

# Hydraulic, Pneumatic, and Robotic Power

## Unit 39 Key Terms

- **Fluid power** — transfer of force with liquids to gases.
- **Hydraulics** — use of liquids to transfer force.
- **Pneumatics** — use of air to transfer force.
- **Force** — pushing or pulling action.
- **Pressure** — force acting upon an area.
- **Bourdon tube** — measures fluid pressure.
- **Manometer** — measures fluid pressure and vacuum.
- **Viscosity index** — a measure of a fluid's tendency to flow at a given temperature.
- **Additive** — a chemical or material introduced into a fluid to change one or more of the fluid's characteristics.
- **Viscosity improver** — a chemical added to a fluid to make it more stable when subjected temperature changes.
- **Antifoam** — an additive that reduces a fluid's tendency to foam.
- **Corrosion inhibitor** — a material or additive that reduces or prevents corrosion.
- **Rust inhibitor** — a material or additive that reduces or prevents rusting.
- **Antiscuff** — an additive that helps polish moving parts.
- **Extreme-pressure resistor** — an additive that reduces oil breakdown under high pressure.
- **SAE** — See Society of Automotive Engineers.
- **SAE rating** — a number assigned to an oil to represent its viscosity.
- **API** — See American Petroleum Institute.
- **Double-action cylinder** — works two ways.
- **Positive displacement** — a design arrangement that ensures that a consistent volume of fluid is pumped during each revolution.
- **Eccentric** — off-center.
- **Air compressor** — pump that increases pressure on air.
- **Fluid coupling** — uses fluid to transfer motion.
  
- **Impeller** — fan-shaped rotor.
- **Pressure regulator** — maintains constant line pressure.
- **Direction control valve (check valve)** — restricts fluid movement to one direction.
- **Spool valve** — a valve with one inlet and multiple outlets.
- **Tolerance** — acceptable variation.
- **Full-flow system** — a filter system in which all fluid flows through the filter.
- **Bypass system** — a filter system in which some of the fluid bypasses the filter.
- **Hydraulic cylinder** — tank with inlet and piston.
- **O ring** — piece of rubber shaped like an O that fits in a groove on a shaft and prevents liquids from passing.
- **Hydraulic motor** — receives power from moving fluid.
- **Robot** — mechanical device capable of humanlike movements.
- **Robotics** — study and application of technology to robots.
- **Rotation** — circular motion performed by a robot or other machine.
- **Translation** — linear movement motion performed by a robot or other machine.
- **Axis** — a straight line around which a body rotates.
- **Degree of freedom** — a way in which a body may move, based on its having a certain axis of rotation; the total degrees of freedom a body has is equal to its number of axes.
- **Cartesian working area** — box-like shape.

- **Cylindrical work area** — a work area in shape of a cylinder, containing a hollow space in the center.
- **Hollow** — a space in the center where the robot cannot function.
- **Hollow sphere work area** — a work area in the shape of a hollow ball, with a hollow area at the center.
- **Solid sphere work area** — a work area in the shape of a solid ball, with no hollow area at the center.