A320 Nose Landing Gear

Real-time asset documentation and handover pack

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This document accompanies a real-time nose landing gear asset built for simulation, training and visualisation use. It records what the asset contains, how it was built, the conventions it follows, and what remains outstanding, so that another artist or a technical lead can pick it up without reverse engineering the source file.

1 Asset summary

SUBJECT	Airbus A320 nose landing gear, extended and locked down
PURPOSE	Real-time simulation, training and visualisation
OBJECTS	41 separate meshes in one assembly
TEXTURE SETS	4, PBR metal-rough, 2048 x 2048
LODS	LOD0 to LOD3, 9,500 / 4,750 / 2,374 / 1,188 triangles
UNITS	Metric, scale applied at source
SOFTWARE	Blender, Adobe Substance 3D Painter, Unreal Engine 5
BUILT	8 to 19 September 2026
AUTHOR	Olive Maxwell, sole author of all geometry and textures

2 Scope

Included. The full nose gear assembly as it appears on a parked aircraft, modelled from walkaround reference rather than from a generic gear leg.

Deliberately excluded.

- **Brake assembly.** The A320 nose gear is free-rolling. Braking is carried entirely by the main gear, so there is no brake unit, no torque plate and no hydraulic brake line on this assembly. Their absence is correct, not an omission.
- **Retraction animation.** The asset is modelled in the extended, locked-down state. Parts are separate objects, so a rig can be added without remodelling.
- **Aircraft structure above the trunnion.** The gear terminates at its attachment lugs; the wheel well and surrounding fuselage are out of scope.

3 Dimensional reference

Dimensions were taken from published figures and the model was sized to them, rather than estimated from photographs.

TIRE SPEC	30 x 8.8 R15
TIRE DIA	76 cm, section width 22.4 cm, measured on Tire_L
ASSEMBLY	225 cm tall; UE5 bounds 88 x 100 x 225 cm
STRUT DIA	22 cm outer diameter, 80 cm long
REFERENCES	Walkaround photo board assembled from public aviation photography; dimensions cross-checked against the published 30 x 8.8 R15 nose tire specification

All figures above were read off the source file on 19 September 2026.

4 Texture sets

Sets are driven by material assignment in Blender and grouped by how a surface behaves under light, not by which object it belongs to. Grouping by object would have produced more sets, more draw calls, and inconsistent wear between neighbouring parts.

SET	COVERS	NOTES
mat_strut	Polished chrome oleo, bare actuator rods, cad-plated hardware	Three distinct finishes share one set, separated by ID map rather than by splitting the mesh
mat_mech	Main fitting, drag stay, lock stay, torque links, brackets	Largest set; carries most of the wear and dirt
mat_wheels	Wheel hubs and rims	Surface treatment appropriate to a free-rolling nose wheel, with no brake dust
mat_tires	Tires	Unwrapped as a straight rectangle, which is what made procedural tread possible

5 Texturing method

- **Mesh maps.** Normal, ambient occlusion, curvature, thickness and position were baked using the low-poly as its own high-poly. This is valid here because the bevels are real geometry rather than a normal-map effect, so the bake has genuine edge information to read. It saved roughly a day of high-poly work with no meaningful loss at the resolution this asset is viewed at.
- **ID masking.** An ID map was baked using Mesh ID / Polygroup as the colour source. Colour-selection masks in Substance then isolate individual parts inside a shared set, which is how the chrome oleo, the bare rods and the plated fasteners were separated without adding texture sets or draw calls.
- **Tire tread.** Four circumferential grooves are authored as a height-channel fill layer driven by a stripe procedural, masked to the tread band. No tread geometry exists in the mesh. This depends on the straight-rectangle tire UV; a warped or islanded tire unwrap would force the tread into geometry.

6 UVs and texel density

Each texture set was unwrapped in multi-object edit mode and passed through Average Islands Scale, which enforces consistent texel density within that set. Consistency between the four sets was verified visually with a

colour grid checker map.

No pixels-per-centimetre figure is claimed for this asset. Density was enforced and verified by the method above, not measured numerically. If a project requires the asset to meet a stated texel density, that is a measured pass over the existing UVs rather than a rebuild.

7 Levels of detail

Four levels, generated with Unreal Engine's built-in mesh reduction on a halving chain. Each level was checked in the editor for silhouette preservation before being accepted. Counts are read from the engine rather than estimated.

LEVEL	TRIANGLES	VERTICES	INTENDED USE
LOD0	9,500	8,933	Close inspection, walkaround, maintenance training
LOD1	4,750	5,563	Mid distance
LOD2	2,374	3,354	Far distance
LOD3	1,188	1,639	Silhouette only

Note on counting: Nanite has been disabled for this asset. Any triangle figure quoted must come from the static mesh LOD0 count, not from a Nanite cluster count and not from the Nanite fallback mesh, which reports a far lower figure.

8 Engine notes

- Imported to Unreal Engine 5 as a static mesh assembly with materials rebuilt from the exported PBR maps.
- Nanite is off. At this triangle budget, and with the LOD chain above in place, Nanite was not earning its overhead, and a conventional LOD chain is what a simulation pipeline typically expects to receive.
- Parts remain separate objects, so individual components can be isolated, highlighted or animated for training use without re-authoring the mesh.

9 Build notes worth carrying forward

- **Arrays before mirroring.** Radial bolt patterns were built with an Empty-offset array. An array stores a relationship to its Empty rather than an absolute rotation, so mirroring those objects makes the copies spiral. Apply the array first, then mirror the resulting real geometry.
- **Scale at source.** Scale is applied on every object in the source file. Nothing downstream should need a scale correction on import.

10 Outstanding before release

Geometry, textures, LODs and dimensions are complete and verified. One administrative item remains open.

ITEM	SOURCE
Export settings record	File format, axis convention and scale used for the UE5 export