



Compiled by

HOOSIER BRITISH 4x4 & GUNS N' ROVERS

AJ133 5.0L V8

Engine overhaul specifications

Jaguar / Land Rover 5.0L V8 lower end.
Shop notes from the bay.

AJ133 (2009–2025)

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Jaguar AJ133 5.0L V8 — lower-end rebuild specifications

All values below are specific to the AJ133 (2009–2025).

■ **Calculated** — derived in the bay from journal size, bearing wall, and clearance. Verify on the block before you machine.

Component	Specification	Min	Max	Notes
Main bearing journal diameter	70.000 mm	69.995 mm	70.000 mm	Tolerance ± 0.005 mm. Out-of-round max 0.010 mm. Polish the crank if you exceed that.
Connecting rod journal diameter	56.000 mm	55.995 mm	56.000 mm	Tolerance ± 0.005 mm. Rod center distance ~160 mm.
CALCULATED Connecting rod big-end bore diameter	~59.040 mm	59.015 mm	59.065 mm	Calculated: journal (56.000) + 2× bearing wall (1.505 mm) + clearance (0.020–0.040). Tolerance ± 0.025 mm. Caps torqued to spec before you measure.
CALCULATED Main cap bore diameter	~75.034 mm	75.009 mm	75.059 mm	Calculated: journal (70.000) + 2× bearing wall (2.502 mm) + clearance (0.030–0.040). Tolerance ± 0.025 mm.
Main bearing oil clearance	0.022–0.040 mm	0.022 mm	0.040 mm	Slightly tighter than rod clearance for stability. Target 0.038 mm; consistency across journals matters more than the exact number. Plastigage for a first look, then polish if needed.
Connecting rod bearing clearance	0.020–0.040 mm	0.020 mm	0.040 mm	Target 0.038 mm. Plastigage or a bore gauge.
Connecting rod side clearance	0.150–0.380 mm	0.150 mm	0.380 mm	Measured between rod pairs at 6 o'clock. Excess >0.50 mm increases windage.
Wrist pin (piston pin) diameter	22.000 mm	21.995 mm	22.000 mm	Tolerance ± 0.005 mm. Measure in two directions; replace if out-of-round >0.005 mm. Fits aluminum pistons with circlips.
Piston diameter (skirt, 90° to pin)	92.440–92.460 mm	92.440 mm	92.460 mm	Measured ~10 mm from the skirt bottom. Tapered upward.
Cylinder bore diameter	92.500 mm	92.475 mm	92.525 mm	Tolerance ± 0.025 mm. Max taper / out-of-round 0.025 mm. Factory cast-in dry iron sleeves. 93 mm is the first oversize.
Piston-to-bore clearance	0.040–0.060 mm	0.040 mm	0.060 mm	Tight end for longevity. Forged pistons may run +0.020 mm. Oversizes: +0.25 / +0.50 mm.
Crankshaft end play (thrust clearance)	0.21–0.43 mm	0.21 mm	0.43 mm	Measure at the rear main with a dial indicator; pry the crank fore/aft. Adjust with graded thrust washers if needed.
Engine block deck straightness	Max 0.080 mm	—	0.080 mm	Straightedge and feeler. Total <0.100 mm with the paired head. Deck if exceeded. 0.05 mm across 150 mm, 0.02 mm across 25 mm.
Main line bore alignment (tunnel run-out)	≤ 0.025 mm	—	0.025 mm	Total run-out across all mains after align-hone.
Crankshaft journal taper / out-of-round (main & rod)	≤ 0.005 mm	—	0.005 mm	Service limit before polishing or replacement.
Connecting rod small-end bore	22.005–22.012 mm	22.005 mm	22.012 mm	Ream if tight; must match the wrist pin.
Top compression ring end-gap	0.30–0.45 mm	0.30 mm	0.45 mm	File-fit if needed. Measured in the bore.



Quick Reference — Torque Specs

Nm is the spec we start from unless the row is a foot-pound sequence — then Ft-lbs is bold. The other columns are converted for the wrenches on the bench.

Item	Ft-Lbs	Nm	In-Lbs	Notes
Piston Oil Jets	8.9 ft-lbs	12 Nm	106 in-lbs	For supercharged engines only
M10 Main Cap Studs (Xotic Performance)	23.5 / 46.5 / 70 ft-lbs	31.9 / 63 / 94.9 Nm	—	3-stage torque sequence
M8 Main Cap Studs & Bolts (Xotic Performance)	10 / 20 / 30 ft-lbs	13.6 / 27.1 / 40.7 Nm	—	3-stage torque sequence
M8 Windage Tray Bolts	18.4 ft-lbs	25 Nm	—	—
M8 Oil Pump to Windage Tray Bolts	18.4 ft-lbs	25 Nm	—	—
M8 Oil Drive Sprocket to Oil Pump Bolt	15.5 ft-lbs	21 Nm	186 in-lbs	—
M6 Oil Pickup / Output Tube Screws	8.9 ft-lbs	12 Nm	106 in-lbs	—
M6 Rear Main Seal Screws	8.1 ft-lbs	11 Nm	97 in-lbs	—
Oil Pump Chain Tensioner	15.5 ft-lbs	21 Nm	186 in-lbs	—
M6 High Pressure Fuel Pump Camshaft	8.9 ft-lbs	12 Nm	106 in-lbs	—
Oil Pump Drive Chain Static Guide	8.9 ft-lbs	12 Nm	106 in-lbs	—
Flexplate to Crankshaft	33.2 + 90° ft-lbs	45 + 90° Nm	—	E14 external Torx
M6 Oil Extraction Tube Screws	7.4 ft-lbs	10 Nm	89 in-lbs	Screws mounting the tube to the oil pan.
Oil Pan to Block	18.4 ft-lbs	25 Nm	—	—

How to use this sheet

This is a Guns N' Rovers / Hoosier British 4x4 shop sheet: the clearances we actually look for when an AJ133 comes apart. Plastigage is fine for a first look; a bore gauge and micrometer win the argument. If a number here fights the block in front of you, stop and measure again — then write the shop. We can try to help you solve it. These engines have their quirks, and the more we learn, the more we can help others down the road.

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