6 - ENGINE

87. The starting up sequence will be found in para. 420 to 426 . It is inserted near the end of Chapter 1 rather than in the engine section as it refers to several different systems.

DESCRIPTION

88. The vehicle is fitted with a "Meteor", Mark 1A or Mark 3, 12 cylinder V type, liquid cooled, overhead valve, gasoline engine.

89. The engine develops approximately 600 b.h.p. at 2,550 r.p.m., which is the maximum governed speed. Maximum torque (1,450 lb.-ft.) is developed at 1,500 r.p.m.

90. The numbering of the cylinders is as follows:-

FRONT
Timing case end

LEFT "A" bank		RIGHT "B" bank
6		6
5		5
4		4
3		3
2		2
1		1

REAR
Fan drive end

91. The engine modification certificate is contained in a clip secured to the front end of "B" bank. A plate carrying the engine number, mark and description is fitted on the fan drive casing.

92. There is no difference between the Mark 1A and Mark 3 engines as far as operation and user maintenance is concerned.

OPERATION OF CONTROLS

Barring over shaft

93. The starter motor, which is mounted vertically on top of the starter bevel box (Fig. 10) in the fighting compartment, has a fitting which enables the engine to be turned over by hand for maintenance purposes. It is operated by a ratchet spanner which fits on a small hexagonal spindle which projects from the side of the starter motor.

94. To operate:-

Fit the ratchet over the spindle so that the upward movement of the ratchet turns the spindle. Continued up and down movement will turn the engine.

***CAUTION:** Under no circumstances will the engine be turned over by means of a bar inserted in the clutch spring cups, as this distorts the cups and prevents free movement of the clutch springs, eventually causing clutch slip.*

(b) Method -

(i) Open the radiator and rear engine access doors (Combination tool).

(ii) Disconnect the oil feed pipe from the union on the fan drive casing (Fig. 9) ($\frac{3}{8}$ in. or 5/16 in. spanner).

(iii) Remove the union from the fan drive casing (Fig. 9) ($\frac{1}{2}$ in. or 5/16 in. box spanner). Take care not to lose the aluminium washer.

(iv) Check that the spray hole is clear

(v) Replace the union and washer and connect the feed pipe.

(vi) Start the engine and check the pipe and union for leaks.

8 - COOLING SYSTEM

DESCRIPTION

131. Fig. 16 shows the layout of the system and will familiarize the crew with the position and function of all external pipes and unions and assist them in tracing leaks and in diagnosis of faults. The following brief description will act as a background to the practical instruction following.

132. The system is sealed and has a capacity of approximately 15 gallons. The coolant used is a mixture of 1/3rd ethylene glycol and 2/3rds water (anti-freeze mixture).

133. The pump, mounted at the front of the engine, draws coolant from the bottom of both radiators and forces it through pipes to the cylinder jackets of both banks.

134. Coolant from the front of each bank passes through a common inlet to the induction manifold jacket. Coolant from the rear of each bank and from the manifold jacket passes through a common outlet pipe to the thermostat.

135. When the thermostat is open, the coolant is forced through two steam separators in the header tank, to the header tank. Steam can escape from the tops of the separators to be condensed in the header tank. When the thermostat is closed, the coolant is prevented from passing to the radiators and is taken back to the pump suction pipe by the thermostat by-pass pipe.

136. The coolant in the header tank enters the system through the header tank outlet pipe to replace coolant lost by leakage or evaporation. Excessive pressure in the header tank is prevented by the pressure and vacuum relief valve.

137. The system is drained by means of an extraction pump which is connected to the outlets of both radiators.

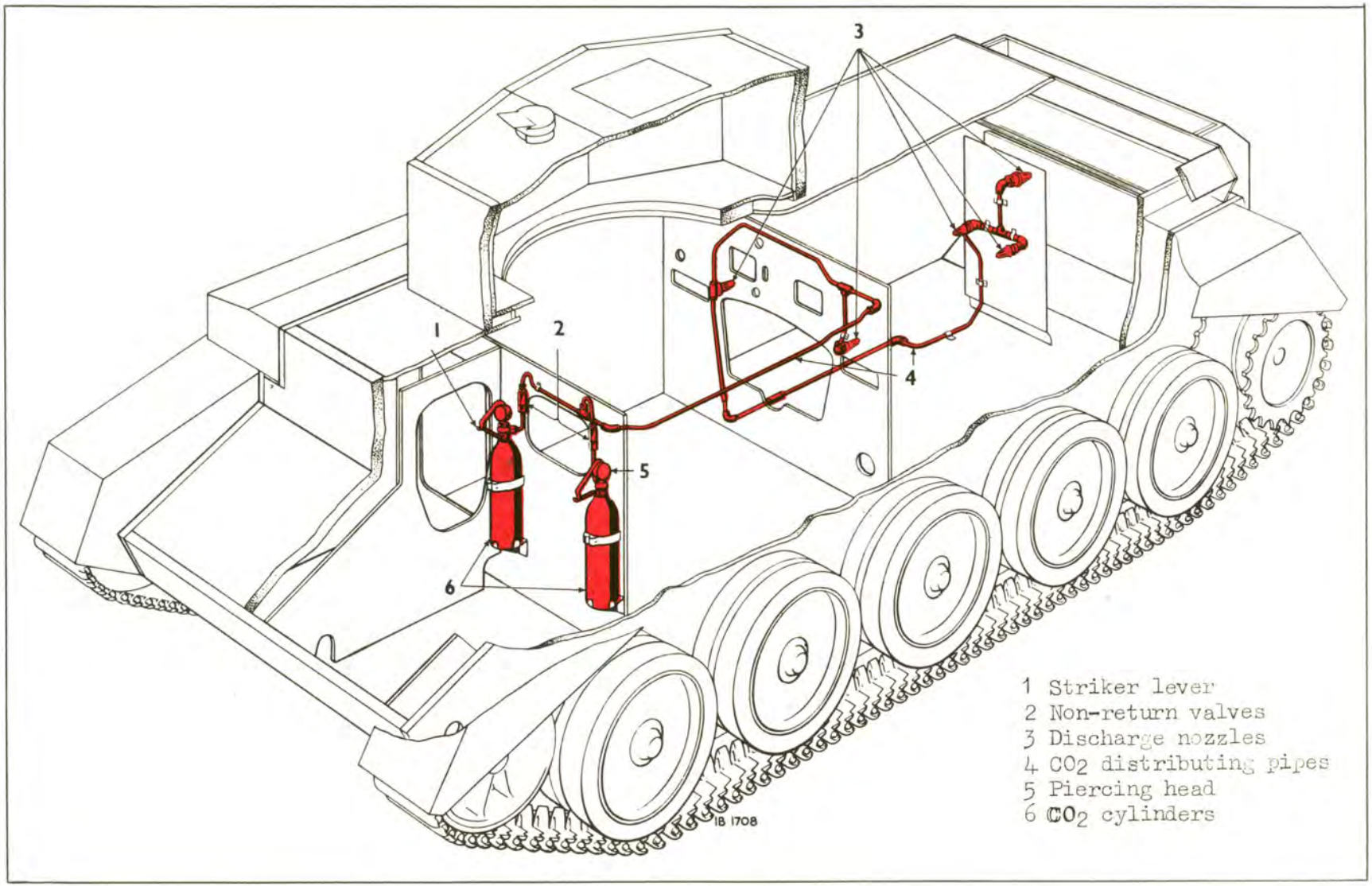
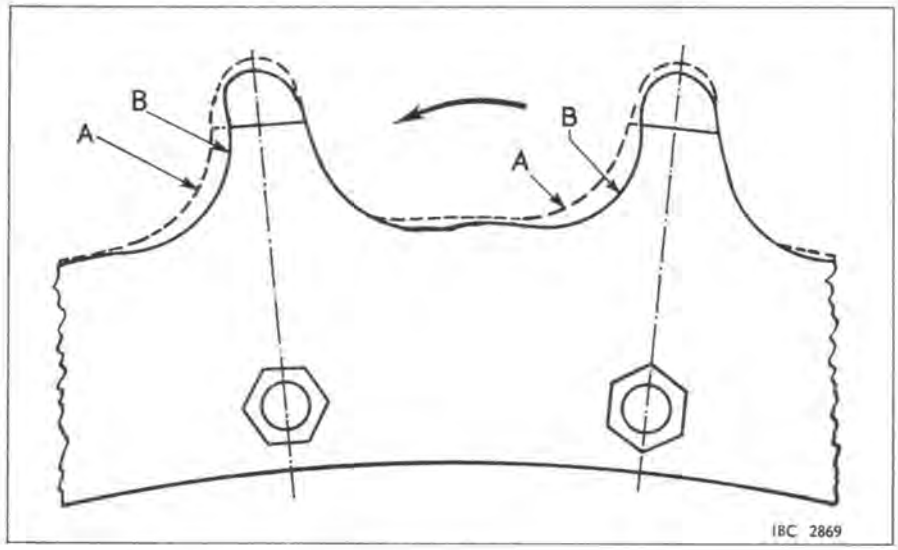


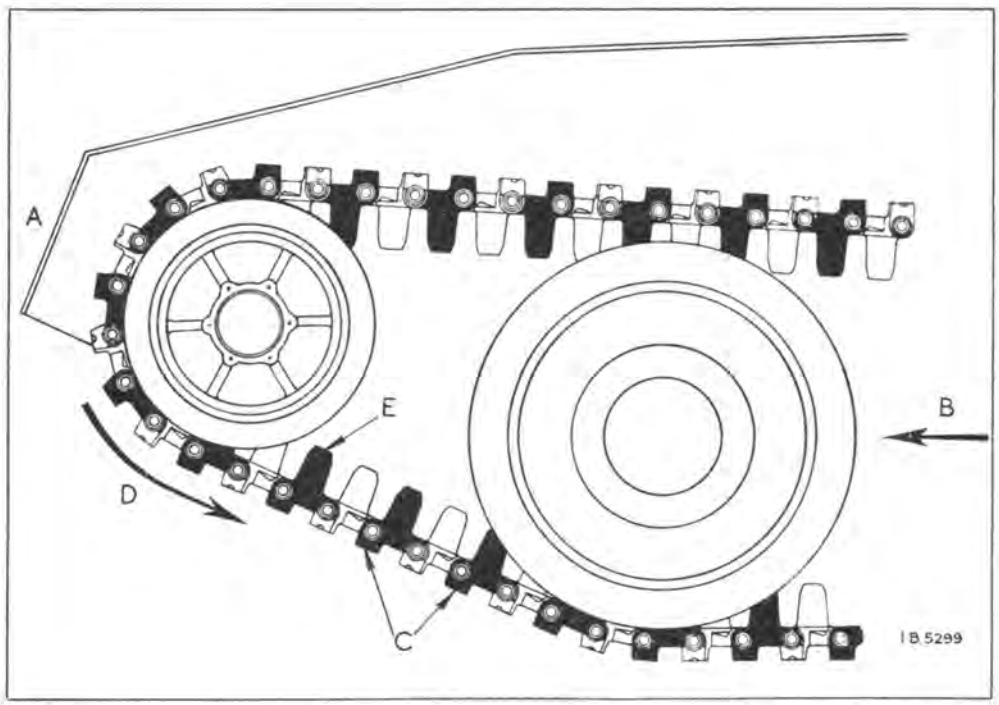
Fig.61 Lay-out of CO_2 equipment

RESTRICTED



A Outline of new teeth B Outline of worn teeth

Fig.50 Worn sprocket teeth



A Front of vehicle
B Forward direction of vehicle
C Spuds trailing
D Direction of track

E To show clearly the correct way to fit the track, every alternate link is shown black

Fig.51 Track fitting diagram

BIBLIOGRAPHY

The following publications are required to complete the crew's technical training on this vehicle.

MECHANICAL

(a) Servicing schedule (insert to AB 413) *(not yet published)*

(b) Crew Duty Card *(not yet published)*

ARMAMENT

(a) Royal Armoured Corps Training Volume III - Charioteer Armament training pamphlet *(not yet published)*

(b) 20 pr. Gunnery Wallet *(not yet published)*

(c) Technique of Shooting (W.O.Code No. 8745)

(d) R.A.C. Range Practices (W.O.Code No. 8381)
Sec. 1 - Range Instructions (W.O.Code No. 8379)
Sec. 2 - Open Range Practices (W.O.Code No. 8380)
Sec. 3 - Miniature Range Practices (W.O.Code No. 8462)
Sec. 4 - 30 yds. Range Practices (W.O.Code No. 8588)
Sec. 5 - Personal Weapons Practices (W.O.Code No. 8762)

(e) Miniature Range Training. *(not yet published)*
Until this is published use "Miniature Range Training with .22 in. Rifle Bracket Nos. 4 and 5" (W.O.Code No. 8397)

(f) Infantry Training Vol. 1, Pamphlet No. 7 - Grenades (W.O.Code No. 8592)

(g) Infantry Training Vol. 1, Pamphlet No. 4 - Machine Carbine *(not yet published)*

(h) Infantry Training Vol. 2, Pamphlet No. 26 - Range Finder No. 12, 1946 (W.O.Code No. 7152)

INTERCOMMUNICATION

(a) Working instructions for W.S. No.19 Marks 1, 2 and 3 (W.O.Code No. 1055)

(b) Provisional User Handbook, Working Instructions for W.S. No. 31 A.F.V. (SRDE Pamphlet No.765A)

The following publications are of use to technical personnel:-

Technical Handbook for Charioteer *(not yet published)*