

## **Knowledge Domain: Mechanical**

### **Unit: Lubrication**

### **Skill: Greasing / Oiling**

#### **Tools and Parts Required:**

- 1) Penetrating Oil
- 2) Silicone Spray
- 3) Motor Oil
- 4) Bicycle or Car Grease
- 5) Grease gun
- 6) Items to lubricate (e.g. hinges, windows, gears)
- 7) Flathead screwdriver (optional)
- 8) Hammer (optional)
- 9) Pliers (optional)

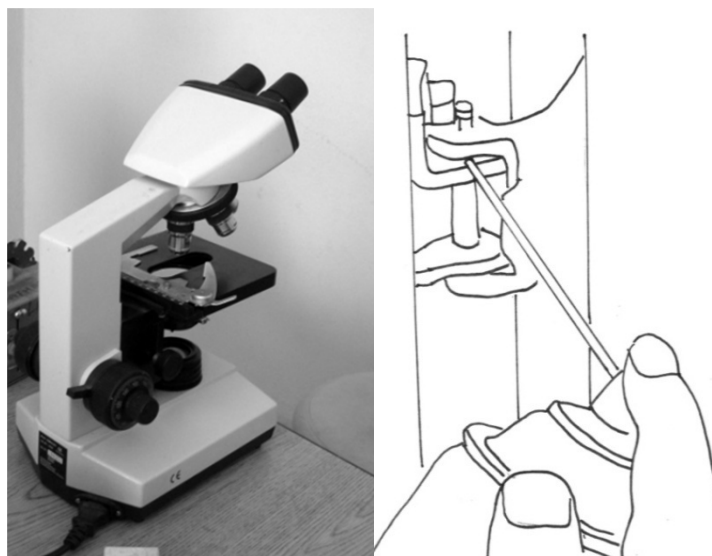
#### **Introduction**

Lubrication is an important part of preventative maintenance. Machines often have moving surfaces. A lubricant reduces the friction between two moving surfaces. In addition, lubricants can perform the following functions:

- Transfer heat
- Carry away contaminants & debris
- Transmit power
- Protect against wear
- Prevent corrosion
- Seal for gases
- Stop the risk of smoke and fire

#### **Example**

Below are examples of items you may need to lubricate. Microscopes (left) have moving surfaces that need to be lubricated annually. Hinges (right) that are squeaky or tight need to be lubricated.



## Identification and Diagnosis

In your hospital, you may need to lubricate doors, wheel bearings, sliding doors, and rotating objects like fans or x-ray machines. Lubrication is needed when movement is difficult or when movement creates a mechanical noise.

There are two main types of lubricants, oil and grease.

	Oil	Grease
Properties	<ul style="list-style-type: none"><li>• Liquid (thinner than grease)</li><li>• Easier to control amount of lubricant</li><li>• Many ways to deliver oil (drip, wick, dunk, spray)</li><li>• Carries away moisture and particulate matter.</li></ul>	<ul style="list-style-type: none"><li>• Semisolid (thicker than oil)</li><li>• Clings to surfaces</li><li>• Low lubricant loss.</li><li>• Long lasting and requires less frequent relubrication.</li><li>• Can seal a joint</li></ul>
When to use	<ul style="list-style-type: none"><li>• Circulating systems</li><li>• Rapidly moving systems</li><li>• Difficult to access parts or surfaces</li></ul>	<ul style="list-style-type: none"><li>• When oil will not stay in position.</li><li>• When the joint cannot be lubricated frequently.</li></ul>

Additional information can be found at:

[http://www.kamandirect.com/resources/2010/downloads/timken\\_lubrication\\_guide.pdf](http://www.kamandirect.com/resources/2010/downloads/timken_lubrication_guide.pdf)

## Procedure

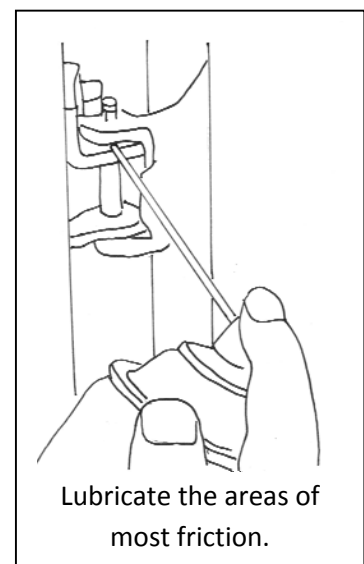
### Tips and Cautions

- Grease and oil are sticky and can stain clothing. Wear gloves to keep your hands clean.
- Cover your work area with old newspapers
- Do not over lubricate.
- Do not use water to lubricate. Water can cause rusting!

### How to Lubricate Hinges

*Use:* penetrating oil, silicone spray, plumber's grease, motor oil

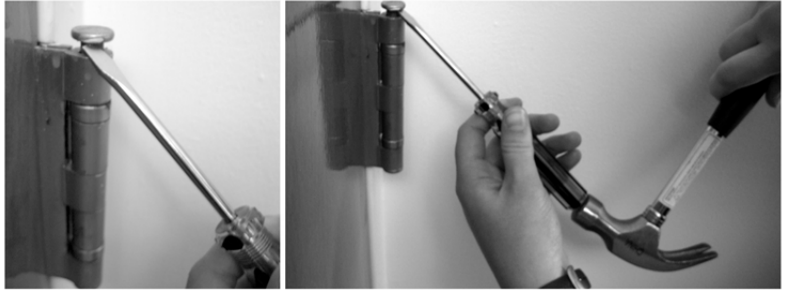
1. If the hinge is dirty, clean the hinge using a damp rag.
2. Identify which surfaces experience the most friction. Apply lubricant to these surfaces.
3. If the hinge is squeaky or stiff, remove the pin from the hinge.
  - If you cannot remove the pin with your hands, use a screw driver to push the pin out. Use a hammer if



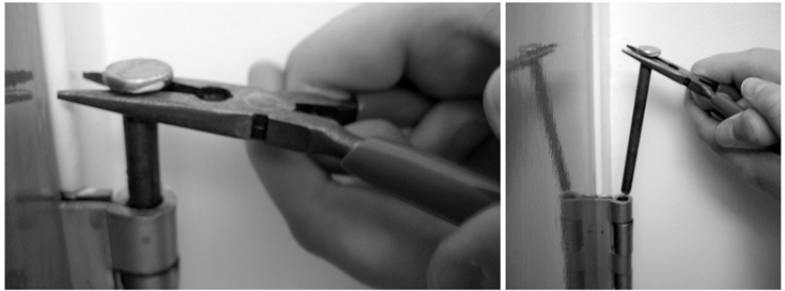
necessary. You can also use pliers to pull on the pin.

- Lubricate the pin and the inside of the hinge.
  - Reinsert the tip of the pin into the hinge and tap it back into place gently with the hammer.
  - Note: Not all hinges will have removable pins
4. Swing the door open and closed to spread the lubricant.
  5. Wipe the excess lubricant from the outside of the hinge.
  6. Repeat with other hinges as necessary.

Step 3: Removing the Pin



Use a flathead screwdriver (and a hammer) to push the pin out



Use pliers to pull the pin out.

### **How to Lubricate a Sliding Door/Window**

*Use:* lubricating grease or silicone spray, bicycle or car grease

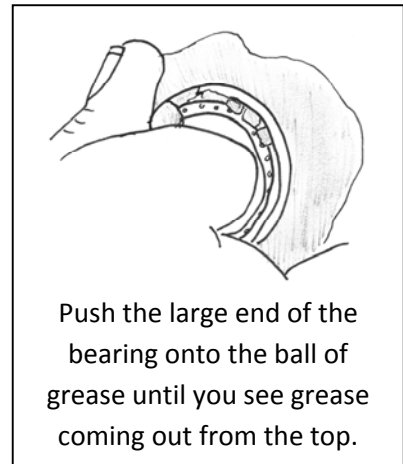
1. Open the door all the way. Using a flathead screwdriver, scrape the grime in the door track. Remove all loosened dirt and grime from the door track.
2. Lubricate the door track with the lubricating grease. Apply small amount of grease with the applicator or your fingers.
3. Open and close the sliding door repeatedly. This distributes the grease. Do this process for at least two minutes.

### **How to Lubricate Wheel Bearings**

*Use:* grease

1. Carefully remove the bearing from the wheel. Clean the bearing with ethanol or isopropanol to remove old grease. Let the parts dry completely.
2. Inspect the bearing for bends, chips, cracks, rust and worn spots and replace with a new bearing if necessary.
3. Put a small amount of high temperature wheel-bearing grease on the palm of your hand. The grease ball should be approximately 4-5 cm in diameter.

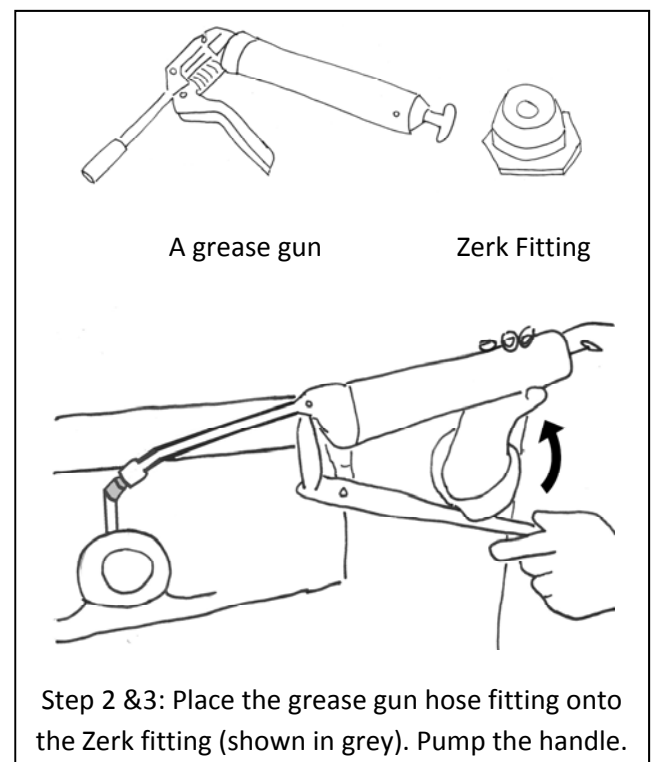
4. Pick up the wheel bearing with your other hand, the larger end of the wheel bearing faces down.
5. Push the large end of the wheel bearing onto the ball of grease with a slow sweeping motion. That forces the grease into the bearing cage. Repeat the process until you see grease coming out through the top of the bearing cage.
6. Rotate the bearing and repeat the sweeping motion until all of the rollers inside the bearing cage are covered in grease and you can see grease coming out around the top of the bearing cage.
7. Apply a coat of grease all the way around the outside of the wheel bearing as well.
8. Apply a coat of wheel bearing grease to the bearing housing before installing it.



### How to Lubricate Bearings, Gears, and Axels with Zerk Fittings

*Use:* Grease in a grease gun

1. Pump the grease gun handle a few times. Grease should flow from the end fitting. If grease does not begin to flow, push the T handle farther into the grease gun. This allows excess air to escape.
2. Clean the grease fitting with a clean rag.
3. Place the grease gun hose fitting onto the Zerk fitting where you want lubrication.
4. Pump the handle on the grease gun until grease is coming out.



### Exercise

Your instructor will give you an item to lubricate. Identify which lubricant you will use and lubricate the appropriate parts. Your instructor must verify your work before you continue.

### Preventative Maintenance and Calibration

Always calibrate every medical device before returning it to use.