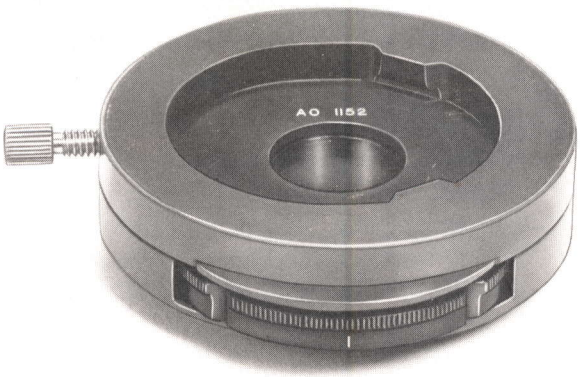
REFERENCE MANUAL

1152 AND 1991 ANALYZER TURRET And 1153 POLARIZER/FULL WAVE PLATE

Installation And Operation On Series Ten, One-Ten, One Twenty and Four-Ten MICROSTAR® Microscopes, DIASTAR SERIES Microscopes

I. INTRODUCTION

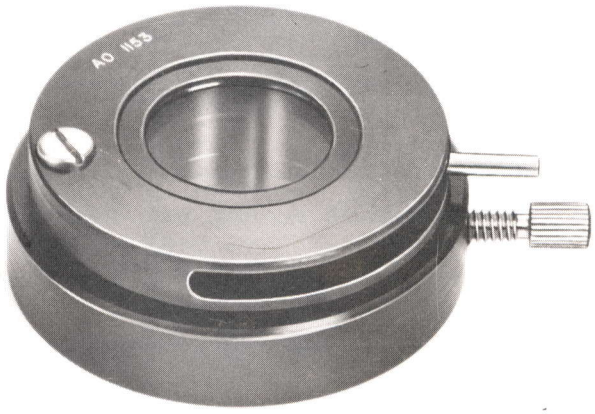
The addition of an 1152 or 1991 Analyzer Turret and 1153 Polarizer/Full Wave Plate to your 110, 120, 410 or DIASTAR microscope enables quick yet accurate differentiation of Gout/Pseudo Gout. Components and installation are slightly different on the Series 10 Microscope. Procedure using the 110/120/410/ DIASTAR is described first; a section covering the Series 10 follows.



No. 1152 ANALYZER

II. INSTALLATION

Installation of the 1152 or 1991 Analyzer Turret and the 1153 Polarizer/Full Wave Plate is a simple, straightforward operation. Care should be taken, however, to ensure proper alignment of the parts relative to one another and the microscope stage. Filters and accessories such as Vertical Fluorescent Illuminators, Aperture Viewers or Dual Viewing Attachments should be removed from the microscope prior to installing the Analyzer Turret.



No. 1153 POLARIZER

A. 1152 or 1991 Analyzer Turret

1. Remove Body and place Turret on stand as shown in Figure 1.
2. Orient turret so that Filter Wheel faces front of microscope (Figure 1). Tighten Arm Locking Screw.
3. Mount Body on turret with eyetubes facing front of microscope. Tighten Locking-Screw.

B. 1153 Polarizer/Full Wave Plate

1. Raise Condenser to upper stop position. If auxiliary condenser is attached, rotate it out of light path.
2. Place 1153 Polarizer on Illuminator Window Assembly (Figure 1).
3. Orient analyzer assembly approximately as shown in Figure 2. (Final positioning is described as follows.)

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C. Orienting 1153 Polarizer/Full Wave Plate

1. Rotate Filter Wheel to "1" position.
2. Rotate Full Wave Plate out of light path (dotted line in Figure 2).
3. Turn on illuminator.
4. Field should be nearly (or totally) black.
5. **Rotate 1153 until maximum extinction (blackest field) is achieved. This should require only slight movement in one direction or another. If not, double check original mounting position of 1153 (Figure 2).**
6. Tighten Locking-Screw.

III. OPERATION

A. Brightfield

For brightfield viewing, turn Analyzer Turret to "0" position. Cat. No. 1153 Polarizer can be left in position, but be sure Full Wave Plate is swung out of light path.

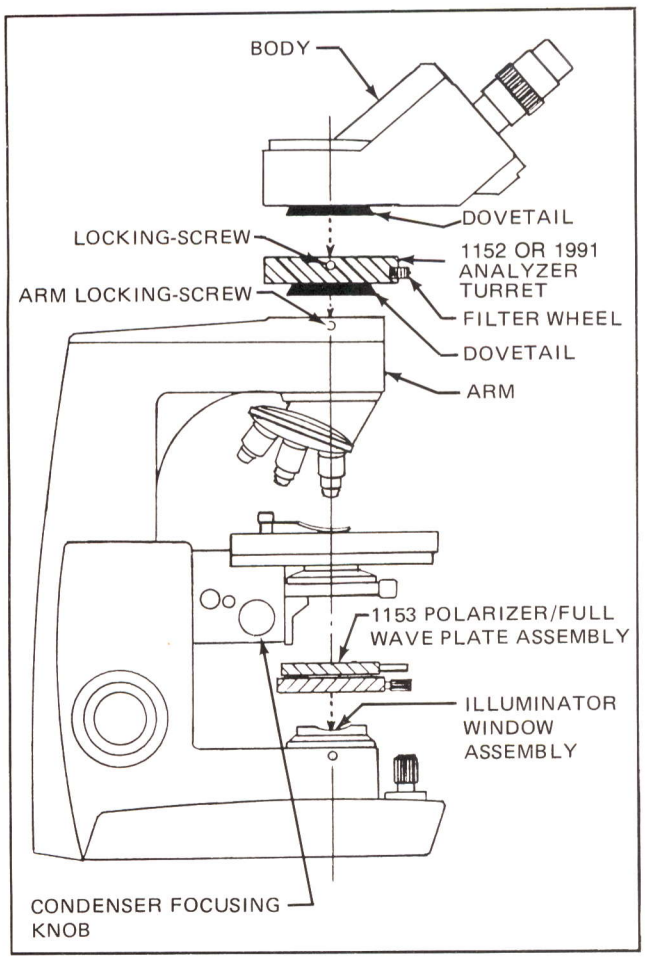

Figure 1.

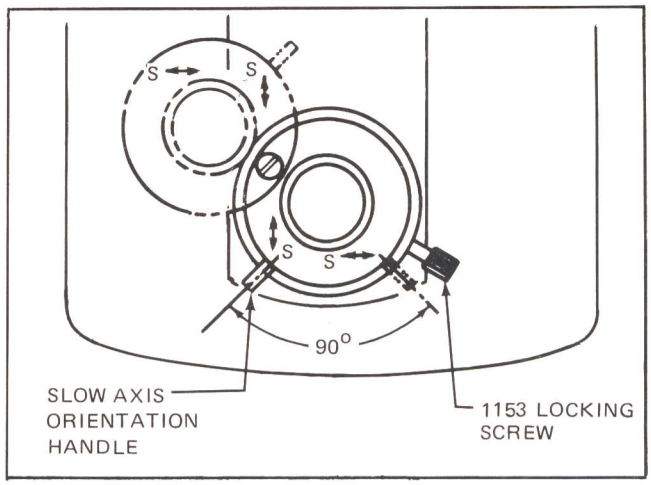

Figure 2.

B. Normal Polarization

Once Polarizer is correctly oriented (Section II, C), the microscope is set up for polarized light. Merely swing Full Wave Plate out of light path and set Analyzer Turret to "1" position.

C. Differentiation of Gout/Pseudo Gout

The following section explains the basic procedure for Gout/Pseudo Gout differentiation. Basically, this test is made possible due to the negative birefringence of urates and positive birefringence of pyrophosphates. If you would like additional information on theory, please consult the reference listed at the bottom of page 3.

Both Gout (Monosodium Urate) and Pseudo Gout (Calcium Pyrophosphate) crystals tend to be needle shaped. However, many crystals may be broken and/or irregular. To do the test, it is necessary to find at least one intact crystal oriented North-South (i.e., vertically) and one East-West (horizontally) in the field of view. Use of 40X objective is recommended.

Following is the procedure for identification of Gout. **To insure the test is being done correctly, a slide of known Monosodium Urate crystals should be used initially.**

1. Swing Full Wave Plate out of light path.
2. Place slide on stage and bring crystals into sharp focus. The needle shaped crystals will appear white regardless of orientation.
3. Swing in Full Wave Plate and put Orientation Handle in extreme left position. Crystals with long dimension in the N-S direction should appear yellow, those E-W blue.
4. Move Orientation Handle to extreme right position. Now N-S crystals should be blue, E-W yellow. (See Figure 3.)

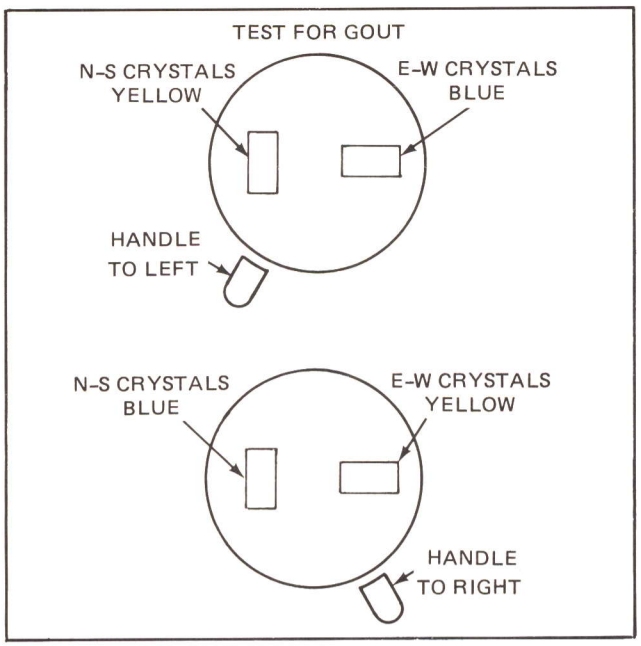

Figure 3.

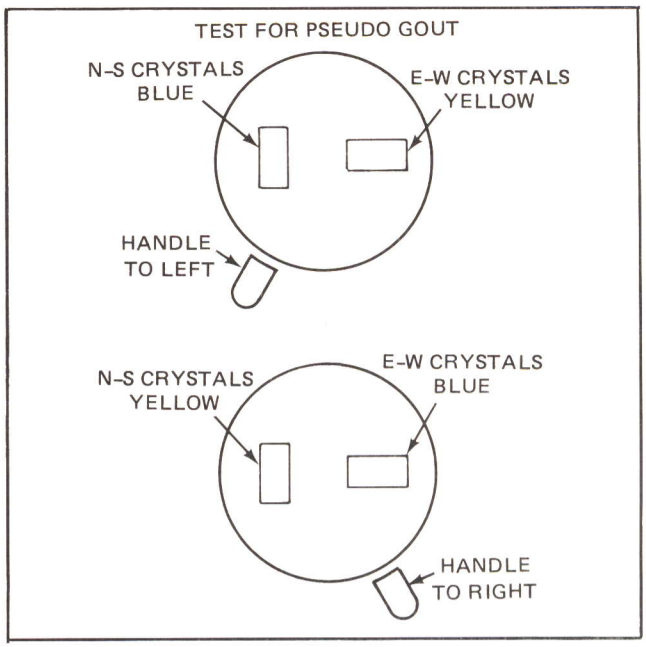

Figure 4.

Be sure to test crystals with Orientation Handle in each position to insure positive identification.

The test for Pseudo Gout is done identically to that described above. However, the color change is opposite that in Gout. That is, with the handle at the left extreme, N-S crystals are blue, E-W yellow, and vice versa with the lever at the right side. (See Figure 4.)

IV. INSTALLATION OF 1114 ANALYZER TURRET AND 1153 POLARIZER/FULL WAVE PLATE WITH ADAPTER ON SERIES 10 MICROSCOPES

A. Installing and Aligning the 1114 Analyzer Turret

1. Position the 1114 Analyzer Turret so that the Filter Wheel faces left or right (90° from front of scope) and lock by tightening screw.

2. Mount the Body on the 1114 Analyzer Turret with the eyepieces facing front and lock it in place by tightening the Locking-Screw.

B. Installing the 1153 Polarizer/Full Wave Plate and Adapter

The 1153 Polarizer/Full Wave Plate and Adapter 1153A are mounted on the Illuminator Window Assembly Mounting Flange as shown in Figure 5. (Orient as per Figure 2.) Rotate 1114 Filter Wheel to "1" position. Proceed with installation instructions Section II, C, Steps 2 — 6.

C. Follow Section III. on Operation.

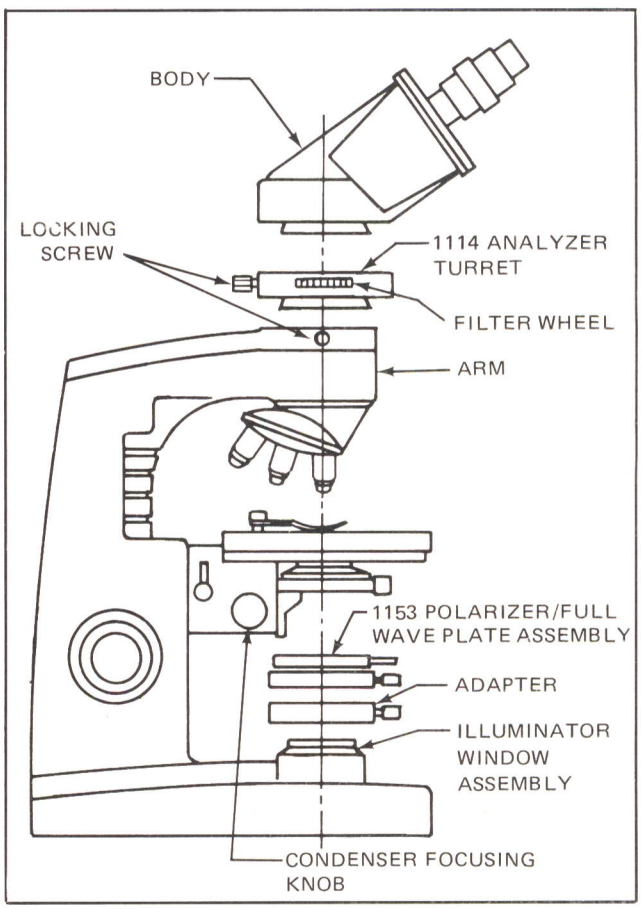

Figure 5.

Reference: P. Phelps, A.D. Steel, and D.J. McCarty, Jr., "Compensated Polarized Light Microscopy: Identification of Crystals in Synovial Fluids from Gout and Pseudogout," JAMA, 203, No. 7 (1968), 166-70.

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