

OPERATION & TROUBLESHOOTING

Model 1600



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SAFETY

When using the Azuradisc Model 1600 disc repair machine, the following basic safety precautions should always be followed to reduce the risk of fire, electric shock, or injury to persons:

- Read this manual before assembling or using the machine.
- Use this machine only for its intended use as described in this manual.
- Use only with Azuradisc-recommended accessories and repair materials. (The use of repair materials not approved by Azuradisc may damage discs permanently or cause injuries.)
- Pay close attention when the machine is used near children. The machine is not intended for use by children.
- Do not operate the machine if the cord or plug is damaged, is not working properly, has been damaged, or immersed in water. If these conditions are present, return the machine to Azuradisc for examination, repair, or adjustment.
- Do not drop or insert objects into any openings.
- To disconnect, turn off the machine, then remove plug from the electrical outlet.
- Use a grounded plug when using an extension cord.
- Keep fingers and all body parts away from moving parts and openings.
- Disconnect electrical supply before cleaning.

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Every effort has been made to ensure that the information in this manual is accurate. Azuradisc is not responsible for printing or clerical errors.

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Azuradisc Inc. is not responsible or liable for damage, of any type, to discs inserted into an Azuradisc machine. If you believe that an Azuradisc machine is malfunctioning, discontinue use and contact Azuradisc or an authorized representative.

OUT OF THE BOX

After unpacking the Model 1600, verify the following items, in the quantities shown, are included. Contact Azuradisc, or the local representative if any items are missing.



- 2 ea. - Stage 1 Final Polishing Head** - Repairs up to 300 discs
Open cell foam polish head for the final polishing stage.
Item #ST1 00157 2
- 2 ea. - Stage 2 Polishing Head** - Repairs up to 300 discs
Used to remove light scratches.
Item #PH 00048 3
- 3 ea. - Super Life™ Polishing Head - Long Life** - Repairs up to 5,000 plus discs
Apply abrasive polishing papers to head for scratch removal.
Item # PH 00159 6
- 1 ea. - Booster Plate**
Attached to the Stage 2 Polishing Head
Item #PH00126-6



- 1 ea. - Aqua-Lube 8 oz Bottle** - Repairs up to 300 discs
A water additive to prolong the life of the micro abrasive papers and give consistent finishes.
Item #PCW 00053 7
- 1 ea. - Polish Compound 8 oz Bottle** - Repairs up to 300 discs
Used to polish disc during stages one and two.
Item #PCW 00053 7
- 1 ea. - Optical Spray Cleaner 8 oz Bottle** - Repairs up to 500 uses
Cleans optical surfaces without ammonia or alcohol. Recommended for use with micro-fiber wiping cloths.
Item #SC 00001 8



- 1 ea. - Micro-Fiber Wiping Cloth** - Hand washable and reusable
Super soft material to clean optical surfaces. Recommended for use with Optical Spray Cleaner.
Item #PC 00392 7

- 1 ea. - Polishing Paper Tracking Chart**
Used to track the polishing papers' life span for consistent results.

- 30 ea. - Micro-Abrasive Polishing Papers**
Item #PPV 00337 8. Includes 10 each of Stages 3, 4 and 5

- 1 ea. - Waste Water Drain Hose**
- 1 ea. - Power Cord (240 Volt Model Only)**
- 1 ea. Owner Documentation**

- Model 1600 Operation & Troubleshooting Manual
- 10 ea. Promotional Tri-fold Brochures
- Warranty Registration Card

Polish Paper Tracking Chart (sample)	
Stage 3	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Change!
Stage 4	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Change!
Stage 5	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Change!
Optional Stage 6	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Change!

Waste water container (5 gallon recommended) is not included.

PART IDENTIFICATION



Stage 3



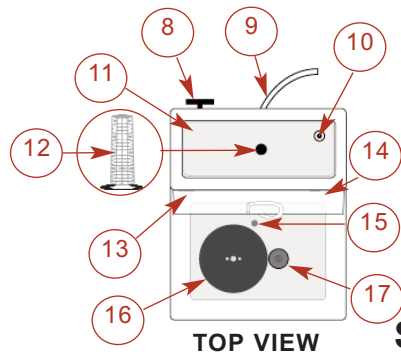
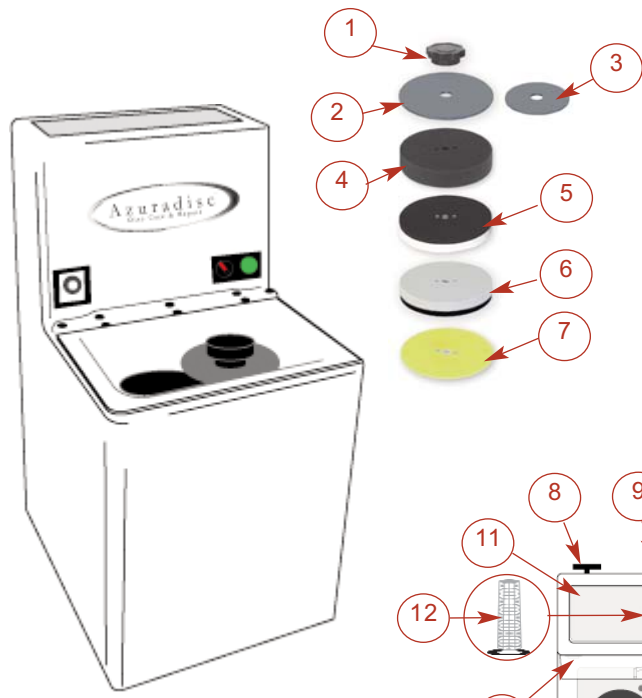
Stage 4



Stage 5



Stage 6
(Optional)
Not Included



1. Disc Retaining Knob
2. 5 inch (12 cm) Disc Retaining Plate
3. 3 inch (8 cm) Disc Retaining Plate (optional)
4. Stage 1 Final Buff Head
5. Stage 2 Polishing Head
6. Super Life™ Head
7. Booster Plate
8. Water Flow Adjustment Knob
9. Waste Water Hose
10. Low Water Float Sensor
11. Fresh Water Tank
12. Fresh Water Filter
13. Timer
14. Power Switch with Start/Reset Button
15. Waste Water Drain
16. Large Platen
17. Small Platen

TOP VIEW SET UP

DO NOT PLUG THE MACHINE IN YET!

Place the machine on sturdy surface. Ensure there are no obstructions of air circulation around the bottom and rear of the machine.

WASTE WATER

The Model 1600 uses water during the disc repair process and requires a method to dispose of used water during the repair process.

- Connect the waste water drain hose to the outlet on the rear of the machine.
- Use a 5 gallon container (not supplied) or a suitable drain to collect the waste water.

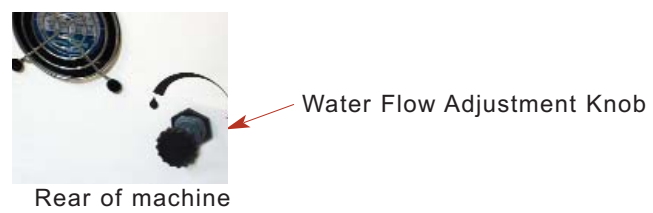
FILL WATER TANK

- Verify the fresh water filter is in place before adding water (See Part Identification Section of this manual)
- Add two caps full of Aqua-Lube water treatment per tank (1 gallon or 3.8 liters) of water.
- Always use clean tap water.

Adjust Water Flow

- Turn the Water Flow Adjustment Knob (on the rear of the machine) counter-clockwise approximately 3 full turns from the “closed” position as an initial setting. Adjust as needed to provide a small steady flow during repair processes.
- **Never operate the machine dry.**

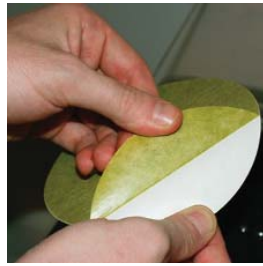
APPLY ABRASIVE PAPER TO SUPER LIFE™ HEAD



Removing Abrasive Papers



1. Place a Super Life™ Head (Light grey side up) on the large platen and press down firmly



2. Peel the backing from the polishing paper.



3. Curve the polishing paper as shown and place it on the head using the 3 alignment studs.



4. Smooth the polishing paper from the center to the edges, ensuring there are no wrinkles.

Note: A Stage 5 polishing paper is shown for illustration purposes only. Stage 3 & 4 polish papers are installed using the same method.

To avoid damage to the Super Life™ head, press into the side of the head with a finger and with the other hand remove the adhesive paper with an upward motion.

PLUG THE MACHINE IN



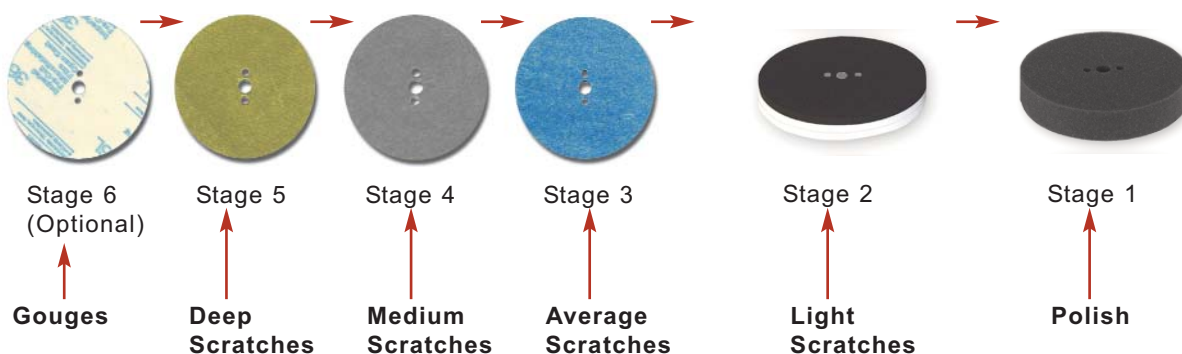
- Ensure the main power switch is in the off position.
- Plug the machine cord into a compatible outlet.

OPERATION

THE REPAIR PROCESS

The Model 1600 uses four abrasive stages (Stage 6 is optional) and two polishing stages to repair scratches. Use the chart below to help determine which stage to begin using to repair a disc. Sort multiple discs by the type of repair needed (i.e. gouged, deep scratches, medium etc.) and use the stages sequentially from the highest down through Stage 1. Always use 3 - 4 sprays of Anti-Static Spray Cleaner with the abrasive stages (Stages 6 through 3) when new or dry. Always use 3 - 4 sprays of Anti-Static Spray Cleaner plus a 1 inch (2.5 cm) spot of polish compound with the polishing stages (Stages 1 & 2).

WARNING: Inadequate lubrication may cause overheating and damage discs!



ABRASIVE STAGES (6 - 3)

Note: Discs should be sorted by the type of repair needed. (i.e. gouged, deep scratches, light scratches, etc.)

10. When the first abrasive stage is complete, ensure the original scratches are removed before beginning the next stage. It is important to remove these scratches with the first stage used.



1. When using a new or dry polishing paper, use 3-4 sprays of Anti-Static Spray Cleaner to lubricate the paper before use.



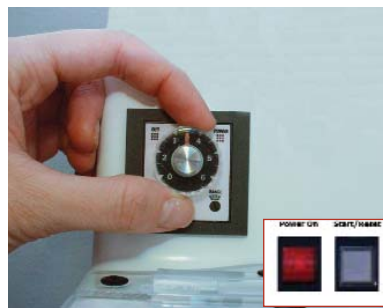
2. Place disc, with the label side up, on the small platen against the polishing element.*



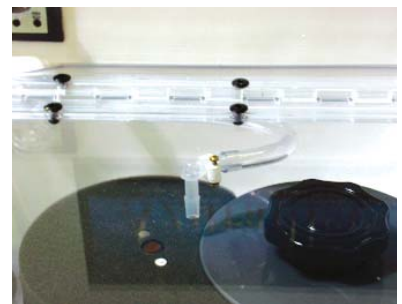
3. Place the disc retaining plate on the small platen with soft side against disc.



4. Hold the disc and retaining plate while tightening the retaining knob. Ensure knob is firmly tightened.**
5. Close lid.



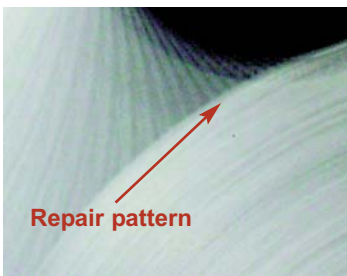
6. Set timer to 35 seconds for this and all the following stages.
7. Ensure the water adjustment knob is turned on.
8. Turn the power switch on and press the start/reset button.



9. Monitor and adjust water volume to a small steady flow using the water adjustment knob on rear of the machine.

Never operate dry!

POLISHING STAGES (2 - 1) DOUBLE SIDED DVDs



11. Repair marks produced by the abrasive stage are shown to the left. If scratches remain, other than the repair pattern, run the disc through the same stage again, repair it with a more abrasive stage, or run the same stage for a longer period of time. If there are no scratches, proceed to the next stage.

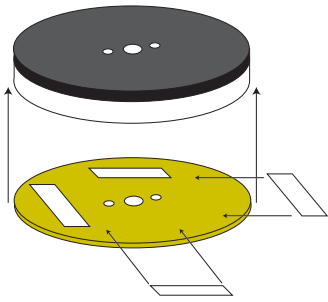
12. Repeat the same process for each abrasive stage used, successively down through Stage 3.

Tips

* Caution: To prevent disc breakage, ensure the disc is properly aligned on the small platen turntable.

** Note: When inserting or removing a disc from the machine, hold the disc stationary while tightening or loosening the retaining knob.

Azuradisc offers a specially designed Micro-Abrasive Polishing Paper to prevent contact with the manufacturer's



1. Before using a new Stage 2 head, attach the Booster Plate with double-sided tape as shown.



2. Install a clean Stage 2 head with the fabric side up.
3. Apply 3-4 sprays of Optical Spray Cleaner to the fabric surface for lubrication.



4. Apply a 1 inch (2.5cm) spot of polishing compound as shown.



5. Place the disc and retaining plate over the polish compound. Secure disc and retaining plate with the retaining knob. Ensure knob is firmly tightened.*
6. Close the lid and push the start button.



7. When Stage 2 is complete, replace the Stage 2 head with a clean Stage 1 (open cell foam) head.



9. Apply a 1 inch (2.5cm) spot of polishing compound to the head.
10. Place the disc and retaining plate over the small platen, covering the polish compound. Secure the disc with the retaining knob.**

Note: This stage may be slightly taller than the other heads.
8. Apply 3-4 sprays of Optical Spray Cleaner to the foam surface for lubrication.

Never operate dry!



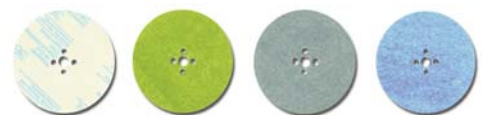
11. Close the lid and press the start button.
12. When the proper amount of polish compound is used the disc will only need some spot touch-up with a micro-fiber wiping cloth.

label area (see figure below). Double sided **Manufacturer's Label Area** polishing papers DO NOT come with the standard Multi Disc Repair Packages.

WARNING: A standard polishing paper will damage this area of a double-sided DVD.



Double sided polish papers are smaller in diameter and have five holes instead of three.



Tips

* **Caution:** To prevent disc breakage, ensure the disc is properly aligned on the small platen turntable.

** **Note:** When inserting or removing a disc from the machine, hold the disc stationary while tightening or loosening the retaining knob.

TIPS & POINTERS

A tracking chart, similar to the sample below, may be used to evaluate the amount time that each paper is used and aid in consistent disc finishes. Stages 3, 4, 5 and 6 polish papers may be used between 15 and 20 cycles at 35 seconds for each cycle.

Polish Paper Tracking Chart (sample)																
\ = 1/2 minute X = full minute of use																
Stage__minutes of use:	X	X	X	4	5	6	7	8	9	10	11	12	13	14	15	Change!
Stage__minutes of use:	X	X	X	X	5	6	7	8	9	10	11	12	13	14	15	Change!
Stage__minutes of use:	X	X	X	X	X	X	X	8	9	10	11	12	13	14	15	Change!
Stage__minutes of use:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Change!
Stage__minutes of use:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Change!
Stage__minutes of use:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Change!

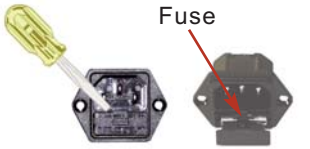
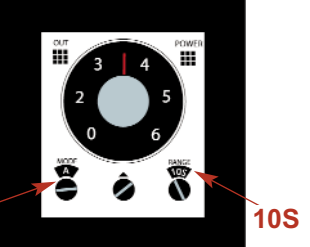
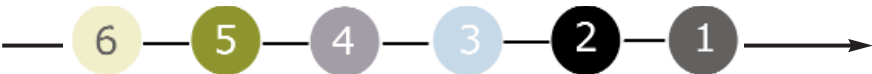
Use two caps-full of Aqua-Lube in each tank (1 gallon or 3.8 liters) of water to help soften water, prolong life of the abrasive papers, and give a better finish to discs.

Replacement Stage 2 Heads are not shipped with a new booster plate as these are sold separately. Use double sided tape to secure the booster plate as shown in the Polishing Stages section of this manual.

If initial scratches have not been removed, re-use stage 4 or run stage 5 for 35 seconds. After the initial scratches are removed proceed to the next stage. The recommended stage sequence is from the highest number initially used, through all stages sequentially down through number 1.

Note: The first stage used should always remove the initial scratches before you move on to the next stages.

TROUBLE SHOOTING

<p>No Power</p>	<ul style="list-style-type: none"> Verify the power cord is properly inserted in a working outlet; test the outlet with another device. Check the fuse (by the power connector) on 230 Volt machines. <p>Caution: To avoid electrical shock, ensure the outlet is properly equipped with a ground connection.</p>	
<p>Machine Overheating</p>	<ul style="list-style-type: none"> Verify the machine is on a flat sturdy surface. A carpeted surface may block the air inlet on the bottom of the machine. Leave space behind the machine to allow air flow for the cooling fan. 	
<p>No Water or Low Supply</p>	<ul style="list-style-type: none"> Ensure the low water float sensor in the water tank is not obstructed and moves freely. Ensure the water tank is at least half full. Check the clean water filter and ensure it has no obstructions blocking the flow of water. Start the machine and check to see if the water flow is steady and even. (lid closed) 	
<p>Water Does Not Drain</p>	<ul style="list-style-type: none"> Check that the water drain (located in the rear of the sink basin) has no obstructions. Ensure the water drain hose is not bent or obstructed. <p>Caution: To avoid damage, never insert sharp objects in the drain hose.</p>	
<p>Timer Malfunction</p>	<ul style="list-style-type: none"> The left adjustment must be set position A as shown. If an optional key switch is installed, the left adjustment must be set to position D. The center adjustment must be set as shown. The right adjustment must be set to "10S" to control the length of time the machine will run in a cycle. 	
<p>Inconsistent Repair Results</p>	<ul style="list-style-type: none"> Check the size and condition of the polishing heads. Refer to the Advanced Operation section of this manual. Mismatched polishing head heights may cause repair marks, poor performance, tearing papers, or premature wear. Ensure the papers being used are not worn out. If one paper is new and the next stage paper is worn, poor performance or repair marks may be experienced. It is recommended to use the tracking chart supplied. Refer to Tips & Pointers. Ensure the papers are attached to the light grey side when using Super Life™ heads. Ensure the right sequences of abrasive papers and polishing heads are being used. 	

PROBLEM SOLVING

Problem	Probable cause	Solution
Short Paper Life	<ul style="list-style-type: none"> • Hard Water • Applying adhesive back to a wet surface • Super Life™ heads may be different heights • Polishing head pressure is not correct 	<ul style="list-style-type: none"> • Use Aqua-Lube to soften the water and extend the life of Polishing Papers • Dry the surface of the Super Life™ Head before applying the new paper. • Refer to the Super Life™ Head Inspection section of this manual. • Refer to the “Machine Adjustment” section of this manual.
Repair Marks	<ul style="list-style-type: none"> • Papers are not used in the correct sequence • 1 or more micro-abrasive polishing papers are worn out. • Polishing head pressure is not correct. 	<ul style="list-style-type: none"> • Steps 5, 4, 3, 2, 1 should be used in the corresponding sequence. (Step 6 is optional) • Replace ALL papers. It is important to remove all of the marks of the previous step. • Refer to “Advanced Operation” in this manual.
Water Not Running	<ul style="list-style-type: none"> • Knob on back of machine is closed or not opened enough • Solenoid valve is clogged 	<ul style="list-style-type: none"> • If water is not flowing, verify that the water flow control knob is open. Maintain a steady stream of water just beyond a fast drip as a starting point. If the machine is tuned aggressively and overheating is a concern, open the valve all the way. Proper cooling must always be maintained. NOTE: The knob is located on the back of the machine. (Models equipped with this knob beginning late 2002) • Turn the machine on and press the Start/Reset button a few times with the lid open.

ADVANCED OPERATION

Important Notice: Machine is factory set for optimum performance - Contact Azuradisc or an authorized representative before making adjustments.

1.800.933.4923 or 1.480.827.8786
 South Pacific New Zealand +64.9.414.1430
 Australia +61.300.360.565

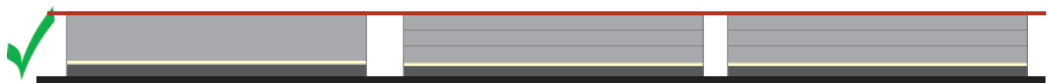
SUPER LIFE™ HEAD INSPECTION

Place all the Super Life™ heads on a flat surface and verify they are the same height. If they are not the same height, the heads will need to be adjusted or replaced.

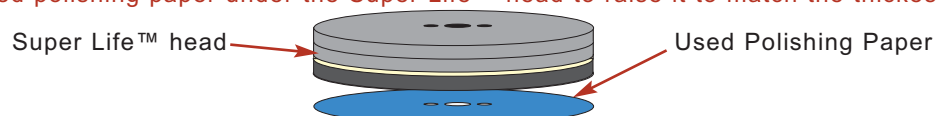
Example of improper height of heads.



The height of the machine heads should all be the same.



Tip: Place as used polishing paper under the Super Life™ head to raise it to match the thickest head.

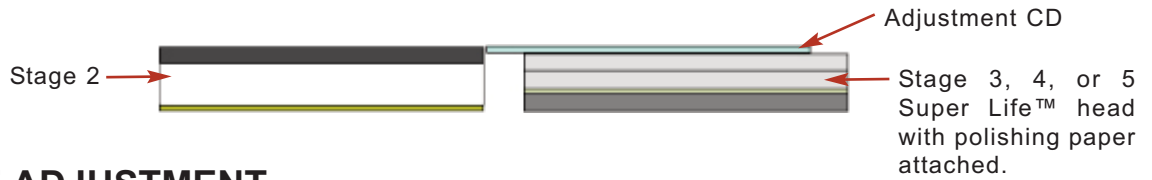


If the heads are the same height, and there are problems with the life span of the paper, proceed to the Pressure Adjustment section of this manual.

STAGE 2 HEAD HEIGHT

The Stage 2 polish head must be thicker than Stage 3, 4, or 5 Super Life™ heads by less than the thickness of an average disc as shown below. Place a used polishing paper under the booster plate for the Stage 2 head to raise it to match the other head.

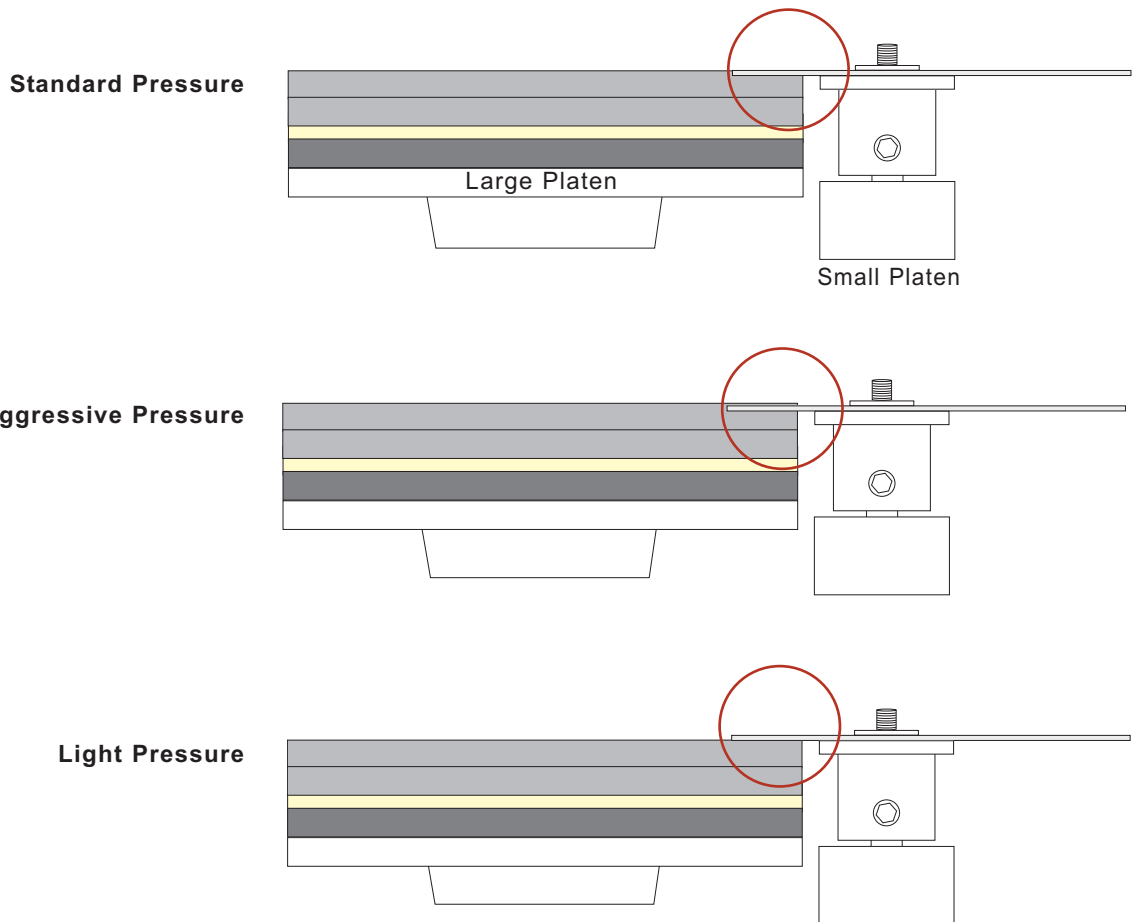
Tip: Use the Adjustment CD for this measurement.



PRESSURE ADJUSTMENT

ADJUSTMENT PROCESS

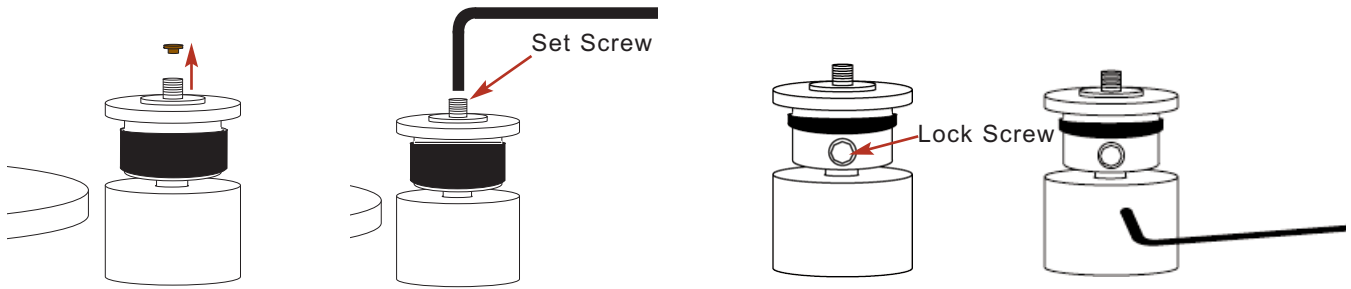
The amount of pressure applied to the disc is directly related to the height of the small platen compared to the “stationary” height of the large platen, and the booster plate when assembled correctly. Adjusting the small platen to a lower setting will apply more pressure to the repair process.



Do not Perform this procedure unless it is necessary

Verify you are familiar with all the parts and their purposes found in the Part Identification section.

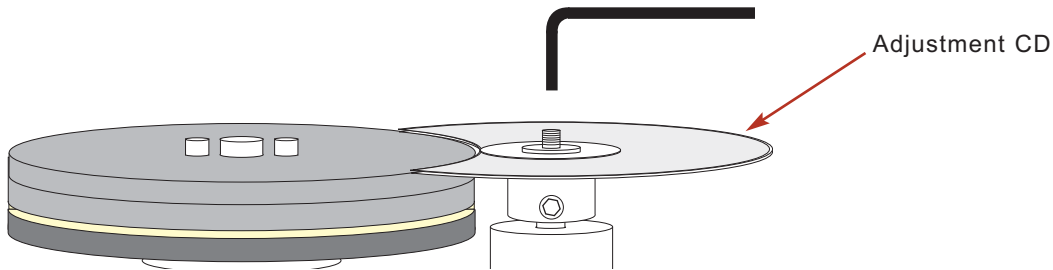
1. Plug the water drain hole to prevent small parts from falling and plugging the drain system.
2. Start the adjustment by cleaning the set and lock screws.



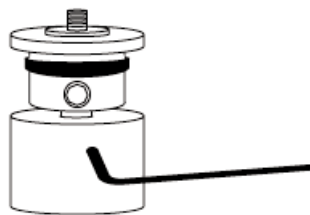
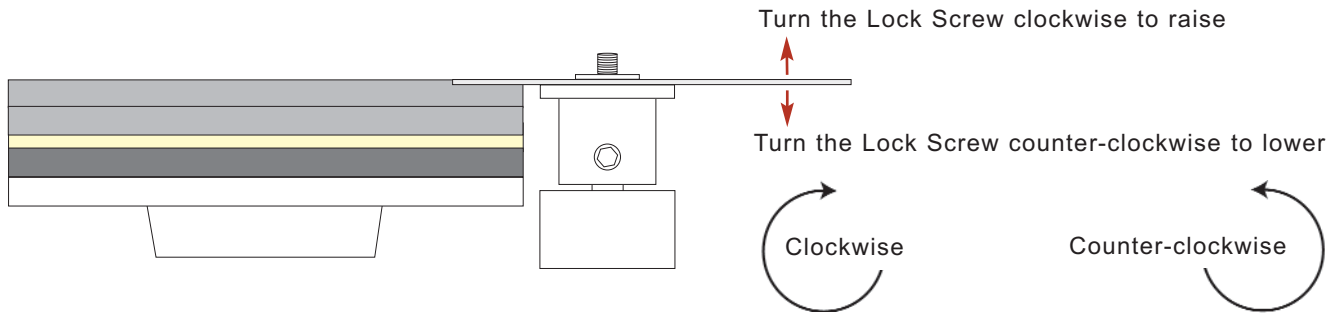
3. Remove rubber plug from the center of the small platen and store in a safe place.
4. Using a 3/32 inch hex key, remove the set screw from the small platen, clean and lubricate.
5. Re-insert the clean set screw and turn it until it stops.
6. Roll the black rubber cover to expose the lock screw.
7. Using a 1/8 inch hex key, remove the lock screw, clean and lubricate.
8. Re-install the clean lock screw and turn until it is snug. **Do not tighten!**

Note: Occasionally remove the small platen and clean the mounting shaft to make adjustment easier. Re-install the turntable, with the lock screw located on the flat spot on the shaft.

9. Place the Super Life™ head on the large platen and the adjusting CD on the small platen as any disc to be repaired.

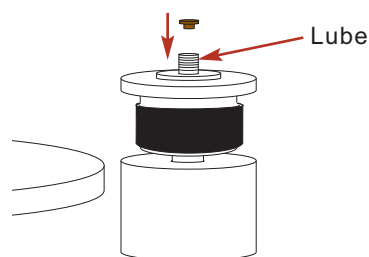


10. With a 3/32 inch hex key, turn the set screw until the top of the adjusting CD is flush with the top of the Super Life™ head and abrasive paper. (Important: It is key to check the height of all the Super Life™ heads before performing this step. (see the Super Life™ Head Inspection section of this manual) Gently tap the top of the small platen with a plastic hammer or screwdriver handle if necessary.



11. Tighten the lock screw with the 1/8 inch hex key.

Note: Verify the adjustment made in Steps 9 & 10 is still correct after tightening the Lock Screw.



12. Roll black rubber cover back into place and insert rubber plug into the center of the small platen.

13. Carefully lube the threads for the Knob on the Turntable with a graphite-type spray.

14. Remove the plug from the water drain hole.

Repair Stages Information And Usage Recommendations

The Azuradisc water-cooled Model 1600 compact disc repair machine is capable of removing a lot of plastic material from the disc at once by using very aggressive abrasive stages. That unique capability of the Model 1600 allows repairing CDs with very deep gouges, because less aggressive stages can't reach the bottom of these scratches. However, this process has to be used with caution on some discs that, by their plastic material and their form factor, may be damaged beyond repair by really aggressive abrasives. While a typical repair cycle time of 35 to 60 seconds remains the norm, it needs to be adjusted for some stages to achieve better results. Here are a few recommendations and tips:

Stage 6

One hundred times more aggressive than the next stage, this film based number 6 has to be used with extreme caution. Standard CDs (harder polycarbonate) with extremely deep gouges are candidates for a 10- to 20-second (maximum) Stage 6 cycle with a good continuous stream of water. The thinner polycarbonate of DVDs and Play Station 2 discs is also softer and can be damaged rapidly. Stage 6 is not recommended at all for GameCube discs because of their smaller diameter and polycarbonate make up.

**AS A SAFEGUARD: AVOID STAGE 6 FOR PLAYSTATION 2 AND DVD!
NEVER USE STAGE 6 WITH GAMECUBE DISC!**

Stage 5

This is the usual starting stage for deep scratches on CDs. For deep gouges on DVDs and PlayStation 2 discs, start with a short Stage 5 cycle of 10 to 20 seconds and repeat only if necessary to remove all the original scratches. GameCube discs are quite sensitive and Stage 5 should be avoided with these particular discs whenever possible. For these, simply start at Stage 4 with a longer cycle.

AS A SAFEGUARD: DO NOT USE STAGE 5 WITH GAMECUBE DISCS!

Stage 4

This is the perfect starting stage for deep scratches on all game discs and all DVDs, as well as for medium scratches on CDs. It is the most aggressive stage recommended for GameCube discs and then only to remove gouges and deep scratches. It can be repeated if necessary.

STAGE 4 IS THE HIGHEST STAGE RECOMMENDED FOR GAMECUBE DISCS!

Stage 3

Stage 3 is the normal starting stage to repair medium scratches on GameCube discs as well as most medium and light scratches on DVDs and game discs. Starting with Stage 3 can also repair most CDs with light scratches, making it a very short process.

STAGE 3 IS THE STARTING STAGE FOR MOST AVERAGE REPAIRS!

Stage 2

This is the stage that removes all visible repair marks left by Stage 3. It is also the starting stage for very light scratches and scuffs on many kinds of discs. Remember though that the pad is not doing the work, the polishing compound is. So make sure to use plenty of it and apply about the diameter of a quarter (1" or 2.5 cm) on the pad where the disc will cover it. Keep a good continuous flow of water - this stage tends to get hot and must remain well lubricated. The Spray Cleaner also helps lubricate this step.

THE POLISHING COMPOUND DOES THE WORK, NOT THE PAD!

Stage 1

This is the finishing stage, where a lighter pressure is applied to give the disc its final shine. Again, the polishing compound is doing the work so use plenty of it (1 hor 2.5 cm diameter.) Keep that flow of water coming and be generous with the Spray Cleaner that will provide lubrication and give the disc its bright finish.

THE POLISHING COMPOUND DOES THE WORK, NOT THE PAD!

Tip 1: *If a disc comes out of Stage 1 with an orange-peel looking finish, it is because the polishing compound ran out too early in the cycle. If this occurs, simply repeat the Stage 1 using more polishing compound.*

Tip 2: *After the normal Stage 1 cycle, run it for an additional 5-10 seconds without water to dryup most of the disc. However use caution not to allow heat to build up. If you experience a problem, shorten this drying step.*

Tip 3: *If a disc is non-functional after a complete repair, re-run the Stage 2 and the Stage 1 with an even larger amount of polishing compound and Spray Cleaner, while increasing the cycle time.*

Tip 4: *If Tip 3 fails, and the ruined disc is worth a try anyway, you may attempt to repair it again starting with a short 10-20 seconds Stage 5, repeated until all the scratches have been removed. Make sure there is always a good continuous flow of water, not just a trickle. Proceed through the subsequent Stages 4, 3, then the Stages 2 and 1 remembering to use plenty of polishing compound and Spray Cleaner.*

Recommended Repair Stage Sequence For Each Disc Type And Condition

Disc Type	Depth Of Scratches - Disc Condition					
	Gouges*	Deep**	Medium	Light	Scuffs	Dirty
CD, CDR, Data CD, PSI:						
DVD, Xbox, and PS2:	-----	Gouges	Deep	Medium	Light	Dirty
Game Cube Disc:	-----	-----	Gouges**/Deep	Medium	Light	Dirty
	↓	↓	↓	↓	↓	↓
Repair Stage Sequence:	6	5	4	3	2	1
	→	→	→	→	→	

* 10-20 seconds or less, and repeat that stage only if necessary to remove the original scratches

** Repeat that stage if necessary to remove all the original scratches

Important Notes Concerning Polishing Papers

Recent Studies have shown drastic improvements and success rates of disc repairs if the following operations are followed.

1.) Always place sticky side of polish papers down onto black side of holder. On each disc you received there is a wax paper type backing that must be peeled off. This surface must be absolutely **DRY!** If it is damp the adhesive will not cure and the papers will come off the surface and rip.

When changing papers it is recommended to have a second set of black & white pads that are dry to switch with. Take a paper towel and dry the wet surface, then let it air-dry to ensure the papers will stick.

2.) Wrinkles will occur on each paper, if there is a large wrinkle in a paper after it is installed, smooth it out to the best of your ability, this will prevent premature wear. If there is a large wrinkle in the paper, this area will wear first and whiten. Once the minerals have worn off the paper, it must be replaced. Continuing use of the paper after it has worn will result in repair marks upon final polish. When you pull the polishing pad off the machine, smooth out the wrinkles, this will extend the life of each disc. Stage six does not necessarily act the same, once water gets between the polish paper holder and the paper it will come off and could rip apart.

3.) Several things, water alchemy, and surface of the disc determine the life of polish papers (if the disc has heavy scratches or pebbles imbedded in it they will wear faster) but the most important is time. The more time the disc has been in action the more it will wear. The total run time of each disc will be about 10-15 minutes before the quality of repairs is very noticeable, once the disc wears, you will notice repair marks that do not seem to come out in the final polish stage. We recommend changing the papers after 10 minutes of run time or 20 repairs which ever comes first. Some tests have shown that you can get up to 30 repairs out of one paper, but you must keep in mind the more the paper has worn, the less aggressive it is and will take longer dwell times to reach the same result. If you want a constant system to go on, run each stage for an average of 1 minute per repair and this will give you 10 repairs out of the paper. After the 10th disc you will be able to visually tell that the paper will have become less effective and could possibly start leaving inconsistent repair marks after the final polish. To avoid re-works and headaches simply run each disc ten times at a minute per (maximum) and this should eliminate reworks.

4.) New studies have found that you can improve the quality of you repairs and extend the life of your polishing papers by adding a surfactant to each tank of water. If you have purchased our **CD SPRAY CLEANER**, simply pour 2 ounces of the spray cleaner into each full tank of water. This will add a lubricant to the polish process and help remove swarf off each disc. This will extend the life of the papers, and polish them to a finer stage than using regular tap water. This will also prevent loading and lock up when using the very course stage 6.

5.) Do not lay your polish pads or papers onto a dirty surface! They will pick up extra abrasive particles that will re-scratch the disc, and in a random fashion. This will make life very difficult, you will wonder why these crazy repair marks keep showing up out of nowhere. **KEEP THEM CLEAN** and **CHANGE THEM OFTEN**. It is better to spend a little more time and do a repair right the first time, then it is to fight the process and pinch pennies trying to get "one more" repair out of a worn out paper.

6.) DO NOT SKIP STEPS! It will cost you more in time and frustration then it is worth. We have a full time staff of polishing experts working on the development of this process. We are looking for faster and more efficient ways of repairing discs, as soon as something new is learned will be the first ones to inform you of our new methods.

PREVENTIVE MAINTENANCE

WARNING: Always disconnect the machine from its power supply before cleaning.

NORMAL MAINTENANCE

Replace the main polishing heads (Stage 1 & 2) when worn. Replace the Micro-Abrasive Polishing Papers after 10 minutes of run time. For consistent finishes, replace the entire of set Super Life™ Heads at the same time. Match the old and new heads to ensure that they are the same height. If there is a difference in height you may have to adjust the polish pressure for the new set. Before making any adjustments, contact Azuradisc or a local representative, as making adjustments will greatly affect the performance of your machine.

CLEANING

- The machine should be cleaned every three months, or after 100 repairs, whichever comes first.
- The outer case can be cleaned with a damp non-abrasive cloth. Do not get the power switch or timer wet. Do not flood the sink area with water.
- The sink basin is designed to accept a small amount of water from run off during repairs only. Check and clean the drain often. If the drain becomes clogged or blocked, turn the machine off, disconnect it from its power supply and unclog the drain before continuing use. NEVER use sharp objects or chemical cleaners to clean drain. Use hot water to occasionally clean the drain system
- To clean the inside tray of the machine it is recommended that you use a small damp cloth. This will pick up any dust residue. If the machine requires a more thorough cleaning, use a mild cleaning product such as standard window cleaner or Armor All™.
- The remaining areas, including inside the water tray, may be wiped with a damp cloth.

EDUCATION

HOW DISCS ARE MADE

CDs consist of 99% clear polycarbonate plastic. The reflective layer, protective layer and screen print comprise the remaining 1% of the disc.

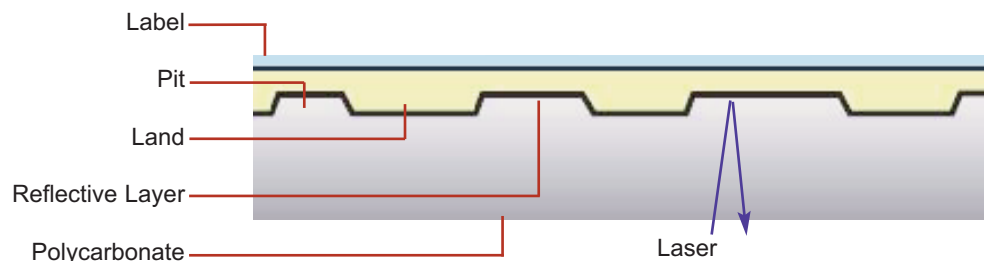


1. A disc is created from molten polycarbonate and digital information is stamped on the top of the disc, while it is still near melting point, using a die with microscopic bumps. These bumps are known as “pits and lands”.
2. After the information is molded into the polycarbonate, a reflective foil layer is applied using a process called sputtering or wet silvering. This layer reflects the laser back to the player, so its integrity is extremely important. The layer is usually silver, but can be made of gold or platinum.
3. A clear lacquer coating is applied to seal the reflective layer and prevent oxidation. This layer is very thin and offers little protection from top side scratches.
4. Finally the artwork is screen-printed on the top of the disc.

Pits and Lands are imprinted into the disc to indicate a one or a zero. A laser beam is sent from the player to the disc and the reflective layer reflects it back to the reader and the ones and zeros are translated by the player.

Recordable discs have a photosensitive dye type layer instead of the stamped information layer. This layer, when exposed to a certain light, will make an impression of a pit into the layer.

Re-recordable discs use a layer that allows the laser to polarize the photosensitive layer back and forth between a visible pit to an invisible pit.



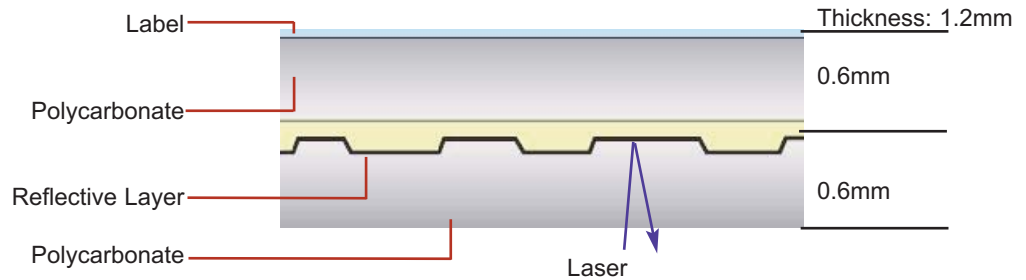
HOW A DVD IS MADE

DVDs are made in different ways depending on the amount of information that is recorded on the disc. DVDs may be single or double layered and single or double layered double sided.

NOTE: Due to the position of the data layer on DVDs, the amount of polycarbonate is less than a normal CD; therefore a DVD can not be repaired as many times as a CD.

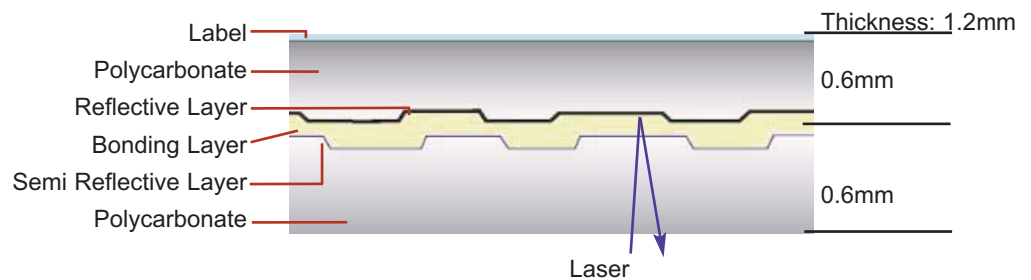
Single Layer DVDs (DVD-5) (4.7GB)

These DVDs are made the same way as a CD with one additional polycarbonate layer added between the label and the pits and lands.



Double Layered DVDs (DVD-9) (8.5GB)

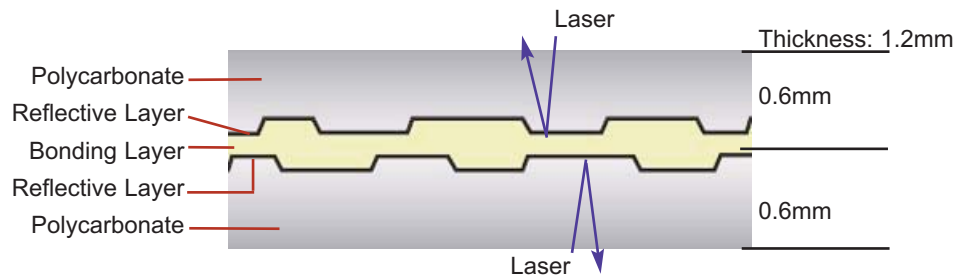
Double layered DVDs have a semi reflective layer and a reflective layer giving two layers to store information.



Double Sided DVDs (DVD-10) (9.4GB)

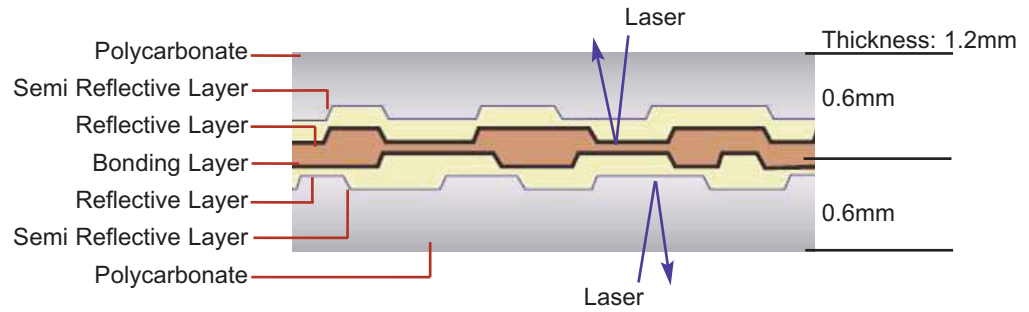
Double sided DVDs consist of two discs bonded back to back with the reflective layers in the middle and both sides are repairable.

Note: Double sided DVDs require a different size of micro-abrasive polishing papers to prevent the manufacturer's label area from being removed during the repair process.



Double Sided/Double Layered DVDs (DVD-18)
(17.1GB)

Double sided/double layered DVDs are simply two double layered discs bonded back to back.



IDENTIFYING SCRATCHES

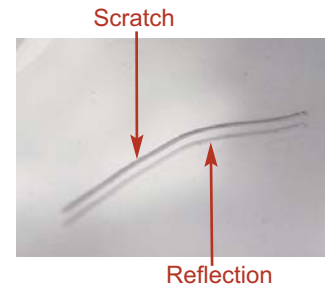
The three basic types of scratches are topside, reading side, and the top side foil dent. When repairing DVDs the top side scratch and the foil dent do not apply due to the construction of the disc.

CDs, CD-ROMs & DVDs

Reading Side Scratches

Reading side scratches are the most common type, the easiest to identify, and the only type of scratch that can be repaired.

If the scratch has a double image, as shown in the figure to the right, it is a reading side scratch and can be repaired by using an Azuradisc scratch repair machine. The double image is the result of the actual scratch and a reflection made by the reflective foil layer.



CDs & CD-ROMs ONLY

The scratches shown below are not found on DVDs

Top Side Scratches

Top side scratches are caused by a sharp object damaging the printed label of a disc. In this case, the information just below the printed label is damaged and causes a skip. Top side scratches cannot be repaired, however they can be prevented by using an Azuradisc Scratch Guard.

The easiest way to identify the top side scratch is to hold the suspected scratch up to a light source and the light will pass through the disc.

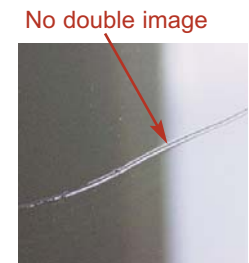
Note: If light does not pass through, check the reading side of the disc and if there is a scratch without a “double image”, it is a top side scratch that did not remove any of the label.



Top Side Foil Dents

Top side foil dents are not scratches but look like a scratch on the reading side of the disc. The dent is made by a large amount of pressure put on the label side of the disc, causing the foil layer to dent. This dent will cause skips and cannot be repaired, however they can be prevented using an Azuradisc Scratch Guard.

The easiest way to identify the top side foil dent is to see if there is a “double image” produced. There should not be a second image because the damage is to the inner foil layer. There will not be any evidence on the label side of the disc because the pressure did not cause any of the label to be removed.



THE MODEL 1600

Disc Repair Technologies

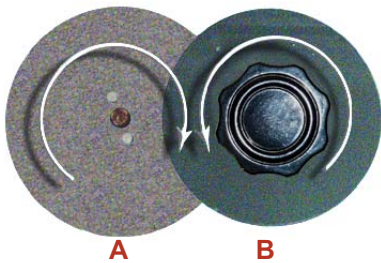
Low and high friction are the two main types of disc repair methods available.

Low friction disc repair machines, such as the Azuradisc Model 747, are excellent for repairing light scratches and scuff marks. The process consists of one turntable (A) powered by a motor as the second turntable (B) spins freely. The high speed of the power driven turntable causes the second turntable to turn in the opposite direction as illustrated in the diagram below. This method creates a low amount of friction allowing a dry process that will not damage the disc.

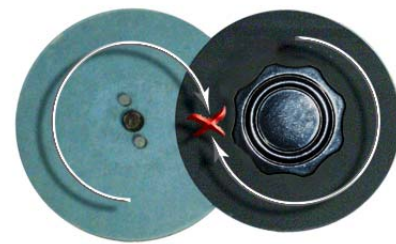
Note: This repair process only permits the use of polishing heads and not abrasive materials.

High friction machines, such as the Azuradisc Model 1600, utilize up to 4 different abrasive steps and 2 polishing steps, and are ideal for repairing scratches found on the reading side of a disc. The process consists of two power-driven turntables rotating in the same direction, creating the most friction and allowing for a faster cut rate when using an abrasive material. Water is used to cool the disc to prevent damage by the friction and permits a wide range of disc repairs.

Low Friction - Model 747



High Friction - Model 1600



High Volume Disc Repair

The Model 1600 can be used as a single repair station, or multiple machines may be used to create a high volume disc repair line. The repair process times can be decreased by designating each machine with its own stage and operating multiple machines simultaneously. For more details, please contact the Azuradisc representative.



Single Machine



Multiple Machines

INSTALLATION AND ADJUSTMENT OF OPTIONAL FAST-ON HANDLE

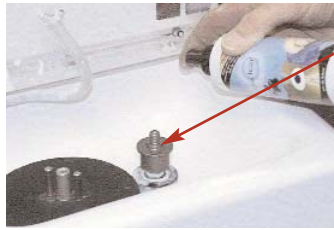
REMOVING THE SMALL TURNTABLE



1. Small Turntable



2. Roll back the black rubber cover to expose the lock screw.



3. Spray Azuradisc Spray Cleaner on the exposed lock screw to clean and lubricate.



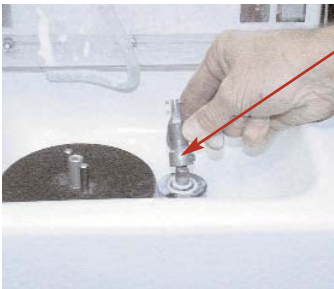
4. Using the 1/8 inch hex key, remove the lock screw.



5. Remove the small turntable from the shaft.

Note: Clean the shaft with a soft Scotch-Brite® type of material, so the new spindle will slide onto the shaft easily.

INSTALLING THE FAST-ON SPINDLE



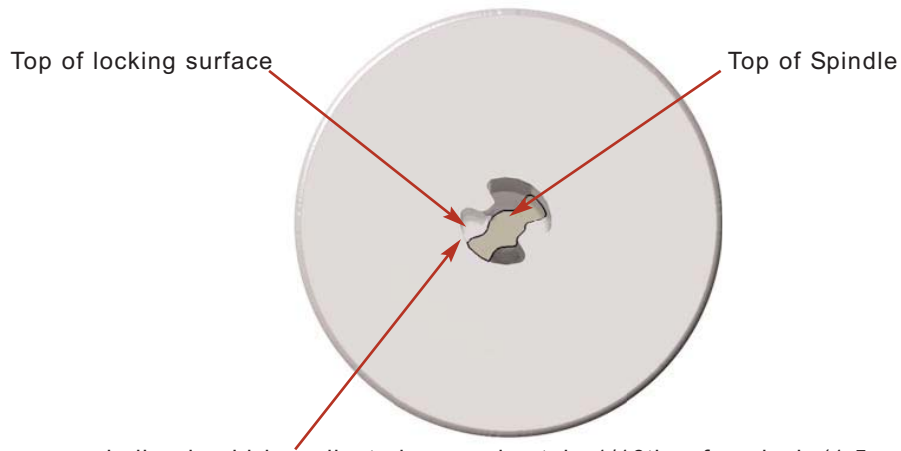
6. Place the spindle on the shaft, taking care to align the lock screw with the groove on the shaft. Tighten the lock screw enough to hold the spindle in place, but loose enough to allow it to be adjusted up and down.



7. Place a SuperLife™ Head on the large turntable and a disc on the spindle. Set the Fast-On Handle over the spindle and disc, but do not lock it down.



8. Adjust the spindle so the top of the spindle is approximately 1/16th of an inch higher than the top of the locking surface. (See the next figure) Tighten the lock screw with the 1/8 hex key.



The top of the new spindle should be adjusted approximately 1/16th. of an inch (1.5 mm) above the locking surface of the Fast-On Handle.

NOTE: Due to differences in manufacturing tolerances, this adjustment may need to be adjusted to a higher or lower position on an individual machine.

USING THE FAST-ON HANDLE



Place the disc (label side up) on the spindle. Place the handle assembly on the spindle. Press the handle down and twist ¼ turn counter-clockwise to lock it in position. When the repair cycle is complete, twist the handle ¼ turn clockwise to unlock.

Note: Rinse the handle assembly with clean water when repairs are complete. Do not leave handle assembly mounted and locked in position when not in use.



FAST-ON HANDLE MAINTENANCE



If the Fast-On Handle appears to be binding or hard to remove, carefully spray with a waterproof silicone-type lubricant (such as "Slick 50®) as shown. Do not over lubricate; wipe off any excess.

ONE-YEAR/100,000 DISC LIMITED WARRANTY

WARRANTY COVERAGE

Azuradisc's warranty obligations for its products are limited to the terms set forth below:

Azuradisc, Inc. ("Azuradisc") warrants all of its non-replacement products or parts (the "Warranted Products"), against defects in materials and workmanship for a period of one (1) year from the date of original purchase or (for disc repair and disc testing machines and parts thereof) until 100,000 discs have been processed using that Warranted Product, whichever comes first ("Warranty Period").

If a defect is discovered and a valid claim received by Azuradisc within the Warranty Period, at its option, Azuradisc will (1) repair the Warranted Product at no charge, using new or refurbished replacement parts, (2) exchange the Warranted Product with one that is new or that has been manufactured from new or serviceable used parts and is at least functionally equivalent to the Warranted Product, or (3) refund the purchase price of the Warranted Product. No Lemon Guarantee: Notwithstanding the foregoing, if more than 3 valid claims are received by Azuradisc during the Warranty Period for the same defect in a Warranted Product, Azuradisc will replace the Warranted Product with a new one.*

Azuradisc warrants replacement products or parts provided under this Limited Warranty against defects in materials and workmanship from the date of the replacement or repair for ninety (90) days or for the remaining portion of the Warranted Product's warranty, whichever provides longer coverage for you. When a Warranted Product is exchanged, any replacement item becomes your property and the Warranted Product becomes Azuradisc's property. When a refund is given, the Warranted Product becomes Azuradisc's property.

30-DAY/720-DISC MACHINE REFUND POLICY*

If you are in any way dissatisfied with your purchase of one of our disc repair or disc testing machines, you may return it to Azuradisc within 30 days or before processing 720 discs, whichever comes first. Azuradisc will provide you with a full refund, minus your shipping costs and a restocking fee of up to 15% of the price of your machine (depending on the condition of the machine). In order to receive a refund, your machine must be returned undamaged and postmarked within 30 days of receipt. Return shipments to Azuradisc must be insured for the entire cost of the machine.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to the Warranted Products. This Limited Warranty does not apply to any other products, whether or not packaged or sold with the Warranted Products.

This Limited Warranty can be redeemed only by the original purchaser of a Warranted Product. If you wish to transfer this Limited Warranty, please contact Azuradisc for more information.

Any Software distributed by Azuradisc, whether or not incorporated into the Warranted Products, is not covered under this Limited Warranty. Refer to Azuradisc's Software License Agreement, reviewable at www.Azuradisc.com or by calling 1 (800) WE-FIX-CDS, for more information.

This Limited Warranty does not apply to the following:

- Normal wear or deterioration (follow preventative maintenance schedules to minimize wear and tear on your machine);
- Improper installation or maintenance including but not limited to failure to follow any preventative maintenance schedule;
- Damage caused by accident, abuse, misuse, misapplication, or failure to follow usage directions;
- Warranted Products that have been used with non-Azuradisc products;
- Damage caused by service performed by anyone other than Azuradisc or an Azuradisc-certified service technician;
- A Warranted Product that has been modified without the written permission of Azuradisc;
- If any Azuradisc serial number, date stamp or other marking has been removed or defaced;
- Any item concerning the Warranted Product's appearance that is not due to a defect in material or workmanship.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. AZURADISC SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF AZURADISC CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN TO THE EXTENT POSSIBLE ANY CLAIMS UNDER SUCH IMPLIED WARRANTIES SHALL EXPIRE ON EXPIRATION OF THE WARRANTY PERIOD. No Azuradisc reseller, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

IN NO EVENT SHALL AZURADISC BE LIABLE, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT PRODUCT LIABILITY OR OTHERWISE, FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF A WARRANTED PRODUCT, OR FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING LOSS OF PROFITS, LOSS OF USE, INTERRUPTION OF BUSINESS, OR ANY COSTS OF RECOVERING OR REPRODUCING ANY PROGRAM OR DATA STORED IN AN OPTICAL DISC, ARISING OUT OF OR IN CONNECTION WITH THE USE OF OR INABILITY TO USE THE WARRANTED PRODUCT OR AZURADISC'S PERFORMANCE OF ITS OBLIGATIONS HEREUNDER, TO THE FULL EXTENT THESE DAMAGES MAY BE DISCLAIMED BY LAW.

This Limited Warranty gives you specific legal rights and you may also have other rights that vary from jurisdiction to jurisdiction.

OBTAINING WARRANTY SERVICE

If you have a problem with one of the Warranted Products, **DO NOT SHIP THE PRODUCTS DIRECTLY TO AZURADISC**. Instead, please contact our Technical Support personnel at 480. 827.8786 or 1.800.WE.FIX.CDS for a return authorization number.

For all warranty service, the Warranted Product must be returned to Azuradisc or an Azuradisc-designated repair center with the transportation charges prepaid through an insured carrier. Proof of purchase and location purchased from, as well as an explanation of the problem, must accompany the Warranted Product. You are responsible for any import duties, taxes and other such fees. Azuradisc will reimburse your prepaid transportation charges only when replacing Warranted Products pursuant to the No Lemon Guarantee. Provided that your Warranted Product is returned to Azuradisc in the manner prescribed above and that your Warranted Product requires service covered by this Limited Warranty, Azuradisc will pay for return shipping to you anywhere in the Continental United States.

*No Lemon Guarantee and 30-day/720-disc machine refund policy apply only to Continental United States customers.