CARRIERS :—

UNIVERSAL, Mark I
UNIVERSAL, No. 1, Mark II
UNIVERSAL, No. 2, Marks I and II
UNIVERSAL, No. 3, Mark II
3 inch MORTAR, No. 1, Marks I and II
3 inch MORTAR, No. 2, Mark II
3 inch MORTAR, No. 3, Mark II
BREN, No. 2, Marks I and II
and
ARMOURED O.P., No. 1, Marks I, II and III

SERVICE INSTRUCTION BOOK

This book has been prepared to the instructions of the Chief Inspector of Fighting Vehicles, to whom all suggestions for its improvement should be addressed.

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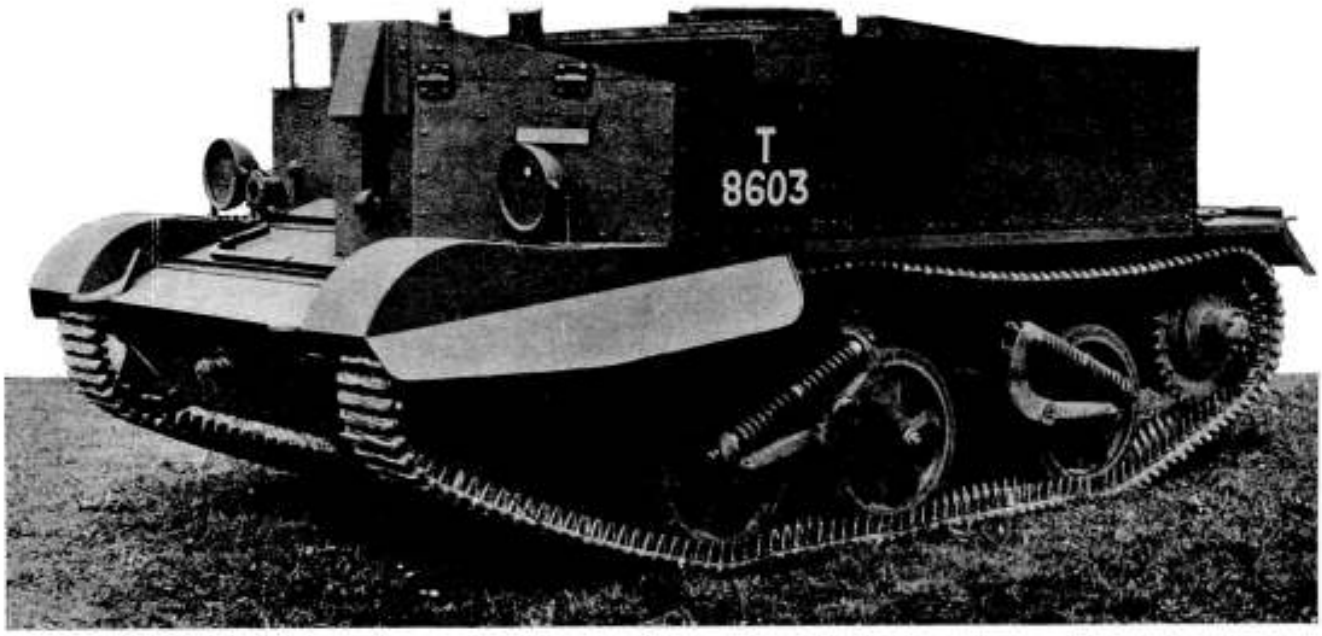

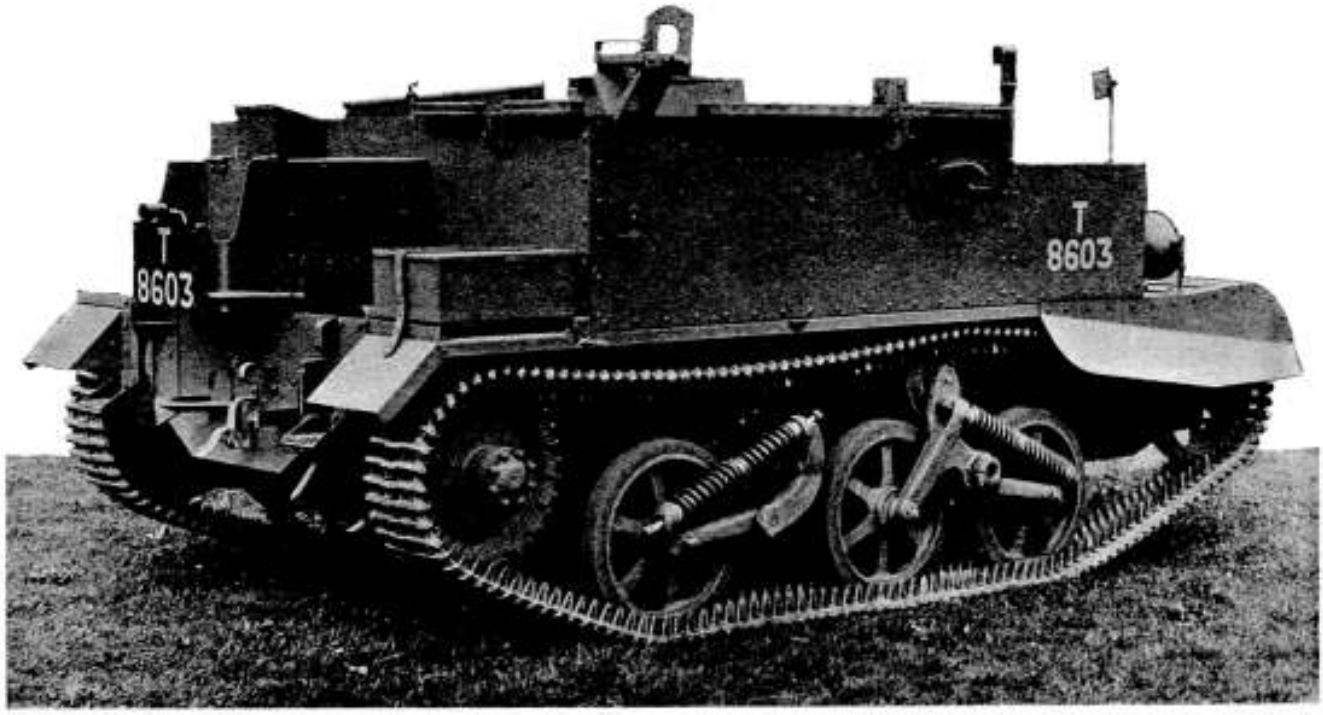

THE CARRIER—Front and Rear Views.

Foreword

This instruction book has been compiled to assist personnel in the correct operation and maintenance of the following types of vehicles :—

Carrier, Universal, Mark I.
Carrier, Universal, No. 1, Mark II.
Carrier, Universal, No. 2, Marks I and II.
Carrier, Universal, No. 3, Mark II.
Carrier, 3 inch Mortar, No. 1, Marks I and II.
Carrier, 3 inch Mortar, No. 2, Mark II.
Carrier, 3 inch Mortar, No. 3, Mark II.
Carrier, Bren, No. 2, Marks I and II.
Armoured O.P., No. 1, Marks I, II and III.

Recognition of the different Nos. and marks of vehicles is described in the following paragraphs, but it must be appreciated that only the main features are mentioned.

The prefix numbers (No. 1, 2 or 3) represent the alternative types of engine fitted as follows :—

No. 1 is the 65 h.p. engine.
No. 2 is the 85 h.p. engine.
No. 3 is the 95 h.p. engine.

The spare parts of the 85 h.p. and 95 h.p. engines cannot be fitted to the other type, but the complete engine units are fully interchangeable.

The explanation of the Marks is described below.

All Universal Carriers have a square and vertical hull back plate.

CARRIER, UNIVERSAL, MARK I. This vehicle has a crew of three, two in the front compartment and one seat in the rear right-hand side of the hull.

An angular mud deflector is fitted on the front track guards.

Two foot steps are provided, one on each side of the vehicle.

NOTE :—This " mark " of Carrier covers a number of vehicles which have been modified and brought up-to-date.

CARRIER, UNIVERSAL, No. 1, MARK II, has a crew of four, two in the front compartment, and two seats in the rear of the hull, one either side.

The front quarter of the top track run is totally enclosed by a valance.

Four foot steps are provided, two each side of the vehicle.

A spare wheel and tow rope are fitted on the front of the vehicle.

A large kit box fits transversely across the rear of the hull.

CARRIER, UNIVERSAL, No. 2, MARKS I AND II. These vehicles are the same as Carriers, Universal, No. 1, Marks I and II, except that the engine is 85 h.p. instead of 65 h.p.

CARRIER, UNIVERSAL, No. 3, MARK II. This Carrier is the replica of No. 1, Mark II, except that the engine is 95 h.p. instead of 65 h.p.

CARRIER, 3 inch MORTAR, No. 1, MARK I. This vehicle carries a crew of five, two in the front compartment, two in the rear right-hand side of the hull, and one in the rear left-hand side.

The mortar equipment is stowed on the rear of the hull over the axle.

Mortar bombs are stowed in special compartments each side of the vehicle over the track guards.

The spare wheel is fitted on the front and the tow rope at the rear.

Two foot steps are fitted on each side of the vehicle.

CARRIER, 3 inch MORTAR, No. 1, MARK II, carries the same crew as the Mark I.

No spare wheel is fitted and the tow rope is at the front.

Water drain plugs are fitted in the front and engine compartments, with operating controls inside the hull.

Four foot steps are provided, two each side of the vehicle.

Front quarter valances are fitted on the top track run.

CARRIER, 3 inch MORTAR, Nos. 2 and 3, MARK II, are similar to No. 1, Mark II, except that 85 h.p. and 95 h.p. engines are fitted respectively.

Armoured O.P. Carriers are recognisable from other vehicles of this type by the sliding observation shutter fitted in the gunner's compartment. The vision slot is large enough to permit the use of binoculars.

ARMOURED O.P., No. 1, MARKS I and II. These vehicles can be grouped together.

They carry a crew of three, two in the front compartment and one in the right rear of the hull.

The cable drum is fitted to the rear of the vehicle.

Two foot steps are provided in the same manner as other Mark II Carriers.

ARMOURED O.P., No. 1, MARK III, carries a crew of four, two in front and one each side of the hull.

Two cable drums are fitted, one in front and one in the rear of the hull.

The hull is welded on the Mark IIIW instead of riveted.

CARRIER, BREN, No. 2, MARKS I and II. All these vehicles are recognised by the sloping hull back-plate, otherwise the marks correspond to those of the Universal Carriers.

It will be appreciated that all these vehicles are basically the same, but have been adapted for a number of different purposes, but the maintenance is the same for all types.

They are of open type construction and the rectangular hull is built of armoured plates.

The power unit is a petrol engine, transmitting power through a dry plate clutch to a selector type gearbox.

The gearbox output shaft drives a final drive axle which is fitted with driving sprockets to engage the tracks.

Suspension is slow motion type, the bogie wheels rotating in forked assemblies, with coil springs mounted to absorb the wheel shocks.

Service instructions have been divided up, for clarity, into three main sections :—

SECTION "A" Operation and crew maintenance of the vehicle, including unit adjustment.

SECTION "B" Detailed description of the moving parts of the vehicle.

SECTION "C" Detailed specifications suitable for workshops. Instructions for the removal and replacement and the repair of all assemblies.

From the above you will see that the crew are particularly interested in "A" and "B," whilst workshops will make a closer study of "C" than "A" or "B," schools working mainly from "B." Sections "A" and "B" are issued to all personnel.

The complete volume, sections "A," "B" and "C," is issued only to workshop personnel and those on the distribution list of W.S.5(*b*).

Mechanical maintenance must be carried out as laid down in the R.E.M.E. Permissive Repair Schedule.

For FROST PRECAUTIONS see page 12.

Before DRIVING the vehicle away, see pages 11 and 12.

ALL TOOLS REQUIRED FOR ROUTINE OPERATIONS DESCRIBED IN SECTION "A" ARE CARRIED ON THE VEHICLE.

SECTION
A

OPERATION AND MAINTENANCE

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SECTION A

DRIVING AND MAINTENANCE

GENERAL INSTRUCTIONS

This is a tracked vehicle, and the hull is rectangular, constructed of armoured plates, giving protection to the crew.

The normal engine is a V8 petrol unit developing 60 b.h.p. at 2840 r.p.m.

Transmission is by a single dry plate clutch, driving a four-speed gearbox of the selective type.

The gearbox is operated by a remote control change speed lever.

Final drive is a fully-floating type differential axle driven by pinion and bevel gears.

Fitted to the final drive axle are the brake drums and track driving sprockets.

Steering is controlled by a steering wheel which operates a moving cross tube by rods and cams. The initial movement therefore throws the tracks out of alignment, causing a " slow " turn. Further movement of the steering wheel applies the brakes, and " sharper " turns result.

Suspension is by bogie wheels fitted on each side of the vehicle, each bogie wheel being controlled by a coil spring which gives a " slow motion " effect.

Bogie wheels are mounted on forked assemblies, and rotate on bearings.

The bogie fork brackets are fitted to the side plates of the hull and carry the whole weight of the vehicle, and at the same time are so arranged to absorb all road shocks.

Adjustable seats are provided for the driver and gunner. Each seat has two positions, "high" and " low."

In the high position vision is obtained over the front hull plates, whilst in the low position vision is obtained through the visors. The latter position affords protection in action.

It is very important to note that certain vehicles are fitted with an 85 h.p. engine.

Whilst both types are interchangeable as a complete unit, component parts are not, and care should be exercised, therefore, when ordering spare parts. The 85 h.p. and 95 h.p. engines can be recognised by the following points :—

(*a*) **24 cylinder head studs,**
(*b*) **14 mm. sparking plugs.**

DETAILS

Weight of vehicle	...	$3\frac{3}{4}$—$4\frac{1}{4}$ tons
Overall length	...	12 ft. } approx.
Overall width	...	7 ft. } approx.
Overall height ...	...	5 ft. 3 in. } approx.
Length of track contact on ground ...	...	5 ft. 3 in.
Track centres	...	5 ft. 3 in.
Width of track ...	...	$9\frac{1}{2}$ in.
Pitch of track		1.718 in.
Vertical obstacle crossed	...	2 ft. $1\frac{1}{4}$ in.
Gap crossed	...	4 ft. 6 in. wide
Height of idler from centre	...	2—$1\frac{3}{4}$ in.
Ground clearance	...	8 in.
Engine		V8 90° L head
Bore	...	3.0625 in. (77.79 mm.)
Stroke		3.75 in. (95.25 mm.)
B.h.p. at r.p.m. ...	...	Not less than 60 b.h.p. at 2840 r.p.m.
Fuel capacity	...	20 gallons
Consumption	...	7 m.p.g. (on road)
Maximum speed	...	30 m.p.h., governed
Gearbox ...	...	Selective type. Four speeds and reverse
Clutch	...	Dry single plate with plate pressure increased by centrifugal force
Suspension	...	Slow motion bogie assembly type

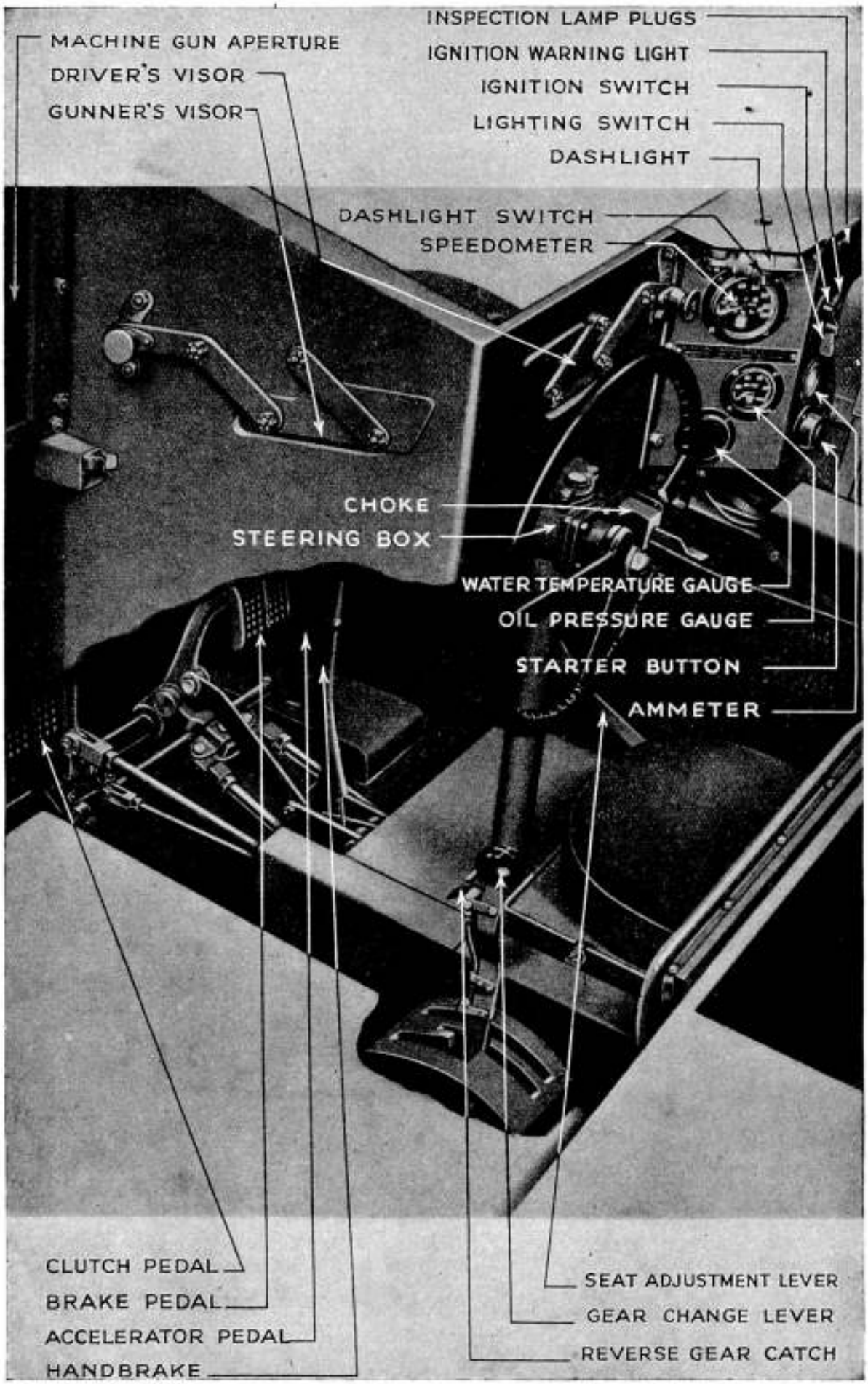

Fig. 1. INSTRUMENTS AND CONTROLS.