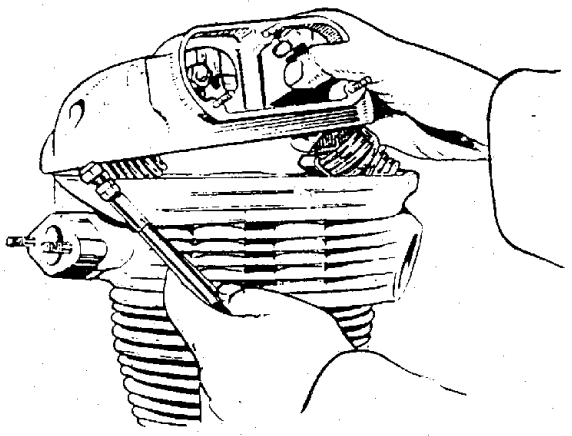
EASIWAY TUNE-UP ..... No. 17

BERNAL OSBORNE
Gives Valuable Information on Overhauling

MATCHLESS and A.J.S. SINGLES

Companion 350 c.c. and 500 c.c. Models from London Factory Repay Careful Maintenance

ENGINES dealt with are those for the separate-gearbox, G-type Matchless "singles" in 347 c.c. and 498 c.c. form, and for the A.J.S. equivalents, identified respectively as the Model 16 and Model 18. Both ranges have hairpin valve-spring heads and the method of dismantling and assembling is the same throughout, regardless of the touring or competition specifications with which the two makes in both capacities have been catalogued for the past 10 years. Apart from the particular gadget recommended to facilitate refitting the valve springs, no special tools need be acquired by the private owner intent on saving money by carrying out his own top overhaul. But as a precaution before starting work he should obtain a replacement set of gaskets, push-rod sealing rings and, if the model has covered an extensive mileage since last receiving attention, or is heavy on oil, a new set of piston rings. In general the work described relates also to earlier models with coil-type valve springs.

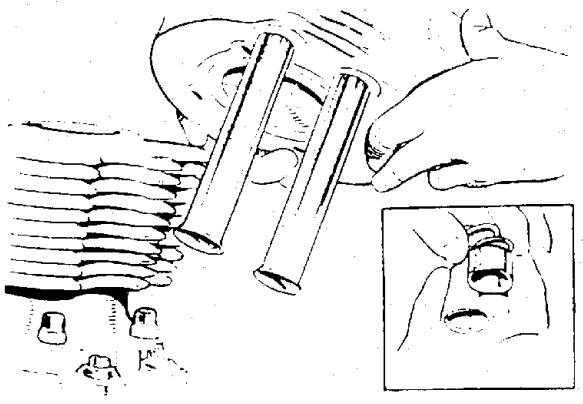


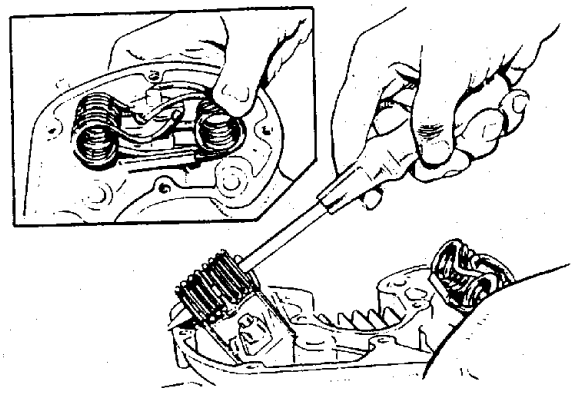
1. PREPARATION

REMOVE the fuel tank, retained on cross-lugs by bolts, two at the front and one at the rear. On current models it is necessary to release the front seat bolts and to raise the nose slightly. Disconnect the petrol line, remove the carburetter, tying it up out of the way; take off the exhaust pipe, the rocker box oil feed pipe and the tappet cover. The cover gasket will permit leakage unless it is in good condition. This is secured by three knurled nuts, normally tightened with pliers. Remove the exhaust lifter cable, head-steady and the nine bolts and washers retaining the rocker cover. Lift the rocker box and take out the push-rods. The gasket must be in good condition and oil-tight. Renew it in doubt.

2. OIL-TIGHT PUSH-ROD TUBES

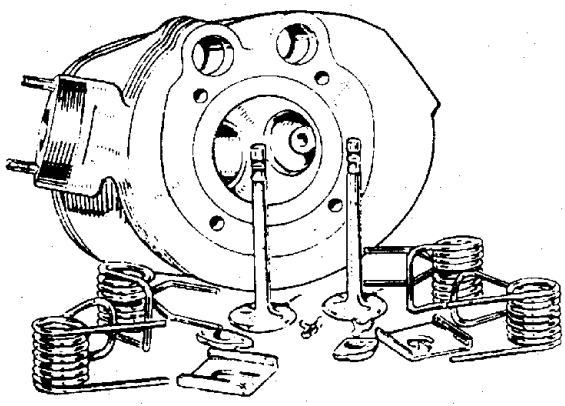
APPLY an open-ended or box spanner to the four cylinder-head bolts; when these are extracted the head will be free. Remove it, complete with valves, springs and push-rod tubes. Each tube is a press fit in the cylinder head and is belled at the lower end to bed down on a rubber gland encircling the tube. The tubes should come away, leaving the lower gland seals in position. Being exposed under running conditions to oil and heat these are expendable and, therefore, need replacing at intervals. Each push-rod tube carries at the top a conical ring, a rubber seal and one or more shims (shown inset). This arrangement makes the assembly rigid and oil-tight yet sufficiently flexible to allow for variations in fitting and for expansion.





3. SPRINGS AWAY

ALTHOUGH hairpin-type valve springs have long been associated with racing, rather than touring-type, engines and, therefore, look more complicated in their working and appearance than the coil-spring arrangement does, those used on the Matchless/A.J.S. heads are very easily extracted. No special tool is needed: in fact, if a finger is inserted in the spring coil, the assembly can usually be pulled free. Inset are shown the two matching springs with the closed ends tensioned beneath the spring collar holding the valve closed. Applying screwdriver leverage (instead of finger pressure) makes the dismantling job yet easier. Here the second spring in one of the two double-spring assemblies is seen being pulled away, leaving the valve to free itself and drop out through the guide.

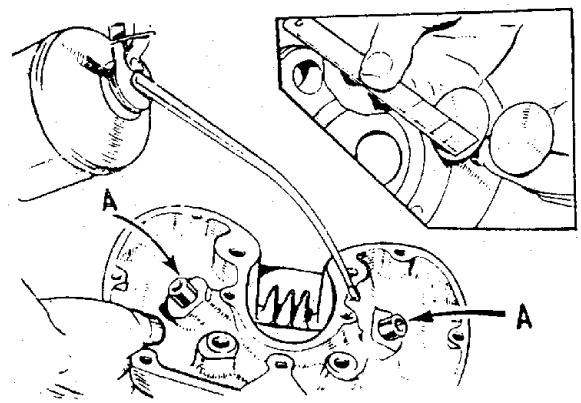


4. BITS AND PIECES

SPECIAL taper collets pair up in grooves at the top of each valve stem to locate the collar. When the springs have been pulled away it may be necessary to tap the assembly lightly with a mallet before the parts will separate. The parallel spring legs slide into seats, each seat having a raised impression on the lower side which must register with a hole drilled in the valve-guide boss: this is the only means of getting the seats properly positioned. Reasons for dismantling to this extent are (1) a top-overhaul and inspection of the valve stems and seatings or (2) a broken valve spring, denoted by a sudden fall-away in performance and noisy valve operation. A new spring should be fitted at once to avoid risk of the collar freeing to let the valve drop into the combustion chamber.

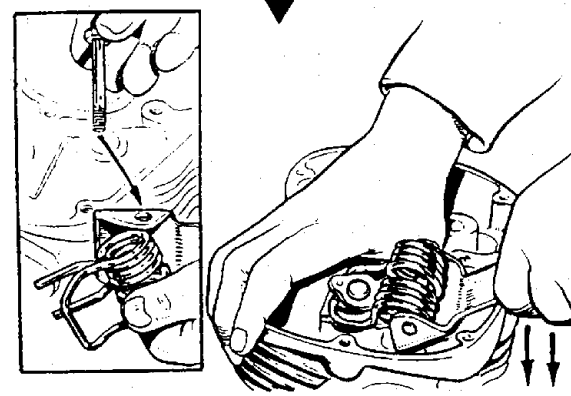
5. IMPORTANT DIMENSIONS

VALVES are not interchangeable. Current "350s" have inlet valves 1⅝-in. across the head, compared with the 1½-in. exhaust size. On the 500 c.c. model (1960-61) the inlet valve stem is $\frac{7}{16}$-in. dia. and likewise the head is larger than that of the exhaust. Make sure which type of valve is required (inset) before ordering. Carefully clean the head, scraping carbon from the combustion chamber area, valve stems and the bore of each guide. New valves and guides give a new lease of life to an old engine and also involve recutting the valve seats to 45° and grinding-in the valves. New guides must be inserted to protrude ½-in. at "A." Check that the head and guide oil-ways line up and lubricate as illustrated before fitting the valve.



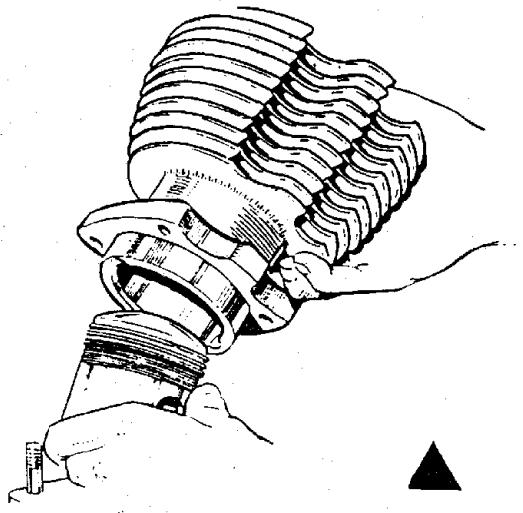
6. A SPECIAL TOOL

ALTHOUGH, at a pinch, hairpin-type valve springs can be fitted by hand, the extra leverage obtained from use of the simple tool illustrated makes the work really simple. The makers list a compressor tool as Part 018276 but, in the absence of this official gadget, a length of mild steel strip can be fashioned to do the job equally well. The chief need is a downward spoon-like action forcing the parallel legs into position on the seating. Component parts (inset) are (1) the spring, (2) the effective end of the compressor and (3) a pivot bolt which, in fact, can be any spare bolt or piece of suitably sized rod. The loop of the spring is hooked beneath the collar and held in position by hand while the tool is applied, as shown, to force the legs fully home.



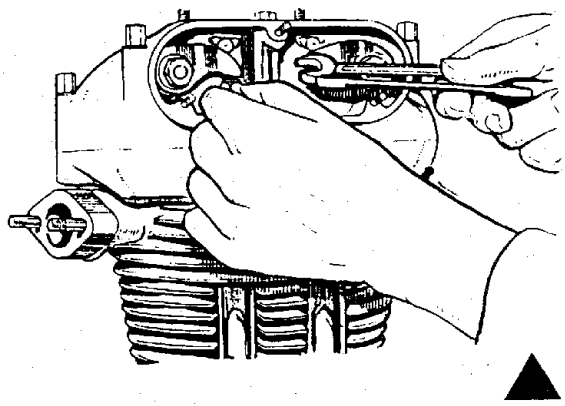
MORE TUNE-UP TIPS OVERLEAF

Easiway Tune-up No. 17 ..... Continued



7. PISTON DETAILS

LOSS of power, or rising oil consumption, are the two chief reasons for pulling off the cylinder and inspecting piston-ring condition. Four base nuts release the barrel. Make sure to support the piston skirt to prevent it impacting with the connecting rod or crankcase edge. Normal compression-ring gap is .006 in., new rings being required when wear extends from this dimension to .030 in. New rings are fitted with the part marked "Top" uppermost in the groove. Below the ring grooves the piston of the current 350 c.c. model is wound with a belt of wire which helps to counter the effect of expansion and avoid distortion. Engines made before 1947 can use this piston only if the latter type of connecting rod (½ in. longer) is also fitted.

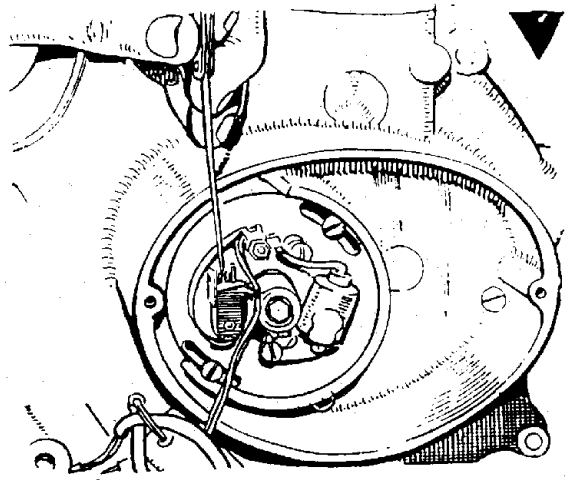


8. BUILDING UP

REPLACE the barrel, having first fitted a new base washer cemented on the lower face. Tighten the flange nuts, work around to each in turn. Assemble the push-rod tubes with gland rubbers, oil seals and shims. Fit a new head gasket and lower the head into position, tightening down the four head bolts. Fit the push-rods and the rocker box with the piston at t.d.c. at the conclusion of the compression stroke. Tighten the nine bolts and check that the push-rods are just free to spin, with a nil tappet clearance when warm. Adjust if necessary. Reconnect the oil feed pipe, the exhaust-lift mechanism and ancillary components.

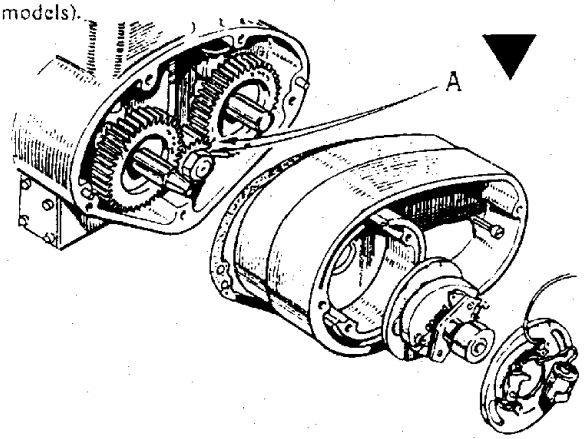
9. CHECK ON SPARKS

MODERN A.M.C. "singles" have the contact-breaker and condenser mounted on a base-plate within a special timing-side housing. The base-plate is secured by two screws in slots permitting limited rotation for ignition-timing adjustment. This should not be disturbed but, if it is upset accidentally, the correct setting can be regained by swivelling the plate to get the contact points just about to separate when the piston is ⅛ in. before t.d.c. on the compression stroke, full retard. This can be fixed without disturbing the automatic mechanism housed in the c.b. plate. Normal maintenance, however, is limited to cleaning the c.b. points and occasionally adjusting the moving bracket (secured by a screw) to obtain a correct opening of 0.14-.016 in. Check the wiring connections.



10. FOR THE CURIOUS

FOR owners interested in the subject, the layout of the camwheels is inspected by removing the contact-breaker cover, the c.b. base-plate, and the c.b. cam, which is a taper fit on the end of the inlet camshaft spindle and bolted in position. Two long screws secure the housing to the crankcase face where it is located by two dowels and backed by a paper washer. The inlet cam and timing pinion are meshed first at the No. 2 spot (500 c.c. touring and competition models) or No. 3 spot (350 c.c. touring models). Rotate the engine, moving the timing pinion around to "A" and mesh with No. 1 spot on the exhaust camwheel (all touring models) or No. 2 spot (all competition models).



NEXT WEEK'S "EASIWAY" TIPS WILL DEAL WITH THE PANTHER 100 and 120 MODELS