

E46 M3 Interior

DIY Guide

www.nam3forum.com

Replace Electrochromic Mirror Glass



NOTICE

This document is prepared as a useful guide for the E46 M3 community. To the best of the author's ability this document contains true and correct information. The author will not be held responsible for any incorrect information, damage caused as a result of following this guide or any breach of manufacturer warranty, etc.

FOR AMMENDMENTS

Reach out to me (@karter16) on nam3forum.com

VERSION HISTORY

Version 1.0	30/12/2023	Initial version

Table of Contents

1. Overview	5
Scope	5
2. Pre-requisites	6
Parts & Consumables	6
Tools	6
3. Remove Rear View Mirror Assembly from Vehicle	7
Tools Required	7
Remove Mirror Base Trim Covers	7
Detach Rear View Mirror Assembly from Windshield	9
4. Disassemble Rear View Mirror Assembly	10
Tools Required	10
Separate the Mirror Housing	10
Disconnect Mirror PCB from Housing	14
Remove Mirror from Front Housing Trim	15
Detach PCB from Mirror	17
Remove PCB bracket from Mirror	18
5. Reassemble Rear View Mirror Assembly	20
Parts & Consumables	20
Tools Required	20
Prepare PCB Bracket for Affixing to New Mirror	21
Affix PCB bracket to New Mirror	22
Connect PCB to Mirror	25
Set Mirror into Front Bezel	26
Reconnect PCB to Mirror Housing	27
Reattach Front Bezel to Mirror Housing	28
6. Install Rear View Mirror Assembly in Vehicle	30
Attach Rear View Mirror Assembly to Windshield	30
Reattach Mirror Base Trim Covers	31

7. Optional: Repair Procedure for Broken Mirror Housing Clips	32
Parts & Consumables	32
Tools Required	32
Preparation	32
Embed Pin into Stubs of broken clip	32
Affix pins to broken clip stubs	33

1. Overview

The electrochromic (auto-dimming) mirror on the E46 M3 is known to fail over time. The liquid-filled mirror glass leaks, dropping corrosive fluid onto the centre console below, and forming a bubble between the glass layers of the mirror, rendering the auto-dimming feature non-functional.

This guide provides step-by-step instructions to replace the mirror glass component of the rear view mirror.

Scope

This guide applies to the following vehicles:

- E46 M3 Coupe (2001-2006) with oval rear view mirror (51167892261,51167892263, 51167892264)
- E46 M3 Convertible (2001-2006) with oval rear view mirror (51167892261,51167892263, 51167892264)
- E46 M3 CSL Coupe (2002-2003) with oval rear view mirror (51167892261,51167892263, 51167892264)

2. Pre-requisites

The following are required in order to complete this DIY.

Parts & Consumables

1. Electrochromic mirror glass panel*
2. Double-sided tape (3M Scotch Indoor Double Sided Mounting Tape https://www.scotchbrand.com/3M/en_US/p/d/cbgnawus1862/ or similar)
3. Solder
4. Optional: Brass pins from 2.54mm PCB header connectors (<https://befr.rs-online.com/web/p/pcb-headers/2518086> or similar)
5. Optional: Araldite 2 part epoxy (<https://www.go-araldite.com/en/araldite-ultra-strong-24ml> or similar)

* Replacement electrochromic mirror glass panels are not available as an Original Equipment (OE) part from BMW.

The panel is available from various 3rd parties, at the time of writing the following sources are known:

- AliExpress (Search for “E46 M3 auto dimming mirror”)
- Ebay (Search for “E46 M3 auto dimming mirror”)
- MirrorJohn

Tools

- A. Small trim removal tool
- B. Small flat-head screwdriver
- C. New craft knife blade
- D. Soldering Iron
- E. Tweezers

3. Remove Rear View Mirror Assembly from Vehicle

Tools Required

- A. Small trim removal tool

Remove Mirror Base Trim Covers

The mirror base trim covers are made up of two symmetrical pieces that clip together.



In order to remove the trim covers, insert the tip of the small trim removal tool (Tool A) into the join where the two trim covers meet.



Carefully pry apart the two covers, they should separate easily. They will be retained in place by the rubber grommet around the wiring that leads to the headlining. Remove the covers and set them aside.

Detach Rear View Mirror Assembly from Windshield

The rear view mirror assembly is attached to a mount that is affixed to the windshield.



To remove the mirror assembly, firmly grasp the arm of the mirror assembly, and carefully rotate the entire unit anti-clockwise approximately 45 degrees. The mirror unit will detach from the mount on the windshield.

Continue to support the mirror assembly while you disconnect the electrical connector inside the mirror arm. Depress the retaining clip on the connector and separate it.

The mirror assembly is now detached from the vehicle.

4. Disassemble Rear View Mirror Assembly

Tools Required

- A. Small trim removal tool
- B. Small flat-head screwdriver
- C. New craft knife blade
- D. Soldering Iron

Separate the Mirror Housing

The mirror housing consists of the main housing, attached to the arm. The front part of the housing that encompasses the mirror is a separate bezel trim which is attached to the main housing via a series of plastic clips around the rim of the housing.

The photo below shows the arrangement of the clips. This photo was taken with the mirror glass already removed.



These clips are extremely delicate, especially on original mirrors which are now nearly 20 years old. Even being extremely careful it is almost impossible to avoid breaking at least some of the clips (as can be seen in the photo).

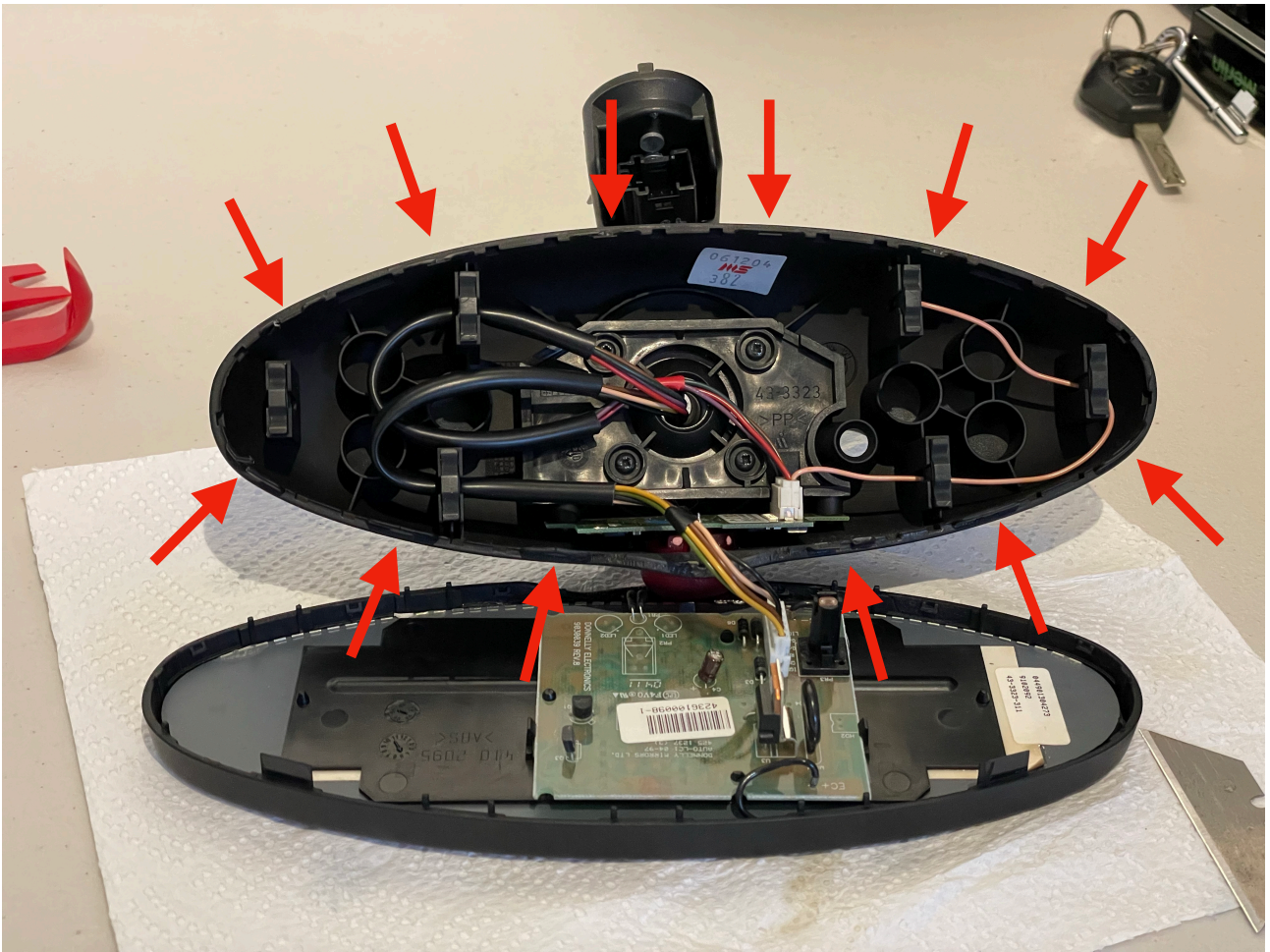
It is best to start from one end of the mirror. To avoid damaging the exterior of the mirror housing use the craft knife blade (Tool C) to work the trim apart enough to insert the small trim removal tool (Tool A) into the gap.





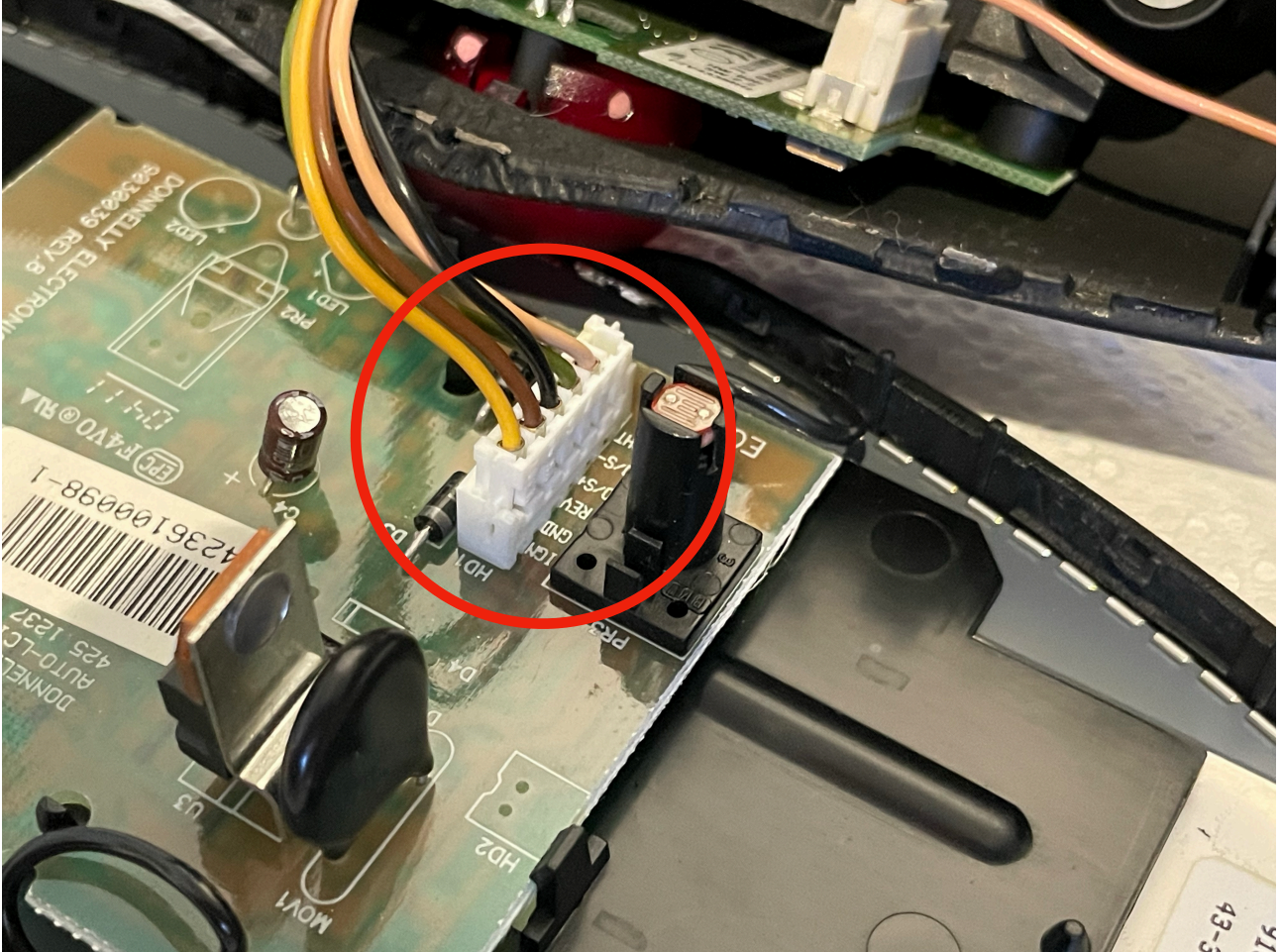
Carefully work around the mirror lifting the front trim piece so that the clips separate (refer to reference image on page 9 if needed).

The photo below is marked to show where each of the clips is located.

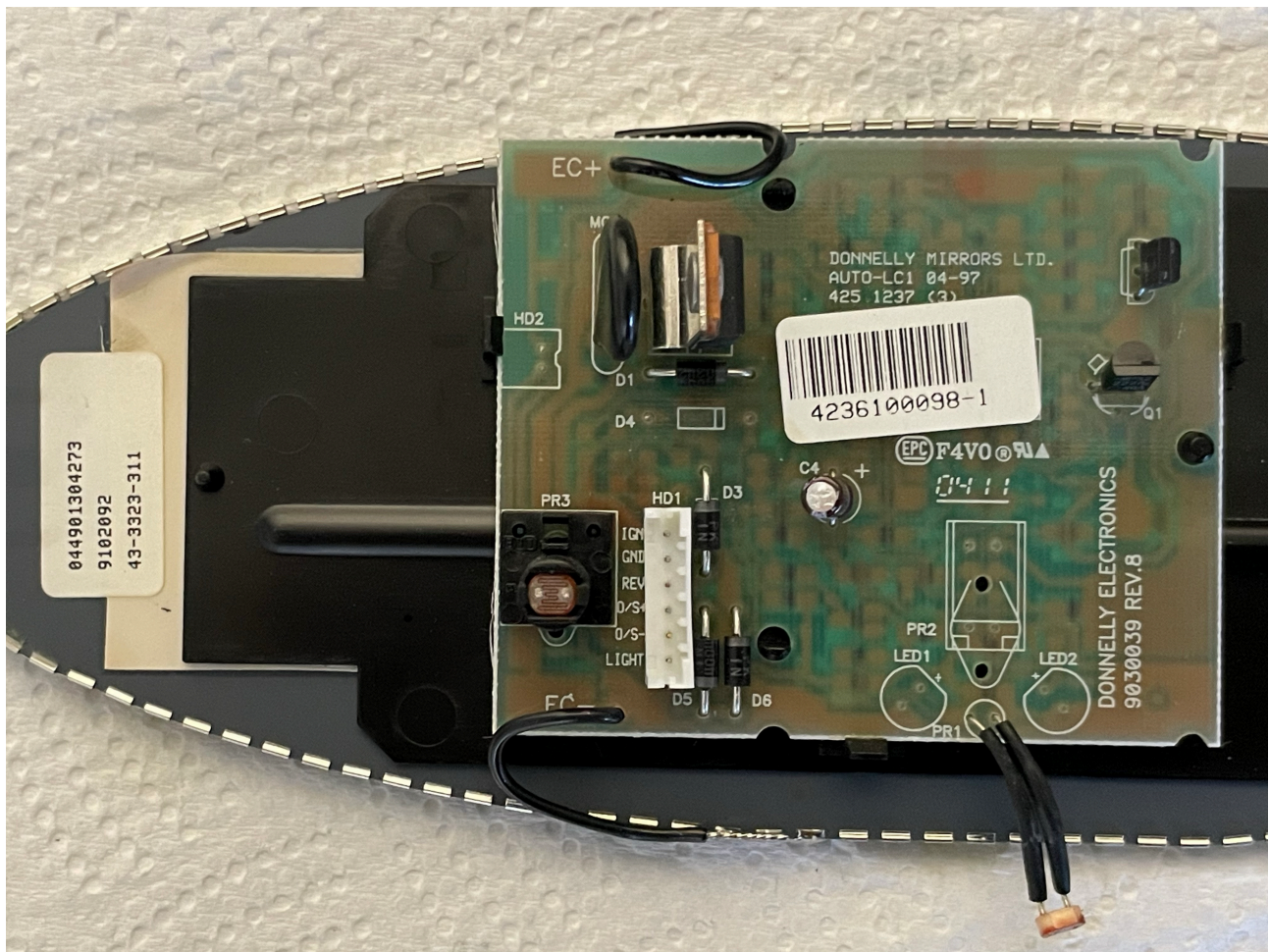


Disconnect Mirror PCB from Housing

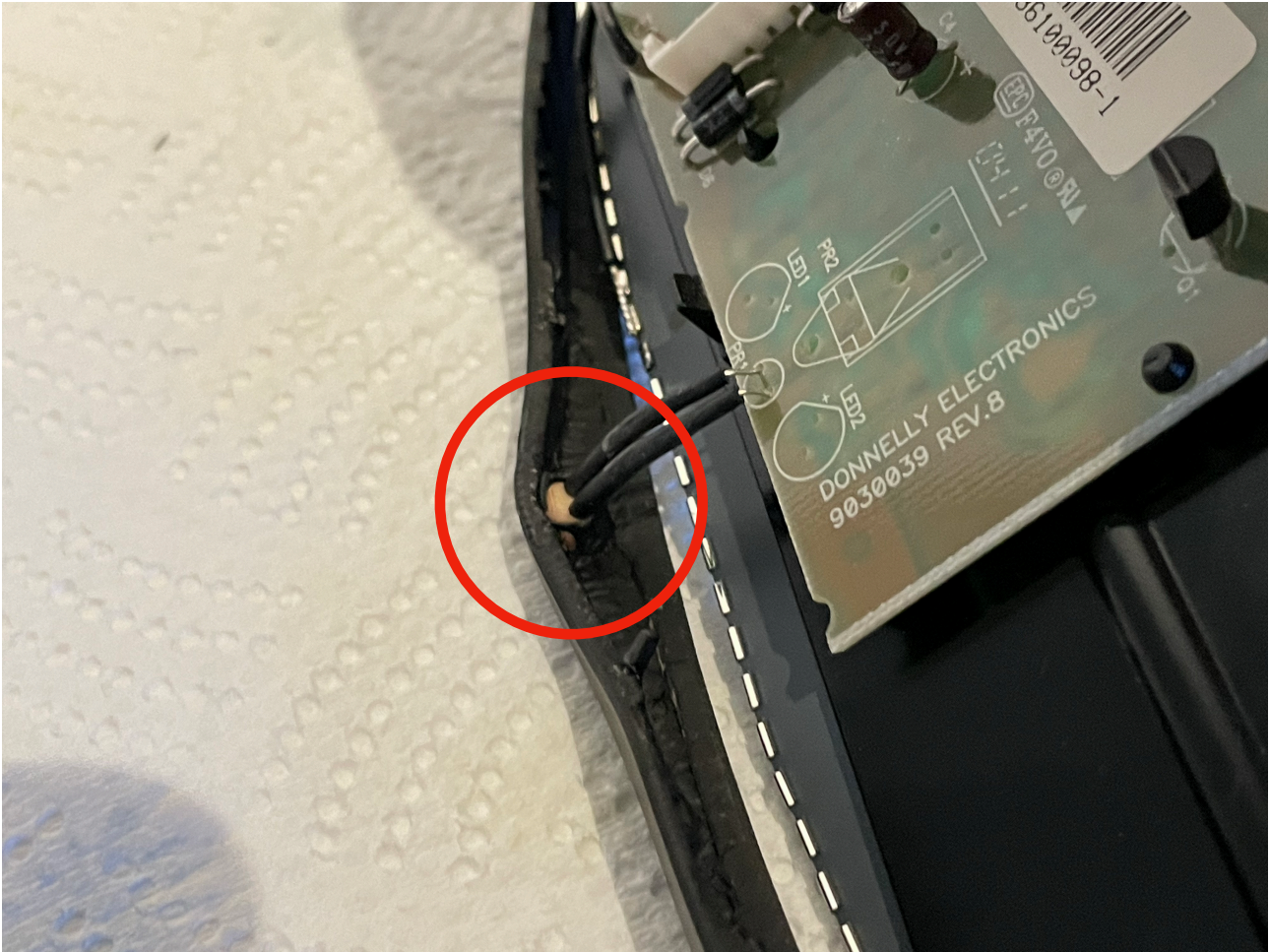
Unplug the white 6-pin connector from the circuit board on the back of the mirror. If needed use the small flat head screwdriver (Tool B) to loosen the connector.



Remove Mirror from Front Housing Trim



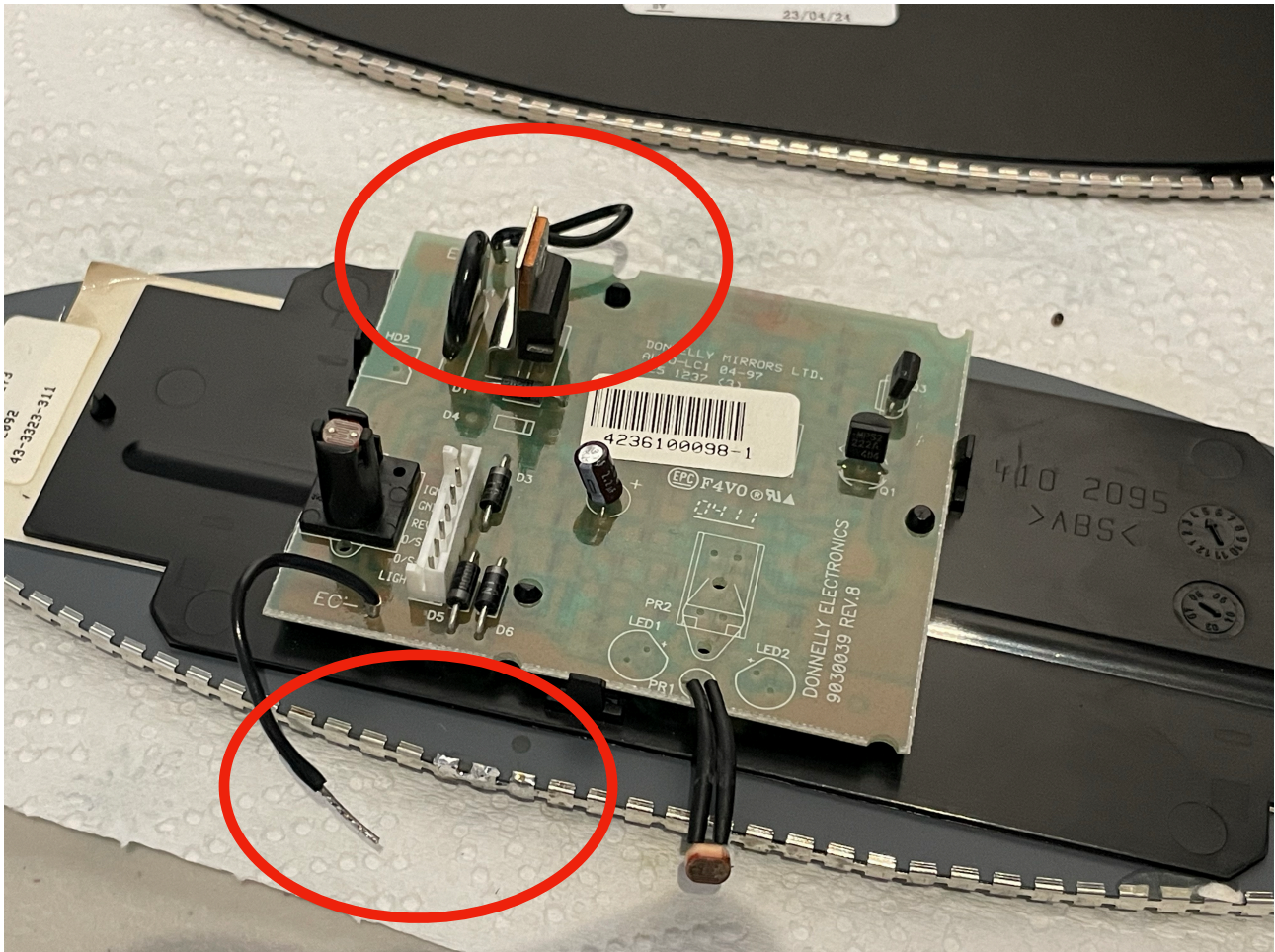
When removing the mirror from the Front Housing Trim be careful that the PCB that the rear-facing light dependent resistor is free from its casing.

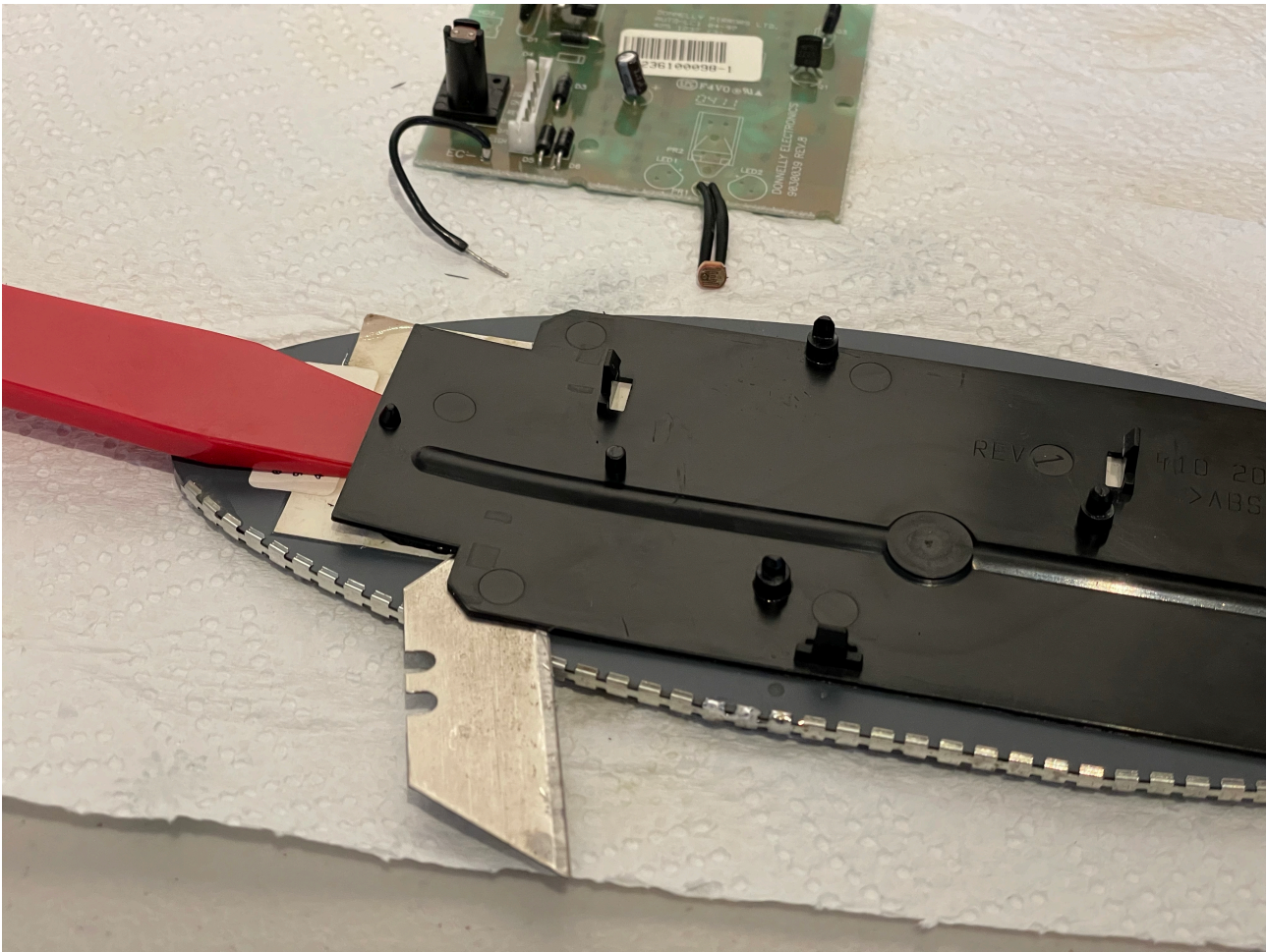


Carefully lift the mirror from the trim and set it face down on a soft surface.

Detach PCB from Mirror

To detach the PCB from the mirror, use the soldering iron (Tool D) set to approximately 400 degrees celsius to detach the black leads soldered to the metal mirror frame.





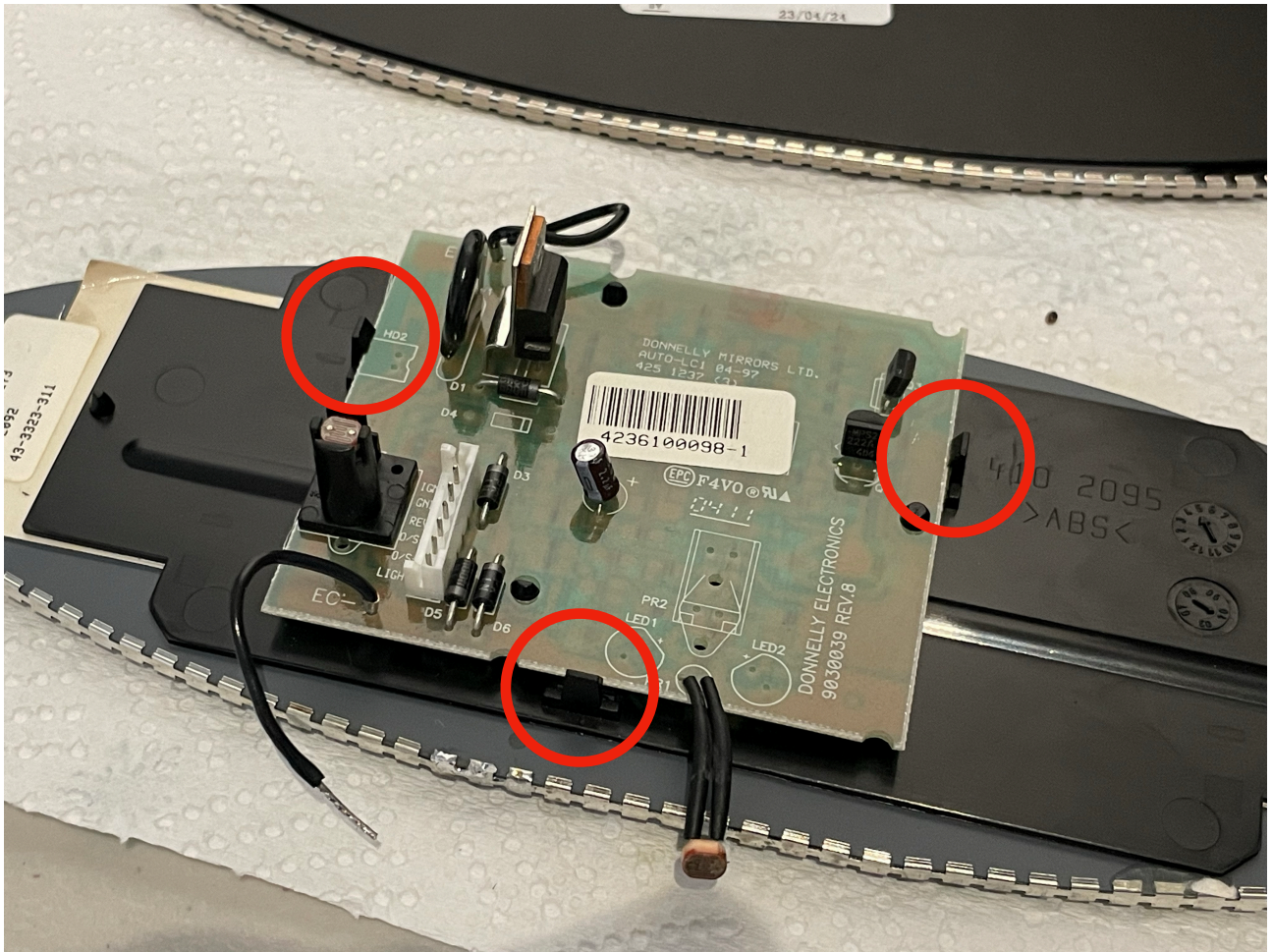
The PCB can then be removed from the bracket affixed to the back of the mirror. Use the small flat head screwdriver (Tool B), if needed, to release the PCB from the 3 clips around the edge of the PCB.

When the PCB is free, set it aside.

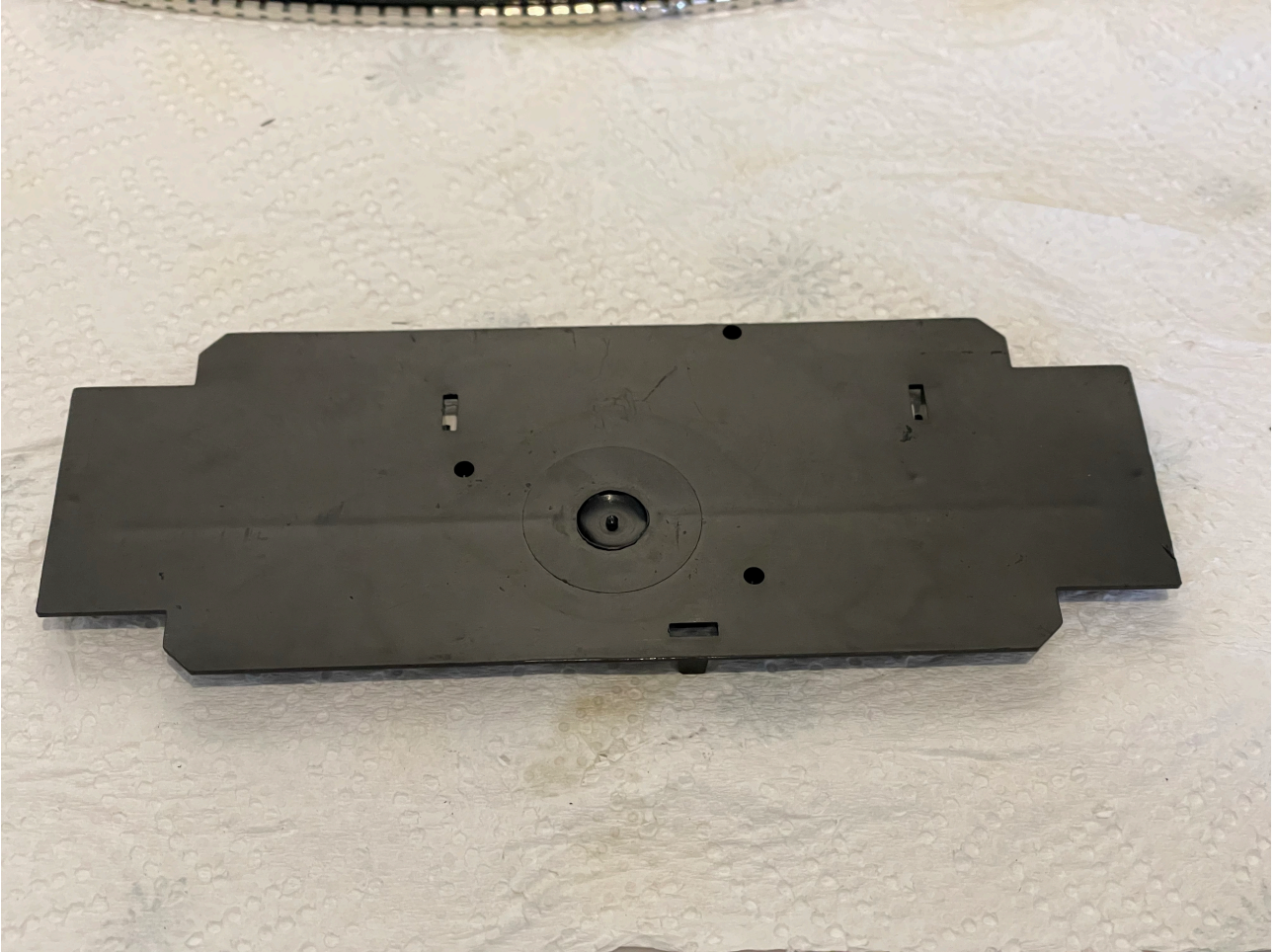
Remove PCB bracket from Mirror

The PCB bracket is affixed to the mirror back with a considerable amount of adhesive tape. This tape is extremely strong and sticky, take your time when separating the bracket and be careful to not bend or break the bracket.

Use the small trim removal tool (Tool A) to carefully pry under one end of the bracket. Then use the craft knife blade (Tool C) to carefully help separate the bracket.



Once the bracket is free, use the craft knife blade (Tool C) to help lift the rest of the adhesive tape. A piece of the removed tape is helpful for removing any remaining sticky residue.



5. Reassemble Rear View Mirror Assembly

Parts & Consumables

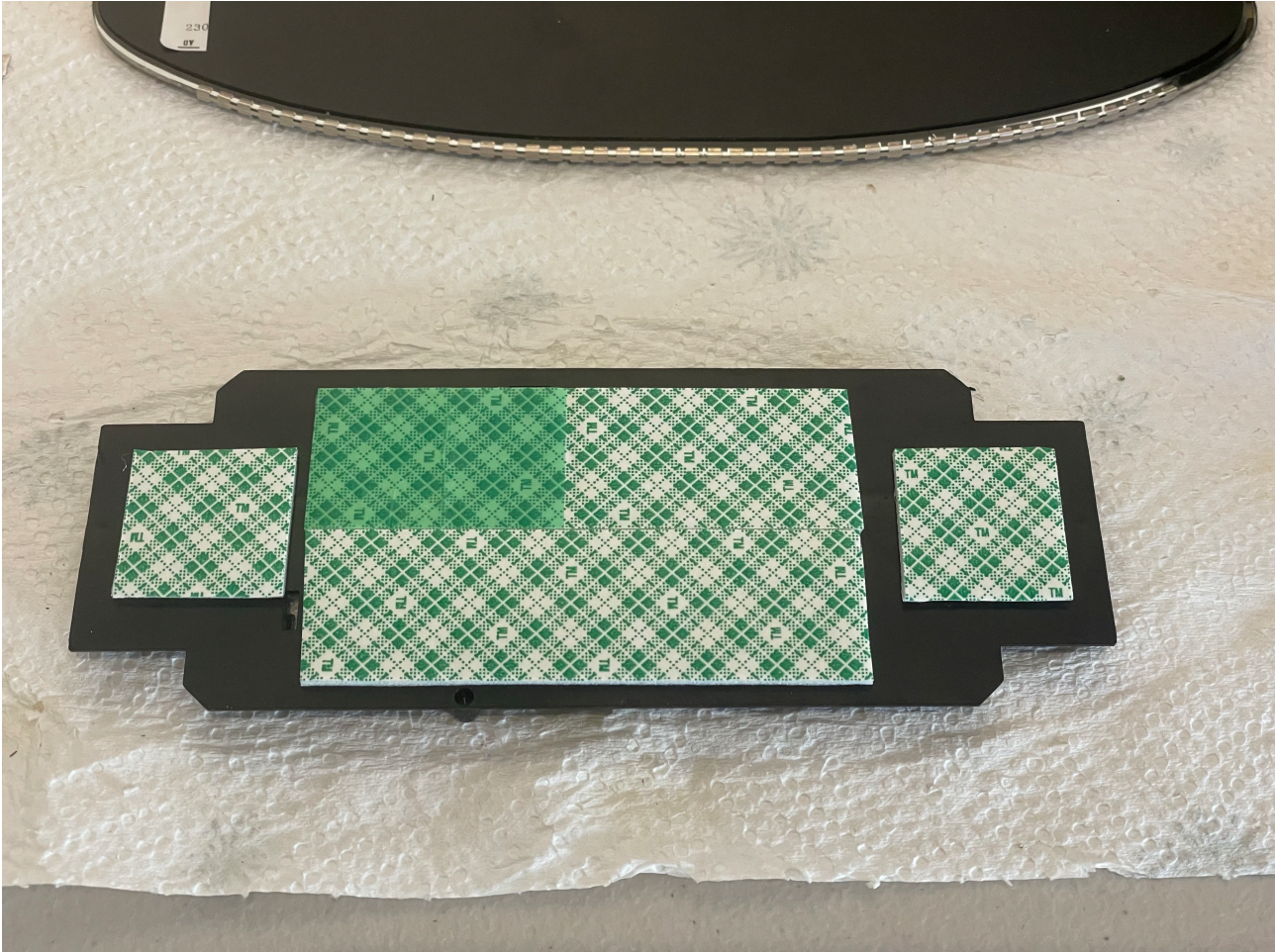
1. Electrochromic mirror glass panel*
2. Double-sided tape (3M Scotch Indoor Double Sided Mounting Tape https://www.scotchbrand.com/3M/en_US/p/d/cbgnawus1862/ or similar)
3. Solder

Tools Required

- D. Soldering Iron

Prepare PCB Bracket for Affixing to New Mirror

Apply double sided tape (2) to the PCB bracket. Depending on the exact positioning of the bracket it may slightly overhang the mirror on one side. Therefore leave a quarter inch perimeter free of tape.

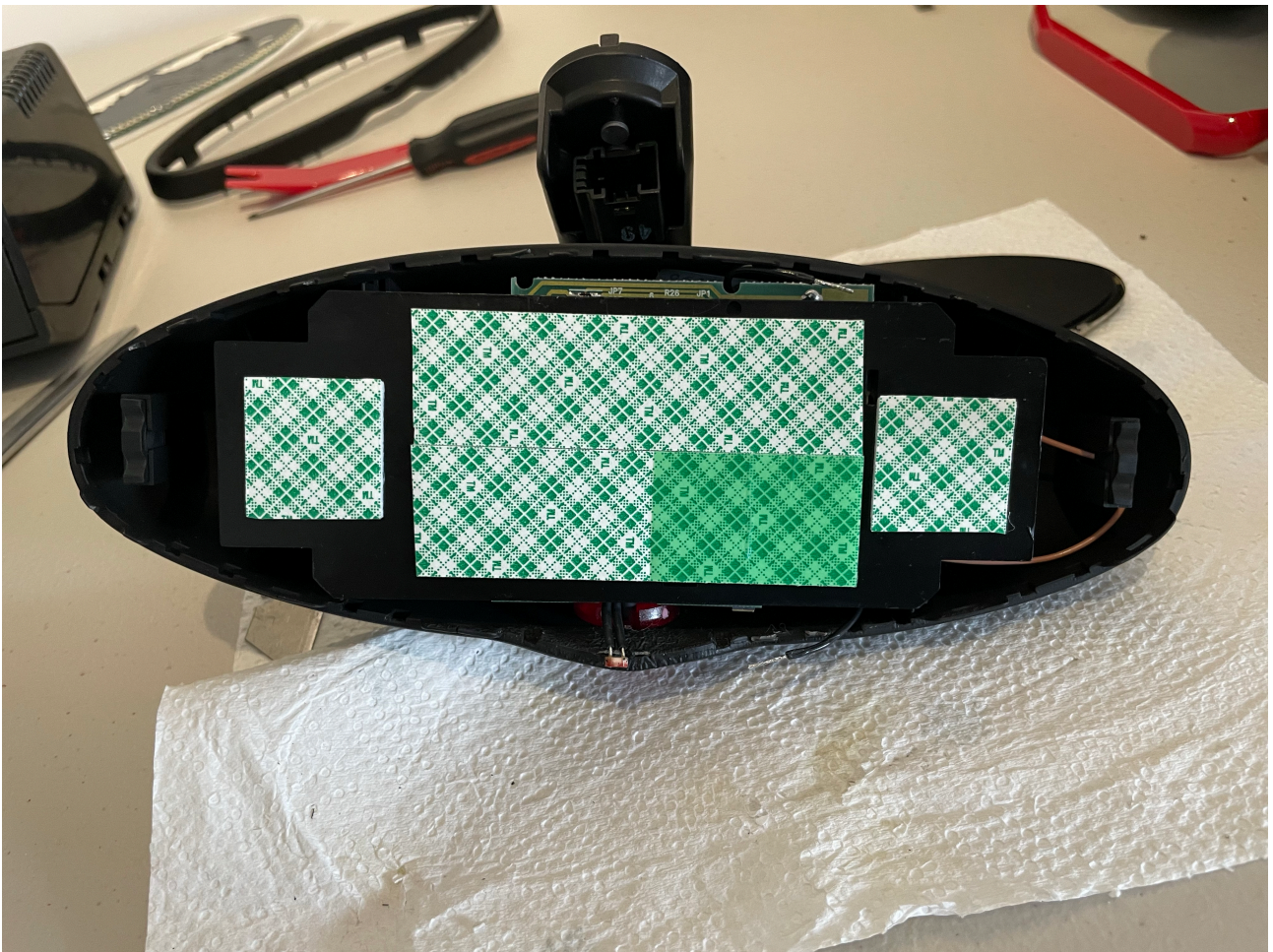


Seat the PCB back into the mounting bracket.

Affix PCB bracket to New Mirror

To affix the PCB bracket to the new mirror it is necessary to ensure that they are correctly aligned. If misaligned then the front facing light dependent resistor housing will not sit correctly aligned with the port in the mirror housing.

To ensure correct alignment, fit the PCB (attached to mounting bracket) into the mirror housing. Ensure that the PCB is seated properly and that the front facing light dependent resistor is aligned.





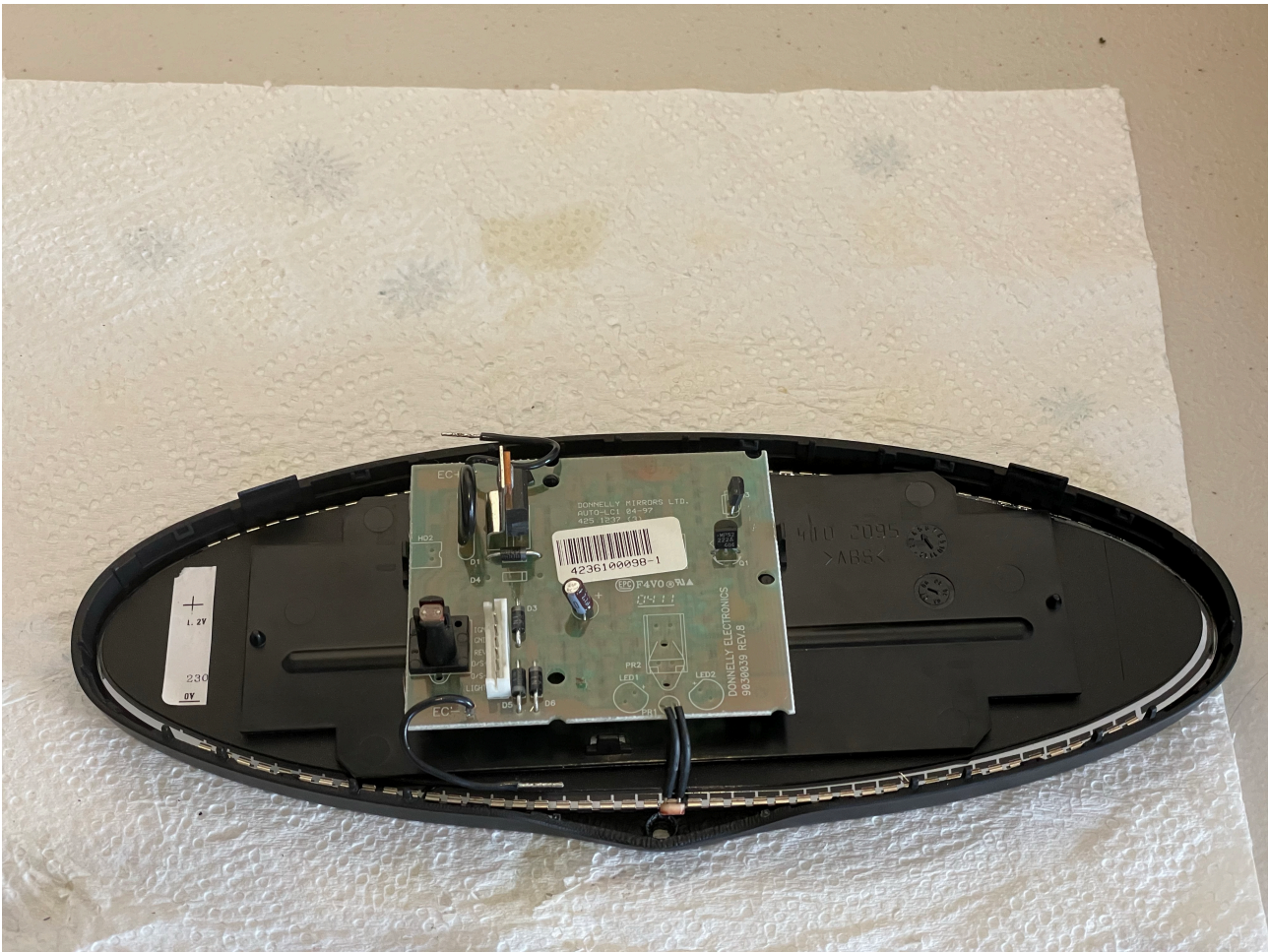
Next seat the new electrochromic mirror glass into the front mirror housing bezel. Ensure that the mirror is oriented correctly. The + terminal is at the top and the - terminal is at the bottom (which also has the hole in the bezel for the rear facing light dependent resistor).



Remove the backing from the adhesive tape, then holding the mirror housing, use one finger on each side to hold the PCB mounting bracket in place. Rotate the mirror housing so that the adhesive tape is facing down. Gently mate the mirror housing with the front bezel, ensuring that the two are aligned. Do not actually clip the mirror housing to the front bezel.

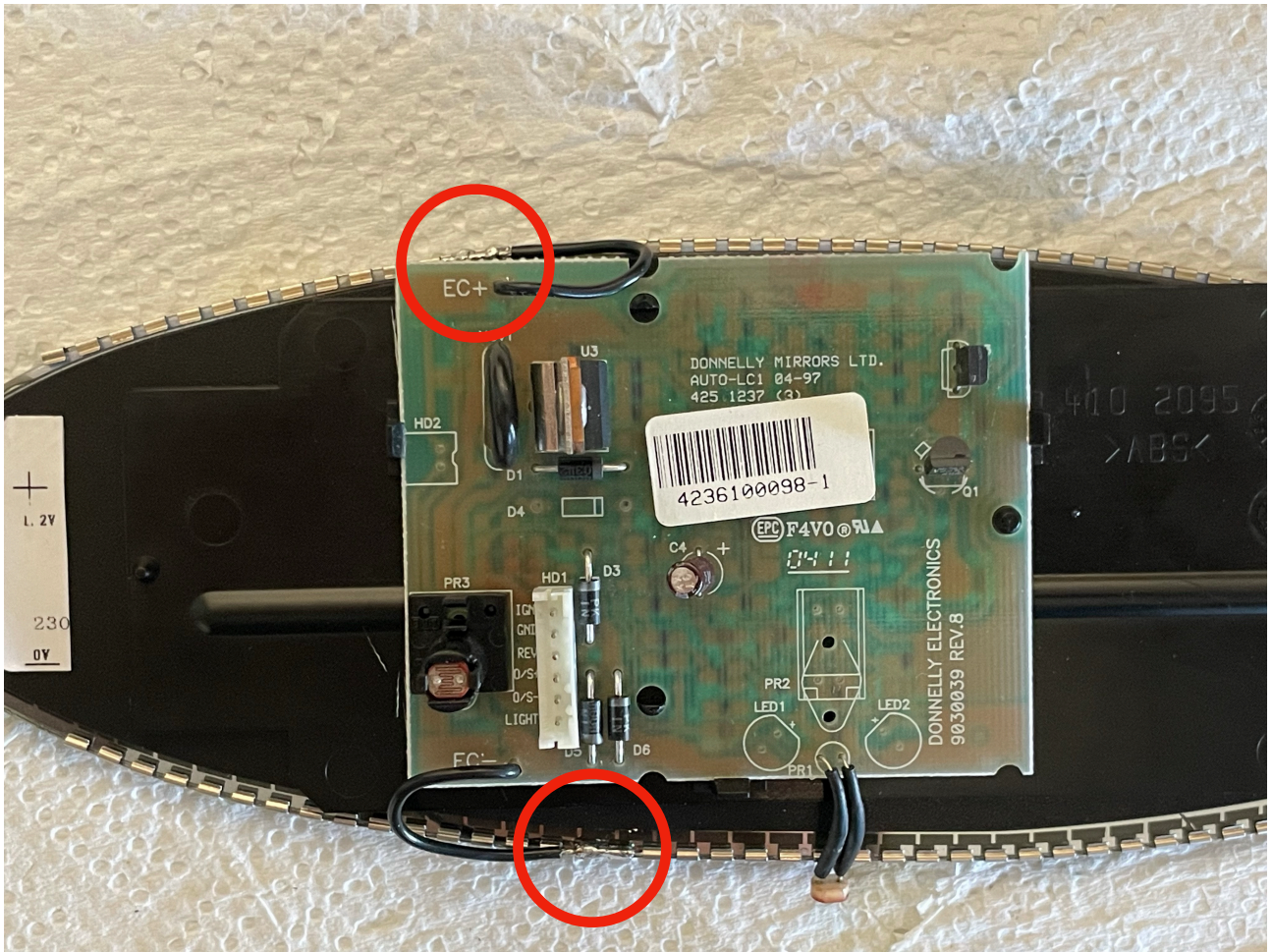
Once you are satisfied that the two are aligned let go of the PCB mounting bracket and allow it to drop onto the mirror. Carefully lift up the mirror housing so that the PCB and PCB mounting bracket remain on the mirror.

Gently but firmly press down on the mounting bracket (not the PCB) to ensure that it is well-adhered to the mirror.



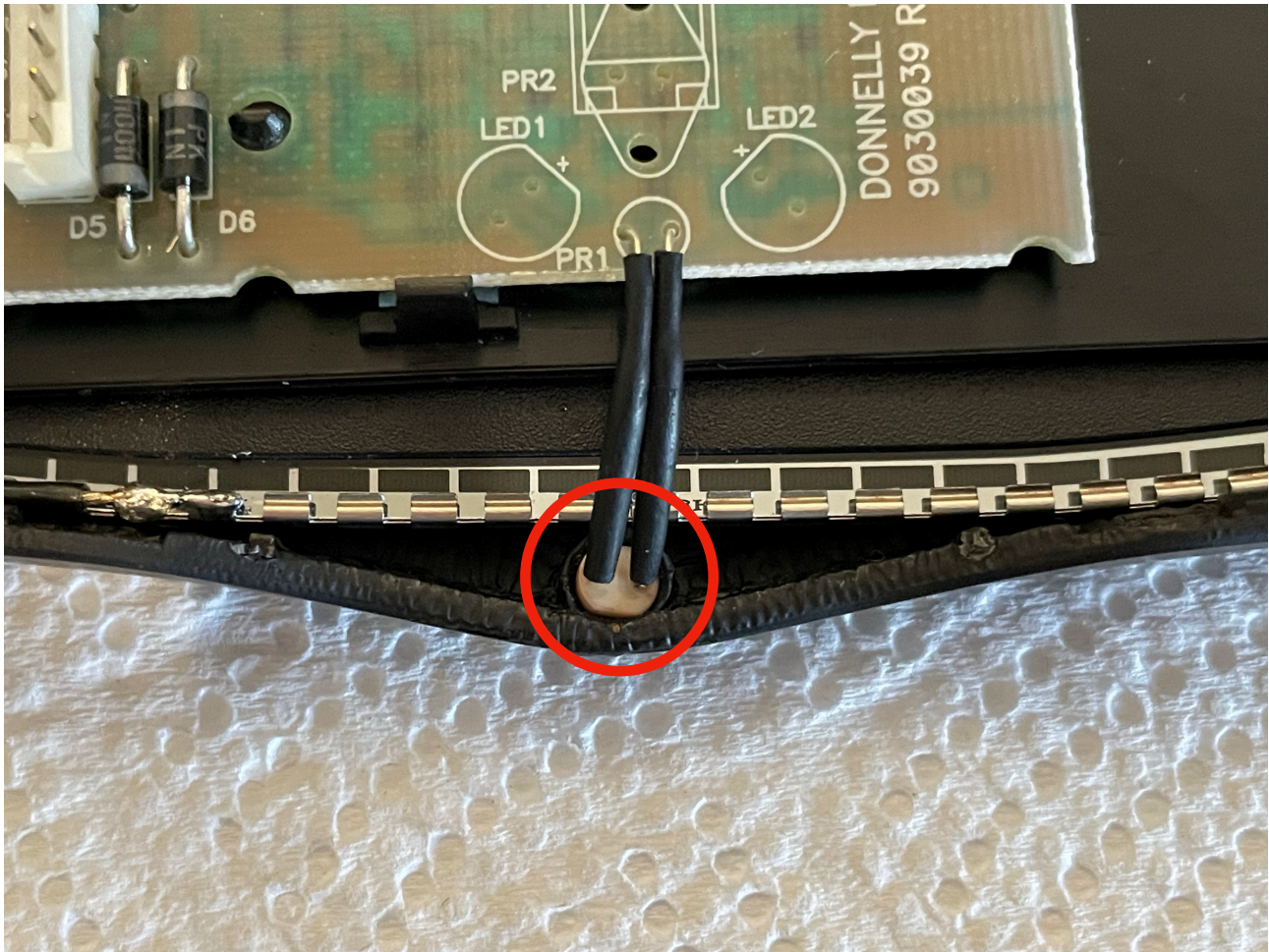
Connect PCB to Mirror

Using the Soldering Iron (Tool D) and solder (3) attach the + and - leads to the metal terminals on the mirror.



Set Mirror into Front Bezel

Re-seat the mirror into the front bezel, and ensure that the rear facing light dependent resistor is correctly seated.



NOTE: If you have adjacent broken tabs, or the end tabs are broken it is recommended that at this point that you follow the instructions in Section 7 to repair the broken tabs.

Reconnect PCB to Mirror Housing

Connect the white 6 Pin connector in the mirror housing to the socket on the PCB.



Reattach Front Bezel to Mirror Housing

Carefully align the mirror housing and the front bezel, and then gently but firmly press the two together so that the clips re-seat.



If the bezel is not held firmly and tightly in place then too many of the clips have been broken. It is recommended that you follow the instructions in Section 7 to repair the broken clips.

If you do not wish to do this you can use a small amount of Araldite 2-part epoxy (5) to glue the bezel in place. Note that if you do this you will NOT be able to disassemble the mirror housing in the future.

The mirror assembly is now ready to be returned to the vehicle.

6. Install Rear View Mirror Assembly in Vehicle

Attach Rear View Mirror Assembly to Windshield

Connect the electrical connector on the windshield to the socket in the mirror assembly arm, press the two together until they click into place.

Holding the mirror assembly at a 45 degree angle (anticlockwise from vertical). Press the arm onto the mount affixed to the windshield. Once it is seated in place carefully rotate the mirror assembly clockwise until it is aligned vertically.



Reattach Mirror Base Trim Covers

Take the two mirror base trim covers and holding them either side of the mirror arm press them together so that they click into place. Ensure that the rubber grommet is placed correctly.



The mirror installation is now complete.

7. Optional: Repair Procedure for Broken Mirror Housing Clips

Parts & Consumables

3. Solder
4. Optional: Brass pins from 2.54mm PCB header connectors (<https://befr.rs-online.com/web/p/pcb-headers/2518086> or similar)
5. Optional: Araldite 2 part epoxy (<https://www.go-araldite.com/en/araldite-ultra-strong-24ml> or similar)

Tools Required

- D. Soldering Iron
- E. Tweezers

Preparation

Remove the mirror/PCB sub assembly and set it safely aside.

Using the soldering iron (set to 450 degrees celsius) heat up the brass pins from the PCB header connector one by one and using the tweezers remove the pin from the black connector base. Set the pins aside to cool.

Embed Pin into Stubs of broken clip

Holding the pin with the tweezers align it to the subs of the broken clip. Refer to an unbroken clip to see where to align it. The gap between the pin and the base of the clip should be the same as for an unbroken clip.

Using the soldering iron, heat up one end of the pin. Be careful to heat only the pin and not directly connect the soldering iron with the plastic clip stub.

When the pin is sufficiently heated you can gently press the pin into the plastic stub until it sits flush. Do not press the pin all the way through the stub. Repeat for the other end of the pin.

The pin should now sit in the indents created in the stubs, although the pin will probably not be held tight.

Carefully use the front bezel to test the placement of the pin and ensure that the clip fits into place.

Repeat this process for each clip to be fixed.

Affix pins to broken clip stubs

Using the Araldite 2-part epoxy (5) carefully affix each pin into place. Use a piece of scrap to ensure that the Araldite does not sit too proud of the pin.



Allow the Araldite 16 hours to harden. Once hardened the clips are functional.