

Austin A 70 and A90 Hampshire and Atlantic 1948 - 1950

Important Notice

This document has been put together using motor trader service data sheets produced in 1951 and other information of unknown origin saved by my father as a reference.

All the information below is produced from information which was designed to aid skilled mechanics in a professional workshop, our aim is to make this available to people wishing to restore these vehicles, but please be aware that this document is by no means an instruction sheet or safe working procedure and we cannot be held responsible for any injury or damage whatever the cause.

We may have added comments in red from time to time, where we think safety should be considered but this is by no means conclusive,

These vehicles replaced the old Austin 16, the A70 Hampshire saloon came in September 1948, it used the engine of the Austin 16 in a new chassis that had independent front suspension. Shortly after this the A90 Atlantic convertible was introduced but this was not available in the UK till the following year, this was followed by the A90 saloon, the engine design was based on the 16, but has the same bore as the 4 litre Sheerline, the chassis was much the same as the A70 in basic design. In September 1950 the A70 Hereford saloon appeared, it had a slightly longer chassis,(an increase of 3" in the wheelbase)

On the A90 Atlantic Convertible, a hydraulically operated hood and electric windows were an optional extra.

Type Symbols	
A70 Hampshire Saloon	BS2
A70 Hereford Saloon	BS3
A70 Countryman Utility	BW3
A70 Pick Up Truck	BQU2
A90 Atlantic Convertible	BD2
A90 Atlantic Saloon	BE2

The chassis and engine number along with the type symbols were stamped on a plate attached to the offside sun visor, the chassis number was also stamped on a plate attached to the nearside chassis frame member close to the front shock absorber, the engine number

was also stamped on a plate fixed to a boss on the off side of the cylinder block just above the distributor.

Engine.

Engine data		
	A70	A90
Number of cylinders	4	4
Bore	79.4mm	87.3mm
Stroke	111.1	111.1
Cubic capacity	2199cc	2660cc
RAC rated HP	15.63	18.91
Max BHP @ 3800 RPM	68	88
Max torque	116 lb/f @ 1700 rpm	144 lb/f @ 2000 rpm
Compression Ratio	6.8 to 1	7.5 to 1

The front mounting consists of L shaped brackets bolted to the front engine plate, these rest on large bonded rubber blocks bolted to the engine brackets, crankcase and chassis frame brackets. There are torque reaction rubber buffers bolted to the top lips of the engine brackets, these press on the tops of the frame brackets, there are packing pieces (0.036" and 0.048") to give buffers a clearance of 0.012" to 0.032"

At the rear there is a U shaped bracket bolted to the gearbox extension housing which rests on rubber blocks bolted to both the gearbox brackets and the frame brackets, as with the front there are packing pieces (0.036" and 0.048") There is a cross member with brackets which carry the rubber block below the gearbox, again with packers to take the direct weight. There are forward and aft stay rods bracketed to the gearbox, these go through the small cross member with rubber pads on either side, the nuts and locknuts on these rods should be tightened against the distance piece so that the rod is not under tension or compression.

Engine removal.

The engine can be removed with the gearbox attached (Motor trader recommend this) or the gearbox can be left in place. On the Hereford the complete front wing, bonnet and grill assembly can be removed for access to the engine. On the other models you need to detach the bonnet, unbolt the horns, (leaving wires attached on A70) ----- **At this point most modern manuals would have first suggested that the battery lead be disconnected.**

Disconnect the water hoses and detach the radiator from its mounting frame (note the A90 has a thermometer connection to the radiator header tank. Remove the radiator mounting frame and fan, on the A70 remove the air cleaner and rocker cover together, disconnect all wires pipes and control cables including heater connections. Disconnect the gear change linkage from the cross shaft, and lever the shaft towards the engine until it can be withdrawn. Detach the bracket from the bell housing, remove the distributor cap and coil, also remove the starter.

Use suitable lifting tackle to take the weight of the engine, there were lifting brackets or eyes designed to fit in the four corner cylinder head studs, (these are 7/16" BSF) With the weight of the engine safely carried by the lifting tackle, take out the bolts holding the front mounting brackets to the frame, disconnect the propeller shaft, cross-change cable from the gearbox,

Also the speedo drive and clutch link, take out the eleven bolts holding the rear mount and stay rod brackets to the frame, draw out the engine and gearbox assembly forwards and upwards.

Crankshaft and Connecting Rod Data in inches				
	Main Bearings			Crank Pins
	No 1	No 2	No 3	
Diameter	2.479"	2.479"	2.479"	2.000"
Length	1.75"	1.75"	1.995"	1.23"
Running Clearance	0.001 - 0.0025"	0.001 - 0.0025"	0.001 - 0.0025"	0.0005 - 0.002"
End Float	0.002 - 0.003"	0.002 - 0.003"	0.002 - 0.003"	0.008 - 0.012"
Undersize	0.020" & 0.040"	0.020" & 0.040"	0.020" & 0.040"	0.020" & 0.040"
Con Rod Centres	8.183" +/- 0.0045"			

Crankshaft and main bearings.

The crankshaft has three main bearings, these are Vandervell thin wall steel backed white metal lined shells located by tabs in the cap, the end float is controlled by split thrust washers on either side of the centre main bearing, these bearings were not designed to require hand fitting. The centre bearing and thrust washers can be changed in an emergency with the crankshaft in place, I can only assume this would be a temporary measure in a situation where excessive end float on the crankshaft was effecting the operation of the clutch. The end caps can only be removed if the engine is dismantled, the caps have 3/8" BSF draw holes.

The flywheel is spigotted to the rear flange of the crankshaft and secures by four equally spaced bolts and flatted dowel nuts, it has a shrunk on starter ring.

The timing sprocket and fan belt pulley are keyed to the front end of the crankshaft with separate woodruff keys, there is an oil thrower ring between them, they are secured by the starting handle dog nut with packing washers behind the sprocket for correct alignment.

The front and rear main bearing caps fit in square recesses in the crankcase with round cork seals, these should be seated after the caps have been tightened down and once in place should be well proud of the sump face of the block.

The rear main cap forms the lower half of the oil collecting ring around the oil return thread on the crankshaft, the upper half of this collector ring bolts to the crankcase with three setscrews and a paper gasket, if this is removed during strip down it should only be refitted once the bearing cap is in place to make sure it butts up to the cap correctly.

The connecting rods

The big end bearings are Vandervell thin wall steel backed white metal lined shells located by tabs like the main bearings, they are not designed for hand fitting. The gudgeon pins are secured in the top by cotters in the small ends.

The big ends are off set, the number one and three positions have a larger boss to the rear and the small end clamp on the near side, the number two and three positions have the small end clamp bolt on the off side.

The Pistons

The pistons are made of aluminium alloy finished by the Alumilite process, they have dished heads and tee slotted skirts, they should be fitted with the slot to the near side in conjunction with the big end offset, ('front' is stamped on the top of the piston) The A90 pistons are interchangeable with the

Princess and Sheer line models, the second compression ring has a tapered face, this should be fitted with the larger diameter downwards (fit with side stamped 'top' to piston crown)

The big ends will pass through the cylinder bores but the pistons will not pass the crankshaft, so they should be removed through the top when the crankshaft is in place.

The Camshaft

The camshaft is driven by an endless duplex chain, which means both the sprockets and the chain must be removed together, the camshaft sprocket is described by the motor trader as having a rubber tensioner ring between the teeth and oil catcher plates, it is keyed to the shaft by a woodruff key and held by a nut, there is a thrust plate trapped between the sprocket and the shoulder of the front journal, and bolted to the

crankcase, this thrust plate has an oil groove in the back face, the plane side is stamped 'front'.

Camshaft Data			
	Bearing 1	Bearing 2	Bearing 2
Journal diameter	1.790"	1.750"	1.625"
Journal length	1 11/16"	1 3/4"	1 5/8"
Clearance	0.001" to 0.002"		
End float	0.002" to 0.008"		
Timing Chain			
Pitch	3/8"		
Number of links	62		

The camshaft has three bearings, they are white metal lined steel bushes pressed into the crankcase, if new bushes are fitted they must be line reamed, the centre bush is cut away for the oil pump and distributor gears.

The camshaft can be removed with the engine in place. Remove the radiator, the sump, oil pump, fuel pump and distributor, draw out the push rods and tappets, remove the timing cover and draw off the sprockets and chain together, then remove the thrust plate and the camshaft can then be drawn out.

When it comes to refitting, please note that the sprockets have timing marks dot punched on the sprocket teeth in line with the centres.

Valves.

Overhead on inlet and exhaust, the inlet and exhaust valves are not interchangeable, the inlet are larger than the exhaust valves, they all have single springs with split cotter fixing and rubber sealing washers located on the valve stems by pressed caps, the split cotters have spring clips to hold them in place, the A70 and A90 engines use the same exhaust valves but have different inlet valves.

The valve guides are plane with no shoulder, they have a stepped bore, new guides should be pressed in from the combustion chamber until 5/16" projects from the valves seat, the smallest bore is outwards, the exhaust guides are longer than the inlet ones and have springs located by stepped collars found the guides.

	Valve Data			
	Inlet Valves		Exhaust Valves	
	A70	A90	A70	A90
Head Diameter	1.6"	1.725"	1.415"	1.415"
Stem Diameter	11/32"	11/32"	11/32"	11/32"
Face Angle	45'	45'	45'	45'
Tappet Clearance (cold)	To eng no 74486 0.015"	To eng no 75327 0.015"	To eng no 74486 0.015"	To eng no 75327 0.015"
	After eng no 74486 0.012"	After eng no 75327 0.012"	After eng no 74486 0.012"	After eng no 75327 0.012"
Spring length -- free	1 25/32"	1 55/64"	1 25/32"	1 25/32"
Spring length -- fitted	1.526"	1.526"	1.526"	1.526"
At Load	53lb	69lb	53lb	53lb

Tappets and Rockers.

Barrel tappets are used, they slide directly in the crankcase and are removed through the side opening. Bushed rockers are used, these are interchangeable, and are carried on a hollow shaft clamped in four pillars oil is fed from a drilled way in the cylinder head and up through the third pillar, the other three pillars can be interchanged, the shaft is locked into the third pillar. The spacing of the rockers is done by three identical springs, the centre one also having a spacer to make up the required length. All but the end rockers can be pushed aside to remove a push rod if required, the end rockers are held in place by washers, spring washers and split pins.

Oil is forced through the drilled rockers so that spaces are filled with oil while each valve is closed, it is important to make sure that the push rod end of the rocker is pressed down firmly when checking each tappet clearance.

Lubrication

Oil circulation is provided by a gear pump in the sump, the Holbourn Eaton eccentric rotor pump was used as an alternative and can be identified by the patent number 596,739 stamped on its body, on the A90 the upper end of the shaft also drives the rev counter.

The pump and drive housing assembly is spigotted into the crank case and locked by a taper ended grub screw and cap nut on the outside, to remove the pump from the engine block, disconnect the delivery pipe from the crank case, slacken the grub screw and draw out the pump assembly. When refitting the pump, make sure not to omit the spring and washer on the return pipe from the relief valve to the intake strainer.

To dismantle the pump, remove the intake strainer and bottom cover, tip out the driven gear and draw the drive gear off its shaft, the shaft runs directly in the drive housing integral with the body.

The rectangular intake strainer with a gauze element bolts to the pump cover, oil is delivered from the pump through the pipe to the opposite side of the crank case, then through drillings to a tecaiemit full flow filter with a felt element.

A non adjustable spring loaded taper seated relief valve is situated in the crank case behind the filter, this is accessible from the outside after removal of the filter element. Normal oil pressure is 50 to 55psi at 30mph.

Manifolds and Head.

The inlet and exhaust manifolds are bolted together with a hot spot deflector plate between them, it should be fitted with the plate directly onto the exhaust manifold and with the joint gasket between the plate and the inlet manifold, leave these bolts finger tight until the assembly is mounted on the engine.

Ignition system.

The distributor turns in an anticlockwise direction it has centrifugal and vacuum advance / retard its spigot goes directly into the crankcase and is retained by a clamp plate and setscrew.

Ignition Data		
	A70	A90
Advance range (centrifugal)	30 deg	34 deg
Advance range (vacuum)	16 deg	24 deg
Advance starts at --- RPM	400 to 1000	650 to 1000
Max advance at --- RPM	3800	4000
Cam angle (closed period)	49 +/- 4 deg	49 +/- 4 deg
Contact breaker tension	20 to 24 oz	20 to 24 oz
Condenser capacity	0.2 mf	0.2 mf
Firing point (BTDC)	6 ½ deg	6 deg
Firing order	1342	1342
Contact breaker gap	0.010 to 0.012"	0.010 to 0.012"
Plugs – make	Champion	Champion
Type	N8	NA8
Size	14mm	14mm
Gap with standard coil	0.018"	0.018"
Gap with HT coil	0.024 to 0.026"	

Cooling system.

A fairly standard design of cooling system consisting of a fan cooled radiator and a mechanical circulation pump, controlled by a non adjustable bellows thermostat under a bolted cover in the cylinder head, the pump has a carbon and rubber seal.

The pump can be removed with the radiator in place. Remove the fan, the pump body is spigotted to the cylinder block and is secured by three studs, note that the two nearside studs have longer nuts.

To dismantle the pump, remove the pulley, (held by a nut and woodruff key, will need drawing off)

Tap out the shaft complete with its impeller and seal assembly, this seal assembly consists of a carbon ring and a rubber seal with a spring cap and spring which is held in place by the impellor, this is secured to the shaft by a nut and woodruff key. When replacing the seal, make sure that the spring applies just enough pressure the hold the carbon ring against the shoulder on the shaft, this ensures that the correct pressure is applied when the pump is assembled.