To turn the vehicle to the *left*, pull back the *left*-hand steering lever. To turn the vehicle to the *right*, pull back the *right*-hand steering lever.

Should the vehicle be moving forward on the higher gears and a sharp turn is required, the driver must change down to a lower gear.



Fig. 4A.-Diagram showing operation of steering levers.

STEERING IN REVERSE.

Remembering that you are scated *facing forwards*, to cause the rear end of the vehicle to turn to *your* left, pull the *right*-hand lever. For the rear end of the vehicle to move to your *right*, pull the *left*-hand lever. This can more readily be understood on referring to Fig. 4A which shows that no matter in what direction the vehicle is moving, pulling the *right*-hand lever turns its nose to the right and its tail to the left, while pulling the *left*-hand lever turns its nose to the right.

BRAKING AND STOPPING.

To slow down or stop, apply the foot brake, which actuates the hydraulically operated track brakes fitted between the gearbox output shaft and the final drive. When stopping, declutch and move the gear lever into neutral.

INTRODUCTION

The Meteor tank-engine (see Figs. 9A, 10A and 11A) is of the 12-cylinder type, having two integral pressure-liquid-cooled banks of six cylinders forming a 60° V, and is designed to operate on 67 octane fuel.

The cylinder blocks, which may be of either the one-piece or two-piece type (see Chapter I B) are mounted on inclined upper faces of the crankcase, and are designated "A" and "B" banks respectively, the "A" bank being on the left-hand side of the engine when viewed from the fan drive end. The "A" (left-hand) side camshaft cover bears the cylinder firing order plate. The separate



Fig. 10A.-Meteor engine-right-hand or "B" side.



Fig. 11A.-Meteor engine-front view.

steel liners are of the wet type and are provided (on the one-piece block) with shoulders at each end which abut against the block and crankcase respectively. On the two-piece block the liners are clamped at their upper ends between the head and skirt, while their lower ends float in the crankcase apertures.

Each cylinder has *four* valves—two inlet and two exhaust valves and two sparking plugs. The valves of each cylinder block are operated from single centrally-disposed overhead camshafts through a system of individual tappet fingers.

The balanced six-throw crankshaft is supported within the crankcase in seven leadbronze lined main bearings. The connecting rods are H-section steel forgings and are of the plain type on the "A" (left-hand) side, and of the forked type on the "B" (right-hand) side. A divided steel block is bolted to the forked rod and retains a flanged thin leadbronze lined steel shell in its bore, which works directly on the crankpin. Similar split bearing shells are fitted to the plain rod, working on the outer surface of the forked rod block.

Bolted to one end of the crankcase is the fan drive unit and mounted at the other end of it is the wheelcase which houses the gear wheel assemblies transmitting the drive to the camshafts and wheelcase accessories. The

- (4) Slacken the bleed value on the top pipe from the value box to the Vane Oil motor at the value box end, and place a tin under the spade grip.
- (5) Operate the spade grip left and right several times to clear the air out of the dashpot.
- (6) Move the gearbox selector lever to the midway position so that hand and power are engaged, when the Vane Oil motor can be rotated by hand traversing.
- (7) The recuperator must be kept full and pumped continuously during this operation. Operate the spade grip to the full *right* position and hand traverse slowly *left*, when air will issue from the bleed valve. Continue until all air is ejected. Test and, if free from air, tighten the bleed valve while traversing.
- (8) Unscrew the motor relief valve cap a few turns to release any small quantity of air which is trapped at this point. Take care not to unscrew the cap too far or you risk losing the spring and ball.



Fig. 78A.—Traverse gearbox and controls.

Regular Maintenance.-When the gear is in constant use:-

- (a) Apply grease gun to the two lubricators on the traverse gearbox; two strokes should be sufficient.
- (b) Check all nuts, unions and fixing bolts in the system for tightness.
- (c) Lubricate the control handle linkage with the oil can.
- (d) Take up any lost movement in the master valve linkage by adjusting the tappet at the lower end of the master valve piston rod.





Fig. 61B.-Magnetic circuit diagrams.

casting of the magneto body. The magnetic circuit is completed by two further pole pieces which transfer the flux from the rotor circuit to the armature core. This is illustrated in Fig. 61B, which shows how movement of the rotor changes the direction of magnetism in the armature core.

The armature winding is affected by the changes in direction of this magnetism in its iron core, and the result is to produce in this winding a series of electric surges of approximately 5,000 volts. This winding is built on an insulating spool and is composed of two sections, primary and secondary. The primary winding has a very low voltage current induced in it as the magnetic flux changes, the current passing through the contact breaker points which are opened by the movement of a six-lobed cam. This opening of the contact breaker points occurs at the instant of a reversal of flux in the armature core and this induces a high voltage surge in the secondary winding which, when transmitted to a sparking-plug, causes a spark at its points.

A condenser, connected across the contact breaker points, absorbs any current after the points have opened, and functions as follows:---

- (1) Prevents an arc forming at the points, which would cause pitting of their surface as well as giving a "dirty" break.
- (2) As soon as the primary voltage commences to fall it gives back its charge in the form of a reverse current, thereby helping to hasten the rate of collapse of the magnetic field, in consequence of which the generated voltage in the secondary winding is increased.

High tension current is taken from a specially insulated terminal on the armature by a carbon brush in the centre of an insulated distributor rotor. This rotor has a radial electrode which distributes the current to distributor electrodes connected to the sparking-plugs by suitable wiring. A starting electrode is also provided on the distributor rotor, retarded approximately 35° behind the main electrode, and this is supplied by current from an external source (booster coil) via a small spark-gap, in the centre of the distributor block (see Fig. 59B).

There are only two rotating parts, the inductor rotor and the distributor rotor. The duty of the inductor rotor is to cause reversal of magnetism in the armature core, which occurs four times for every revolution, and to drive the distributor rotor (ratio 3 to 1).