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CARRIER, INSTALLATION, FULL TRACKED, MKs 2 AND 2/1 (FV439)

TECHNICAL DESCRIPTION

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence
Issued by

DEFENCE LOGISTICS ORGANISATION

AMENDMENT RECORD

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TECHNICAL DESCRIPTION

Chapter

0 General technical information
1 Power pack assembly – List of chapters
2 Final drives, suspension and tracks – List of chapters
3 Hull and fittings
4 Environmental control system
5 Electrical equipment
6 Special to Role equipment

PREFACE

Sponsor: LASS IPT DLO Andover
File ref: 13076
Publication Agency:
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INTRODUCTION

1 Service users should forward any comments concerning this Publication through the channels prescribed in AESP 0100-P-011-013. An AESP Form 10 is provided at the end of this document; it should be photocopied and used for forwarding comments on this AESP.

2 AESPs are issued under Defence Council authority and where AESPs specify action to be taken, the AESP will of itself be sufficient authority for such action and also for the demanding of the necessary stores, subject to the provision of Para 3 below.

3 The subject matter of this publication may be affected by Defence Council Instructions (DCIs), Standard Operating Procedures (SOPs) or by local regulations. When any such instruction, order or regulation contradicts any portion of this publication it is to be taken as the overriding authority.

RELATED AND ASSOCIATED PUBLICATIONS

Related Publications

4 The Octad for the subject equipment consists of the Publications shown. All references are prefixed with the first eight digits of this Publication. The availability of the publications can be checked by reference to the relevant Group Index (see AESP 0100-A-001-013).

Category/Sub-category			Information level			
			1 User/ Operator	2 Unit Maintenance	3 Field Maintenance	4 Base Maintenance
1	0	Purpose and Planning Information	101	101	101	101
	1	Equipment Support Policy Directives	*	*	*	*
2	0	Operating Information	201	201	201	201
	1	Aid Memoire	*	*	*	*
	2	Training Aids	221	*	*	*
3		Technical Description	201	302	302	302
4	1	Installation Instructions	*	*	*	*
	2	Preparation for Special Environments	*	*	*	*
5	1	Failure Diagnosis	201	522	522	522
	2	Repair Instructions	201	522	523	524
	3	Inspection Standards	*	*	*	*
	4	Calibration Standards	*	*	*	*
6		Maintenance Schedules	*	*	*	*
7	1	Illustrated Parts Catalogues	711	711	711	711
	2	Commercial Parts Lists	*	*	*	*
	3	Complete Equipment Schedule, Production	*	*	*	*
	4	Complete Equipment Schedule, Service Edition (Simple Equipment)	741	741	741	741
	5	Complete Equipment Schedule, Service Edition (Complex Equipment)	*	*	*	*
8	1	Modification Instructions	811	811	811	811
	2	General Instructions, Special Technical Instructions and Servicing Instructions	821	821	821	821
	3	Service Engineered Modification Instructions (RAF only)	*	*	*	*

* Categories/Sub-categories not published

Associated Publications

Reference	Title
AESP 2350-T-250-Octad	FV430 Series, Vehicles, All Marks
AESP 5895-H-514-Octad	Secondary Access Switch / Message Centre, (TKD), in AFV439
AESP 5895-H-515-Octad	Radio relay (R/R) Installation in Carrier, Full TKD FV439
AESP 6115-G-251-Octad	Generator set diesel engine driven DC 3KW 28V
Army Code 31785	Carrier Installation Ptarmigan/Triffid AFV 439 Radio Relay Access (Tracked)
Army Code 33069	Carrier, Full Tracked, FV439, Mk 2/1, fitted for communication system (Forming part of Complex 30155)
Army Code 33070	Carrier, Full Tracked, FV439, Mk 2/1, fitted for RS C50/R236
Army Code 46162	Installation Kit, Electronic Equipment for S.H.F. Radio UK/TRC 481 in FV439
Army Code 46189	Conversion Kit from AC Petrol to DC Diesel system for:- Corps Hard Radio Relay in FV439, Mk 2
EMER Pwr P410/9 to 419/9	Control Box No 10 Mk 1

ABBREVIATIONS

6 Throughout this Publication, any reference to right or left is as seen from the rear of the vehicle looking forward, unless otherwise stated. Where non standard abbreviations are used, the full meaning is written out in full the first time the subject is mentioned in the text, followed by the abbreviation in brackets.

CHAPTER 0

GENERAL TECHNICAL INFORMATION (FV439 SAS/MC)

CONTENTS

Para
1 Introduction
Electrical equipment
2 System
3 Batteries
4 Fuel system
5 Data
8 FV439 Radio Relay

Table Page

1 Physical data 2/6
2 Lamps 7
3 Circuit breakers 7/8

Fig

1 Overall dimensions 9/10

INTRODUCTION

1 This chapter gives general and technical information common to the:

1.1 Carrier, Installation, Full Tracked, Mks 2 and Mk 2/1 (FV 439)

ELECTRICAL EQUIPMENT

System

2 A 24 V negative earth system is used within the vehicle, with an ac generating system that is rectified for external battery charging.

Batteries

3 There are eight batteries fitted within the vehicle, two connected in series for automotive purposes, two fitted in series for the ventilation system, two connected in series for radio equipment and two connected in series for the APU's.

FUEL SYSTEM

4 The fuel system consists of two main tanks which are mounted in the rear of the vehicle, one on either side above the track guard, and a collector tank which is located on the hull bottom plate under the rear floor. The two main tanks feed via a stop cock into the collector tank where the fuel is drawn up by an electric pump which delivers the fuel through a filter to the fuel injector. In addition to the standard fuel system, there is a fuel feed via a 3-way valve to the roof of the vehicle, this fuel supply feeds two 3kW roof mounted diesel generators. Each tank is vented through a pipe, which is connected to a vent valve mounted on the roof plate.

DATA

5 Table 1 lists the physical data relevant to the Carrier Installation, Full Tracked Mks 2 & 2/1 (FV439) SAS/MC

TABLE 1 PHYSICAL DATA

Serial (1)	Heading (2)	Detail (3)	
1	Crew	Two, driver and commander	
2	Personnel	One operator	
3	Dimensions	Refer to Fig 1	
4	Weights Laden	 17,750 kg (17.75 tons)	
5	Bridge classification	19	
6	Fuel	Multi-fuel – diesel, gas turbine, MT gasoline, premium grade motor spirit or a mixture of these fuels	
7	Engine	K60 Mk 4F and 6F, two stroke, multi-fuel, compression ignition. Opposed piston type	
8	Gearbox	GM-Allison TX200-4B automatic gearbox having six forward gears and one reverse, with a torque converter operating in 1st, 3rd, and reverse	
9	Governed speed Maximum Idle	 3,750 rev/min 800 Rev/min	
10	Gears and speed		
	Gear	Speed	
	1	8.9 km/h	5.56 mile/h
	2	12.3 km/h	7.72 mile/h
	3	17.5 km/h	10.93 mile/h
	4	24.3 km/h	15.2 mile/h
	5	33.8 km/h	21.6 mile/h
	6	47.2 km/h	29.42 mile/h
	Reverse	7.8 km/h	4.87 mile/h
11	Performance [redacted] (permitted)		
12	Fuel consumption [redacted]		
13	[redacted]		

(continued)

TABLE 1 PHYSICAL DATA (continued)

Serial (1)	Heading (2)	Detail (3)
14	Range of operation	[redacted]
15	Maximum gradient	35 degrees (620 mils)
16	Maximum vertical obstacle	609.6 mm (2 ft)
17	Minimum turning circle	5.33 m (17 ft 6 in.)
18	Suspension	Torsion bar, five units on each side with axle arms in the trailing position. Track adjuster at rear.
	Type	609 mm (24 in.) diameter, rubber tyred. Two on each suspension unit and track adjuster.
	Wheels	2 ft dia. (609.6 mm) double rubber tyred, five per side.
	Shock absorber	Friction type, fitted to the front and rear stations only.
19	Tracks	
	Links per track new)	90
	Condemnation limit	88 (with hydraulic ram fully extended)
20	Track guide rollers	Two for each track
21	Steering	Lever operated controlled differential unit
22	Smoke protection	Two forward facing multi-barrelled smoke dischargers
23	Ammunition	
	Machine gun	Eight boxes of 200 rounds, belted for GPMG
	Smoke discharger	Six rounds (loaded in dischargers)
24	Vision	
	Driver	Head out for opened up position. Single wide angled AFV No. 33 Mk1 periscope
	Commander	360-degree rotation cupola with three periscopes, both outer periscopes fixed. Centre AFV No. 32 Mk 1 periscope can be pivoted axially in vertical plane

(continued)

TABLE 1 PHYSICAL DATA (continued)

Serial (1)	Heading (2)	Detail (3)	
25	Capacities	Litres	Imperial
	Fuel tanks	454	100 gal
	Engine lubrication system	33	58 pints
	Gearbox (modified)	16.5	29 pints
	Engine governor	1.15	2 pints
	Coolant system	44.3	78 pints
	Hydraulic fan drive	22.4	39 pints
	Steering unit	26.7	47 pints
	Final drives (each)	4.3	7.5 pints
	Road and track adjuster wheels (each)	1.7	3 pints
26	Electrical equipment System	24V negative earth with AC generating system rectified for battery charging and general purposes	
26.1	Batteries	No. 4 Mk 3 - FV546133	
	Number off	8 (Para 3 refers)	
	Voltage	12V	
	Capacity	100Ah	
26.2	Alternators	2 off	
	Main output	0.5 kVA, 3 phase, 0.95 Power factor, 25V, line current 81 amps within the speed range of 1,750 to 1,2600 rev min (87.5 to 630 cycles sec)	
	Cutting in speed	1,250 rev min alternator speed	
	Rotation	Reversible	
	Phase rotation	A B C looking on the drive and with alternator rotating counter clockwise	
	Field resistance	0.34 ohms to 0.37 ohms at 20 deg C (68 deg F)	
	Number of poles	6	
	Drive ratio (gearbox)	2.95:1	
	Input torque	30.5 Nm - (22.5 lb ft (max))	
	Input HP	6.37	
	Cooling	Engine oil	
	Bearing lubrication	Oil bled of main supply 500 cc per minute at 122 deg C(251 deg F)	
	Weight	31.3 kg (69 lb)	
	Gear teeth	22	
26.3	Control panel, alternator	2 off	
	Type	No.1 Mk 1 - FV342587 static voltage regulator, silicon controlled rectifier	
	Voltage control	Normal 28.5V ± 2%	
	Current limiting	30A max field current	
	Field over heat	Alternator output reduced when field temperature exceeds 250 deg C (122 deg F)	

(continued)

TABLE 1 PHYSICAL DATA (continued)

Serial (1)	Heading (2)	Detail (3)
26.4	Rectifier unit	
	Type	No. 1 Mk 1 - FV342588 6 half phase bridge rectifier
	Input	165A, 22V, 3 phase
	Output	200A, 28,5V dc
	Frequency range	87.5 to 630 cycle sec
	Cooling	Engine oil
	Oil temperature	122 deg C (max)
	Minimum depth of oil	Oil level to be 13 mm (0.5 in.) above any inlet hole at any angle of tilt
	Fuse	250A
	Ammeter shunt	300A, 75mV
	Weight	13.8 kg (30.5 lb)
26.5	Distribution link box	
	Type	No. 1 Mk 1 - FV494570
	Relay No.1 (Radio	
	Type	CAV BBNG
	Rating	Continuous
	Coil resistance	28.5 to 31.5 ohms at 20 deg C (68 deg F)
	Pull in voltage	16V (min)
	Relay No. 2 (Alternator only load relay)	
	Type	CAV L6
	Coil resistance	64 to 70 ohms
	Pull in voltage	6V to 8V
26.6	Starter	
	Type	No. 3 Mk 1 - FV546101
	Rotation	Clockwise viewing DE
	Brake HP	11.5 (max) at 14V
	Torque	54.24 Nm (40 lb ft at max BHP) 149.2 Nm (110 lb ft stall (2,250A, 10V approx))
26.7	Accessories control box	
	Type	No. 1 Mk 2 - FV562043
	Relays (3 off)	Plessey 7CZ-106198
	Pull in voltage	15V to 18V
	Drop out voltage	12V (max)
	Coil resistance	165 ohms ± 5% at 20 deg C (68 deg F)
26.8	Distribution panel	
	Type	No. 6 Mk 1 - FV534891
	Relays (4 off)	Plessey 7CZ-106198
	Pull in voltage	15V to 18V
	Drop out voltage	12V (max)
	Coil resistance	165 ohms ± 5% at 20 deg C (68 deg F)

(continued)

TABLE 1 PHYSICAL DATA (continued)

Serial (1)	Heading (2)	Detail (3)
26.9	Relay (generator only load)	Hendry D4485
	Pull in voltage	15V to 18V
	Drop out voltage	12V (max)
	Coil resistance	123 ohms ± 5% at 20 deg C (68 deg F)
26.10	Relay (generator only load)	Hendry D4485
	Pull in voltage	15V to 18V
	Drop out voltage	12V (max)
	Coil resistance	123 ohms ± 5% at 20 deg C (68 deg F)
26.11	Radio distribution box	
	Type	No. 1 Mk 3 - FV534890
	Relay	Plessey 7CZ-106198
	Pull in voltage	15V to 18V
	Drop out voltage	12V (max)
	Coil resistance	165 ohms ± 5% at 20 deg C (68 deg F)
26.12	Fuel pump	
	Type	No. 2 Mk 1 - FV342593
	Rotation	Clockwise viewing pump end
	Current	4.5A (max)
	Fuel pressure	1.7 bar (25 lb sq in)
	Fuel flow	136.4 ltr (30 gallon) per hour
	Operating temperature	-40 deg C to 105 deg C (221 deg F)
	Weight	5.5 kg (12 lb)
26.13	Ventilation fan motor	
	Type	No 8 Mk 1 FV481818
	Rating	Continuous
	Output	0.27 HP at 4500 rev/min (max.), 24V with zero external resistance (17 amps max.)
26.14	Fan controller	
	Type	No 10 Mk 1
	Resistance, total	28 ohms

6 Table 2 details the lamps fitted to the Carrier Installation, Full Tracked Mks 2 & 2/1 (FV439) SAS/MC.

TABLE 2 LAMPS

Light (1)	Volts (2)	Watts (3)	Type (4)
Tail/stop	28	30/7	SBC index pins
Side, Registration plate, Convoy, interior, locker and bulkhead	26	6	SCC
Warning and instrument panel	28	0.04	Midget flange
IR	26	100	European cap
Turn and fire warning	24	24	SCC

7 Table 2 details the rating and location of the circuit breakers fitted to the Carrier Installation, Full Tracked Mks 2 & 2/1 (FV439) SAS/MC.

TABLE 3 CIRCUIT BREAKERS

Circuits (1)	Circuit Breaker		
	Location (2)	Identification (3)	Type and rating (4)
Circuit controlled by fuses F1, F3 and F5 in auxiliary junction box and smoke dischargers.	Distribution panel No. 6 Mk 1	A	15 A
Horn, 12 point socket, Lights: head, side, tail, convoy, registration plate, turn stop, IR driving.		B	25 A
Fire alarm warning lights.		C	10 A
Distribution panel inspection light sockets.		D	10 A
External lighting sockets.		F	35 A
NBC Relay Control Circuuit		G	5 A
NBC Power supply.		H	50 A
Fire alarm.		J	15 A
Circuits controlled by engine switch, instrument panel light fuse and DC supply to alternator field circuits.		K	15 A
Fuel pump, injection pump stop solenoid, battery analogue.		L	15 A

(continued

TABLE 3 CIRCUIT BREAKERS (continued)

Circuits (1)	Circuit Breaker		
	Location (2)	Identification (3)	Type and rating (4)
Engine coolant thermometer, fuel gauge, gearbox oil thermometer, oil pressure switch, alternator (GEN) warning light, starter switch, alternator boost and instrument panel lights fuse.		M	10 A
Scavenge fan circuit breaker	NBC/Ventilation control box	SCAV FAN CIRC BRKR	5A
Charging circuit	Lighting and interface panel	CHARGE CIRCUIT	2A
Driver and front light in rear compartment		LIGHTING DRIVER FRONT PENT	2A
Commander and rear light in rear in rear compartment		LIGHTING CMDR REAR PENT	2A

FV439 Radio Relay

8 The General Technical Information for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) is identical to that in the FV430 Series, Vehicles, All Marks. The General Technical Information is detailed in AESP 2350-T-250-302.

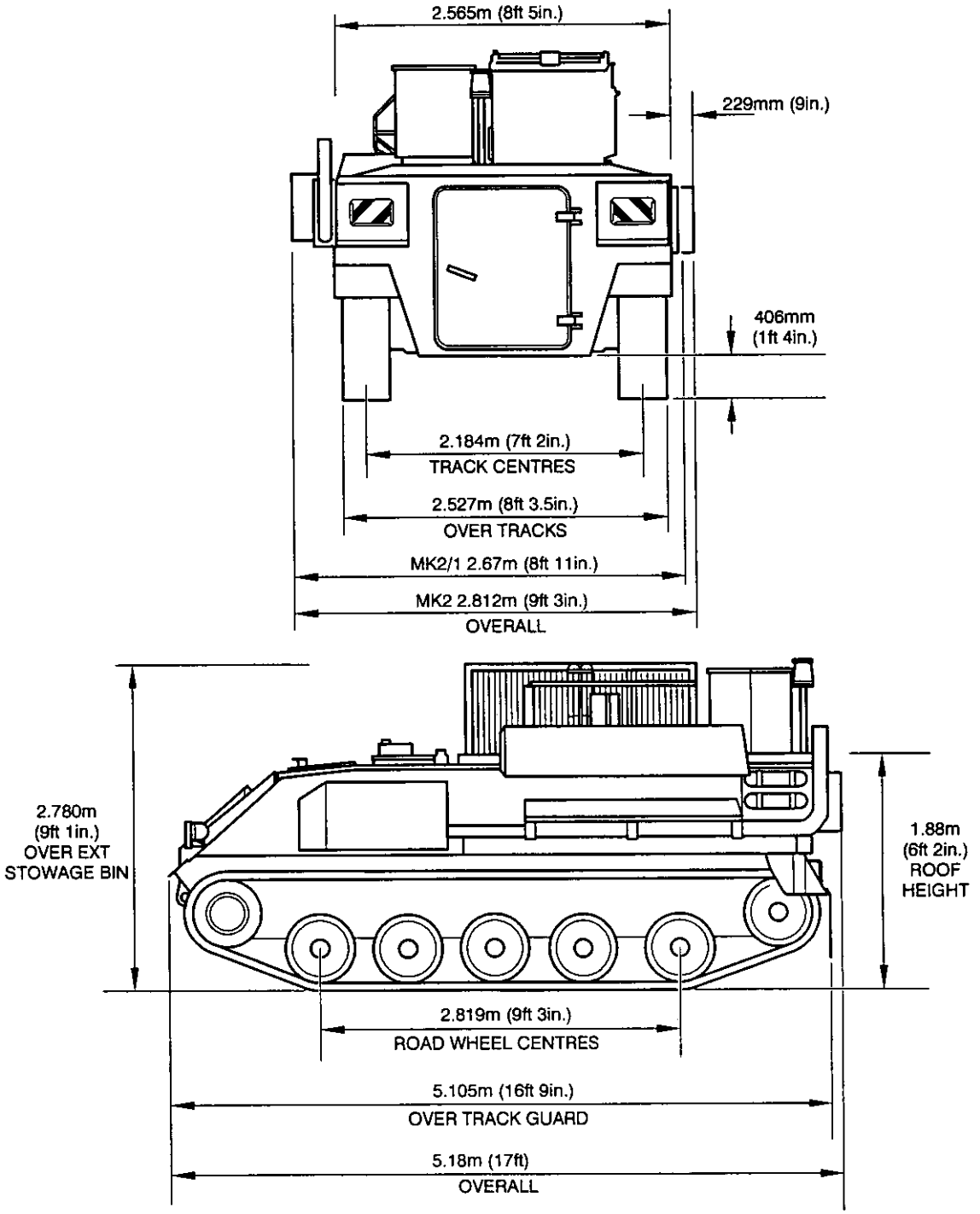

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Fig 1 Overall dimensions SAS/MC

CHAPTER 1-0

POWER PACK ASSEMBLY – LIST OF CHAPTERS

CONTENTS

Fiche No.	Frame	Para	
1	C2	1	List of chapters (this chapter)

LIST OF CHAPTERS

1 This chapter is further sub-divided as follows:

Fiche No.	Frame	Chap	
1	D2	1-1	Power pack
1	E2	1-2	Engine
1	F2	1-3	Fuel system
1	G2	1-4	Cooling system
2	B2	1-5	Transmission

CHAPTER 1-1

POWER PACK

CONTENTS

Fiche No.	Frame	Para	
1	D2	1	General

GENERAL

1 The power pack for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) is identical to that used on the FV430 Series, Vehicles, All Marks. The technical description of the power pack is detailed in AESP 2350-T-250-302.

CHAPTER 1-2

ENGINE

CONTENTS

Fiche No.	Frame	Para	
1	E2	1	General

GENERAL

1 The Rolls Royce K 60, No 4, Mk 6F engine fitted to the Carrier Installation Full Tracked MKs 2 and 2/1 (FV439) is identical to that used on the FV430 Series, Vehicles, All Marks. The technical description of the engine is detailed in AESP 2350-T-250-302.

CHAPTER 1-3

FUEL SYSTEM

CONTENTS

Para

1 General

Fig Page

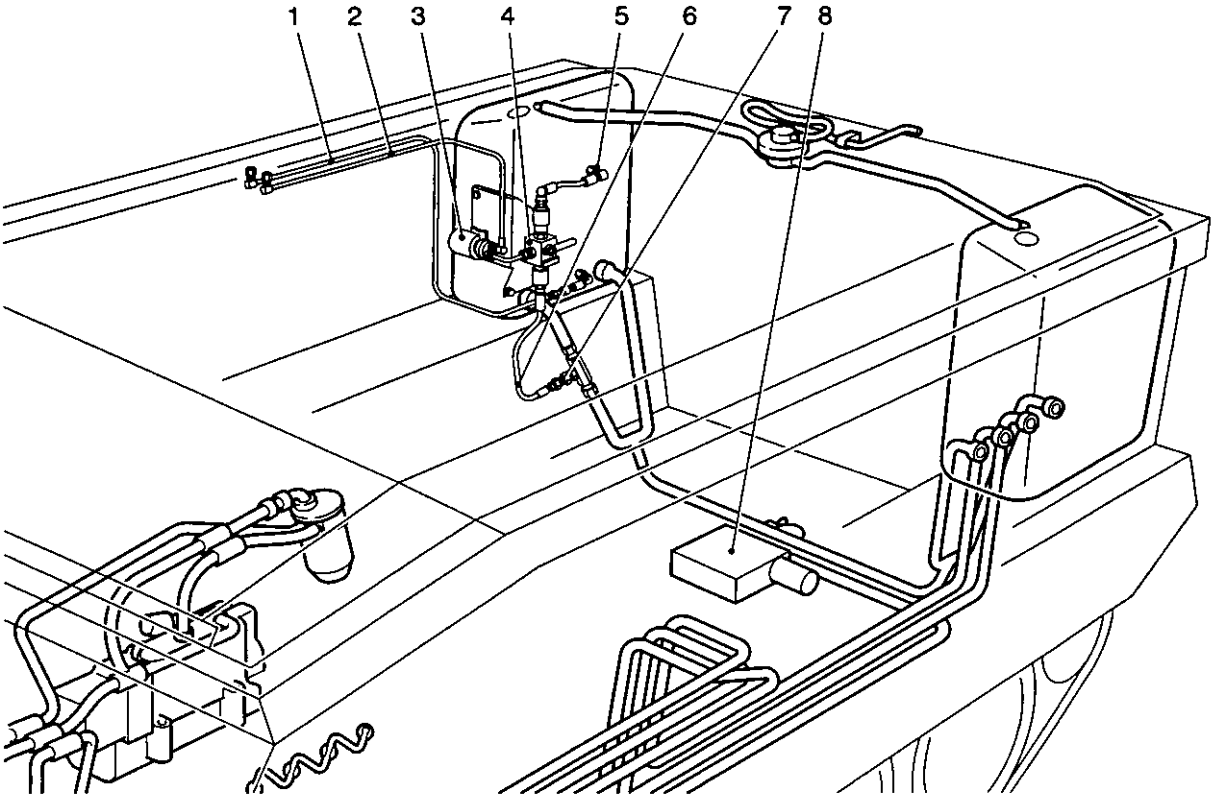
1 Diagrammatic of FV439 SAS/MC fuel system for roof generators 1

GENERAL

1 The fuel system for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) is similar to that used in the FV430 Series, Vehicles, All Marks. The technical description for the Power Pack fuel system is detailed in AESP 2350-T-250-302.

2 In addition to the standard fuel system, there is a fuel feed for the FV439 SAS/MC variant from the R/H fuel tank via a 3-way valve to the roof of the vehicle (Fig 1), this fuel supply feeds two 3kW roof mounted diesel generators.

3 AESP 2350-T-254-811 Mod Instr No 1, (EMER TV 107/9 Mod Instr No 8, Title: Diesel generators.) refers to the modification of the vehicle fuel system to allow a fuel feed from the vehicle fuel tanks to the roof, to run the roof mounted generators.



432/551

1	Return pipe to tank	5	Fuel feed to pump
2	Fuel Feed to roof	6	Fuel feed to pump
3	Fuel Pump	7	'T' Pipe
4	Fuel Valve	8	Collector Tank

Fig 1 Diagrammatic of FV439 SAS/MC fuel system for roof generators

CHAPTER 1-4

COOLING SYSTEM

CONTENTS

Fiche No.	Frame	Para	
1	G2	1	General

GENERAL

1 The cooling system fitted to the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) is identical to that used in the FV430 Series, Vehicles, All Marks. The technical description of the cooling system is detailed in AESP 2350-T-250-302.

CHAPTER 1-5

TRANSMISSION

CONTENTS

Fiche No.	Frame	Para	
2	B2	1	General

GENERAL

1 The transmission fitted to the Carrier, Full Tracked, MKs 2 and 2/1 (FV439) is identical to that used in the FV430 Series, Vehicles, All Marks. The technical description of the transmission is detailed in AESP 2350-T-250-302.

CHAPTER 2-0

FINAL DRIVES, SUSPENSION AND TRACKS - LIST OF CHAPTERS

CONTENTS

Fiche No.	Frame	Para	
2	C2	1	List of chapters (this chapter)

LIST OF CHAPTERS

1 This chapter is further sub-divided as follows:

Fiche No.	Frame	Chap	
2	D2	2-1	Final drives
	E2	2-2	Suspension and tracks

CHAPTER 2-1

FINAL DRIVES

CONTENTS

Fiche No.	Frame	Para	
2	D2	1	General

GENERAL

1 The final drives fitted to the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) are identical to those used on the Carrier Maintenance Full Tracked FV434 MK 1 and 1/1, AESP 2350-T-252-302 refers. The technical description is detailed in AESP 2350-T-250-302.

CHAPTER 2-2

SUSPENSION AND TRACKS

CONTENTS

Fiche No.	Frame	Para	
2	E2	1	General

GENERAL

1 The suspension and tracks for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) are similar to that for the FV430 Series, Vehicles, All Marks. There are differences to the adjustment of the torsion bars to which AESP 2350-T-254-522 refers. The technical description is detailed in AESP 2350-T-250-302.

CHAPTER 3

HULL AND FITTINGS

CONTENTS

Para

1 General
3 Mortar hatch
4 Roof Mounted Generators
6 APU Exhausts and Extensions
7 Fire Extinguishers
8 Armoured Outlet

Fig Page

1 External fittings 2
2 SAS/MC Installation Equipment 4

GENERAL

1 The hull and fittings for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) are similar to that used in the FV430 Series, Vehicles, All Marks. The technical description of the hull and fittings is detailed in AESP 2350-T-250-302, with the exception of the mortar hatch. The mortar hatch detailed in Fig 1.

2 The technical description of specialist to role equipment can be found in the following publications:

2.1	AESP 5895-H-514-302	Secondary access switch/message centre (TKD) in AFV439
2.2	AESP 5895-H-514-304	Secondary access switch/message centre (TKD) in AFV439
2.3	AESP 5895-H-515-302	Radio relay installation in carrier full TKD FV439
2.4	AESP 5895-H-515-304	Radio relay installation in carrier full TKD FV439
2.5	AESP 6115-G-251	Generator set diesel engine driven 3KW 28V DC

Mortar Hatch

3 The mortar hatch fitted to the FV439 variant is replaced with a circular armoured plate. This is positioned over the mortar hatch and welded in position, after the removal of the hatch doors. Therefore no access or casualty evacuation is achievable through the hatch.

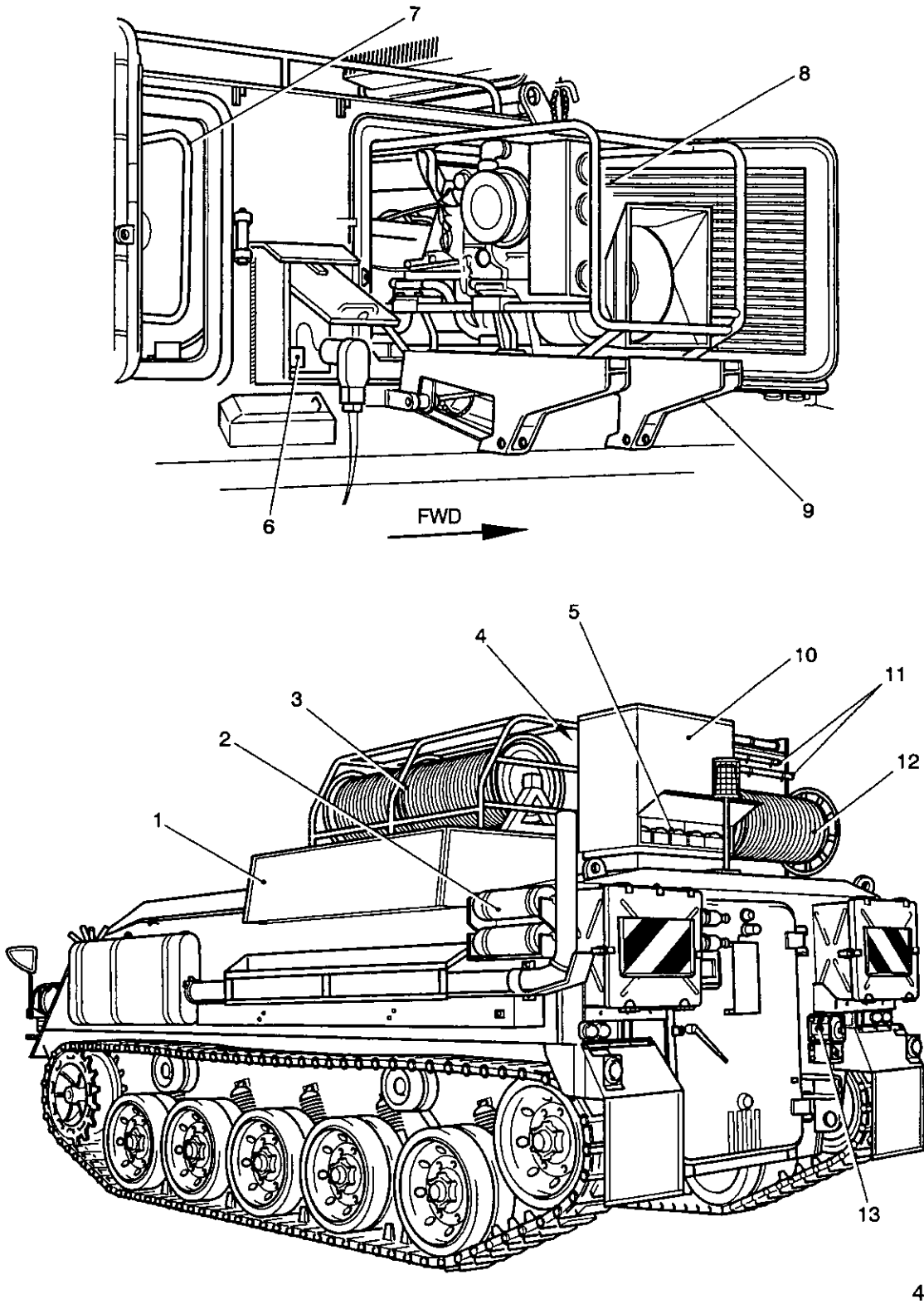
ROOF MOUNTED GENERATORS (APU'S)

4 Mounted on the vehicle roof are two 3 kW generators (APU's), one active and one standby, which normally supply 28 V d.c. for use by the equipment in the vehicle. (Para 2.5 refers)

NOTE

APU 1 is the rear of the generators.

5 Two outrigger arms (shown deployed in Fig 1(9)) are stowed in the roof stowage box. They may be locked into position with special pins and enable the APU's to slide out from their housings for servicing and maintenance.



1	Armoured Outlet	8	APU 2
2	APU Silencers	9	Outriggers Deployed
3	Quad Cables	10	Stowage Box
4	Jerrican Rack	11	Hammer, Sledge and Rod Earthing
5	Quad Distribution Boxes (X 6)	12	Import/Export cable
6	Import Connector	13	Vehicle earth
7	APU 1		

Fig 1 External fittings

APU Exhausts and Extensions

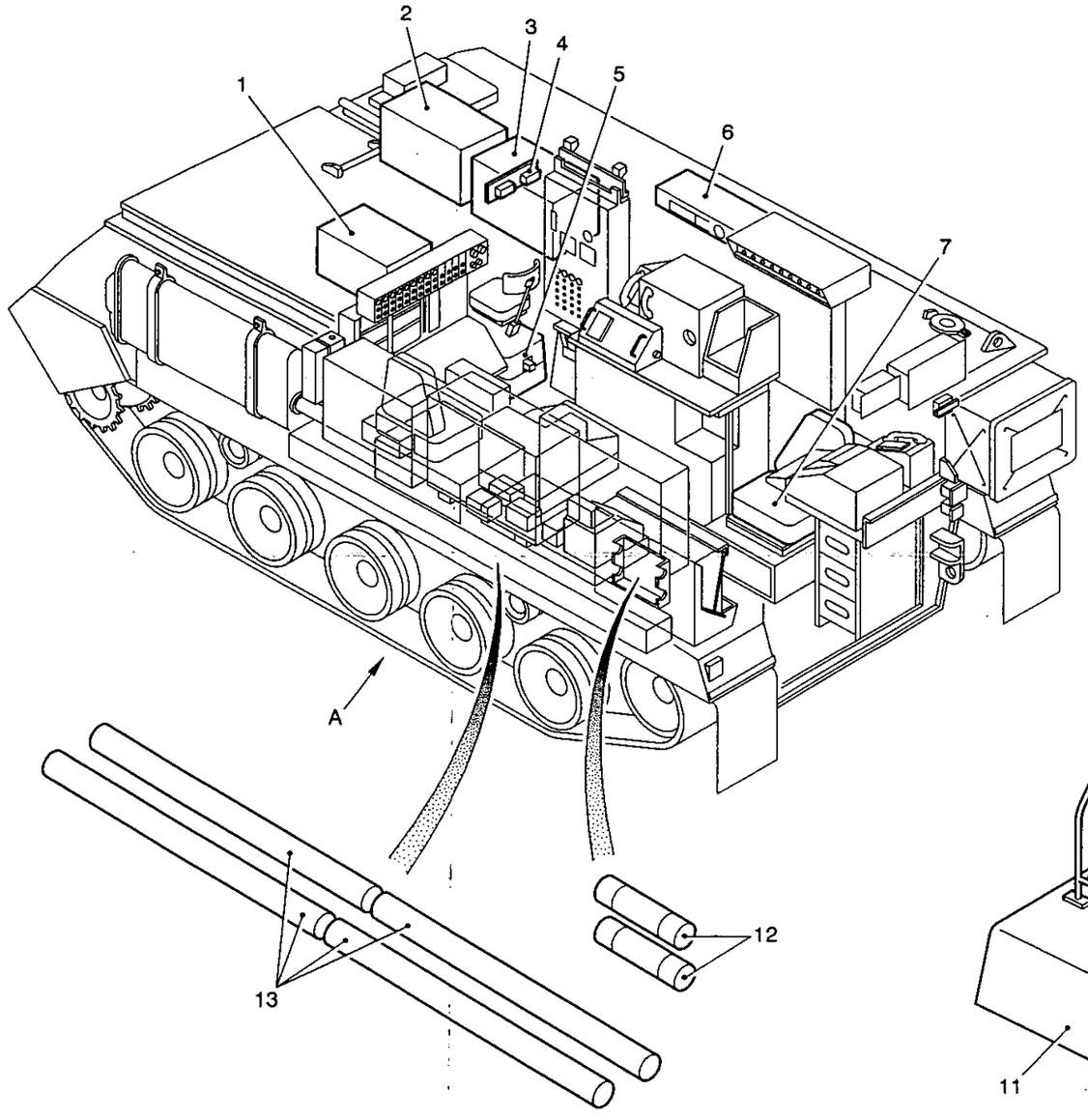
6 Four extension lengths are provided for the APU when the vehicle is deployed, these are stowed on the L/H side of the vehicle in a box under the armoured housing (Fig 2 (13) refers)). Two silencers are strapped and located above the exhaust boxes (Fig 1 (2)). The lengths of extension pipe are coupled together and fitted with silencers for deployment away from the vehicle.

Fire Extinguishers

7 An internal fire alarm and extinguisher system has been fitted to the APU's, this may be operated remotely from within the vehicle. Two additional hand operated extinguishers are located on the top L/H exterior of the vehicle door. The operation and testing of the Fire Control Suppression System is described in AESP 5895-H-514-201.

ARMOURED OUTLET

8 The armoured outlet (Fig 2 (11)) protects the internal equipment outlets and has fitted switched lights to enable the user to see the outlet designations during darkness. The outlets and lights are not directly visible from the vehicle exterior and have to be viewed from under the housing.



1 NBC Batteries
2 Vehicle Batteries
3 Radio Batteries
4 Fire Warning and Emergency Light
5 APU Batteries
6 NBC Control Unit
7 Operators Seat
8 APU Armoured Housing
9 Fire Warning Junction box
10 APU
11 Armoured Outlet
12 APU Silencers
13 APU Exhaust Extensions

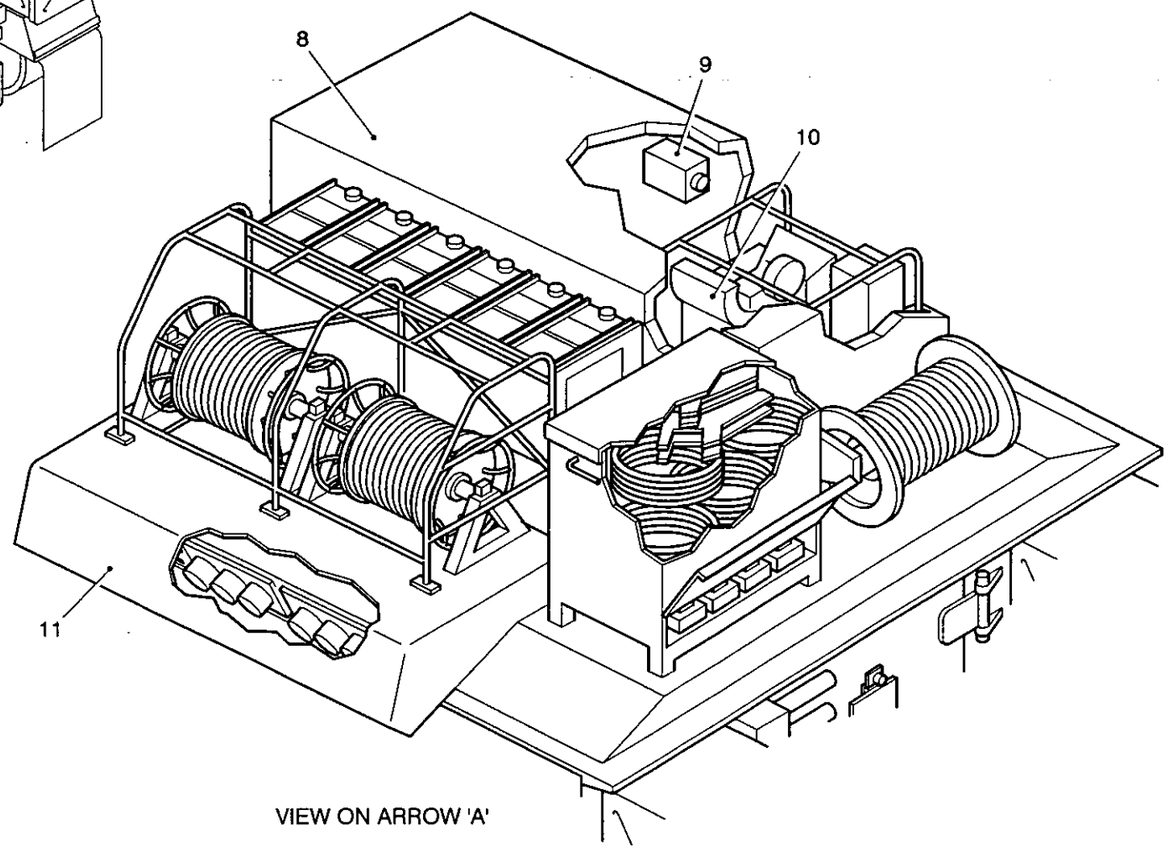


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Fig 2 SAS/MC Installation Equipment

CHAPTER 4

ENVIRONMENTAL CONTROL SYSTEM (FV439 SAS/MC ONLY)

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INTRODUCTION

1 The ventilation control system fitted to the Carrier, Installation, Full Tracked MKs 2 and 2/1 (FV439) Radio Relay is similar to that fitted to all FV430, Vehicles, All Marks. The technical description of the ventilation control system is detailed in AESP 2350-T-250-302.

2 The Carrier, Installation, Full Tracked MKs 2 and 2/1 (FV439) SAS/MC does not only have a ventilation control system, but is also fitted with a Full NBC protection system. The technical description of this system is as follows.

General

3 The NBC system is contained within two main assemblies, the Control box No. 10 Mk 1 (Fig 4) and the NBC pack No. 7 Mk 1 (Fig 3). These units are connected by multi-core cables.

4 The supply for the system is taken from the Distribution panel No. 6 Mk 1 via contact breaker H. An isolating relay RL1 is included in the control box circuit to inhibit the system unless a generator is on line.

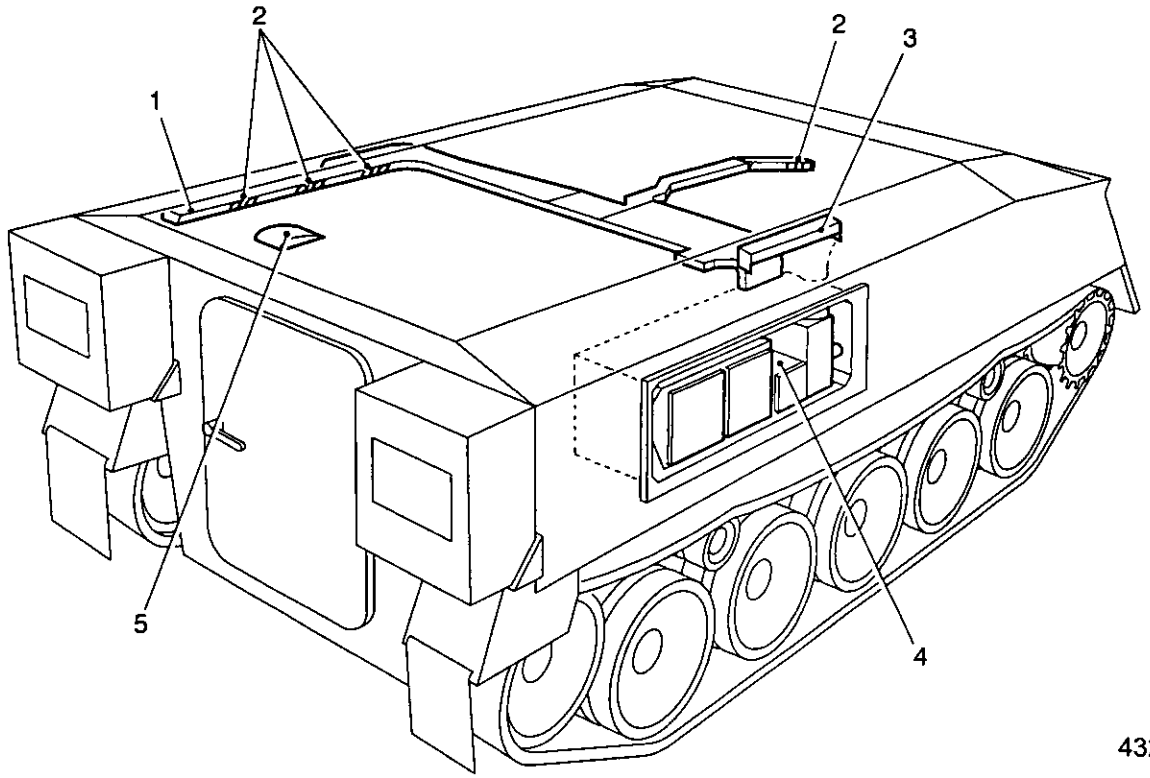
5 A circuit diagram of the system is shown in Fig 2. When the fan speed selector switch SW1 is moved from the OFF position, the rear wafer contacts will energise the isolating relay RL1 which will operate the scavenge fan via TB2W, TB2Y, the scavenge fan circuit breaker and SK1L on the control box.

6 If the selector switch is moved to any of the NBC positions, the NBC relay RL2 will be energised via the centre wafer contacts C1 and D1. The closing of relay contacts 3 and 4 will then supply power to the NBC fan via SK1X.

7 Setting the selector switch to any of the VENT positions will similarly operate the vent fan by energising the vent relay RL3 and supplying power via SK1W.

8 The speed of the NBC and vent fans is controlled by the front wafer of SW1, which introduces resistors into the field windings of the motors via SW1G and SW1M, as the switch is rotated.

9 The NBC air filtration system (Fig 1) is provided to both ventilate the interior of the vehicle under normal uncontaminated conditions and to protect the crew from nuclear fallout and bacteriological or chemical attacks.



1 Ducting
2 Diffusers
3 Armoured air intake
4 NBC/Ventilation pack
5 Armoured air outlet from vehicle pressure relief valve

Fig 1 NBC/Ventilation system, diagrammatic

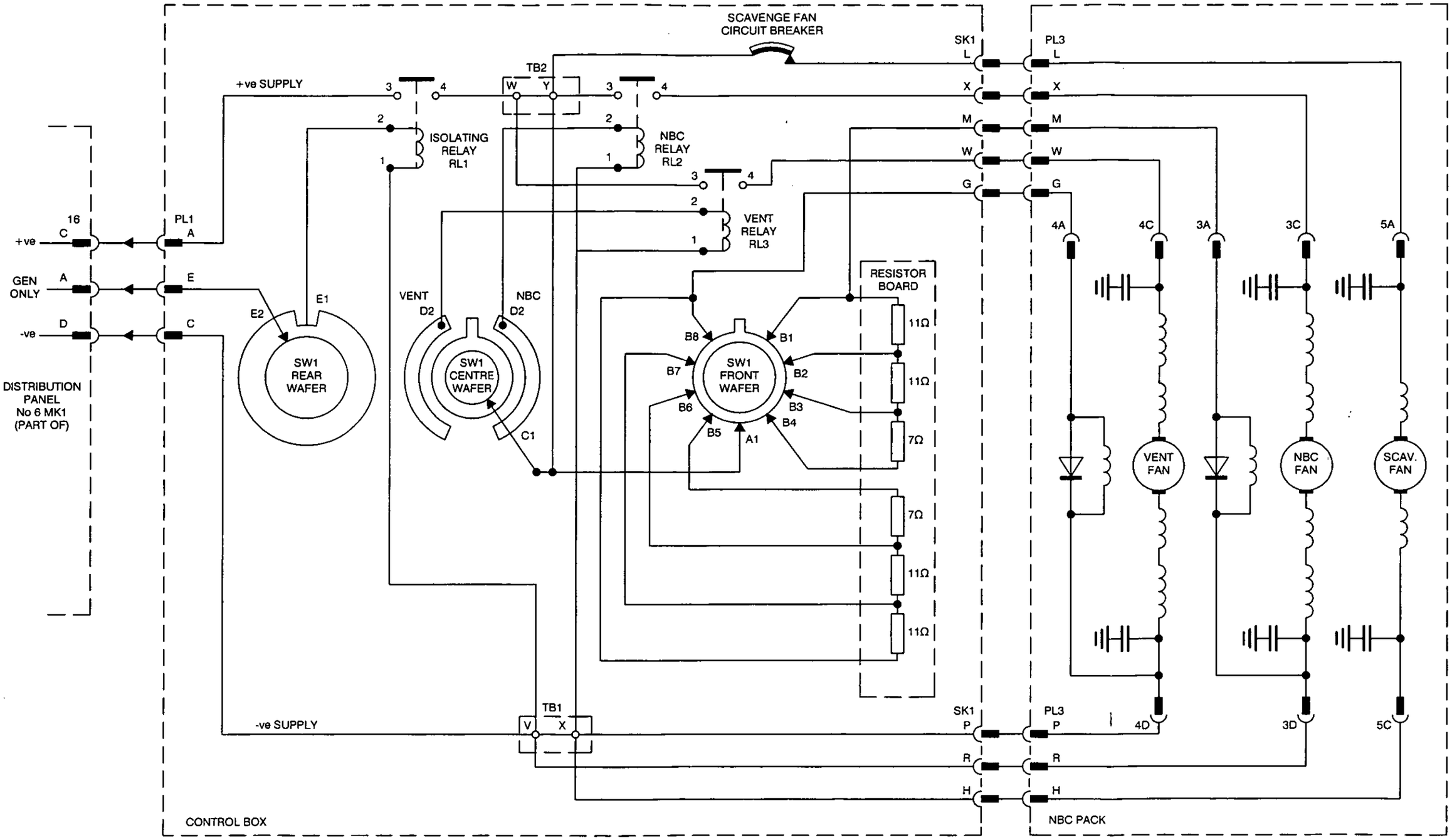


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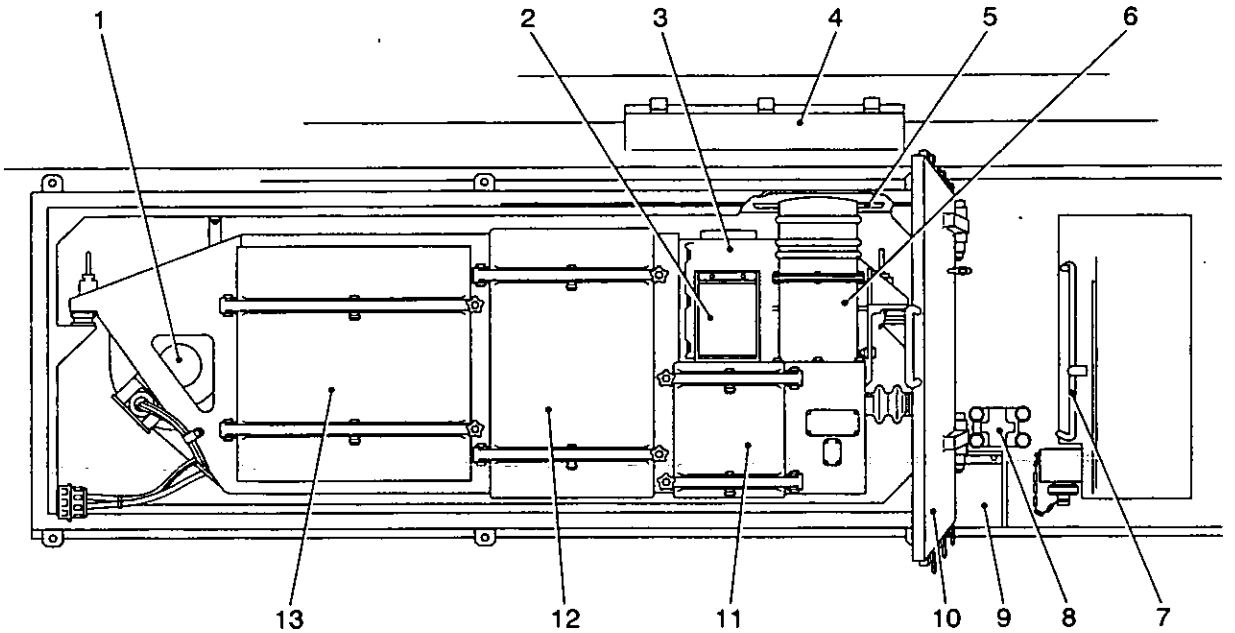
Fig 2 NBC System Circuit Diagram

10 The NBC pack, No. 7 Mk 1, (Fig 3) is mounted within a compartment set in the right side of the vehicle. A hinged armoured access door (10)) forms the outer side of the compartment and is secured by captive bolts.

11 The pack consists of a ventilation fan (3), an NBC fan (1), a scavenge fan and four separate stages of filtration.



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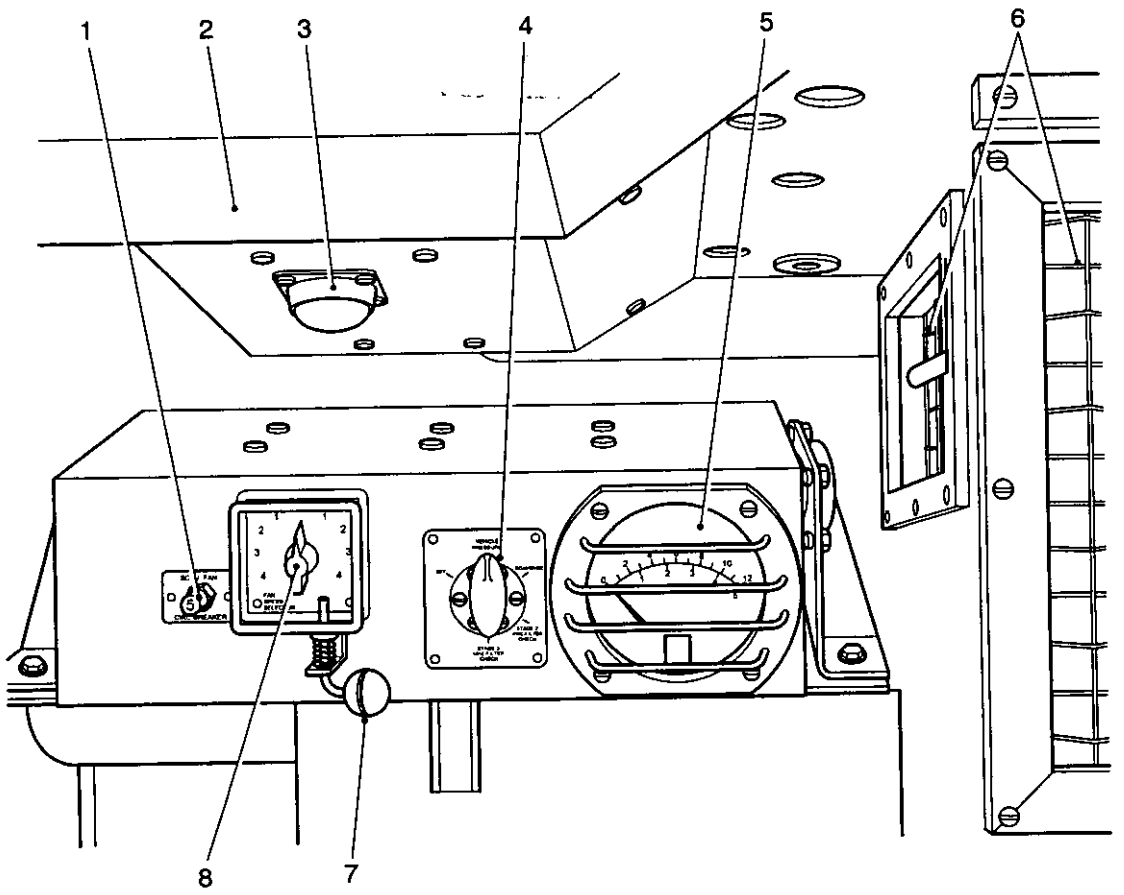
1	NBC fan	6	First stage (CYCLONE) filter	10	Armoured door
2	Vent fan outlet flap valve	7	Stay bar	11	Second stage (PRE) filter door
3	Vent fan	8	Scavenge fan outlet	12	Third stage (UHE) filter door
4	Armoured air intake	9	Rubber flap, over fire extinguisher handle	13	Fourth stage (AV) filter door
5	Outlet from the NBC/ Vent pack to the vehicle interior				

Fig 3 NBC No. 7 Mk 1

12 Mounted inside the vehicle is the control box (Fig 4) containing a fan speed selector switch (8) and a differential pressure gauge (5) with its selector rotary valve (4).



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1	Scavenge fan circuit breaker	4	Pressure differential gauge selector knob	6	ACU ducting louvres
2	NBC/Ventilation ducting	5	Pressure differential gauge	7	Safety catch
3	NBC/Ventilation diffuser			8	Fan speed selector switch

Fig 4 NBC control box

13 Fitted in the vehicle roof is a pressure relief valve (Fig 5), which permits spillage of excess air to the atmosphere.

14 The NBC pack comprises a sheet metal prefabricated casing of welded assembly. Bolted to the casing are four main assemblies and housed in three apertures in the casing are the filter units.

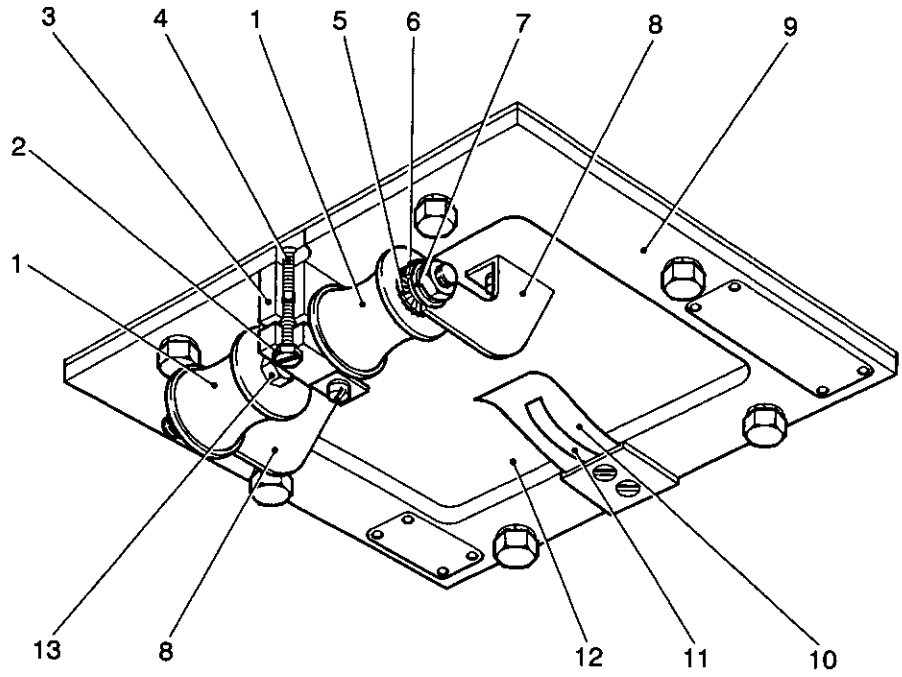
15 The four assemblies are, the NBC fan support assembly, the vent fan support assembly, the scavenge fan assembly and the cyclone pack.

16 The NBC fan support assembly is a cast aluminium frame on which is bolted the NBC fan. The frame forms the mounting point for one end of the pack and has a lifting eye screwed into a boss between the two securing boltholes.

17 The mating faces of the NBC fan support assembly and the pack casing are sealed to prevent leakage of air between the two assemblies.

18 The vent fan support assembly is bolted to the opposite end of the pack casing from the NBC fan support assembly and is sealed to the casing to prevent leakage of air. The assembly consists of a cast aluminium frame with the vent fan bolted onto it. The frame forms the other mounting point for the NBC pack and has a lifting eye screwed into a boss between the two securing bolts holes.

19 Bolted to the pack casing, below the vent fan support assembly motor, is the scavenge fan assembly consisting of cast aluminium frame and the scavenge fan which is bolted to it.



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1	Metalastic rubber spring	6	Plain washer	10	Nylon rubbing strip
2	Clamping screw	7	Single coil spring washer	11	Spring
3	Slotted pillar	8	Hinge bracket	12	Flap valve
4	Pillar mounting screw	9	Flap seating and mounting	13	Bush hexagon
5	Shakeproof lock washer				

Fig 5 Vehicle pressure relief valve

20 The cyclone pack (Fig 3(6)) is bolted onto the casing above and to one side of the scavenge fan. The cyclone pack is sealed to the casing to prevent air leakage and the lower part of the casing has a stub pipe welded to the side nearest the scavenge fan. This stub pipe is joined to the scavenge fan inlet using a flexible hose secured at either end with a hose clamp. The scavenge fan outlet connects to a pipe in the front of the NBC compartment using flexible bellows secured with a hose clamp at either end.

21 Flexible bellows are used to connect the armoured inlet (4) in the top of the NBC compartment to the inlet of the cyclone pack. The top of the bellows is circular to fit the connection in the top of the NBC compartment to which it is secured using a hose clamp. The bottom of the bellows is of rectangular section, which is secured to the cyclone pack using a clamping place, and bolts.

22 The NBC pack is supported on resilient mountings by the use of a rail at either end of the pack, which enables the pack to be withdrawn from the compartment. By attaching a sling to the two lifting eyes or by supporting the pack on a forklift it can be removed for servicing or repair.

23 The NBC pack is bonded to the vehicle by a bonding strip fitted from the top of the NBC fan support casting to the top of the NBC pack compartment. Because jointing compound and gaskets are used to seal all the major components to the pack casing, bonding strips are fitted between the casing and the NBC fan support assembly, the vent fan support assembly and the scavenge fan assembly.

Filters

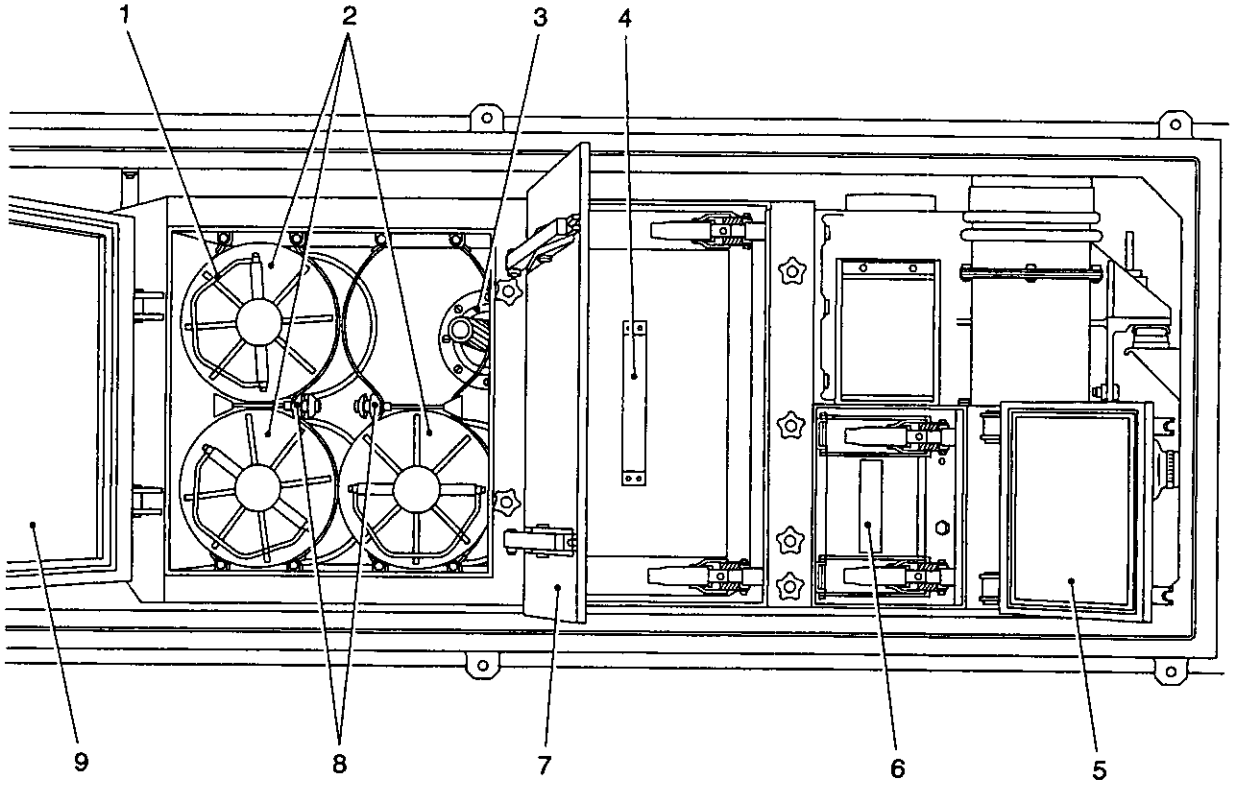
24 The first filtration stage consists of cyclone separator pack bolted to the top front end of the NBC pack casing. The outer casing encloses eleven tubes with swirl vanes fitted in their upper ends. Mounted inside the lower ends of the tubes are conical tubes with a space between the two tubes. Air is drawn through the tubes and as it passes over the swirl vans a rotary motion is imparted to the airflow. Heavy dust particles are thrown outwards under the influence of centrifugal forces and pass down between the two tubes to the bottom of the unit where the scavenge fan extracts the dust particles and passes them to the atmosphere. The air in the tube centre now depleted of dust particles passes through the centre of the conical tubes and on to the second stage filter.

Second stage filter

25 The second filtration stage is the two-layer synthetic fibre pre-filter element assembly (Fig 6(6)). The pre-filter element is housed in a rectangular sheet metal frame with expanded wire mesh screens either end. The element is a two-layer synthetic fibre pleated cloth, with corrugated PVC separators, which stiffen the folds.

26 The pre-filter assembly is clamped to the second/third stage bulkhead by means of a frame and two toggles. The seal with the bulkhead is made by an expanded silicone rubber gasket fixed to the outer face of the filter.

27 The pre-filter clamp frame is centrally pivoted on the two clamp assemblies to distribute the load evenly when securing the filter position. The filter can be removed and cleaned when it becomes clogged.



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1	Carrying handle	5	Second stage (PRE) filter door	8	Filter clamp hand nuts
2	Fourth stage (AV) filters	6	Second stage (PRE) filter handle	9	Fourth stage (AV) filter door
3	O-ring seal	7	Third stage (UHE) filter door		
4	Third stage (UHE) filter handle				

Fig 6 NBC/Ventilation filters

Third stage filter

28 The third stage filter (4) is the first of the two critical NBC filtration stages and is the ultra high efficiency (UHE) particulate filter.

29 The UHE filter contains a pleated length of glass fibre paper material that is inside a sealed unit. This filter cannot be cleaned and if damaged cannot be repaired, therefore, damaged or clogged filters must be replaced.

30 The filter unit must be handled with care to avoid damaging the glass fibre filtration material inside and the expanded silicone rubber gasket fitted on the outlet side of the filter unit. The third/fourth stage bulkhead is a machined casting sealed to the steel casing with a gasket and secured by bolts through the steel casing. The filter unit is clamped to the bulkhead by a clamping arrangement similar to that used on the second stage filter and a seal is formed by the gasket on the outlet side of the filter.

Fourth stage filter

31 The fourth filtrations stage comprises four removable cylindrical anti-vapour (AV) filters (2) and forms the second critical NBC filtration stage. The filters use activated charcoal packed between inner and outer finely perforated sleeves capped at either end to form a cylinder. One end cap has a centrally disposed air passage, which is threaded for filter mounting purposes. The other end cap has a carrying handle (1), which is also used for hand tightening when fitting onto the mounts.

32 The AV filters are located in the rear compartment of the NBC pack casing. Bolted to the back of the compartment are four perforated conical mounting spigots with an external thread at their base. The AV filters are positioned over the spigots and screwed onto the threads until hand tight. An O-ring (3) seated in a groove in the facing of each spigot base, seals the filter end cap to the spigot base and prevents air from by-passing the filter.

33 The carrying handle ends of the filters are secured in metal bane clamps, which are secured by hand nuts (8). The bands support and also prevent the filters becoming unscrewed.

34 Air flow is radially inwards through the outer finely perforated sleeves, there being a tendency for the flow to be distributed throughout the filtration media due to the presence of the perforated cones. The air passes through the base of the cones into the chamber formed at the rear of the NBC pack casing and onto the NBC fan inlet.

35 The filters cannot be cleaned and if the charcoal requires changing the filter must be removed for re-filling. The AV filters must not be exposed to vapours from the pain, Benzine, CTF etc, because they seriously shorten the useful life of the filter.

Filter access doors

36 Access to the filters is by opening the appropriate filter door, which has a seal on the face those mates with the pack casing. The cast aluminium doors ((5), (7) and (9)) are supported on two arms that are secured to the casing by pivot pins, washers and split cotter pins. The arms are secured, when the doors are shut, with tow hand nuts and swing bolt assemblies. The doors pivot on the arms at the central position allowing the doors to seal with an evenly distributed load when the hand nuts are tightened.

Pressure sensing points

37 Pressure sensing points are provided on the NBC pack to enable the pressure differential across the filters to be checked using the control panel rotary valve and pressure gauge. These sensing points are fitted at the following positions:

37.1 Scavenge fan inlet on the rubber elbow through a tube insert and elbow fitting.

37.2 Pre-filter inlet through bulkhead coupling and elbow fitting at back of NBC pack casing.

37.3 UHE filter inlet through bulkhead coupling and elbow fitting at back of NBC pack casing.

37.4 UHE filter outlet through bulkhead coupling and elbow fitting at back of NBC pack casing.

37.5 An ambient air pressure tapping is supplied through a hole in the vehicle roof in front of the armoured air intake for the NBC pack.

38 These five sensing points are connected by colour coded nylon tubes to the rotary valve on the control panel. The nylon tubes from the NBC pack pass through the rear of the NBC pack compartment by the use of four bulkhead couplings.

Fans

39 The three fans used in the NBC pack are the vent fan, NBC fan and scavenge fan. All are supplied with 28.5V dc from the control box - inside the vehicle through harnesses via bulkhead connectors fitted in the rear of the NBC compartment.

40 The fans are all of unit construction with a centrifugal fan being driven by a 28.5V dc motor. The vent and NBC fans are of identical construction.

Scavenge fan

41 The scavenge fan operates in both the vent and the NBC conditions and draws the dust particles from the cyclone pack and passes it to the atmosphere.

42 The fan is of unit construction with a 3.8in. diameter impeller mounted direct onto the shaft of a 28.5V dc motor and is enclosed in a volute casing.

43 The direction of rotation is anti-clockwise viewed from the inlet side of the impeller.

44 The fan is bolted on the forward left side of the NBC pack casing. The outlet from the cyclone pack is connected by a rubber elbow and two hose clamps to the scavenge fan intake. The outlet from the scavenge fan is connected, using rubber bellows and two hose clamps, to the stub pipe in the front end of the NBC pack compartment. The stub pipe is welded into the bulkhead and passes through the side plate to atmosphere. This outlet is protected by a scavenge outlet block with a threaded outlet facing downwards. Adjacent to the outlet is a stowage block, which houses a screwed plug. The screwed plug is secured to the vehicle side by a short length of chain. The plug is to be screwed into the scavenge outlet when washing down the vehicle.

Vent fan

45 The vent fan is of unit construction with a 5.1in. diameter centrifugal impeller mounted direct onto the shaft of a 28.5V dc motor and enclosed in a volute casing. The direction of rotation is anti-clockwise when viewed on the inlet to the impeller.

46 Four bolts secure the vent fan to the aluminium casting which forms the support frame for the forward end of the NBC pack

47 Both inlet and outlet apertures are sealed with neoprene seals fitted to the fan before bolting the fan to the casting.

48 The outlet has a polythene, flap type, non-return valve (Fig 3(2)) bolted to the casting on the opposite side to the fan.

49 When the vent fan support assembly is secured to the NBC pack casing the vent fan inlet seat presses against the casing between the second and third stage filters.

50 When the fan is running it draws air through the cyclone pack and pre-filter and blows it through the non-return valve at the fan outlet into the NBC pack compartment. From the compartment the air passes through the vent ducting (Fig 1(1)) and diffuser nozzles (2) into the vehicle or direct to the personal respirators through the hose adaptors in the vent ducting. The air pressure in the NBC compartment forces the NBC fan non-return valve to shut and prevents air passing back through the NBC fan and filters.

NBC fan

51 Identical to the vent fan in construction the NBC fan is mounted at the rear of the NBC pack. Four bolts secure the fan to the aluminium frame that forms the rear support for the NBC pack. Sealing the inlet and outlet apertures is the same as for the vent fan and the outlet is fitted with the same polythene, flap type, non-return valve.

52 The fan draws air through the cyclone pack, pre-filter, UHE filter and the AV filters and blows the air through the non-return valve into the NBC pack compartment. The air pressure in the compartment forces the non-return valve of the vent fan shut.

53 Air from the NBC compartment passes through holes (Fig 3(5)) in the top near the front end of the compartment and into the vent ducting to the interior of the vehicle or respirators as required.

Control box

54 The controller consists of a box with a front panel on which is mounted a 5 amp circuit breaker, fan speed selector switch, switch guard, vehicle pressure switch and a differential air pressure gauge. Electrical and pneumatic connections to the box are via connectors at the sides. When these are detached the box can be removed for repair or component replacement, by releasing the two screws on each side of the box. The control box operates on 28-30 volts dc supply to input plug 1, +ve to pins A and E, -ve to pin C (See Circuit Diagram Fig 2). The isolating relay is operated by the fan speed selector switch, selecting Vent or NBC positions 1 to 4 or 5 to 8. This operates the Vent or NBC relay whichever is selected, operating relay RL1 that feeds the 5-amp circuit breaker for constant speed Scavenge fan. Speed control of Vent and NBC fans is by the selector switch position 2, 3, 4 for NBC and 6, 7, 8 for vent fan through the selected resistors on the resistor board to output socket 1. The vehicle pressure switch is a pneumatic valve, see Fig 3 for connection, and the differential pressure gauge is calibrated 0-5 inches water gauge (0-12.5 millibars). It is coupled by the position of the selector valve to the pressure vents over which the pressure difference is to be monitored. The No. 10 Mk 1 control box is mounted on anti-vibration mountings and brackets to the top forward left side of the NBC bulkhead inside the vehicle. The control box is connected via a harness to the vehicle electrical distribution box. The NBC pack is connected by nylon tubes to the NBC assembly, control pack assembly and the vehicle roof.

Description

55 The control box comprises the following:

55.1 Vent/off NBC fan speed selector switch (Fig 4(8)).

55.2 Differential pressure gauge (5).

55.3 Selector knob (4) for monitoring pressure differentials across filter stages of the NBC pack.

55.4 Circuit breaker (1) for protection of the scavenge fan.

55.5 Two fixed electrical connectors.

55.6 Five colour coded pressure connectors.

56 The fan speed selector switch cannot be switched to the vent position unless the spring-loaded safety catch (7) beneath it has first been pulled down. This is a safety precaution against the possibility of air that is only partially filtered air entering the vehicle from a contaminated environment.

Dismantling

CAUTION

Ensure that the battery supply is switched OFF before disconnecting any plug or sockets.

57

57.1 Remove the two screws from each side of the control box and remove front panel.

57.2 Remove four retaining screws and remove bottom lid.

57.3 Remove four retaining screws and withdraw resistance panel to the full extent of the leads.

57.4 No special dismantling instructions are required for the removal of the remaining components.

58 The differential pressure gauge is used to indicate the depression at the scavenge fan inlet and the vehicle internal air pressure. The NBC pack second and third stage filters condition can be indicated by the measurement of the pressure drop across them. These various pressures are fed to the differential pressure gauge via a rotary valve referred to as the selector switch.

59 The pressure gauge is calibrated from 0-12.5 millibars (0-59in. water gauge).

Pressure relief valve

60 A pressure relief valve (Fig 5) is fitted in the vehicle roof under an armoured cover adjacent to the rear vehicle door.

61 The valve ensures an adequate supply of air to the vehicle interior by permitting spillage of excess air to the atmosphere. This occurs particularly during vent operations when, due to the lower flow restriction resulting from only the first two filtration stages, a higher air flow is induced by the vent fan.

Description

62 The valve seating and mounting (9) is a rectangular plate frame bolted to and overlapping the aperture in the roof. The flap valve (12) is secured by the tow hinge brackets (8) and metalastic rubber springs (1) to a pillar (3) secured to the front edge of the seating and mounting plate frame.

63 A gasket is interposed between the frame and roof and another between the frame and flap valve. These gaskets seal the aperture in the roof when the valve is shut by the rubber springs.

64 Mounted on the opposite side to the hinge is a nylon rubbing strip (10) with a flat spring (11) pressing it into contact with the flap valve. The rubbing strip opposes the rubber springs shutting action and prevents the flap valve banging shut onto the valve seat gasket.

65 The spindles of the rubber springs screw into either end of a bush which passes through a split hole in the mounting pillar. The bush can be rotated to increase or decrease the operating pressure of the valve and can be secured in the desired position by clamping screw (2) through the split in the mounting pillar. The bush has a hexagon on one end, for use when adjusting the spring tension, the opposite end is drilled through, after screwing in the spindle, and a split cotter pin is fitted to retain the spindle.

Valve setting

66 On initial installation the rubber springs are rotated through 25° and the clamping screw tightened.

67 The final pressure setting of 7.5millibars (3in. standard water gauge) is obtained by pressurising the vehicle and adjusting the rubber springs tension. This is done by releasing the clamping screw, and using a spanner on the hexagon (13) rotate the bush until the desired pressure is reached then tighten the clamping screw.

Assembling

68 Assemble in the reverse order to dismantling.

Testing

69

NOTES

(1) Check that plug 1 has a supply of 28-30 volts dc, before removing control box.

(2) Unit, field and base repairs to control box No. 10 Mk1 are permitted only when a serviceable vehicle is available to test the repaired unit in Situ.

Continuity testing

69.1 Using a suitable multimeter, checks are to be carried out using Table 1 and Fig 2.

Insulation testing

69.2 Test the insulation resistance with all circuits paralleled. Resistance should not be less than 5 MΩ when measured at 250V dc.

69.3 Place the control box in a serviceable vehicle and functionally test it as part of the NBC ventilation system.

Pneumatic testing

69.4 Check for damage to connection unions, pneumatic loom, losses connection, blocked piping or if any air connections unions are disturbed they should be tightened firmly but care should be taken not to over tighten.

69.5 Individual components of the inner assembly are replaceable (AESP 2350-T-251-711 Annex B refers).

69.6 Place the control box in a serviceable vehicle and functionally test it as part of the NBC ventilation system.

TABLE 1 TESTING OF CONTROL BOX No. 10 Mk 1

Serial (1)	Test (2)	Results (3)
1	Check resistance from terminal 4 on relays 1, 2 and 3 to terminals L, X and W in turn.	All should be less than 0.50 ohms.
2	Check resistance from terminal 4 on relay 1 to terminal M on socket 1 and terminal 2 on relay 2 with switch in NBC speed 1 position.	All should be less than 0.50 ohms.
3	Check resistance from terminal 4 on relay 1 to terminal 2 on relay 3 and terminal G on socket 1 with switch set to VENT speed 1 position.	Both should be less than 0.50 ohms.
4	Check resistance from terminal 4 relay to terminal M on socket 1. Selecting speed 2 NBC Selecting speed 3 NBC Selecting speed 4 NBC	 Speed 2 11 ohms ± 1.50 ohms Speed 3 22 ohms ± 1.50 ohms Speed 4 29 ohms ± 1.50 ohms
5	Check resistance from terminal 4 relay to terminal G on socket 1. Selecting speed 2 VENT Selecting speed 3 VENT Selecting speed 4 VENT	 Speed 2 11 ohms ± 1.50 ohms Speed 3 22 ohms ± 1.50 ohms Speed 4 29 ohms ± 1.50 ohms
6	Apply (28 volts) -ve to C and +ve to terminals A and E on plug 1 with switch in OFF position test terminals R, H, P, G, M, X, L and W socket 1 from terminal 3 on relay 1.	Terminals R, H and P should be 28 volts, all other terminals should be zero.
7	Apply (28 volts) -ve C and +ve to terminals A and E on plug 1. With the switch in the speed 1 NBC. Relays No. 1 and 2 should close. Test terminal M, X and L socket 1 from terminal X on terminal block. TB1	All should be, with respect to +ve 28 volts.

TABLE 1 TESTING OF CONTROL BOX No. 10 Mk 1 (continued)

Serial (1)	Test (2)	Results (3)
8	Apply 28 volts -ve to C and +ve to terminals A and E on plug 1. With the switch in the speed 1 VENT. Relays No. 1 and 3 should close. Test terminals G, L and W on socket 1 from terminal X on terminal block.	All should be with respect to +ve 28 volts.

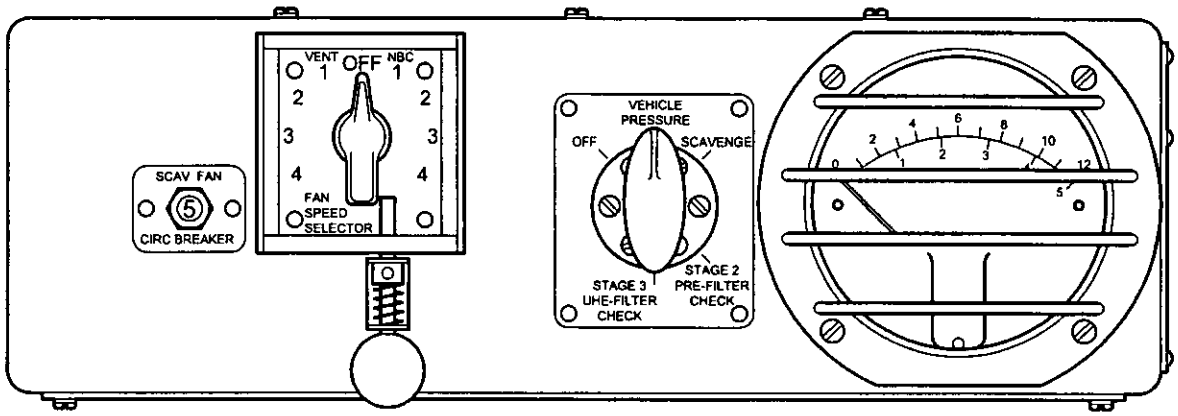

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Fig 7 View of front panel of control box No. 10 Mk 1

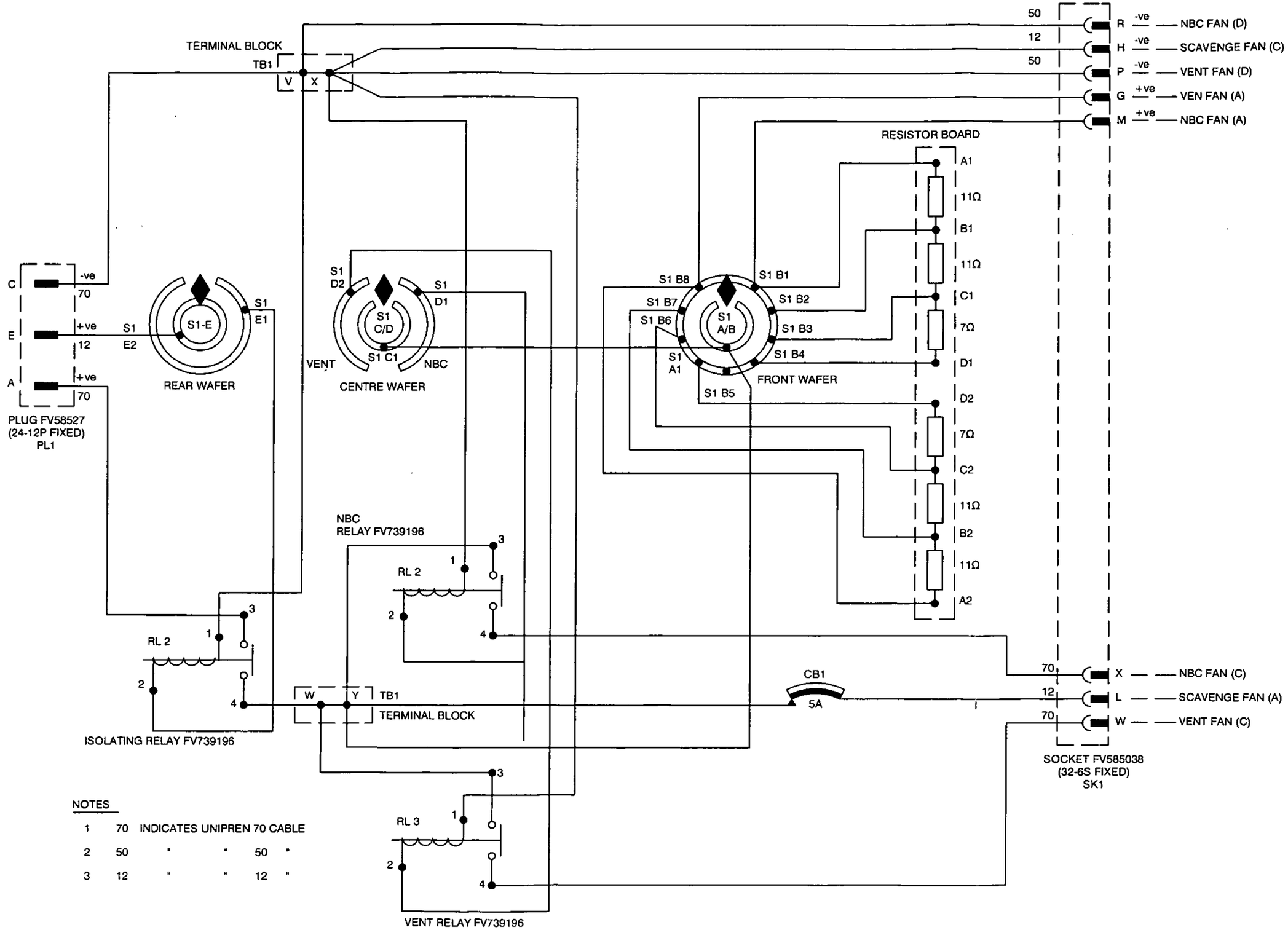

Fig 8 Wiring diagram

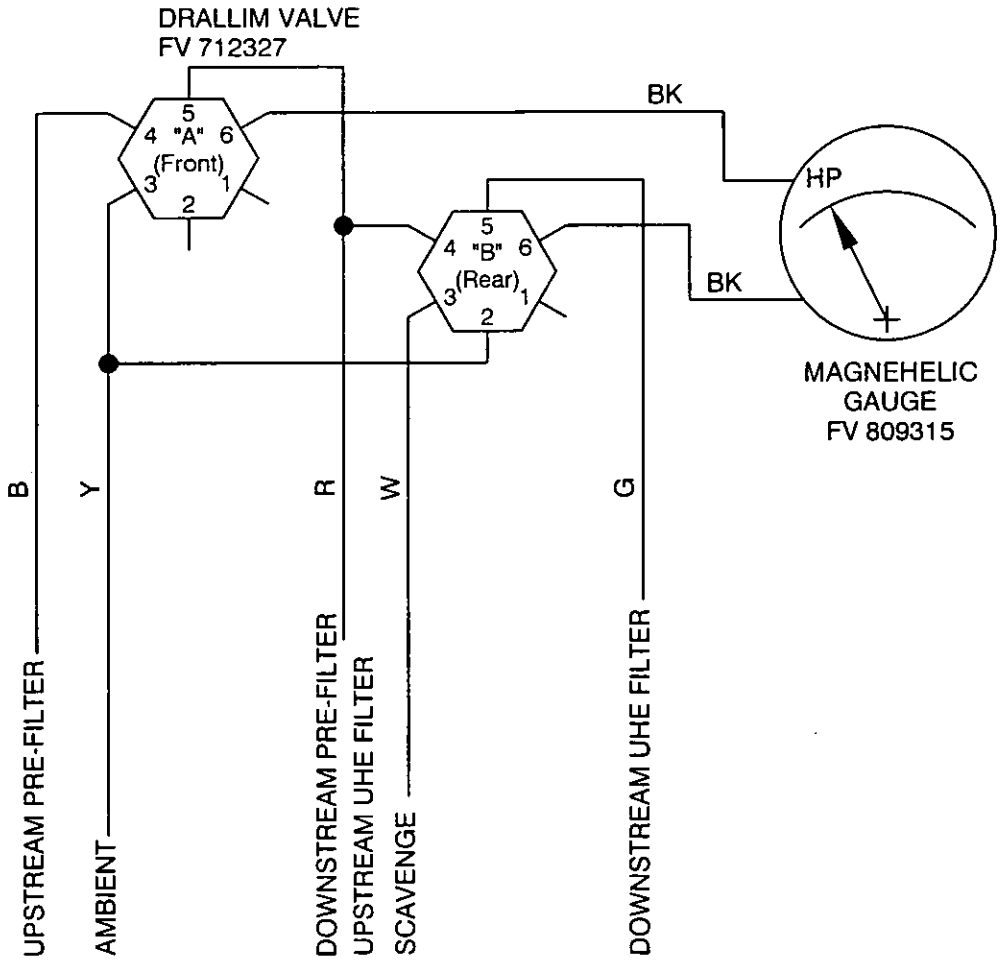

Fig 9 Pneumatic circuit diagram

CHAPTER 5

ELECTRICAL EQUIPMENT

CONTENTS

Para

1 General
Control Box, No. 10 Mk 1, FV 809352
3 General description

Fig

1 View of front panel of control box No. 10 Mk 1 1
2 Pneumatic circuit diagram 2
3 Wiring diagram of control box No. 10 Mk 1 3

GENERAL

1 The electrical system for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439 SAS/MC) is identical to that used in the FV430 Series, Vehicles, All Marks with the exception of the NBC system and special to role equipment (Para 2 refers).

2 The technical description of special to role equipment can be found in the following publications:

2.1	AESP 5895-H-514-302	Secondary access switch/message centre (TKD) in AFV439
2.2	AESP 5895-H-514-304	Secondary access switch/message centre (TKD) in AFV439
2.3	AESP 5895-H-515-302	Radio relay installation in carrier full TKD FV439
2.4	AESP 5895-H-515-304	Radio relay installation in carrier full TKD FV439

CONTROL BOX, NO. 10 MK 1, FV 809352

General description

3 The control box No 10 Mk 1 consists of a box with a front panel on which is mounted a 5 amp circuit breaker, fan speed selector switch, switch guard, vehicle pressure switch and a differential air pressure gauge.

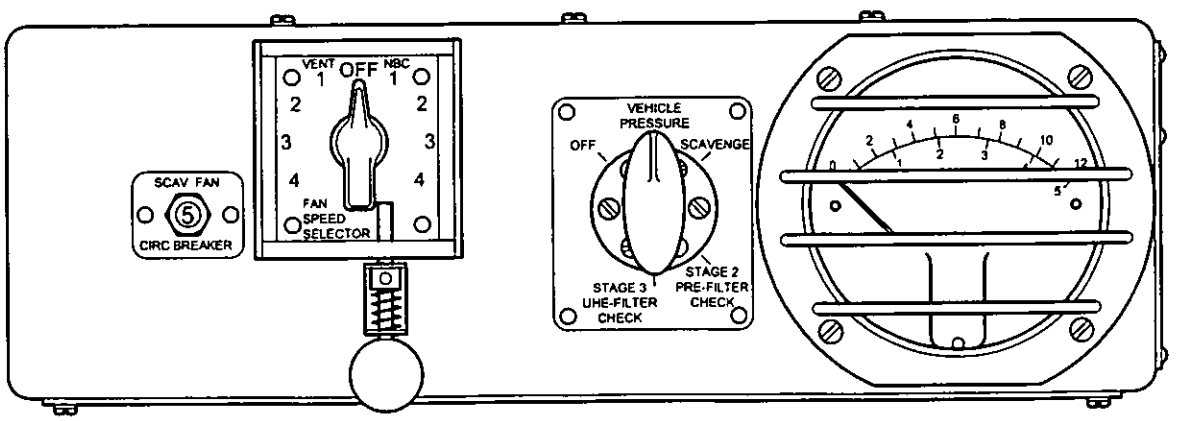

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Fig 1 View of front panel of control box No. 10 Mk 1

4 Electrical and pneumatic connections to the box are via connectors at the sides.

5 When these are detached the box can be removed for repair or component replacement, by releasing the two screws on each side of the box.

6 The control box operates on 28-30 volts dc supply to input plug 1, +ve to pins A and E, -ve to pin C (Circuit Diagram Fig 3 refers).

7 The isolating relay is operated by the fan speed selector switch, selecting Vent or NBC positions 1 to 4 or 5 to 8. This operates the vent or NBC relay which ever is selected, operating relay RL1 that feeds the 5-amp circuit breaker for constant speed Scavenge fan. Speed control of vent and NBC fans is by the selector switch position 2, 3, 4 for NBC and 6, 7, 8 for vent fan through the selected resistors on the resistor board to output socket 1.

8 The vehicle pressure switch is a pneumatic valve, for connection, and the differential pressure gauge is calibrated 0-5 inches water gauge (0-12.5 millibars). It is coupled by the position of the selector valve to the pressure vents over which the pressure difference is to be monitored.

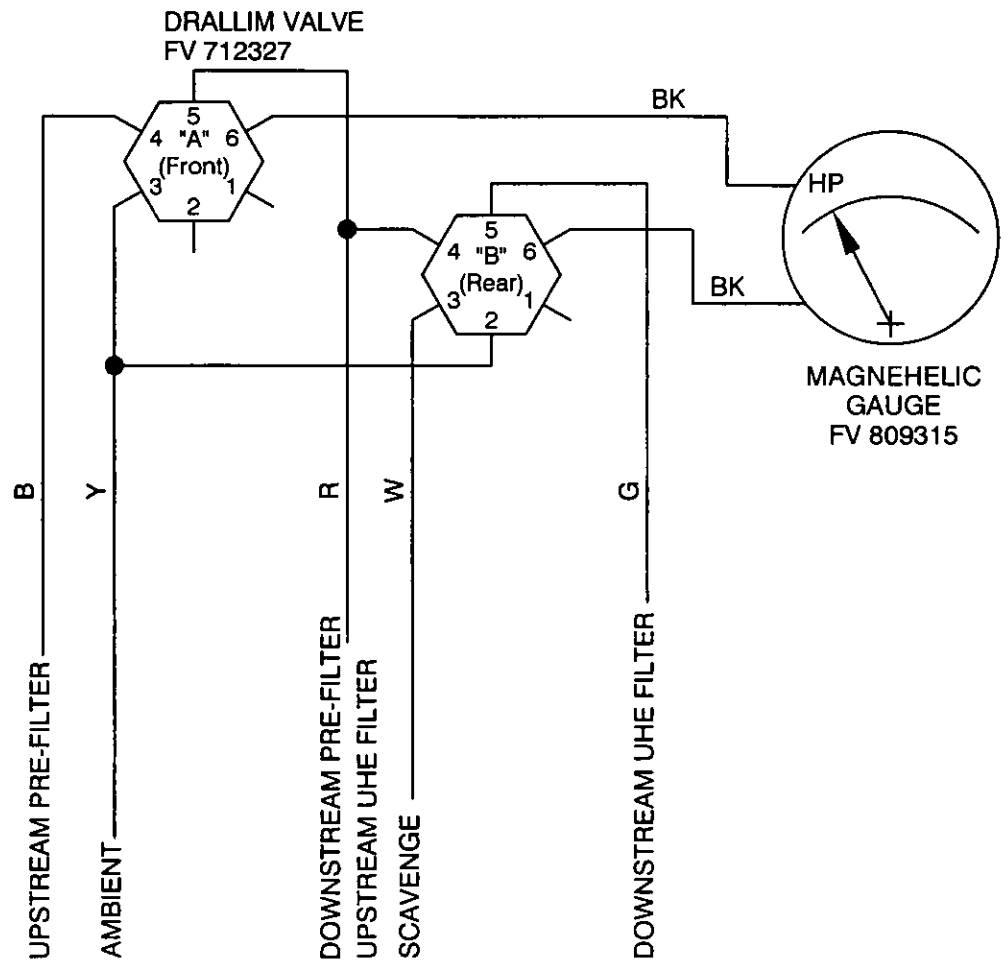

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Fig 2 Pneumatic circuit diagram

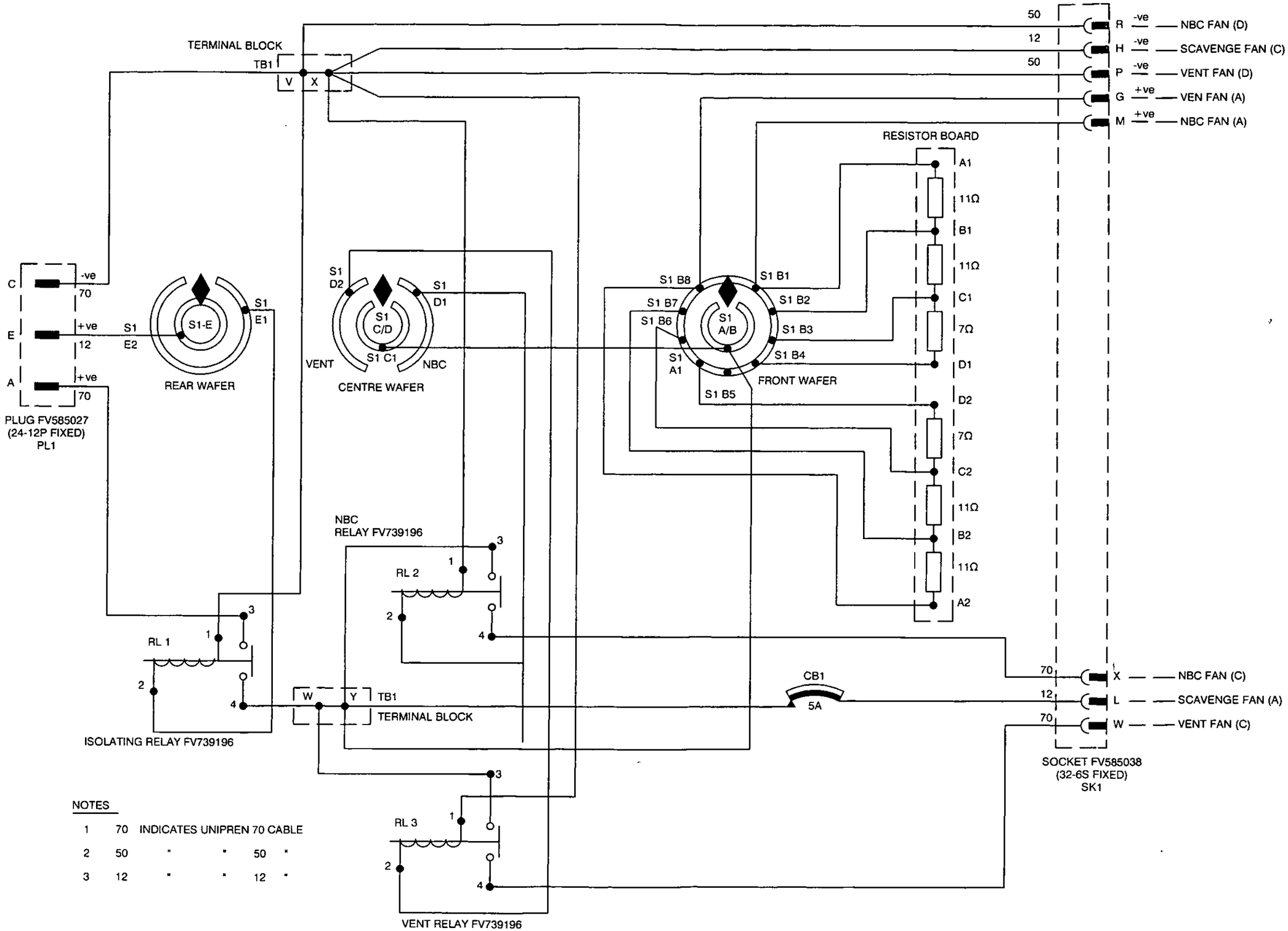

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Fig 3 Wiring diagram of control box No. 10 Mk 1

CHAPTER 6

SPECIAL TO ROLE EQUIPMENT

CONTENTS

Fiche No.	Frame	Para	
3	C2	1	General

GENERAL

1 The special to role equipment for the Carrier, Installation, Full Tracked, MKs 2 and 2/1 (FV439) is detailed in the technical publications listed below.

2 For technical description of the installations refer to:

2.1	AESP 5895-H-514-302	Secondary access switch/message centre (TKD) in AFV439
2.2	AESP 5895-H-514-304	Secondary access switch/message centre (TKD) in AFV439
2.3	AESP 5895-H-515-302	Radio relay installation in carrier full TKD FV439
2.4	AESP 5895-H-515-304	Radio relay installation in carrier full TKD FV439
2.5	AESP 6115-G-251	Generator set diesel engine driven DC 3KW 28V

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