Stripping a SUNBEAM mk. 3

THIS STURDY SPORTING SALOON CAR WILL REPAY TIME SPENT ON PUTTING IT INTO TOP FORM.

by JOHN THORPE

ALTHOUGH the Sunbeam Mark 3 enjoyed only a relatively short production run—little more than two years—it earned for itself a reputation for combining sturdy construction with a sporting performance. Consequently it is still a highly popular secondhand "buy," especially for the man who needs a full four-seater saloon but likes to have the power of an over-2 litre engine without the dimensional disadvantages of a big car.

Save for the 7.5 to 1 compression ratio the engine fitted to the Mark 3 is identical with that of the Humber Hawk Mk. 6—a 2,267 c.c. o.h.v. unit. It is of basically simple design, making it an easy unit to overhaul despite the comparative lack of working space beneath the Sunbeam bonnet.

The car used for this PRACTICAL MOTORIST overhaul was a 1956 model which its second owner had purchased only a few weeks before. On examination, considerable carbon formation was found in the carburetter, suggesting that one or more of the inlet valves was in dire need of attention.

please turn over

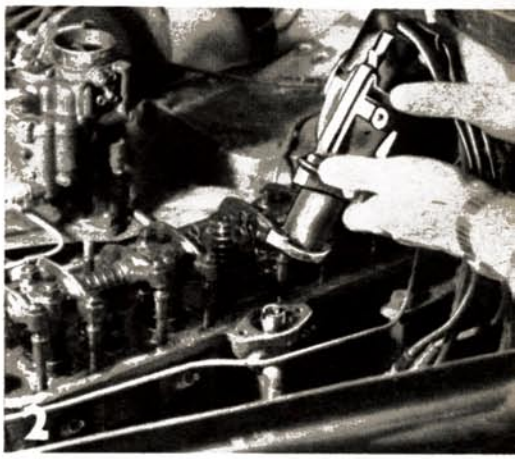
Having drained the coolant—there is a tap and drain pipe on the radiator's lower tank and a drain valve on the right-hand side of the radiator block—the first stage in dismantling was to free the screw clip holding the intake hose to the stub on the left front wing. The air filter, held by a single bolt at the rear and one nut at the front, was then lifted from the engine.

Two knurled screws held the rocker cover, which was next to be detached, followed by the plug leads. The vacuum advance pipe was freed at the distributor end (¼in. B.S.F. spanner); the "CB" lead detached from the distributor body; and the two $\frac{1}{4}$in. B.S.F. bolts securing the distributor to the cylinder head were removed. It was then possible to lift the complete distributor/drive shaft assembly out of the car.

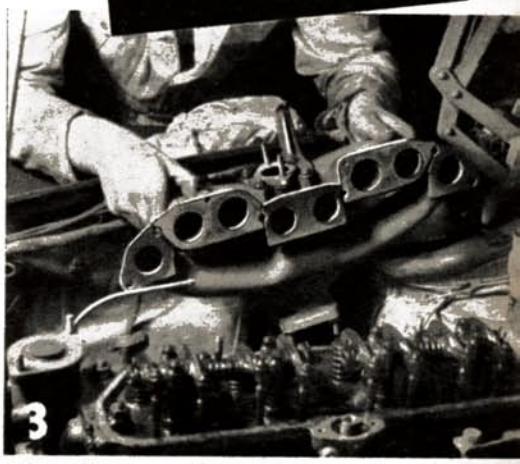
The next step was to free the two clips holding the vacuum pipe to the cylinder block and to detach its remaining terminal from the manifold. The throttle linkage was released, the choke cable disconnected, and the throttle spring and petrol pipe detached. Removal of the carburetter and its heat shield was then simply a matter of releasing two nuts. Since clearance between the carburetter body and the nuts is limited, it was necessary to lift the instrument slightly once the nuts had been partially freed.

A drain pipe is fitted to the Sunbeam manifold. It is held by a single screwed terminal and by a clip on the exhaust pipe. The pipe itself is normally freed by removing four nuts which secure it to the manifold, but on this particular car there were two additional nuts on the front mounting. These had once held a shield to protect the generator.

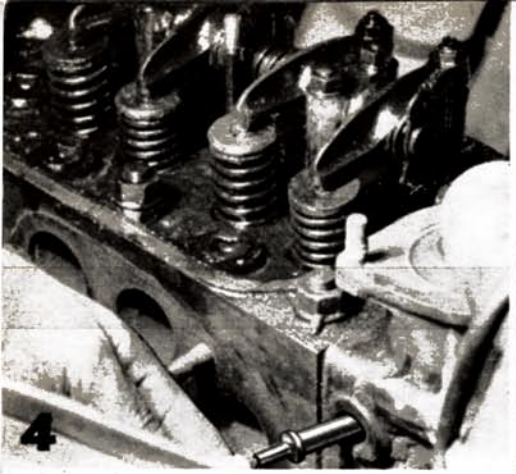
Free the clip which secures the hose of the air cleaner, remove the intake from the carburetter and lift the cleaner off.



The distributor is held by two bolts. Do not forget, however, to remove the vacuum advance pipe before detaching this unit.



There is no need to separate the two manifolds before they are on the work bench. It is easier to lift them as one.

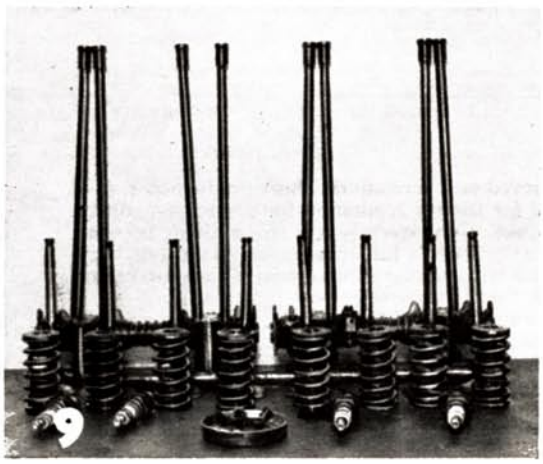


The thermostat housing contained this capsule for the temperature gauge. It must be detached before the head is lifted.

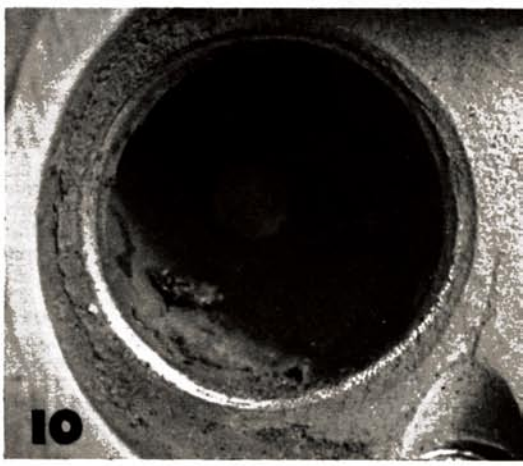
When removing the rocker gear, take care not to lose the two washers which lock the nuts. Be gentle with the pushrods, too.

The fan and the belt pulley are held by four bolts. They must be removed to make the rest of the dismantling more simple.

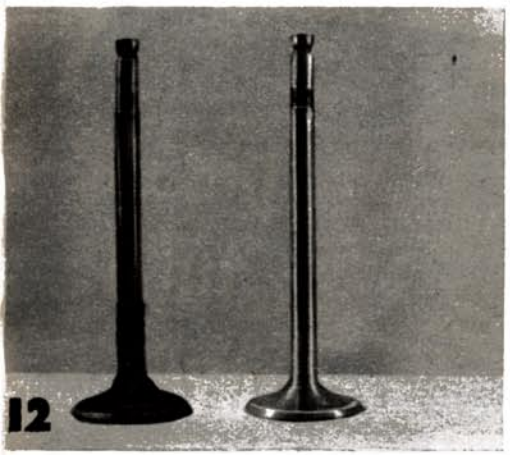
If the water pump is to be removed it is best done before the head is lifted. Space is limited. Ensure that your grip is firm.



Set out all the parts you have taken off in their proper order. This will facilitate the work of reassembling the power unit.



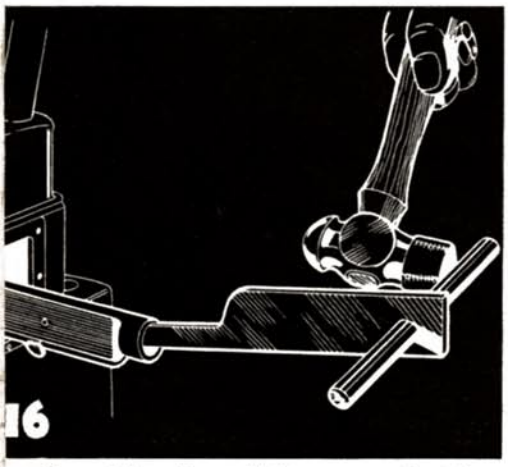
This is a prime example of a valve seat in poor condition. Thick carbon and deep pitting makes it inefficient as a gas seal.



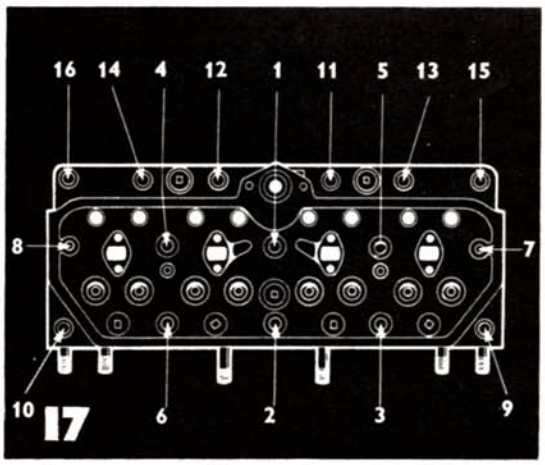
On the left, an exhaust valve just as it was taken from the engine. On the right, a second valve after a thorough cleaning.

Really bad valve seats, such as that shown on this page, can only be treated by using a 45-degree cutter, to make a fresh seat.

The pistons need not be taken out. Scrape the carbon off the crowns and then finish the job with metal polish. Wash with petrol.



A special tool is needed to remove the tube. It can be made of $\frac{1}{4}$in. steel plate 1in. deep. The hook is $3\frac{1}{2} \times \frac{5}{16}$in. Use it with a hammer.



A torque wrench must be used to tighten the head nuts. It is important that the sequence shown here is followed exactly.

Don't forget that ancillary components will also need to be cleaned. This carburetter contained considerable carbon.

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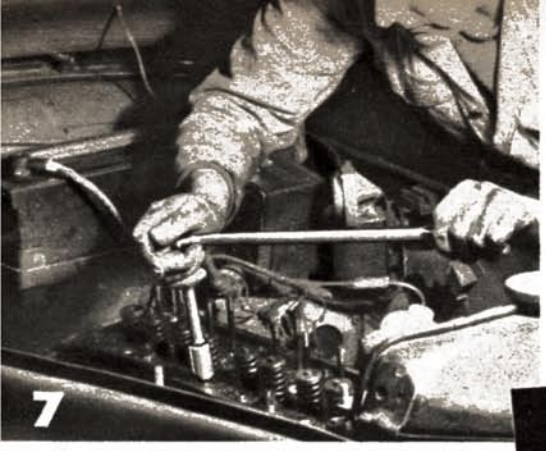
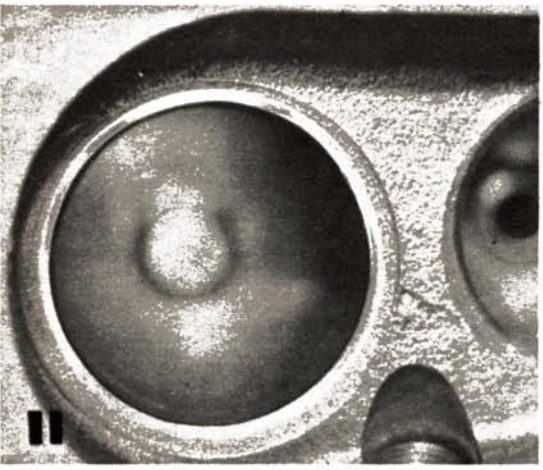
Continued



Loosen each head nut slightly first. Then slacken each in turn. Bolts are used for the rearmost points where a stabiliser fits.



The same valve seat after it had been recut and the valve ground in. This is the standard at which to aim when overhauling.

Fouling of the water passages may be suspected. Open up the plates on the head and check the internal distribution tube.

Finally, change the engine oil and fit a new filter element. A core which is in this condition is merely by-passed completely.

After the six nuts securing the manifolds to the block had been freed ($\frac{1}{8}$in. B.S.F. spanner) the two manifolds were lifted from the car. Examination showed that the hot spot flap valve had jammed in the open position. To free it, the inlet and exhaust manifolds were separated and petrol and thin oil run on to the flap valve spindle.

Next the top radiator hose and the thermostat were taken off. The thermometer capsule was screwed from the thermostat housing; the oil feed pipe to the rocker box removed; and the dynamo strap detached. The fan belt was then slipped out of place.

There are eight nuts holding the rocker pillars, each with one spring and one flat washer. Once these had been undone ($\frac{5}{16}$in. B.S.F. spanner) the rocker gear was lifted off. Next the pushrods were removed, each being gently eased out of place to avoid pulling the tappets out of their seatings in the block.

Further ancillary dismantling followed—first the rear engine stabiliser bracket; then the cooling fan (held by four nuts requiring a $\frac{1}{4}$in. B.S.F. spanner). The water pump, secured by six bolts, was also removed for examination. Normally, it should not be necessary to disturb it.

RECUTTING VALVE SEATS

No heater was fitted to this particular car, so the head was now held only by its 16 head nuts—actually the left rear two are bolts—on which a socket spanner was used. On a heater-equipped car the heater pipes would, of course, also have to be disconnected.

Removal of the head proved difficult. Consequently the plugs were replaced and the engine was swung over compression several times to help break the joint. It was also jarred with a hide-faced mallet.

Upon removal and examination, it was found that several of the valve seats were in poor condition and that all the valves had heavy carbon deposits on the stems. The seats were therefore recut, using a 45-deg. cutter, and each valve was first scraped clear of carbon and then its stem was polished with fine "wet-and-dry" emery. Afterwards, each was ground-in to the new-cut seat in the normal way.

DISTRIBUTION TUBE

On the head, both front and rear back plates were removed so that the coolant channels could be examined. A distribution tube is fitted to ensure an adequate flow to all areas liable to experience excessive heat, in particular the top of the exhaust valve seatings. Normally, this tube is not disturbed unless severe overheating has been experienced and blockage is suspected. To remove it, it is necssary to fabricate, from $\frac{1}{4}$in. steel plate, a special hooked tool, with a shank $3\frac{1}{2}$in. long and an extended handle. This tool connects with a hole in the lower surface of the distribution tube. By inserting a tommy bar through a hole in the handle the tube can be hammered out.

The combustion chambers and the piston crowns had previously been cleared of carbon but before re-assembly the ports were thoroughly cleaned, using a wire brush and an electric drill, and the piston crowns polished with metal polish. They were then thoroughly washed with petrol.

The carburetter, too, had the carbon deposit removed. Here, a wooden scraper was used to avoid any possibility of damage to the relatively soft body metal. The distributor was checked and the contact-breaker points refaced.

Re-assembly of the Sunbeam engine presents no major difficulties—but it is essential to follow the correct sequence in tightening the head bolts and to use a torque wrench to obtain the correct tension of 58lb./ft. (8.02kg./mm.) on the bolts.

Once the engine has been rebuilt it should be run until it reaches its normal working temperature of 170 deg. F. and the tension of the head bolts must then be rechecked.