

Complete Teardown, Cleaning, and Reassembly of the Olympus BHSU/BHTU Reverse Nosepiece Assembly

Revision 3



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Introduction

The microscopes in the Olympus BH-2 line have largely been replaced in the professional and clinical world, due to their advancing age and the lack of repair parts from Olympus. A great many of these microscopes were produced in their day, and because of this they are readily available on the used market for very reasonable prices. Thanks to their excellent build quality and solid optical performance, these scopes are now very popular with hobbyists, providing an affordable, high-quality alternative to the Chinese-made scopes prevalent today.

One issue that might be encountered when purchasing either the BHSU or BHTU version of these microscopes is that the grease in the reverse nosepiece assembly may be dried and gummy, resulting in a stiff or gritty feel of the revolving nosepiece.

Another issue that may be encountered is with the mechanical detents in the revolving nosepiece. After many years of hard service, especially if the nosepiece assembly has not been periodically lubricated throughout its life, one or more of the detent stops may be worn to the point where the detents are sloppy, and the affected objectives do not maintain proper radial indexing. At best, this is annoying to the operator, and at worst can render the revolving nosepiece unusable.

This document describes the complete teardown, cleaning, lubrication, and reassembly of the reverse nosepiece assembly on a BHTU microscope stand. Completion of this maintenance procedure should restore the proper feel to the nosepiece turret. Additionally, this maintenance should reduce further wear of the mechanical detent stops. Note that if the detents stops are already excessively worn, there is no repair for this other than the replacement of the revolving turret.

Scope of this Document

The procedures detailed in this document apply to the reverse nosepiece assembly used on the Olympus BHSU and BHTU microscope stands.

Note that the original Olympus service literature did not address the teardown and repair of the various revolving nosepiece assemblies used on BH-2 stands, as these were field-replaceable assemblies that were considered unserviceable by Olympus.

Tools Needed

The following tools will be needed to complete the teardown, cleaning, lubrication, and reassembly of the BHSU/BHTU reverse nosepiece assembly.

- Center punch or nailset tool

- Electric heat gun (item 1 of [Appendix 1](#))
- Lens-spanner tool (item 6 of [Appendix 1](#))
- Screwdriver set, JIS (item 2 of [Appendix 1](#))
- Soft-jaw pliers (item 5 of [Appendix 1](#))

A Few Words About JIS Screws

Screws with JIS heads are frequently found in much of the equipment designed and manufactured in Japan. JIS screws look very much like standard Phillips screws, but they differ in that JIS screws were designed to not cam-out under torque, whereas Phillips screws were designed to intentionally cam-out, as a means to limit the torque applied to the fasteners. Because of this crucial difference in the geometry of the two driver types, JIS screws will be damaged by standard Phillips drivers if too much torque is applied. JIS screws can usually be identified by the presence of a single dot, or by an “X”, stamped into one of the four quadrants of the cross-point depression (see [Figure 1](#)).

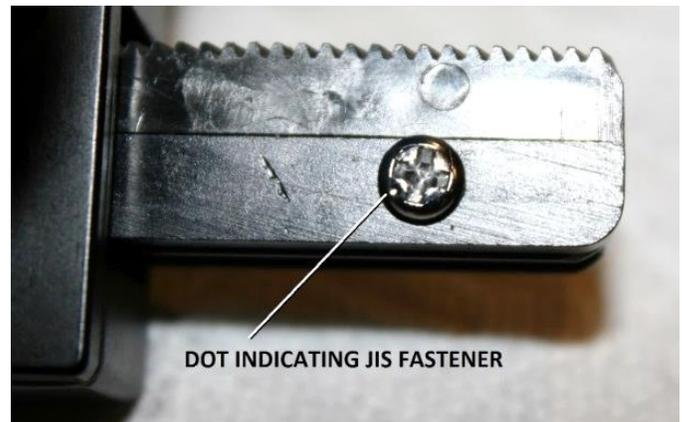


Figure 1 – A typical JIS screw

Supplies Needed

The following supplies will be needed to complete the teardown, cleaning, lubrication, and reassembly of the BHSU/BHTU reverse nosepiece assembly.

- Cleaning solvent (see recommendations below)
- Lubricant (see recommendations below)
- Silicone RTV adhesive, black (item 7 of [Appendix 1](#))

Recommended Lubricant Types

Plastilube® Brake Grease or Mobilgrease 28 (item 8 of [Appendix 1](#)) are recommended for use in the reverse nosepiece assembly. Both Plastilube® Brake Grease and Mobilgrease 28 are medium-consistency greases which will remain stable and serviceable for many years to come.

Recommended Solvents

Some type of cleaning solvent will be needed to remove the old grease from the various components of the BHSU/BHTU reverse nosepiece assembly. Solvents that can be used are acetone (commonly sold as fingernail

polish remover), diethyl ether, heptane, hexane, mineral spirits, turpentine, and xylene. Of the solvents listed, acetone fingernail polish remover is available in most grocery or department stores. Look for a fingernail polish remover that is labeled as 100% acetone. Mineral spirits will work well for Plastilube® Brake Grease.

Safety Considerations with Solvents

Regardless of whichever solvent is chosen, make sure that adequate ventilation is present during the cleaning process, and that any necessary personal protective equipment is utilized to minimize exposure. Consult the MSDS sheet before using any unfamiliar solvents. Many of the solvents listed above are flammable, and their vapors may represent an explosion hazard if mishandled. Whichever solvents are chosen, be sure to follow all manufacturer's instructions and safety precautions.

Solvent Compatibility with Parts and Finishes

Many solvents will damage the finish of painted surfaces (isopropyl alcohol or 409 Cleaner may be safely used to clean most painted surfaces) or will dissolve or damage plastic parts. Do not allow untested solvents to contact any plastic parts or any painted surfaces. Before using a solvent to clean plastic parts or painted surfaces, test a small amount of the solvent in an inconspicuous area (such as inside a plastic knob) to ensure compatibility with the plastic parts or painted surfaces. Never use xylene to clean nylon parts, as xylene dissolves nylon. Isopropyl alcohol and trichloroethylene will cause swelling of nylon due to solvent absorption. The list of solvents generally considered safe for nylon includes acetone, diethyl ether, heptane, mineral spirits, naphthalene, and turpentine.

Before Starting with the Overhaul

Before beginning the removal and teardown of the reverse nosepiece assembly, perform the following.

Remove the Objectives from the Nosepiece

Carefully remove all the objectives from the revolving nosepiece turret and store them someplace where they will be protected from physical damage, dust, and debris.

Label Parts for Identification and Reassembly

During the teardown of the reverse nosepiece assembly, be sure to bag and tag the various parts to prevent their loss and to facilitate their proper identification during reassembly.

The BHSU/BHTU Reverse Nosepiece Assembly

The reverse nosepiece assembly used on the BHSU and BHTU stands consists of a five-position turret assembly, a wedge mount, and an accompanying corrective-optics assembly. The turret assembly is the same one used on the BH2-5RE revolving modular nosepiece assembly for the BHS and BHT stands, but rather than utilizing a machined dovetail slide to mount the turret assembly onto the stand, the BHSU/BHTU version includes a wedge mount to secure the turret assembly onto the stand in reverse orientation, and a corrective-optics assembly to correct for the difference in tube length introduced with the incorporation of the wedge mount (see [Figure 2](#)).

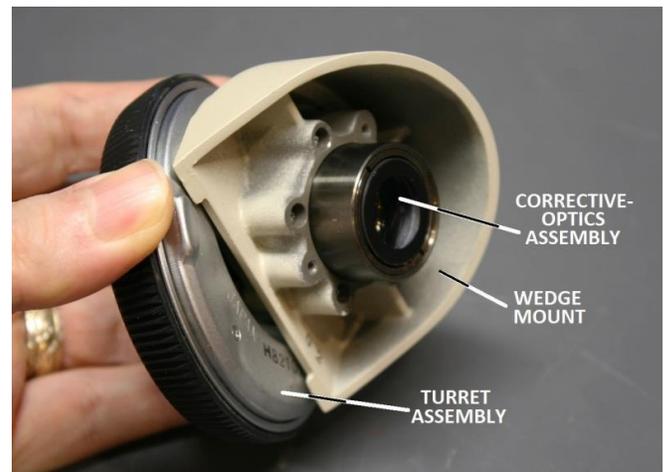


Figure 2 – The BHSU/BHTU reverse nosepiece assembly

Servicing the Reverse Nosepiece Assembly

The following sections detail the disassembly, cleaning, and reassembly of the BHSU/BHTU reverse nosepiece assembly.

Remove the Reverse Nosepiece Assembly

The reverse nosepiece assembly, which must be removed from the arm as a complete assembly, is secured to the top of the pillar arm by three M2.6X14 pan-head screws (see [Figure 3](#)).

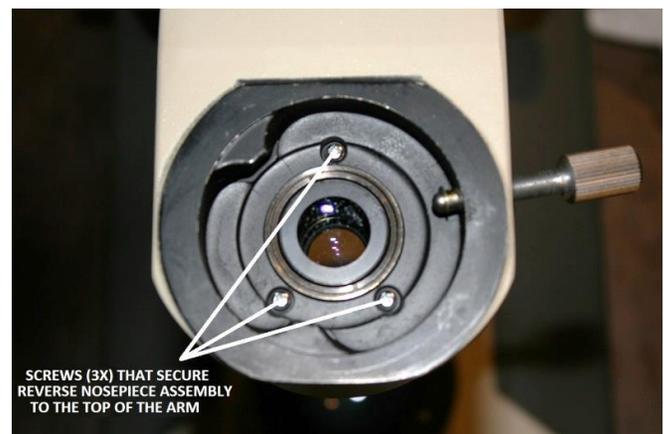


Figure 3 – Screws securing reverse nosepiece assembly

To remove the reverse nosepiece assembly, hold the reverse nosepiece assembly in place with one hand and use a suitable JIS screwdriver to remove the three M2.6X14 pan-head screws securing it to the microscope arm with the other hand (see [Figure 4](#)).



Figure 4 – Remove screws securing nosepiece assembly

Remove Corrective Optics and Wedge Mount

The wedge mount is attached to the stationary base of the turret assembly with four M2.6X25 pan-head screws, and by the corrective-optics assembly, whose threaded end passes through the center bore of the wedge mount and screws into the tapped center bore of the stationary base (see [Figure 5](#)).

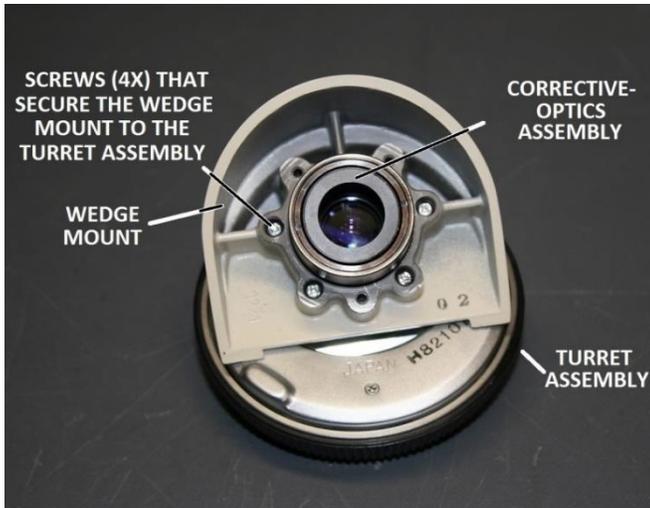


Figure 5 – Screws securing the wedge mount

Before attempting to loosen and remove the corrective-optics assembly, use a suitable JIS screwdriver to remove the four M2.6X25 pan-head screws securing the wedge mount to the stationary base of the turret assembly (see [Figure 6](#)). It is important to remove these four screws before attempting to remove the corrective-optics assembly, to prevent the barrel of the corrective-optics assembly from binding with the center bore in the wedge mount (due to the very close

tolerances involved) when the corrective-optics assembly is loosened and removed.



Figure 6 – Remove screws securing the wedge mount

Once the four M2.6X25 pan-head screws securing the wedge mount to the turret assembly have been removed, use non-marring pliers or a suitable strap wrench to grip the barrel of the corrective-optics assembly and loosen the corrective-optics assembly by rotating it counter-clockwise (see [Figure 7](#)).



Figure 7 – Loosen the corrective optics assembly

Unscrew and remove the corrective-optics assembly, which at this point is all that is holding the wedge mount onto the stationary base of the turret assembly (see [Figure 8](#)). Once the corrective-optics assembly has been removed, place it someplace where it will be protected from physical damage, dust, and debris.



Figure 8 – Remove the corrective-optics assembly

Now that the four M2.6X25 pan-head screws and the corrective-optics assembly have been removed, remove the loose wedge mount from the turret assembly (see [Figure 9](#)).



Figure 9 – Remove the wedge mount

Remove the Cover from the Turret Assembly

Use a suitable JIS screwdriver to remove the three M2X3 countersink screws securing the protective cover onto the stationary base (see [Figure 10](#)) and remove the protective cover (see [Figure 11](#)).

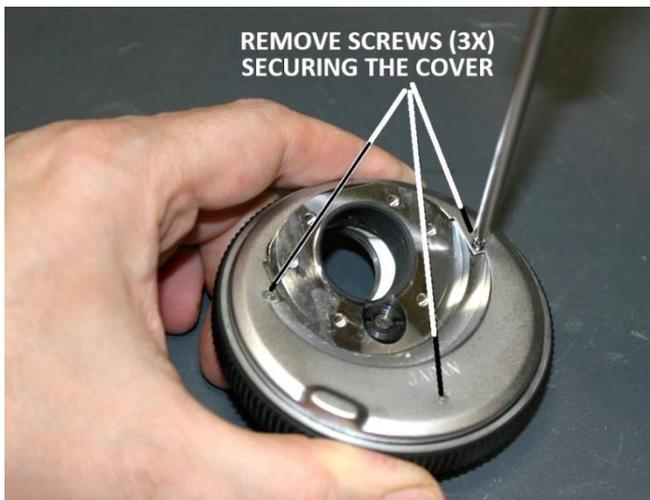


Figure 10 – Remove screws securing the cover in place



Figure 11 – Remove the protective cover

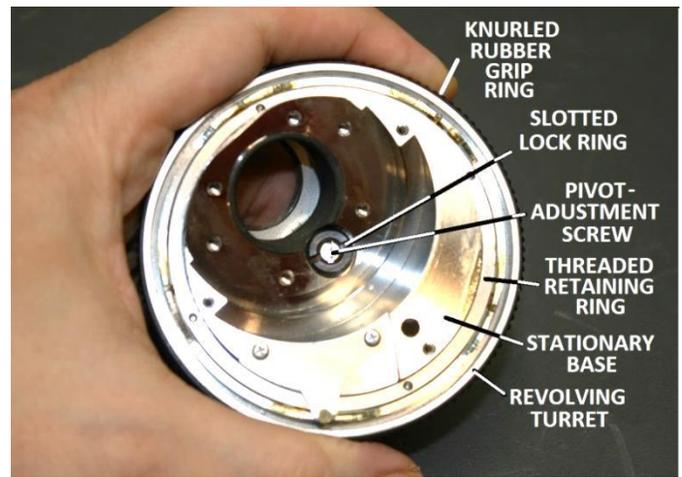


Figure 12 – The turret assembly (without cover)

Remove Lock Ring for the Pivot-Adjustment Screw

The slotted lock ring for the pivot-adjustment screw (see [Figure 12](#)) can be difficult to remove unless the proper tool is used. Do not attempt to remove the slotted lock ring and pivot-adjustment screw unless you have access to such a tool, since the slot in the lock ring will likely be damaged if you use an improper tool, making removal of the lock ring much more difficult¹. A suitable tool for this task can be easily made by filing or grinding a relief notch for the pivot-adjustment screw in the center of the blade of a large slotted screwdriver, as shown in [Figure 13](#). Note that if you decide to make such a tool, be sure that the tip of the screwdriver you select has a blade width matching the outer diameter of the slotted lock ring, and that the thickness of the blade is such that it will seat fully into the slot of the slotted lock ring.



Figure 13 – Screwdriver modified to remove slotted lock ring

Before attempting to loosen the slotted lock ring, the revolving turret must first be locked in position relative to the stationary base, in order to allow for sufficient torque to be applied to the slotted lock ring to loosen

¹ Don't even think about using a pair of needle-nose pliers to loosen the slotted lock ring. It will end badly if you do. Don't ask me how I know this.

and remove it. To lock the position of the revolving turret, first spin the revolving turret until the bore in the stationary base aligns with one of the five threaded objective bores in the revolving turret. While holding the turret such that these two bores remain aligned, insert a small screwdriver handle of the appropriate size into the two bores (see [Figure 14](#)). This will prevent the revolving turret from moving relative to the stationary base when torque is applied to loosen the slotted lock ring. The handle of the screwdriver should safely prevent the turret from spinning, without causing any damage to the fragile brass threads in the revolving turret.



Figure 14 – Insert screwdriver into bores to lock the turret

Hold the turret assembly by grasping the knurled-rubber grip ring on the outer perimeter of the revolving turret and use the slotted screwdriver with the notched tip (see [Figure 13](#)) to loosen the slotted lock ring securing the pivot-adjustment screw to the stationary base (see [Figure 15](#)).

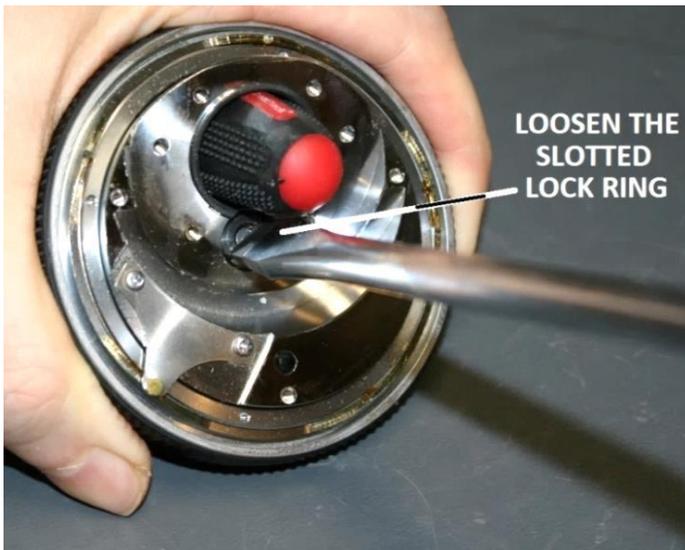


Figure 15 – Loosen the slotted lock ring

Once the slotted lock ring has been loosened, remove the screwdriver handle from the bores in the revolving turret and the stationary base (which is locking the revolving turret to the stationary base) to get it out of the way. Unscrew and remove the slotted lock ring from the pivot-adjustment screw (see [Figure 16](#)).



Figure 16 – Remove the slotted lock ring

Remove the Pivot-Adjustment Screw

With the slotted lock ring removed, use a suitable slotted screwdriver to unscrew and remove the pivot-adjustment screw from the center bore of the stationary base (see [Figure 17](#)). Note that there is a $\frac{1}{4}$ " bearing ball in the center bore of the stationary base, beneath the pivot-adjustment screw. Do not allow this bearing ball to fall out or it may become lost.



Figure 17 – Remove the pivot-adjustment screw

Remove the Center Pivot Bearing Ball

Use a tweezers or other suitable tool to remove the 1/4" bearing ball from the center bore in the stationary base (see [Figure 18](#)).



Figure 18 – Remove the center-pivot bearing ball

Remove the Mechanical Detent Stop

The next step is to remove the mechanical detent stop. Use a suitable JIS screwdriver to remove the two M2x4 pan-head screws securing this stop to the stationary base of the turret assembly (see [Figure 19](#)). These screws are staked in place with adhesive and can be surprisingly stubborn, so be sure to use the proper JIS screwdriver to prevent damaging the screw heads. It might also be helpful to heat the screws with a heat gun before loosening them, but do not melt the black knurled-rubber grip ring in the process.



Figure 19 – Remove the screws securing the detent stop

Remove the loose mechanical detent stop from the stationary base (see [Figure 20](#)).

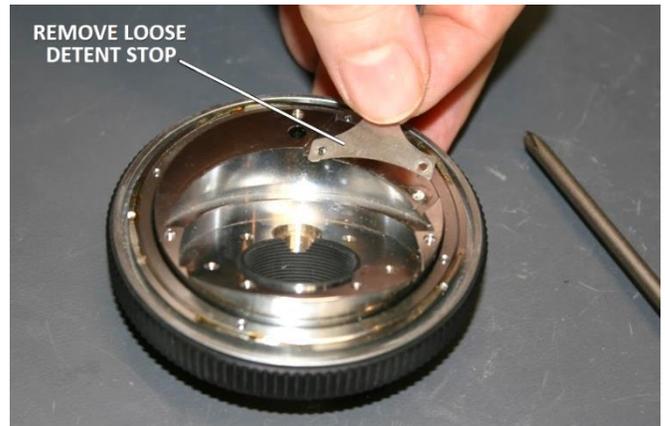


Figure 20 – Remove the mechanical detent stop

Remove the Black Knurled-Rubber Grip Ring

Carefully remove the black knurled-rubber grip ring from the outer perimeter of the revolving turret (see [Figure 21](#)), being careful not to stretch or damage it in the process. This ring is held onto the turret with a few spots of adhesive, so proceed carefully here.



Figure 21 – Remove the knurled-rubber grip ring

Remove the Threaded Retaining Ring

The stationary base is held inside the recess of the revolving turret by the threaded retaining ring (see [Figure 22](#)).

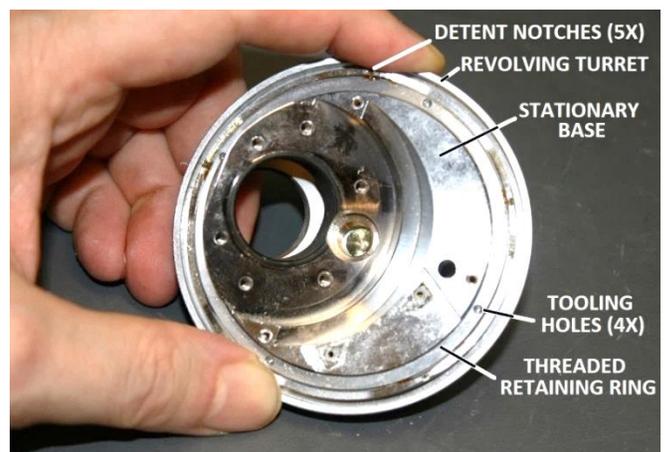


Figure 22 – Components of the turret assembly

Place the turret assembly into a suitable work vise and use a heat gun to thoroughly heat the turret assembly, to soften the internal grease. Then use a center punch or nailset tool to loosen the threaded retaining ring by placing the tip of the tool into one of the four tooling holes in the threaded retaining ring (see [Figure 22](#)) and driving the threaded retaining ring counter-clockwise by carefully tapping the tool with a small hammer or mallet (see [Figure 23](#)). Be careful and do not accidentally put the center punch or nailset tool into one of the five detent notches in the revolving turret (instead of into one of the four tooling holes in the threaded retaining ring), or the revolving turret will be irreparably damaged when the punch is struck by the mallet.

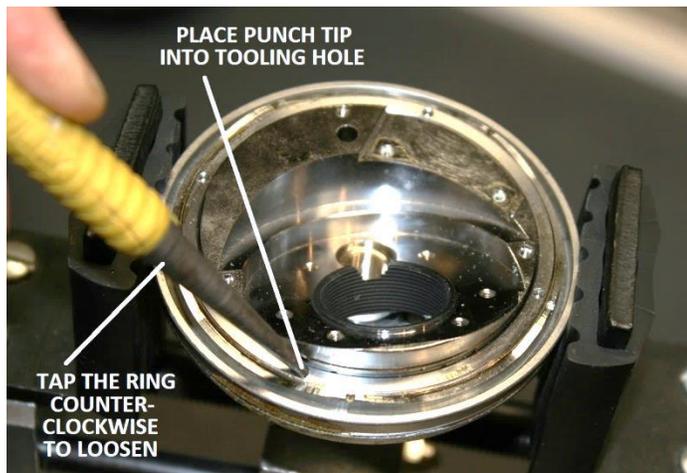


Figure 23 – Loosen the threaded retaining ring

Continue loosening the threaded retaining ring and remove it, being careful that the perimeter bearing balls beneath the threaded retaining ring do not fall out and become lost in the process (see [Figure 24](#)).

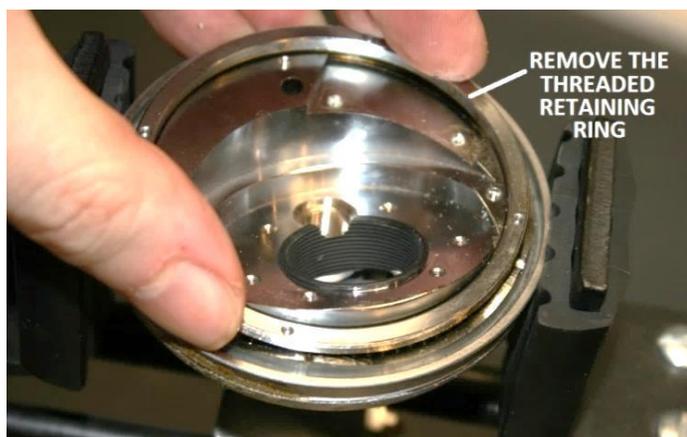


Figure 24 – Remove the threaded retaining ring

Remove the Perimeter Bearing Balls

Carefully remove the 3/32" bearing balls (there are 80 of them) from the channel formed by the outer perimeter of the stationary base and the inner

perimeter of the revolving turret. A small magnet can come in handy here (see [Figure 25](#)).



Figure 25 – Remove the perimeter bearing balls

Remove the Stationary Base from the Turret

Once the perimeter bearing balls have been removed from the channel, lift the stationary base free of the recess in the revolving turret and remove it (see [Figure 26](#)).



Figure 26 – Lift and remove the stationary base

Thoroughly Clean the Various Components

Use a suitable solvent (e.g., acetone) to thoroughly clean all the old grease from the stationary base, revolving turret, threaded retaining ring, perimeter bearing balls, center-pivot ball, mechanical detent stop, pivot-adjustment screw, and the slotted lock ring, in preparation for reassembly.

Reinstall Stationary Base into the Revolving Turret

Hold the stationary base such that the center pivot is facing downwards, and then lower the stationary base into the recess of the revolving turret (see [Figure 27](#)).



Figure 27 – Reinstall stationary base into revolving turret

Apply a Ring of Grease for the Perimeter Balls

The next step is to apply grease into the ring in which the perimeter bearing balls will be placed. Carefully apply a ring of grease (item 8 of [Appendix 1](#)) into the channel formed between the outer perimeter of the stationary base and the inner perimeter of the revolving turret (see [Figure 28](#)). Do not apply too much grease here, to minimize the squeeze-out that will occur when the threaded retaining ring is reinstalled to hold the stationary base into the recess of the revolving turret.



Figure 28 – Apply ring of fresh grease for the bearing balls

Reinstall the Perimeter Bearing Balls

Use tweezers to carefully set the 3/32" bearing balls (there are 80 of them) into the grease ring (see [Figure 29](#)), placing the bearing balls as close together as possible as you proceed.



Figure 29 – Place the bearing balls into the ring of grease

Reinstall the Threaded Retaining Ring

Carefully engage the threads of the threaded retaining ring with the threads in the revolving turret (see [Figure 30](#)).

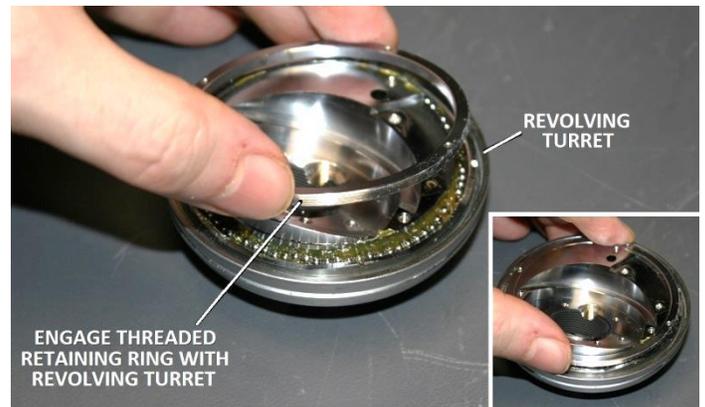


Figure 30 – Engage the threaded retaining ring

Use a suitable lens-spanner tool (item 6 of [Appendix 1](#)) in a pair of opposing tooling holes to tighten the threaded retaining ring² (see [Figure 31](#)).



Figure 31 – Tighten the threaded retaining ring

² Or use a center punch or nailset tool to snug the threaded retaining ring by placing the tip of the tool into one of the four tooling holes and lightly tapping the tool with a small hammer or mallet to drive the threaded retaining ring clockwise.

While holding the stationary base in one hand, spin the revolving turret multiple times in both directions with the other hand, to drive out any excess grease from beneath the threaded retaining ring. Use dry cotton swabs to remove any grease squeeze-out (see [Figure 32](#)). Do not use a solvent here, otherwise the solvent may run into the revolving turret mechanism and foul the grease within.

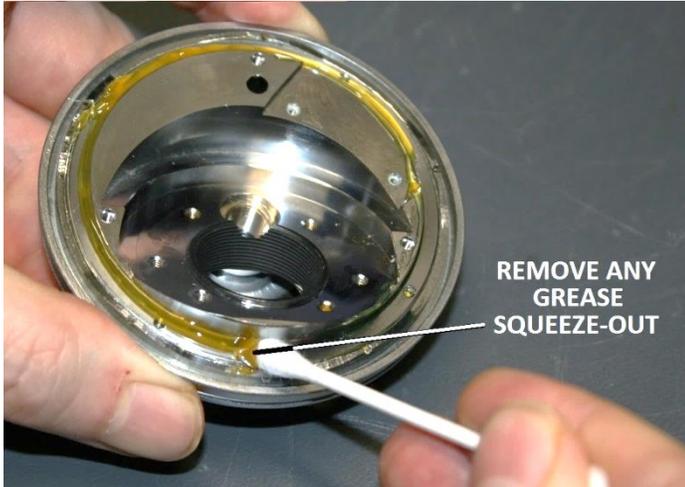


Figure 32 – Remove any grease squeeze-out

Apply Grease to the Center-Pivot Bore

Apply a small amount of grease (item 8 of [Appendix 1](#)) into the center-pivot bore of the stationary base for the $\frac{1}{4}$ " bearing ball (see [Figure 33](#)).



Figure 33 – Apply grease to the center-pivot bore

Reinstall the Center-Pivot Bearing Ball

Now that the center-pivot bore has been greased, reinstall the $\frac{1}{4}$ " bearing ball into the freshly greased center-pivot bore. The grease will hold the center-pivot bearing ball in the proper position during subsequent reinstallation of the pivot-adjustment screw (see [Figure 34](#)).



Figure 34 – Place bearing ball into the center-pivot bore

Apply Grease to Top of the Center-Pivot Ball

Apply a small amount of grease (item 8 of [Appendix 1](#)) onto the top of the $\frac{1}{4}$ " bearing ball in the center-pivot bore (see [Figure 35](#)).



Figure 35 – Apply grease to the top of the bearing ball

Reinstall the Pivot-Adjustment Screw

Use a suitable slotted screwdriver to reinstall the pivot-adjustment screw into the threaded bore in the center of the stationary base (see [Figure 36](#)). Carefully snug the adjustment screw just to the point where a slight bit of resistance is felt. Test the feel of the revolving turret. If the motion feels rough, back the screw off a bit until it feels smooth. Leave the screw in this position.

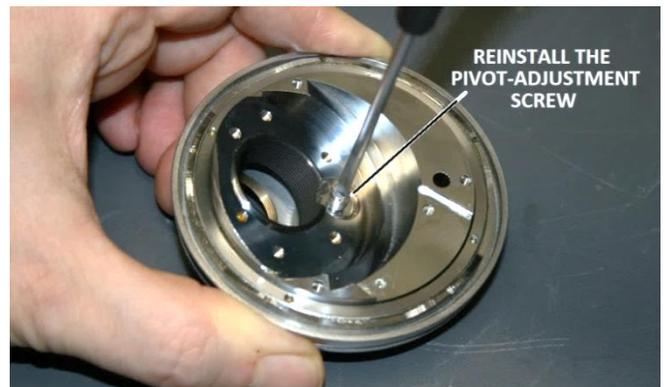


Figure 36 – Reinstall the pivot-adjustment screw

Reinstall the Slotted Lock Ring

Carefully engage the threads of the slotted lock ring with the pivot-adjustment screw (see [Figure 37](#)).



Figure 37 – Reinstall the slotted lock ring

Spin the revolving turret until one of the five threaded objective bores in the revolving turret aligns with the bore in the stationary base. Insert a suitably sized screwdriver handle into these bores to lock the revolving turret to the stationary base. Use a suitable tool (see [Figure 13](#)) to snug the slotted lock ring down to lock the pivot-adjustment screw in place (see [Figure 38](#)). Do not allow the pivot-adjustment screw to rotate while tightening the slotted lock ring.



Figure 38 – Tighten the slotted lock ring

Verify the Feel of the Revolving Nosepiece

Hold the turret assembly by gripping the stationary base in one hand and spin the revolving turret with the other hand. The motion of the turret should not feel gritty, erratic, or excessively stiff. If it does, loosen the slotted lock ring, readjust the pivot-adjustment screw, and retighten the slotted lock ring (as described above) until the turret motion feels acceptable.

Clean Off Any Visible Grease

Use a suitable solvent (e.g., mineral spirits) and a clean rag or tissue to thoroughly clean any visible grease from the exterior of the turret assembly. Be careful while removing the excess grease, to prevent any of the solvent from dripping into the revolving turret mechanism and fouling the grease within.

Reinstall the Mechanical Detent Stop

Place the mechanical detent stop in position on the stationary base, aligning the two holes in the mechanical detent stop with the tapped holes in the stationary base (see [Figure 39](#)). Make sure the stop ball on the mechanical detent stop is facing downwards (see [Figure 40](#)).



Figure 39 – Place the mechanical detent stop in position

Use a suitable JIS screwdriver to reinstall two M2X4 pan-head screws to secure the mechanical detent stop into place (see [Figure 40](#)).

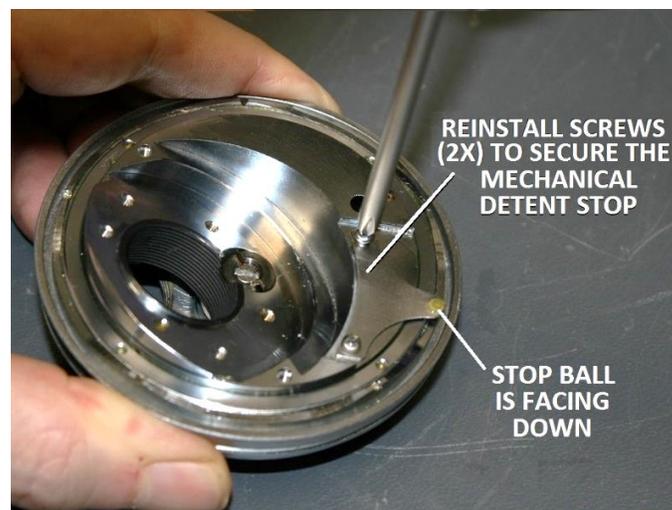


Figure 40 – Secure the detent stop with two screws

Apply Grease to the Mechanical Detents

Apply fresh grease (item 8 of [Appendix 1](#)) to the five mechanical detent notches in the revolving turret (see [Figure 41](#)). Be careful that you do not get grease anywhere else.

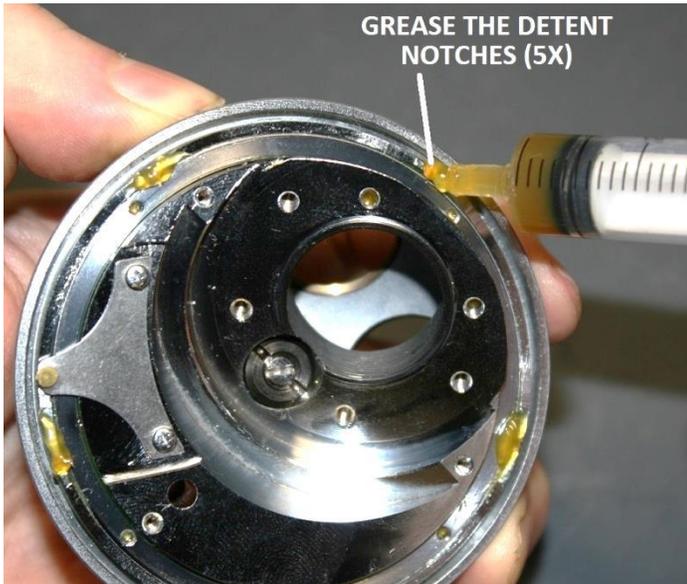


Figure 41 – Apply grease to the five detent notches

Reinstall the Protective Cover

Place the protective cover into position on the back side of the turret assembly, lining up the three holes in the protective cover with the tapped holes in the stationary base (see [Figure 42](#)).



Figure 42 – Place cover in position on the turret assembly

Use a suitable JIS screwdriver to reinstall three M2X3 countersink screws to secure the protective cover onto the stationary base (see [Figure 43](#)).



Figure 43 – Secure protective cover using three screws

Reinstall the Knurled-Rubber Grip Ring

The final assembly step for the turret assembly is to reinstall the black knurled-rubber grip ring around the outer perimeter of the revolving turret and secure it in place with a suitable color-matching adhesive. Black silicone RTV is a good choice of adhesive here, since it will bond well with the metal of the revolving turret as well as to the black knurled-rubber grip ring. Additionally, any of the inevitable squeeze-out that is not removed will not be visible. Apply two dabs of black silicone RTV (item 7 of [Appendix 1](#)) onto the outer perimeter of the revolving turret, spaced approximately 180° apart (see [Figure 44](#)).

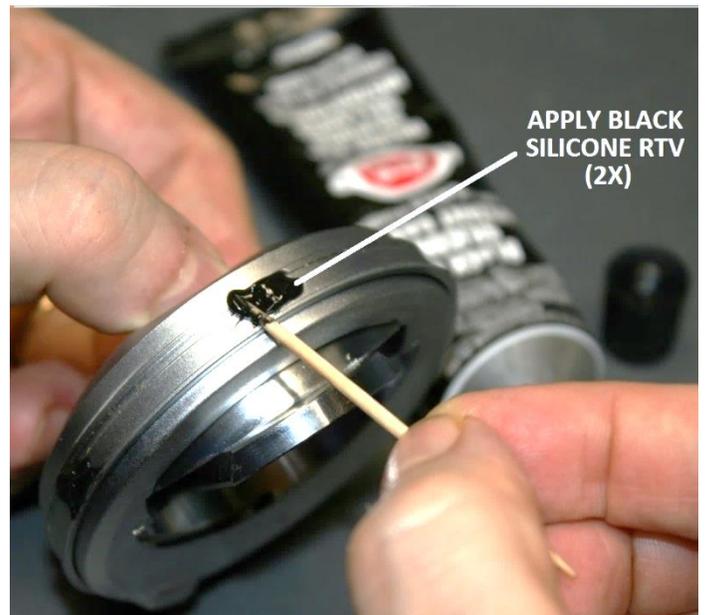


Figure 44 – Apply black silicone RTV to revolving turret

Carefully reinstall the knurled-rubber grip ring onto the outer perimeter of the revolving turret, making sure to not stretch or damage the grip ring (see [Figure 45](#)).



Figure 45 – Reinstall the knurled-rubber grip ring

Use dry cotton swabs to thoroughly remove any visible silicone RTV squeeze-out (see [Figure 46](#)).



Figure 46 – Remove any silicone RTV squeeze-out

Reinstall the Wedge Mount and Corrective Optics

In order to guarantee proper optical alignment of the turret assembly, and in order to minimize the mechanical strain in the corrective-optics assembly for polarizing work, reinstall the wedge mount and corrective-optics assembly per the following procedure. Place the wedge mount in position on the stationary base of the turret assembly, aligning the four screw holes in the wedge mount with the tapped holes in the stationary base (see [Figure 47](#)).

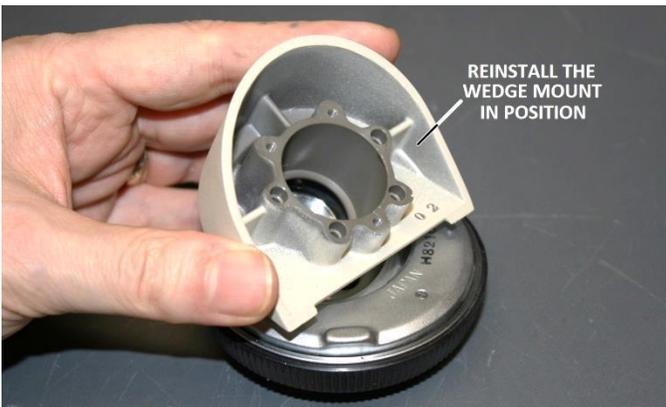


Figure 47 – Place the wedge mount in position

While holding the wedge mount in this position, place the threaded end of the corrective-optics assembly through the center bore of the wedge mount and screw the corrective-optics assembly into the tapped center bore of the stationary base (see [Figure 48](#)). Tighten the corrective-optics assembly until it is hand tight, then back it off approximately ¼ turn. The barrel of the corrective-optics assembly fits the hole in the wedge mount with very tight tolerances, and this precision fit holds the wedge mount in the proper physical location so that the mounting screws can be reinstalled.

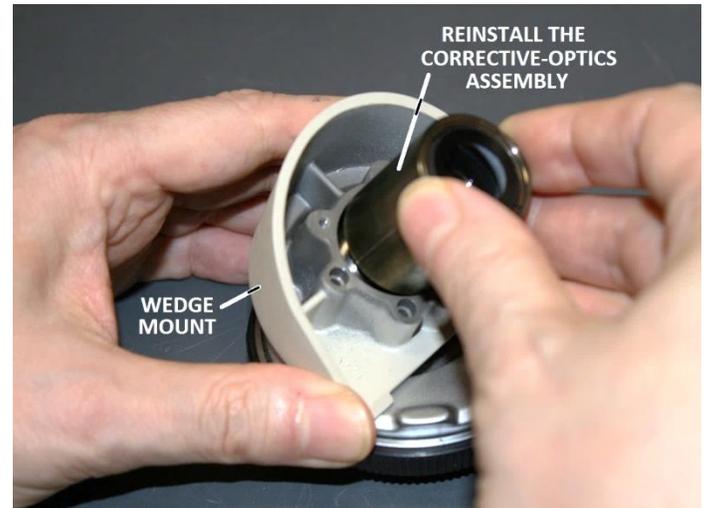


Figure 48 – Reinstall the corrective-optics assembly

Use a suitable JIS screwdriver to reinstall four M2.6X25 pan-head screws to secure the wedge mount onto the stationary base of the turret assembly (see [Figure 49](#)).



Figure 49 – Reinstall screws to secure the wedge mount

Use non-marring pliers or a suitable strap wrench to grip the barrel of the corrective-optics assembly and tighten the corrective-optics assembly a bit beyond hand tight (see [Figure 50](#)).



Figure 50 – Tighten the corrective optics assembly

Reinstall the Reverse Nosepiece Assembly

Hold the reverse nosepiece assembly in place on the top of the arm (see [Figure 51](#)) and align the three screw holes in the arm with the tapped holes in the wedge mount on the reverse nosepiece assembly (see [Figure 52](#)).



Figure 51 – Hold reverse nosepiece assembly up to arm

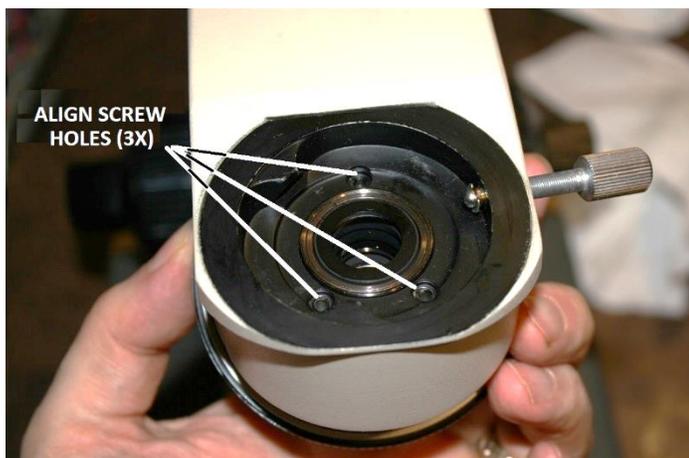


Figure 52 – Align holes for the mounting screws

While holding the reverse nosepiece assembly in this position, use a suitable JIS screwdriver to reinstall three

M2.6X14 pan-head screws to secure the reverse nosepiece assembly onto the arm (see [Figure 53](#)).

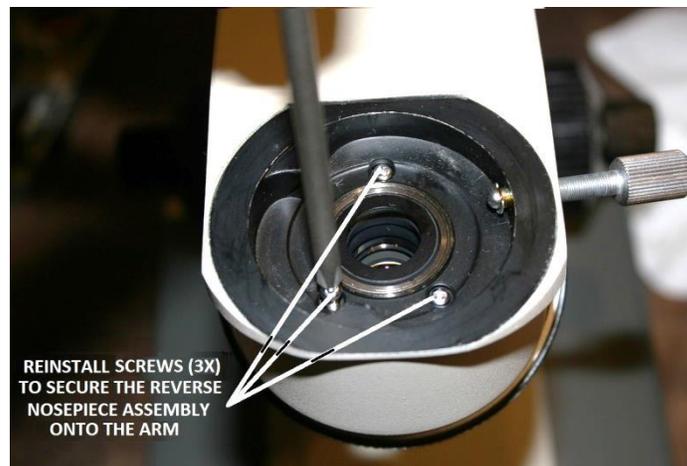


Figure 53 – Reinstall three screws to secure it to the arm

Ready for Service

The microscope stand with the newly reconditioned reverse nosepiece assembly is now ready to be put back into service.

Requirements for Periodic Maintenance

Periodic cleaning and application of fresh grease to the mechanical detent notches in the stationary base is necessary to minimize wear of the mechanical detents, thereby maximizing the useful service life of the reverse nosepiece assembly. Follow the procedures detailed in this document to remove the reverse nosepiece assembly from the microscope stand, remove the wedge mount and corrective-optics assembly, and then remove the protective cover to expose the mechanical detent notches. Next, clean and re-grease the exposed mechanical detent notches and reassemble the reverse nosepiece assembly, and then reinstall it onto the microscope stand. If the equipment sees heavy usage, this service should be performed on a six-month interval³.

Problems with the Turret Assembly

A few problems with the turret assembly can sometimes be found in the reassembled nosepiece. The first will be seen if one or more of the mechanical detents are excessively worn. This will cause radial float of the revolving turret in one or more of the objective positions, and these objectives will have trouble returning to and maintaining their proper index position. This can make it difficult to utilize some illumination types, such as phase contrast, since the

³ Field experience has shown that even heavily used scopes (such as those used in hospitals and clinical lab settings), when lubricated on a six-month interval, can be expected to provide many years of trouble-free service.

phase annuli will not be able to hold an acceptable alignment due to variations in objective indexing.

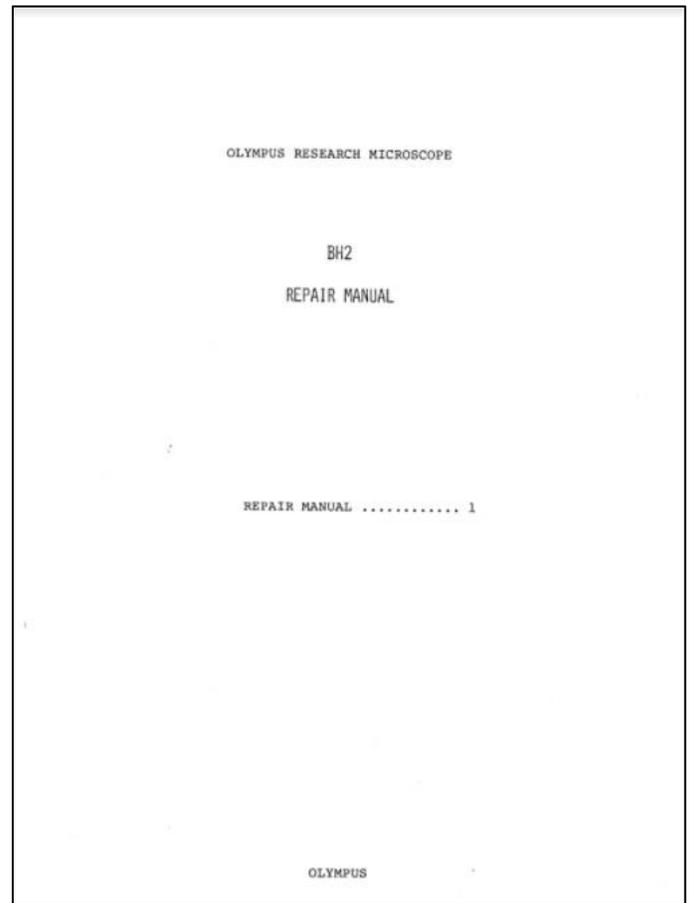
The other problem that may be seen is caused by overall float of the revolving turret, relative to the center point of the stationary base. If there is excess play in the center-pivot ball, such that the turret is not held in the exact center point, the whole turret may move slightly, resulting in poor objective centering and all that that entails. This problem may be encountered if the threaded retaining ring has not been properly snugged down, or if the center pivot-adjustment screw has not been properly adjusted to remove the play in the center-pivot mechanism.

How to Contact the Author

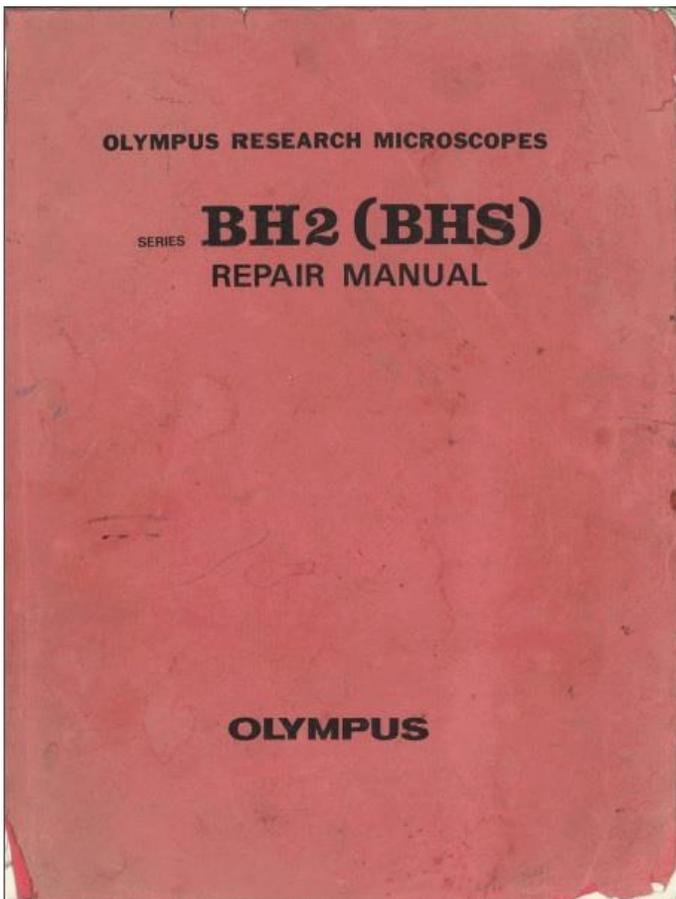
Please feel free to direct any questions or comments regarding this document (or Olympus BH-2 microscopes in general) to the author at the email address listed on the cover of this document.

Original Olympus Documentation

Scanned versions of the following PDFs are available for download at various microscope-related hobbyist sites on the internet. These can also be found by searching for the titles in an internet search engine, such as Google.



Olympus Research Microscope BH2 Repair Manual



Olympus Research Microscopes Series BH2 (BHS) Repair Manual

Appendix 1

Sources for Replacement Parts, Tools, and Supplies Referenced in this Document

Table 1 lists specific information for the various parts, tools, and supplies discussed in this document. The pricing and availability listed below is accurate as-of April 2021 but is subject to change without notice.

Item	Description	Manufacturer	Manufacturer Model #	Vendor	Vendor #	Price
1	Heat gun, electric, 1500W	Drill Master	---	Harbor Freight	96289	\$9.47
2	Screwdriver set, JIS, 4 pieces	Hozan	JIS-4	Amazon	---	\$19.00
3	Bearing balls, chrome steel, 3/32" G25, 100-count	various	---	Amazon	---	\$5.40
4	Bearing balls, stainless steel, 1/4", G25, 25-count	various	---	Amazon	---	\$4.95
5	Pliers, soft-jaw	---	Non-Scratch Pliers	Micro-Mark	85161	\$34.95
	Pliers, soft-jaw	Tamiya	74061	Amazon	---	\$32.64
6	Lens-spanner tool, pointed tips	various	---	Amazon	---	\$14.95
7	Silicone gasket RTV, black, 3oz	J-B Weld™	32329	Amazon	---	\$7.05
	Silicone gasket RTV, black, 3oz	Harbor Freight	---	Harbor Freight	90024	\$3.99
8	Plastilube® Brake Grease, 75cc	Plastilube®	ATE70015	Amazon	---	\$10.88
	Plastilube® Brake Grease, 75cc	Plastilube®	ATE70015	Autohausaz	1161688	\$8.35
	Mobilgrease 28® Grease, 13.4 oz.	Exxon	Mobilgrease28®	Amazon	---	\$27.75

Table 1 – Parts, Tools, and Supplies

Table 2 lists the contact information for the vendors referenced in **Table 1**.

Vendor	URL	Local Phone	Toll Free	Fax	email
Amazon	www.amazon.com	---	---	---	---
Autohausaz	www.autohausaz.com	---	---	---	sales@autohausaz.com
Harbor Freight Tools	www.harborfreight.com	---	1-800-423-2567	---	---

Table 2 – Vendor Listing