

RESTRICTED

AL No 440
(Fuel/Derv Changeover Facility - intro)

AP 101B-1801-2
Leaflet No H15

Gnat T Mk 1 Aircraft - Fuel System - To make provision for and to introduce a changeover facility "Fuel/Derv" for the No 2 Port and Starboard tanks.

(Mod No Gnat/721)

(Class SOO to 10 A/C)

(AB/A/24662.- 20. 4.72)
(ADP No GNO72100)

1. INTRODUCTION

To provide increased fuel capacity for ferry purposes by using the Derv tankage.

(1) This modification does not supersede, partially supersede or satisfy the work called for by any other Modification, Command Modification, STI, SI or SRIM.

(2) This modification is essentially connected with Mod No Gnat/442 (Fuel System - Special Equipment - To make provision for and to introduce smoke generating equipment); if that work is not already embodied it must be effected concurrently.

2. EMBODIMENT

This modification is to be embodied as directed by Command Headquarters.

Note: The Trial Installation modification will be retained in Aircraft XR993.

3. APPROXIMATE TIME REQUIRED FOR EMBODIMENT

The work will take approximately 245 man hours (60 to strip; 45 to embody; 100 to re-assemble; 40 to test).

4. DRAWINGS REQUIRED

The following drawings are required and are to be demanded in accordance with AP 3158, Vol 2, Leaflet No D7:-

<u>Drawing No</u>	<u>Title</u>
1804/1361 Sht 1 & 2	GA of Increased Range Facility
1804/1367A	Electrical Requirements
1804/1411 Sht 1 & 2	Test Schedule (Addendum)
1804/1417A	Assy of Drip Deflector
1804/1419A	Drip Flange Assy

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5. PARTS AND SPECIAL TOOLS REQUIRED

(1) Parts and/or Materials

(a) The Modification Kit referenced 26DN/100721 consists of the following:

(i) Items supplied by the Contractor:

<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
26DN/-	1804/1355	Nipple, Special	1	-
26DN/-	1804/1357	Plate, Reinforcing	1	-
26DN/-	1804/1359	Quadrant	1	-
26DN/-	1804/1361E	Label	1	-
26DN/-	1804/1361F	Label	1	-
26DN/-	1804/1361G	Label	1	-
26DN/-	1804/1363	Fairlead	2	-
26DN/-	1804/1365A	Bracket	1	-
26DN/-	1804/1369A	Support, Fuel Cock	1	-
26DN/-	1804/1371A	Pipe Assy	1	-
26DN/-	1804/1373A	Pipe Assy	1	-
26DN/-	1804/1375A	Pipe Assy	1	-
26DN/-	1804/1377A	Pipe Assy	1	-
26DN/-	1804/1379A	Pipe Assy	1	-
26DN/-	1804/1381A	Pipe Assy	1	-
26DN/-	1804/1383A	Pipe Assy	1	-
26DN/-	1804/1385A	Pipe Assy	1	-
26DN/-	1804/1387A	Pipe Assy	1	-
26DN/-	1804/1389A	Pipe Assy	1	-
26DN/-	1804/1391A	Pipe Assy	1	-
26DN/-	1804/1413	Plate, Reinforcing	1	-
26DN/-	1804/1415	Quadrant	1	-
26DN/-	1804/1417B	Drip Deflector	1	-
26DN/6853	FOS 6- $\frac{1}{4}$	Tag Bonding	1	C
26DN/6956	FOS 40.4	Nut	3	C
26DK/23257	AS.2811-5-060	Tube, Distance	2	C
28E/1006378	AS.3181-8-C	Clip	1	C
28E/1012877	AS.3181-5-C	Clip	1	C
28F/8011886	AGS.1142-D	Nipple	3	C
28F/8011897	AGS.1142-F	Nipple	2	C
28F/4051597	AGS.1142-G	Nipple	1	C
28F/9486111	AGS.1142-H	Nipple	1	C
28F/13968	AGS 1143-G	Plug	1	C
28F/4051714	AGS 1119-G	Tee	1	C
28Q/16373	AGS 2065-405	Rivet Avdel	2	C
28Q/9148740	AGS 2048-320	Rivet Pop	8	C
28Q/1013423	AGS 2048-329	Rivet Pop	10	C
26DN/-	1804/1367B	Label	1	-
26DN/-	1804/1367C	Label	1	-
28DU/9419966	A 102- $\frac{1}{2}$ D	Bolt	2	C
28F/NIV	AGS 2120-F or	Nipple	2	C
28F/4051592	AGS 1170F			
26DN/-	1804/1419B	Drip Flange	1	-
28E/20012	SP 91C	Clip	1	C

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<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
28F/4051885	AGS 2120-G or	Nipple	6	C
28F/NIV	AGS 1170G			
28F/1036552	AGS 2120-H or	Nipple	2	C
28F/NIV	AGS 1170H			
28DU/9419565	A 102.1.D	Bolt	3	C
28DU/9419967	A 102.2.D	Bolt	2	C
28DU/9419969	A 102.7.D	Bolt	2	C
28DU/9419645	A 113.10.D	Bolt	1	C
28DU/9436330	A 173.10.D	Bolt	1	C
28W/9457834	SP 124.D	Washer	2	C
28Q/NIV	AS.156.405	Rivet (or SP.78.405)	8	C
28Q/9676	AS.164.403	Rivet	8	C
28Q/9564474	AS.164.405	Rivet	7	C
28E/9130755	AS 5419/12	Clip	2	C
5K/7001266	AS.3360.C3.C	Bonding Flex	1	C
26DN/-	1804/1369C	Packing	1	-
28W/9129655	SP 122B	Washer	1	C

(ii) Service Supply items:

<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
27FS/2151	2032.Q	Valve, $\frac{3}{4}$ in. Saunders	1	A
27FS/6204	1488.D	Valve, 1 in. Saunders	1	B

All the above items will be issued on issue order to RAF units at home and those overseas units on direct re-supply; no demands are to be submitted. RAF units abroad and all other users are to demand separately their requirements of kits as listed above in accordance with current regulations.

(b) The following materials to be provided under Unit arrangements.

<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
30A/9437135	-	Locking Wire 22 SWG DTD 189A	As reqd	C

(2) Special Tools and/or Test Equipment

The following special tools or test equipment are required:

<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
26DN/1498023	MKT 721	Tools Set	1	
comprising of:				
26DN/NIV	MKT 721/1	Template aircock	1	
26DN/NIV	MKT 721/2	Template Fuel Cock	1	
26DN/NIV	MKT 721/3	Stencil	1	
26DN/NIV	MKT 721/4	Stencil	1	
26DN/NIV	MKT 721/5	Stencil	1	

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6. MODIFICATION OF SPARES

No spares are affected by this modification.

(See Para 11 for disposal of redundant parts).

7. CHANGE OF REFERENCE, PART AND ASSEMBLY NUMBERS

There are no changes of Reference, Part or Assembly Numbers as a result of this modification.

8. SEQUENCE OF OPERATIONS

The following is the sequence of operations:-

Note 1: Before any electrical circuit is disturbed or disconnected, all electrical power supplies in, to or from the aircraft are to be disconnected. Power supplies are to be reconnected only when the person responsible for embodying or inspecting the modification is satisfied that all action has been taken to make the aircraft safe for reconnection.

Note 2: Location Jigs to be used in accordance with instructions attached thereto.

(1) Fuel tanks to be drained off in accordance with AP 101B-1801-1A, Sect 2, Chap 2. Derv tanks to be swabbed out and thoroughly cleaned.

(2) Assuming rear fuselage and engine have been removed, locate the air pipe assembly Part No 1804/1195A running from the connection near the starboard tank top to the pipe coupling in the spine, remove and discard, leaving the spine coupling and bonding wire in the aircraft, retain the bonding clip and fairlead.

(3) Locate the pipes Part Nos 1804/981A, 1804/983A and 1804/985A which inter-connect the port and starboard Derv fuel tanks at the lower connection, discard these pipes but retain the 3 clips.

(4) Using template Part No MKT.721/1 position and mark off the holes for the aircock on the starboard wing root upper surface, rivet in place the Reinforcing Plate, Part No 1804/1413 and the Quadrant Part No 1804/1415 as shown on Drawing 1804/1361A.

(5) From the aircock Part No 2032Q (Ref No 27FS/2151) remove the handle and modify in accordance with Drawing 1804/1361. Re-part number the handle 1804/1361H, assemble the cock and refit the handle in accordance with Drawing 1804/1361A.

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- (6) Using template Part No MKT 721/2 position and mark off the holes for the fuel cock in the starboard main U/C wheel well, drill all holes and rivet in place the Reinforcing Plate Part No 1804/1357 and the Quadrant Part No 1804/1359.
- (7) From the fuel cock Part No 1488D (Ref No 27FS/6204) remove the handle, and modify in accordance with Drawing 1804/1361A. Re-part number the handle 1804/1361J, assemble the cock using bracket 1804/1369A, re-assemble the handle in accordance with Drawing 1804/1361A.
- (8) From the Mod Kit take the 4 new pipes Part Nos 1804/1381A 1804/1383A, 1804/1389A and 1804/1391A and assemble to inter-connect the port and starboard Derv tanks at the lower connections, using the 3 existing clips.
- (9) Take new pipe Part No 1804/1385A and assemble to the fuel cock and to the new pipe Part No 1804/1381A.
- (10) Locate the blanked off fuel connection on the No 3 centre tank at Frame 18A starboard side and remove the plug and outer sleeve, take new pipe Part No 1804/1387A and assemble to this connection and to the fuel cock as shown on Drawing 1804/1361A.
- (11) Take new air pipe Part No 1804/1379A and fit to the air cock (forward connection) and to the existing pipe Part No 1804/957A in the spine using the existing pipe coupling and bonding clips, replace the fairlead at the fuselage top skin.
- (12) Fit new pipe Part No 1804/1377A to connect between existing pipe Part No 1804/1193A and pipe Part No 1804/963A on the starboard tank top.
- (13) Fit new pipe Part No 1804/1375A between the air cock (centre connection) and the branch on the new pipe Part No 1804/1377A.
- (14) Remove the blanking plug from the end of existing pipe Part No 1804/1023B (starboard end) and connect new air pipe Part No 1804/1371A to this pipe and to the air cock (rear connection).
- (15) Fit bracket Part No 1804/1365A and fairlead Part No 1804/1363 supporting the air pipes to the shear wall between Frames 19 and 20 as shown on Drawing 1804/1361A.
- (16) The new pipes to be fitted with nipples as called for and clips as shown on Drawing 1804/1361A, check that blanking plug Part No AGS 1143G is fitted to drain pipe Part No 1804/1389A.

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(17) Add all labels and transfers as shown on Drawing 1804/1361A. Care must be taken when drilling holes for rivets not to permit the drill to damage pipes, etc, behind the skin being drilled. Use stencil templates Part No MKT 721/1-5 and Drawing No 1804/1367A for the alterations to the spine access door (electrical requirements).

(18) Locate and remove the Derv tank filler cap, Part No 1804/997, drill for locking wire and fit bonding tag Part No FOS/6/1 $\frac{1}{4}$ as shown on Drawing 1804/1361A.

(19) Fit drip deflector to the Derv NR Valve when this is fitted between Frames 25 and 26 as shown on drawing 1804/1417A. On some aircraft the NRV is positioned between frames 24 and 25 and the drip flange as shown on drawing 1804/1419A is to be fitted at this position. On aircraft where Command Mod 022 has introduced a pipe joint between frames 25 and 26 the drip deflector Part No 1804/1417A must be fitted here.

Note: Paint, grease, etc, must be removed locally from the pipes and structure at bonding positions to ensure good electrical connections.

(20) Refuel the aircraft and carry out fuel/flow leak test.

(21) Record Mod No 721 on the modification plate located on the outer face of the shearwall in the starboard wheel bay.

9. SPECIAL TESTS AFTER EMBODIMENT

When this modification has been embodied and inspected the following special tests are to be carried out:-

(1) Bonding test and see Test Schedule Addendum 1804/1411 Sheets 1 and 2.

Note: As the embodiment of this modification involves disturbance of the engine and flying control systems an independent check of the control systems is to be made in accordance with AP 3158, Vol 2, Leaflet B 28.

10. RECORDING ACTION

When this modification has been embodied and inspected in accordance with current authorised procedure, the relevant entries are to be made in the appropriate aircraft records.

11. DISPOSAL OF REDUNDANT PARTS

The undermentioned parts rendered redundant by the embodiment of this modification are to be disposed of as scrap in accordance with AP 830, Vol 1 (5th Edition), Leaflet A19/1:

<u>Ref No</u>	<u>Part No</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Class of Equipment</u>
26DN/8672	1804/981A	Pipe Assy (Derv)	1	C
26DM/8673	1804/983A	Pipe Assy (Derv)	1	C
26DN/8674	1804/985A	Pipe Assy (Derv)	1	C
26DN/8669	1804/1195A	Pipe Assy, Air	1	C

12. EFFECT ON WEIGHT AND MOMENT

This modification causes a change in the basic weight of plus 5.0 lb with a change in moment of plus 1240 lb ins. about the CG Datum.

13. EFFECT ON AIRCRAFT OR EQUIPMENT OPERATION AND HANDLING

This modification allows the Derv tanks to be fitted with fuel for longer ferry flights, with the facility to convert back to Derv for display flights. There are no further changes in operation and handling after each change over (on the ground) has been carried out.

14. EFFECT ON SERVICING AND ON GROUND SUPPORT EQUIPMENT

Servicing the aircraft after each role is selected is unchanged. When conversion is carried out this will have to include thoroughly cleaning out the Derv tanks.

Testing to include the information in the test schedule addendum (1804/1411 Sht 1 and 2). Flight simulators and ground support equipment are not affected.

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