

10

Minutes of the Motorcycle Development Meeting  
held on June 2nd, 1961.

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Present:- Major V.T. Mountford  
Mr. J.J. Booker  
Mr. R.A. Wilson-Jones  
Mr. G.H. Baker  
Mr. R. Thomas

Matters arising:-

These items are numbered in order of priority.

1.- Pressed Steel Fork Head for Leading Link Fork:-

The sample pressing has been modified; the ball head clip is in the process of being machined, and should be ready by Monday, night, June 5th. The fork should therefore be ready for assembly by Tuesday or Wednesday, and approval given for the pressings, and also the ball head clip in malleable iron in the very near future.

2.- Bottom Link Front Forks:-

It was agreed that the only possible modification required to the original setting of the shock absorber, would be a slight increase in the length of the springs. A pair of springs  $\frac{1}{8}$ " larger have been ordered, and should be available for test during week ending 10th June. Providing these are satisfactory, it is desirable not to prolong the testing in order that orders may be placed as soon as possible.

3.- Lubrication on 700 cc Engines:-

As the results of tests recently carried out, it has been decided to modify all Constellation engines leaving the factory in future, so that the scavenge pump draws on both sides from the sump. Mr. Booker has already notified Westwood. It is not practicable to make an effective seal between the cam tunnels and the cylinder barrel sprocket, and a more fruitful line of experiment would appear to be to open the camshaft tunnels to the crankcase, and use this in conjunction with the other modifications on lubrication given in previous reports.

Preliminary tests have been run on an engine so modified, but after 20 hours, it was found that one inlet cam on the off side was running short of oil. This would appear to be due to the fact that

the opening into the crankcase from the camshaft tunnel was not directly in line with the cam and tappet. The crankcase is being dismantled, and examined to see what modification can be made to increase the oil thrown on to this particular cam and tappet. As soon as possible tests are to be run on the bench with only the timing cover modification carried out as on the two road machines.

A prolific source of oil leakage on Constellation machines has always been the primary chaincase, and this occurs even on new machines. Tests recently carried out showed that the back half of the latest type chaincase distorted to the extent of 0.30" when the centre retaining nut was tightened. This distortion carried on right until the centre bolt locked on to its shoulder, and started as soon as any pressure was applied. A steady bracket attached to the gearbox bolts has proved effective in reducing this distortion to half the original amount. Mr. Thomas is to proceed with the original design of such a bracket. It would appear desirable to pin the bracket to the back of the chaincase if at all practicable. Also it should have a wide bearing at the back of the chaincase to prevent any possibility of twist.

As the result of the proximity of the Enfield type clutch to the shoulder of the countershaft sprocket nut, which runs in the oil seal, this shoulder was in some instances barely effective in the seal. On one engine on which a bracket was attached to the back of the chaincase, it was found that this oil seal leaked oil probably due to the fact that previously the back half of the chaincase was being pushed back so that the oil seal had a greater bearing on the nut. Now that we are fitting the Albion type clutch there is no reason why the shoulder on this nut should not be extended so as to ensure adequate penetration of the oil seal. Mr. Booker has already spoken to Mr. Lovekin on this matter.

#### 4.- Silencing:-

After some discussion it was decided to continue with the silencer that is fitted as at present with the copper asbestos, and not to proceed further at this stage with the brazed up silencer.

In view of an increasing number of complaints being received of Police action in relation to riders of Crusader Sports, the production of a more efficient silencer must be proceeded with as a matter of extreme urgency. Mr. Wilson-Jones reported that sample sheets of stabbed steel have been ordered and delivery is awaited. As soon as these are received a silencer will be built up with the minimum of delay. No great time is to be spent testing the proprietary Murray silencer.

5.- Pistons for 250 cc Super Sports:-

Comments contained in Mr. Wilson-Jones' report dated 26.5.61. were noted and approved. With a view to using Constellation pistons in stock at Westwood, a Super Sports Crusader had been run with a Constellation piston on which the valve clearance had been modified giving  $5/32$ " valve opening clearance at top dead centre. This has considerably reduced the thickness of metal in the piston. The machine was run for 10 laps at M.I.R.A. at maximum speed with no suggestion of piston burn or over heat. Major Mountford is investigating with Westwood about the possibility of using their Constellation pistons modified on Sports Crusader models when existing stocks at Redditch have been exhausted. This could be used on either Clipper, Crusader or Crusader Sports, and eventually on the 250 cc Clipper when this model is fitted with an aluminium head.

6.- Five Speed Gear Boxes:-

Tests are continuing on the five speed gearboxes on the Constellation model, and providing these are satisfactorily completed, this box can be offered as an extra for the 1962 Constellation.

With regard to the Super Sports Five Speed Gearbox. On consideration it has been decided to fit a 48 T rear sprocket to make use of the increased power of the new engine and the five speed gearbox. The ref to difficult gear change in Mr. Wilson-Jones' report referred to the original hand made gear set - the production set in the other machine is satisfactory.

7.- 350 cc Crusader Engine:-

This seems to be satisfactory, and the only point of doubt is the clutch. It is agreed that the improvised clutch, which is at the moment fitted requires springs of such strength as to make operation difficult, and that the five plate clutch, which is being designed in the Drawing Office, should be fitted as soon as possible. This should incorporate a malleable iron drum with a plain bearing replacing the existing ball bearing. Mr. Thomas is to let Mr. Baker have a drawing of the new clutch so that he can see if we can make one of these up out of present materials for testing.

Mr. Wilson-Jones reported that Messrs. Hepworth and Grandage said that they had no available dies from which they could produce the piston required, but they could offer sample pistons made from semi-dies, which could be available in eight weeks from ordering. Before any decision was taken on this, it was decided to approach other manufacturers regarding pistons of the right dimensions.



8.- Reynolds 250 cc Frame:-

Nothing to report from Messrs. Reynolds. Mr. Thomas reported that he now had a pair of B quality rear side tubes, which are now being assembled into a frame and are to be tested over the Pave at M.I.R.A.

It was reported that one case of failure of the rear side tube of the swinging arm had occurred at the forward end of the fork end plate. Analysis showed that this is probably due to local hardening during welding. Mr. Baker undertook to have these annealed in future. Mr. Thomas suggested that we should try B quality tubes for the swinging arm side tubes. It was reported that tests had been carried out with the silent block rubber swinging arm bearings utilizing side tubes of B quality. Mr. Baker will find from Messrs. Reynolds the gauge of the tube used on the original assembly in time for the next meeting.

9.- 175 cc Engine:-

As the result of various other commitments, Mr. Thomas has made little headway, but he hopes that by the next meeting some progress can be reported.

10.- Siba Self Starter:-

It was noted that the two Police type batteries had not given any marked improvement over the standard batteries. It transpires however, that the battery had been discharged after trying to start the machine with a faulty plug, and in view of this it is desirable to have the batteries fully charged on the bench and run through a series of tests again. If these tests prove unsatisfactory, the system will have to be altered to 24 volt.

11.- Oil Filter on 250 cc machines:-

Mr. Thomas undertook to telephone the suppliers to see if the present delivery of mid August could be improved upon.

12.- Chrome Plated Cylinder Bores:-

It was noted that the sample aluminium cylinder barrels which have been plated by Monochrome were now being lapped, and would be delivered to Mr. Booker on Monday or Tuesday next.

Metal Spraying of Cylinder Bores:- Mr. Baker reported that the cylinder barrels were being machined, and should be ready within seven to ten days.

13.- Slotted Clutch Plates:-

Before making any decision to accept these as standard, it was decided to await results from tests being carried out by customers - namely Messrs. Gander and Gray and a private customer. (Mr. C.A.E. Booker to report)

14.- The Scooter:-

The modified gearchange whereby the clutch lever is in a different position on the handlebar for each gear is quite unsatisfactory. Mr. Welshe is now modifying this with a view to eliminating some of the mechanism, which is creating the sponginess.

Redesigned Frame:- The frame is now being built, and it should be ready for assembly next week. The engine is to be the one which has been bench tested to which the new Zenith carburettor is to be fitted.

Suspension:- A new suspension unit for the rear wheel will be available in time for the assembly of the 2nd Scooter. At the same time with the 2nd machine a means of varying the trail of the front fork is to be incorporated. Mr. Welshe is redesigning the centre stand, and it was suggested that this should be positioned further to the rear of the machine with an idea of facilitating the removal of the rear wheel.

15.- New Fork Head Clip:-

No comment.

16.- Cross Cylinders and Pistons:-

Nothing further to report.

17.- Batch Tests:-

Whilst the performance of the Crusader Sports was generally satisfactory, the maximum speeds achieved by the Meteor Minor Sports model were disappointing. With regard to fuel consumption, it was noted that the carburettors were not correctly adjusted for the tests, and Mr. Baker is taking the matter up.

It was decided that as most models had now been batch tested, batch tests should be deferred for one month.

18.- Nylon Roller Cages:-

It was noted that these have now been received, and they will be

used for all purposes as soon as present stocks of metal cages have been exhausted. No more metal cages will be produced.

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(J. J. Booker.)