



AEGIS
TOOLS INTERNATIONAL®



**Windshield Repair
 System
 Kit 2000**

Instruction

CONTENTS

FOR CUSTOMER ASSISTANCE.....	Inside Front Cover
LIMITED WARRANTY INFORMATION.....	Inside Front Cover
INTRODUCTION TO YOUR QUICKSILVER TECHNOLOGY™ SYSTEM	
Welcome to the System.....	1
Learning the to Use AEGIS® Equipment.....	2
AEGIS® Training Seminar.....	2
Types of Windshield Breaks.....	3
General Repair Guidelines.....	4
Your AEGIS® QuickSilver Technology™ Equipment.....	6
How the AEGIS® QuickSilver Technology™ Repair System Works.....	11
MAKING REPAIRS	
Repair Procedure.....	12
Preparing the Windshield.....	13
Which Resin to Use.....	13
Setting Up Your Repair Fixture.....	14
Preparing the Injection Chamber.....	16
Primary Dry Vacuum Cycle.....	17
Initial Pressure Cycle.....	18
Secondary Vacuum Cycle.....	18
Final Pressure Cycle.....	19
Curing the Resin.....	19
Finishing the Repair Process.....	20
SPECIAL TECHNIQUES	
Drilling Techniques.....	21
Pit Filling.....	24
Repairing Cracks.....	25
Advanced Techniques for Difficult Breaks.....	26
TROUBLESHOOTING GUIDE	
Problems and Solutions.....	28
MAINTENANCE	
Maintenance Schedule.....	34
Replacement Parts.....	36

Save These Instructions

FOR CUSTOMER ASSISTANCE

By Phone:

US/Canada: 888.247.6000

International: 608.274.9254

By Internet:Website: www.aegistools.come-mail: info@aegistools.com**By Fax:** 608.274.9395**By Mail:**

Letters: PO Box 259688, Madison, WI 53725-9688 USA

Packages: 2810 Syene Road, Madison, WI 53713 USA

Please provide the following information when you contact us: model number, serial number (if applicable), date of purchase, your complete mailing address including zip code, your day-time telephone number including area code and a description of the problem.

LIMITED WARRANTY

What Does This Warranty Cover? Products manufactured by Aegis Tools International® are expressly warranted to be free from defects in material and workmanship.

How Long Does The Coverage Last? Items covered by this expressed warranty are covered for one year from the date of delivery. Parts and products not manufactured by Aegis® are covered by the warranty of the original manufacturer. For additional information concerning parts or products not manufactured by Aegis®, you may contact Customer Service. Service work and repairs performed at Aegis® are warranted for six months from the date of repair.

What Will Aegis Tools International® Do? Seller's exclusive obligation under this warranty is to repair the defective item or replace it, at Aegis® option, without charge, provided the defective item is returned no later than 30 days after the end of the applicable warranty period. Aegis® reserves the right to use new, reconditioned or used parts in performing warranty work.

What Does This Warranty Not Cover? This warranty is non-transferable. This warranty is void if the item has been repaired, damaged, or modified by anyone other than Aegis® or has been damaged as a result of vandalism, acts of God, misuse or abuse. This warranty does not cover normal wear and tear or damage caused by shipment.

How Do You Get Service? In order to be eligible for service under this warranty you must call Aegis® Customer Service at 888.247.6000 or 608.274.9254 to get a return authorization number. Return the complete product with a copy of the original purchase receipt and return authorization number, freight pre-paid and insured to Aegis®. Aegis® will pre-pay return freight on warranty service. Return authorization numbers expire 30 calendar days after issue.

Your Rights Under State Law: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL AEGIS TOOLS INTERNATIONAL® BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS.

This statement supersedes all previously published expressed warranties.

QuickSilver Technology™ is a trademark of AEGIS Tools International®, Inc. The device is patented under United States Patent 6,485,281 and United States Patent 6,663,371.



Welcome to AEGIS®

Congratulations on your purchase of AEGIS® windshield repair equipment! Your AEGIS® windshield repair equipment was designed and manufactured by auto glass professionals for use by professionals.

Please read these instructions thoroughly before attempting to repair a customer's windshield.



PLEASE REVIEW AND FOLLOW THESE INSTRUCTIONS BEFORE ATTEMPTING A REPAIR ON A CUSTOMER'S VEHICLE. Before doing any actual customer repairs please: READ ALL INSTRUCTIONS and practice. We recommend repairing at least 6 breaks before working on a customer's windshield. Remember to wear eye protection, gloves and protective clothing to prevent exposure to adhesives.

Disclaimer: AEGIS Tools International®, Inc., its principals and suppliers are not responsible for damages resulting from misuse of this equipment.

THE WINDSHIELD REPAIR PROFESSION

To be successful at windshield repair, you need professional equipment, experience using your equipment and a good understanding of the best practices in the industry. In the United States, windshield repair professionals have the benefit of a voluntary standard that outlines proper procedures and practices. The standard, known as the *Repair of Laminated Automotive Glass Standard* (ROLAGS), was approved in 2007 by the American National Standard Institute (ANSI).

The ROLAGS standard was developed by the National Glass Association (NGA) and the National Windshield Repair Association (NWRA), two trade organizations in the automotive glass and windshield repair industries. You can review and download the standard at www.rolags.com.

The guidelines and instructions for AEGIS® Windshield Repair equipment are intended to be compliant and consistent with the ROLAGS standard. Our manual is updated and printed as needed to ensure that it reflects the ROLAGS standard at the time of purchase. Since revisions to ROLAGS may have occurred since purchasing your kit, it is best to check the ROLAGS website or www.aegistools.com for the most up-to-date information.

The NWRA also administers a program to certify repair technicians who demonstrate proficiency and compliance with ROLAGS. Information on NWRA certification is contained in your kit.

LEARNING TO USE AEGIS® EQUIPMENT

While operating AEGIS® Windshield Repair equipment is not difficult, practice is required to become proficient. The more you practice, you will learn each break is unique, and certain techniques yield better results on some breaks than others.

For best results, follow these steps:

- Get a scrap windshield and make several breaks with an AEGIS® Hook Tool (TLS2526).
- Let the breaks stabilize 24 hours.
- Review this manual.
- Repair the breaks according to the “Making Repairs” instructions in this manual before working on a customer’s windshield.

If problems or questions arise, see the “Troubleshooting Guide” in this manual. If you do not find the solution, contact AEGIS®. Our technical support staff is available 8 am to 4 pm CST, Monday through Friday.

AEGIS® TRAINING SEMINAR

Most AEGIS® users are self-trained, but training is available for those who want it. AEGIS® offers a **complimentary**, hands-on windshield repair training at our Madison, Wisconsin headquarters. In a one-day, comprehensive session, you will learn from our experts how to perform repairs and care for your equipment. You only pay for your travel and related expenses. However, for a fee, an AEGIS® trainer can conduct a seminar at your location. Please contact us directly for more information about AEGIS® training seminars.

WINDSHIELD REPAIR SCIENCE

The windshield repair process involves evacuating trapped air, moisture and debris from a break using a vacuum, then using pressure to fill the damaged area with adhesive. The process permanently prevents the damage from spreading and greatly improves the appearance of the break.

About Laminated Glass

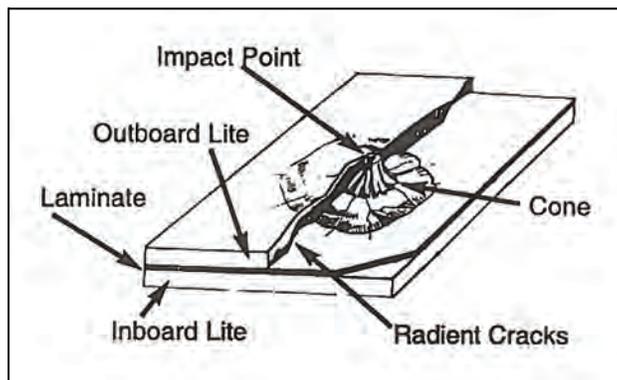
Laminated glass is used in windshields and some side windows (sidelites) because it holds together when shattered. Laminated glass consists of a polyvinyl butyral (PVB) interlayer bonding two layers of glass (lites). The PVB layer is also called the laminate.

To view a 5-minute video of how windshields are made, go to the following web address:

http://www.youtube.com/watch?v=fq3moE19V5g&feature=channel_page

Only laminated glass can be repaired. Back windows (backlites) and most sidelites are made of tempered glass. Tempered glass shatters into small pieces when broken and cannot be repaired.

You will be able to repair a break in the outer layer of glass as long as it does not penetrate the PVB. When a break damages the PVB (causing a foggy or cloudy appearance) or affects the inside layer of glass, the windshield should be re-



placed.

TYPES OF WINDSHIELD BREAKS

Any type of break in a windshield is called **damage**. Damage can occur from the **impact** of an object or from **stress** on a windshield caused by twisting or improper installation. The location where a windshield is struck by an object is called the **impact point**. Stress damage typically does not have an identifiable impact point.

There are four common categories of breaks. Although no two breaks are ever exactly the same, most breaks will fit into one of these four categories.

BULL'S EYE BREAK

A bull's eye break will have a small impact point and a circular air-gap surrounding it.

This type of break is generally quick and easy to repair. A properly repaired bull's eye break will leave only a slightly visible pit at the impact point where the surface of the glass was damaged or missing.



Bull's Eye

STAR BREAK

A star break has cracks of varying lengths and widths radiating from a center impact point.

This type of break will spread very easily from temperature changes or stress placed on the glass. The star break is a more difficult break to repair. A properly repaired star break will leave a skeleton outline of the cracks and a slightly visible pit at the impact point where the surface of the glass was damaged or missing.



Star Break

CRACK

A crack is a single line of separation in the outer layer of glass with a microscopic gap. A crack may extend from an impact point and sometimes will not penetrate the outer surface of the glass. A crack is a more difficult break to repair. Even a properly repaired crack will remain visible from the head-on view. Instructions for crack repair will be covered in the "Special Techniques" section of this manual.



Crack

COMBINATION BREAK

A combination break includes two or more of the break types described above. The most common type of break is a combination of a bull's eye break and star break. Combination breaks can be filled very effectively, although the repaired break will remain more visible than a bull's eye.



Combination

GENERAL REPAIR GUIDELINES

With your AEGIS® windshield repair equipment, you will be able to repair most, but not all, windshield breaks. It is important that you analyze each break before beginning the repair process. Although there are no laws regulating windshield repair in most countries, some states and countries require vehicle inspections. In these locations, inspectors may have the authority to reject a windshield if they consider it unsafe.

NOTE: It is to your advantage to know the regulations pertaining to vehicle inspection and windshield damage in your area.

The break size, condition and location should all be considered when evaluating the repairability of a break.

LOCATION

The **Driver's Primary Viewing Area (DPVA)** is an area on the windshield approximately 12 inches wide (or 30.5 cm), from the top to the bottom of the wiper sweep centered directly in front of the driver.

ROLAGS allows repairs to be done in the DPVA depending on the size of the break. Refer to the table below for size limitations. More than one repair is allowed in the DPVA as long as they are not closer than 4 inches to each other.

However, **AEGIS® does not recommend repairing damage in the DPVA**; AEGIS® has always recommended replacement as the best option in these instances due to customer acceptance and to prevent any possible effects on vision, especially at night.

SIZE

There are recommended limits on the size and type of damage that should be repaired. While it is possible to repair larger damage, the structural integrity of the repaired glass may suffer. In addition, larger repairs will show more evidence of the original damage and may not meet your customer's expectations. The time it will take to

Type of Break	Size Limit
Bull's eye/Half Moon	1"/ 2.5 cm in diameter
Star Break/Combination Break	
Outside DPVA	2"/ 5 cm in diameter, including all legs*
Inside DPVA	1"/ 2.5 cm in diameter**
Cracks	
Outside DPVA	14"/ 35.6 cm long***
Inside DPVA	1"/ 2.5 cm long**
Surface Pit	
Outside DPVA	1/8"/ 3 mm diameter, 3/8"/ 1 cm depth
Inside DPVA	3/16"/ 5 mm diameter**

complete the larger repair may also be a deciding factor. ROLAGS size limits are:

*AEGIS® recommends 1.5 inches/ 3.8 cm diameter, including all legs.

**AEGIS® does not recommend repairs in the DPVA.

***AEGIS® recommends 6 inches/ 15.2 cm.

CONDITION OF THE BREAK

Repairs should NOT be made in the following situations:

- The damage penetrates both the inner and outer lites;
- There are 3 or more long cracks extending from the impact point;
- The damage is on the laminate or has discolored the laminate;
- The damage is on the inner lite;
- The damage has contamination that cannot be removed;
- The damage is in an area where value-added features, such as rain sensors, may be affected;
- The pit depth is greater than 3/8 inch (1 cm);
- Edge crack touches more than one edge of the windshield, and
- Any stress crack

CUSTOMER EXPECTATIONS

Properly setting the customer's expectations prior to a repair can be the most important step to insuring customer satisfaction. Visual aids are helpful in showing the customer what the finished product will look like.

Review of Repairable Breaks

- Break is in the outside lite
- Laminate/PVB layer is intact
- Break is outside the Driver's Primary Vision Area
- Break is less than 1.5 inches (4 cm) or less than 6 inch (15 cm) crack
- No local or state restrictions
- Customer understands repair results

PARTS OF YOUR AEGIS®
QUICKSILVER TECHNOLOGY™ WINDSHIELD REPAIR SYSTEM



KIT 2000 Contents

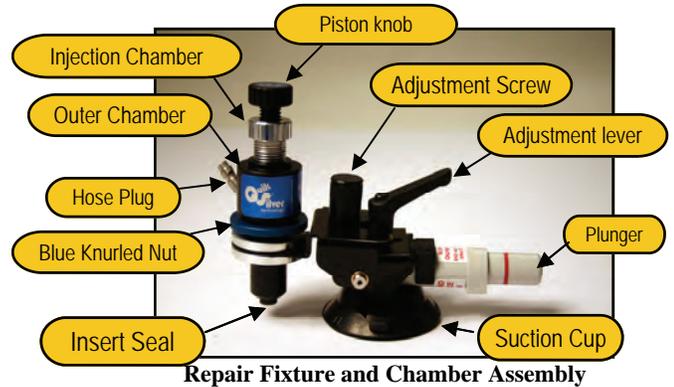
FIX4500 Repair Fixture
FIX4000 QuickSilver Technology™ Chamber
PMP4015 Gauged Vacuum Pump
HOS2000 Hose Assembly
MIR2000 Mirror
LMP3000 12-volt UV lamp w/ suction cups
LIQ2060 Single Shots, Extreme II - 25 PK
LIQ2070 Single Shots, Crack Fill - 25 PK
LIQ2080 Single Shots, Polymer II - 25 PK
LIQ3000 Alcohol, 125 mL (4.2 oz)
LIQ2000 Glycerin, 30 mL (1.0 oz)
LIQ2030 Pit Polish, 60 mL (2.0 oz)

FRM9412 Instructions
CAS2019 Carrying Case

Supply Box (SBX5001) contents:
HDW5412 Razor blades – 6 PK
HDW3000 Mylar squares – 100 PK
SBX2017 Insert Seals, 10 PK
SBX2019 O-Rings, Small, 12 PK
SBX2021 O-Rings, Large, 12 PK
SBX2018 Single Shot Filling Adaptor (4)

YOUR AEGIS® QUICKSILVER TECHNOLOGY™ EQUIPMENT

Your AEGIS® QUICKSILVER TECHNOLOGY™ Windshield Repair System (*KIT2000*) includes everything you need to make top-quality repairs. In order to follow along with this manual, it is important that you are familiar with the names and uses of each component included in your kit.



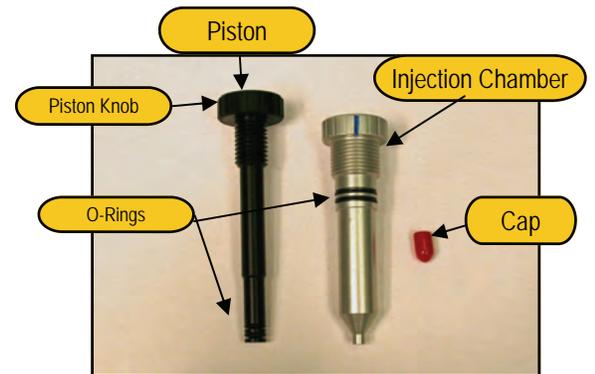
REPAIR FIXTURE (FIX4500)

The repair fixture is the heart of your AEGIS® system. It is designed to attach securely and easily to any windshield. By pumping the plunger, the suction cup holds the repair fixture tightly against the windshield. The fixture holds the chamber assembly. The adjustment lever allows you to center the chamber over the break. The adjustment screw changes the angle of the chamber so that you can work on curved areas of the windshield.

QUICKSILVER TECHNOLOGY™ CHAMBER (FIX4000)

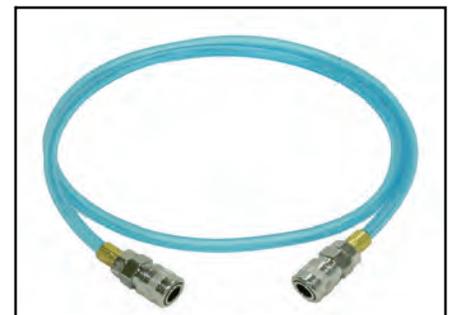
The QUICKSILVER Technology™ Chamber is made up of the outer chamber, injection chamber and piston. On the side of the outer chamber is the quick connect plug where the hose attaches. At the base of the outer chamber is the reusable insert seal which creates the air-tight seal around the break.

The injection chamber, which screws into the outer chamber becomes a reservoir for the resin. The piston and injection chamber are rotated throughout the repair process to draw dry suction, force hydraulic pressure and inject resin into the break.



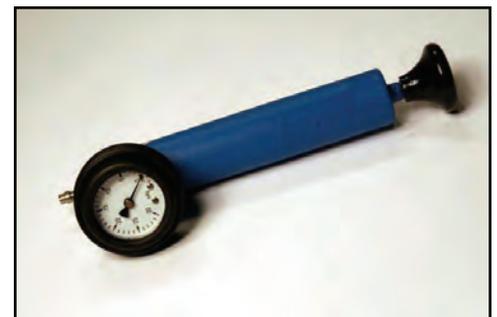
HOSE ASSEMBLY (HOS2000)

Quick-connect sockets at each end link the hose to the chamber and the gauged vacuum pump.



GAUGED VACUUM PUMP

Pull the handle in a pumping motion to draw the vacuum. Pump attaches to the hose assembly. Readings will vary slightly due to altitude and barometric pressure.





Inspection Mirror

INSPECTION MIRROR (MIR2000)

The inspection mirror helps you to monitor the repair process without getting in and out of the car. You will be able to look directly into the rear of the break from your work area at the front of the windshield.



12-Volt UV Lamp with Suction Cups

12-VOLT UV LAMP WITH SUCTION CUPS (LMP3000)

All AEGIS® resins cure with ultraviolet rays. The UV lamp easily mounts to the windshield with 4 suction cups for hands-free curing. The 10 ft. power cord plugs into the cigarette lighter inside the vehicle for complete mobile operation. Curing time with the LMP3000 is usually 60-90 seconds. If you are using a different UV lamp, curing times may vary. Uses AEGIS® UV bulbs (LMP5000 or LMP5002).

CAUTION Wear Eye Protection when using UV lamps, excessive exposure can cause permanent eye damage.



Supply Box with Contents

SUPPLY BOX (SBX5001)

Your AEGIS® QuickSilver Technology™ Windshield Repair System includes a supply box filled with razor blades, Mylar squares, insert seals, large and small o-rings, and single shot filling adaptors. All supplies can be replenished individually by ordering directly from AEGIS®. Part numbers can be found in the Parts List on page 36.

RESINS

There are three different resins included in your AEGIS® QuickSilver Technology Windshield Repair System. All are exclusive to AEGIS® repair systems, require Mylar squares for curing, and harden (cure) under exposure to ultraviolet light. Resin must be stored at room temperature and out of any light source, especially sun light. All resins are non-yellowing and cure optically clear.

AEGIS® POLYMER II (LIQ2080)

Polymer II is thicker and works best on bull's eyes and half-moon breaks without any radiant cracks.



Polymer II Single Shot

AEGIS® CRACK FILL (LIQ2070)

Crack Fill is thinner and works well on all types of breaks. It works extremely well on breaks with small tight cracks.



Crack Fill Single Shot

AEGIS® EXTREME II (LIQ2060)

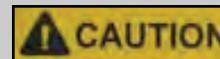
EXTREME II is the thinnest of the resins and has excellent flow properties allowing you to fill the most stubborn breaks.



Extreme II Single Shot



DO NOT allow AEGIS® resins to come in contact with vehicle paint. AEGIS® resins will damage vehicle paint; always use a protective cloth in the repair area. The AEGIS® Hood Cover (*HDW5532*) and Fender Cover (*HDW5523*) are sold separately for this use.



For your safety, read all labels and MSDS sheets included in your kit. Use AEGIS® resins only in a well-ventilated area and avoid contact with eyes and skin. If any AEGIS® resin gets in your eyes, flush with clean water for 15 minutes and see a doctor immediately. If you swallow any AEGIS® resin, drink two glasses of water and see a doctor immediately. If you get any AEGIS® resin on your skin, wash well with soap and water.



Alcohol

ALCOHOL

Alcohol is used to clean resin from the repair system parts.



Glycerine

GLYCERIN

Glycerin is used to keep rubber **suction cups** in top-condition. It softens and treats the rubber **suction cup** of the **repair fixture** and the **inspection mirror**, maintaining pliability and extending service life.



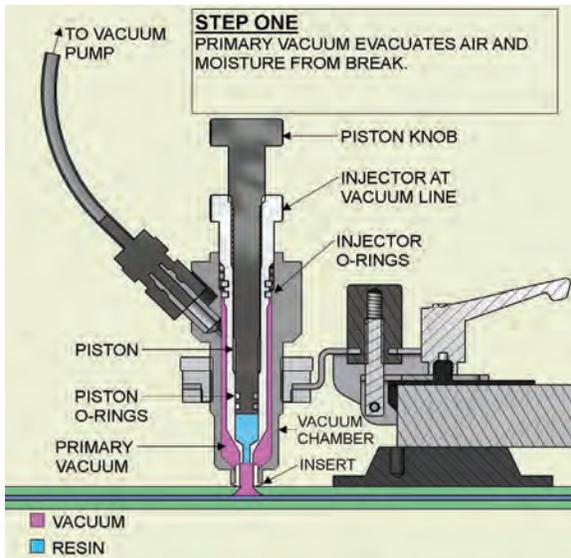
Pit Polish

PIT POLISH

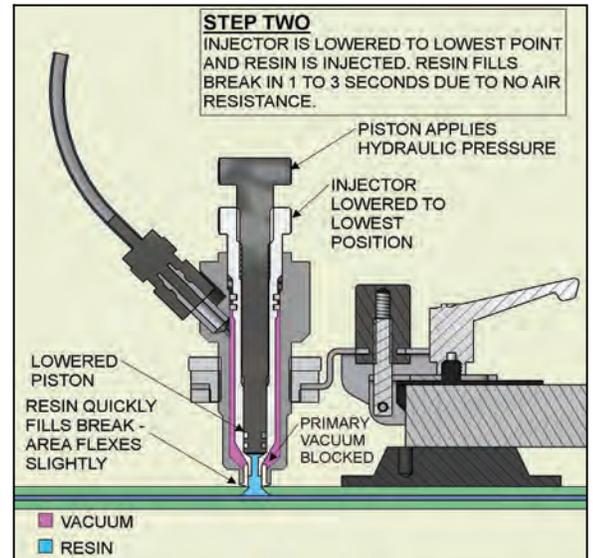
Pit Polish can be used with **Pit Filler**, **Polymer II**, **Crack Fill**, and **Extreme II resins** to provide a clearer finish.

HOW THE QUICKSILVER TECHNOLOGY™ AEGIS® WINDSHIELD REPAIR SYSTEM WORKS

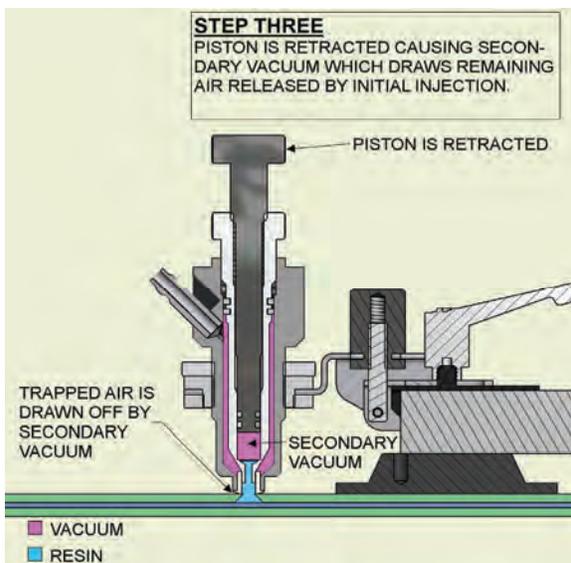
The cross-sectional diagrams below show how the QuickSilver Technology™ repair process works.



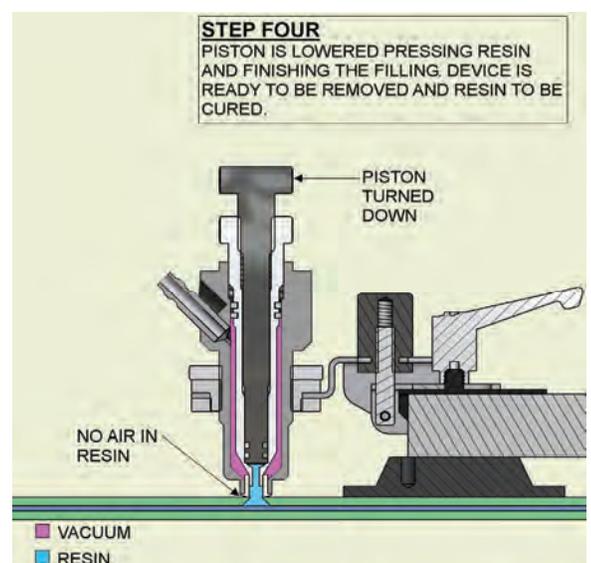
Step One: Primary Vacuum



Step Two: Primary Pressure



Step Three: Secondary Vacuum Cycle



Step Four: Final Pressure Cycle

Making Repairs



AEGIS® Hood Cover



AEGIS® Sun Screen



Moisture Evaporator

REPAIR PROCEDURE

IMPORTANT

Before performing repairs for customers, carefully read this entire manual and practice repairs on a scrap windshield to become familiar with the process.

ENVIRONMENTAL FACTORS

There are a number of environmental factors that will affect the outcome of a repair. The most important factors are presence of moisture in the break, temperature of the glass, dirt in the break, or direct sunlight. To guard against excessive direct sunlight, use the optional AEGIS® Sun Screen – UV Blocker (KIT1044). Put a protective cloth over the hood area below the break or use an AEGIS® Hood Cover (HDW5532) Fender Cover (HDW5523).

Moisture

Moisture in a break will often show up as a cloudy area at the bottom of the break. If moisture is present, dry the break with the Moisture Evaporator (TLS5000) before proceeding.

Temperature

The ideal glass temperature for doing a repair is between 40°F and 85°F (5°C to 30°C).

CAUTION Too much heat can run a break. When heat is used, always allow windshield to cool before continuing.

COOL THE GLASS:

- Park car in shade and open windows.
- Run air conditioning or defroster on cool.

WARM THE GLASS:

- Park car in heated building

CAUTION Sudden change in glass temperature may cause break to run.

Run heater or defroster on warm.

Dirt

Dirt or loose glass in the pit area must be removed. **Gently** flick it out with the tip of a razor blade or the optional AEGIS® Carbide Probe (HDW5040).

CAUTION Eye protection is recommended for this procedure.

Direct Sunlight

Direct sunlight or even cloudy skies can produce enough UV light to cure the resin prematurely. Always do repairs in the shade or cover the work area with a shop cloth or an AEGIS[®] Sunscreen UV Blocker (KIT1044).

PREPARING THE WINDSHIELD

Clean the glass around the break using an **alcohol-based** glass cleaner. To avoid contaminating the break, spray the glass cleaner on a towel. **DO NOT** spray the cleaner directly onto the glass.

Put a protective cloth over the hood below the break area or use an AEGIS[®] Hood Cover (HDW5532) or Fender Cover (HDW5523).

Use a dampened towel to moisten the suction cup on the inspection mirror. Gently press the mirror on the inside of the window centered behind the break.

Inspect the break for dirt or glass debris. Clean the impact point with the corner of a razor blade or AEGIS[®] Carbide Probe (HDW5040), if necessary.

WHICH RESIN TO USE?

The decision will be a matter of preference, as you become familiar with the different properties of each resin. As a general guide:

AEGIS[®] POLYMER II

Polymer II is thicker and works best on bull's eyes and half-moon breaks without any radiant cracks.

AEGIS[®] CRACK FILL

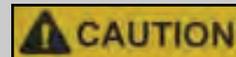
Crack Fill is thinner and works well on all types of breaks. It works extremely well on breaks with small tight cracks.

AEGIS[®] EXTREME II

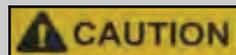
EXTREME II is the thinnest of the resins and has excellent flow properties allowing you to fill the most stubborn breaks.

Remember:

- Any of the 3 resins can be used for any type of break.
- Always keep equipment clean to avoid any mixing of resins.
- ALWAYS KEEP RESIN OUT OF SUNLIGHT!

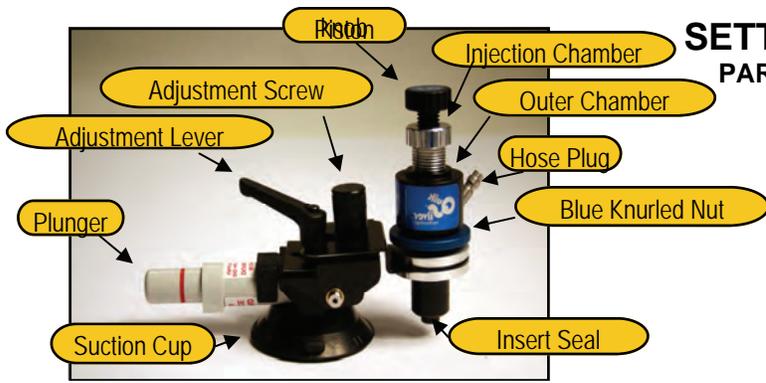


AEGIS[®] resin will damage painted surfaces. **DO NOT** allow resin to come into contact with vehicle paint. See "Troubleshooting" section if spillage occurs.



For your safety, read all labels and MSDS sheets included in your kit. Use AEGIS[®] resins only in a well-ventilated area and avoid contact with eyes and skin. If any AEGIS[®] resin gets in your eyes, flush with clean water for 15 minutes and see a doctor immediately. If you swallow any AEGIS[®] resin, drink two glasses of water and see a doctor immediately. If you get any AEGIS[®] resin on your skin, wash well with soap and water.

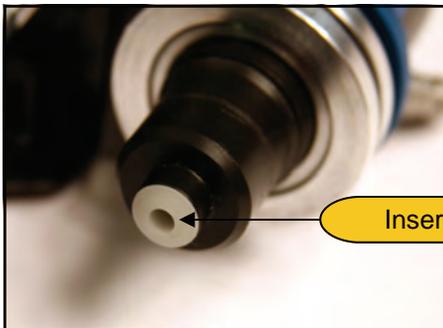
Making Repairs



Repair Fixture

SETTING UP YOUR REPAIR FIXTURE PARTS OF THE FIXTURE

The unique design of the QuickSilver Technology™ repair fixture allows repairs on virtually all windshield angles and curvatures. The suction cup at the base of the fixture attaches to the glass by pumping the plunger. The plunger's red line indicates if there is a loss of suction. The opening in the fixture arm holds the outer chamber. By releasing the adjustment lever, the fixture opening can be positioned easily and precisely over breaks, and can even reach into corners and near the edges of windshields. Small angle adjustments are made using the adjustment screw.



PREPARE THE INSERT SEAL

The insert seal must be clean and dry. Be sure there is no contamination or build up of resin on the insert seal. If there is, clean and dry it thoroughly before using or replace it.

NOTE: The insert seal must be dry to work properly. Insert Seals typically last 50-60 repairs.

Insert seal must be clean and dry for a proper seal!

SET UP THE FIXTURE

1. Insert Outer Chamber

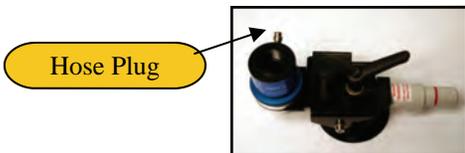
- Rotate blue knurled nut to its highest position on the outer chamber.
- Insert outer chamber into the arm, making sure the hose plug is in 12 o'clock position.
- Rotate outer chamber clockwise 5 full turns. The hose plug should be in 12 o'clock position when finished with rotations.



Blue Knurled Nut in Highest Position

2. Attach the Fixture

- Place the repair fixture on windshield and center the break by looking through the outer chamber. Make sure the impact point is visible in the opening of the bottom of the outer chamber.
- Push on fixture, then pump the plunger until the red line is no longer visible.



Hose Plug in 12 O'clock Position

3. Cant the Fixture Arm

- a. Using the adjustment screw, adjust the fixture arm so the outer chamber is slightly canted in towards the suction cup of the repair fixture.

4. Final Adjustment

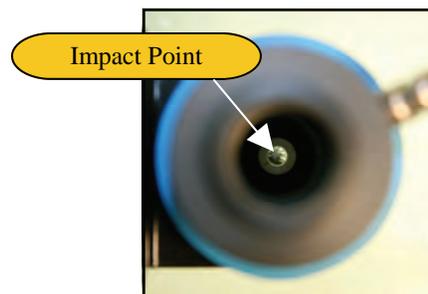
- a. If needed, loosen the adjustment lever to re-center the impact point in the opening of the outer chamber.
- b. Once the break is centered, retighten the adjustment lever.
- c. Re-check to be sure that impact point is still centered before proceeding.



Before and After Canting the Fixture

5. Placing the Outer Chamber

- a. Turn outer chamber clockwise until you feel the insert seal make contact with glass.
- b. Then add **ONE FULL TURN – DO NOT OVER TIGHTEN!**
- c. Tighten blue knurled nut by turning clockwise.

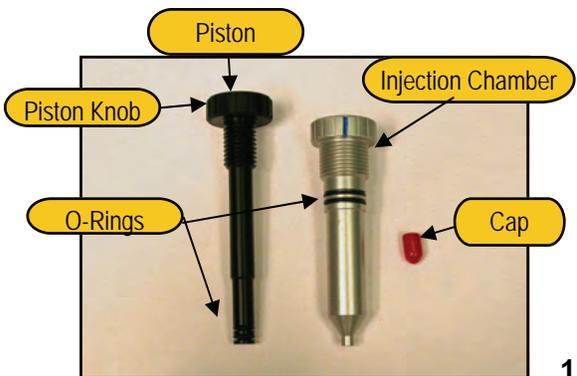


Impact Point Centered in Bottom of Outer Chamber

NOTE: The insert seal must not cover the impact point. If it does, back out the outer chamber, reposition the fixture arm with the adjustment lever to re-center the impact point with the hole in the bottom of the outer chamber.

A proper seal is critical. If the seal is too loose, you will have trouble with the insert seal not sealing during the pressure cycle. If it is too tight it may cause the break to run, or it may pinch the cracks closed and keep them from filling properly. Check to see that the red line on the plunger has not reappeared. Make any necessary adjustments before proceeding.

Making Repairs



QuickSilver Technology™
Chamber



Drawing resin into the
adaptor and injector



Turning the Injection Chamber

PREPARING THE INJECTION CHAMBER

The injection chamber will hold one AEGIS® Single Shot, however only a few drops will actually be used to fill the break. If doing multiple repairs in the length of one day, the remaining resin can be capped and stored in the injection chamber. In order for the repair device to operate effectively the **loaded injection chamber must be free of air.**

1. Prepare the Injection Chamber

- Insert piston into injection chamber and screw down until it stops - **about 6 full turns.**
- Use the blue marking on the injection chamber for a reference mark.
- With injection chamber upside down place filling adaptor on end of injection chamber.
- The resins must be gently mixed before use by turning the single shot upside down a few times. **DO NOT SHAKE.**
- Open AEGIS® Single Shot.
- Place the open end of Single Shot slightly inside the adaptor.

2. Check the Resin

The resin should be a clear liquid. If it is cloudy or contains particles, **DO NOT USE!** It is either too old or has been contaminated from earlier repairs.

- Slowly turn piston clockwise to draw resin into injection chamber.
- Once all resin is in injection chamber, carefully rotate piston counter-clockwise to push any extra trapped air out of the injection chamber.
- Rotate piston clockwise to draw the air-free resin back into the injection chamber, stopping when a small amount of resin is still visible at the opening of the injection chamber.
- Remove the filling adapter.

3. Lubricate the O-Rings

- Using a gloved finger, lubricate o-rings on injection chamber with alcohol.

4. Place the Injection Chamber

- Place the loaded injection chamber into the outer chamber.
- Line up the blue indicator line on the injection chamber with the hose plug on the outer chamber as a reference point.

- Turn injection chamber 2 ½ clockwise turns**, slightly past the point where you feel the seal engage. The repair fixture is now in position to draw the primary dry vacuum.

PRIMARY DRY VACUUM CYCLE

The primary vacuum evacuates air and moisture from the break.

1. Attaching Hose

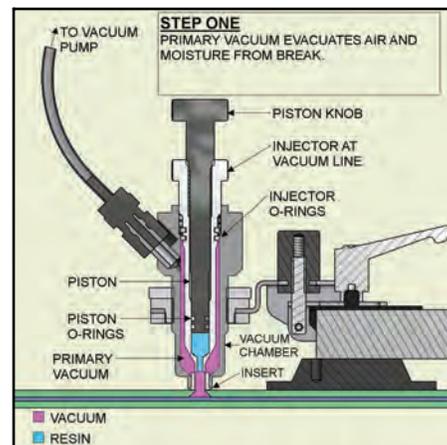
- Attach the quick-connect socket on the hose assembly to the hose plug on outer chamber. To make these connections, pull back the sleeve of the quick-connect socket and push it firmly onto the plug. Release the sleeve and the socket should snap into place.
- Attach the other end of hose assembly to the vacuum pump in the same manner.
- Give the hose a gentle tug to check the connections.

2. Initiate Primary Vacuum

- Pump the vacuum cylinder 2-6 times. This creates a vacuum that will draw out any trapped air and moisture from the break.
- Monitor the gauge. Gauge readings should remain at approx. 23 - 25 inHg. Readings will vary slightly due to altitude and barometric pressure.

3. Maintain Vacuum

- Hold the vacuum for a minimum of **one full minute**.



Primary Dry Vacuum Cycle



Attach the Hose Assembly to the Repair Fixture

▲ **TIP:** Can't maintain a vacuum? Turn the knurled nut ¼ turn clockwise and initiate vacuum again. If this does not solve the problem, consult Troubleshooting Guide.

▲ **TIP:** Applying heat to the inside of the windshield using a lighter or AEGIS® Moisture Evaporator during the vacuum cycle will effectively remove moisture and trapped air from the break.

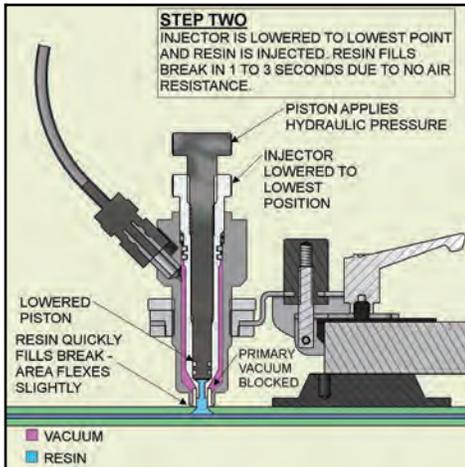


Too much heat can run a break. When heat is used, always allow windshield to cool before continuing.



Pump Gauge Holding 25 inHg of Vacuum

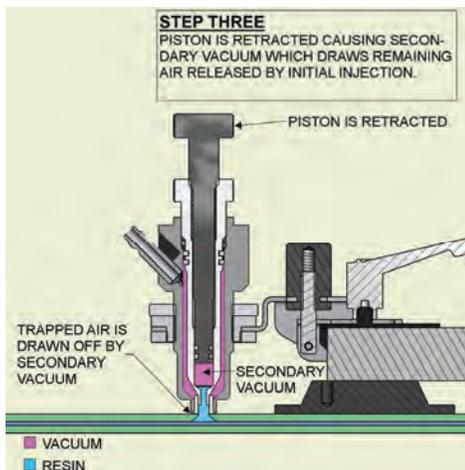
Making Repairs



Initial Pressure Cycle



Turning the Piston Knob



Secondary Vacuum Cycle

INITIAL PRESSURE CYCLE

During this cycle the injection chamber is lowered to the lowest point and blocks the primary vacuum. Hydraulic pressure from the piston rotation injects resin into the break. Typically the break is filled in 1-3 seconds.

1. Lower Injection Chamber

- Screw injection chamber clockwise (down) until it stops, about 3-4 full turns.
- Remove the hose assembly from the repair fixture by pulling back on the quick-connect socket.

2. Inject Resin

- Rotate piston knob clockwise until you feel a slight amount of pressure, then back it off by turning the piston knob counter-clockwise.
- Rotate the piston knob clockwise again and you will notice the break beginning to fill with resin.

CAUTION Watch carefully! Too much pressure can cause the break to run or to cause the glass to separate from the laminate creating permanent damage. In either case, back off the pressure immediately. Then reapply pressure at a slower and lower level.

- If necessary, repeat clockwise and counter-clockwise rotations of the piston to open the break and fill it with resin.
- This process usually takes about 1 minute for a typical break.

TIP: If after rotating piston knob to inject resin, you find there is no resin filling the break, then the o-rings on the piston may need to be replaced. O-rings typically last about 200 repairs. (SBX2019 & SBX2021)

SECONDARY VACUUM CYCLE

When the piston is retracted it causes the initiation of the second vacuum which draws out the remaining air released by the initial injection.

Retract the Piston

- When the outer tips of the cracks are almost filled, rotate the piston knob counter clockwise 3-4 turns to create the second vacuum cycle.

TIP: Applying heat to the inside of the windshield using a lighter or AEGIS® Moisture Evaporator during the vacuum cycle will effectively remove moisture and trapped air from the break.

FINAL PRESSURE CYCLE

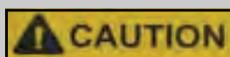
NOTE : When you inspect a break, air will appear as a black spot. Unfilled areas will cast a shadow when a light is shined on the break. See “Advanced Techniques” in the “Special Techniques” section in this manual for details on

The final pressure cycle finishes filling the break.

1. Engage Piston

- a. Rotate piston clockwise until slight pressure is felt and remaining outer tips of cracks should fill.
- b. Leave in place for at least **one to two minutes**.

▲ TIP: PRESSURE CURE If cracks extend beyond diameter of seal, then cure with UV Light for **1 minute** WHILE THE REPAIR FIXTURE IS IN PLACE DURING THE FINAL PRESSURE CYCLE.



AEGIS® resin will damage painted surfaces. **DO NOT** allow resin to come into contact with vehicle paint.



Wear Eye Protection when using UV lamps, excessive exposure can cause permanent eye damage.

CURING THE RESIN

1. Remove the fixture

- a. Lift the tabs on the suction cup to release the repair fixture.

2. Place the Mylar square

- a. Quickly place a Mylar square over the break, capturing the extra resin underneath.

3. Apply Lamp

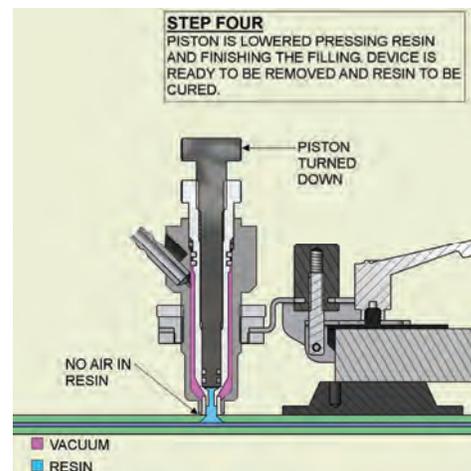
- a. Attach the lamp with the bulb directly over the repair area.
- b. Turn on the lamp.
- c. Leave lamp in place for at least **1 ½ minutes**.

4. Check for Complete Cure

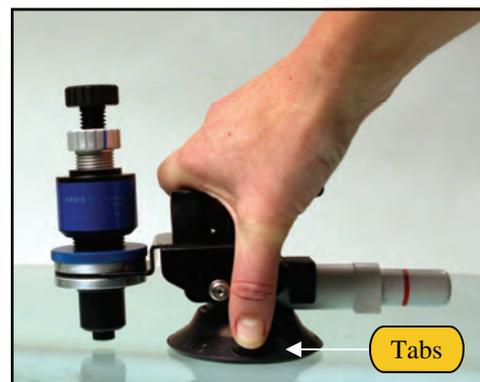
- a. If the resin is fully cured it will feel hard to the touch. A greasy surface film may be on top of the Mylar square.

NOTE: Curing time will vary with the quality of the UV lamp and bulb. Typically, a good quality UV Lamp will cure the resin in 1 to 1 ½ minutes.

NOTE: If curing time exceeds two minutes, see the “Troubleshooting Guide”



Final Pressure Cycle



Lift Tabs to Release Repair Fixture



Curing the Resin
(110 V UV Lamp (LMP3500) shown)



Lift Mylar with Razor Blade

FINISHING THE REPAIR PROCESS

1. Remove Mylar Square

- a. Place the edge of a razor blade between the glass and the Mylar and lift to remove Mylar.

2. Scrape Excess Resin

- a. Cut away excess resin around the impact area. Place the razor blade at a 45 to 90 degree angle to the glass and sweep the blade edge across the impact point several times to remove the excess resin.

3. Remove the Mirror.

4. Clean the Windshield

- a. Clean the windshield inside and out with an alcohol-based glass cleaner.



Remove Excess Resin

NOTE: If the pit area is large or looks dull, see Pit Filling in the "Special Techniques" Section.

SPECIAL TECHNIQUES

The following “Special Techniques” are designed to help with difficult repairs, to make repairs faster and give better results.

DRILLING TECHNIQUES

With most breaks, you can get quicker results by using the drill to create a channel for the resin to flow into the break. Some technicians drill every break, whether needed or not. Most bull’s eye breaks do not need drilling. Many combination breaks do not need drilling because they usually have a large area of crushed glass at the impact point allowing for easy penetration of the resin into the break.

Some breaks must be drilled to make them repairable. You can expect better repair results by drilling these types of breaks:

Star breaks = drill a small pilot hole in the pit; then drill at an angle towards the major legs.

Star breaks with disconnected legs = drill a small pilot hole in the pit; then drill at an angle towards the disconnected legs.

Half bull’s eye = Drill into the air space only. Use the drill hole for injecting resin.

Cured repair with trapped air = drill directly into the air space.

Combination with long radial crack = drill at the end of the long crack and follow crack fill process to fill.

Breaks without impact point = drill in center of break.

Breaks with an obstructed opening = ream out pit area with drill bit.

It is important that all these techniques be practiced several times prior to drilling on a customer’s vehicle.

ALWAYS:

- use safety glasses when drilling.
- use a carbide drill burr for drilling.
- drill in an up and down motion.
- use the drill at high speed.
- start the drill turning before you place it against the glass.
- use a “two-second drill/two-second release” approach to prevent burr damage.
- drill the minimum depth required to open a passage-way.



Dremel MultiPro Cordless Drill

NEVER:

- enlarge the pit more than necessary.
- allow burr to touch the laminate.
- apply pressure to the drill. Allow the drill to do the work.
- allow the burr to get “red hot”

NOTE: If the bit is not penetrating, change it. One burr should drill 10-15 breaks.

TIP: You can drill as many times as necessary. Start by drilling shallow. If your break does not fill, then drill again a little deeper. If your fixture is mounted with resin in the chamber, just loosen the adjustment knob or rotate the outer chamber off the glass, carefully loosen the adjustment lever and rotate the fixture arm away from the break and retighten the adjustment lever. This procedure will save your resin while you re-drill the break. Rotate the chamber back into place after drilling, using the mirror to make sure the impact point is centered in the insert seal.

EQUIPMENT

CORDLESS ROTARY TOOL (*PWR5040*)

Your AEGIS® Cordless Drill can improve results and shorten the repair time required for most breaks.

CARBIDE BURRS

The Carbide Burrs are used for drilling into a break to clear a passage way for the resin. (*DRL2021*)

DIAMOND BALL BURRS

The Diamond Ball Burr is used before pit filling to roughen the pit surface for better pit filler adhesion. (*DRL5005*)

CROSS-CUT FISSURE BURR

Cross-cut Fissure Burrs are the best bit we offer for drilling breaks. The cross-cut design efficiently creates a pathway for resin flow while running cooler than other burrs, resulting in longer service life. (*DRL2031*)

DRILL USE AND CARE INSTRUCTIONS

To get the optimum benefit from your drill, please read these instructions thoroughly. The Dremel 7.2V cordless drill includes a drill, 1/16" collet, carbide burr, charger and power pack.

FOR YOUR OWN SAFETY

Read and save these safety instructions

- When you put away the tool, switch off the motor and ensure that all moving parts have come to a complete standstill.
- Avoid injury by using personal protection like safety goggles, gloves, etc.
- In case of jamming, immediately switch off the tool
- Do not activate the switch when changing accessories
- Never use grinding wheels over 1"
- Never use drill bits over 1/8"
- Never use shaft lock while tool is running
- Ensure that the collet size corresponds with the shaft size of any accessory.
- Check voltage indicated on nameplate of charger
- Charge power pack only with the charger supplied
- Do not attempt to recharge non-rechargeable batteries with the charger
- If power pack is cracked, do not insert in charger
- Do not burn power pack for any reason
- Never charge power pack outdoors
- Do not expose charger to rain
- Do not use charger when damaged.
- Do not remove power pack when tool is running.
- Do not touch the contacts in the charger.

HOW TO HANDLE

Charge power pack before first use.

Insert power pack into charger then plug charger into standard outlet. The red light will turn on and stay on, indicating proper electrical connection as long as power pack is in charger.

Full capacity is reached in 3 hours, however, it cannot be overcharged.

NOTE: Do not repeatedly recharge power pack after only a few minutes of operation, this can lead to a reduction of power pack efficiency. Completely drain the power pack before recharging.

TO MOUNT ACCESSORIES:

Turn switch to "OFF" position. Push in button on front of drill and hold it in while you turn the cap nut "counter-clockwise" to open the collet. To tighten, continue to hold down the button while turning the cap nut "clockwise" until tight.

PIT FILLING

After you complete a repair, the break area will often have a small pit on the surface of the glass at the impact point. Pit filling eliminates this pit and gives you a repair that is smooth. It also eliminates the water trail caused by a large pit during windshield wiper usage.

Pit Filler (*LIQ2020*) is thicker and harder than repair resin, which makes it perfect for filling surface pits.

NOTE: We do not recommend that AEGIS® Polymer be used to fill pits because it is not as hard when cured.



Pit Fill Kit

1. After a repair has been completed, examine the pit area for trapped air bubbles. The Pit Fill Kit (*KIT1030*) comes with a magnifier for this purpose.
2. If you see air bubbles, use a razor blade or drill to pick a path to them.
3. Whether you use a razor blade or the AEGIS® Drill (*PWR5040*) is a matter of preference. To pit fill, you will need to rough up the perimeter of the impact point to improve the adhesion of the Pit Fill resin. Remove all crushed glass in the impact point. When using a razor blade, pick around the pit area. Using your drill and a Diamond Ball Burr (*DRL5005*) at the lowest speed, go around the entire pit area.
4. Use your Syringe (*SBX2003*) and Needle (*SBX5003*) to draw out a small amount of Pit Filler. If you are using Pit Filler from a dropper bottle (*LIQ2022*), you can apply the resin directly from the bottle.
5. Place a drop of the Pit Filler on the glass just above the impact point and let gravity draw it in. Maintain a slow flow into the impact point to keep air from becoming trapped. Add more Pit Filler if needed to fill the impact point.
6. When the impact point is filled, place a Mylar square (*HDW3000*) over the Pit Filler. Start from the bottom edge and catch the Pit Filler running down the glass. Roll the Pit Filler up and into the impact point.
7. Cure the Pit Filler with the UV Light at least five minutes on thick applications. Thin layers may require less cure time.

8. Remove the Mylar square. Remove the excess Pit Filler with a razor blade held at a right angle to the glass. Sweep the blade edge across the impact point several times to remove the excess Pit Filler. The impact point should now be filled and level with the glass. If not, repeat process.
9. To put a clear finish on the impact point, apply a tiny drop of Pit Filler on the dull spot, apply a Mylar square and press the thin layer of Pit Filler around to cover the diameter of the dull impact area. Cure for one to three minutes. You'll need to judge the size of the resin drop carefully, since the best finish is achieved without scraping.
10. Polish the surface with AEGIS® Pit Polish (*LIQ2030*).
11. For additional polishing, use the AEGIS® Buffing Wheel Assembly (*DRL2025*).

REPAIRING CRACKS

Although the QuickSilver Technology™ System can repair cracks, it is not recommended. Instead, for the most consistent, quick and professional results we recommend the AEGIS® Long Crack Repair Kit (*KIT1036*).

CRACK EXPANDER METHOD

Repairing a crack with the AEGIS® Long Crack Repair Kit (*KIT1036*) is quick and easy. This method is specially designed to repair surface cracks. A surface crack is one that you can feel when rubbing the glass with the edge of a razor blade as described above. You can repair any length crack with this method.

1. Prepare the break as you would any other break.
2. Using the needle and syringe, place a drop of resin on the crack at the point where it seems to stop. The resin should flow into the crack. If the resin does not flow freely into the crack, gently flex the glass from the opposite side. Once the end of the crack is filled with resin, cover it with a Mylar square and cure the resin with the UV Light for at least 1 minute.
3. Repeat Step Two on the other end of the crack.
4. Apply a very small amount of glycerin to the suction cups of the AEGIS® Crack Expander .
5. Place the crack expander on the opposite side of the glass with the adjusting screw directly over the crack and midway between the cured ends.

NOTE: It is best to view the crack from an angle so that you can see the resin filling the void.



**Long Crack Repair Kit
(KIT1036)**

CAUTION Wear Eye Protection when using UV lamps. Excessive exposure can cause permanent eye damage.



Use minimum force when placing the crack expander, too much force may cause the crack to run.

6. Once in place, turn the adjusting screw until it makes contact with the glass. Slowly turn the adjusting screw another 1/2 to 3/4 turn. If the crack starts to run, back off a quarter turn immediately.
7. Now you can continue to fill the crack. Starting at one end, place a drop of resin on the crack at the point where the crack seems to disappear. Continue to place resin over the crack moving slowly as the resin seeps into the crack. Always keep the drop of resin just **BEHIND** the front edge of the resin flow to avoid trapping air in the crack. Once an area is completely filled with resin, add another drop of resin and cover it with mylar. Mylar should overlap the previous piece to assure no air will enter the break. Cure the resin at 2" (5 cm) intervals with the UV lamp. **DO NOT** allow anything to flex the glass, including the lamp.
8. Once the crack is completely filled and fully cured, remove the crack expander and Mylar and scrape off the excess resin in the direction of the crack.

NOTE: Though much more difficult, and time consuming, this method can be used without a crack expander by using your thumb to press along the crack.

ADVANCED TECHNIQUES FOR DIFFICULT BREAKS

Below are some advanced techniques to try on difficult breaks that will not fill under normal repair procedures. These procedures should be used after you have tried the normal repair process, and have drilled and probed the break.

ADDITIONAL VACUUM CYCLES

If trapped air is present in a break, often-repeated vacuum cycles will remove the air. This is common in star breaks with radial cracks. Use several short vacuum cycles followed by short pressure cycles.

NOTE: Check resin level. One of the most common reasons that radiant cracks won't fill is that too little resin is present in the chamber.



The techniques below should be used only as a “last resort” because of the high risk of running the break.

USING HEAT

Heating a break will cause the glass to expand; this will give the appearance that the break is filling, although it has not. It has only temporarily closed and will return as soon as the glass cools. However, applying heat to the crack can help remove trapped air. Then as the glass cools and the crack reopens, causing capillary action to help pull the resin into the break.

Tips for Using Heat

- Never use heat when the windshield is extremely cold. The sudden change in temperature will cause the break to run.
- Use a direct heat source behind the radiant cracks that will not fill.
- A match or cigarette lighter works well.
- Use heat only on the vacuum cycle.
- Allow windshield to completely cool before switching to pressure.

TROUBLESHOOTING GUIDE

The following Troubleshooting Guide is designed to answer frequently asked questions. Use this guide as a checklist anytime you are unsure of the steps to be taken.

We are happy to answer any questions you have about AEGIS® equipment or repair techniques. Call us toll-free Monday through Friday from 8:00 a.m. to 4:00 p.m. Central Standard Time at 1-888-247-6000.

PROBLEM

MIRROR FALLS OFF

REPAIR FIXTURE LOSES SUCTION (red line on plunger shows)

REPAIR FIXTURE CONTINUES TO LOSE SUCTION (red line on plunger shows)

SOLUTION

CLEAN GLASS AND MIRROR

Clean the inside of the windshield with an alcohol-based solution. Dry thoroughly. Use a damp cloth to wipe the sealing surface of the mirror and then immediately reapply the mirror to the windshield.

APPLY GLYCERINE

Put a little glycerine on the sealing surface, and then wipe it clean with a lint-free cloth. Reattach mirror. If the problem continues, check the mirror cup for scratches or cuts, which might be causing the suction to fail. If scratches or cuts are present, you will need to replace the mirror.

PUMP PLUNGER

If pumping the plunger does not solve the problem, the fixture must be removed.

CLEAN THE GLASS AND SUCTION CUP

Use a damp cloth and clean the glass carefully. Put a little glycerin on the sealing surface of the suction cup, then wipe it clean with a lint-free cloth. Very small dust particles can cause a sealing problem.

CHECK FOR DAMAGE

If the problem continues, check the suction cup for scratches or cuts, which might be causing the failure.

If there are scratches present, the suction cup will need replacement.

If there is no apparent defects or damage on the suction cup-sealing surface, the problem is most likely in the plunger. Call AEGIS® to order a replacement plunger (*FIX2025S*).

PROBLEM

RESINS WILL NOT CURE

SOLUTION

COVER WITH MYLAR:

Crack Fill: The crack fill resin must be covered with Mylar in order for it to cure.

Polymer: It is not necessary to cover with Mylar, but it is helpful.

Pit Fill Polymer: The pit fill polymer must be covered with Mylar to cure.

AEGIS RESINS WILL TAKE BETWEEN 1-2 MINUTES WITH A HIGH QUALITY UV LAMP.

Other resins may take longer.

RESIN CONTAMINATED

Do not use the same syringe or needle for Polymer and Crack Fill. Clean the Fixture Chamber and Quad Ring prior to switching resins. The resins are not compatible and should never be mixed. Even a slight contamination can cause curing problems. If you believe your resin could be contaminated, do not use.

Cleaning solutions can also contaminate the resin. Be sure to dry your syringe and needle after cleaning.

LIGHT TOO WEAK

Battery Lamp: If you are using a battery lamp, check your batteries to see if they are applying full power. Use new alkaline batteries only, each battery must put out at least 1.35 volts to light the lamp. If you are confident your batteries are at full power, replace the bulb.

12-Volt Lamp: The lamp may not be at full power. Check the power connection. If you are confident your lamp is receiving full power, replace the bulb.

ALTERNATE SOURCE:

Sunlight can be used as an alternate source to cure the resin. Pull vehicle into direct sunlight until resin is fully cured. This can take up to 20 minutes.

THE ULTRAVIOLET LAMP WON'T LIGHT

12 VOLT LAMP

The lamp may not be at full power. Check the power connection. If you are confident your lamp is receiving full power, replace the bulb.

PROBLEM

BUBBLES EMERGE FROM EDGE OF INSERT SEAL DURING VACUUM CYCLE

SOLUTION

Bubbles from the edge of the insert seal indicate a bad seal.

CHECK FOR RED LINE

Check for a red line on the fixture plunger. If pumping the plunger does not solve the problem, refer to above Troubleshooting item #3. If there is no red line showing on the plunger, loosen the fixture chamber 1/4 turn and tighten to original position. Re-establish vacuum and check the seal.

If a bad seal still exists, turn the fixture chamber 1/4 turn clockwise.

CHECK FOR PROPER SET-UP

Check to assure the insert seal is tight against the glass and the impact point is centered in the hole in bottom of the outer chamber. See "Setting up your Repair Fixture" in the "Making Repairs" section of this manual. Reset fixture if necessary.

CHECK INSERT SEAL FOR DAMAGE

A worn or damaged insert seal can cause a leak during vacuum. Release vacuum and remove the fixture chamber. Clean and dry the insert seal and check for damage. Replace if damaged.

CHECK FIXTURE CHAMBER

Check and clean the opening on the bottom of the outer chamber on the repair fixture where the insert seal fits. All parts must be dry to work properly. Reposition the repair fixture, center the break in the opening in the bottom of the repair fixture and finish the repair.

PROBLEM

BREAK RUNS DURING SET-UP

SOLUTION

DO NOT PRESS ON GLASS

Do not press on the glass when setting up the repair fixture. Hold the repair fixture lightly to the glass and let the plunger do the work for you.

CHECK OUTER CHAMBER POSITION

Check to see that the outer chamber is raised up and not pressing against the glass.

BREAK RUNS DURING PRESSURE CYCLE

GLASS TOO HOT

Immediately release pressure if a break starts to run. If the glass is hot to your touch, cool the glass before proceeding.

USE LESS PRESSURE

Re-establish pressure at a lower level than previously used. You will need to maintain a lower pressure for a longer period of time to get the same results.

REPAIR TURNS CLOUDY

MOISTURE IS PRESENT

If a repair turns cloudy, it is usually due to moisture in the break. If this occurs, continue the vacuum cycle until the moisture is removed from the break. You will have to remove the repair fixture to clean up the outer chamber, injection chamber and insert seal. You will also need to start over with fresh resin.

OTHER CONTAMINATES

Wax, soap, oil, Rain-X, and many other foreign materials can cause resin to turn "milky" in appearance. It is a good idea to ask the customer prior to repairing if the windshield has come in contact with any of these items. This is particularly important if the break looks old. Reaming out the pit area with a Diamond Ball Burr (DRL5005) is the best way to remove these contaminants.

LAMINATE SEPARATED FROM GLASS

Laminate that has separated from the glass will often have a cloudy appearance. This can happen at any time, but it is more common on very old vehicles that have weak spots in the laminate. Too much heat, too much pressure, or repairing while the glass is extremely hot can cause this separation if the laminate is weak.

RESIN HAS BEEN CONTAMINATED

Care should always be taken to assure resin does not become contaminated.

PROBLEM

BREAK DOES NOT FILL

SOLUTION

NOT ENOUGH PRESSURE

Try increasing the pressure slowly by turning the piston. If too much pressure is applied, permanent damage to the laminate will cause a shadowing effect on the final repair.

IMPROPER ALIGNMENT OF OUTER CHAMBER

Check to assure that the impact point is fully centered in the opening at the bottom of the outer chamber by looking through the opening at the top of the outer chamber. Adjust the outer chamber as needed.

CHAMBER TOO TIGHT

If the outer chamber is too tight against the glass, it may be stopping the resin flow. Loosen the outer chamber 1/4 turn.

RESIN NOT COVERING IMPACT POINT

If the outer chamber is properly aligned and the resin does not fully cover the impact point, you will need to add more resin to the injection chamber and re-start the repair from the beginning. Remember to never mix resins.

BLOCKAGE IN IMPACT POINT

The impact point may be blocked with glass debris, dirt, or wax. Remove the repair fixture from the windshield, replace suction cup cap and set repair fixture down. Use a razor blade to pick away any debris, dirt or wax. At this point, you may also try drilling to open up the passage. See "Drilling Techniques" in the "Special Techniques" section of this manual.

TRY ADVANCED TECHNIQUES

Try the ADVANCED TECHNIQUES in the "Special Techniques" section of the manual.

USE A DRILL

The only way to fix a break with no apparent impact point is to drill a passageway for the resin. See "Drilling Techniques" in the "Special Techniques" section of this manual.

TRY ADVANCED TECHNIQUES

If radiant cracks will not fill, a longer pressure time will often solve the problem. For additional help with stubborn cracks, see Advance Techniques in the "Special Techniques" section of this manual.

NO IMPACT POINT

RADIANT CRACKS WON'T FILL

PROBLEM

DULL AREA IS LEFT AFTER A REPAIR

BREAK REAPPEARS

SOLUTION

PIT FILLING

Often when a large area of missing glass is present in a break, filling the pit after a repair is necessary. Follow the Pit Filling Instructions in the “Special Techniques” section of this manual.

THERE ARE SEVERAL REASONS

Most Common Reasons:

1. The Mylar was removed prior to a complete cure of the resin and resin escaped.
2. Too much pressure used during the repair process creating a “Halo” effect.
3. Windshield was too hot when the resin was cured. This happens when heat is used and a complete cool down does not happen until after the break is cured.
4. There is trapped moisture in the break.
5. Not enough resin was used. All resin will shrink when cured. Unfortunately, there is no good solution to this problem, other than to learn from this experience to not let it happen again. If just one leg has reappeared, you can repair by drilling into the end of the leg.

MAINTAIN YOUR EQUIPMENT FOR OPTIMUM RESULTS

Proper maintenance of all tools and equipment is important to keep them operating optimally. The same is true of your QuickSilver Technology™ AEGIS® Tools International equipment. Your QuickSilver Technology™ AEGIS® equipment must be kept clean in order to get reliable, professional results.

AFTER EACH USE

The following are cleaning steps that should be taken after each use:

NOTE: If you will be performing multiple repairs in one 24 hour period, the resin can be stored within the injection chamber. When performing another repair, you will not have to repeat the section called Preparing the Injection Chamber. However you WILL have to check the resin prior to loading the injection chamber to ensure there is an adequate amount.

Injection Chamber and Resin

- a. Remove the injection chamber from outer chamber.
- b. Wipe silver injection chamber with alcohol and a clean, lint-free cloth to remove any excess resin.
- c. Cap the tube.
- d. Store in kit.

Repair Fixture

- a. Remove insert seal from outer chamber and rinse with alcohol after each repair.
- b. Allow to dry.
- c. Drip some alcohol into the outer chamber to remove any resin.

AT THE END OF EACH DAY

The following cleaning steps should be followed at the end of each day.

Injection Chamber and Resin

- a. Remove remaining resin from injection chamber and properly dispose of.
- b. Wipe silver injection chamber with alcohol and a clean, lint-free cloth to remove any excess resin.
- c. Store in kit.

Repair Fixture

- a. Remove insert seal from outer chamber and rinse with alcohol.
- b. Drip some alcohol into the outer chamber to remove any resin.
- c. Clean the suction cup with an alcohol based glass cleaner.
- d. Use your finger to spread a generous amount of glycerin on the area of the suction cup that touches the glass.
- e. Wipe off the excess glycerin with a clean, lint-free cloth; replace suction cap lid.
- f. Wipe off the piston with alcohol.
- g. Store in kit.

Inspection Mirror

- a. Clean the mirror with an alcohol-based glass cleaner.
- b. Apply glycerine on the sealing surface. Wipe off excess glycerine with a lint-free cloth.
- c. Store in kit.

PERIODIC MAINTENANCE

The following are steps that should be taken after every 15-20 repairs.

Repair Fixture

- a. Inspect all fixture parts carefully and check operation.
- b. Remove any resin build-up.

Injection Chamber

- a. Inspect all parts carefully and check operation.
- b. Remove any resin build-up.
- c. You may periodically need to replace the o-rings on the injection chamber and piston. Use only o-rings supplied by AEGIS® as these are compatible with AEGIS® resins. Generic rubber o-rings will jam or possibly ruin the equipment, and can also chemically react with and contaminate the resin.

Hose

- a. Lubricate the gaskets inside the quick connect sockets with glycerin applied with a cotton swab.

Vacuum Pump

- a. Apply light oil to the inner shaft and wipe off excess. Remove any resin buildup on the connection plug with the Hose Cleaning Brush (*optional on some models, part HOS2001*).

Ultraviolet Lamp

- a. Perform a general cleaning. Replace bulb yearly (*LMP5000 blue bulb , LMP5002 white bulb*).

REPLACEMENT PARTS

To order online from our secure website, visit www.aegistools.com. US and Canadian customers may phone us toll-free at 888.247.6000; international customers can reach us at 608.274.9254.

PARTS LIST

Part Number	Description
DRL2021	Carbide Drill Burrs (10 pk)
DRL2031	Cross-cut Fissure Drill Burrs (5 pk)
DRL5005	Diamond Ball Burr (1pk)
FIX2004	Fixture Chamber Cleaning Brush
FIX2025	Plunger
HDW3000	Mylar Squares, 1 in / 2.5 cm (100 pk)
HDW3010	Mylar Strips, 1 x 3 in / 2.5 x 7.6 cm (100 pk)
HDW5015	Penlight
HDW5040	Carbide Probe
HDW5410	Razor Blades (100 pk)
HOS2000	Connector Hose Assembly, 3 ft / 91 cm
HOS2001	Hose Cleaning Brush
HOS2010	Connector Hose Socket Seals (2 pk)
HOS2020	Connector Hose Assembly, 5 ft/ 1.5 m
KIT1030	Pit Filler Kit
KIT1036	Long Crack Repair Kit
KIT1044	Sun Screen – UV Blocker
LIQ2000	Glycerin 30ml
LIQ2020	Pit Filler 2ml Glass Bottle
LIQ2022	Pit Filler 4ml Dropper Bottle
LIQ2030	Pit Polish 60ml
LIQ2060	Extreme Single Shot Resin (25 pk)
LIQ2070	Crack Fill Single Shot Resin (25 pk)
LIQ2080	Polymer II Single Shot Resin (25 pk)
LIQ3000	Alcohol 60ml
LMP5000	UV Light Bulb, Blue
LMP5002	UV Light Bulb, White
MIR2000	Inspection Mirror
PWR5025	12-Volt Extension Cord, 15 ft/4.6 m
PWR5040	Drill Assembly
SBX2017	Insert Seals (10 pk)
SBX2019	O-Rings, Small (12 pk)
SBX2021	O-Rings, Large (12 pk)
SBX2018	Single Shot Filling Adaptor (4 pk)
TLS5000	Moisture Evaporator