

# Advanced Hydraulics | Multimedia Courseware

Hydraulic Motor Applications - WXB839-XA01XEN-E1

Objective 12: Explain the Basic Design Rule for Hydraulic Motor Braking Circuits

### Motor Cavitation Description

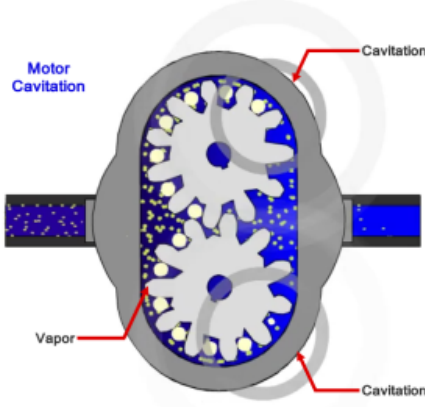
As these vapor bubbles flow through the motor, they collapse suddenly causing very small points of high temperature and high pressure.

These points of high pressure and temperature act like many small chipping hammers that destroy the motor by removing particles from critical areas in the motor or pump. This process is called cavitation.

The degree of cavitation depends on how low the pressure drops.

Unless it is severe, it is difficult to determine because system performance is unaffected.

Severe cavitation can be heard as a rattling sound and can destroy a motor or pump in a matter of seconds.



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## Multimedia Courseware: MB839

Hydraulic power is used in everything from automotive brakes to industrial robots. Amatrol's Multimedia Courseware - Intermediate Hydraulics (MB832) teaches learners about essential intermediate hydraulics concepts applicable across a variety of modern industries, such as manufacturing, transportation, agriculture, and construction. Learners using Amatrol's intermediate hydraulics eLearning course study a wide variety of intermediate hydraulics concepts and skills, such as the operation and applications of hydraulic directional control valves, hydraulic cylinders, hydraulic relief and check valves, and accumulators.

## Teach Intermediate Hydraulics

Amatrol's eLearning curriculum uniquely, and thoughtfully combines in-depth theoretical knowledge with practical, hands-on skills. This powerful combination of knowledge and skills solidifies understanding and creates a strong foundation for pursuing more advanced skills.

### Hydraulic Motor Applications

Learners begin with an introduction to hydraulic motor applications, including hydraulic motor types, free-wheeling motor circuits, and unidirectional and bidirectional motor braking. Individual lessons focus on topics like methods of synchronizing hydraulic motors, the function of a make-up check valve, motor cavitation, and the function and operation of hydraulic brake valves. Learners will also practice skills, such as measuring hydraulic motor speed using a photo tachometer, connecting and operating a parallel motor synchronization circuit, and connecting and operating a unidirectional motor braking circuit using a relief valve.

### Hydraulic Pump and Motor Performance

Learners will study the components and performance of hydraulic pumps and motors, including pump flow rate and power, hydraulic motor displacement, and hydraulic motor torque. Individual lessons focus on topics like pump volumetric efficiency, theoretical motor speed, motor volumetric efficiency, and torque specifications. Learners will also practice skills, such as calculating actual pump flow rate given volumetric efficiency, calculating the theoretical speed of a motor given its displacement and flow rate, and calculating the theoretical hydraulic motor torque given torque specification.

### Fluids and Conditioning

Learners using Amatrol's advanced hydraulics eLearning course will study basic principles of fluids and conditioning, including conductors, fluid viscosity and compressibility, filtration, reservoirs, and heat exchangers. Individual lessons focus on topics like how to size a conductor, the effects of viscosity on internal leakage and pressure settings, how seal materials are determined by hydraulic fluid type, and the construction and operation of various types of filters. Learners will also practice skills, such as measuring the viscosity of a fluid, inspecting the seals of a subplated directional control valve, and sizing a heat exchanger.

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