DUCATI ENGINE ANALYSIS

WORKSHOP INFORMATION

The Ducati motors are all essentially the same when it comes to maintenance work. The design is fairly simple, making for easy working and only a couple of special tools are needed.

Because these engines are so simple, it is easy to forget that they are made of high-precision parts which need a certain amount of care and respect.

The specification could be for a racing machine—just remember that!

First, regular and frequent oil changes will easily pay for themselves by the motor's longevity when it is properly looked after.

Second, there are several special tools available which will make life a lot easier if you're stripping the motors frequently, but the ordinary owner only *needs* one. This is an extractor for the alternator rotor, and you risk a lot of expensive damage if you try to remove the rotor without it.

Ducati have now swung right over to desmodromic layout—this has many advantages, like eliminating valve bounce, but the biggest bonus is in reduced wear on the valve gear.

A conventional spring system puts a basic load of 70 or 80 lb. on the valve. This is either taken by the valve seat or acts on the cams and followers. Consequently, the valve seats and opening gear take quite a pounding.

In the desmodromic layout, small hairpin springs are used, just to supply a bit of tension and keep the valves in place, but the loading is only 8–10 lb.

This obviously reduces wear on the valves enormously, but, because they are closed mechanically rather than by a hefty spring, you should pay close attention to the clearances. As there are two rockers to each valve, both the opening and closing are affected by the clearance at the rocker.

When rebuilding the motor, you'll find that nearly all the shafts are shimmed to control end-float. It is a good idea to keep each shim labelled after it has been removed, to avoid confusion, and to check end-float wherever possible with the figures in the workshop manual.

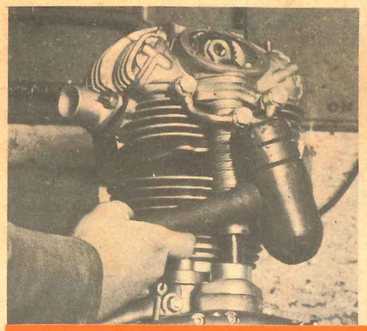
A final note on the 450 cc machines. They are in many ways similar to the 250s and 350s, but, of course, differ in the odd detail.

We did not have space to include them in this feature and the specification for the 250/350 should not be read for the 450.

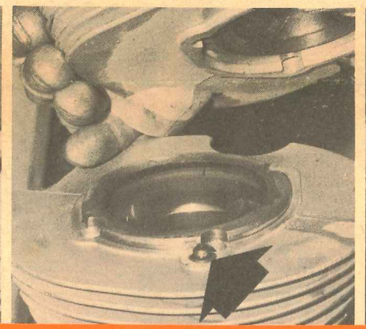
Workshop manuals, handbooks, spares, machines and advice can be obtained from the U.K. concessionaire, Vic Camp Motorcycles, 131 Queen's Road, London, E.17.

One final point, especially if you have just completed an overhaul, is to check the ignition timing as accurately as you possibly can. Ducatis are not renowned for easy starting and a newly rebuilt motor benefits a lot from precise timing.

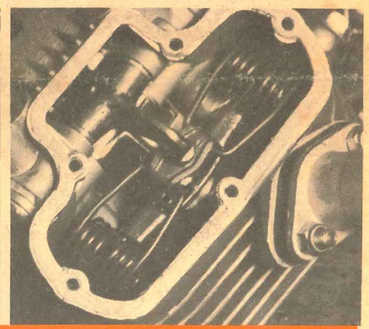
Check that the firing point is spot on and the cb points are clean and set to the correct gap.



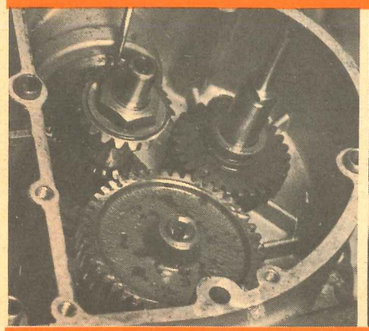
The head is located by four long bolts. As it is spigoted, it may be a tight fit and need tapping off. Use a rubber mallet. There is no head gasket



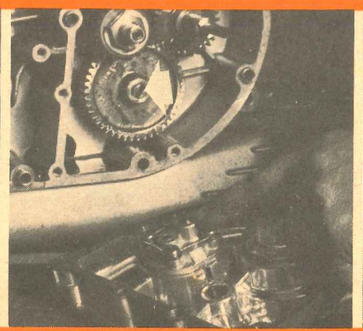
The spigoted barrel makes the seal, but a small rubber "O" ring is fitted around this dowelled oilway—renew ring each time the head is taken off barrel



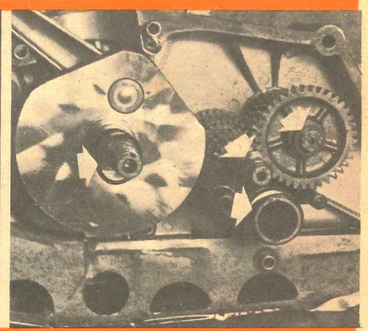
Light hairpin springs are used on the desmodromic valve gear to give a seat pressure of 8–10 psi. Such light loading gives the valves a very long life



The timing gear train is punched to set up alignment—check on the position of the dots before you strip the gears to ensure correct reassembly afterwards



The oil pump drive is taken from the arrowed slot. When replacing timing cover ensure that the oil pump shaft lines up with this slot or damage may be caused



The shafts located in the massive crankcase-sump housing are all shimmed. As all the shims are different, keep each one labelled for correct repositioning

DUCATI

MOTORCYCLE
SCOOTER & THREE-WHEELER
MECHANICS
THE ILLUSTRATED HOW-TO-DO-IT MAGAZINE

ENGINE ANALYSIS
No. 14

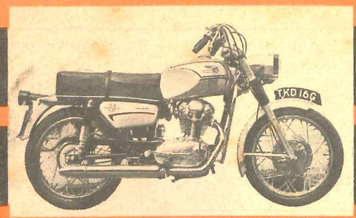
First home in the 1970 lightweight Production TT! This is a remarkable achievement for a four-stroke single but a fitting result for a marque which has enjoyed a long line of sporting successes.

The 250 Ducati piloted by Chas Mortimer was prepared by Vic Camp —"works" Ducatis are hardly ever raced outside Italy—and the speed and reliability of the machine is backed up by the fact that two other Ducatis were on the leaderboard. One came in fourth and one eighth.

Undoubtedly, the desmodromic valve gear now used plays a big part in the reliability.

As Mortimer said, "I knew I could over-rev it on the last lap without doing any damage."

A successful ohc single on both road and track



DUCATI ANALYSIS

MAIN SPECIFICATION

Model	250 Monza	250 Mk 3	250 Mk 3D	350 Sebring	350 Mk 3	350 Mk 3D
lubrication						
Wet sump cast integral with crankcase-gearbox unit. Pressure feed to bearing surfaces from gear pump. Gearbox shafts and gears run in oil bath common with sump						
engine						
single cylinder four-stroke, ohc with desmodromic valve operation						
capacity, cc	248.6	248.6	248.6	340.2	340.2	340.2
bore × stroke, mm	74 × 57.8	74 × 57.8	74 × 57.8	76 × 75	76 × 75	76 × 75
compression ratio	9:1	10:1	10:1	9.5:1	10:1	10:1
max. power developed at, rpm	7000	7800	9500	8000	8500	7500
rebore oversizes, mm	+ .4, .6, .8, 1.0 →					
fitted ring gap, mm 1st	.25–.40 →			.30–.45 →		
2nd	.30–.45	.25–.40 →		.30–.45 →		
Oil control	.30–.45	.20–.35 →		.25–.40 →		
max. permissible gap, mm	1.00	1.00	1.00	1.00	1.00	1.00
valve timing, ± 5°:						
checking clearance, inlet	.2 mm	.15 mm	.15 mm	.2 mm	.10 mm	.1–.15 mm
exhaust	.2 mm	.30 mm	.15 mm	.2 mm	.10 mm	.1–.15 mm
inlet opens, btdc	20°	62°	70°	20°	65°	70°
inlet closes, abdc	70°	76°	82°	70°	76°	82°
exhaust opens, bbdc	50°	70°	80°	50°	80°	80°
exhaust closes, atdc	30°	48°	65°	30°	50°	65°
running valve clearance, mm	.05–.10	.05–.10	.10–.15	.05–.10	.05–.10	.10–.15
inlet valve lift, mm	7.5	8.55	—	7.5	10.0	—
exhaust valve lift, mm	7.5	8.0	—	7.5	8.5	—
ignition timing:						
static ± 2°, btdc	5°–8° →					
fully advanced, btdc	33°–36° →					
points gap, mm	.3–.4 →					
spark plug	Marelli CW 260N →					
plug gap, mm	.6–.8 →					
bearings: the crankshaft is supported in two roller bearings with roller big-end and plain bush small-end bearings						
transmission						
gear primary drive to five-speed crossover gearbox via a multiplate clutch. Final drive by chain						
primary reduction	2.5	2.5	2.5	2.11	2.11	2.11
gearbox sprocket, teeth	17	16, 17 or 18	16, 17 or 18	15	14, 16 or 17	15 or 17
rear wheel sprocket, teeth	45	45	45	43	45	40 or 42
internal ratios, 1st	2.46 →					
2nd	1.73					
3rd	1.34					
4th	1.10					
5th	.97					
electrics						
6-volt ac/dc lighting and ignition, supplied from flywheel-mounted alternator and battery. Charging current is rectified and voltage-regulated by controlled diodes						
alternator output	6v, 70W →					
battery	6v, 13.5 aH →					
carburettor						
Dell'Orto type	UBF 24BS	SSI 29D	SSI 29D	UBF 24BS	SSI 29D	SSI 29D
choke, mm	24	29	29	24	29	29
main jet	108	112	115	108	112	115
idler jet	45	45	45	40	45	45
valve	80	60	60	70	60	60
atomiser	260	260	260	260A	260	260
float	6.5	14	14	—	14	14
needle	11/2	14/2	14/2	16/2	14/2	14/2

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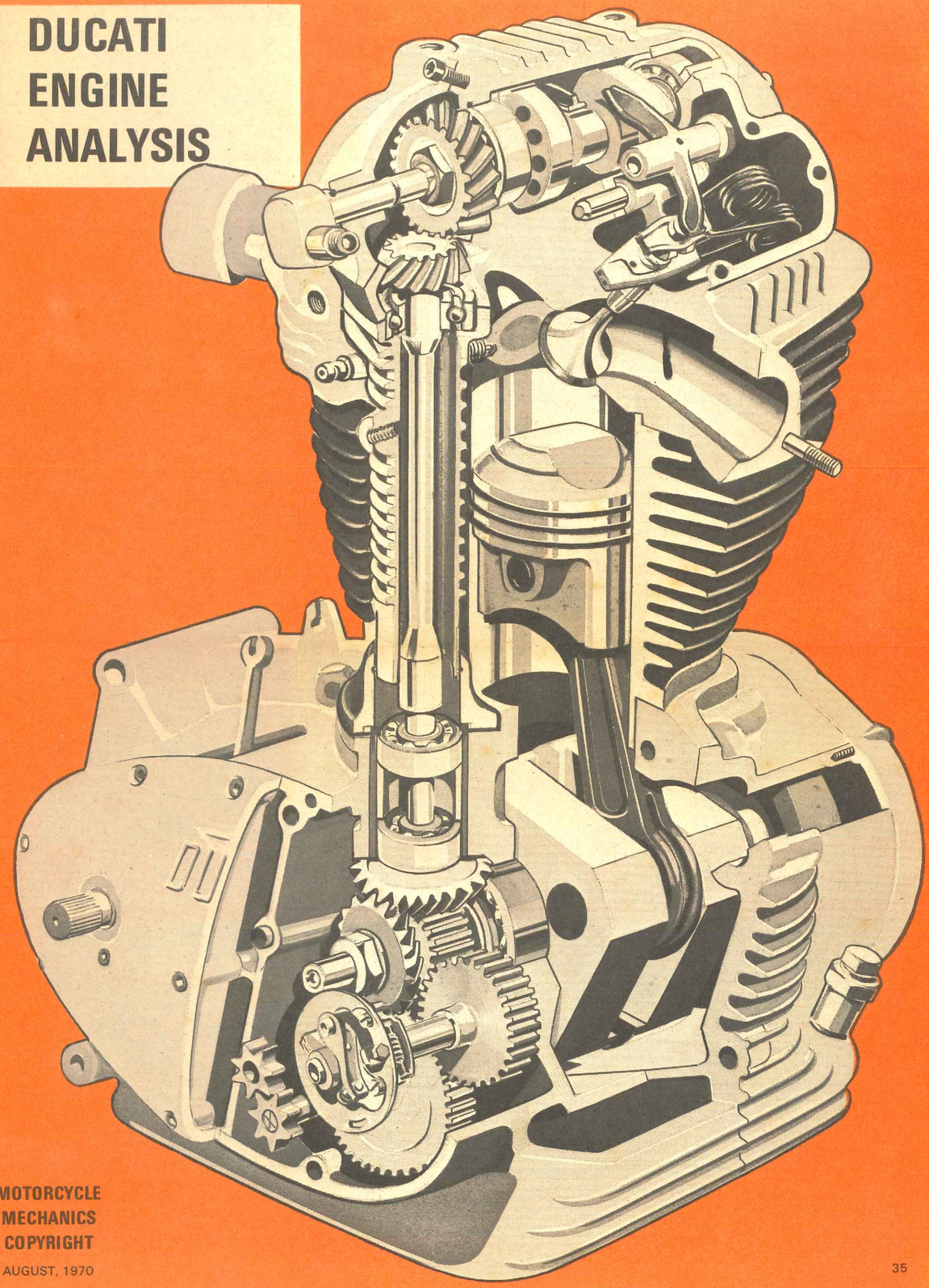

AUGUST, 1970