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Project Overview

Aston Martin V8 engine rebuild
Scope – Rebuild 1985 Aston Martin V8 - US spec low compression engine to European performance spec.

General

Drain fluids and removed engine and transmission from car
Separate transmission, clean transmission and store
Tear down engine, inspect and measure for wear
Engine found to be in good condition mechanically with wear indicative of the low mileage.

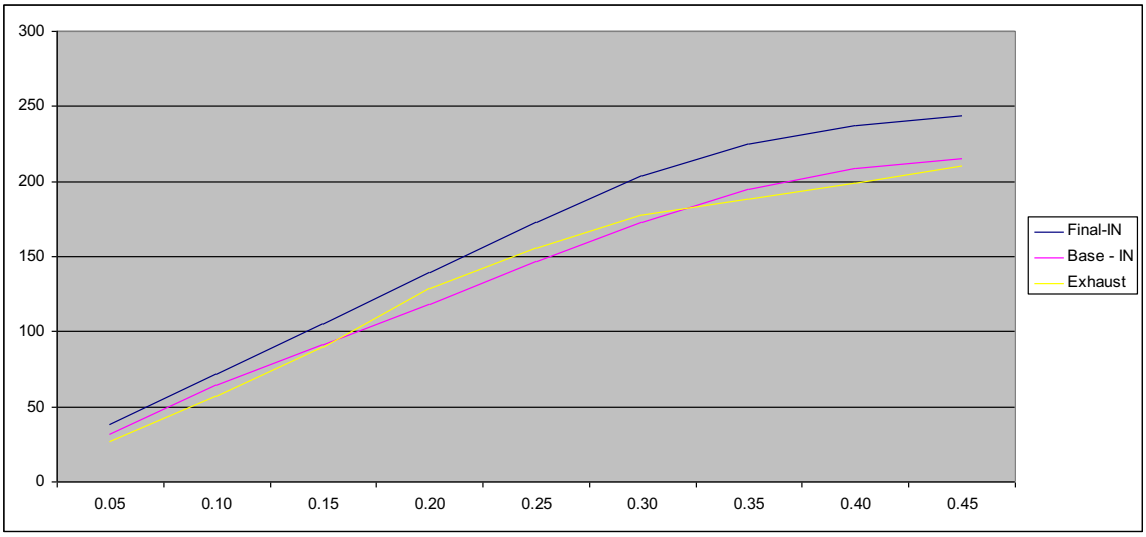
Short Block

The block showed significant corrosion in the lower liner bores and significant sediment build up in the coolant passages. Yearly flushing and renewal of coolant is necessary, along with a corrosion inhibitor.
The block and heads sent out for hot tank cleaning, a process that removes the worst of the oil and dirt, but still leaves much to clean by hand.
The crankshaft and connecting rods were magna fluxed to check for any cracks, mostly a formality and no issues found.
The block was bored oversize to remove all corrosion, the decks milled (.005”) and the cylinder liner flange bores machined to accept oversize cylinder liners made from high tensile ductile cast iron sourced from Darton Sleeve Inc.
Since increased performance was part of the rebuild scope, the resulting increase in liner wall thickness allowed a 4.080” bore size, from 3.9375”, and displacement increased from 5.3 litres to 5.7 litres.
The block main line was align-honed slightly to achieve main bearing clearances of .0015” +/- .0002”.
Connecting rods were re-sized to achieve bearing clearance of .0025” and new fasteners installed. Rod small end bushings honed to accept a new piston pin size.
Cylinder liners and head studs installed in block as well as torque plates to clamp the liners and simulate as assembled stresses on block. Cylinders honed to finish size in Sunnen CK10, providing .0035” clearance with CP 10:1 forged pistons. This piston uses a special alloy that allows tighter fitment for street use, less noise, better oil ring control etc.

Set cylinder liner protrusion within specified .003” - .005” above block deck surface.
Pistons and rods were match weighed and the crankshaft rotating assembly balanced.
New OEM bearings used in rods and mains.
New OEM gaskets used throughout assembly.
Total Seal piston rings were file fit with end gaps as specified, .016” top and second.
Oil pump assembly cleaned and inspected; oil pressure met the specified 80 PSI @ 3000 rpm prior to teardown, replacement not required, assembled with new O-ring seal.
Oil pump pick up screen removed and cleaned, entire pick up Cad plated.
New SKF pilot bearing installed in crankshaft.
Rear main mechanical oil seal clearances set.
Rebuilt crankshaft damper installed, TDC mark verified.
All fasteners and brackets Cad plated.
Assemble cylinder liners in block and perform fluid pressure test.
Thoroughly clean stains from block surfaces, flush oil galleries, gallery plugs installed with new copper sealing washers.

Cylinder Heads

Cylinder Heads were flow tested with original components to establish baseline capacity. Valve seats angles were set and intake ports reshaped to increase average port flow 15%. The stock exhaust ports flow 85% of the modified intake ports, a ratio generally considered ideal.



Milled cylinder head deck surface .005”.
New ductile cast iron intake valve seats installed to accommodate the flow testing work.
Valve springs tested for the correct load at installed height and the complete set were within the specified load.
Installed new Ferrea stainless steel valves installed and valve guides honed to provide .001” guide to intake stem clearance and .002” exhaust stem clearance, +.0002” / -.000”.
Machine 3 angle valve seats and blend intake seats as per flow testing.
Check and set spring installed heights.
Vacuum test valve sealing

Grind camshafts with Series 1 Vantage profile– .425” net lift, 272 degrees duration @ .012” lift (zero valve lash)
Trial assemble head on short block to check valve to piston clearance
Set tappet clearance .009” intake .010” exhaust, supply shims as required.

General

Rebuild 42 DCNF carburetors, clean and install rebuild kits. Install new sealed throttle shaft bearings (not included with kits)
Manufacture throttle assembly to adapt cable throttle system from firewall to early linkage style throttle on engine. Nickel plate components as well as valve cover nuts and washers.
Install European air box.
Install new/remanufactured power steering pump, using original reservoir housing.
Install new / remanufactured alternator.
Rebuild water pump assembly, install new SKF bearings and OEM seal. Pump housing ceramic coated.
All external components are Cad plated, nickel-plated or powder coated black.
Re-core radiator
Repair and repaint lower valance panel
Install new clutch assembly
Resurface flywheel
Install new lightweight gear reduction starter

Install engine in car
Install stainless steel European exhaust manifolds
Manufacture 340 SS adapters to mate exhaust manifolds to smaller exhaust system 2 ½” reduced to 2” diameter.
Reinstall exhaust system.
Pressurize oiling system with external pump. Penrite 5W50 oil
Start engine and set initial tune.
Balance carburetors and adjust mixture with air fuel ratio meter.
Change transmission oil.