



Gear Pump 101

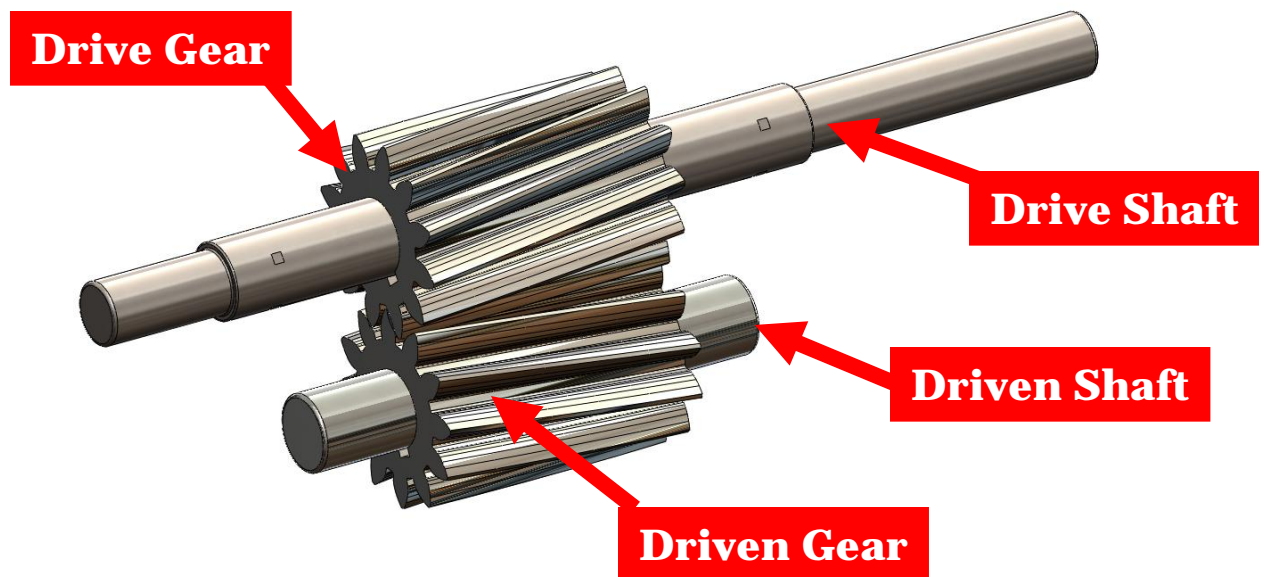
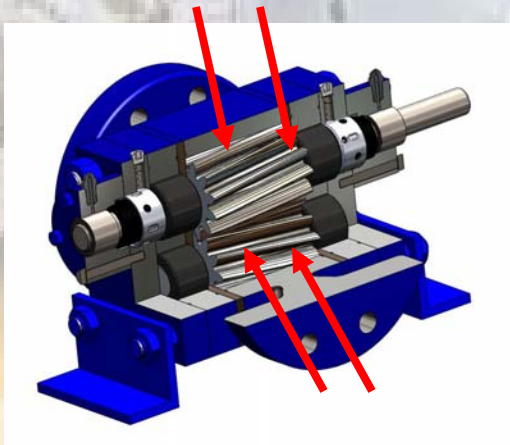
Lesson 3: Gear Pump Components

When your reputation depends on it!

Northern® Lesson 3: Gear Pump Components

Gears & Shafts –

- Gears – Heart of Positive Displacement Gear Pump
- Drive Gear and Driven Gear
- “Floating Gears” – Gears Allowed to Move Freely
- Heated Treated Helical Gears
- Gears Have Profile Ground - Improves Life Cycle

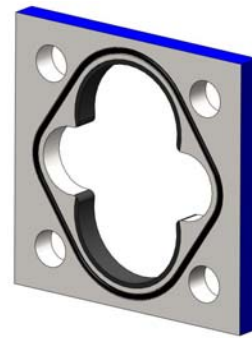
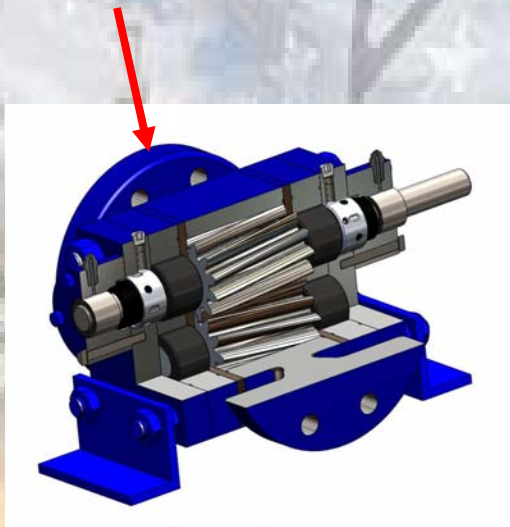


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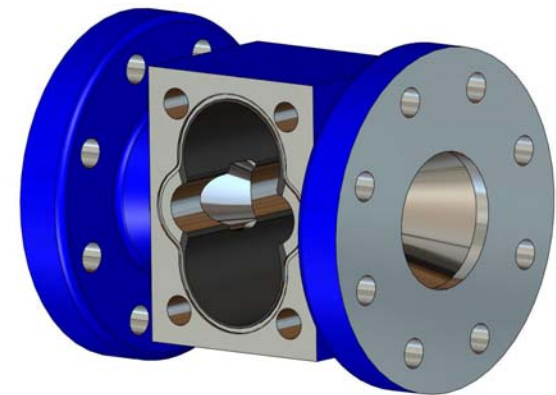
Pump Cylinder

- Gears Rotate Within
- Tight Clearances = Increased Volumetric Efficiency
- Increase Clearances for Higher Viscosities
 - ↓ Decrease Horse Power Required
- Decrease Clearances
 - ↑ Improve Flow
- Flanged Connections Available (NPT or “Blind”)



Blind

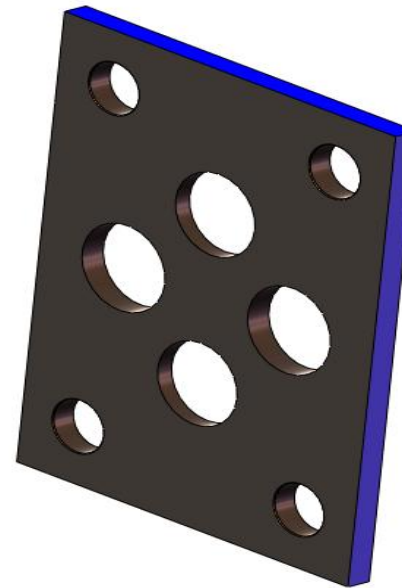
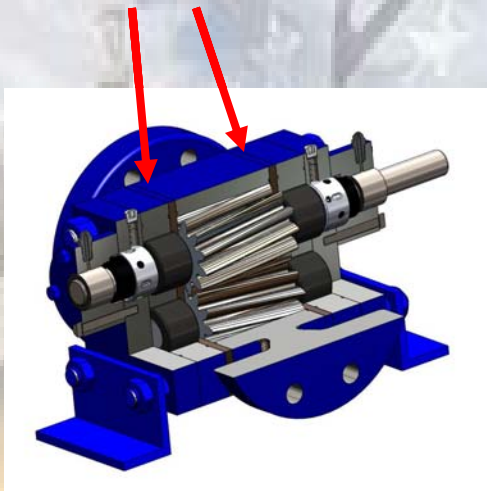
Flanged



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Pump Liner Plates

- Located on Both Sides of Cylinder
- Used When Additional Surface Needed to Rotate Against
- Used in the case of Pumping Extremely Abrasive Material
- Several Liner Plate Materials Available
- Liner Plates are Replaceable – Reduces Maintenance and Life Cycle Costs

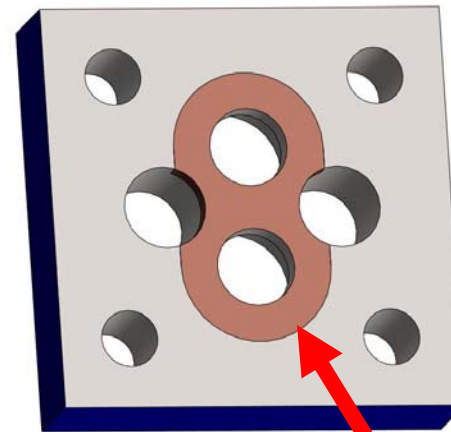
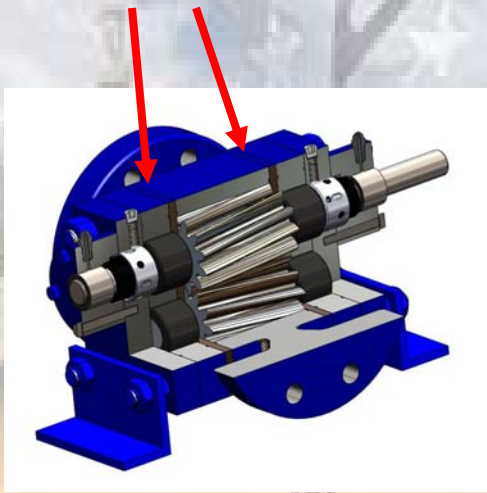


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Pump Bearing Plates

- Located on Both Sides of the Cylinder
- Holds Main Shaft Bearings
- Provide Wear Surface for Pumps Without Liner Plates
- Available in Many Materials



Inlaid Wear Surface

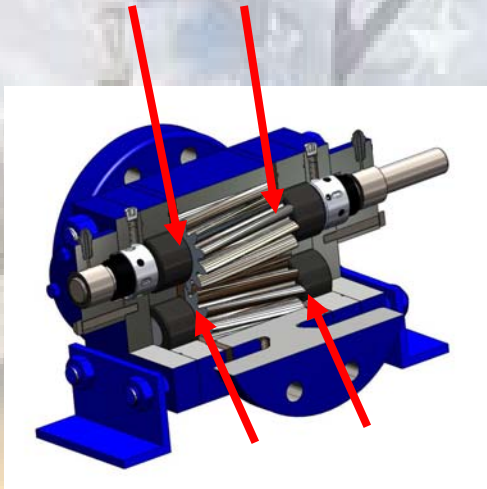


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Pump Shaft Bearings

- Design and Configuration is Most Important Factor Affecting Gear Life Cycle
- Lubricated by Liquid Being Pumped
- Available in Wide Variety of Types and Configurations
- 52100 Roller – Most Common Type for Liquids
- Shafts Specially Designed to be the Inner Bearing Race
- Sleeve Type Bearings
- Bearing Plate Can be Designed with Integral Bearing surface.

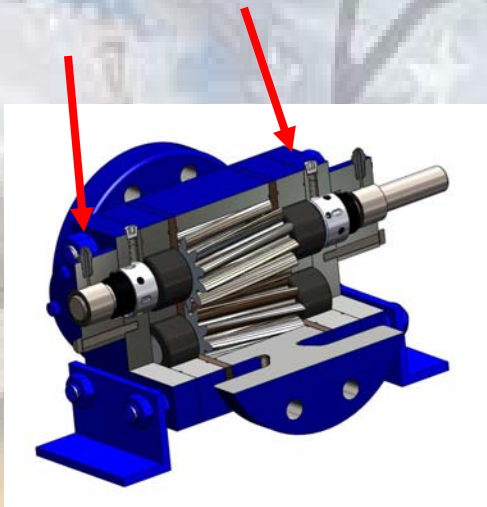


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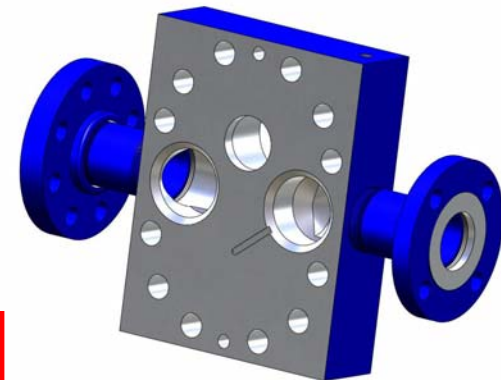
Packing Plate, Suction & Discharge Plate, Seal Adapter Plate

- Located on the Front of the Pump
- Multiple Configurations Depending On:
 - ✓ Shaft Seal, Piping Connections, or Pump Design
- Used on Pumps with Packing Rings for Shaft Sealing
- Suction & Discharge Plates Have Pipe Connections Installed, or Flanges Welded
- Used with Mechanical Seals for Shaft Sealing
- Used For Flanged Cylinders,



Blind Seal Adapter Plate

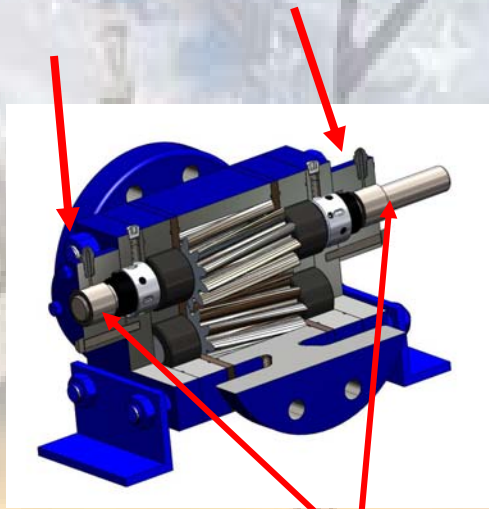
**Seal Adapter Plate
Weldment w/ Flanges**



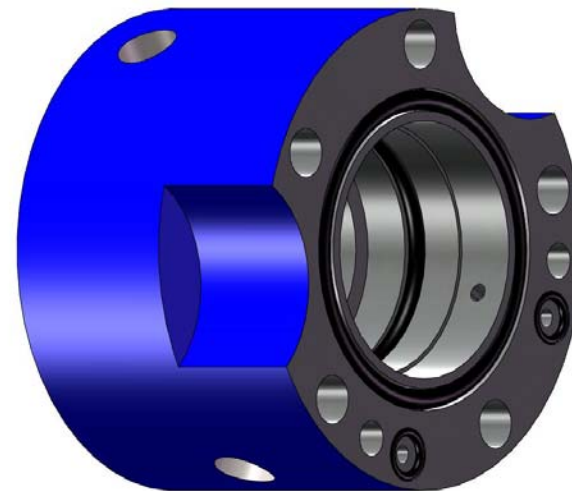
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Seal Housing or Packing Gland

- Holds the Mechanical Seal and Seat for Pumps
- Weep Hole to Identify When a Seal Failure Has Occurred
- Sealed with a Gasket and O-Rings
- Roller Bearing Greased Externally (helps stabilize the shaft which extends seal life)
- Pumps Equipped with Packing - Gland Provides Adjustment Capability



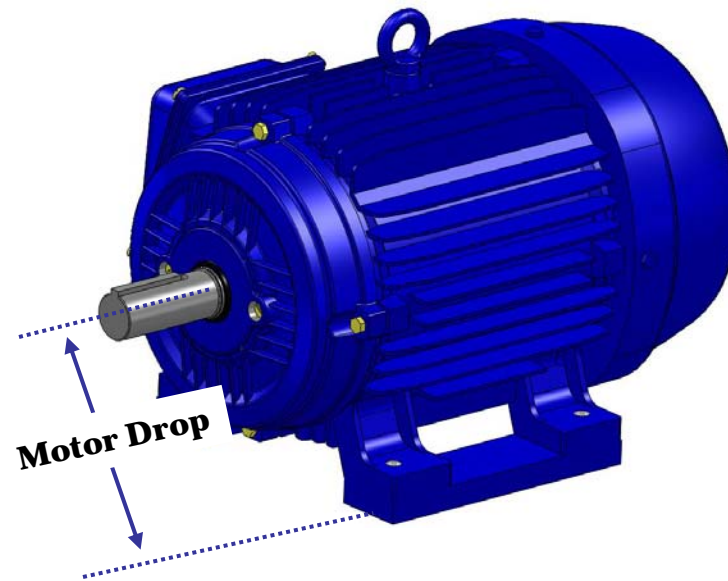
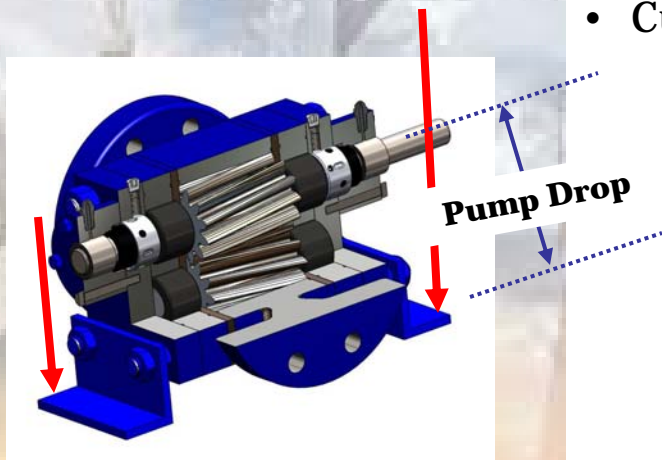
Seal Support Bearings



Northern[®] Lesson 3: Gear Pump Components

Pump Mounting Brackets

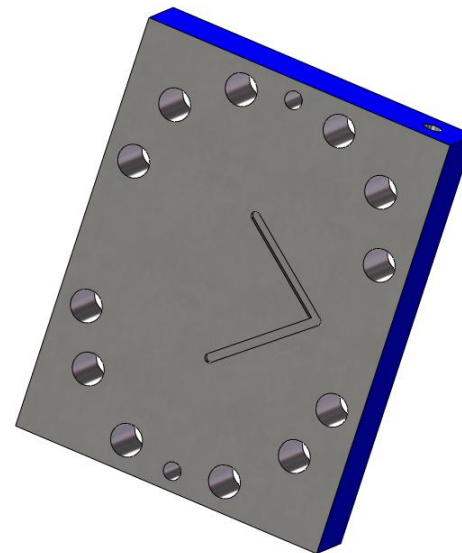
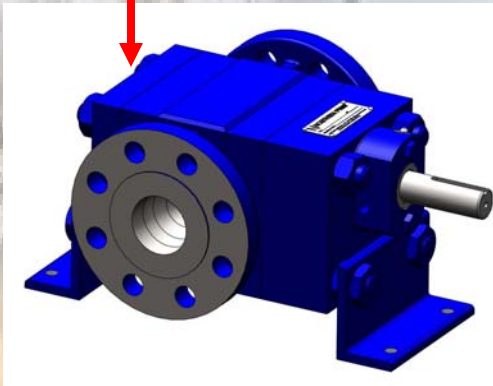
- Located on Front and Rear of the Pump
- Allow for Bolting and Alignment with Any Size Motor
- Customized to Fit the Pump “Drop” or the Motor “Drop”



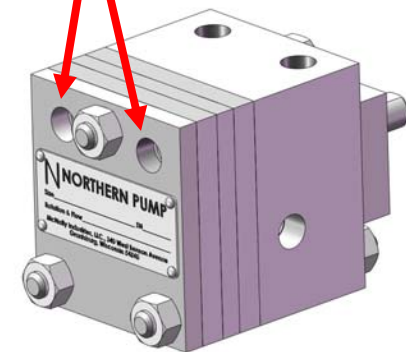
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Pump End Plate

- Located On the Rear of the Pumps
- For Pumps with Packing or a Single Mechanical Seal
- “Caps” the End of the Pump
- Contain Special Grooves to Move Liquid Through the Pump



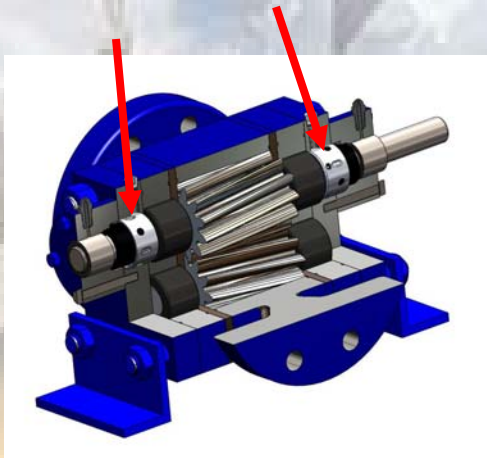
Pump design with internal Heating connections. NPT connections are installed in the end plate



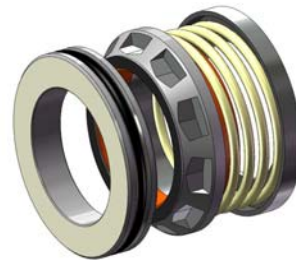
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Mechanical Shaft Seals and Packing

- Constant Suction Pressures on Drive Shaft
- Provides Reliable Sealing Mechanism
- Several Types
- Hydraulically Balanced Option - Suction Pressures > 25 PSI



Type 21



Type 8-1, 8B-1, Type 9



Visit our custom pump page to explore seal options

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Pump Unit Assembly

Northern Pump is a full service gear pump manufacturer. We frequently build and assemble pump unit assemblies, or “Skids” as they are sometimes called. They typically consist of a Northern Heavy Duty Gear Pump, Electric motor, Shaft Coupling, and Coupling Guard, mounted on a Unit Base. We configure the mounting holes to match the application and install lifting hooks to safely move the unit.

