Manufacturers of Royal Enfield BICYCLES and MOTOR CYCLES

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THE ENFIELD CYCLE COMPANY LIMITED

HEAD OFFICE AND WORKS
REDDITCH
WORCS. ENGLAND

Your Ref. Our Ref

31st January, 1962

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REPORT OF DEVELOPMENT WORK IN PROGRESS
JANUARY, 1962

(Sub-section Nos. refer to Minutes of the Meeting held on 2nd January, 1962)

1. Bottom Link Forks

The "spindle mounted" mudguard has been run both on the road and on the Pavé. It performed satisfactorily for 250 miles on the road but after 7 laps on the Pavé (10 miles) one of the front stays broke and one of the rear ones developed a crack.

The method of securing the mudguard stays to the fork links causes the guard to oscillate in a violent manner on rough roads. Not only does this put very severe loads on the attachment stays but also a large clearance is necessary round the guard which at the ends of the fork travel is far from concentric with the wheel. A much more satisfactory method of mounting would be to duplicate the brake cover plate and anchorage on the right hand side of the wheel and attach the mudguard stays with suitable bosses on the actual cover plate and on the dummy plate. In this way the mudguard and wheel move strictly in unison.

A pair of the latest type Armstrong damper units are now fitted to the prototype machine with bottom link forks. These have shorter springs and require a shorter bump stop than the current production pattern. After 507 miles with these units including 25 laps on the Pavé a peculiar noise developed in the fork. Examination showed that the

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1. Bottom Link Forks (Cont.)
zinc alloy casting which is screwed on to the upper end of the piston rod and through which the upper attachment bolt passes had become detached from the piston rod due to thread stripping. These castings are screwed on to the rod as far as they will go and a hole is then drilled through the casting and the rod and split pin fitted. Further examination showed that on this particular damper the casting must have been unscrewed at some time (probably to fit the spring for which Armstrong had been kept waiting) and when replaced, it had not been screwed right home so that the split pin had not passed through the hole in the piston rod ~~and~~ but had gone over the end of the rod. The pin was still intact in the casting. Messrs. Armstrong's attention had been drawn to this defective assembly which, however, is extremely unlikely to occur in the ordinary run of production units.

2. 750 cc Engine
This had now been built with a crankshaft giving 55% balance. This is considered to be smoother than the average production 692 cc 'Constellation'.

The most satisfactory way of sealing the head joint at the push rod tunnels is to use rubber washers supported by flanged ferrules. These have proved quite oil tight after 500 miles running. The push rods were found to have been rubbing lightly against the bore of the ferrules. Some ferrules, .010" bigger in the bore have now been fitted. If these do not give sufficient clearance we know from past experience that smaller diameter push rods are quite satisfactory.

The crankshaft with 75% balance has been checked statically. The extra weight necessary on the crank pin side at the throw radius to put the shaft in balance was found to be 2 lb. 8 oz. 14 drms., whereas the weight to which the shaft was said to have been dynamically balanced was 2 lb. 8 oz. The weight required to give 75% balance with the connecting rod supplied with the crankshaft and with a pair of 71 mm pistons with smaller diameter gudgeon pins suitable for use with these rods is 2 lb. 8 oz. 3 drms. This crankshaft has now been returned to Westwood to be fitted into a machine and tested there.

The machine has been fitted with a 21 tooth counter shaft sprocket and a 45 tooth rear wheel sprocket giving a top gear ratio of 4.14 : 1. This, however, appears to be too high. Possibly as a result of running on such a high ratio a hole was burnt in the offside piston crown after less than 1,000 miles running.

3. Silencing
The Bench Test with the N.S.U. silencer has not yet been run as the test bench is temporarily out of commission while a new ~~auto~~ water pump is being fitted.

The Dawes Sound Level Meter has at last been received and a very brief check with it shows that it is capable of producing reasonably

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3. Silencing (Cont.)
consistent readings of about the same order as those obtained under the test conditions at the M.I.R.A. Proving Grounds.

Mr. Baker has produced a silencer in a standard 3" diameter barrel - two concentric layers of sound absorbent material (steel wool) separated by expanded metal. The Sound Meter indicates that this is about four dB(A) quieter than our standard Crusader Sports silencer.

Some special stabbed metal sheet has also been obtained from Messrs. Ash and Lacey and a silencer has been made using this in the conical front portion and also in the cylindrical barrel portion of the silencer as an unpacked absorption tube. According to the Sound Meter this silencer is quieter than the standard one but not as quiet as the one with two layers of sound absorbent material.

We are now in a position to run some comparative tests on different types of silencer obtaining objective readings on the meter which will at any rate tell us which silencers are worth taking to M.I.R.A. for testing under approved conditions. We must, however, have a reasonably dry day for our tests since the microphone on the Dawes Meter is damaged if it is exposed to conditions of a relative humidity exceeding 85%. A wet and dry bulb thermometer has been ordered so that measurements of relative humidity can be made at any time.

4. Heavyweight Five Speed Gearbox
This has been returned by Albions, who report that they found the main shaft ball bearing loose in the end cover. A new cover has been fitted together with the new type main shaft ball race oil thrower cap seating on the face of the outer ring of the ball bearing instead of on the end cover. This not only makes a more positive oil seal at this point, but also prevents any possibility of endwise movement of the bearing which could help to pump oil out of the gearbox. The box has now been running for a distance of 600 miles on the road. There is no sign of oil leakage.

5. Crusader 350
This has now covered a total mileage of 7,918. The mileage since the engine was rebuilt with the bronze steady bush is 2,130. This is also the mileage run by the ⅜" pitch final drive chain which has now been adjusted 3 times.

The special EN.30(A) 3% nickel chrome steel case hardened layshaft high gear and kickstarter pinion referred to in the last report was removed intact after 794 miles running and was replaced by a standard production pinion which had been returned to the Albion Engineering Co. for retempering. This had now covered 220 miles and has survived several back fires.

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5. Crusader 250 (Cont.)
The clutch with bonded J.17 facings and 'DU' bearing ring has now covered 4,617 miles (the loose friction plates 4,753 miles) and is still satisfactory.

The original primary chain is still in use.

6. 175 cc Engine
Detailing of the crank case, castings and covers is now complete and quotations for crankcase patterns have been received from Messrs. Dowler and Messrs. Surecast. Quotations for castings have also been received from Messrs. Surecast, and Messrs. Aeroplane & Motor Aluminium Castings Ltd. have been asked to quote for both patterns and castings.

7. Scooter
The Siba starter on the second scooter appeared to be completely dead. This was returned to Siba Electric who sent their Mr. Yate. He found that the trouble was due to one of the screws which secure the fan casting to the generator rotor being too long. This had distorted the commutator and damaged the brush gear. A new rotor has now been received from Siba and the fan attachment scews shortened. The scooter is now ready for tests.

8. Batch Tests
No batch tests have been run during the month.

9. Sports Airflow Fairing
This has been tested on the Pavé after strengthening the top securing bracket. It disintegrated after 75 miles. This is considered not unreasonable in view of the nature of the Pavé Circuit, the fact that we had set out to do only 100 miles and the fact that prior to the disintegration one of the attachment screws apparently came out and was either not noticed or ignored by the tester.

10. Siba Self Starter on Crusader 250
This has continued to function satisfactorily as a starter but trouble has been experienced with the voltage control unit and/or the ignition switch which resulted first in full charge rate being maintained for more than 30 miles running and finally no charge. Mr. Yate of Siba examined this unit and found that the field coils on the generator stator had been overheated. A new stator and control unit have been supplied and the ignition switch and change over switch have been checked by Messrs. Siba Electric. The machine is now running again and the charging system appears to be running correctly although the charge rate is still on the high side, possibly due to the batteries having become appreciably discharged while the machine was out of use.

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10. Siba Self Starter on Crusader 250

Four Exide 3-EC.7 batteries have been obtained for this machine with a view to seeing if they have adequate capacity to operate the starter. This is the type of battery which we fit to our 'Prince' model. They occupy appreciably less space than the Lucas MLZ.9E batteries and cost 2/6 less each which is a considerable saving in view of the fact that four batteries are necessary.

11. Molybdenum sprayed Pistons.

The two pistons sent to the Midland Electric Installation Co. Ltd. of Wolverhampton have been returned sprayed with a thin coating of molybdenum. These were just too large to run in a standard barrel and the coating was too rough to form a satisfactory bearing surface. They have, however, been held in a chuck and polished with emery cloth. One is an easy fit in a standard barrel and the other a light push fit. Both these pistons have now been sent to Messrs. Hepworth & Grandage to have the skirt form checked.

12. Miller Charging Set.

A 250 cc machine has been fitted with a Miller generator, rectifier, contact breaker and automatic advance using for the moment Lucas lamps, switches and cable harness. According to a curve supplied by Messrs. Miller, the generator gives a rather better output than Lucas RM.18. This is confirmed by slightly higher readings on the meter.

R.A. Wilson-Jones

(R.A. Wilson-Jones)