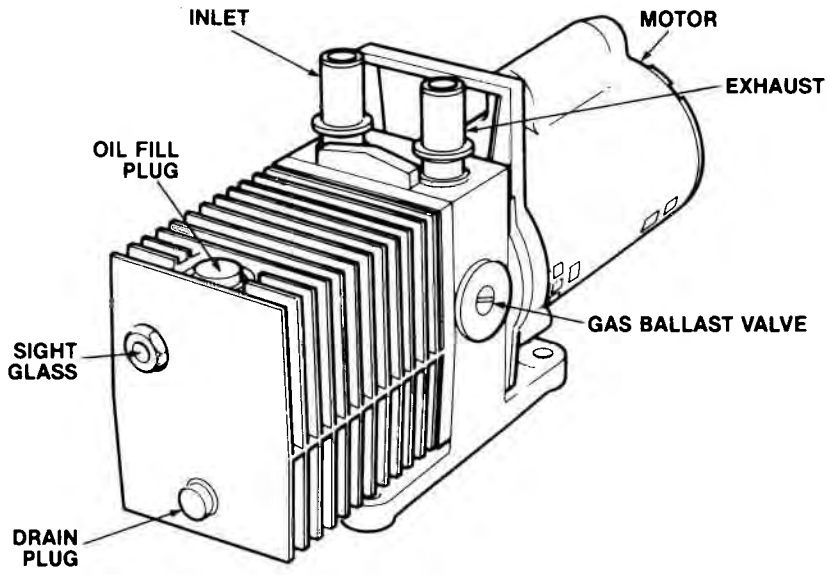
The drive belts on belt-driven pumps should be regularly checked for proper tension and wear. On multiple belt pumps, if one belt is worn, replace all drive belts in matched sets.

Follow the manufacturer's instructions to change oil and to gas ballast properly.

Rotary Vane, Oil-Sealed Mechanical Pump

The rotary vane, oil-sealed mechanical pump removes gases by compressing them to a point slightly above atmospheric pressure. It then expels the gases to the outside world. It is used to produce roughing or forepressures lower than the rotary piston pump. Due to the friction caused by the sliding vanes in this type of pump, the largest size available is about 150 cfm, the smallest is less than 1 cfm.

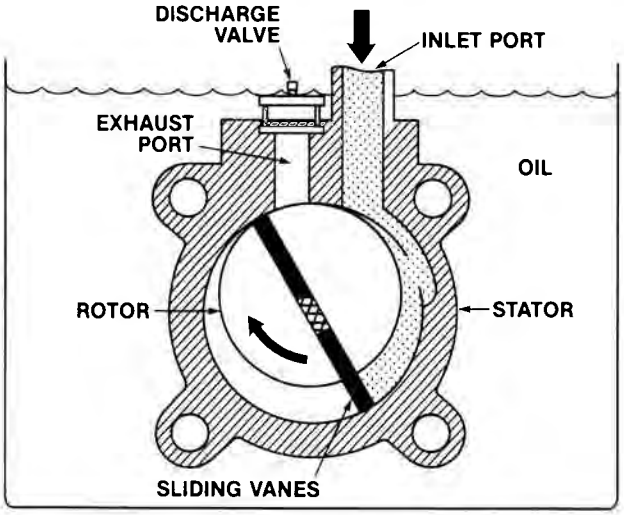


The pump module is immersed in an oil bath. This oil is purified to remove high vapor pressure contaminants. The oil serves the following purposes:

1. Cools the pump.
2. Lubricates.
3. Seals against atmospheric pressure.
4. Opens second-stage exhaust valve at low inlet pressures.

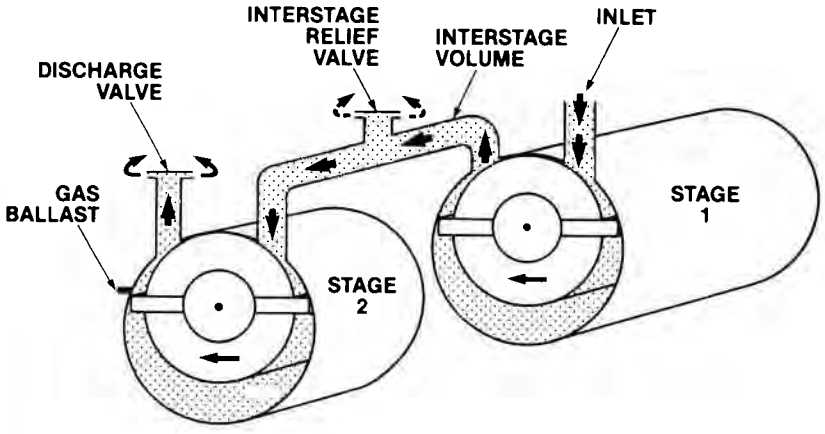
Components

An oil-sealed mechanical pump includes a housing, or stator, an offset rotor with spring-loaded vanes, an intake port and an exhaust port equipped with a discharge valve. It may also have a ballast valve. The pump rotor may be driven by a belt-drive mechanism or it may be directly coupled to the drive motor. Belt-driven pump speeds range from 250 to 400 rpm. Direct drive pumps usually run at 1,725 rpm. Most pumps have two stages to produce better vacuum. This view of a mechanical pump shows the inlet and exhaust ports of one stage.



ROTARY OIL-SEALED MECHANICAL PUMP MODULE

How the Pump Works



Gases from the chamber enter the inlet port. They are swept around by vanes, and compressed. Compression builds up pressure to overcome atmospheric pressure. The spring-loaded discharge valve is opened. The air is then expelled to atmosphere. These pumps can remove over 99.9% of the air from the chamber.