

C 5.18.0.0 - Metal Grinding Debris Damage [CAT-4]

APPROXIMATE TIME PER SQUARE FOOT: 35+ minutes

Metal Grinding Debris Damage commonly arises when construction activities, such as cutting rebar or metal framing studs, occur near glass surfaces. During these operations, hot, nearly molten metal shards are ejected, effectively being 'sprayed' to the glass. These hot metal fragments have the potential to embed themselves into the glass surface, creating deep and often severe damage. The result is not just surface scratching but the actual encapsulation of small metal particles within the glass.

Before embarking on any restoration, it is crucial to attempt to remove as much of the embedded metal from the glass as possible. This preliminary step is essential to prevent further damage during the restoration process. An additional consideration is the relation between the depth of the impact marks – or 'poc' marks – left by these hot metal shards and the overall thickness of the glass, particularly its tempering envelope.

A key threshold in evaluating the damage is whether the depth of the burrows exceeds 10% of the total thickness of the glass. If the damage remains within this limit, the tempering envelope of the glass is generally considered to remain intact. However, in instances where the damage penetrates deeper, a thorough evaluation of the glass's safety and operational integrity becomes imperative. Understanding this relationship is crucial for technicians to determine the appropriate course of action, balancing the restoration of the glass with maintaining its structural safety.

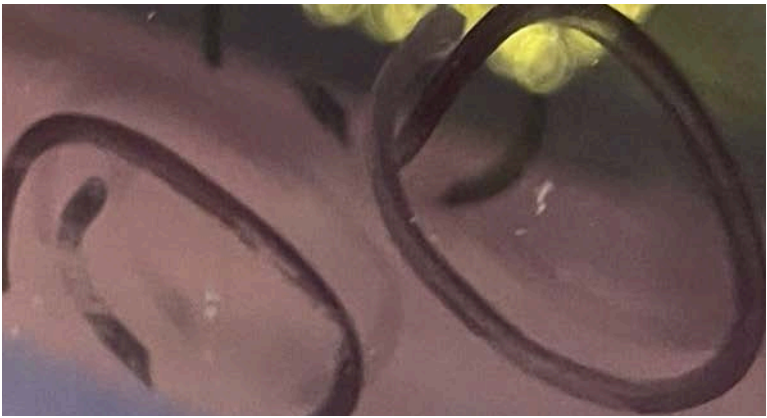


Fig. 51800A



Fig. 51800B

IMPORTANT NOTE: During the glass restoration process, it's crucial to closely monitor the temperature of the glass pane. The heat generated from grinding or polishing can increase the risk of thermal stress, potentially leading to cracks or breakage. To effectively manage this risk, it is recommended to use a non-contact thermometer, a tool available at most hardware stores. This allows for accurate and safe temperature measurements without interrupting the workflow.

Regular monitoring of the temperature differential between the repair area and the rest of the pane is key to preventing thermal damage. Should the temperature in the work area rise significantly, pause the restoration and allow the glass to cool. Immediate cessation of work and allowing the pane to return to a normal temperature range is necessary if overheating occurs. For specific temperature guidelines and detailed procedures on managing thermal expansion, please refer to section C 3.1.1.0 - Thermal Expansion.

TEMPERATURE ADVISORY	Delta	Maximum Temperature
Annealed	+80°F Δ	N/A
Tempered	+120°F Δ	N/A
Laminate- Annealed	+80°F Δ	145°F
Laminate- Tempered	+120°F Δ	145°F
Mirrored	+80°F Δ	N/A

Fig. 51800C

Tool Checklist

- Corded, Variable Speed, Rotary Polisher (600-3000 RPM MINIMUM, 5/8"-11 threaded spindle)
- Backing Pad
- Red RenuDisk(s)
- Grey RenuDisk(s)

- Polishing Felt
- Polishing Compound
- Rasp
- IR Thermometer

Workspace Checklist

- Power Access
- Workbenches, ladders, scaffolding, lifts, etc. (If Applicable)
- Masking Tools

- Drop Clothes/ Tarps/ Waste Receptacles
- Temperature Control Tools (If Applicable)

Damage Assessment Checklist

- Confirm Glass Type
- Confirm Damage Type
- Inspect Glass System Integrity (Framing, Glazing, Etc.)

- Inspect Glass Pane Integrity (Cracks, Chips, etc.)
- Identify Damage Location(s)

Notes:

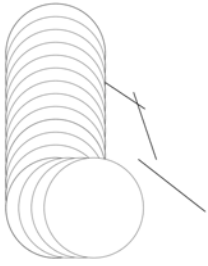


Fig. 51810A

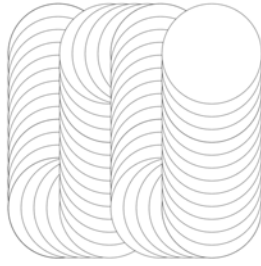


Fig. 51810B

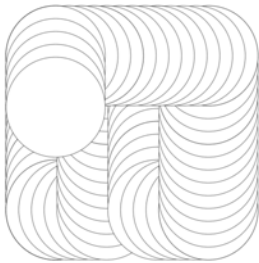


Fig. 51810C

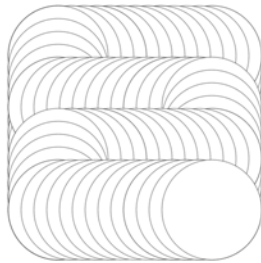


Fig. 51810D

C 5.18.1.0 - Step One: Abrasion utilizes a Red RenuDisk to quickly remove target damage.

1. Secure a Red RenuDisk to the designated backing pad.
2. Adjust the polisher to operate at a rotational speed of 1800 RPM.
3. Align the RenuDisk surface directly above the glass's damaged area, ensuring that the disk remains parallel to the glass pane.
4. Engage the polisher's power trigger, and trigger lock.
5. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths across the damaged area. This action should form a precise cross-hatch pattern. Maintaining uniform pressure, continue abrading until all damage has been removed.
6. Disengage the RenuDisk from the glass pane.
7. Disengage the polisher's power trigger. Ensure the disk is stationary.
8. Detach the Red RenuDisk.
9. Continue to [Step Two: Pre-Polish].

NOTE: Over the course of the abrasion, glass stock will accumulate on the RenuDisk surface. It may be necessary to periodically unplug the disk surface to maintain optimal performance. To do this:

- Disengage the polisher, ensuring the disk is stationary.
- Utilize the flat, non-aggressive face of the rasp file or wire brush.
- Gentle tapping motions on the RenuDisk surface will dislodge glass stock that has accumulated during operation. Refrain from brushing.

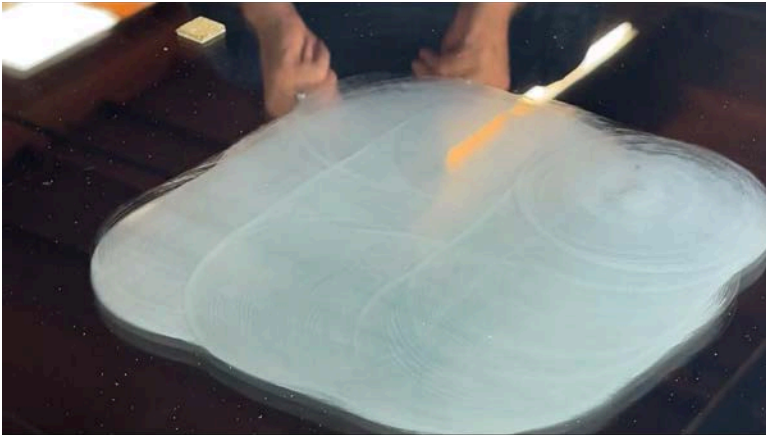


Fig. 51810F



Fig. 51810G

Notes:

C 5.18.2.0 - Step Two: Pre-Polish is broken down into two distinct sub-steps: Mid Speed, and High Speed Pre-Polish. Each sub-section utilizes the same Grey RenuDisk to refine, feather, and expand the established work area.

MID SPEED PRE-POLISH

1. Attach a new Grey RenuDisk to the designated backing pad.
2. Adjust the polisher to operate at a rotational speed of 1800 RPM.
3. Engage the polisher's power trigger, and trigger lock.
4. Align the RenuDisk surface to overlap the top left corner of the established work area by approximately $\frac{1}{2}$ the diameter of the RenuDisk, ensuring that the disk remains parallel to the glass pane.
5. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths, expanding the established work area created in Step One by approximately $\frac{1}{2}$ the diameter of the RenuDisk. This action should form a precise cross-hatch pattern. Maintain uniform pressure.
6. When the work area has been fully refined, expanded, and made uniform edge to edge, cease cleaning the Grey RenuDisk. At the end of the Mid Speed Pre-Polish subsection, it is necessary to allow the glass stock being removed from the pane to accumulate on the surface of the Grey RenuDisk.
7. Disengage the RenuDisk from the glass pane.
8. Disengage the polisher's power trigger.
9. Ensure the Grey RenuDisk surface is completely coated in glass stock.
10. Continue to High Speed Pre-Polish.

NOTE: Over the course of the Mid Speed Pre-Polish, glass stock will accumulate on the RenuDisk surface. If the RenuDisk is clogged, and further refinement/ expansion of the established work area is required, it may be necessary to clean the Grey RenuDisk and continue the Mid Speed Pre-Polish. To maintain optimal performance of the Grey RenuDisk:

- Disengage the polisher's power trigger. Ensure the disk is stationary.
- Utilize the non-aggressive face of the rasp file or wire brush.
- Administer gentle tapping motions on the RenuDisk surface. Refrain from brushing.

High Speed Pre-Polish

1. Adjust the polisher to operate at a rotational speed of 3000 RPM.
2. Engage the polisher's power trigger, and trigger lock.
3. Align the RenuDisk surface to overlap the top left corner of the established work area by approximately $\frac{1}{2}$ the diameter of the RenuDisk, ensuring that the disk remains parallel to the glass pane.
4. Employ a systematic abrasion approach by guiding the RenuDisk in alternating horizontal and vertical paths, expanding the established work area created in Step One by approximately $\frac{1}{2}$ the diameter of the RenuDisk. This action should form a precise cross-hatch pattern. Maintain uniform pressure.
5. Disengage the RenuDisk from the glass pane.
6. Disengage the polisher's power trigger. Ensure the disk is stationary.
7. Remove the Grey RenuDisk.
8. Continue to: [Step Three: Polish].

NOTE: The Grey RenuDisk surface should maintain full glass stock accumulation during the entirety of the High Speed Pre-Polish subsection. No disk maintenance should be required.

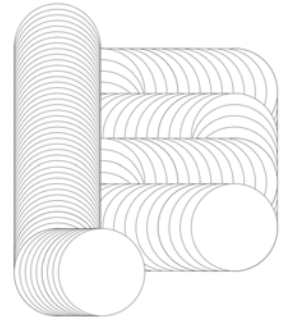


Fig. 51820A

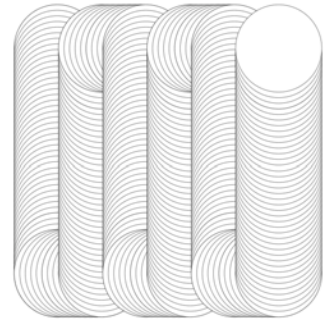


Fig. 51820B

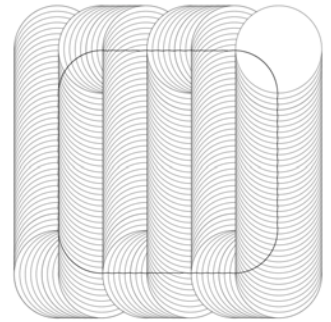


Fig. 51820C

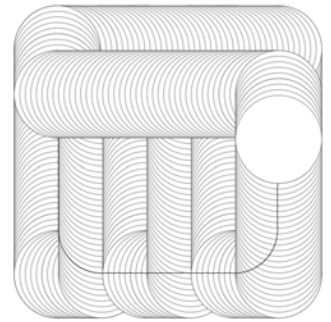


Fig. 51820D



Fig. 51820E



Fig. 51820F

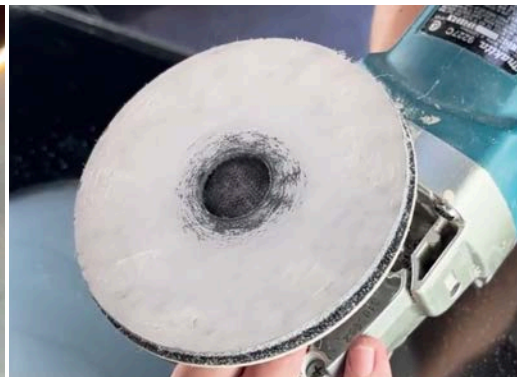


Fig. 51820G

