

DRIVING SIMULATOR

TEST DRIVER

A red sports car is driving on a two-lane road that stretches into the distance. The road has a white dashed line on the left and a solid white line on the right. The car is positioned in the right lane, moving away from the viewer. The background features a line of green trees on a grassy hill under a clear sky. Power lines and poles are visible along the left side of the road.

REAL-TIME PHYSICS

120 HZ · ABS · ESC · TCS

ICE PATCH · BLOWOUT
OBSTACLE

PLAYER'S MANUAL

How to drive, recover and score

Controls, the HUD and cockpit instruments, incidents, scoring, conditions and every setting.

VERSION 0.13

OCTOBER 2026

Welcome to Test Driver

Test Driver is a driving simulator about one thing: what you do in the seconds after something goes wrong. You cruise along a country road at speed — then the road turns to ice, a tyre lets go, or cargo lies in your lane. Keep the car on the road, bring it back to a calm, straight line, and the game scores how well you did it.

The car is simulated with real-world vehicle physics at 120 updates per second: tyre grip that depends on load and slip, a torque curve and six-speed automatic gearbox, ABS, stability control and traction control. Grip, braking distances and cornering limits have been checked against typical road-car figures, so what works here tends to work in a real car too.

1	Getting started	requirements, start screen, your first run
2	Controls	keyboard, gamepad, steering wheel
3	The screen	HUD layout and telemetry
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5	A run, incidents and scoring	phases, outcomes, medals
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7	Conditions	time of day, weather, road surface
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Credits

Car model "Car Concept" by Eric Chadwick, Darmstadt Graphics Group GmbH — licensed under CC BY 4.0, from the Khronos glTF Sample Assets. Built with three.js and lil-gui. Everything else — road, landscape, vegetation, interior, instruments and physics — is generated by the game itself.

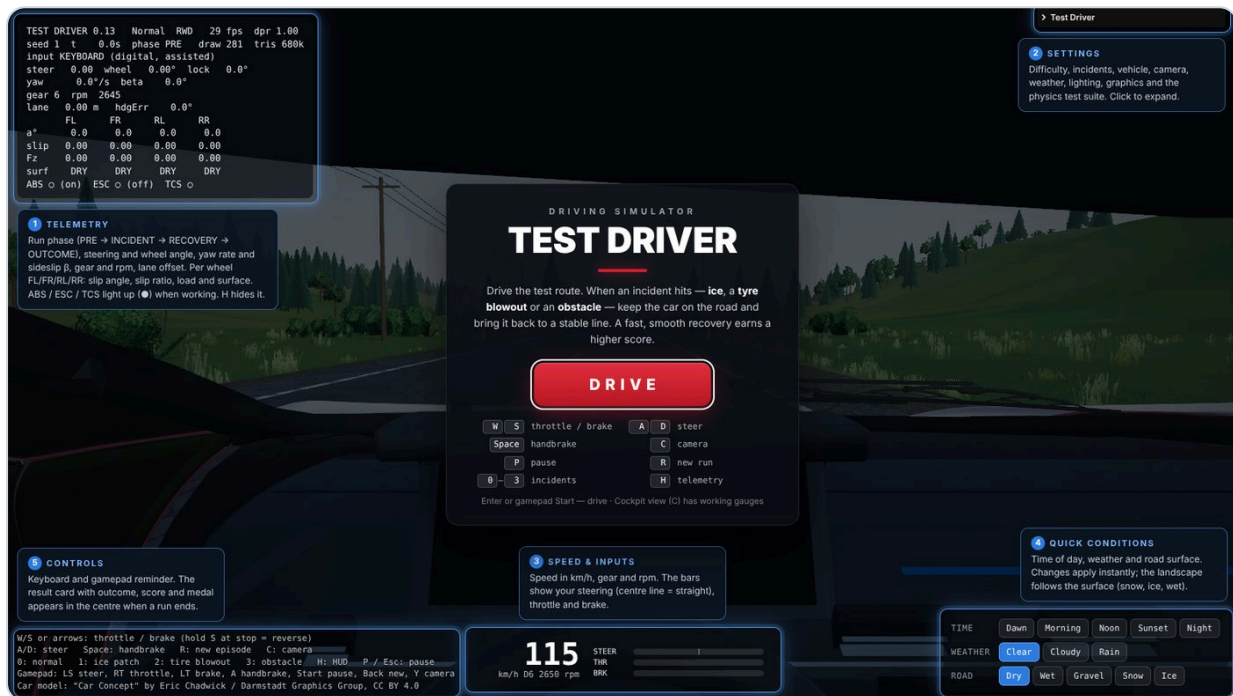
1 Getting started

What you need

- A desktop browser with WebGL 2: current Chrome, Edge, Firefox or Safari. A dedicated graphics card is recommended but not required.
- An internet connection on first start: the 3D engine and the 12 MB car model are loaded from a public CDN. If the car model cannot be downloaded, the game uses its built-in car and keeps working.
- A keyboard. A gamepad or a steering wheel with pedals is optional.

Open `test-driver.html` in the browser. The world is generated in a few seconds and the start screen appears.

The start screen



The start screen labels every part of the interface in place. On smaller windows the same explanations are listed inside the centre card.

The start screen explains the interface (the HUD) right on top of the real panels: **1** telemetry, **2** settings, **3** speed and inputs, **4** quick conditions and **5** the controls reminder. The game is frozen while it is shown — you can still change the time of day, weather or road surface with the buttons, or open the settings.

Press **DRIVE** (or **Enter**, or Start on a gamepad) to begin. The run always starts clean from time zero. You can bring the start screen back at any time: *Settings* → *Episode* → *Show start screen*.

Your first run

- The car starts in the right-hand lane already at speed (115 km/h on Normal difficulty). Hold **W** to keep the speed, steer gently with **A** / **D**.
- By default the car is in the **Normal** state: nothing goes wrong until you ask for it. Press **1** for an ice patch, **2** for a tyre blowout or **3** for an obstacle — or turn on *Auto incident* to be surprised 15–40 s into the run.
- Recover, hold the car steady for 1.5 s, and the result card shows your score. A new run starts automatically a few seconds later, or press **R**.

2 Controls

Keyboard

KEY	ACTION
W or ↑	Throttle
S or ↓	Brake. Hold at a standstill to select reverse; release and press W to drive forward again.
A D or ← →	Steer left / right. Keyboard steering is assisted: it ramps in smoothly and the maximum angle shrinks at high speed so a tap cannot spin the car.
Space	Handbrake (locks the rear wheels)
C	Camera: Cockpit → Top → Chase
P or Esc	Pause / resume. The game also pauses when the window loses focus.
R	New run (next seed)
0	Normal — clears the current incident, car fully OK
1 2 3	Trigger an incident: ice patch ahead, tyre blowout, obstacle
H	Show / hide the telemetry panel
Enter	DRIVE on the start screen

Gamepad

CONTROL	ACTION
Left stick	Steer (dead zone and response curve adjustable)
Right trigger / Left trigger	Throttle / brake (analog)
A	Handbrake
Y	Camera
Start	Pause / resume; DRIVE on the start screen
Back	New run

The game switches automatically to whichever device you touch last. The active device is shown in the telemetry panel (input ...).

Steering wheel

Wheels from Logitech, Thrustmaster, Fanatec, Moza and Simucube are recognised by name. With a wheel the steering is linear and unassisted: the road wheels turn exactly in proportion to your wheel, up to the steering lock set in *Vehicle* → *Steer lock*. Pedal mapping differs between models; if a pedal behaves oddly, use a gamepad or keyboard.

Tip

Keyboard steering is digital, so the game smooths it for you. For precise recoveries an analog device — gamepad or wheel — gives noticeably better scores.

3 The screen



Chase camera with the full HUD.

ELEMENT	WHAT IT SHOWS
1 Telemetry top left	Live engineering data about the car and the run — see the field reference below. Press H to hide it.
2 Settings top right	The settings menu (collapsed). Chapter 8 describes every option.
3 Speed & inputs bottom centre	Speed in km/h, gear (D1–D6 or R) and engine rpm. STEER grows left or right from the centre line, THR and BRK show pedal positions 0–100 %.
4 Quick conditions bottom right	One-click buttons for time of day (Dawn, Morning, Noon, Sunset, Night), weather (Clear, Cloudy, Rain) and road surface (Dry, Wet, Gravel, Snow, Ice). The active choice is highlighted.
5 Controls bottom left	A reminder of the keyboard and gamepad controls, and the car model credit.
Result card centre	Appears when a run ends: outcome, incident, score, medal and the measured recovery figures.
Messages top centre	Short notices, e.g. car model loading progress.

Telemetry field reference

FIELD	MEANING
TEST DRIVER 0.13	Version, difficulty, drivetrain (RWD/FWD/AWD), frame rate, render resolution scale
seed · t · phase	Run seed (the same seed replays the same run), run time in seconds, current phase: PRE, INCIDENT, RECOVERY or OUTCOME. Also draw calls and triangles.
input	Active device: KEYBOARD (digital, assisted), GAMEPAD (analog) or WHEEL (analog, linear)
steer · wheel · lock	Steering input –1...+1, road-wheel angle and the current maximum angle (lock) in degrees
yaw · beta	Yaw rate (how fast the car rotates, °/s) and sideslip β — the angle between where the car points and where it travels. Large β means the car is sliding.
gear · rpm	Current gear, engine speed; [shift] during a gear change

lane · hdgErr	Offset from the centre of your lane in metres, and heading error relative to the road in degrees
FL FR RL RR	Columns for front-left, front-right, rear-left, rear-right wheel
a°	Tyre slip angle: how much the tyre is pointed away from its direction of travel. Grip peaks at a few degrees.
slip	Longitudinal slip ratio: -1 = locked wheel, 0 = rolling freely, positive = wheelspin
Fz	Vertical load on each tyre in kN. Braking moves load forward, cornering moves it outward.
surf	Surface under each tyre: DRY, WET, GRVL, SNOW, ICE, GRASS, SHLDR (shoulder)
ABS · ESC · TCS	● when the system is intervening right now, ○ when idle; (on)/(off) shows whether it is enabled
incident	Appears during an incident: its type and state (armed, active, recovery)

4 Cockpit and instruments

The cockpit camera puts you in the driver's seat of a left-hand-drive car with a fully working digital dashboard. It is the default view; press **c** to cycle cameras.



Cockpit view. Camera height and tilt: Settings → Camera.



Speedometer, trip computer, tachometer, warning lamps.

Instrument cluster

- **Speedometer** 0–260 km/h with a digital readout. The blue arc fills with speed.
- **Tachometer** 0–8000 rpm, red zone from 6500 rpm. The large figure is the current gear; an amber ▲ asks for an upshift near the limiter.
- **Centre column:** clock (scene time of day), outside temperature, selector P R N D with the active gear, trip distance, odometer, instant and average fuel consumption, range, fuel level (E–F) and coolant temperature (C–H). Fuel and temperature are cosmetic and do not affect the car.

Warning lamps

ABS	Flashes while anti-lock brakes work; steady when ABS is off	TPMS	Tyre pressure lost — a tyre has blown out
ESC	Flashes while stability or traction control intervenes	ICE	Outside temperature at or below +3 °C
ESC OFF	Stability and traction control disabled	LIGHTS	Headlights on (automatic at dusk and night)
(P)	Handbrake applied	FUEL	Low fuel

DRIVE INFO screen



Centre screen.

- **G-meter:** the white dot shows lateral (left/right) and longitudinal (braking/acceleration) acceleration, with a short trail. Rings at 0.5 g and 1 g.
- **Tyres:** green = gripping, amber = sliding, red = beyond the limit or **FLAT**. Numbers are tyre loads in kN.
- **ABS / ESC / TCS** chips turn amber while the system works.
- **STEER:** steering-wheel angle; **THR/BRK** pedal bars; header: surface and its grip coefficient μ .

5 A run, incidents and scoring

Phases

PRE

Normal driving. Nothing has happened yet.

INCIDENT

The event is happening: on the ice, tyre deflating, obstacle ahead.

RECOVERY

The event is over. Bring the car back to a stable line within 12 s.

OUTCOME

Result card, score and medal.

Incidents



Ice patch ahead.



Fallen cargo in the lane.

INCIDENT	WHAT HAPPENS
Ice patch 1	A patch of black ice appears at least 30 m (about 1.4 s) ahead. It may cover the whole road, only your lane, or be split — one side of the car on ice, the other on asphalt. The incident starts when a tyre touches the ice and ends 0.3 s after the last tyre leaves it.
Tyre blowout 2	One random tyre loses pressure instantly: much less grip and a strong drag on that corner. A rear blowout makes the car want to rotate; a front one pulls it to the side. The TPMS lamp comes on.
Obstacle 3	Wooden crates and boxes lie in your lane. They appear at a distance you reach in 1.7–3.2 s depending on difficulty (at least 25 m). They are solid: hitting them ends the run.

Press **0** (or choose *Normal*) to clear an incident: the tyres are restored, the ice and the cargo disappear.

How a run ends

RESULT CARD	CAUSE
RECOVERED	Success. After the incident the car stayed stable for 1.5 s in a row: sideslip under 3°, heading within 6° of the road, within 1 m of the lane centre, rotating no more than the road's curve requires, still moving.
NOT STABILIZED	Still unstable 12 s after the incident ended
OFF ROAD	The car's centre went more than 0.9 m beyond the road edge
SPUN OUT	Sideslip over 80° while moving — the car is going sideways or backwards
HIT BARRIER	Impact with a guardrail faster than 1 m/s
COLLISION	Impact with a tree, rock, pole, lamp post or the cargo faster than 1 m/s

With *End on fail* switched off, failures are only recorded and you can keep driving. Collisions are physical either way: the car bounces off trees and slides along guardrails.



A result card after hitting the cargo.

Score and medals

Only a successful recovery is scored. You start with 1000 points:

$$\begin{aligned} \text{score} &= 1000 \\ &- 45 \times \text{time to stabilize (s)} \\ &- 12 \times \text{maximum sideslip (}^\circ\text{)} \\ &- 90 \times \text{maximum distance from lane centre (m)} \\ &- 60 \times \text{average steering rate (input units per second)} \\ &+ 150 \times (\text{speed kept} - 1) \quad \text{clamped to } 0 \dots 1000 \end{aligned}$$

In plain words: recover **quickly**, without **sliding**, without **leaving your lane**, with **calm hands**, and without scrubbing off more speed than necessary.

			
Gold	Silver	Bronze	None
800 and above	600 – 799	400 – 599	below 400

Difficulty

LEVEL	START SPEED	ABS	ESC + TCS	ICE GRIP M	ICE LENGTH	OBSTACLE WARNING
Easy	90 km/h	on	on	0.35	~30 m	3.2 s
Normal	115 km/h	on	off	0.25	~40 m	2.6 s
Hard	145 km/h	off	off	0.16	~55 m	2.1 s
Expert	170 km/h	off	off	0.10	~75 m	1.7 s

Blowouts also get harsher with difficulty: the damaged tyre keeps 65 % of its grip on Easy and only 28 % on Expert. ABS and ESC can be changed afterwards in *Settings* → *Vehicle*.

6 Driving technique

The physics behave like a real car, so real-world advice works. The common rule for every incident: **be smooth**. Sudden inputs on a car at its limit are what turn a wobble into a spin.

Ice patch

- **Before the ice:** if there is time, brake in a straight line while still on asphalt — every km/h you lose before the ice is worth much more than braking on it.
- **On the ice:** keep the steering still and straight, ease off the throttle gently. Do not brake hard and do not steer sharply — on μ 0.1–0.35 the tyres have a tenth to a third of their normal grip.
- **Split ice** (one side on ice): braking pulls the car towards the grippy side. Expect it and hold the wheel straight; ABS helps a lot here.
- **Leaving the ice:** grip returns suddenly. If you are still steering when the tyres bite, the car will dart — straighten the wheel before you reach asphalt.

Tyre blowout

- **Do not brake hard immediately.** Hold the wheel firmly, keep the car straight, and let it slow down on its own with a little throttle to stay stable.
- A **front** blowout pulls towards the flat tyre — counter it with a small, steady correction.
- A **rear** blowout makes the tail swing. Correct gently in the direction of the slide, then straighten; avoid big steering inputs.
- Brake gently once the car is under control.

Obstacle

- Look past the obstacle to where you want to go. Brake hard first while going straight; with ABS you can keep steering while braking.
- Steer around it smoothly — a single, measured input — then straighten. A second, opposite correction is usually needed: make it smaller than the first.
- Without ABS, release the brake while steering, or the locked front wheels will not turn the car.
- Stay off the grass and away from the guardrail: both end the run.

Catching a slide

- Watch **beta** in the telemetry: once it grows past a few degrees, the car is sliding. Steer into the slide (countersteer) and come off the throttle smoothly.
- As the car straightens, unwind the countersteer quickly — a held countersteer causes the "pendulum" slide the other way.
- The handbrake locks the rear wheels: useful for a deliberate rotation, never for a recovery.

Practice routine

Pick a seed in Settings → Episode, press **1**, **2** or **3**, and use *Restart same seed* to try the identical situation again. The physics are deterministic: the same inputs give exactly the same result.

7 Conditions

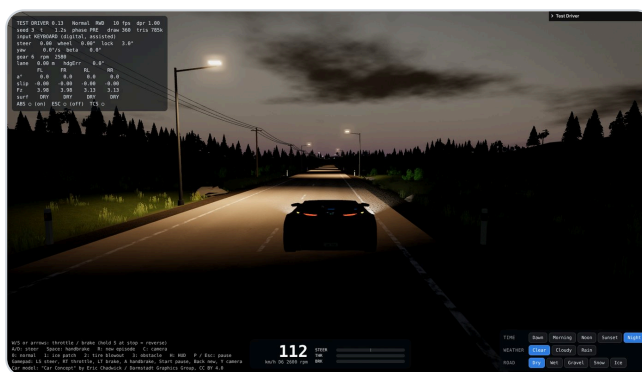
Use the quick buttons (bottom right) or Settings → Road, Environment and Lighting. Changes apply instantly, even during a run.

Road surface

SURFACE	GRIP M	NOTES
Dry	1.00	Asphalt, full grip. Braking 100→0 km/h with ABS: about 38 m.
Wet	0.72	Spray from the rear wheels; the landscape looks darker and glossier. Rain sets the road to wet automatically.
Gravel	0.58	Loose, slides earlier and progressively; dust trails.
Snow	0.35	Ground, hills, trees and guardrails covered in snow; snow powder from the tyres.
Ice	0.12	Glassy road, frosted landscape. The hardest surface by far.
Shoulder · Grass	0.80 · 0.45	Beside the road. Grass also adds rolling resistance and shakes the camera.



Snow: the landscape follows the road surface.



Night with street lights.

Time of day and weather

- **Time:** Dawn, Morning, Noon, Sunset, Night (or any time from 05:30 to 20:30 in Settings → Lighting). The sun moves across the sky; headlights switch on at dusk.
- **Street lights** light the road at dusk and night; they can be switched off in Settings → Lighting.
- **Weather:** Clear, Cloudy, Rain. Rain brings low cloud, fog that limits visibility and wet roads.

8 Settings reference

Click **Test Driver** at the top right to open the settings, then click a folder.
Every change applies immediately and is written to the run log.

Episode

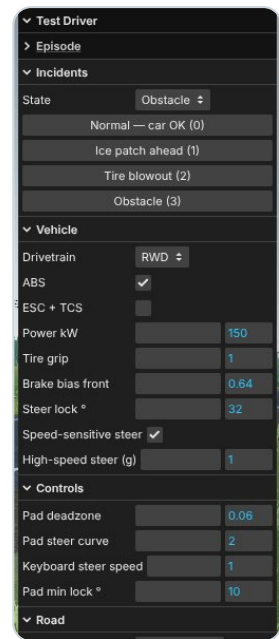
Difficulty · Episode seed · Auto incident (a random incident 15–40 s into each run; off by default) · End on fail · Auto restart · Pause · New episode · Restart same seed · Download last log · Show start screen.

Incidents

State: Normal / Ice patch / Tire blowout / Obstacle, plus one button for each (keys 0–3).

Vehicle

Drivetrain RWD / FWD / AWD · ABS · ESC + TCS · Power 80–400 kW (default 150) · Tire grip · Brake bias (front share, default 64 %) · Steer lock · Speed-sensitive steering · High-speed steer limit (g).



Settings panel.

FOLDER	OPTIONS
Controls	Pad dead zone · Pad steer curve · Keyboard steer speed · Pad minimum lock
Road	Surface · Track seed · Rebuild track (generates a new 12 km road)
Camera	Mode (Chase / Cockpit / Top) · FOV · Speed FOV boost · Chase distance and height · Cockpit height and pitch · Road vibration
Environment	Weather · Cloud cover
Lighting	Time of day · Sun · Exposure · Sky light · Street lights (night)
Car	Model: Realistic (detailed model) or Procedural (built-in, no download)
Colors	Car paint · Grass tint · Foliage tint
Post Processing	Bloom · Bloom strength · Vignette
Debug	Show HUD · Show tire forces (force arrows at each wheel) · Time scale (slow motion)
Validation	Run physics tests · Download report
Performance	Quality preset High / Medium / Low · Max DPR · Shadows · Grass distance · Adaptive resolution

9 Data, physics tests and performance

Run logs

Every run is recorded at 120 samples per second: position, speeds, yaw, sideslip, all inputs, steering angle, gear and rpm, and for each tyre the slip angle, slip ratio, wheel speed, load and surface — plus events such as incident start, impacts, pauses and setting changes. *Settings* → *Episode* → *Download last log* saves it as a JSON file for analysis in a spreadsheet or Python.

Physics tests

Settings → *Validation* → *Run physics tests* drives a set of standard vehicle tests in under a second and compares the results with typical road-car figures:

TEST	RESULT	TYPICAL RANGE
Braking 100→0 km/h, dry, ABS	37.8 m	34–40 m
Braking 100→0 km/h, locked wheels	43.6 m	+10–35 % vs ABS
Acceleration 0–100 km/h	6.8 s	6.5–8 s
Top speed	241 km/h	220–245 km/h
Skidpad maximum lateral grip	0.87 g	0.85–0.95 g
Understeer gradient	1.36 °/g	1–4 °/g
Step steer response time (ISO 7401)	0.16 s	0.15–0.4 s
Moose test ISO 3888-2, no ESC / ESC	67 / 70 km/h	65–80 km/h
Replay determinism	identical	bit-identical

Performance

- **Adaptive resolution** (on by default) lowers the render resolution when the frame rate drops below about 42 fps and raises it again when there is headroom.
- If the game is slow: choose *Quality preset* → *Medium* or *Low*, lower *Max DPR*, turn off *Shadows*, reduce *Grass distance*.

Troubleshooting

PROBLEM	SOLUTION
The world never loads	Check the internet connection (the 3D engine loads from a CDN) and that WebGL 2 is enabled in the browser.
"Car model unavailable"	The 12 MB model could not be downloaded; the built-in car is used. Switch Car → Model to Realistic to retry.
Keys do nothing	Click inside the game window so it has keyboard focus. While the start screen is shown, press DRIVE first.
Game paused by itself	It pauses when the window loses focus or the tab is hidden. Press P to resume.
Gamepad not detected	Press any button on the pad after the page has loaded.