

**Knowledge Domain: Motors**  
**Unit: Belts/Gears/Shafts/Coupling**  
**Skill: Identifying worn belts/glazing**

### Tools and Parts Required:

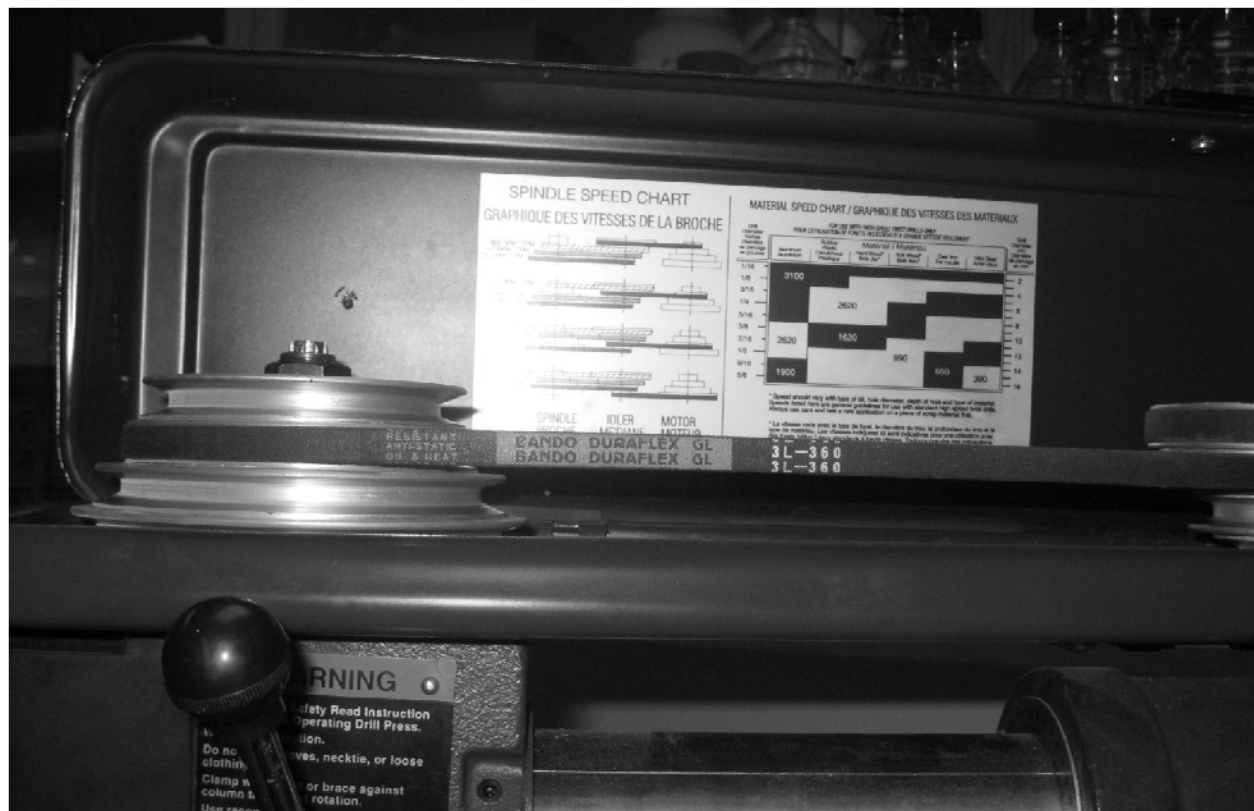
- 1) Motor belts for observation
- 2) Philips screwdriver
- 3) Gloves

## Introduction

A belt is a loop made of flexible and durable material. A belt may be used to mechanically link rotating motor shafts. Belts need to be maintained for the motor to work effectively. Constant use may damage the belt. A damaged belt will become worn or cracked. Constant use may also make the belt smooth or shiny. A smooth or shiny belt is called glazed. A glazed belt will not be able to provide adequate traction for the rotation of the connected shafts. A worn, cracked or glazed belt needs to be identified and replaced. Belt damage may be caused by high belt tension, excessive slippage, age, contamination, excess heat and motor vibration.

### Example

Below is a picture of a belt used in a drill press system



## **Identification and Diagnosis**

The first sign of belt damage is a change in the sound or speed of the running motor. A damaged belt may display a squeaking noise. Never inspect a belt with the motor running. Always turn the motor off and wait until the belt is motionless. Inspect all along the length of the belt. Use a screwdriver to lift the belt and inspect the underside. Press on the belt to check changes in tension. A taut belt will deflect less than a loose belt. Change in tension indicates the state of the belt.

## **Procedure**

Inspect the belt for the presence of the following conditions:

### ***Cracks***

Cracks in a belt indicate damage. A cracked belt will eventually fail.

### ***Oil-soaked***

Prolonged or excessive contact with petroleum-based lubricants will cause the belt to lose traction. An oil-soaked belt will easily slip and should be replaced. A slipping belt may reduce the speed of rotation of the components attached to the belt. Before installing a replacement belt, identify and repair the source of oil-contamination.

### ***Glazing***

Glazing is caused by friction. Friction may result from excessive contact with the shaft surface. Glazing may also be due to improper installation of the belt. A loose belt will slip easily. A slipping belt causes polishing. Polishing the belt results in glazing. If glazing is due to a loose belt, replacement may not be necessary. Tightening the belt may be sufficient. Slipping of the belt will accelerate cracking. Belts also become glazed with age and use. A worn and glazed belt should be replaced. To differentiate between glazing caused by wear and glazing caused by looseness, look at the condition of the belt. A worn belt will show other signs of wear like fraying and cracks. Check the tension of a belt that is glazing.

### ***Torn***

Belts may be torn or split due to wear. Torn or split belts need to be replaced immediately.

### ***Non-uniform thickness***

A worn-out belt may also show non-uniform thickness. Change in thickness along the length of the belt is caused by stretching and wear.

**Exercise**

In this exercise, you will practice differentiating between worn and usable belts. Your instructor will provide you with an assortment of belts. Examine the belt for wear and damage. Determine the type of damage. Would you replace the belt? Would you tighten the belt?

Your instructor must verify your work before you continue.

**Preventative Maintenance and Calibration**

Regular inspection of all belts is necessary to keep motors running efficiently. Belts must be tightened or replaced as required. Regular inspection will keep all devices associated with motor drives in optimal working condition.

Always calibrate every medical device before returning it to use.