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EASTERN STATES DISTRIBUTOR FOR BSA MOTORCYCLES / A SUBSIDIARY OF THE BIRMINGHAM SMALL ARMS COMPANY, LTD. OF ENGLAND

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## despatch to all dealers:

SERVICE BULLETIN #6-69

January 21, 1969

FROM: Walter Brown, Service Manager

SUBJECT: How to obtain maximum performance from the 650 c.c.  
Lightning, Spitfire and Firebird engines.

### PERFORM A SYSTEMATIC SERVICE CHECK & TUNE-UP

1. TAPPETS:            .008" Inlet  
                          .010" Exhaust
  
2. CONTACT POINTS:  
                          Contact Breaker .015" Gap.  
                          Check Spark Advance (34°) B.T.D.C.
  
3. SPARK PLUGS:  
                          .025" Gap- Use Champion N4 for "running-in".  
                          Change to KLG-FE100 for fast riding.
  
4. CARBURETORS- WITH AIR CLEANERS:  
  
                          #200 Main Jets  
                          #2 Needle Positions  
                          #2-1/2 Throttle Valves
  
5. CARBURETORS- WITHOUT AIR CLEANERS:  
  
                          #210 Main Jets  
                          #2 Needle Positions  
                          #2-1/2 Throttle Valves

Note: There is a restriction in most air cleaners that are supplied on motorcycles sold for general riding. Therefore, in order to obtain maximum performance, it will be necessary to remove the air cleaner. The carburetor will have to be re-calibrated.

Continued . . . . .

SUBJECT: How to obtain maximum performance from the 650 c.c. Lightning, Spitfire and Firebird engines, Continued.

6. CARBURETORS- WHEN SILENCERS ARE REMOVED:

#200 Main Jets  
#2 Needle Positions  
#2-1/2 Throttle Slide

7. CARBURETORS - WITHOUT AIR CLEANERS AND WITH SILENCERS REMOVED:

#210 Main Jets  
#2 Needle Positions  
#2-1/2 Throttle Valves

NOTE: The Carburetor specs shown are for general all around running. We recommend that you re-calibrate the carburetors for the particular engine you are concerned with and to the exact conditions under which the motorcycle will be running. See the Instruction Manual and Amal Carburetor Sheets for complete carburetor tuning procedures.

8. IGNITION TIMING ON ADVANCE: (34°) B.T.D.C.

TIMING: Accurate ignition timing is important. Be sure timing is accurate on both cylinders.

9. VALVES-PORTS-VALVE SPRINGS:

Make sure the valve faces and valve seats are true and have a perfect seal. Test for a perfect seal by filling the valve ports with gasoline. It will be necessary to re-grind the valves if there is a leak. Install S & W valve springs spaced to 1-5/16" with 185 pound spring tension.

10. CYLINDER HEAD

Remove the valve guides and turn the end that extends into the valve port to a taper. Increase the inside diameter of the valve seats and valve ports and polish the ports, manifold, and combustion chamber to a mirror-finish.

Continued . . . .

SUBJECT: How to obtain maximum performance from the 650 c.c.  
Lightning, Spitfire and Firebird engines, Continued.

11. SILENCERS

The high performance Lightning engine could be classified as a racing engine and when silencers are installed, the top speed is affected. In other words, maximum performance is obtained when straight-through pipes or megaphones are installed.

The silencers are standard equipment on Lightnings to abide by the Motor Vehicle regulations. However, when the machine is going to be run where the Motor Vehicle regulations are not in effect they may be replaced with extension pipes or megaphones.

12. GEARING-SPROCKETS:

To obtain quicker acceleration on the early Lightning and to reach peak R.P.M. and high speed sooner, assemble a 19 tooth sprocket on the engine. The overall gearing will be 5.12 to 1.

13. In order to obtain maximum top speed from an engine, it is necessary to take advantage of the four speeds in the gearbox and run the speeds up gradually as per example shown below:

Run in 1st speed up to 6000 RPM.

Run in 2nd speed up to 7000 RPM.

Run in 3rd speed up to 7000 RPM.

Run in 4th speed up to 7000 RPM.

14. OTHER FACTORS THAT AFFECT TOP SPEED PERFORMANCE.

Tire pressure  
Chain adjustment  
Brake adjustment  
Wheel bearings

CHECK OR ADJUST THESE THINGS ACCORDING TO THE INSTRUCTION  
AND MAINTENANCE MANUALS.