Activity 3.2.1 Fluid Power Applications

Purpose

Some fluid power devices such as the cylinders that lift the bed of a dump truck are easy to identify. Others may not be so obvious. Many people benefit from artificial limbs that are fluid-powered and well disguised. Some hydraulic powered devices are used to rescue people from vehicular wrecks. The rescue devises to the right are cutters, spreaders, and a ram. All fluid-powered devices are designed to make work easier. All devices providing fluid power under pressure share four basic components: a reservoir or tank, a pump or compressor, a valve, and a cylinder.

Equipment

- Internet access
- Printed sources about fluid power systems, if available
- Word processing and presentation software
- Digital camera

Procedure

In teams of two or three, you will choose a fluid power device that possesses at least the four major components. Your team will research the device, take pictures of the device, and interview someone knowledgeable about the device. Your team will share your findings with the class.

Choose a Fluid Power Device

1. As you choose a fluid power device, consider the following requirements:
   - You must photograph the device.
   - You must have access to an individual who is knowledgeable about your chosen device. You will be required to interview this individual.
   - Your device must contain at least the following components:
     - Reservoir (hydraulic) or receiver tank (pneumatic)
     - Pump (hydraulic) or compressor (pneumatic)
     - Valve
     - Cylinder
   - Your device must be different than devices chosen by others.
Visit the Site

2. Conduct an on-site observation of the device and interview an expert. As you observe the fluid power system, complete the tasks identified below.
   - Take pictures of the entire device and of individual device components.
     Photograph the device in operation if possible. Photograph your team with the device.
   - Gather details from device labels and instructions if possible.
   - Ask the expert to detail the function(s) of the system, the names and purposes of the different components, what works well with the device, areas that could use improvement, and any other information that the expert would like to share.
   - Read the deliverables section to ensure that you have collected all of the necessary project information.

Create a Presentation

3. Prepare and deliver a 3-5 minute presentation. The presentation should highlight the most important information that your team gathered. Include pictures and descriptions of the function(s) of the device, component descriptions, and other interesting aspects of your device. Your target audience is your class members. Your goal is to present the information in an interesting and informative manner.

Prepare the Deliverables

4. Prepare the deliverables. Your final documentation should include page numbers and topic headings for each section. The entire document must be grammatically correct. You can use information from trustworthy sources and from your expert interview. Use the list below to organize your deliverables.

- **Title Page**: This section includes the title of the project, a picture of the device and team members, team member names, course title, name of your school, and the date. The title page should be on its own sheet of paper.
- **Table of Contents**: This section includes a listing of all topic headings and the corresponding page numbers. The table of contents should be on its own sheet of paper.
- **Device Description**: This section includes details about the function(s) of the device. Includes additional information such as brand name, version, model, model number, etc. The Device Description should be 100-150 words.
- **Component Identification**: This section describes each of the four major components and any additional components that are part of the fluid power system. Use pictures to label each component. The items below are suggestions for what each component description might contain. This section should be 150-200 words.
  - *Reservoir or receiver tank*: type, pressure/volume of operation, mode of operation, etc.
  - *Pump or compressor*: type, location, capacity, etc.
  - *Valve*: type(s), location(s), what is controlled, etc.
  - *Cylinder*: type(s), location(s), function(s), etc.
  - *Additional components*: type(s), location(s), function(s), etc.
- **System Operation**: This section provides a detailed description of the device function. Bullets or numbers may make the text easier to interpret. This section should be 150-200 words.
Schematic: Create a schematic to detail the components and operation of the device. Be sure to label each component.

Reflection: This section includes your impression of the device, including what works well and suggestions for improvement to the device. This section should be 50-100 words.

Presentation: Include a printout of your presentation in handout view with six slides per page.

References: Using APA format, list all sources that were used to complete this activity.

Conclusions

1. List and describe the functioning components and purpose of a fluid power device at your house or school.

2. Explain an everyday task that could be performed more efficiently if a fluid power device were utilized.