delivery is lower when slip or inlet loss is present.