

Subject: DIAGNOSTIC TIPS FOR WINDSHIELD FLAWS / SCRATCHES / CRACKS CAUSED BY EXTERNAL FACTORS	Bulletin No: 09-002/10
	Last Issued: 01/07/2010

APPLICABLE MODEL(S) / VINS

2006-2010 MX-5
2004-2010 RX-8
2004-2010 MAZDA3
2006-2010 MAZDA5
2003-2010 MAZDA6
2007-2010 CX-7
2007-2010 CX-9

DESCRIPTION

Most flaws, scratches and cracks on the surface of the windshield are caused by external factors during customer use, such as flying debris (small stones). Flaws, scratches and cracks on the windshield are normally not covered under warranty. However, careful investigation is required for correct root cause analysis of windshield damage. This service information describes the distinguishing features of windshield flaws, scratches and cracks to support your diagnosis and judgment in determining whether the damage was caused by the customer or not.

MECHANISM OF FLAWS/SCRATCHES/CRACKS OCCURRENCE:

All vehicle windshields are exposed to flying debris. During three years of normal vehicle use, about 10,000 subtle flaws ranging in size from 0.1 mm ~ 1.0 mm appear on the windshield. However, as for the occurrence of visible flaws, scratches and cracks, some occur immediately after a subtle flaw appears and some occur after additional mileage is put on the vehicle.

If the impact of flying debris isn't big enough, the windshield glass may show subtle flaws without having a visible scratch and/or crack at that time. After that, the stress applied to the glass while the vehicle is driven (wind pressure, vibration, body distortion, temperature change etc.) can make subtle flaws grow and cause visible flaws, scratches and cracks. These may appear as if they had occurred suddenly.

HOW TO TAKE CARE OF FLAWS/SCRATCHES/CRACKS:

After understanding the mechanism of flaws, scratches and cracks, we need to take care of them by performing an appropriate inspection and diagnosis of the occurrence situation. The following procedure is for your reference.

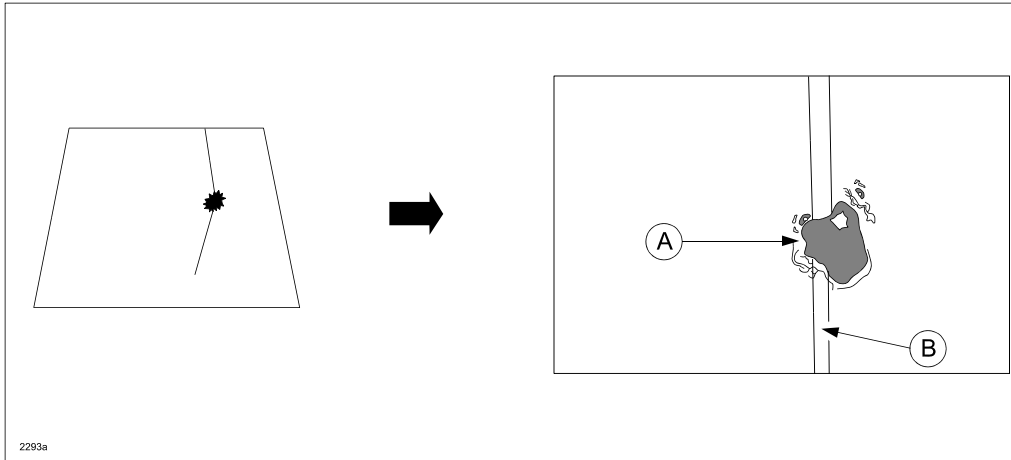
- Interview the customer to understand the situation in which they recognized the flaws, scratches or cracks and whether they experienced flying debris hitting the windshield or not.
- By using a fingernail, needle or pencil, trace the crack and verify the possible starting point.
- Carefully check underneath the windshield moulding as necessary, since the starting point can be found there.
- Observe the flaws, scratches and cracks with a magnifying glass.
- Review the results of the customer interview and observation with the “Causes” and “Features” below to identify the root cause.
- Explain the root cause of occurrence to the customer with digital photos taken during observation.
- If it is difficult to verify the starting point of a crack, check for damage on the paint surfaces such as the bumper, hood, etc.

CAUSES AND FEATURES OF FLAWS/SCRATCHES/CRACKS:

Crack Due To Flying Debris:

Cause: Crack (B) occurs when flying debris such as small stones or fallen objects on the road hit the windshield while driving the vehicle.

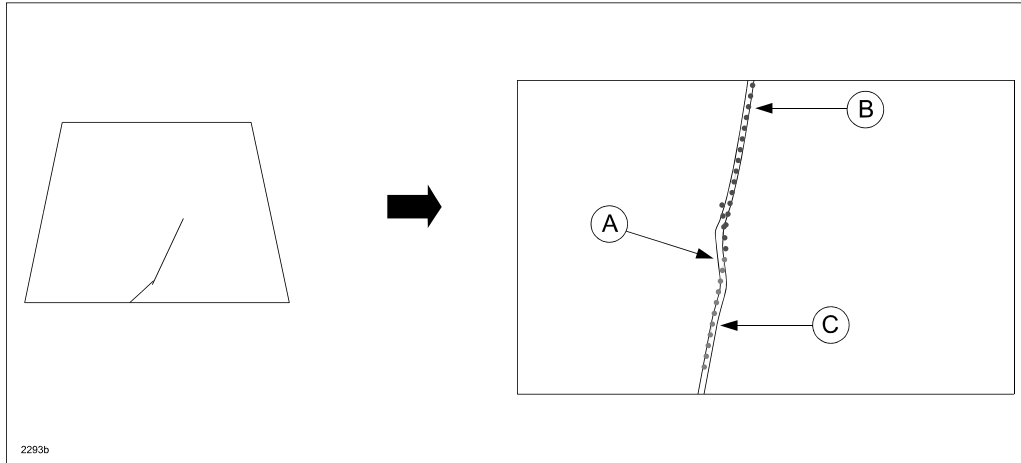
Feature: Impact scar (A) remains.



Crack Due To Flaws:

Cause: Linear flaw (due to a metallic hit, etc.) is expanded and causes a crack (B).

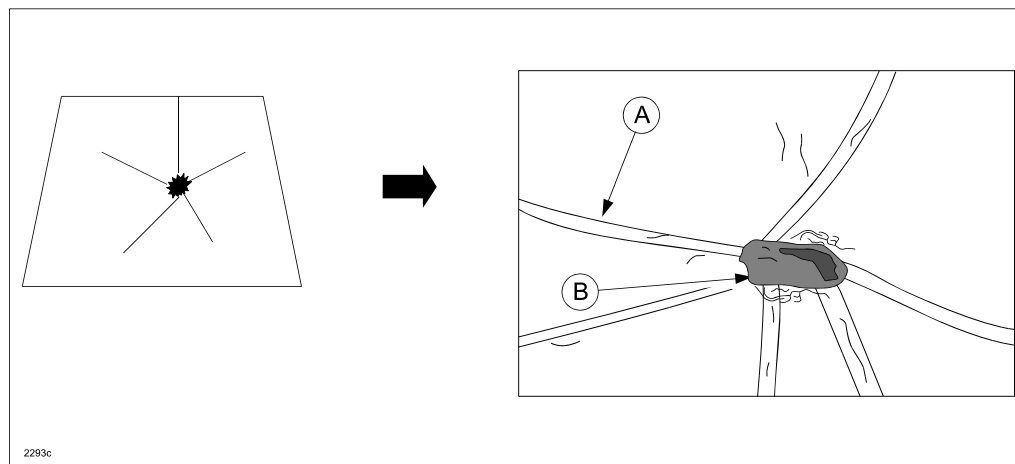
Feature: Crack begins at the end of the flaw (A), then expands to an extension line of the flaw (C).



Crack Due To External Force:

Cause: After the flaw occurred, some force (B) is applied causing the flaw to expand and result in a crack (A).

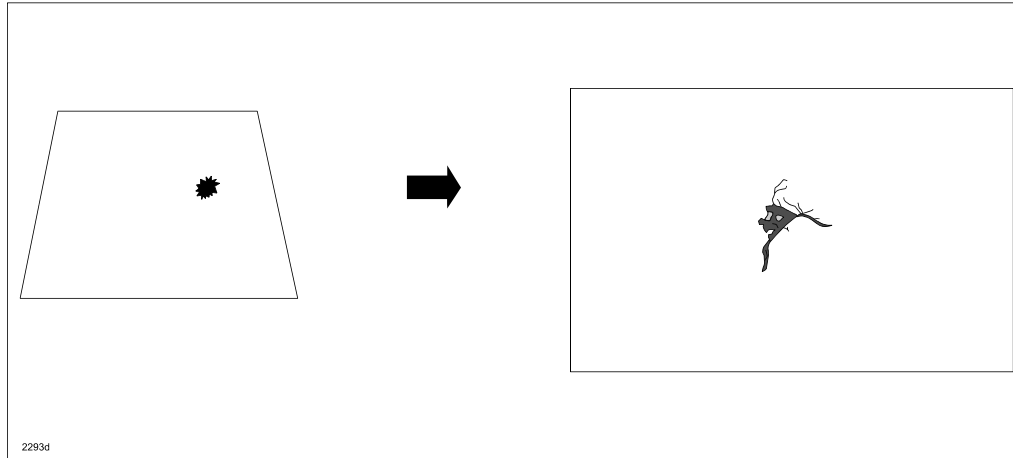
Feature: In many cases, a radial type crack occurs. Depending on the direction of external force, a single crack may occur.



Flying Stone Flaw:

Cause: This occurs when flying debris such as small stones hits the windshield while driving or under strong wind condition (i.e. thunderstorm, etc.).

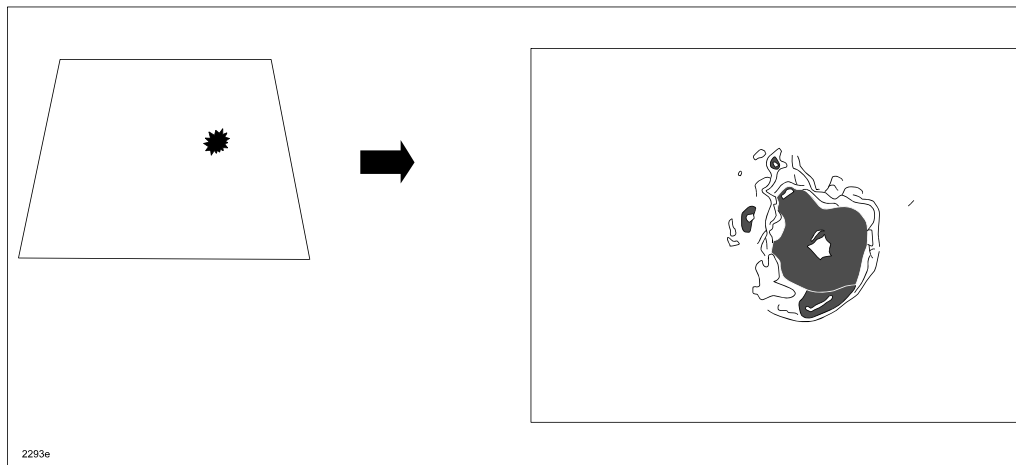
Feature: Drop-shaped flaw. Its size ranges from 0.1 mm ~ several mm.



Welding Spark Flaw:

Cause: This occurs when flying sparks generated by welding work (at construction site, etc.) hit the windshield.

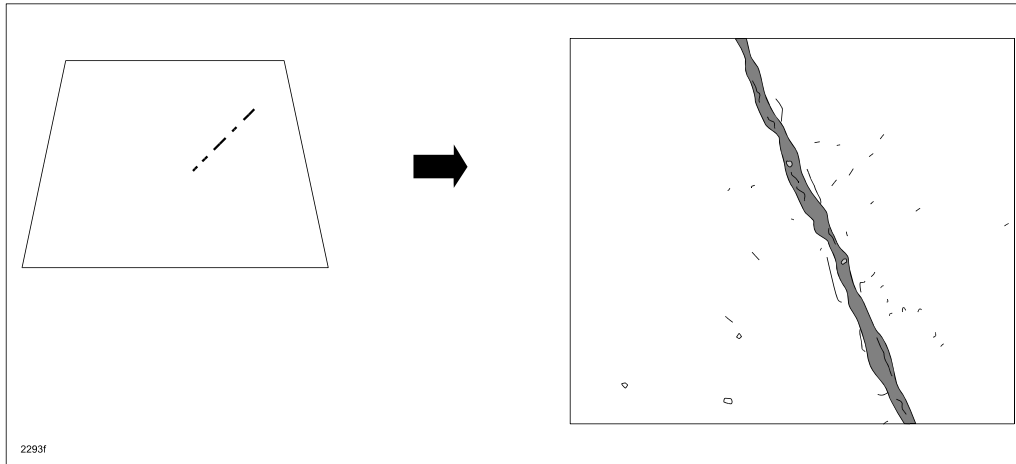
Feature: The flaw is drop-shaped with a size range of 1 mm ~ 2 mm in most cases. The surface of the glass looks melted. These spots might also occur on glass other than the front windshield.



Metal Flaw:

Cause: This occurs when some metallic material such as an automobile key, a metal button, and/or the tip of an umbrella contact the windshield.

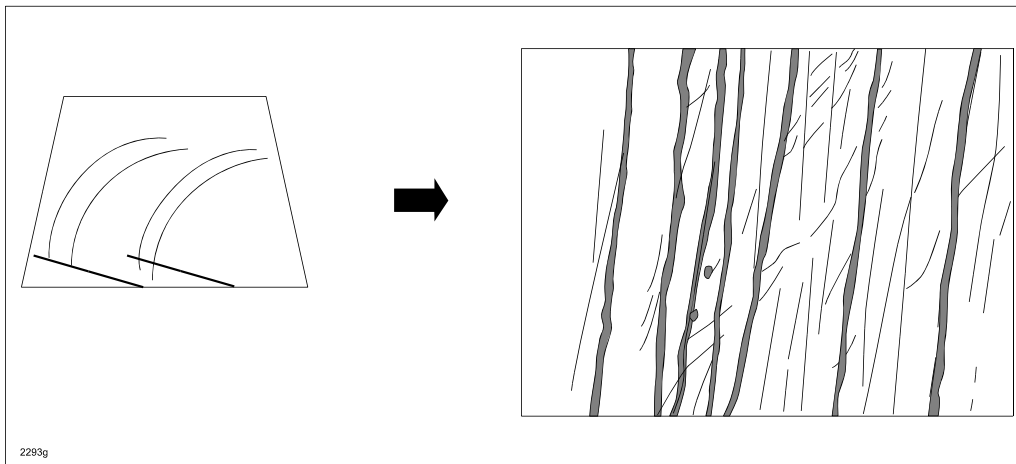
Feature: Relatively sharp flaw. Sizes are random. A single flaw is observed in most cases. Direction of the flaw differs.



Wiper Flaw:

Cause: Sand and other objects get into the space between the wiper rubber and windshield causing flaws on the windshield when the wiper is used.

Feature: Flaw occurs in the wipers path. There is only one flaw or several flaws in a mass. If they are in a mass, they occur almost in parallel in many cases. The length of the flaw is random. This flaw can be avoided by cleaning the sand and debris from the wiper path.



Wiping Flaw:

Cause: This occurs when the windshield is cleaned with a towel or cloth containing dust or sand.

Feature: It is a relatively long flaw. Several flaws are crowded and overlapped with each other. As it occurs along with the wiping path, many form into an arc.

