

VALVE AND IGNITION TIMING DATA

**ROLLS-ROYCE
PRE-WAR CARS**

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TIMING MARKS ON FLYWHEEL

T.D.C.	Top dead centre	B.L.I.	Battery late ignition
B.D.C.	Bottom dead centre	M.L.I.	Magneto late ignition
I.O.	Inlet (valve) opens	B.A.I.	Battery advanced ignition
I.C.	Inlet (valve) closes	M.A.I.	Magneto advanced ignition
E.O.	Exhaust (valve) opens	IGN.	Ignition
E.C.	Exhaust (valve) closes	LI.	Late ignition

The marks on the flywheel provide accurate timing only when the clearances between the valve stem ends and the rocker arm faces are set to the specified values.

In some cases, owing to the effects of manufacturing limits and a cam form with slow rates of opening and closing of the valves, the correct timing may not apparently coincide with the marks on the flywheel. In this event, care should be taken to obtain the I.C. and E.O. settings accurately.

Firing order: 1, 4, 2, 6, 3, 5.

Phantom III

The marks on the flywheels of Phantom III cars are applicable only to cylinders Nos. 1 and 6 of 'A' bank (the right-hand bank when viewed from the driver's seat). Markings T.D.C. and B.D.C. are common to both cylinders; all other markings apply alternately to No. 1 and No. 6 cylinder as the crankshaft revolves.

Firing order: 1, 4, 2, 6, 3, 5,
 6, 3, 5, 1, 4, 2.

When carrying out or checking valve or ignition timing, the crankshaft should always be turned by the flywheel and not by means of the starting handle; otherwise, the action of the spring drive assembly may cause variations in the readings on the flywheel and inaccuracy of the timing.

VALVE TIMING PROCEDURE

1. Turn the camshaft anti-clockwise until the valves of No. 6 cylinder are on the point of rocking; the exhaust valve just closing and the inlet valve just opening.
2. Adjust the tappets of No. 1 cylinder to the *flywheel marking clearance* specified for the engine.
3. Turn the camshaft to the point where the inlet valve of No. 1 cylinder is just closing.
4. Turn the crankshaft until the I.C. mark on the flywheel is aligned with the timing pointer on the clutch case.
5. Fit the gear and the crankshaft damper unit to the crankshaft and tighten them onto the taper.
6. Check the timing. *An error of one tooth on the gear is equivalent to $\frac{3}{4}$ in. (1.9 cm.) at the flywheel periphery.*

TIMING—TO CHECK

1. Turn the crankshaft until the valves of No. 6 cylinder are on the point of rocking; the exhaust valve just closing and the inlet valve just opening.
2. Adjust the tappets of No. 1 cylinder to the *flywheel marking clearance* specified for the engine.
3. Turn the crankshaft to the point where the inlet valve of No. 1 cylinder just closes. This point may be recognised as the push rod becomes free to be turned by the fingers.

4. Check that the timing pointer on the clutch case is aligned with the I.C. mark on the flywheel. Maximum tolerance is $\frac{1}{8}$ in. (0.32 cm.) early or $\frac{5}{8}$ in. (1.59 cm.) late (preferably late).

On completion of the valve timing operation, reset all tappets to the *running clearance* specified for the engine.

Silver Ghost

Inlet Valve Opens when the piston has travelled .050 in. (1.27 mm.) on its downward stroke, or $1\frac{1}{2}$ in. (38.10 mm.) on the circumference of the $17\frac{1}{8}$ in. (43.50 cm.) diameter flywheel; this is equal to an angular movement of 10° past T.D.C.

Inlet Valve Closes 54° past B.D.C. or when the piston has travelled $\frac{1\frac{3}{16}}$ in. (20.64 mm.) on its upward stroke; this is equal to a distance of $8\frac{1}{8}$ in. (20.64 cm.) on the circumference of the flywheel

Exhaust Valve Opens when the piston is $\frac{1\frac{5}{8}}$ in. (23.81 mm.) before B.D.C. or a distance of $8\frac{5}{8}$ in. (21.91 cm.) on the circumference of the flywheel; this is equal to an angle of 58° before B.D.C.

Exhaust Valve Closes 10° after T.D.C. or when the piston has travelled .050 in. (1.27 mm.) on its downward stroke; this is equal to $1\frac{1}{2}$ in. (38.10 mm.) on the circumference of the flywheel.

IGNITION TIMING PROCEDURE

1. Set the contact breaker gap to 0.020 in. (0.051 cm.).
2. Turn the crankshaft until the No. 1 piston is on its firing stroke and the mark B.A.I. (or B.L.I.) on the flywheel is aligned with the timing pointer on the clutch case.
3. Fully advance (or retard, for B.L.I.) the ignition lever, then set the contact breaker cam to the point of opening opposite the No. 1 segment of the distributor. Reference to the car ammeter will assist determining precisely when the points open.
4. Tighten the screw securing the contact breaker cam to its taper.

Phantom III ignition timing

1. Set the contact breaker gap to 0.028 in. (0.071 cm.).
2. Turn the crankshaft until the No. 1 piston of 'A' bank is on its firing stroke and the flywheel mark A & B.A.I. (on some chassis only B.A.I.) is aligned with the timing pointer on the top of the flywheel housing.
3. Note the position 1.A. on the distributor cover of 'A' ignition tower and set the ignition arm at this position with the cam temporarily fixed on the driving shaft.
4. Set the ignition lever on the steering column to the fully advanced position, slacken the nut securing the fine adjustment device on the underside of the distributor body, then return the ignition lever to the centre of its travel. With the controls thus set, the contact breaker cam should be on the point of causing one of the contacts to open.

Adjustment can be made on the fine adjustment device, turning it to the right or left until the contacts open. If, however, this does not provide the required setting, the cam must be turned one serration on the driving shaft and the adjustment repeated.

On completion of the operation care must be taken to insert and tighten the screw securing the cam and to tighten the nut locking the fine adjustment device.

5. Repeat this procedure for 'B' ignition tower.

Silver Ghost (Battery Ignition)

With the ignition control in the fully advanced position and the No. 1 piston on its compression stroke, the low tension contact should just *make* when the piston is $2\frac{3}{4}$ in. (69.85 mm.) before T.D.C. [a distance of $15\frac{1}{4}$ in. (38.73 cm.)] on the circumference of the flywheel or an angle of 102° .

With the ignition control fully retarded the low tension contact must not *make* until after T.D.C.

To start on the switch, the contact generally has to be set much later than this and the position is best found experimentally; if it is too late, bad starting will result and the advanced position will be insufficiently early.

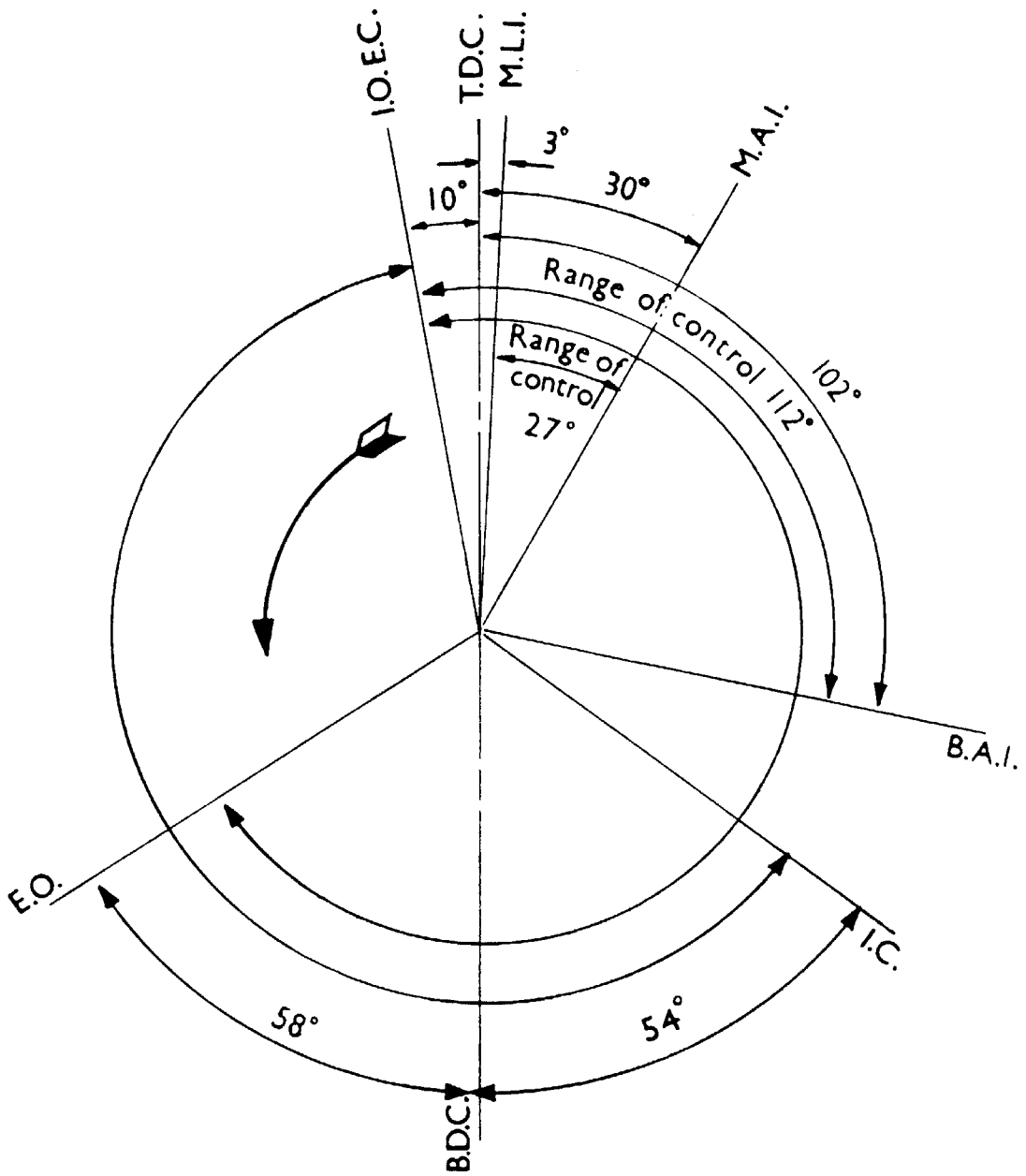
The full range of control is 112° .

Silver Ghost (Magneto Ignition)

When the control is in the 'earliest' or advanced position, the contacts should *break* 30° before T.D.C. or when the piston is $\frac{3}{8}$ in. (9.52 mm.) before T.D.C.; this is equal to $4\frac{1}{2}$ in. (11.43 cm.) on the circumference of the $17\frac{1}{2}$ in. (44.45 cm.) diameter flywheel.

When the control is in the 'latest' position, the contacts should *break* just before T.D.C. (a distance of $\frac{1}{2}$ in. (1.27 cm.) on the flywheel or an angle of 3° before T.D.C.).

Firing Order: 1, 4, 2, 6, 3, 5.

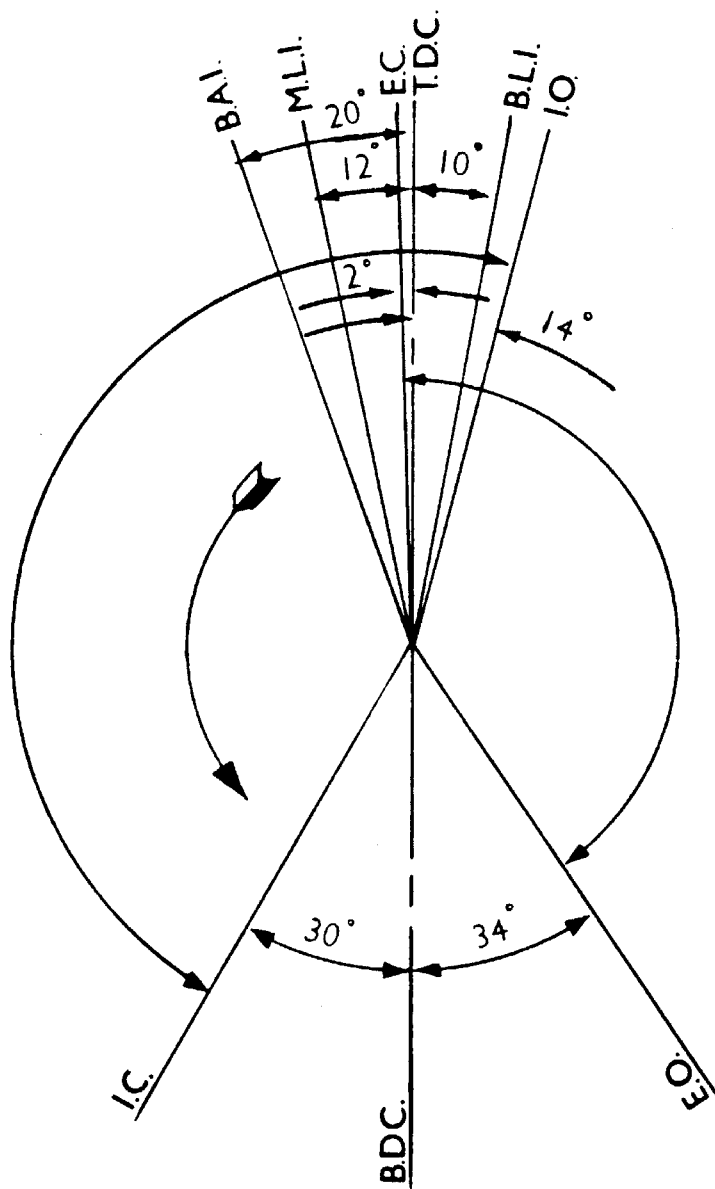


40/50 HP SILVER GHOST

4½ in. STROKE ENGINE

Running Clearance

.004 in. (.010 cm.)



40/50 H.P. PHANTOM I

ALL CHASSIS

Flywheel Marking Clearance

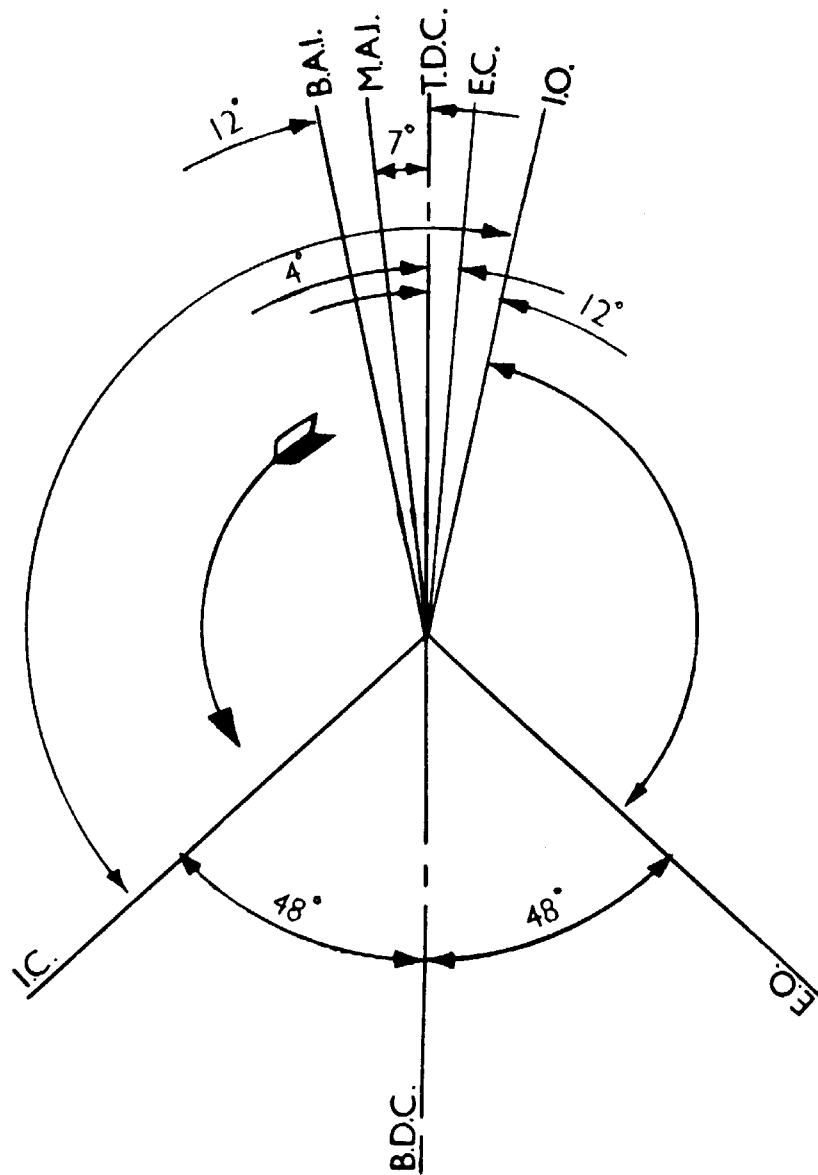
.020 in. (.051 cm.)

Running Clearance

.003 in. (.008 cm.) Cast iron head

.006 in. (.015 cm.) Aluminium head

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



40/50 HP. PHANTOM II

CHASSIS: J2 SERIES TO 50 IN 02 SERIES,
ALSO T2 and U2 SERIES

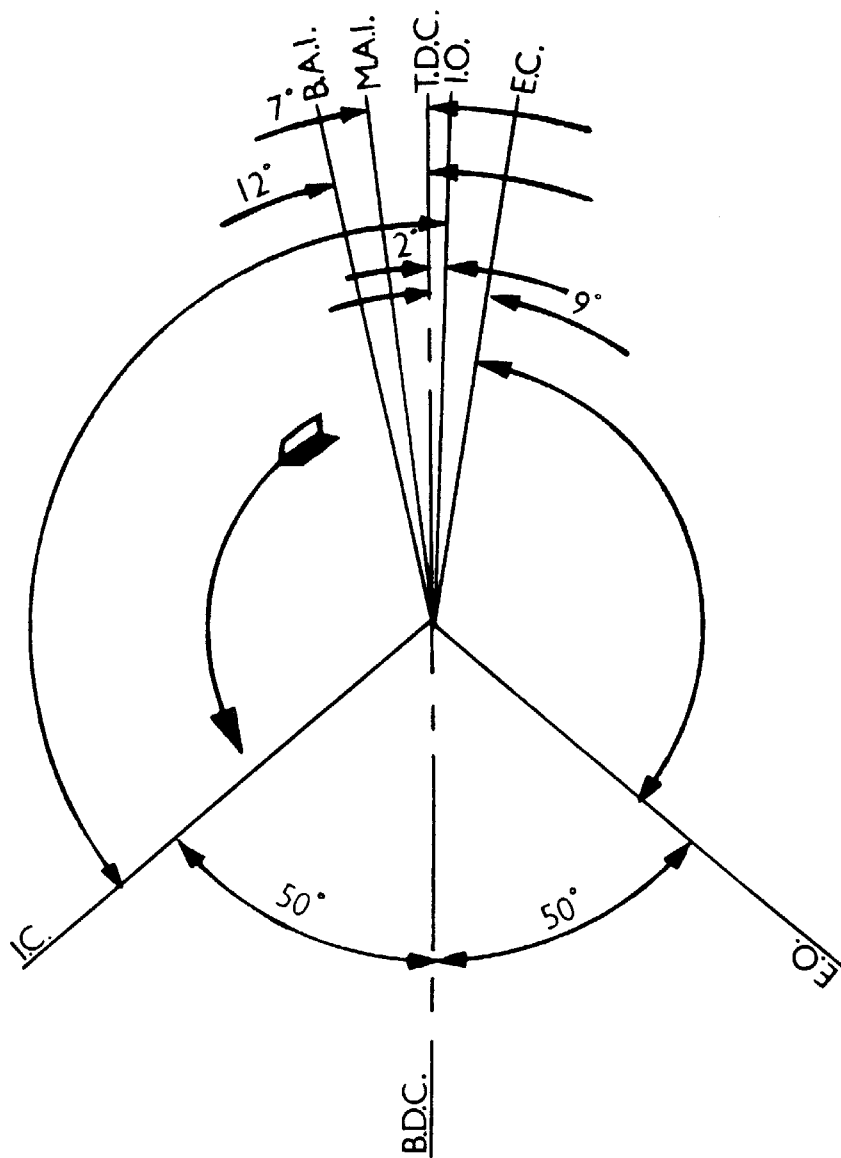
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.003 in. (.008 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



40/50 H.P. PHANTOM II

CHASSIS: 51 IN 02 SERIES TO T2 SERIES

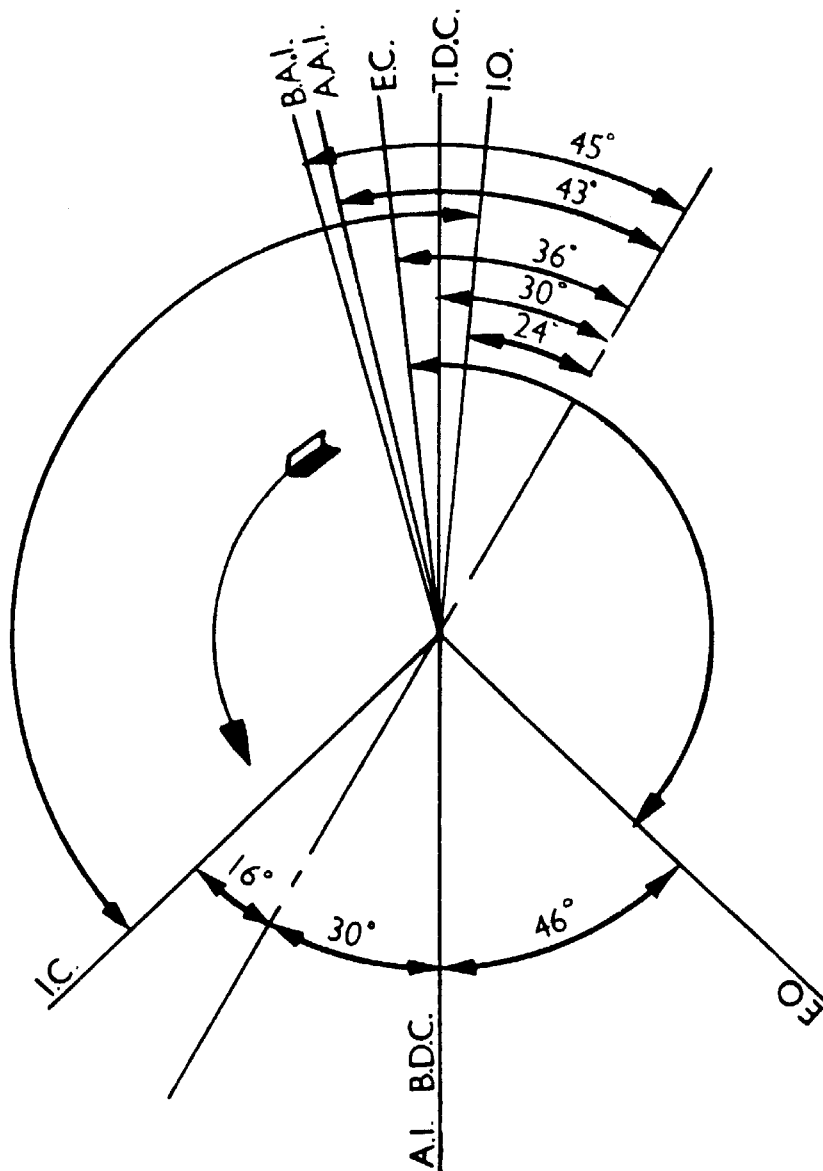
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.003 in. (.008 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



PHANTOM III

CHASSIS: A, B AND C SERIES

Flywheel Marking Clearance

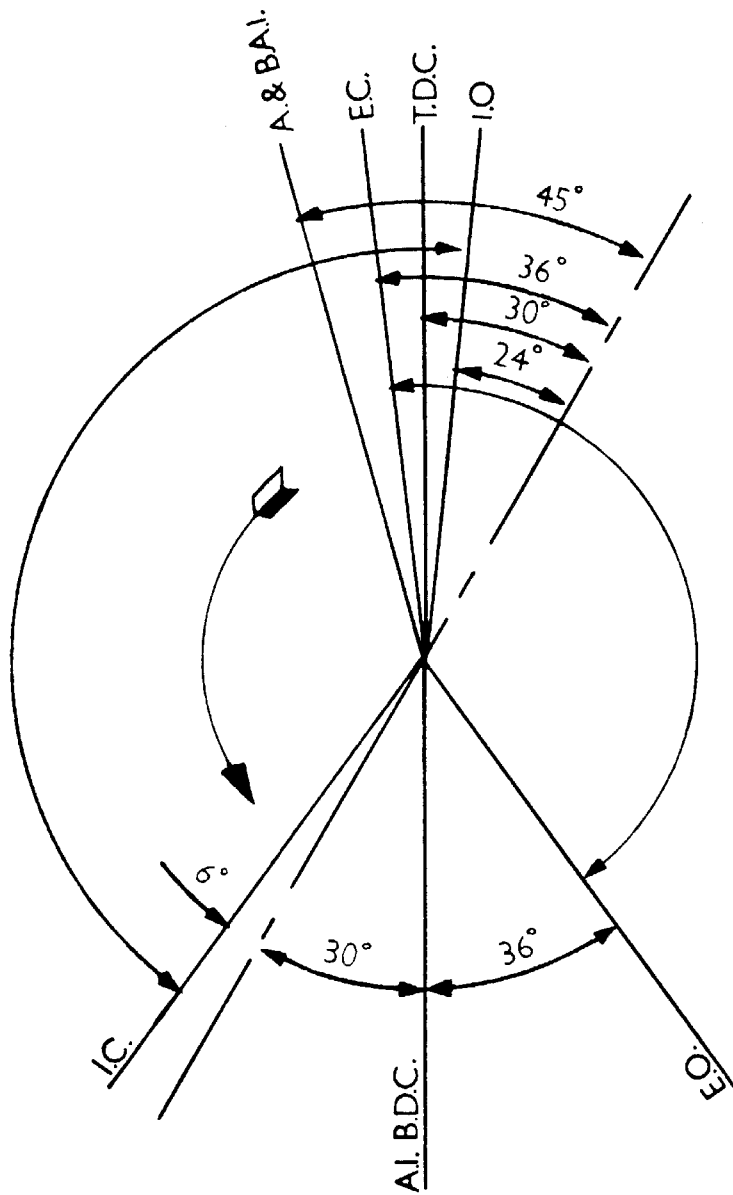
.020 in. (.051 cm.)

Running Clearance

.006 in. (.015 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE

AAI—'A' BANK ADVANCED IGNITION
 BAI—'B' BANK ADVANCED IGNITION



PHANTOM III

CHASSIS: D SERIES

Flywheel Marking Clearance

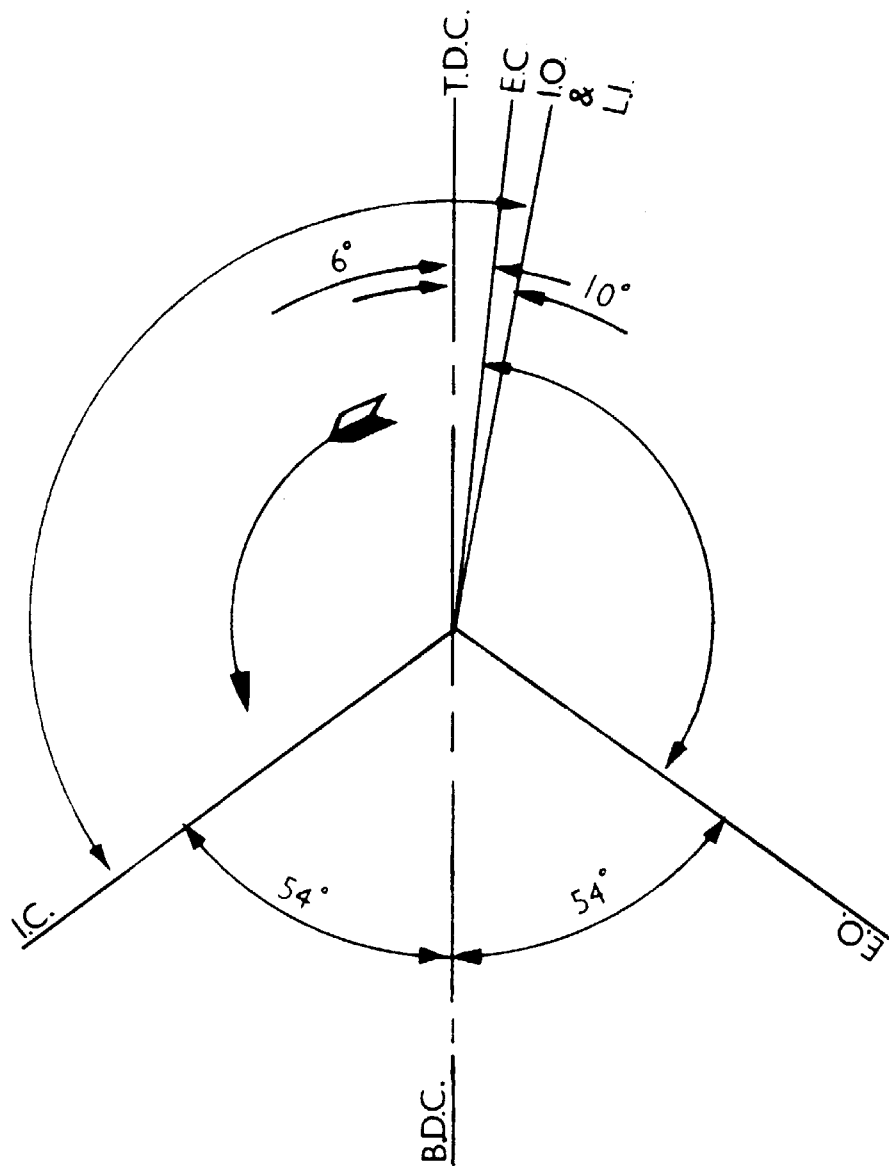
.030 in. (.076 cm.)

Running Clearance

.006 in. (.015 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE

AAI—'A' BANK ADVANCED IGNITION
 BAI—'B' BANK ADVANCED IGNITION



20 H.P.

CHASSIS: 1 TO 675

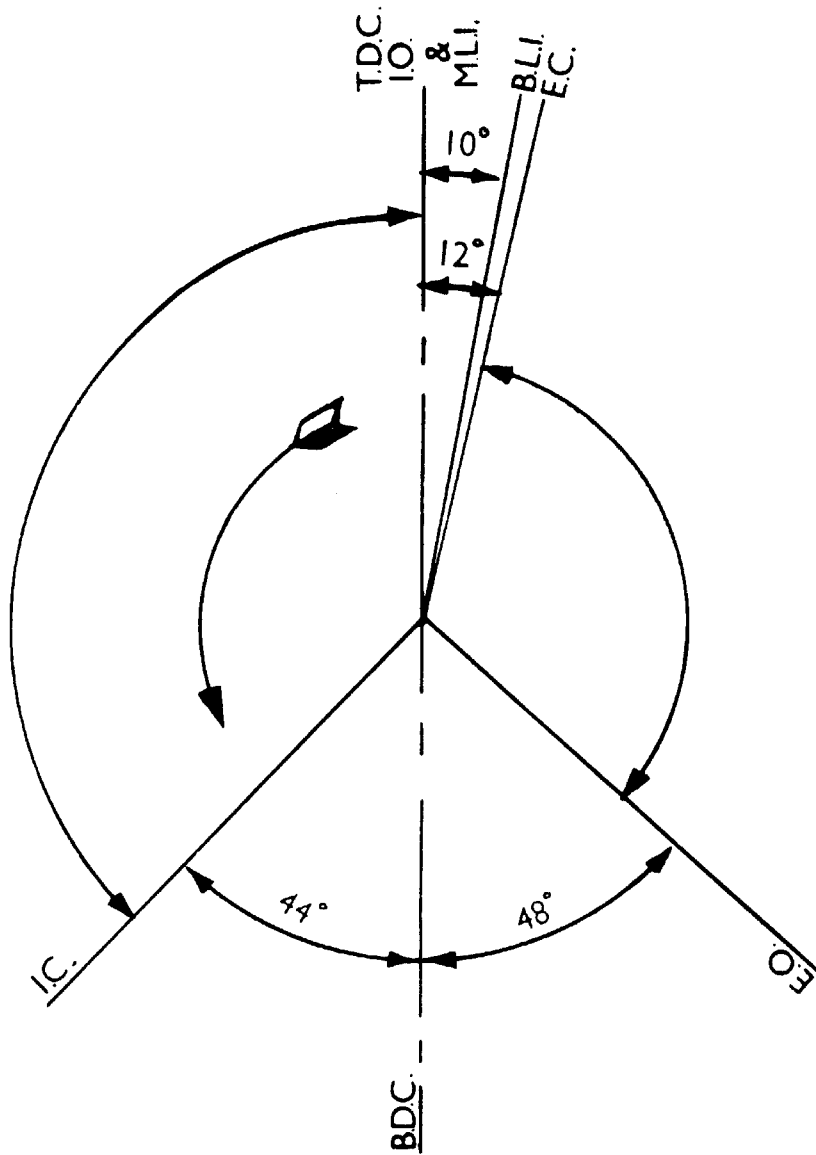
Flywheel Marking Clearance

.010 in. (.025 cm.)

Running Clearance

.004 in. (.010 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



20 H.P.

CHASSIS: 676 TO 111 IN J SERIES

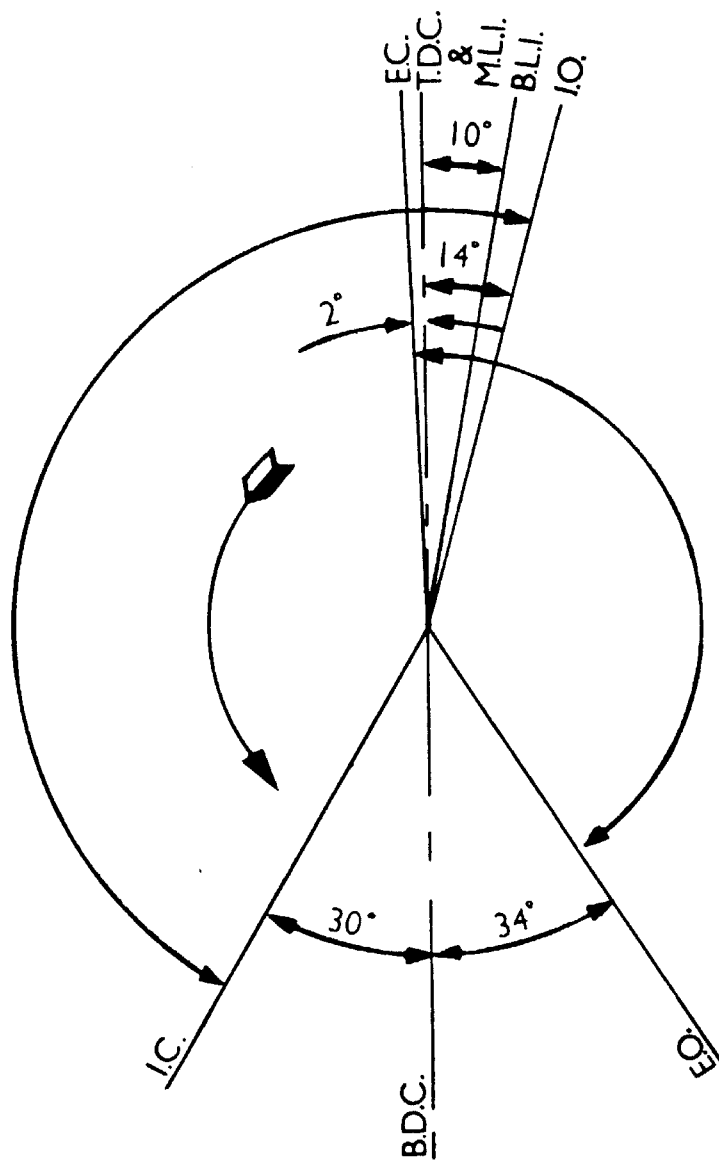
Flywheel Marking Clearance

.010 in. (.025 cm.)

Running Clearance

.004 in. (.010 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



20 H.P. AND 20/25 H.P.

CHASSIS: 112 IN J SERIES TO 24 IN R SERIES

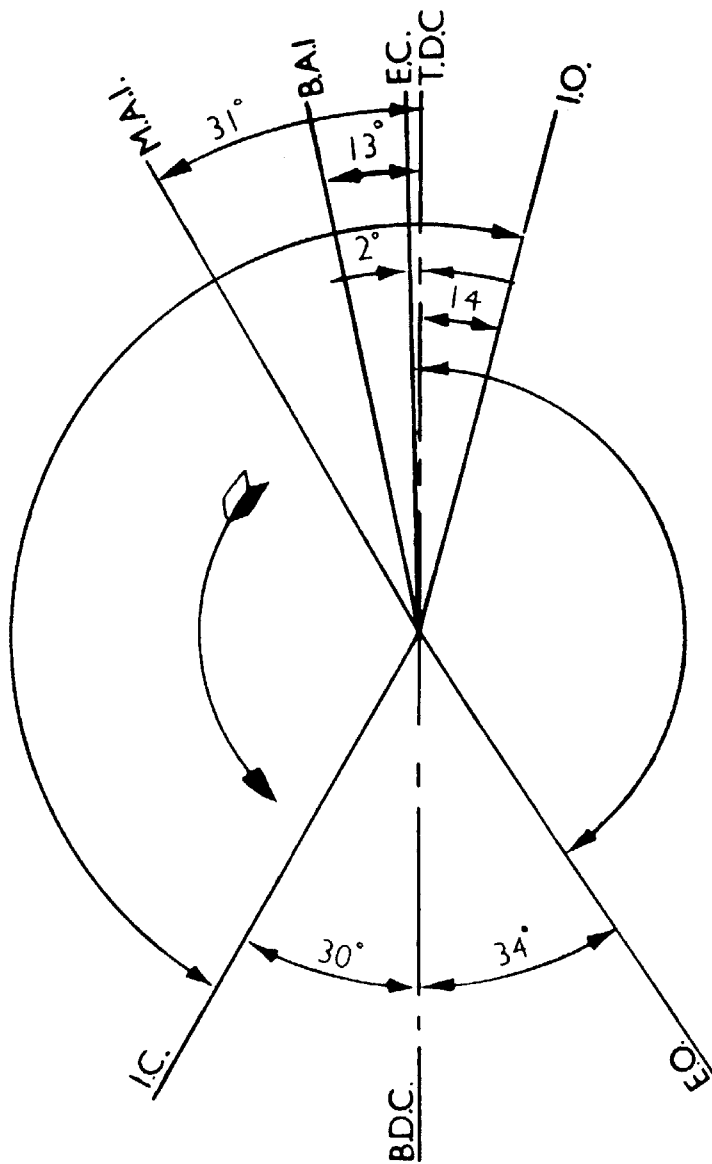
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.004 in. (.010 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



20/25 H.P.

CHASSIS: 25 IN R SERIES TO THE END OF Y SERIES

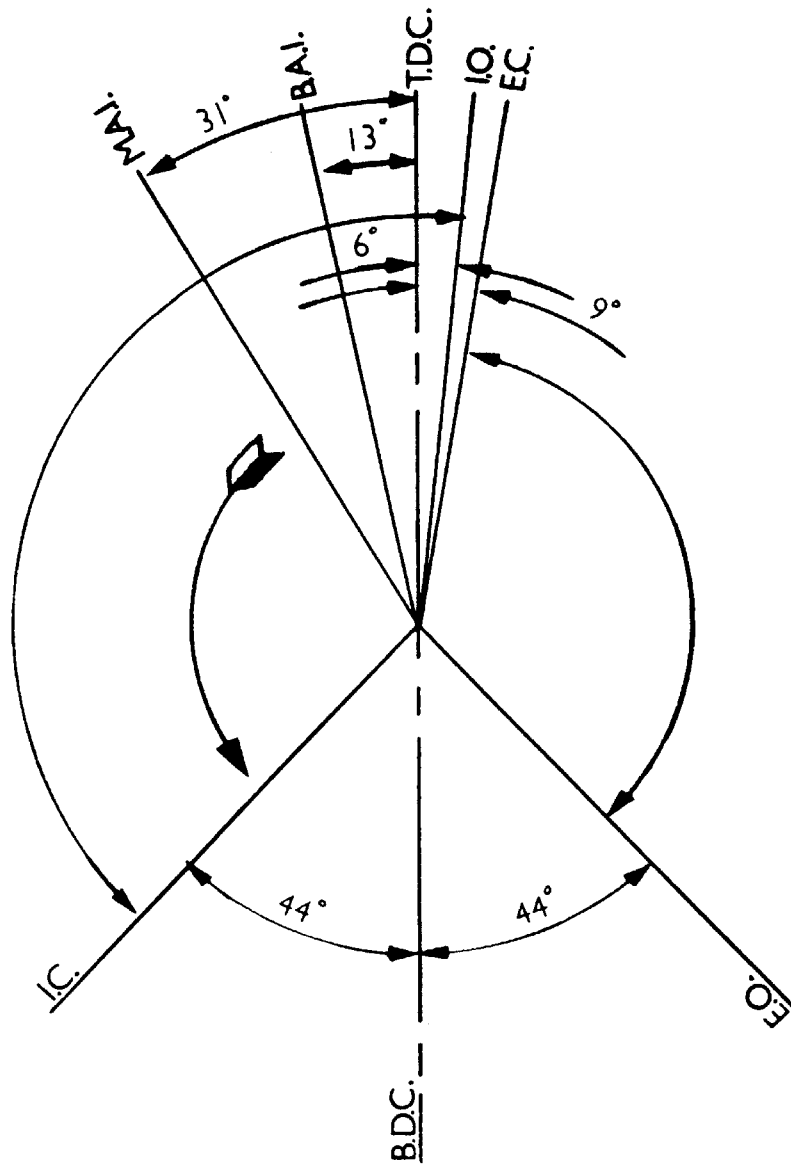
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.004 in. (.010 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



20/25 HP

CHASSIS: Z SERIES ONWARDS

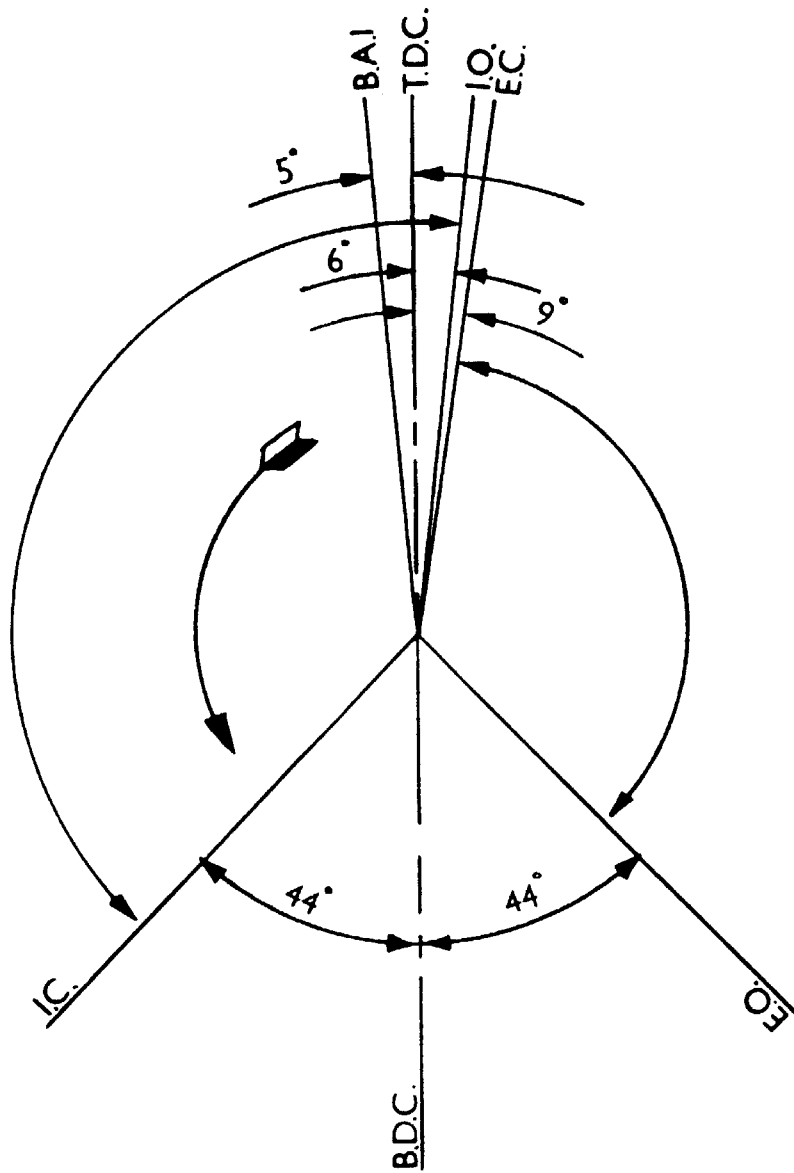
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.004 in. (.010 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



25/30 HP

CHASSIS: L2 SERIES ONWARDS

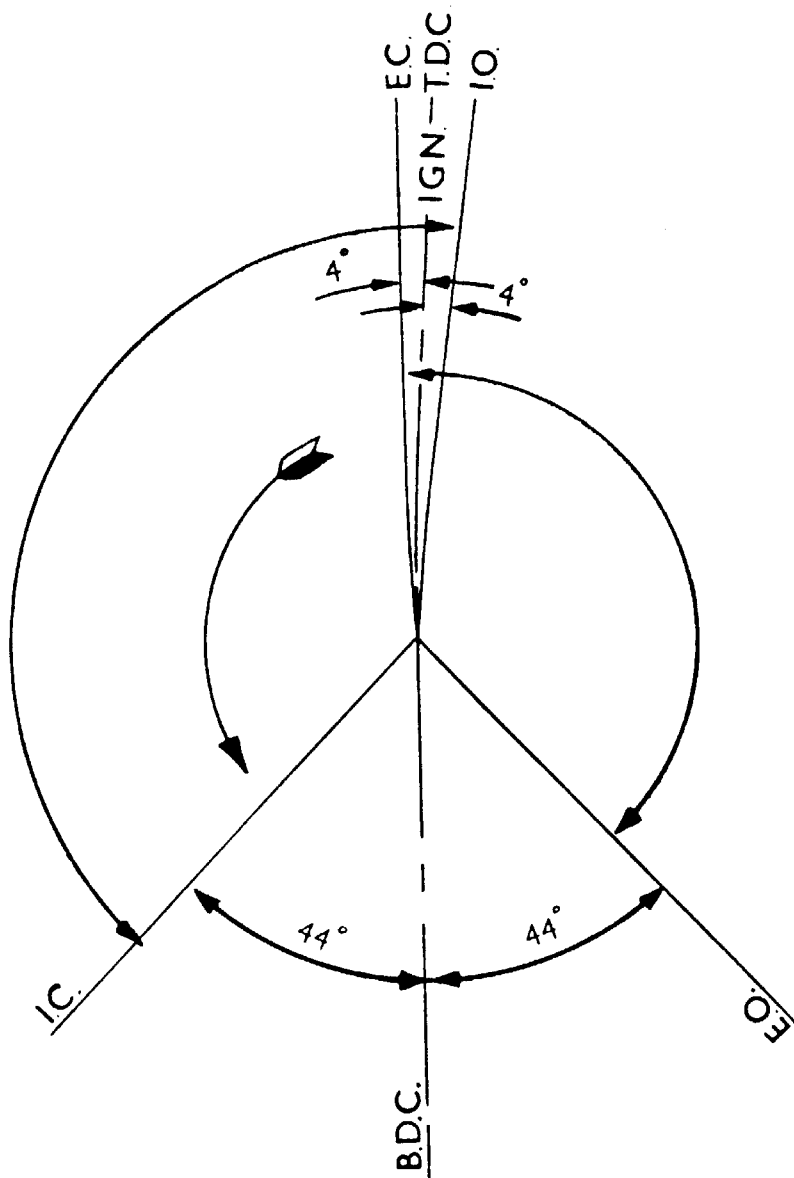
Flywheel Marking Clearance

.020 in. (.051 cm.)

Running Clearance

.006 in. (.015 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE



25/30 H.P. WRAITH

ALL CHASSIS

Flywheel Marking Clearance

.025 in. (.064 cm.)

Running Clearance

.008 in. (.020 cm.)

BETWEEN THE VALVE STEM END AND THE ROCKER ARM FACE