



FIELD GUIDE / 2026 EDITION

Car CGI Is Won and Lost on Reflections

Why a car body is effectively a mirror, how paint is actually built in layers, what CAD you must supply and in what state, and how to check the delivery.



START HERE

The environment is the product shot

Point a camera at a car and most of what you photograph is not the car. It is the sky, the ground, the buildings and the studio walls, bent around a set of large curved surfaces. Automotive CGI is the one product category where the subject is largely a mirror, and that single fact reorganises everything about how the work is done.

Why designers read a body by its reflections

A shoulder line is not visible as a line. It is visible because a reflection compresses and snaps along it. Get the environment wrong and the surfacing the design team spent two years on simply does not appear — the car looks soft, or bloated, or generic, and nobody can say precisely why.

What follows from that

- The lighting environment is a deliverable, not a setting
- A clean studio HDRI flatters some bodies and destroys others
- Glass, chrome and gloss black each need different treatment
- What is behind the camera matters as much as what is in front of it

The four surface families, in order of difficulty

01	Gloss body paint	A mirror with a coloured layer underneath. Shows every flaw in the environment and every flaw in the surfacing.
02	Chrome and polished metal	A pure mirror. Contains no information of its own — it is entirely a picture of the surroundings.
03	Glass	Reflects and transmits at once, and the interior behind it has to be finished enough to survive being seen through it.
04	Tyres and matte trim	The easy ones, and the ones most often neglected. A perfect body above a plastic-looking tyre reads as fake overall.

A useful review habit: when a car render looks wrong, look away from the car. The fault is usually in what it is standing in.

PAINT

Three layers, and what each one is doing

Automotive paint is not a colour. It is a stack, and each layer behaves differently under light. Knowing the stack lets you give a precise note instead of “the red is not our red.”

LAYER	WHAT IT DOES	HOW IT GOES WRONG
Base coat	Carries the colour. Absorbs most of the light that gets past the layers above it and returns the hue.	Matched on screen from a digital swatch instead of from a physical paint chip. The hue is close and the depth is absent.
Metallic or pearl flake	Suspended particles that glint individually and shift the colour depending on viewing angle. This is what makes a metallic look expensive.	Flake too large, so the body sparkles like glitter; or too uniform, so it turns into a flat grey sheen with no travel.
Clearcoat	A transparent layer on top that produces the sharp reflection and the deep, wet look. It is a separate reflective surface above the colour.	Merged into one material with the base, which collapses the depth. Real paint reflects twice, slightly offset.
Orange peel optional	The very slight texture of real sprayed paint. A subtle unevenness in the reflection.	Left out entirely, which is the small thing that separates a real car from a perfect one. Ask whether it is there, then decide.

Colour, properly

Send a physical painted panel or a manufacturer paint chip, and the paint code. Then approve the colour on a calibrated screen against that chip, under daylight, with one named person responsible. A metallic cannot be judged from one image at all: ask for the same body at three angles, because travel across angles is the whole character of the finish.

Note language that works

“Flake is too coarse.” “Clearcoat reflection is too sharp for this finish.” “Base reads brown in shadow, ours goes plum.” “The reflection break along the shoulder line is too soft.” Each of these points at one layer and can be acted on. “It looks like a toy” cannot.

YOUR SIDE OF IT

CAD, HDRI and plates

Three supply questions decide most of the schedule. Settle them before anyone quotes, because each one has a cheap answer and an expensive one.

01 Which CAD, and at what stage is it frozen?

Engineering data in a neutral solid format is the usual starting point. What matters more is whether it is final: rendering an unfrozen surface means rendering it twice. Ask your design office for the release status in writing.

02 Has it been prepared for visualisation, or is it raw engineering data?

Raw CAD is built to be manufactured, not to be lit. It arrives with gaps between panels, missing fillets, no shut lines that read at camera distance and tessellation that creases under a reflection. Preparation is real work and it belongs in the quote openly rather than as a surprise.

03 Exterior only, or interior too?

Glass transmits. The moment a window is in frame, the cabin behind it has to exist to some standard. Decide whether that standard is “visible through glass” or “photographed directly” — they are very different jobs.

04 Which trims, wheels and colourways, and in what order?

Wheels are geometry and cost more than colours, which are materials. Build the full matrix once, at the start, rather than discovering the second wheel option after the scene has been closed.

05 Studio environment, or real location?

A studio environment is controllable and repeatable, which is what a configurator needs. A real location sells an image but ties you to a plate, its weather and its licence.

06 If there is a plate, who shoots it and to what specification?

Camera position, height, lens, time, and a full-coverage HDRI captured at the car's position at the same moment. Without that HDRI the reflections cannot match the plate, and no amount of retouching afterwards will fix it.

07 Are number plates, badges, logos and maps cleared?

Anything legible in a reflection or on a screen inside the cabin. Put the licensing questions to your own adviser; the point here is only that they are answered before the image is published, not after.



Maverick Frame production render.

DELIVERY

What to check, and where to look

Review in this order. The first three rows catch more problems than the rest of the list combined, and none of them are about the car.

CHECK	LOOK HERE
Reflection reads the body	The shoulder line and the door surface. The reflection should compress and snap along the feature line, not drift smoothly over it as though the panel were flat.
Contact with the ground	Under the tyres. A hard shadow floats the car; no shadow floats it further. Look for a dark, tight contact where rubber meets surface and softening as it spreads.
The car belongs to its light	Compare shadow direction on the car with shadow direction in the environment, and check that the environment appears in the paint. If the ground has nothing of the car in it, the car is a sticker.
Paint depth	A large curved panel in a highlight. Two reflections, slightly offset: the sharp clearcoat and the softer flake beneath. One reflection means the layers were merged.
Shut lines and panel gaps	Doors, bonnet, boot. Even width along their full length, with a shadow inside, not a drawn black line.
Glass	Reflection and transmission together, a visible thickness at the edge, and a cabin behind it that survives being seen.
Wheels and tyres	Sidewall lettering crisp, tread not repeating visibly, slight flattening at the contact patch. Perfectly round tyres carry no weight.
Badges and details	At 100 per cent. Logos correct, lettering the right proportion, nothing mirrored.
The colourway set	Every colour from the identical camera, light and environment, so a customer comparing two finishes is comparing finishes and not lighting.

One request worth making at the start

Ask for the car delivered on a transparent background with its shadow and reflection as separate layers, alongside the finished composite. It costs very little while the scene is open, and it lets your team drop the same vehicle into new backgrounds, markets and campaigns for years without a new render.

WORKING WITH A STUDIO

Cost, and how to brief it

Two things people ask us before anything else. Both answers are short.

COMMISSIONED WORK	FREELANCER	STUDIO
Single exterior still	\$100 – 300	\$250 – 600
Single interior still	\$120 – 350	\$300 – 700
Package, 5–8 views	\$600 – 1,500	\$1,500 – 4,000
Animation, per minute	\$1,000 – 3,000	\$3,000 – 8,000

Market ranges we are willing to publish. Turnaround and revision-round figures are deliberately not in this table: ours vary too much by project type to state as a benchmark, and an invented number here would be worse than none.

How to brief it — shorter is better

This is the opposite of what most people assume. Four things:

- What you need — **how many images, and of what**
- The plans and elevations, as they are
- A few reference images for mood and light
- One clear line on what the images are *for*

Inflating a small job into a fifty-page specification backfires: taken literally it comes out ugly, and it misleads the people doing the work. Tell them the intent and let the team that does this daily handle the detail.

The mistake that costs the most

The biggest failure we see is not choosing the wrong vendor. It is **timing**. People start looking only after the first supplier has already failed and the deadline is on fire, then choose in a panic.

Line up and vet rendering partners **before** you need one. One, ideally a few, briefed and ready to take work. It costs an afternoon now and saves a project later.

10+

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When the image has to hold up, **talk to us**

We are a CGI studio: architectural and product rendering, 3D modelling, animation, 360 tours and VR. Ten years, 350+ brands and agencies, and the kind of work that still looks right when somebody counts the windows.

Send us the plans and a line on what the images are for. You get a scope and a price, and no obligation to use either.

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Maverick Frame production render. · Cost ranges are market ranges as of 2026 and are not a quotation.