

## **Hydraulic Motors**

### **1- Introduction**

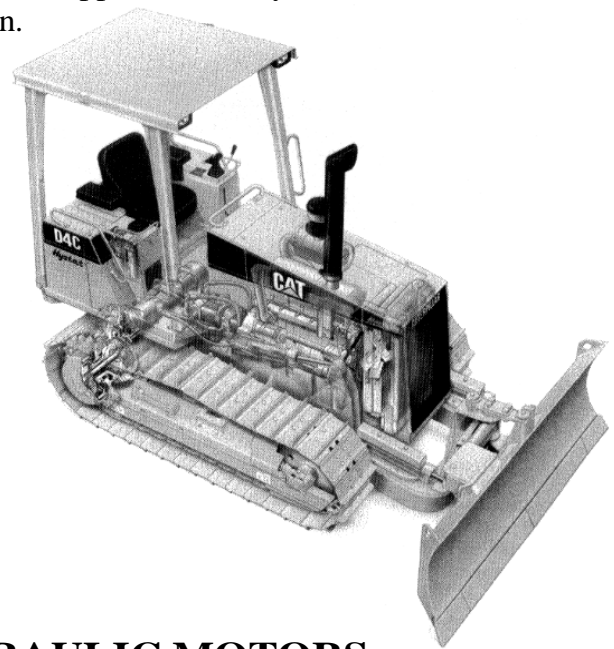
As in the Case of Hydraulic Cylinders, Hydraulic Motors Extract Energy from a Fluid and Convert it to Mechanical Energy to Perform Useful Work. Hydraulic Motors can be of: The Limited Rotation or The Continuous Rotation Type. A Limited Rotation Motor, which is also called A Rotary Actuator or An Oscillating Motor, can rotate Clockwise and Counterclockwise but through less than One Complete Revolution. A Continuous Rotation Hydraulic Motor, which is called a Hydraulic Motor, can rotate continuously at an rpm that is determined by The Motor's Input Flow-Rate.

In Reality, Hydraulic Motors are Pumps that have been redesigned to withstand the Different Forces that are involved in Motor Applications. Hydraulic Motors are of the: Gear, Vane, or Piston Configuration.

Hydrostatic Transmissions are Hydraulic Systems specifically designed to have a Pump Drive a Hydraulic Motor. A Hydrostatic Transmission Transforms Mechanical Power into Fluid Power and then Reconverts the Fluid Power Back into Shaft Power.

The Advantages of Hydrostatic Transmissions include:

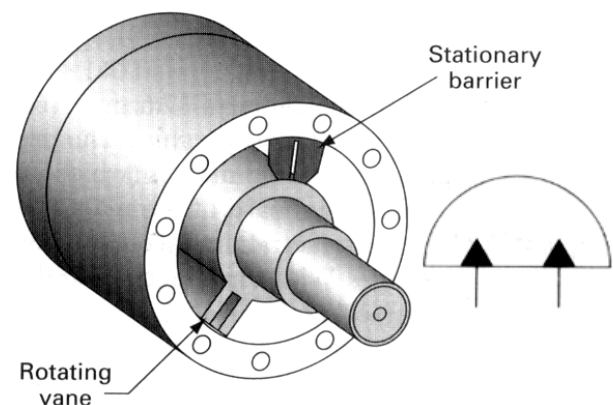
1. Power Transmission to Remote Areas,
2. Infinitely Variable Speed Control,
3. Self-Overload Protection,
4. Reverse Rotation Capability,
5. Dynamic Braking, and
6. A High Power-to-Weight Ratio



### **2- LIMITED ROTATION HYDRAULIC MOTORS**

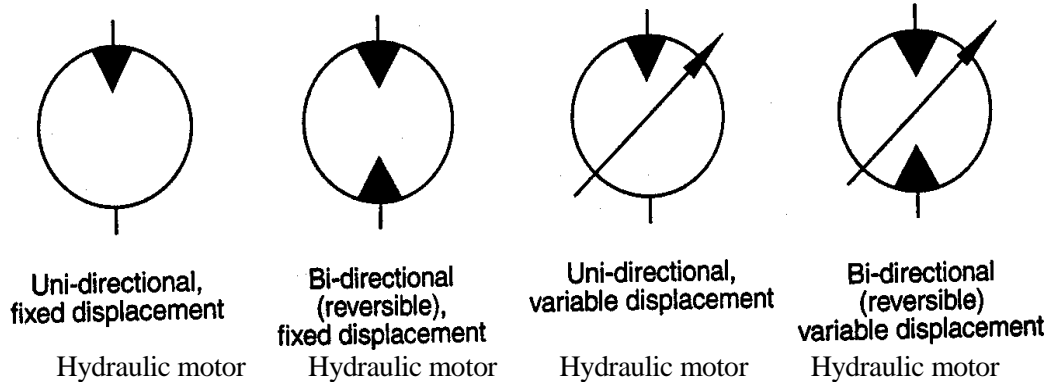
A Limited Rotation Hydraulic (also called Oscillation Motor or Rotary Actuator) provides Rotary Output Motion over a Finite angle. Rotary Actuator Produces High Instantaneous Torque in Either Direction and Requires Only a Small Space and Simple Mountings. Rotary Actuators consist of a Chamber(s) Containing the Working Fluid and a Movable Surface against which the Fluid acts. The Movable Surface is connected to an Output Shaft to produce the Output Motion.

A Direct-Acting Vane-Type Actuator is shown schematically along with its Graphic Symbol. Fluid under Pressure is directed to One Side of the Moving Vane, Causing it to Rotate. This Type provides about 280° of Rotation.



### **3- Rotary Actuators**

Graphic Symbols for Hydraulic Motors



Hydraulic Motors can rotate continuously and as such have the Same Basic Configuration as Pumps. Instead of Pushing on the Fluid as Pumps do, Motors are pushed on by the Fluid. Hydraulic Motors develop Torque and Produce Continuous Rotary Motion. Hydraulic Motor is pressurized from an Outside source; Most Hydraulic Motors have Casing Drains to protect Shaft Seals. The Direction of Rotation of the Motor can be reversed by reversing the Direction of Flow.

There are Three Basic Types of Hydraulic Motors:

1. Gear,
2. Vane, and
3. Piston.

### **4- GEAR MOTORS**

A Gear Motor Develops Torque due to Hydraulic Pressure acting on the Surfaces of the Gear Teeth.

