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A. J. Mee
Publications Officer

A.P. 4099 E & G
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1st. EDITION, DECEMBER, 1958

Superseding

A.P. 4099 E & G, Vol. 4, Pt. 5

1st. Edition, July, 1957

REMOVAL AND INSTALLATION AND CHANGE OF ROLE SERVICING SCHEDULE

VAMPIRE F.B. MKS. 5 & 9

WITH
ONE GOBLIN 2 ENGINE

PROMULGATED BY COMMAND OF THE AIR COUNCIL.

h. J. Dean.

AIR MINISTRY



A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS 5 & 9 AIRCRAFT
1st. Edition, December 1958

AMENDMENT RECORD CERTIFICATE

The incorporation of an Amendment List in this publication is to be recorded by entering full details in the columns of the certificate.

Amendments are to be inserted in strict numerical sequence, the only permitted exception to this rule being when a 'Non-availability Slip' for a particular amendment is issued. This certificate is for official AIR MINISTRY A.L.'s only.

A.L. No.	A.L. MONTH AND YEAR OF ISSUE	AMENDMENT INCORPORATED SIGNATURE	DATE OF INCORPORATION
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2	November 1959	Klaus.	29. 5. 61
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(8362)(2)

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958

INTRODUCTION

1. This Servicing Schedule constitutes the 1st Edition of A.P.4099E & G Vol.5 Pt.5 Servicing Schedule for the Vampire F.B. Mks. 5 & 9 Aircraft and was produced by C.S.D.E.
2. The Schedule is divided into 3 sections as follows:-

SECTION 1 gives in correct sequence the operations considered necessary when removing and installing aircraft components in Vampire F.B. Mks. 5 & 9 Aircraft. When necessary the preparation prior to installation is covered in Part 6 of this Volume (Bay Servicing Schedule). In addition, the schedule is complementary to Parts 3 and 4 of this Volume (Aircraft Servicing Schedules) in that provision is made for attention to certain components inaccessible at normal servicing periods and which do not, therefore, receive the routine servicing normally covered by the latter publication.

SECTION 2 gives in correct sequence the operations considered necessary when removing and installing equipment that changes the role of the aircraft.

SECTION 3 contains the Supplementary Servicing required to sustain the role equipment in use in a serviceable and airworthy condition.

AMENDMENTS

3. No amendments other than the official A.M. amendments produced by C.S.D.E. are to be inserted in the schedule.
4. Amendments to the technical content necessitated by Modifications, Servicing Instructions, geographical, climatic or operational necessity may, if approved by Command Headquarters, be inserted by users on Supplementary Sheets.
5. The additional work inserted on Supplementary Sheets by Command is only to be forwarded to C.S.D.E. when it has universal application.

SCHEDULE NOTES

6. No instructions contained in this schedule is to be interpreted as absolving personnel from the responsibility of acquainting themselves with, or acting upon any circumstances indicating the need for additional servicing.
7. Tradesmen are to sign the relevant aircraft servicing record when completing that portion of the servicing for which they have been detailed.

(8362)(4)

(Continued)

SCHEDULE NOTES (CONTD.)

8. Command Headquarters are to co-ordinate throughout their Command the work indicated by this schedule which is to be kept constantly under review to ensure that:-
- (a) All operations shown by experience to be necessary are included.
 - (b) Servicing no longer considered essential is reported to Command Headquarters.
 - (c) Information given in technical leaflets and other information is included.

GLOSSARY OF TERMS

9. Servicing operations referred to in the text of this schedule are indicated by words having the following meanings, in accordance with A.P.3158, Vol.1, Section 1, Chapter 1:-

(a) Inspect:-

Review the work done by tradesmen to ensure that it has been performed satisfactorily.

(b) Check:-

Make a comparison of measurements of time, pressure, temperature, resistance, dimension or other quantity with a known figure for that measurement.

GLOSSARY OF TERMS (CONTD.)

(c) Test:-	Ascertain whether a component functions correctly by using the appropriate test equipment.
(d) Examine:-	Carry out a visual survey of the condition of an item.
(e) Replenish:-	Refill a tank, bottle or other container to a pre-determined level, pressure or quantity.
(f) Refit:-	Replace an item which has been previously been removed.
(g) Fit:-	Correctly attach one item to another.
(h) Disconnect:-	Uncouple or detach cables, pipelines or controls.
(j) Reconnect:-	Reverse of Operation (h).

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958

LIST OF SECTIONS

Section

- | | |
|---|---|
| 1 | Removal and Installation Schedule - Major Components |
| 2 | Removal and Installation Schedule - Role Equipment (To be issued later if necessary.) |
| 3 | Supplementary Servicing - Role Equipment. (To be issued later if necessary.) |



A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December, 1958

INDEX

SECTION I

Removal and Installation Schedule -
Major Components

Chapter	Title	Sheet No.	No of Sheets
1.	Engine Change		
	Engine N.C.O.	1-11	11
	Engine Man 'A'.	12-24	13
	Engine Man 'B'.	25-36	12
	Electrical N.C.O.	37-45	9
	Electrical Man,	46-54	9
	Instrument Man.	55-57	3



Sheet No. 1
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 6 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

Item
No.

ITEM

OPERATION

(8362)(12)

Sheet No. 2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
 ENGINE CHANGE
 ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
 VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
 1st. Edition, December 1958
 SECTION 1 CHAPTER 1

REF. No.

EQUIPMENT AND TOOLS

	Kits, tool, Engine Fitters((S), to scale A.3,
	A.P.830, Vol.3, Pt.'A'.
1A/3965	Cans, oil replenishing, 2 gallon.
1C/2275	Spanner, O.J., S.E., 1 1/4 in. B.S.W.
1C/2433	Syringe.
1C/8183	Spanner, 'C', adjustable, medium.
1L/59	Spanner, O.J., D.E., 9/16 in. x 5/8 in. B.S.W.
1L/73	Spanner, O.J., D.E., 11/16 in. x 3/4 in. B.S.W.
4G/1019	Trays, drip, 6ft. x 4ft.
4G/2872	Slings, aero engine, Goblin.
4G/3964	Stands, engine, Goblin.
4G/4033	Creepers, servicing.
4G/4342	Mats, mainplane, Type 'C'.
5A/2011	Torches, electric, Type 'C'.
OR	
5A/3908	Torches, electric, Type 'U'.

Required by:-			
NCO	A	B	Total
-	1	1	2
-	-	1	1
-	1	-	1
1	-	-	1
-	-	1	1
-	1	-	1
-	1	-	1
1	-	-	1
1	-	-	1
2	-	-	2
2	-	-	2
1	-	-	1

21C/367	Pails, iron, galvanised.
26FC/5722	Bullet, guide, engine mounting bolts.
26FC/9012	Board, blanking, tail pipe.
26FC/9046	Board, blanking, air intake, port.
26FC/9047	Board, blanking, air intake, starboard.
26FC/9054	Guard, wire, air intake, port.
26FC/9055	Guard, wire, air intake, starboard.
or	(Mk.5 aircraft).
26FC/9057	Guard, wire, air intake, starboard,
	(Mk.9 aircraft).
26FC/9104	Tool, adjusting, cowl ring stirrup.
27F/1951	Priming pump, Ki-gass; Type 40 N.
N.I.V.	Beaker, calibrated.
Loc. Man.	Blanks, air intake, engine.

-	-	1	1
-	2	2	4
1	-	-	1
1	-	-	1
1	-	-	1
1	-	-	1
1	-	-	1
1	-	-	1
1	-	-	1
2	-	-	2
1	-	-	1
2	-	-	2

MATERIALS

N.A.T.O. Code no.

30A/3055	Wire, non-corrodible, 22 S.W.G.
32B/242	Rags, cotton.
34B/9100512	Grease, XG-275.
34B/9100550	Oil, OM-150
34C/9105054	Kerosine.
	Engine oil, specification as
	stated in Form 700G for engine sump.

G-350
O-140
F-58

(8362)(14)

Sheet No. 3
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SAFETY PRECAUTIONS

1. The discharge from the high energy ignition equipment can be lethal. Therefore, before commencing any servicing on the high energy igniter plugs, or on the H.T. wiring, the low tension plug is to be disconnected by the Electrical Man and a period of one minute permitted to elapse. This allows the dissipation of stored capacitor energy and prevents inadvertant discharge. The ignition units are not to be operated with the H.T. leads disconnected. A.D. 5589 is to be displayed.
2. Prior to operation of the nose wheel micro switches ascertain from Armament Man that all stoppages have been cleared and all guns unloaded.
3. Ground running of the engine is to be avoided, wherever possible, under conditions of dense fog and outside air temperatures in the region of 32 degrees Fahrenheit. These conditions can cause overheating of the engine and collapse of the intermediate air intake casings, due to icing up of the air intake guards.



Sheet No. 4
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SERVICING NOTES

1. Inspect all repairs, replacements and modifications carried out.
2. Where any connection are broken, either for routine servicing or repair, inspect reconnections for security of attachment and correct locking.
3. If a mobile crane is to be used ensure that it is available at correct times for engine removal and engine replacement.
4. Ensure Instrument Man is available at correct times for disconnections and reconnections.
5. DAMAGE - 'Examine for damage' in this schedule means an examination to ascertain the the value or usefulness of the item has not been impaired by:-
 - (a) Insecurity of attachment.
 - (b) Cracks or fractures.
 - (c) Corrosion or contamination.
 - (d) Any form of distortion.
 - (e) Loose rivets.
 - (f) Chafing, fraying or scoring.
 - (g) Broken locking.

6. REFLEENISH - The word 'replenish' when applied to liquids in this schedule incorporates the following operations where necessary:-
- (a) Remove cap(s) or cover(s) from filler orifices and/or drains.
 - (b) Clear orifices.
 - (c) Fill container as directed in the item operations.
 - (d) Ensure drains are free from obstructions.
 - (e) Ensure gasket(s) and cap(s) or cover(s) are free from damage.
 - (f) Refit cap(s) or cover(s)
 - (g) Fit locking devices as necessary.

(8362)(18)

Sheet No. 5
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

PRE HANGAR SERVICING

Carry out general supervision as required and the following Items as detailed:-

1. General.
 - (i) Read Safety Precautions and Servicing Notes.
 - (ii) Examine Form 700E for reports of defects and life expired components and detail men for rectification and replacement as necessary.
2.

(a) Air intake blanking boards.	}	Ensure fitted.
(b) Tail pipe blank.		
3. This Item is applicable only if the hangar gantry is to be used.
Aircraft. Ensure correctly positioned beneath gantry.



Sheet No. 6
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

HANGAR SERVICING

Carry out the general supervision as required and the following Items as detailed:-

- | | |
|------------------------------|---|
| 1. Engine. | Ensure all disconnections have been made prior to removal. |
| 2. Engine. | (i) Supervise fitting of sling.
(ii) Supervise removal from airframe and fitting to stand. |
| 3. Air intake joint rubbers. | (i) Examine for deterioration and damage.
(ii) Fold back in preparation for engine installation. |
| 4. Replacement engine. | (i) Examine prior to installation.
(ii) Examine flexible fuel pipes for date of manufacture. |

(8362)(21)

(Continued overleaf)

4. (Contd.)

Note:- Pipes which will be time expired (Five years from date of manufacture) within the next six months are to be exchanged for new pipes, or pipes which have been serviced in accordance with instructions detailed in A.P.4121 B and C, Vol.2, Pt. 4, Sect.2, Chap.10.

(iii) Supervise cleaning of impeller

5. (a) Replacement Engine.

(i) Supervise fitting of sling.

(ii) Supervise removal from stand and installation of airframe.

(b) Teleflex conduits. }
(c) Flying control cable }
pulleys in engine bay.)

Examine for damage caused during installation of engine. If found, inform Airframe N.C.O.

6. Engine installation.

Examine for connections, fitting and bonding for damage and correct locking.

7. Engine Controls.

(a) Throttle. }
(b) H.P. cock. }
(c) L.P. cock. }

Assisted by Man 'A' in cockpit, who will operate controls, as required:-

(i) Examine for full, free and correct movement.

(ii) Ensure control positions in cockpit correspond with the settings on components.

(8362)(22)

(Continued)

Sheet No. 7
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

7. (Contd.) Engine Controls.
(a) Throttle. }
(b) H.P. cock. }
(b) L.P. cock. }

- (iii) Ensure control rods are in safety.
(iv) Examine control rods for correct
locking.

8. (a) Engine installation. }
(b) Aircraft generally. }

Ensure that all tools, rags and other
materials used during Engine Change have been
removed from the aircraft.

9. Ground equipment.

Supervise removal from vicinity of the
aircraft.



Sheet No. 8
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.499OE & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

POST HANGAR SERVICING

Carry out general supervision as required and the following Items as detailed:-

1. (a) Front bearing.

Detail Men to prime with oil as follows:-

(i) Disconnect oil supply pipe banjo union from metering pump body.

(ii) Connect Ki-gass pump to banjo union.

(iii) Gently force $1/3$ pint of clean engine oil, specification as stated in Form 700G, into front bearing.

Note:- Do not disconnect Ki-gass pump until after completion of metered oil supply check.

1. (Contd.)
(b) Rear Bearing.

Detail Men to prime with oil as follows:-

- (i) Disconnect oil supply pipe banjo union from metering pump body.
- (ii) Connect flexible pipe to end of rear bearing oil supply pipe
- (iii) Connect Ki-gass pump to flexible pipe.
- (iv) Gently force 50 to 100 c.c. of clean engine oil, specification as stated in Form 700G. into rear bearing.

Note:- Do not disconnect Ki-gass pump until after completion of metered oil supply check.

2. Fuel tanks.

Detail and supervise refuelling.

3. Engine fuel system.

Prime with fuel and de-inhibit as follows:-

- (1) Request Electrical N.C.O. to disconnect L.T. cables to high energy ignition units.
- (2) Disconnect fuel pipe, L.P. filter to fuel pump inlet at fuel pump inlet.
- (3) Connect external power supply to aircraft.
- (4) Set Ground/Flight switch to 'GROUND'.
- (5) Set H.P. cock lever to 'CLOSED'.
- (6) Set L.P. cock lever to 'ON'.

(8362)(26)

(Continued)

Sheet No. 9
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

3. (Contd.)
Engine fuel system.

- (7) Set pulsometer pump switch to 'ON'.
Collect fuel flow from disconnected pipe in
suitable container.
- (8) When fuel is discharging from pipe at full
bore reconnect pipe, tighten and lock.
- (9) Set pulsometer pump switch to 'OFF'.
- (10) Disconnect fuel pipe, control box to fuel
pump inlet at fuel pump inlet.
- (11) Fit blanks to fuel pump inlet and fuel
pipe union.
- (12) Disconnect spill return pipe, barostat to
bulkhead at barostat. Position suitable
container to collect fluid ejected from
barostat.
- (13) Set auxiliary starting switch to 'ON'.
- (14) Set throttle to 'CLOSED'.

3. (Contd.)

- (15) Press starter button and simulate engine start. Collect fluid ejected from barostat.
- (16) Remove blank from fuel pipe, control box to fuel pump inlet and place end of pipe in suitable container.
- (17) Set H.P. cock lever to 'OPEN'.
- (18) Press starter button and simulate engine start. Open throttle as soon as starting cycle has commenced.
- (19) When engine has attained speed of between 1600 and 1700 R.P.M. set H.P. cock lever to 'CLOSED'. Collect fluid expelled from fuel pipe in container.
- (20) Set throttle to 'CLOSED'.
- (21) Set auxiliary starting switch to 'OFF'.
- (22) Disconnect external power supply.
- (23) Remove blank from fuel pump inlet.
- (24) Reconnect fuel pipe from control box to fuel pump inlet at fuel pump inlet, tighten and lock.
- (25) Reconnect barostat spill return pipe at barostat, tighten and lock.
- (26) Request Electrical N.C.O. to reconnect L.T. cables to high energy ignition units.

(8362)(28)

Sheet No. 10
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

4. High energy igniter
plugs.

- (i) Set L.P. cock to 'OFF'.
- (ii) Examine for correct functioning by pressing
relight button and listening for sharp
crack of electrical discharge in
combustion chambers.

5. Metered oil supply.

- Carry out flow check as follows:-
- (i) Start engine in accordance with Ground
Handling Notes.
 - (ii) Run engine at 3000 R.P.M. Man will collect
metered oil supply from pumps in calibrated
beaker.
- Note:- Oil supply from front and rear
bearing metering pumps is to be 3 c.c. in 2
minutes and oil supply from overspeed
governor metering pumps is to be 1 c.c. in 2
minutes.

(Continued overleaf)

5. (Contd.)

- (iii) While the engine is running the Ki-gass priming pumps are to be gently operated to keep oil feed pipes fully primed with oil.
- (iv) Stop engine.
- (v) Disconnect Ki-gass priming pumps and reconnect banjo unions to metering pumps.
Note:- During this operation care is to be taken to ensure oil feed pipes are kept fully primed with oil.
- (vi) Tighten banjo bolts and lock with wire.

6. Sub-item (b) of this Item is to be carried out before completion of Engine Ground Check.

(a) Engine.

Carry out Engine Ground Check in accordance with Ground Handling Notes.

(b) H.P. fuel cock, control.

With the engine running at cruising R.P.M. and with an observer watching the fuel drains, operate the H.P. cock lever towards the 'CLOSED' position. No dumping of fuel is to take place until the control lever has moved at least 1/4 in. to the rear past the spring gate.

7. Engine installation.

Examine for fuel and oil leaks.

(8362)(30)

Sheet No. 11
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
8.	Engine controls.	Arrange for an independent control check to be carried out in accordance with A.P.3158, Vol.2, Leaflet B 28.
9.	Engine cowlings.	(i) Detail and supervise refitting. (ii) Ensure toggle fasteners are correctly tensioned and locked. Adjust as necessary. Note:- The tension of the fasteners is to be such that they can be disengaged by slight leverage from a small screwdriver, applied behind the toggle lever. (iii) Ensure cowling fastener indicator markings are clearly marked and correspond with the 'LOCKED' position.
10.	(a) Servicing Record Clips. (b) Form 700G. (8362)(31)	} Sign for completing Engine Change Servicing.



Sheet No. 12
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

(8362) (34)

Item
No.

ITEM

OPERATION

(8362) (34)

C.



Sheet No. 13
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

EQUIPMENT AND TOOLS

QTY.

Kits, tool, Engine Fitter (S), to scale A.3, A.P.830, Vol.3,
Pt. 'A'. 1
Spanner, O.J., S.E., 1 1/4 in. B.S.W. 1
Spanner, O.J., D.E., 9/16 in. x 5/8 in. B.S.W. 1
Spanner, O.J., D.E., 11/16 in. x 3/4 in. B.S.W. 1
Bullet, guide, engine, mounting bolts. 2
Torches, electric, Type 'C' or 'U'. Obtain from N.C.O.



Sheet No. 14
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SAFETY PRECAUTIONS

1. The discharge from the high energy ignition equipment can be lethal. Therefore, before commencing any servicing on the high energy igniter plugs, or on the H.T. wiring, the low tension plug is to be disconnected by the Electrical Man and a period of one minute permitted to elapse. This allows the dissipation of stored capacitor energy and prevents inadvertent discharge. The ignition units are not to be operated with the H.T. leads disconnected. A.D.5589 is to be displayed.
2. Prior to operation of the nose wheel micro switches ascertain from Armament Man that all stoppages have been cleared and all guns unloaded.
3. Ground running of the engine is to be avoided, wherever possible, under conditions of dense fog and outside air temperatures in the region of 32 degrees Fahrenheit. These conditions can cause overheating of the engine and collapse of the intermediate air intake casings, due to icing up of the air intake guards.



Sheet No. 15
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SERVICING NOTES

1. If any connections are broken, other than those detailed in the schedule, inform N.C.O. who will inspect when reconnection and locking has been completed.
2. The bonding of all components referred to in the schedule is to be examined for serviceability and good connection during the course of servicing.
3. When tightening Bundy pipe union nuts the instructions given in A.P.4121G and C, Vol.2, Pt.3, Sect.3, Chap.1, Paras. 5(a), (b), (c) and (d) are to be strictly adhered to.
4. DAMAGE - 'Examine for damage' in this schedule means an examination to ascertain that the value or usefulness of the item has not been impaired by:-
 - (a) Insecurity of attachment.
 - (b) Cracks or fractures.
 - (c) Corrosion or contamination.
 - (d) Any form of distortion.
 - (e) Loose rivets.
 - (f) Chafing, fraying or scoring.
 - (g) Broken locking.

(Continued overleaf)

5. REFLEENISH - The word 'replenish' when applied to liquids in this schedule incorporates the following operations where necessary:-
- (a) Remove cap(s) or cover(s) from filler orifices and/or drains.
 - (b) Clear orifices.
 - (c) Fill container as directed in the item operation.
 - (d) Ensure drains are free from obstructions.
 - (e) Ensure gasket(s) and cap(s) or cover(s) are free from damage.
 - (f) Refit cap(s) or cover(s).
 - (g) Fit locking devices as necessary,

(8362)(40)

Sheet No. 16
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No. ITEM

OPERATION

PRE HANGAR SERVICING

1. General.
2. Assist N.C.O. as detailed.

Read Safety Precautions and Servicing Notes.



Sheet No. 17
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

HANGAR SERVICING

1. Ground equipment.

Assisted by MAN. 'B' position the following around
the aircraft:-

- (i) Drip tray
- (ii) Mainplane mats.
- (iii) Step ladder.
- (iv) Servicing creeper.

2. (a) Upper rear cowling. }
(b) Lower rear cowling. }
- (c) Upper front cowling. }
(d) Lower front cowling. }

Assisted by Man 'A':-

- (i) Release toggle fasteners.
- (ii) Remove and place on cowling rack.
- (i) Release toggle fasteners,
- (ii) Remove countersunk bolts securing cowling
to fireproof bulkhead and cowl support
ring.
- (iii) Remove and place on cowling rack.

(Continued overleaf)

3. (a) Rear cone fairing.
 - (i) Ensure electrical cables to downward identification lamps and fire warning circuit have been disconnected by Electrical Man.
 - (ii) Assisted by Man 'B' remove. Examine during removal for accumulations of fuel, oil and foreign materials. Remove and place on cowling rack.
- (b) Fireguard extensions. Remove and place on cowling rack.
4. Sub-items (a), (b) and (c) of this Item are applicable only to Mk.5 aircraft.
 - Engine (Top Port.)
 - (a) Cabin supercharger inlet pipe.
 - (i) Disconnect at cabin supercharger inlet.
 - (ii) Disconnect at air filter.
 - (iii) Rotate to clear engine during removal.
 - (b) Cabin supercharger.
 - (i) Disconnect at cabin supercharger outlet.
 - (ii) Disconnect at outlet.
 - (iii) Remove and place on cowling rack.
 - (c) Cabin supercharger clutch control. Disconnect at clutch lever.
 - (d) Hydraulic compressor delivery pipe. Disconnect at compressor.
 - (e) Air intake joint rubber, Disconnect at engine.

Sheet No.18
Issued with:-
A.L. No.2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

*A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
4.	(Contd.) Engine. (Top Port.)	
	(f) Top cowling former.	} Disconnect at wing root.
	(g) Fire extinguisher. flexible pipe, spray ring to wing root.	
	(h) Extension fire shield support bracket on wing root.	Remove top securing bolts.
5.	Engine. (Bottom Port)	
	(a) L.P. filter to L.P. cock fuel pipe.	Disconnect at L.P. cock.
	(b) L.P. filter to fuel pump fuel pipe.	Disconnect at fuel pump.
	(c) L.P. filter, complete with inlet and outlet pipes.	(i) Remove securing bolts. (ii) Remove. (iii) Fit blanking caps to inlet and outlet pipes.
SM.457 (2)		(8362)45 (Continued overleaf)

5. (Contd.)
- | | |
|---|---|
| (d) Throttle control rod. | Disconnect at throttle valve. |
| (e) H.P. fuel cock control rod. | Disconnect at H.P. fuel cock. |
| (f) Pressure limiting valve drain pipe. | Disconnect at pressure limiting valve. |
| (g) Dump valve spill pipe. | Disconnect at dump valve. |
| (h) Bulkhead to barostat fuel pipe. | Disconnect at barostat. |
| (j) Fuel transfer pipe support clip. | Disconnect at bottom cowling former. |
| (k) Extension fire shield support bracket on wing root. | (i) Remove bottom securing bolts.
(ii) Remove. |
6. Bottom cowling former.
- Assisted by Man 'A':-
- | | |
|-------|---|
| (i) | Remove attachment bolts at wing root. |
| (ii) | Remove attachment bolts to diffuser casing. |
| (iii) | Remove and place on cowling rack. |
| (iv) | Remove attachment bolt bushes. |

(8362)46

Sheet No. 19
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER '1

Item
No.

ITEM

OPERATION

7. Engine.

Supervised by N.C.O. and assisted by Man 'B':-
(i) Fit sling to engine.
(ii) Attach sling to crane and take weight of engine.
(iii) Remove bottom bearer bolts.
(iv) Remove top bearer bolts.
(v) Remove from airframe.
(vi) Fit trunnion mountings.
(vii) Fit to engine stand.
(viii) Fit air intake blanks.
(ix) Remove sling.

8. Engine Bay.

(a) Engine Bay.

Clean with kerosine, paying particular attention to wing root ledges.

(b) Fireproof bulkhead.

(i) Clean with kerosine.
(ii) Examine for cracks.

(8362)(47)

(Continued overleaf)

8. (Contd.)
- (c) Engine bearer struts.
 - (i) Examine for cracks in vicinity of welds, and damage.
 - (ii) Examine bearer bolt holes for elongation. Examine for good fit in bearer struts and wear and damage. Examine for damage.
 - (d) Bearer bolts.
 - (i) Examine for damage.
 - (ii) Examine hose joints for deterioration.
 - (iii) Check hose clips for tightness. Examine for deterioration and damage.
 - (e) Pressure reducing valves.
 - (f) Pipelines.
 - (g) Air intake joint rubbers.
9. Intermediate air intake ducts.
 - (i) Clean.
 - (ii) Examine for damage.
10. Engine Controls.. (Bulkhead.)
- (a) Teleflex control boxes. }
 - (b) Layshafts. }
- Assisted by Man 'B', who will operate controls, as required:-
Examine for damage.

Sheet No. 20
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
10.	(Contd.)	
	Engine Controls.	
	(Bulkhead.)	
	(c) Sprockets.	(i) Clean with kerosine. (ii) Examine for correct alignment and damage. (iii) Lubricate with oil, OM-150.
	(d) Chains.	(i) Clean with kerosine. (ii) Examine for twist and damage. (iii) Lubricate with oil OM-150.
	(e) Tie rods.	(i) Examine for correct tension. (ii) Check locknuts for tightness. (iii) Ensure rods are in safety.
	(f) Tie rods fairleads.	Examine for cleanliness, and damage.
	(g) Throttle control rod. }	(i) Examine for damage.
	(h) H.P. cock control rod. }	(ii) Examine end fittings for wear. (iii) Ensure rods are in safety.

11. Top cowling former.

- (i) Remove attachment bolts to diffuser casing.
- (ii) Remove.
- (iii) Remove attachment bolt bushes.
- (iv) Examine for cracks.
- (v) Examine asbestos tape for damage and security of attachment.
- (vi) Examine support stirrups for damage and correct locking.
- (vii) Fit to replacement engine.

12. Replacement engine.

- (i) Remove blanks.
- (ii) Examine for damage.
- (iii) Examine pipelines for routeing, damage and correct locking.

13. Unserviceable engine.

Fit blanks.

14. Replacement engine.
impeller.

Remove all traces of inhibitor fluid from impeller blades using white spirit and soft brush as necessary. Great care is to be taken to preserve the normal protective treatment of the impeller.
NOTE:- Failure to remove all traces of inhibitor fluid may result in inaccuracy on subsequent crack detection tests.

(8362)(50)

Sheet No. 21
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE

ENGINE CHANGE
ENGINE MAN 'A'

A.P. 4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

15. Replacement engine.

Supervised by N.C.O. and assisted by MAN 'B':-

- (i) Fit sling to engine.
 - (ii) Attach sling to crane and take weight of engine.
 - (iii) Remove from stand.
 - (iv) Remove trunnion mountings.
 - (v) Position in airframe.
 - (vi) Fit top bearer bolts.
 - (vii) Fit bottom bearer bolts.
 - (viii) Examine for correct alignment of engine intakes and intermediate air intake ducts.
- Note:- Maximum malalignment permitted is a step down of 0.20 in. in direction of air flow only. Gap between intermediate air intake duct and engine intake is to be between 0.10 in. and 0.20 in. at any point.

15. (Contd.)
- (ix) Fit bearer bolt nuts, tighten and lock.
(x) Remove sling.
15. Intermediate air intake duct. (Port.)
- (i) Examine for freedom from tools, rags and foreign materials.
(ii) Fit blanking boards.
17. Bottom cowling former.
- Assisted by Man 'B':-
- (i) Fit attachment bolt bushes.
(ii) Fit.
(iii) Fit attachment bolts to diffuser casing.
(iv) Fit attachment bolts at wing root.
18. Engine. (Bottom Port.)
- (a) Throttle control rod.
- (i) Reconnect at throttle valve.
(ii) Lubricate with grease, XG-275.
- (b) H.P. fuel cock control rod.
- (i) Reconnect at H.P. fuel cock.
(ii) Lubricate with grease, XG-275.
- (c) Bulkhead to barostat fuel pipe.
- Reconnect at barostat, tighten and lock.
- (d) L.P. fuel filter. complete with inlet and outlet pipes.
- (i) Remove blanking caps from inlet and outlet pipes.
(ii) Refit to bearer strut. Reconnect at L.P. cock, tighten and lock.

(8362)(52)

(Continued)

Sheet No.22
Issued with:-
A.L. No.2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE

ENGINE CHANGE.
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
18.	(Contd.)	
	Engine. (Bottom Port.)	
(e)	L.P. filter to L.P. cock fuel pipe.	Reconnect at L.P. cock, tighten and lock.
(f)	L.P. filter to fuel pump fuel pipe.	Reconnect at fuel pump, tighten and lock.
(g)	Fuel transfer pipe support clip.	Reconnect to bottom cowling former.
(h)	Pressure limiting valve drain pipe.	Reconnect at pressure limiting valve, tighten and lock.
(j)	Dump valve spill pipe.	Reconnect at dump valve, tighten and lock.
(k)	Extension fire shield support bracket on wing root.	(i) Refit. (ii) Refit bottom securing bolts.
(l)	Starting valve blanking cap.	Ensure blank has been removed from vent hole in adjusting plug.

19. Sub-items (e), (f) and (g) of this Item are applicable only to Mk.5 aircraft.
Engine. (Top Port.)

- | | |
|---|---|
| (a) Fire extinguisher flexible pipe, spray ring to wing root. | (i) Reconnect at wing root, tighten and lock. |
| (b) Top cowling former. | (ii) Ensure pipe does not foul flying control cables. |
| (c) Air intake joint rubber. | Refit to wing root. |
| (d) Hymatic compressor delivery pipe. | (i) Fit to engine. |
| (e) Cabin supercharger inlet pipe. | (ii) Position and tighten Jubilee clips. |
| | Reconnect at compressor, tighten and lock. |
| (f) Cabin supercharger clutch control. | (i) Position. |
| (g) Cabin supercharger silencer. | (ii) Reconnect to air filter. |
| | (iii) Reconnect to cabin supercharger inlet. |
| | (iv) Tighten Jubilee clips. |
| | (i) Reconnect at clutch lever. |
| | (ii) Lubricate with grease, XG-275. |
| | (i) Refit. |
| | (ii) Reconnect at outlet and supercharger outlet. |
| | (iii) Position and tighten Jubilee clips. |

SECTION 1 CHAPTER 1

OPERATION

- (ii) Ensure that the bracket does not foul the flying control cables.

Operate, as required by N.C.O.

.) Remove all tools, rags and other materials
used during Engine Change from the aircraft.

) Assisted by Man 'B' refit.

Assisted by Man 'B', remove from vicinity of aircraft.

(8362)55

(8362) 56

Sheet No. 24
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

POST HANGAR SERVICING

- | | | |
|----|----------------------------|--|
| 1. | Servicing Record Slips. | Sign for completing Engine Change Servicing. |
| 2. | Assist N.C.O. as detailed. | |

1

2



3

4

Sheet No. 24
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'A'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

POST HANGAR SERVICING

1. Servicing Record Slips. Sign for completing Engine Change Servicing.
2. Assist N.C.O. as detailed.



Sheet No. 25
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

Item
No.

ITEM

OPERATION

(8362) (60)

Sheet No. 26
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

EQUIPMENT AND TOOLS

QTY.

Kits, tool, Engine Fitter (S), to scale A.3, A.P.830,
Vol.3, Pt. 'A'.
Cans, oil replenishing, 2 gallon.
Spanner, 'C', adjustable, medium.
Pails, iron, galvanised.
Bullet, guide, engine mounting bolts.
Torches, electric, Type 'C' or 'U'.

1
1
1
1
2

Obtain from N.C.O.



Sheet No. 27
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SAFETY PRECAUTIONS

1. The discharge from the high energy ignition equipment can be lethal. Therefore, before commencing any servicing on the high energy igniter plugs, or on the H.T. wiring, the low tension plug is to be disconnected by the Electrical Man and a period of one minute permitted to elapse. This allows the dissipation of stored capacitor energy and prevents inadvertent discharge. The ignition units are not to be operated with the H.T. leads disconnected. A.D.5589 is to be displayed.
2. Prior to operation of the nose wheel micro switches ascertain from Armament Man that all stoppages have been cleared and all guns unloaded.
3. Ground running of the engine is to be avoided, wherever possible, under conditions of dense fog and outside air temperatures in the region of 32 degrees Fahrenheit. These conditions can cause overheating of the engine and collapse of the intermediate air intake casings, due to icing up of the air intake guards.



Sheet No. 28
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December. 1958
SECTION 1 CHAPTER 1

SERVICING NOTES

1. If any connections are broken, other than those detailed in the schedule, inform N.C.O. who will inspect when reconnection and locking has been completed.
2. The bonding of all components referred to in this schedule is to be examined for serviceability and good connection during the course of servicing.
3. When tightening Bundy pipe union nuts the instructions given in A.P.4121B and C, Vol.2, Pt.3, Sect.3, Chap.1, Paras.5(a),(b),(c) and (d) are to be strictly adhered to.
4. DAMAGE - 'Examine for damage' in this schedule means an examination to ascertain that the value or usefulness of the item has not been impaired by:-
 - (a) Insecurity of attachment.
 - (b) Cracks or fractures.
 - (c) Corrosion or contamination.
 - (d) Any form of distortion.
 - (e) Loose rivets.
 - (f) Chafing, fraying or scoring.
 - (g) Broken locking.

5. REFLENISH - The word 'replenish' when applied to liquids in this schedule incorporates the following operations where necessary:-
- (a) Remove cap(s) or cover(s) from filler orifices and/or drains.
 - (b) Clear orifices.
 - (c) Fill container as directed in the item operation.
 - (d) Ensure drains are free from obstructions.
 - (e) Ensure (gasket(s) and cap(s) or cover(s) are free from damage.
 - (f) Refit cap(s) or cover(s).
 - (g) Fit locking devices as necessary.

(8362)(66)

Sheet No. 29
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

PRE HANGAR SERVICING

1. General
2. Assist N.C.O. as detailed.

Read Safety Precautions and Servicing Notes



Sheet No.30
Issued with:-
A.L. No.2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE.
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

HANGAR SERVICING

- | | | |
|----|--|---|
| 1. | Ground equipment. | Assist Man 'A' to position around the aircraft. |
| 2. | (a) Upper rear cowl.
(b) Lower rear cowl.
(c) Upper front cowl.
(d) Lower front cowl. | } Assist Man 'A' to remove |
| 3. | Rear cone fairing. | Assist Man 'A' to remove. |
| 4. | Rear cone fairing. | (i) Clean.
(ii) Examine for damage.
(iii) Examine drain holes for freedom from obstruction. |

5. Sub-items (a) and (b) of this Item are applicable only to Mk.5 aircraft.
Engine. (Top Starboard.)

- (a) Vacuum pump exhaust pipe.
- (b) Vacuum pump inlet pipe.
- (c) Generator and air compressor cooling pipe

} Disconnect at vacuum pump.

- (i) Disconnect at junction with gun heater pipe
- (ii) Disconnect at generator.
- (iii) Disconnect at air compressor cooling shroud.
- (iv) Remove.

- (d) Air duct to gun heater muff.

Disconnect at flexible joint adjacent to diffuser casing.

- (e) Top cowling former.

Disconnect at wing root.

- (f) Canopy air seal pipe between diffuser casing to pressure reducing valve.

Disconnect at each end and remove.

- (g) Barostat total head air pipe.

Disconnect at hose connection adjacent to generator.

- (h) Air intake joint rubber.

Disconnect at engine.

- (j) Extension fire shield support bracket on wing root.

Remove top securing bolts.

(8362)70

Sheet No. 31
Issued with:-
A.L. No. 2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

6. Sub-item (1) of this Item is applicable only to Mk.9 aircraft.
Engine. (Bottom Starboard.)
- (a) Gun heater pipe between engine to bulkhead. Disconnect at connection adjacent to bottom cowling former.
 - (b) Hydraulic pipes between hydraulic pump and bulkhead. Disconnect at Avery couplings.
 - (c) Overspeed governor oil drain pipe. Disconnect at drain collector box.
 - (d) Overspeed governor fuel drain pipe. Disconnect at overspeed governor unit.
 - (e) Combustion chamber pipe between drain valve and drain collector box. Disconnect at drain valve.
 - (f) Rear bearing drain pipe. Disconnect at engine.
 - (g) Hydraulic pump drain pipe. Disconnect at hydraulic pump.

SM.457 (6)

(8362)71

(Continued overleaf)

6. (Contd.)
- (h) Accumulator drain pipe. Disconnect at accumulator.
 - (j) Drop fuel tank Disconnect at diffuser casing.
pressurising pipe between
engine and pressure
reducing valves.
 - (k) Fuel transfer pipe Disconnect from bottom cowling former.
support clip.
 - (l) Cabin air conditioning (i) Disconnect at each end.
'Y' pipe between engine (ii) Remove.
and control valves.
 - (m) Extension fire shield (i) Remove bottom securing bolts.
support bracket on (iii) Remove.
wing root.
7. Bottom cowling former. Assist Man 'A' to remove.
8. Engine. Assist Man 'A' to remove from airframe
and fit to stand.

(8362)72

Sheet No. 32
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER: 1

Item No.	ITEM	OPERATION
9.	(a) Bottom cowling former.	(i) Examine for damage. (ii) Examine asbestos tape for damage. (iii) Examine support stirrups for damage, and correct locking.
	(b) Drains collector box.	(i) Examine for damage. (ii) Flush out with kerosine.
	(c) Flexible drain pipes.	Examine for deterioration, and damage to drains collector box.
10.	(a) Cowling fastener tie rods.	(i) Examine for damage. (ii) Examine lug ends for safety and correct locking.
	(b) Tie rods springs.	Examine for stretching, and damage. Note:- If stretched, fit new springs.

11. Engine Controls.

(Cockpit.)

- (a) Throttle control. }
- (b) H.P. cock control. }
- (c) L.P. cock control. }
- (d) Engine control box.

Operate, as required by Man 'A'

- (i) Examine for damage.
- (ii) Examine control levers for damage.
- (iii) Examine Teleflex conduits for damage.
- (iv) Examine damper for correct operation.

12. L.P.fuel filter.

- (i) Remove end cap.
- (ii) Remove element.
- (iii) Examine for deposits and damage.
- (iv) Clean with kerosine, using a stiff brush.
Note:- If element is dirty or choked,
fit new element.
- (v) Refit element.
- (vi) Refit end cap, tighten and lock.

12. (a) Engine cowlings.

- (b) Cowling toggle
fasteners.

- (i) Clean.
- (ii) Examine for damage.
- (i) Examine for damage.
- (ii) Examine hooks for damage and spreading.
- (iii) Lubricate hinges with oil, OM-150.

(8362)(74)

Sheet No.33
Issued with:-
A.L. No.2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
14.	Replacement engine.	Assist Man 'A' to remove from stand and install in airframe.
15.	Intermediate air intake duct. (Starboard.)	(i) Remove all tools, rags and foreign materials. (ii) Fit blanking board.
16.	Bottom cowling former.	Assist Man 'A' to refit.
17.	Sub-items (a) and (b) of this Item are applicable only to Mk.5 aircraft. Engine. (Top Starboard.)	
	(a) Vacuum pump inlet pipe. } (b) Vacuum pump exhaust pipe. }	Reconnect to vacuum pump, tighten and lock.
	(c) Air intake joint rubber.	(i) Fit to engine. (ii) Position and tighten Jubilee clips.
	(d) Barostat total head air pipe.	(i) Reconnect at hose connection adjacent to generator.

17. (d) (Contd.) (ii) Position and tighten Jubilee clips.
(e) Canopy air seal pipe (i) Refit.
between diffuser casing (ii) Reconnect at each end, tighten and lock.
and pressure reducing valve.
(f) Top cowling former. Reconnect at wing root.
(g) Air duct to gun (i) Reconnect at flexible joint adjacent to
heater muff. diffuser casing.
(ii) Position and tighten Jubilee clips.
(h) Generator and compressor (i) Refit.
cooling pipe. (ii) Reconnect at air compressor cooling
shroud.
(iii) Reconnect at generator.
(iv) Reconnect at junction with gun heater
pipe.
(j) Extension fire shield (v) Position and tighten Jubilee clips.
support bracket on (i) Refit.
wing root. (ii) Refit top securing bolts.

(8362)76

Sheet No.34
Issued with:-
A.L. No.2
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE.
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
18.	Sub-item (a) of this Item is applicable only to Mk.9 aircraft. Engine. (Bottom Starboard.)	
(a)	Cabin air conditioning 'Y' pipe between engine and control valves.	(i) Refit. (ii) Reconnect at each end, tighten and lock.
(b)	Fuel transfer pipe support clip.	Reconnect to bottom cowling former.
(c)	Drop fuel tank pressurising pipe between engine and pressure reducing valves.	Reconnect at diffuser casing, tighten and lock.
(d)	Hydraulic pump drain pipe.	Reconnect at hydraulic pump, tighten and lock.
(e)	Overspeed governor fuel drain pipe.	Reconnect at overspeed governor unit, tighten and lock.
(f)	Overspeed governor oil drain pipe.	Reconnect at drain collector box, tighten and lock.

SM.457 (8) C.S.D.E. 11/59

(8362)77

(Continued overleaf)

18. (Contd.)

- | | |
|--|--|
| (g) Rear bearing drain pipe. | Reconnect at engine, tighten and lock. |
| (h) Combustion chamber drain pipe between drain valve and drain collector box. | Reconnect to drain valve, tighten and lock. |
| (j) Accumulator drain pipe. | Reconnect to accumulator, tighten and lock. |
| (k) Hydraulic pipes between hydraulic pump and bulkhead. | Reconnect at Avery couplings, tighten and lock. |
| (l) Gun heater pipe, engine to bulkhead. | (i) Reconnect at connection adjacent to bottom cowling former.
(ii) Position and tighten Jubilee clips. |
| (m) Extension fire shield support bracket on wing root. | (i) Refit bottom securing bolts.
(ii) Ensure that the bracket does not foul the flying control cables. |

19. Wheelcase sump.

Replenish with engine oil, specification as stated in Form 706G.

Note:- Care is to be taken not to overfill the sump.

Sheet No. 35
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
20.	(a) Engine installation.) (b) Aircraft generally.)	Remove all tools, rags and other materials used during Engine Change from the aircraft.
21.	(a) Rear cone fairing) (b) Fireguard extensions.)	Assist Man 'A' to refit.
22.	Ground equipment.	Assist Man 'A' to remove from vicinity of aircraft.



Sheet No. 36
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ENGINE MAN 'B'

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

POST HANGAR SERVICING

- | | | |
|----|----------------------------|--|
| 1. | Servicing Record Slips. | Sign for completing Engine Change. Servicing |
| 2. | Assist N.C.O. as detailed. | |



Sheet No. 37
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

Item
No.

ITEM

OPERATION

(8362)(84)

Sheet No. 38.
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

REF. NO.

EQUIPMENT AND TOOLS

Kits, tool, Electrician, to scale A.26, A.P.830,
Vol.3, Pt. 'A'.
4F/1718 Trolley, battery, electric starting, Mk.5
5Q/1635 Ammeters, 50-0-50.
10S/10610 Testmeters, Type 'D'.

Required by:-		
NCO	MAN	Total
1	1	2
1	-	1
1	-	1
1	-	1

MATERIALS

32B/242 Rags, cotton.
33C/887 Compound, protective, insulating, No.2
33C/1172 Compound, silicone, insulating.
34B/9100512 Grease, XG-275.

G-350



Sheet No. ~~38~~ **39**
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SAFETY PRECAUTIONS

1. Before commencing servicing on the high energy ignition units or on the H.T. wiring the low tension plug is to be disconnected and a period of one minute permitted to elapse, this allows the dissipation of stored capacitor energy and prevents inadvertent discharge. The high energy ignition units are not to be operated with the H.T. cable disconnected. Display Air Diagram 5589.
2. When using silicone compound care is to be taken to prevent compound making contact with the eyes.



Sheet No. 40
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SERVICING NOTES

1. Inspect all repairs, replacements and modifications carried out.
2. Where any connections are broken either for routine servicing or repair, inspect reconnections for security of attachment and correct locking.
3. DAMAGE - 'Examine for damage' in this schedule means an examination to ascertain that the value or usefulness of the item has not been impaired by:-
 - (a) Insecurity of attachment.
 - (b) Cracks or fractures.
 - (c) Corrosion or contamination.
 - (d) Any form of distortion.
 - (e) Loose rivets.
 - (f) Chafing, fraying or scoring.
 - (g) Broken locking.



Sheet No. 41
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION1 CHAPTER 1

Item
No.

ITEM

OPERATION

PRE HANGAR SERVICING

Carry out general supervision as necessary and the following Items as detailed:-

1. General.
 - (i) Read Safety Precautions and Servicing Notes.
 - (ii) In conjunction with N.C.O. i/c Servicing examine Form 700 for reports of defects and detail Men for rectification as necessary.



Sheet No. 42
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

HANGAR SERVICING

Carry out general supervision as required and the following Items as detailed:-

1. This Item is applicable only if Type KX generator is fitted.
Engine Driven Generator.

(a) Terminal lugs.

- (i) Ensure correct lugs are fitted.
 - (ii) Examine for excess or protruding solder preventing lugs from locating correctly on insulating plate.
 - (iii) From a $\frac{3}{4}$ inch length of P.U.C. tubing cut a segment, one third of its circumference and $\frac{3}{8}$ inch long. Fit to field terminal.
- (i) Fit the field terminal lug and tighten down.
- (ii) Fit the insulation plate square on its mounting.

(b) Generator.

1. (Contd.)

(iii) Fit the positive and negative terminal lugs and tighten down.

Note:- Ensure that the lugs bed down correctly on the insulation plate and the insulating sleeve is between the field and positive terminal lug.

2. Electric cable connections.
(Engine compartment.)

When engine installation is completed and before cowlings are fitted, examine electric cable connections for security of attachment.

(8362)(94)

Sheet No. 43
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

POST HANGAR SERVICING

Carry out general supervision as required and the following Items as detailed:-

1. This Item is applicable only if replacement engine has Goblin Mod.984 embodied.
High energy ignition units.
 - (i) Disconnect L.T. cable connections when requested by Engine N.C.O.
 - (ii) Connect L.T. cable connections when requested by Engine N.C.O.
2. This Item is applicable only when Mod.393 has been embodied and is to be carried out in conjunction with Engine N.C.O. immediately after a flight or Engine Ground Check of at least 20 minutes using instruments which are calibrated periodically against a known master indicator, e.g. a Type 'D' or 'F' testmeter used in accordance with A.P.3158, Vol.2, Leaflet J2, Appendix 'B'.
Generator control system.
(Type 'A' voltage regulator and cut-out unit.)
 - (i) Assisted by Man, position battery trolley beside the aircraft and plug in to starter socket. Set the Ground/Flight switch to 'GROUND'.

(8362)(95)

(Continued overleaf)

2. (Contd.)

- (ii) Remove main fuse and connect voltmeter across 'G' Pos. and 'G' Neg. of regulator.
- (iii) Remove the cable connected to 'L' Pos. and connect it to 'A' Pos. on the regulator.
- (iv) Set Ground/Flight switch to 'FLIGHT'.
- (v) When the engine has started set battery trolley switch to 'OFF', disconnect and remove trolley.
- (vi) Request Engine N.C.O. to run engine at cruising R.P.M. and check that the generator output remains steady at 27.5 volts, adjust by means of voltage regulator trimmer as necessary.
- (vii) Request Engine N.C.O. to run engine at maximum R.P.M. and check that voltage remains steady at 27.5 volts plus or minus 0.5 volts.
- (viii) Place a dummy fuse and 50-0-50 ammeter in main fuse holder.
- (ix) Ensure that battery cut-out functions correctly as follows:-
 - Battery cut-out is to pull-in at 26 to 27 volts and cut-out at a discharge current of between 5 and 10 amps.

(8362)(96)

(Continued)

Sheet No. 44
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
2.	(Contd.) Generator control system. (Type 'A' voltage regulator and cut-out unit.)	(x) When engine has stopped, set the Ground/ Flight switch to 'GROUND'. (xi) Remove all ground test equipment. (xii) Refit the main fuse, and connect the cable from 'A' Pos. to 'L' Pos. on the voltage regulator (xiii) Refit all covers.
3.	This Item is applicable only to Pre Mod.393 aircraft and is to be carried out in conjunction with Engine N.C.O. immediately after a flight or engine ground run of at least 20 minutes using instruments which are calibrated periodically against a known master indicator, e.g. a Type 'D' or 'F' testmeter used in accordance with A.P.3158, Vol.2, Leaflet J2, Appendix 'B'. Generator control system. (Type F24 voltage regulator.)	(i) Assisted by Man position battery trolley beside the aircraft and plug in to starter socket. Set the Ground/Flight switch to 'FLIGHT'.

3. (Contd.)

- (ii) Remove main fuse and connect voltmeter across 'G' Pos. and 'G' Neg. of voltage regulator.
- (iii) When the engine has started, set battery trolley switch to 'OFF', disconnect and remove trolley.
- (iv) Request Engine N.C.O. to run engine at cruising R.P.M. and check that the generator output remain steady at 27.5 volts, adjust by means of voltage regulator trimmer, as necessary.
- (v) Request Engine N.C.O. to run engine at maximum R.P.M. and check that the voltage remain steady at 27.5 volts plus or minus 0.5 volts.
- (vi) Place a dummy fuse and ammeter in main fuse holder and check that battery cut-out functions correctly as follows:-
 - Battery cut-out is to pull-in at 26 to 27 volts and cut-out at a discharge current of between 5 and 10 amps.
- (vii) When engine has stopped, set the Ground/Flight switch to 'GROUND'.
- (viii) Remove all ground test equipment.
- (ix) Refit the main fuse.
- (x) Refit all covers.

(8362)(98)

Sheet No. 45
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL N.C.O.

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

4. Aircraft generally.

Ensure that all tools, rags and other materials
used during Electrical servicing have been removed
from the aircraft.

5. (a) Servicing Record Slips.)
(b) Form 700G..

Sign for completing Engine Change Servicing.



Sheet No. 46
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B.MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATIONS

Item
No.

ITEM

OPERATION

(8362)(102)

8

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Sheet No. 47
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

EQUIPMENT AND TOOLS.

QTY.

Kits, tool, Electrician, to scale A.26, A.P.830, Vol.3,
Py. 'A'.

1

Sheet No. 48
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SAFETY PRECAUTIONS

1. Before commencing servicing on the high energy ignition units or on the H.T. wiring the low tension plug is to be disconnected and a period of one minute permitted to elapse, this allows the dissipation of stored capacitor energy and prevents inadvertent discharge. The high energy ignition units are not to be operated with the H.T. cable disconnected. Display Air Diagram 5589.
2. When using silicone compound care is to be taken to prevent compound making contact with the eyes.



Sheet No. 49
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SERVICING NOTES

1. If any connections are broken, other than those detailed in the schedule, inform N.C.O. who will inspect when reconnection and locking has been completed.
2. The bonding of all components referred to in the schedule is to be examined for serviceability and good connection during the course of servicing.
3. Before carrying out functional tests, plug in external supply and set switch to 'ON'. Set switch to 'OFF' and disconnect plug on completion of tests.
4. The threads of plugs and sockets disconnected during servicing are to be cleaned and lightly lubricated with grease, XG-275. If corrosion is observed on plug pins they are to be cleaned, dried, and smeared with silicone compound. On no account is compound to be allowed to come into contact with rubber cable or cleating.
5. DAMAGE - 'Examine for damage' in this schedule means an examination to ascertain that the value or usefulness of the item has not been impaired by:-
 - (a) Insecurity of attachment.
 - (b) Cracks or fractures.
 - (c) Corrosion or contamination.
 - (d) Any form of distortion.
 - (e) Loose rivets.
 - (f) Chafing, fraying or scoring.
 - (g) Broken locking.



Sheet No. 50
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

PRE HANGAR SERVICING

1. General
2. Assist N.C.O. as detailed.

Read Safety Precautions and Servicing Notes.



Sheet No. 51
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE

ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5. Pt.5

VAMPIRE F.B. MKS. 5 & 9 AIRCRAFT

1st. Edition, December 1958

SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION:

HANGAR SERVICING

1. Sub-item (b) of this Item is applicable only if Vampire Mod.3238 is embodied.
Engine Rear Cone
Fairing.
(a) Downward identification)
lamps. } Disconnect plug and socket connections.
(b) Flame switches. }
2. This Item is applicable only if engine has Goblin Mod.984 embodied.
High energy ignition Disconnect.
units.
3. Fuel pressure switch. Disconnect.
(Engine.)

4. Engine.
(a) Engine driven }
generator. }
(b) Starter motor. }

Disconnect.

5. Engine Rear Cone Fairing.
(a) Downward identification
lamps.
(b) Electric cables.

- (i) Clean.
(ii) Examine for damage.
(i) Clean.
(ii) Examine for contamination by fuel, grease or
oil for deterioration.
(iii) Examine for correct cleating.

- 5A. Fire Detector Switch.
(27N/90, 27N/91
and 27N/107.)
(Engine rear cover.)

- (i) Remove two holding bolts from one switch.
(ii) Remove cover plate and disconnect both cables.
(iii) Check between the terminals, using a Type
'C' insulation resistance tester. Minimum
permissible reading 2 megohms.
(iv) Check in turn, between each terminal and bo
body of switch, using a Type 'C' insulation
resistance tester. Minimum permissible
reading 2 megohms.
(v) Connect both cables to switch.
(vi) Repeat Operations (i) to (v) on all the
remaining fire detector switches.

(8362)(112)

(Continued)

Sheet No. 52
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1ST. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
5A.	(Contd.)	
	Fire Detector Switch. (27N/90, 27N/91 and 27N/107.) (Engine rear cover.)	(vii) Bridge terminal of any one switch in any one bank, and ensure appropriate warning lamp illuminates.. (viii) Remove bridge and ensure warning lamp is extinguished. (ix) Repeat Operations (vii) and (viii) on remaining banks. (x) Refit cover plate and two holding bolts of all switches.
6.	This item is applicable only if Goblin Mod.984 is not embodied on replacement engine. Booster coils. (Engine compartment.)	(i) Disconnect and remove for Bay Servicing. (ii) Fit and connect serviced booster coils.

7. Engine Compartment.)
 (a) Time delay switch.)
 (b) Type T2 relays.)
 (2 off.))
 (c) Resistors.)
8. Slow engagement relay. (i) Clean.
 (Engine compartment.) (ii) Examine for damage.
9. Engine Compartment. (i) Clean.
 (a) Starter socket. (ii) Examine for damage.
 (b) External supply (iii) Remove cover.
 socket. (iv) Examine points for pitting and signs of
 burning.
 (v) Refit cover and lock.
10. Ground/Flight switch. (i) Clean.
 (Engine compartment.) (ii) Examine for damage.
11. Engine Compartment. (i) Clean.
 (a) Starter socket. (ii) Examine for damage.
 (b) External supply (iii) Rotate cover against spring tension. Ensure
 socket. that when cover is released it returns to
 its original position.

(8362)(114)

Sheet No. 53
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
11.	Engine Compartment. }	
	(a) Plugs and sockets. }	(i) Clean.
	(b) Terminal blocks. }	(ii) Examine for damage.
	(c) Electric cable, }	
	connections. }	(i) Clean.
	(d) Electric cables. }	(ii) Examine for contamination by fuel, grease or oil, and for deterioration.
		(iii) Examine for correct cleating.
11A.	Fire Detector switch.	(i) Remove two holding bolts from one switch.
	(27N/90, 27N/91	(ii) Remove cover plate and disconnect both
	and 27N/107.)	cables.
	(Engine Compartment.)	(iii) Check between the terminals, using a Type 'C' insulation resistance tester. Minimum permissible reading 2 megohms.

11A. (Contd.)

12. Engine.

- (a) Engine driven)
generator.. }
- (b) Starter motor.)

13. Fuel pressure switch.
(Engine.)

(8362)(116)

- (iv) Check in turn, between each terminal and body of switch, using a Type 'C' insulation resistance tester. Minimum permissible reading 2 megohms.
- (v) Connect both cables to switch.
- (vi) Repeat Operations (i) to (v) on all the remaining fire detector switches.
- (vii) Bridge terminals of any one switch in any one bank, and ensure appropriate warning lamp illuminates.
- (viii) Remove bridge and ensure warning lamp is extinguished.
- (ix) Repeat Operations (vii) and (viii) on remaining banks.
- (x) Refit cover plate and two holding bolts of all switches.

Connect.

Connect.

Sheet No. 54
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
ELECTRICAL MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATIONS
14.	This Item is applicable only if Goblin Mod.984 is embodied on replacement engine. High energy ignition units.	Connect.
15.	Engine Rear Cone Fairing. (a) Downward identification lamps. (b) Flame switches.	Connect plug and socket connections.
16.	Aircraft generally.	Remove all tools, rags and other materials used during Electrical servicing from the aircraft.
17.	Servicing Record Slips.	Sign for completing Engine Change Servicing.



Sheet No. 55
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
SUPPLEMENTARY SERVICING
INSTRUMENT MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item
No.

ITEM

OPERATION

Item
No.

ITEM

OPERATION

(8362)(120)

Sheet No. 56
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
INSTRUMENT MAN

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

SERVICING NOTE.

DAMAGE 'Examine for damage' in this schedule means an examination to ascertain that the value or usefulness of the item has not been impaired by:-

- (a) Insecurity of attachment.
- (b) Cracks or fractures.
- (c) Corrosion or contamination.
- (d) Any form of distortion.
- (e) Loose rivets.
- (f) Chafing, fraying or scoring.
- (g) Broken locking.



Sheet No. 57
GOBLIN 2 ENGINE

REMOVAL AND INSTALLATION SCHEDULE
ENGINE CHANGE
INSTRUMENT MAN-

A.P.4099E & G Vol.5 Pt.5
VAMPIRE F.B. MKS.5 & 9 AIRCRAFT
1st. Edition, December 1958
SECTION 1 CHAPTER 1

Item No.	ITEM	OPERATION
1.	General	Read Servicing Note.
2.	Engine	
	(a) Tachometer generator.	(i) Disconnect electric cables.
		(ii) Examine insulation of electric cables for damage.
	(b) Oil temperature bulb plug.	(i) Disconnect.
		(ii) Examine for damage.
	(c) Exhaust gas thermometer thermometer thermo-	(iii) Stow in engine bay.
	couple leads. }	(i) Disconnect at terminal block on starboard side of engine bay.
	(d) Rear bearing thermometer thermometer thermo-	(ii) Examine insulation for damage.
	couple leads. }	

3. Engine.

- (a) Tachometer generator.
- (b) Exhaust gas thermometer thermo-couple leads.
- (c) Rear bearing thermometer thermo-couple leads.
- (d) Oil temperature bulb plug.

Connect electric cables.

Connect at terminal block on starboard side of engine bay.

Connect to bulb.

Note:- If pins are silver plated, plug is to be sealed in accordance with S.I./Inst./2C.

4. Aircraft generally.

Remove all tools, rags and other materials used during Instrument Servicing from the aircraft.

5. Servicing Record Slips.

Sign for completing Engine Change Servicing.