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RICKMAN 8-VALVE

*John Robinson rides
and reports on this
Bonnie conversion kit*

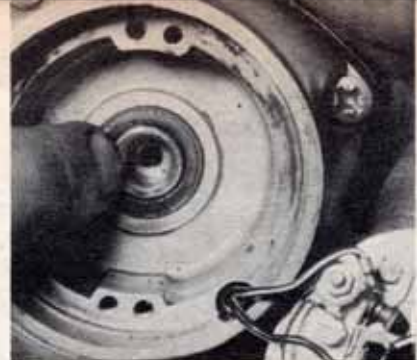


► It looks good . . . it feels good . . . and it goes like the clappers!
Rickman's top-end conversion for the Bonneville gives an all-round jump in power and performance. The response is quicker, the power is smoother and the machine we tested really flew!

CONTINUED OVER



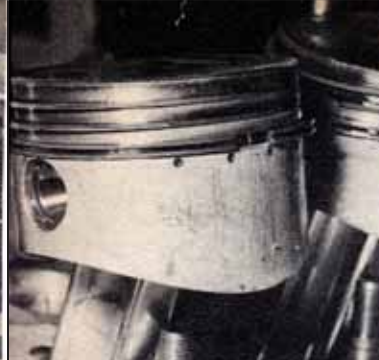
TOP END WORK



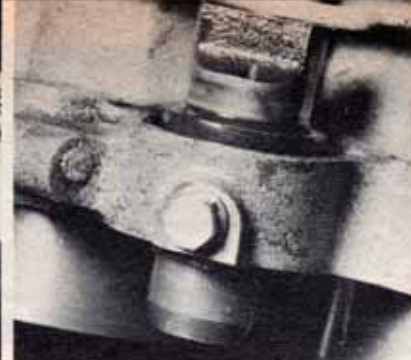
Modifications to the ignition timing are made by removing the peg from the camshaft or by elongating slots in cam plate



As the cylinder head is wider than the Triumph one, the tappet guide wells have to be opened up to suit splayed tubes



Increased power output and thermal loadings require stronger pistons. These forged units give 11.5:1 comp. ratio



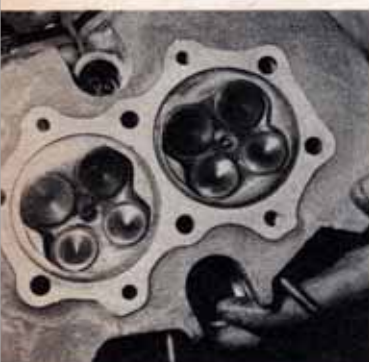
The tappet guide is interference fit in flange and located by set screw. Make sure that the screw fits squarely into guide



The alloy barrels are fitted on to long studs which run all the way up into the head. Larger bore gives capacity of 683 cc



About 1/8 in. may have to be ground off the top of the exhaust pushrod tube and an extension spacer is fitted below seal



The four-valve layout allows very high compression ratio without bad combustion chamber or piston shape



The barrels are spigoted, make sure that the heads seat properly before starting to tighten them down



Intake stubs were not supplied with this kit and were made up. They may be splayed or parallel, with length 2.25 in.



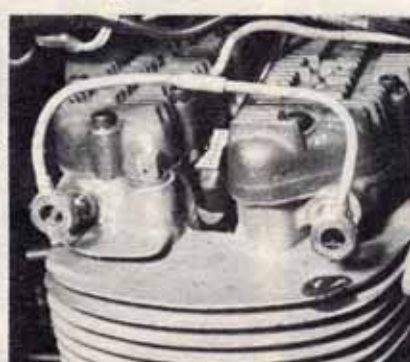
Fitting the heads. Note that the tappet position relative to the cam has been changed, re-timing is explained below



The head is secured by four studs running through block, two studs from block and these Allen screws beside inlet pushrods



One rocker operates each set of twin valves, the valve clearances, set cold are .011 in. inlet and .013 in. exhaust



Rocker lubrication is by reduced-pressure feed taken from the return pipe from the scavenge pump to the tank



Installing the engine is fairly straightforward, although it is a tight fit, being taller than the original

ROAD IMPRESSIONS



► **A Bonneville with a 20 per cent bonus in power! —that's the verdict on Rickman's conversion of the Triumph engine.**

This big-bore, eight-valve layout has been tested extensively in a Metisse frame and as a full-blown racer, but this machine is the first roadster to use all-Bonneville parts.

The parts supplied by Rickman's were carefully built into a new Bonnie at Ray Fisher Motor-

cycles in Christchurch, by Vic Hiscock and Dennis Hatton.

In spite of the 11.5:1 compression ratio, this model was a tourer; there was nothing temperamental about the engine at all. Even starting was easy, usually it fired up second kick.

The first ride was a cautious one, out through the traffic. This was where I noticed the tremendous similarity to the standard engine. There is power there from tickover upwards, but this engine has just that bit more than the Bonnie all the time.

One of the nicest things about the bike is the instant throttle response. Even a slight tweak brings a deep throaty growl from the exhaust and you feel a surge of power hurrying you on.

This, too, is like the Bonnie, but the response is quicker, the growl deeper and the hurrying is faster.

Later on, although the engine was still tight, they told me I could give it a few quick squirts; and using only 6000, this machine flies! And it pulls up

to 6000 in top with virtually no flattening off—this was sitting almost upright with a following breeze.

It was during one of these "quick squirts" along a twisty road that another point became apparent—the Bonneville was prone to weave and snake just a shade.

Dare I suggest that there was too much power for the Bonnie to put on the road? In any event, I would advise beefing up the suspension if you are thinking of using one of these kits on the road.

Good as it was, the bike does have some faults—first the old Triumph trouble of leaking pushrod tubes. This is caused by the cylinders expanding at a different rate to the tubes and leaving gaps for the oil to seep through.

The exhaust tube got so loose when hot that you could see it moving! Don Rickman tells me that they hope to do something about this in the future, but at the moment they are stuck with the Triumph bits.

Another minor fault is the accessibility in the Triumph frame—things do get a bit close at the top end, as you can see in our photographs.

We took no performance

figures because we didn't want to risk damaging the new engine, and anyway, as it was still tight, the figures wouldn't have done justice to the engine's abilities.

From my own impressions, I am sure that in the Bonneville frame, it would give a comfortable top speed of over 120 mph, or you could run on lower gears and out-accelerate anything on the road. The standard Triumph brakes are well up to the job and slightly stiffer suspension units would give good handling.

Apart from the overall increase in power, the machine felt smoother than any Bonneville I have ridden. This may have been the conversion, or it could have been due to the careful preparation Vic and Dennis gave to the engine and cycle parts.

As I mentioned earlier, a machine was tested in America, and the figures they got may be of interest. It was in a Metisse frame (some 60 lb. lighter than the Bonneville) and had disc brakes all round. It was also geared to give a top speed of about 110 mph.

Acceleration 0-60	5.0 sec.
0-100	11.9 sec.
standing 1/4 mile	13.11 sec.
braking from 30 mph	27 feet.

... this bike was completely "street legal" ... 'nuff said?

THE CONVERSION



► **The Rickman Brothers have obviously been dreaming of making a deal between flexible power and a cost which everyone can afford.**

They have now realised this with the Weslake-designed eight-valve conversion for the Triumph Bonneville.

Everything from the conrods downwards is stock Triumph, but the mods to the top half increase the power to about 64 bhp at 7200 rpm! When you think that a Bonneville turns out 48 bhp and then only if it's put together carefully, that is some increase.

Where does the power come from? Well the main changes are the four-valves per cylinder layout, the high compression ratio and the increased swept volume.

The extra 30-odd cubic centimetres add a bit of their own, as well as changing the bore/stroke ratio and increasing the piston area.

The extra valves carry several bonuses. First of all the units are lighter and more easily controlled, second the ports are smaller, giving increased gas velocities which are presumably used to improve cylinder filling. Third and possibly most important, they allow a really high compression ratio without forsaking the design of either the piston or the cylinder head.

There is a common belief that four-valve layouts simply increase the rev limit to give more power at the top end of the scale. This is just not so. In fact, they allow better volumetric and thermal efficiencies at all speeds resulting in a general jump in performance.

To take the increased mechanical and thermal loads, forged alloy pistons are used instead of the standard cast ones. The pistons have an almost flat crown, and resemble those used in the Hillman Imp engine.

Naturally Rickman's supply full instructions with their kits, and there are one or two alterations necessary to the Triumph parts before it can be fitted.

The most difficult is opening out the tappet guide wells in the crankcase. This is necessary because the head is wider than the Bonneville head and so the pushrod tubes have to be splayed outwards.

Template

Rickman's say that this can be achieved without splitting the crankcase (they supply a template to cut to). However, when Vic Hiscock explained the assembly to me, he felt that it would be more satisfactory to strip the bottom half.

As he explained, the machining is then much easier and you also get a chance to give the crankshaft bearings a thorough check over. Obviously they need to be spot on to take the extra loading.

For racing, Nitride treatment to surface harden the crankshaft

is recommended and new, polished conrods are recommended for all applications.

The ignition timing needs changing to suit the improved combustion and it should fire, fully advanced, at 34° btdc.

Also, as the pushrod tubes have been moved, the tappet angle relative to the cam is different and the valve timing will need resetting.

Set the mark on the crankshaft pinion between the twin marks on the idler pinion. Now fit the inlet camshaft pinion with the keyway in line with the dot on that pinion and the dot lining up with the top mark on the idler pinion.

Turn the exhaust camshaft so that the keyway is in the eight o'clock position and fit so that there are 18 whole teeth between the mark on the idler pinion and that on the camshaft pinion.

Exhaust pipes of 37 in. length and 1 1/2 in. inside diameter should be used with Triumph silencers.

The recommended retail price of the kit is £145, and Ray Fisher Motorcycles, Barrack Road, Christchurch, who kindly co-operated with this article will allow an exchange price on the old barrels and heads depending on their condition.