REPLACEMENT OF A PICTURE TUBE

WARNING: CRT HANDLING

The picture tube encloses a high vacuum and care must be taken not to bump or to scratch the picture tube as this may cause the tube to implode resulting in personal injury and property damage. Shatterproof goggles must always be worn by individuals while handling the CRT or installing it in the projector.
Do not handle the CRT by the neck.

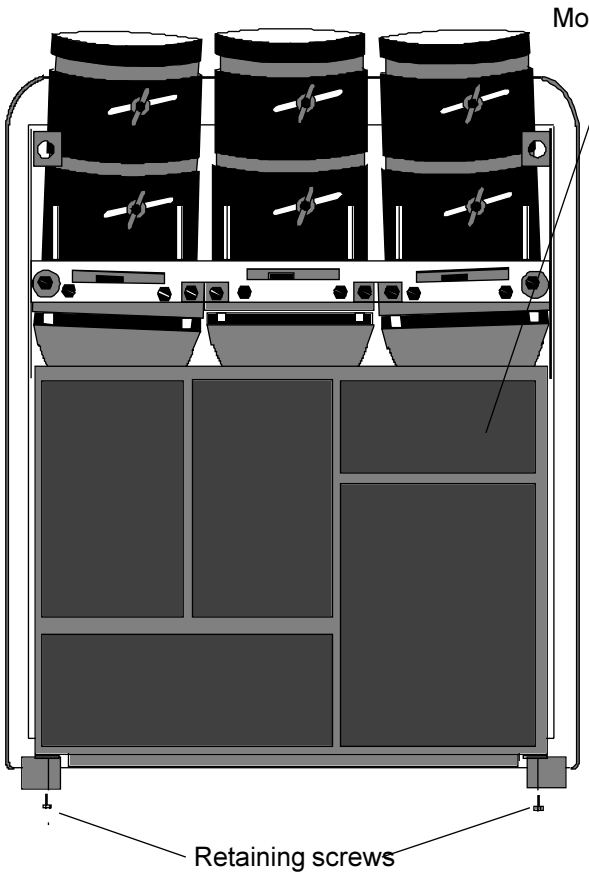
WARNING

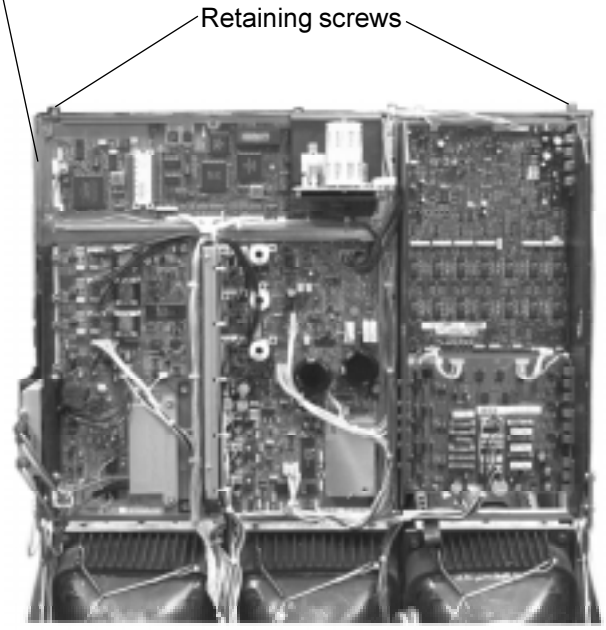
TURN OFF THE PROJECTOR AND UNPLUG THE POWER CORD BEFORE PROCEEDING TO THE REPLACEMENT OF A PICTURE TUBE

I. Removing and disassembling the defective picture tube.

Getting Access to the picture tube

1. Remove the top cover of the projector (please refer to the projector installation manual).
2. Loosen the two locking screws of the module frame.
3. Open the module frame by pivoting it towards the front of projector.





Electrical disconnection

4. EHT lead disconnection

Pull out the EHT lead of the defective picture tube from the EHT splitter.

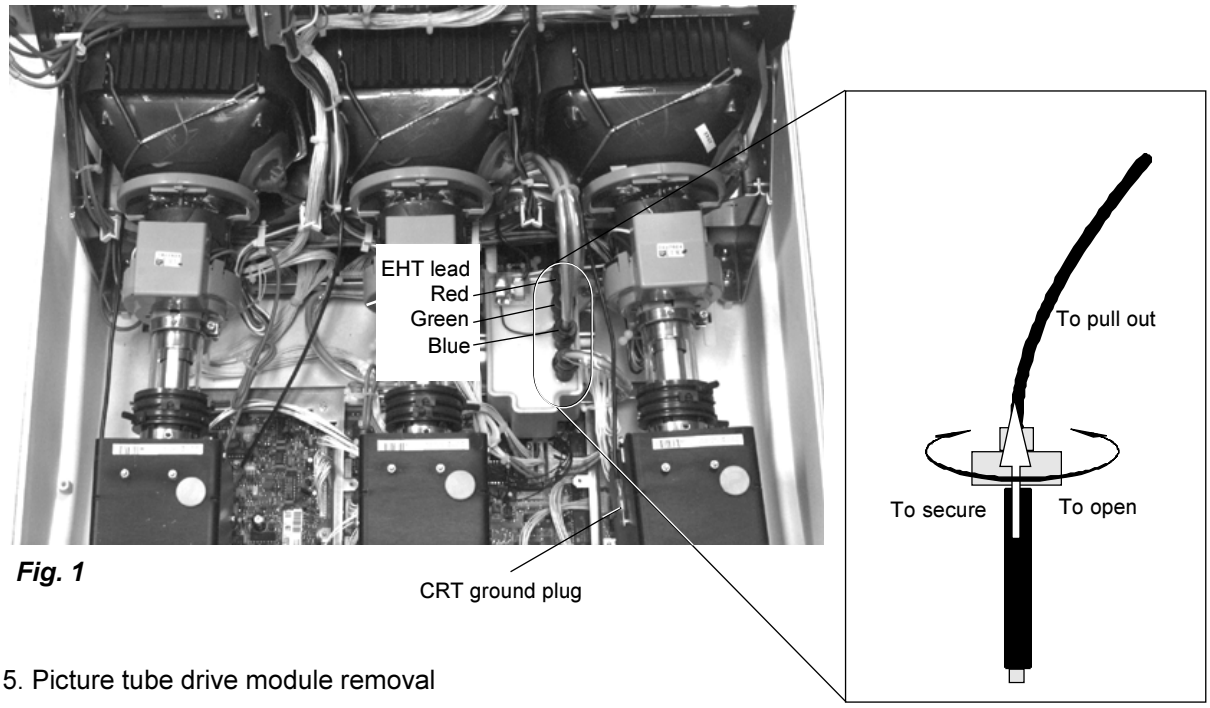


Fig. 1

5. Picture tube drive module removal

Cut the cable-tie indicated with A on the picture below, loosen it and remove it.

Disconnect the CRT ground plug (indicated with B) of the defective picture tube.

Loosen the gear clamp of the Picture tube drive module (indicated with C).

Carefully pull the module (indicated with D) back to slide the CRT socket off from the end of the CRT.

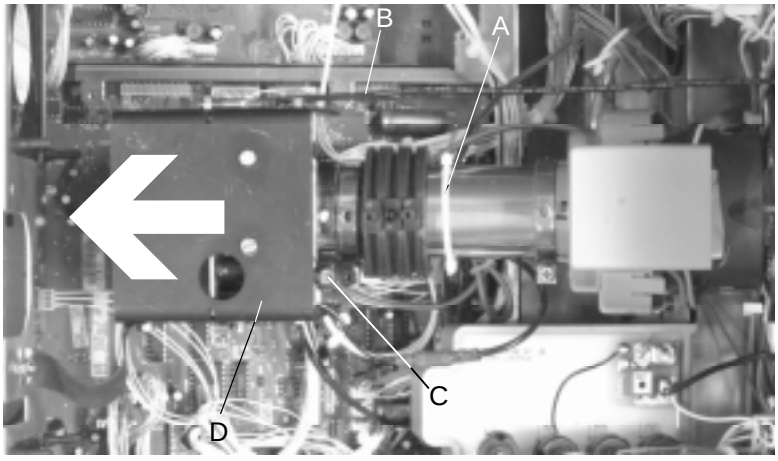
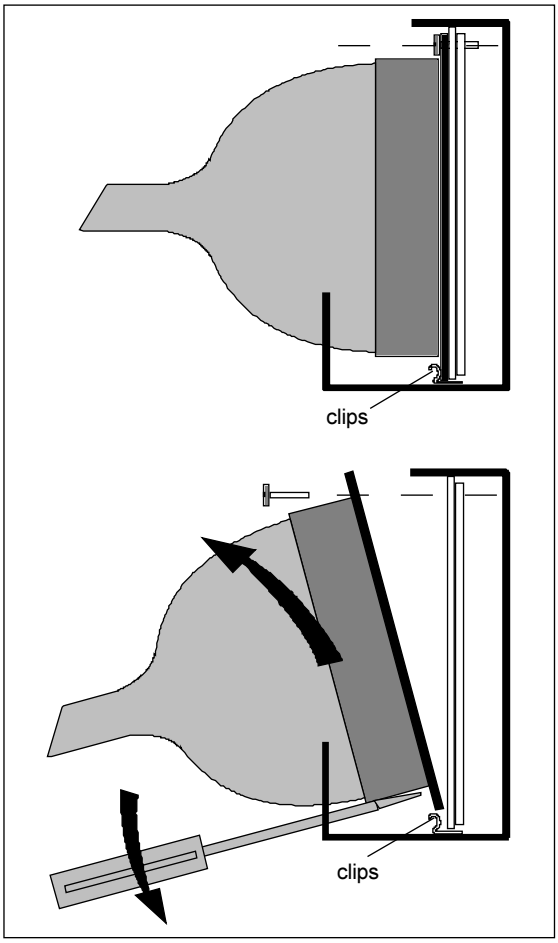


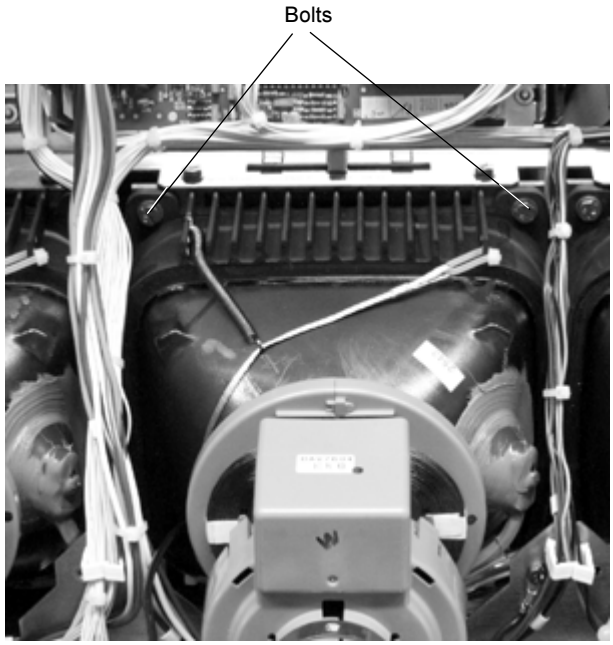
Fig. 2

CRT unit removal

6. Remove the two bolts, holding the CRT unit to the CRT main frame.

   Pull upwards the CRT unit while using a screw driver to push the CRT out of the clips at the bottom, to remove the CRT unit.





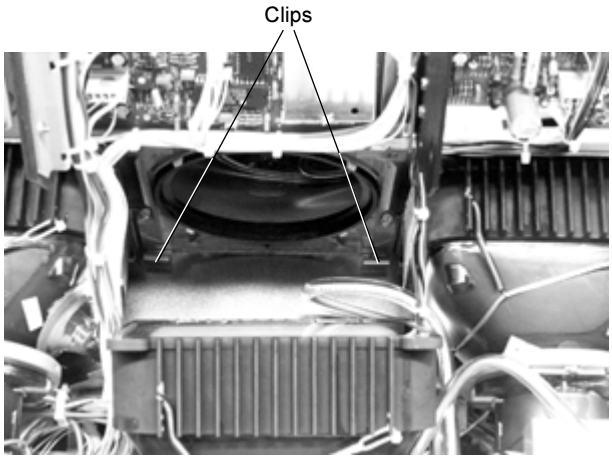


Fig. 3

Removing the deflection unit and the stigmator magnets

- Loosen the gear clamp of the stigmator magnets unit.
- Loosen the gear clamp of the deflection unit.
- Slide the stigmator off from the end of the CRT.
- Remove the mu-metal
- Slide the deflection unit off from the end of the CRT.

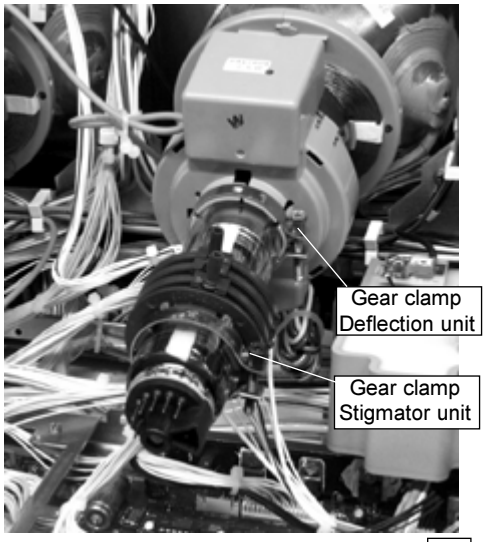
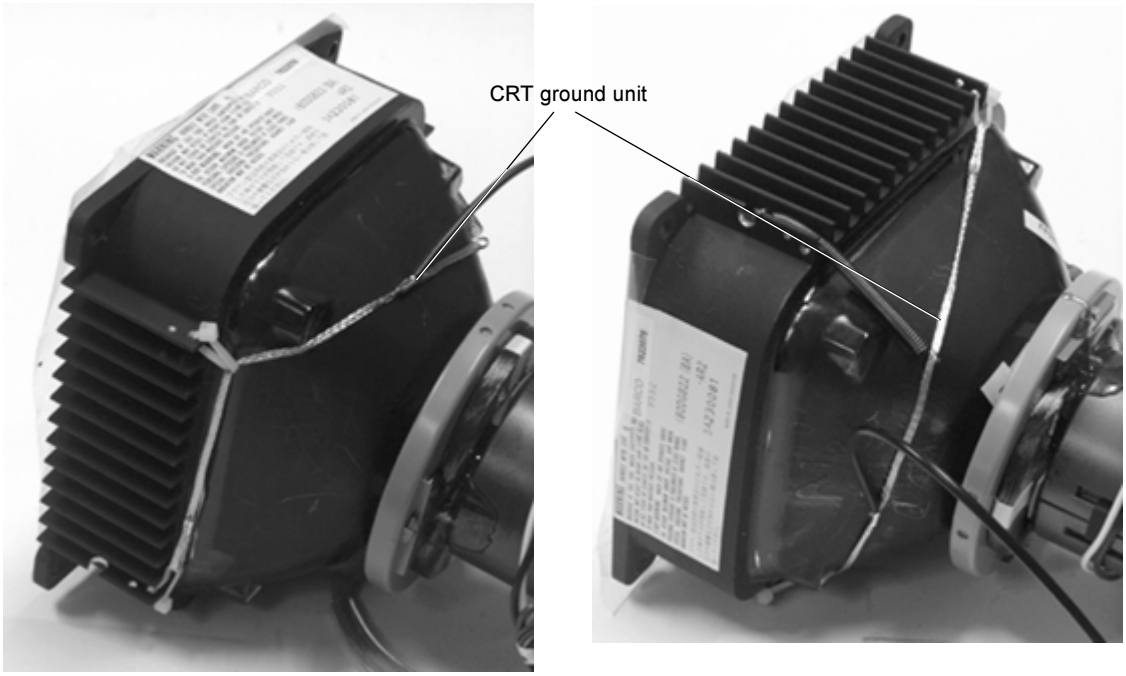


Fig. 4

II. Placement of the new picture tube.

1. Remove the CRT ground unit from the defective picture tube and reinstall it on the new picture tube.



2. Reinstall the two units, stigmator and deflection yoke, on the picture tube neck.

3. Re-install the mu-metal by wrapping it around the neck of the picture tube, then sliding one side a little under the clamping gear of the deflection unit and the other side under the clamping gear of the stigmator. Fix it with a cable-tie. Be sure to also fix the discharging wire as indicated.

4. Secure the respective gear clamps (see Fig. 4) of the stigmator and deflection unit.

5. Place the picture tube unit correctly on its two clips and push it downwards to fit. Secure the position with the two bolts (see Fig. 3).

6. Plug in the EHT lead of the installed picture tube on the EHT splitter and lock the connector (see Fig. 1).

7. Push the CRT Socket module on the picture tube (see Fig. 2).

8. Secure the gear clamp of the Picture tube drive module.

9. Reconnect the CRT ground plug.

III. Picture tube alignment

Introduction

Before starting the alignment of the new picture tube, the projector must warm up for at least 15 minutes at a medium brightness and contrast.

If a set of three tubes must be replaced, it is advisable to start with the replacement of the red and blue tubes first, and using the green as the reference.

Proceed then with the replacement of the green tube, using now one of the other colors tubes as the reference.

A. Replacement of a complete set of three tubes

Apply an external crosshatch pattern at 15 kHz or use the internal crosshatch.

Align the optical and electrical focus of the tube.

Rotate the deflection yoke until the horizontal lines of the crosshatch are levelled on the screen.

Tighten now carefully the screw of the gear clamp of the deflection yoke.

Center the picture on the CRT faceplate (refer to explanation 'Raster centering').

Note: alignment of the stigmators will change again its position, if so, realign raster centering.

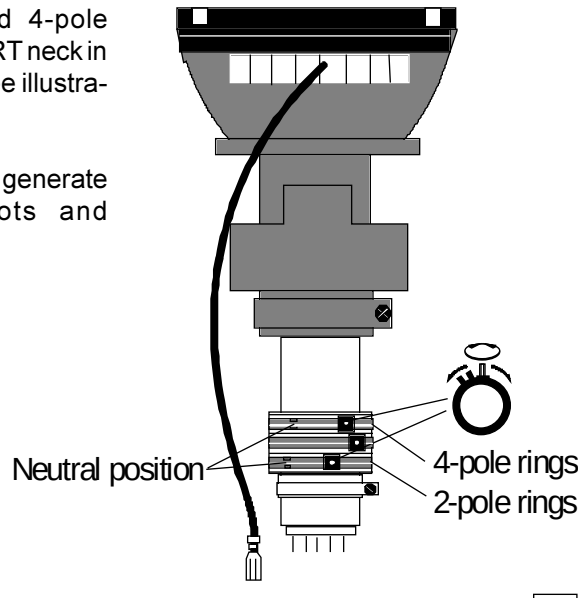
B. Replacement of one or two tubes

In such case, the remaining tube can be used as the reference for centering and positioning of the new tubes.

C. Adjustments applicable to the three tubes

Preparation

- Proceed to quick optical lens focusing (please refer to the projector installation manual).
- Adjust the 2-pole and 4-pole magnetic rings on the CRT neck in their neutral position (see illustration on next page).
- Select a source that will generate a field of small dots and crosshairs.



Adjustment of the stigmators (4-pole magnet ring closest to the deflection yoke)

- Lower the brightness and increase the contrast.

- Overdrive the midpoint focus by adjusting the lens focusing for the respective CRT.

- Adjust the four pole rings until the defocused dots are circular.

- Realign the electrical and optical focus.

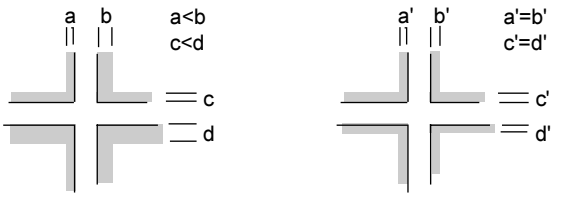
- Reposition the raster as described earlier.

- Due to mutual influence between the stigmators, focus and centering, it is advised to repeat above a couple of times.

Adjustment of the 2-pole magnets (the rings closest to the CRT socket)

- Underdrive the electronic focus by adjusting the left arrow key of the RCU for the respective CRT.

- Adjust the 2-pole magnets rings by rotating one or both up to a point where the 'shading' of both sides of the vertical and horizontal lines is equal (see figure).



- Realign the electrical and optical focus.

- Repeat the alignment of the stigmators if necessary, as both adjustments (stigmator and 2-pole magnets) influence each other.

Re-alignment of the image width coil(s)

- Decrease the contrast and increase the brightness to reveal the background raster.

- Refer to sheet 'Deflection module R762447' in this manual for the alignment of the image width coils.

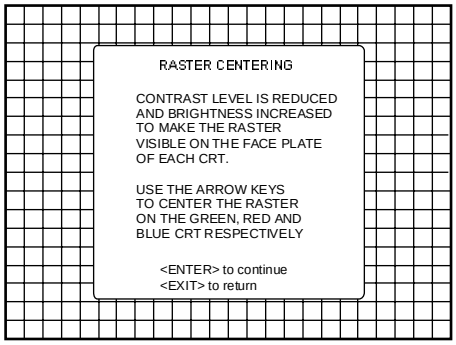
Note:

When only one tube has been replaced, you can use the image width of one of the other tubes as a reference, and obviously limit the adjustment to the core of the corresponding replaced tube.

D. Raster centering

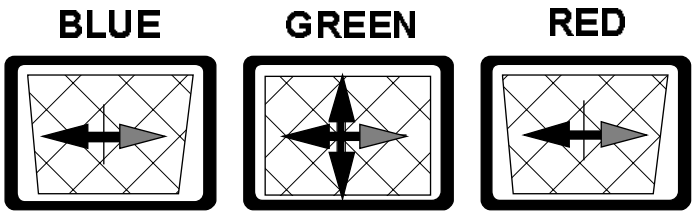
The raster must be centered on the CRT screen surface of each tube, therefore, it is necessary to look into the lenses.

Raster centering controls (please refer to the projector installation manual).



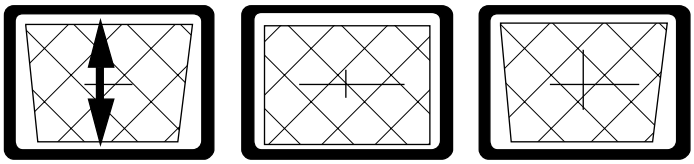
Picture movement when adjusting the arrow keys to center the **GREEN RASTER**

NOTICE: the RED and Blue raster are tracked with the GREEN raster horizontally.



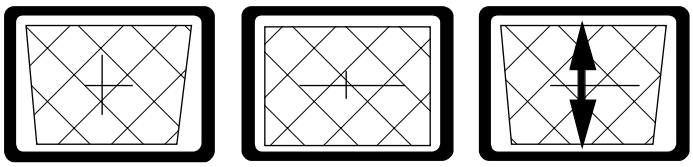
To center the **RED raster VERTICALLY**, press **"ENTER"**

Center the raster vertically, using the arrow keys of the RCU 'up' and 'down'



To center the **BLUE raster VERTICALLY**, press **"ENTER"**

Center the raster vertically, using the arrow keys of the RCU 'up' and 'down'



Additional HORIZONTAL corrections for the RED and BLUE raster after picture tube replacement only.
(Two multiturn potentiometers are provided on the module 'Focusing+Shift")