HINTS AND TIPS ON
SERVICE
For BSA and ARIEL Dealers

Service Bulletin #163 — May 28, 1964

SUBJECT: IGNITION TIMING FOR A65-2SPH HORNET AND A65-2C CYCLONE COMPETITION MODELS

IGNITION TIMING - A50-2C Cyclone - Set at .287" or 33°B.T.D.C. on Advance
A65-2SPH Hornet - Set at .376" or 38°B.T.D.C. on Advance

Special Notes: For 500cc machines, locate the rotor hole marked "S" on peg before setting timing to 33 degrees before T.D.C. For 650cc machines, locate the rotor hole marked "R" on peg before setting timing to 38 degrees before T.D.C.

The letters "S" and "R" are located on the inside face of the alternator rotor.

IMPORTANT NOTICE: These instructions can only apply to the CYCLONE and HORNET Machines equipped with the ENERGY TRANSFER system.

Refer to the A50 - A65 - A65R Instruction Manual and Supplementary Instruction Leaflet for detailed information on Ignition Timing for other twin cylinder models.

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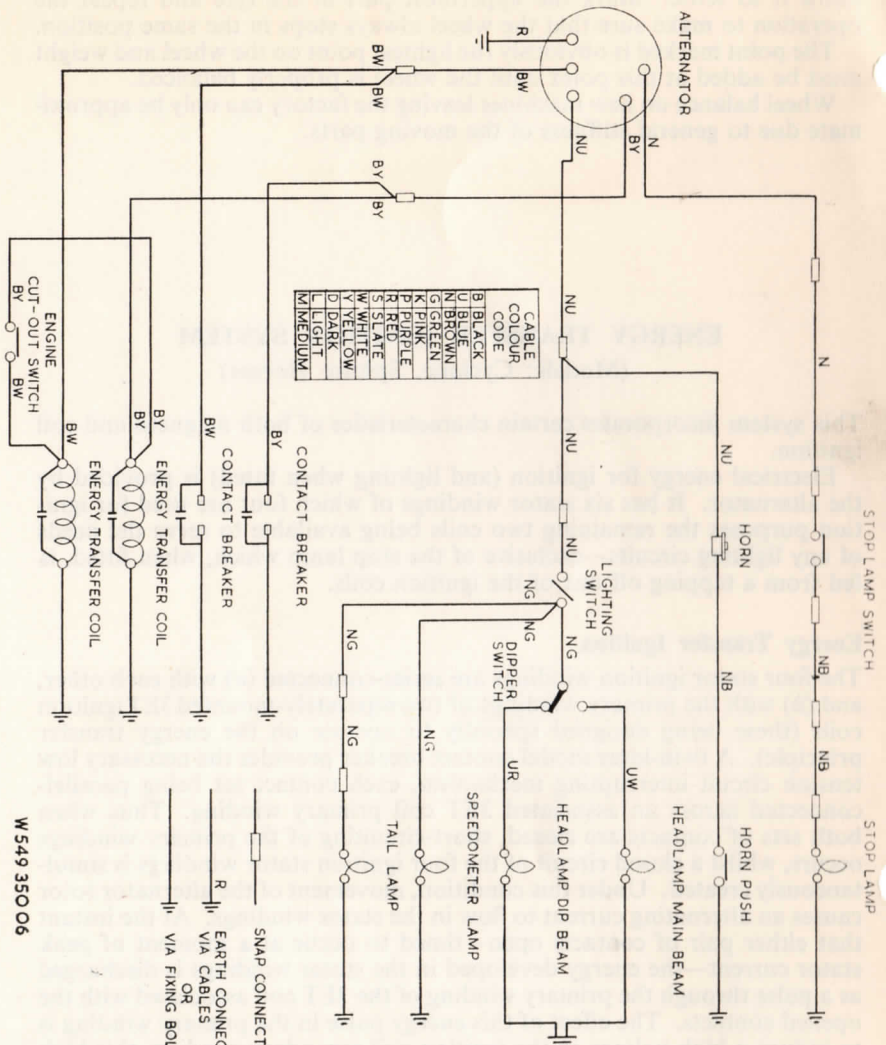
WB/jc



Wiring diagram for energy transfer ignition system, with lighting circuit shown for use when required.

FOR U.S.A. MACHINES ONLY

SUPPLEMENTARY INSTRUCTIONS FOR A50 CYCLONE — A65 THUNDERBOLT ROCKET — A65 LIGHTNING ROCKET AND A65 SPITFIRE HORNET

In general, the details given in the instruction manual will apply to the above models but major differences, requiring special instructions, are described below.

TECHNICAL DATA

	A50 — 2C Cyclone	A65 — 2L Lightning Rocket	A65 — S.P.H. Spitfire Hornet	A65 — IT Thunderbolt Rocket
ENGINE:				
Carburettor ...	2 — 1 1/16″ dia.	2 — 1⅛″ dia.	2 — 1⅛″ dia.	1 — 1⅛″ dia.
Main jet	*180	220	220	310
Pilot jet	25	25	25	25
Throttle valve ...	376/3½	389/3½	389/3½	389/3½
Needle position ...	*3	3	3	3
Needle jet	.106	.106	.106	.106
Compression ratio	9 (Standard)	9 (Standard)	9 (Standard)	9 (Standard)
Ignition timing ...	.287 (33°) B.T.D.C.	.376 (38°) B.T.D.C.	.376 (38°) B.T.D.C.	.376 (38°) B.T.D.C.

IGNITION TIMING:

Special Note:- For 500cc. machines, locate the rotor hole marked "S" on peg before setting timing to 33 degrees before T.D.C. For 650cc. machines, locate the rotor hole marked "R" on peg, before setting timing to 38 degrees before T.D.C.

*Corresponding figures for carburettors used with open pipes are 170 and 2

ELECTRICAL:				
Ignition	Energy Transfer	Twin coil	Energy Transfer	Twin coil
Lighting	Direct	Battery	None	Battery
Battery	None	Lucas MLZ9E	None	Lucas MLZ9E

TRANSMISSION:

	A50 — 2C			
	EAST U.S.A.	WEST U.S.A.		
Top gear ...	4.93	4.93	4.36	4.93	4.36
3rd	5.65	5.65	4.98	5.65	4.98
2nd	7.88	7.25	6.95	7.25	6.95
1st	12.40	10.0	10.92	10.0	10.92
Engine sprocket ...	28		28	28	28
Clutch sprocket ...	58		58	58	58
Gearbox sprocket...	21		20	21	20
Rear wheel sprocket	50		42	50	42

WHEELS:

Type—front ...	Q.D. spindle	Q.D. spindle	Q.D. spindle	Det. wheel
rear ...	Q.D. spindle	Q.D. spindle	Q.D. spindle	Det. wheel
front tyre ...	3.25×19 Trials Universal	3.25×19 G.S. K70	3.50×19 Trials Universal	3.25×18 G.S. K70
rear tyre ...	4.00×18 Trials Universal	3.50×19 G.S. K70	4.00×18 Trials Universal	3.50×18 G.S. K70
front brake	8″ dia offset	8″ dia. offset	8″ dia. offset	8″ dia. full width
rear brake ...	7″ dia. offset	7″ dia. offset	7″ dia. offset	7″ dia. full width

Front Wheel Removal. (Models: Cyclone, Lightning Rocket, Spitfire Hornet)

Slacken off the brake adjuster to remove tension from the cable, lift the operating lever on the brake plate and withdraw the inner cable from its quick-release slot in the fork end. Unscrew the cable adjuster completely at its anchorage, so that the cable is then entirely free from the brake.

Remove the torque link nut on the brake cover plate, slacken the nuts at the opposite end of the link, and release the pinch bolt at the bottom of the left fork leg.

Insert a tommy bar into the hole in the spindle head and unscrew the spindle. It is important to note that it has a left-hand thread and therefore unscrews by turning in a clockwise direction. Support the wheel as the spindle is withdrawn and when it is clear the wheel can be pulled away from the fork leg and removed from the machine.

After removal, do not allow the wheel to fall on to the bush which projects from the brake side of the hub, because although the bush is pressed into position, it may be pushed into the hub if subjected to a sharp blow.

When replacing the wheel and the spindle has been screwed up, before the pinch bolt is tightened, the forks must be depressed sharply two or three times to enable the left fork leg to align itself on the spindle. If this precaution is not observed, the fork leg may be clamped out of position, preventing proper functioning of the forks.

Rear Wheel Removal. (Models: Cyclone, Lightning Rocket, Spitfire Hornet)

Removal of the wheel does not affect the chain or brake adjustment. Insert a tommy bar into the hole in the spindle head and unscrew the spindle. It has a right-hand thread and unscrews by turning in an anti-clockwise direction. The spacer sleeve between wheel and swinging fork end falls clear as the spindle is withdrawn and the wheel can then be drawn out of engagement with the brake drum and removed from the machine.

When removing the wheel it is not necessary to release the brake drum spindle nut on the left side of the machine as this will release the drum and possibly interfere with the easy removal of the wheel.

Rear Brake Adjustment. (Models: Cyclone, Lightning Rocket, Spitfire Hornet)

The rear brake and the foot pedal are on the same side of the machine and consequently there is no cross over shaft. The brake is adjustable at the operating lever on the brake shoeplate by means of the self-locking adjuster as on the other models.

Wheel Balancing

Wheels which are out of balance can have a detrimental effect on steering, particularly at high speeds. As soon as the machine has been run-in, the wheels should be balanced and they should be re-balanced whenever new tyres or other components have been fitted.

Support the machine so that the wheel is off the ground and make sure that it spins freely, i.e. remove the rear chain, check brakes, etc. If there is any sign of stiffness investigate the cause, as unless the wheel is free it will be impossible to balance it correctly. Rotate the wheel slowly and allow it to settle. Mark the uppermost part of the tyre and repeat the operation to make sure that the wheel always stops in the same position.

The point marked is obviously the lightest point on the wheel and weight must be added at this point until the wheel is properly balanced.

Wheel balance on new machines leaving the factory can only be approximate due to general stiffness of the moving parts.

ENERGY TRANSFER IGNITION SYSTEM

(Models: Cyclone, Spitfire Hornet)

This system incorporates certain characteristics of both magneto and coil ignition.

Electrical energy for ignition (and lighting when fitted) is provided by the alternator. It has six stator windings of which four are used for ignition purposes the remaining two coils being available to serve the needs of any lighting circuits—exclusive of the stop lamp which, when fitted, is fed from a tapping off one of the ignition coils.

Energy Transfer Ignition

The four stator ignition windings are series-connected (*a*) with each other, and (*b*) with the primary windings of two separately-mounted 3ET ignition coils (these being designed specially to operate on the energy transfer principle). A twin-lever model contact breaker provides the necessary low tension circuit interrupting mechanism, each contact set being parallel-connected across an associated 3ET coil primary winding. Thus when both sets of contacts are closed, short-circuiting of the primary windings occurs, whilst a closed circuit of the four ignition stator windings is simultaneously created. Under this condition, movement of the alternator rotor causes an alternating current to flow in the stator windings. At the instant that either pair of contacts open—timed to occur at a moment of peak stator current—the energy developed in the stator windings is discharged as a pulse through the primary winding of the 3ET coil associated with the opened contacts. The effect of this energy pulse in the primary winding is to induce a high voltage in the ignition coil secondary winding, this high tension current being discharged in the usual way across the appropriate plug gap. Contact closure is completed (allowing regeneration of the stator winding current) before the second contacts are opened to provide high tension current in a similar fashion to plug number 2.

Timing

Accurate ignition timing is an important requirement in the operation of the energy transfer system. The contact breaker is arranged to open only at the moment of peak value in the alternating current cycle in order that maximum electromagnetic energy is transferred from the alternator to the ignition coil and a good spark obtained at the plug.