Name: _____ Date: _____ Team: _____

Q.A. Lab Experiment # 10

Grid Alignment Check

Purpose

To test the alignment of the radiographic grid with respect to the central ray of the x-ray tube.

Learning Objectives

After completing this lab, you should be able to:

1. Use the laboratory equipment properly.
2. Set up the control console and ceiling tube mount correctly.
3. Function effectively in group work.
4. Perform the experiment independently.

Materials Needed

1. Grid alignment tool

2. 10 × 12 inch image receptor (CR)

Pre-Lab Discussion

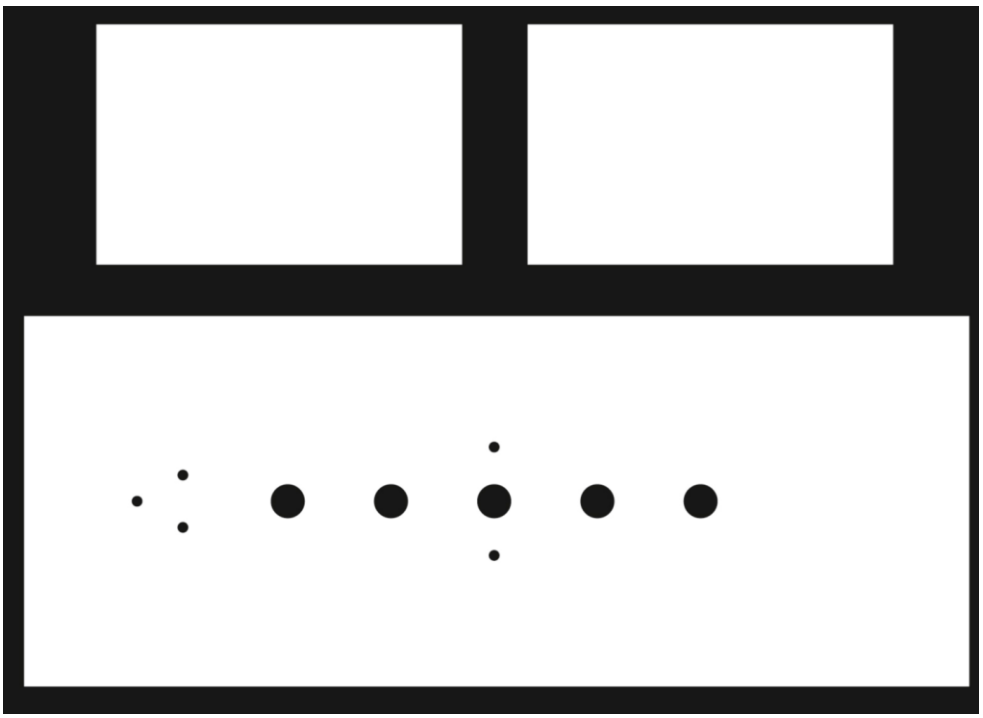
Grids

Grids that are misaligned attenuate more of the primary x-ray beam, and this attenuation results in a loss of image quality and greater patient dosing. Proper alignment refers to centering the x-ray field with the focused grid and maintaining the proper grid focusing distance. Grid focusing distance is the proper distance from the x-ray source that a focused grid can be used, because the angle of the lead strips in the grid and the angle of divergence of the x-ray photons being emitted match at a specific range of distance values only. Alignment is more critical with greater grid

ratios such as 10:1, 12:1, and 16:1, because grid latitude is less. Grid latitude is the margin of error in centering the x-ray beam on the center of the grid before significant grid cutoff appears in the resulting image. The alignment must be within the grid latitude specified by the manufacturer (usually within 1 inch). The grid latitude value is found either on the grid front or in the literature supplied by the manufacturer. A commercial grid alignment tool is available (Figure below) and should be used according to the manufacturer's specification

Figure 1

Grid Alignment Tool



PROCEDURE

1. Position the test tool on top of the table so its long dimension is perpendicular to the grid lines.

2. Center the middle hole of the tool in the optical crosshairs of the collimator light field.

3. Make an exposure at 60 kVp, 4 mAs, and 40-inch SID.

4. Process the image receptor (CR) and measure the brightness of each hole.

ANALYSIS

1. Did the middle hole display the lowest brightness? (If yes, the grid is properly aligned within ±0.5 inches.)

2. Was the brightness falloff pattern symmetric?

3. What effect can a misaligned grid have on radiographic image quality?

Grid Alignment Quality Control Form

Room:_____ Unit:_____ Grid tested:_____

Grid ratio:_____ Line no.:_____ Focal distance:_____

SID:_____ kVp:_____ mA:_____ Time:_____

Date	Measured brightness					Comments	Checker's initials
	Reference Location (Three small marking holes toward the front of the table)						
	2	1	0 Center	1	2		