

Technical Reference

Tags for Long-Range UHF Readers

RF Blocking by Vehicle Features

There is no definitive list of vehicles on which the tags for UHF long-range readers will not read well. The features of the vehicles that may cause interference with the tags' transmission are generally options -- either factory "packages" or after-market additions. The following notes help to identify the small number of vehicles that may block the codes from AWID's windshield tags. These vehicles are almost always "high-end" passenger cars – typically expensive makes. Suggested solutions are shown.

A. Metal Coating on Windshield

Kinds of Coating:

- Automatic windshield wipers, using a coating outside the windshield to sense moisture.
- Anti-glare coating that blocks polarized light, with a purple appearance outside the windshield.
- Absorbent coating to reduce infrared and ultraviolet. (High-end Mercedes cars with windshield marked "Sungate" have a coating to reflect infrared.)

Effect: Metal coating may block the tag's code from inside the car to the reader, causing the tag not to read.

Solutions (in sequence – for both LR-2000 and LR-911 except as noted):

- (a) Install WS tag in an area of the windshield that has no metal coating – perhaps lower left corner (where state registration or inspection stickers attach) or top center of windshield (where toll tags attach).
- (b) (LR-2000 only) Try other adhesive or clip-on tag types – rear-view mirror or sun-visor or hang-tag.
- (c) Support MT tag on dashboard (away from windshield glass), using a Velcro dot; or hold in fingertips.
- (d) Attach MT tag outside vehicle, using the tag's adhesive, screws, pop rivets or wire ties.
- (e) (LR-2000 only) Hold a UHF card (clamshell or graphics type) at the driver's side window, aimed at the reader. This is not a hands-free option.

B. Metal Embedded in Windshield

Kinds of Embedded Wires:

- Heated wires inside laminated glass to defrost or demist the windshield.
- Wire grid inside laminated glass for radio antenna.

Effect: Metal wires may reduce the RF field strength for the tag's code, causing shorter read range.

Solutions (in sequence – for both LR-2000 and LR-911 except as noted)

- (a) Install WS tag in an area of the windshield that has no metal wires – perhaps top center.
- (b) (LR-2000 only) Try other adhesive or clip-on tag types – rear-view mirror or sun-visor or hang-tag.
- (c) Support MT tag on dashboard (away from windshield glass), using a Velcro dot; or hold in fingertips.
- (d) Attach MT tag outside vehicle, using the tag's adhesive, screws, pop rivets or wire ties.
- (e) (LR-2000 only) Hold a UHF card (clamshell or graphics type) at the driver's side window, aimed at the reader. This is not a hands-free option.

C. Metal Compounds in the Glass

Kind of Metal: Heavy tinting for sunlight attenuation, usually in a band along the top of the windshield.

Effect: Heavy tinting may reduce the RF from the tag, or block it. This is unusual in cars from recent years.

Solution: Move the tag so that, when the tag is at the rated reading distance from the reader, it has clear line-of-sight through a non-tinted area on the windshield.

D. RF Transmission from On-Vehicle Devices

Sources of RF Interference:

- Pre-collision warning system – radar-like devices at front and rear of vehicle, to detect roadway hazards.
- RF communications equipment in the vehicle. (But cell phones, GPS, LoJack and “OnStar” type devices do not affect the reader and tag.)

Effect: RF from other sources may reduce the tag’s read range, and may overwhelm tag code transmission.

Solution:

- (a) Install a switch to disable the RF source’s transmission while the tag is in the reader’s effective field.
- (b) Install an MT tag outside the vehicle, away from the RF source, close to and facing the reader.
- (c) (LR-2000 only) Hold a UHF card (clamshell or graphics-quality) at the driver’s side window, aimed at the reader. This is not a hands-free option.

Notes

- AWID’s Installation Kit (required for installers) contains each tag and card type for testing the long-range reader.
- At the rated reading distance from the reader, the tag must be about *parallel* (facing straight on) to the reader.
- The MT tag offers great variety of uses. It almost always works when a WS tag may be blocked. If the MT tag is blocked inside the car, it can be mounted in many places outside the car.
- The WS tag must be adhered permanently inside windshield glass to develop its full rated reading distance.
- The WS tag may work on a coated windshield if a small rectangle is cut from the coating, large enough for the WS tag to be attached inside the cleared space.
- The WS tag may be applied inside a *side* window of the vehicle if the tag faces a reader, and if the window is fixed in position (that is, will not lower the tag inside the door’s metal body).
- Highways using UHF tags for toll collection share the RF blocking problem. Toll road operators may require that the tag be mounted on a special bracket outside the vehicle when traveling. (See the “SunPass” reference, below.)
- “Lead” glass has no effect on RF transmission. Virtually every kind of glass contains lead.

References

- Instructions for mounting AWID’s UHF tags in Manuals (Section 6) and separate sheets.
- Technical Reference, “Readers, UHF – Planning Questions to Define System”
- Technical Reference, “Tags, UHF – WS, Testing Before Installing”.
- Technical Reference, “Tags, UHF– WS & RV, Testing Installed Tags in Vehicles”
- Florida’s SunPass Web site: www.SunPass.com > “How SunPass Works” > “Problem Windshields”.