

# **Nomad**

# SERVICE BULLETIN

Reference No 228

TRANSMITTAL LETTER  
FOR  
SERVICE BULLETIN ANMD-28-21 Rev 2

**FUEL — AUXILIARY TANK — INSPECTION OF FUEL AND VENTING PIPES IN WINGS  
FOR WEAR AT SUPPORT CLIPS**

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**Reason**

1. A main fuel line from an auxiliary fuel tank to a main fuel tank was discovered severely chaffed by a plain supporting 'P' clip. Mod N484 was developed to introduce cushioned clamps, to separate earth braids to overcome the chaffing, and to improve fuel line earthing.
2. Revision 1 amends compliance requirements and manpower allocations and provides Part 4 — Repair — Repair and Replacement Instructions.
3. Revision 2 adds CAUTIONS relating to fuel spillage and replaces reference to DEF AUST 277A with reference to MIL-STD-1247C for fuel pipe identification, plus minor editorial changes.

**Instructions**

4. Remove Service Bulletin NMD-28-21 Rev 1 dated 2 Apr 90 from Service Bulletin binder and insert the attached Service Bulletin NMD-28-21 Rev 2, dated 3 May 91. Annotate the Service Bulletin Index accordingly.

**Revision Status**

Original	19 Oct 89
Revision 1	2 Apr 90
Revision 2	3 May 91

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### FUEL - AUXILIARY TANK - INSPECTION OF FUEL AND VENT PIPES IN WINGS FOR WEAR AT SUPPORTING CLIPS

**1. PLANNING INFORMATION**

**A. Effectivity**

All Nomad Aircraft fitted with option G99, G99M or G99-24 Auxiliary fuel tanks, but not embodying Mod N484.

**B. Reason**

A main fuel feed line from an auxiliary to a main tank was found severely chafed by a plain supporting 'P' clip. The build standard for G99 specifies all-metal 'P' clips to retain and earth fuel and vent lines for the auxiliary tanks. Because of normal structural flexure and vibration, other aircraft may also be at risk. Mod N484 was developed to introduce cushioned clamps and separate earth braids to solve this problem, and to improve fuel line earthing.

**C. Description**

The Accomplishment Instructions (Section 2 of this Bulletin) are broken down into four parts.

Part 1 - Inspection (Ref para 2A). All G99 fuel and vent lines in the wings are inspected for wear, leakage and security of attachment.

Part 2 - Re-assembly (Ref para 2B). Where inspection shows the tubes to be within the limits specified in Part 1, the operator may re-assemble the lines as they were originally, or embody the intent of Mod N484 in accordance with Part 3.

Part 3 - Modification (Ref para 2C). Cushioned 'P' clips and separate earth straps are introduced to incorporate the intent of Mod N484 and to forestall future problems with chafing metal 'P' clips.

Part 4 - Repair (Ref para 2D). Damaged/deteriorated fuel and vent lines are removed and replaced.

**D. Compliance**

The Accomplishment Instructions (Parts 1 to 4 of this Bulletin, ref para 2A to 2D) must be carried out as follows.

Part 1 For aircraft with greater than 1500 hours TIS, Part 1 must be undertaken within 10 hours TIS of receipt of this bulletin and repeated every subsequent 100 hours TIS until Part 3 is completed.

For aircraft with less than 1500 hours TIS, Part 1 must be undertaken at or before 1500 hours TIS and thereafter repeated at intervals not exceeding 100 hours TIS until Part 3 is completed.

Part 2 At the operator's convenience.

Part 3 It is recommended that Part 3 be done concurrently with Part 1.

Part 4 Repairs are to be carried out as required.

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**E. Approval**

The modification detailed herein has been approved pursuant to Civil Aviation Regulation 35 and conforms with Type Certification requirements.

**F. Manpower**

Part 1 and Part 2            Eight manhours.

Part 3                        Twenty manhours.

**NOTE**

Aircraft LS 159 to LS 165 incorporate a variation to the standard configuration.  
'Completion of Parts 1, 2 and 3 will take longer on these aircraft.

Part 4                        Thirty manhours.

**G. Material**

To be obtained from Operator's stock or local sources.

**H. Tooling - Price and Availability**

None required.

**I. Weight and Balance**

<b>N22 Series</b>	<b>N24 Series</b>
Weight + 0.38 kg (0.84 lb)	+ 0.38 kg (0.84 lb)
Moment + 1947 kg mm (168 lb in)	+ 2207 kg mm (192 lb in)
IU (Mom/1000) +1.947 (0.168)	+ 2.207 (0.192)

**J. References**

Maintenance Manual for Customer Option G99, G99M or G99-24.

**K. Publications Affected**

Maintenance Manual and Illustrated Parts Catalogue for Customer Option G99, G99M and G99-24.

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### 2. ACCOMPLISHMENT INSTRUCTIONS

#### A. Part 1 - Inspection

- (1) Disassembly: Refer to Option G99 data.
  - (a) Drain the auxiliary wing tanks.
  - (b) Remove access panels from both wing lower surfaces between WSta 116 and WSta 258.



SOME FUEL SPILLAGE MAY OCCUR WHEN REMOVING HOSE FITTINGS.

- (c) Remove the hose fittings from each end of the four (4) aluminium fuel and vent lines between the main and auxiliary tanks.
- (d) Slacken the attaching screws/bolts for all retaining 'P' clips.
- (2) Inspection
  - (a) Slide fuel and vent lines end-wise to expose the areas beneath clamps.
  - (b) Inspect all five (5) clamp locations on each tube for evidence of chafing and/or fuel leakage. Wear up to 10% of wall thickness is acceptable, provided it is free of pitting.
  - (c) Advise ASTA General Aviation of all inspection results.

#### B. Part 2 - Re-assembly

##### NOTE

Where inspection shows the tubes to be within the limits specified in paragraph 2A(2), the operator may re-assemble the pipes as they were originally, or may embody the intent of Mod N484 by replacing the plain supporting 'P' clips with cushioned clamps, and attaching bonding leads to the pipes and undersurface wing skins in accordance with Part 3.

- (1) Move lines to their original locations and refix the 'P' clips. Check 'P' clip to tube security and replace any 'P' clip which no longer grips tube.
- (2) Reconnect the hoses at each end of each tube and torque the clamps to 12-15 inch pounds.
- (3) Check that bonding resistance between tubes and aircraft structure does not exceed 1.0 ohm.
- (4) Refit the underwing access panels.

#### C. Part 3 - Modification - Refer to Figure 1.

- (1) Remove each supporting 'P' clip and replace with a cushioned clamp, using existing attachment screws. (Where access to screws is limited, AN3 bolts of suitable grip length may be used as an alternative).
- (2) Using serviceable removed 'P' clips attach bonding leads to tubes as shown in Figure 1. Ensure that good electrical contact is obtained between clips and tubes. (Where access to screws is limited, AN3 bolts of suitable grip length may be used as an alternative).

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- (3) Drill hole in lower wing surface adjacent to access panel (Ref Fig 1) to clear stringer and rib, for attachment of bonding lead and secure as shown Figure 1, Detail 'B'. Maintain 13 mm separation between hole centre and edge of wing cut-out.
- (4) Check that bonding resistance between tubes and aircraft structure does not exceed 1.0 ohm.
- (5) Refit the underwing access panels.

### D. Part 4 - Repair

- (1) Disassembly: Refer to Option G99 data.
  - (a) Drain the auxiliary fuel tanks.
  - (b) Remove access panels from both wing lower surfaces between WSta 116 and WSta 258.

**CAUTION**

SOME FUEL SPILLAGE MAY OCCUR WHEN REMOVING HOSE FITTINGS.

- (c) Remove hose fittings from each end of fuel and vent lines between the main tanks and auxiliary tanks.
- (d) Remove the attaching screws/bolts for all retaining 'P' clips.
- (e) Remove Outboard Tank End.
- (2) Fuel Pipes Removal/Replacement
  - (a) Refer to Figure 2. As necessary, remove the following items by de-rieveting Panels A, B or C from the rib at WSta. 259.60:
    - 1 PN 1/N-57-241 Pipe Assy, PN 2/N-57-241 Pipe Assy (Post Mod N681)
    - 2 PN 1/N-57-242 Pipe Assy
    - 3 PN 1/N-57-243 Pipe Assy
    - 4 PN 1/N-57-244 Pipe Assy.
  - (b) Refer to Option G99 data. As necessary, remove and replace damaged/deteriorated fuel pipes.

### NOTE

The removal of some 'in line' fuel system components may be required during this operation.

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(c) Material specifications of Fuel pipes and vent pipes are as follows:

1 Part No: 1/N-57-278

Description: Pipe Fuel, Supply

Specification: 1/2 OD x 0.028 THICK

WW-T-700/6-TYPE-1-0-0R-T4

- Identify fuel pipe with red, black and white 'FUEL' identification tape as specified by MIL-STD-1247C.
- Pressure test to 20 psi.

2 Part No: 1/N-57-276

Description: Pipe, Fuel, Return

Specification: 3/4 OD x .028 THICK

WW-T-700/6-TYPE-1-0-0R-T4

- Identify fuel pipe with red, black and white 'FUEL' identification tape as specified by MIL-STD-1247C.
- Pressure test to 5 psi.

3 Part No: 1/N-57-279

Description: Pipe, Vent

Specification: 3/8 OD x .028 THICK

WW-T-700/6-TYPE-1-0-0R-T4

- Pressure test to 2 psi.

4 Part No: 1/N-57-273

Description: Pipe, vent, upper

Specification: 3/8 OD x .028 THICK

WW-T-700/6-TYPE-1-0-0R-T4

- Pressure test to 2 psi.

(3) Reassembly. Refer to Option G99 data.

(a) Install fuel line(s).

(b) Install items removed at paragraph 2D(2)(a).

## NOTE

Use CHERRYMAX rivets CR3213 or CR3243. Wet assemble CHERRYMAX rivets with PR 1422 Sealing Compound.

(c) Refix the 'P' clips. Check 'P' clip to tube security.

(d) Reconnect hoses to fuel and vent lines. Torque the hose clamps to 12-15 inch pounds.

(e) If Mod N484 has been incorporated, check that bonding resistance between fuel/vent lines and the aircraft structure does not exceed 1.0 ohm.

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- (f) Ensure auxiliary fuel tank is free of foreign objects. Reinstall Outboard Tank End.
- (g) Replace access panels previously removed from lower wing surfaces.

### 3. MATERIAL INFORMATION

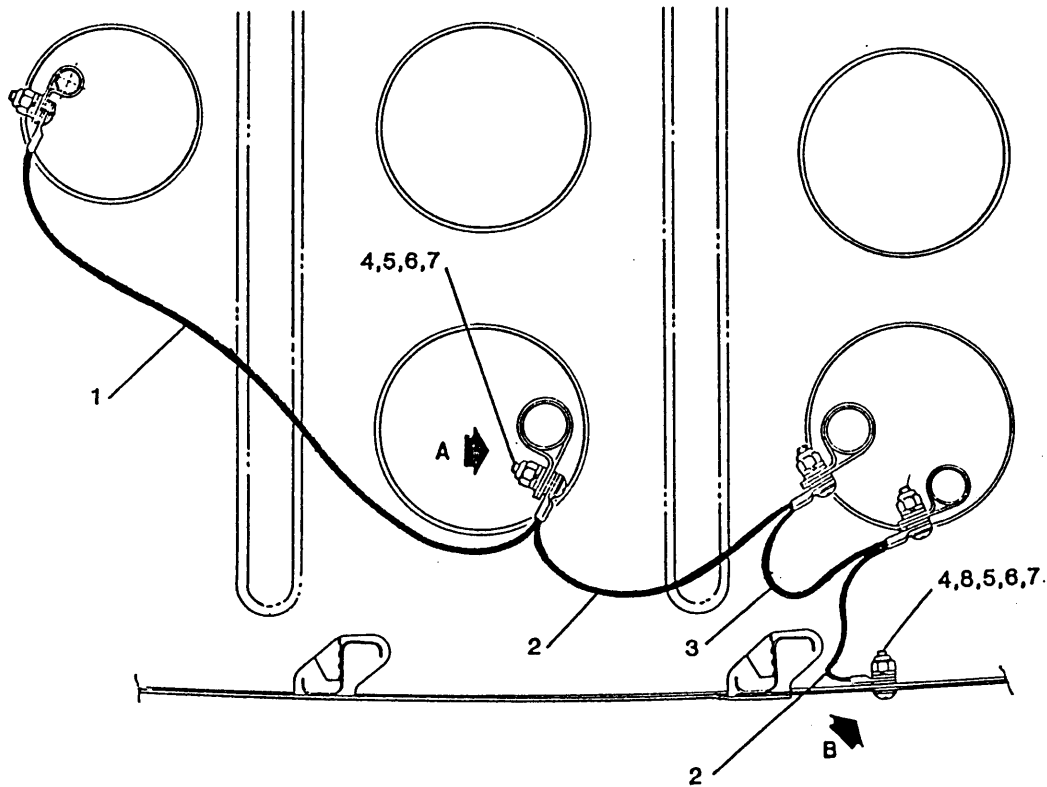
The following items represent one aircraft set of parts, to be obtained from the operator's stocks or from local sources.

New Part No	Qty	Description	Old Part No	Instruction/Disposition
MS25083-2BB10	2	Bonding Lead - 10 inches		
MS25083-2BB6	4	Bonding Lead - 6 inches		
MS25083-2BB3	2	Bonding Lead - 3 inches		
MS35207-263	10	Screw		
AN960-D10	18	Washer		
MS35338-43	10	Lockwasher		
MS21083-N3	10	Locknut		
AN960-10L	4	Washer		
MS21919DF6	10	Clamp (3/8 inch dia)		
MS21919DF12	20	Clamp (3/4 inch dia)		
MS21919DF8	10	Clamp (1/2 inch dia)		

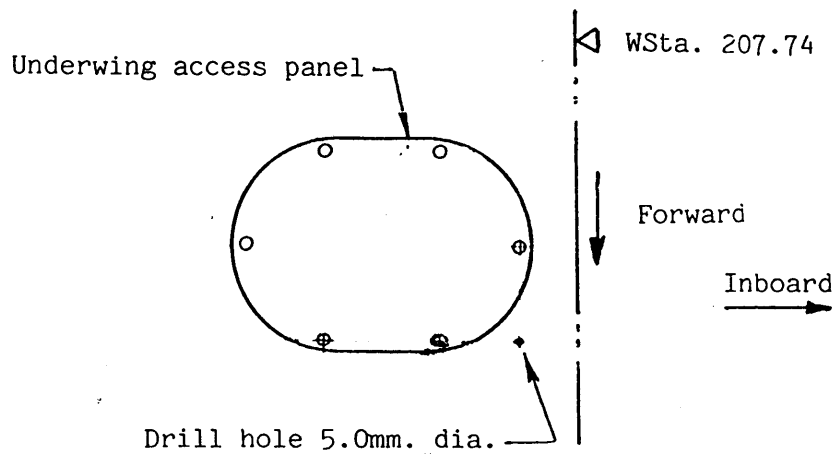
### 4. RECORDING ACTION

Record compliance with Service Bulletin ANMD-28-21 Parts 1 and 2, Parts 1 and 3, or Part 4, as appropriate, in the Airframe Log Book.

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PART-SECTION THROUGH WING SHOWING  
BONDING CONNECTIONS.



TYPICAL LOCATION OF BONDING ATTACHMENT  
TO UNDERSIDE WING SKIN - LH Shown, RH Opposite

**Figure 1 Installation of Bonding Leads (Sheet 1)**



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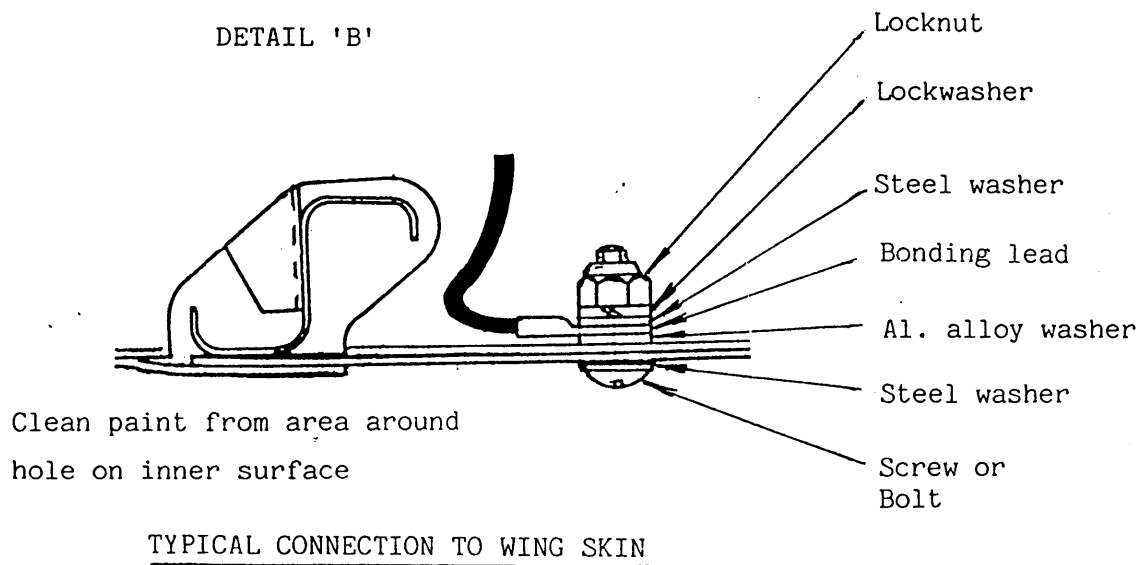
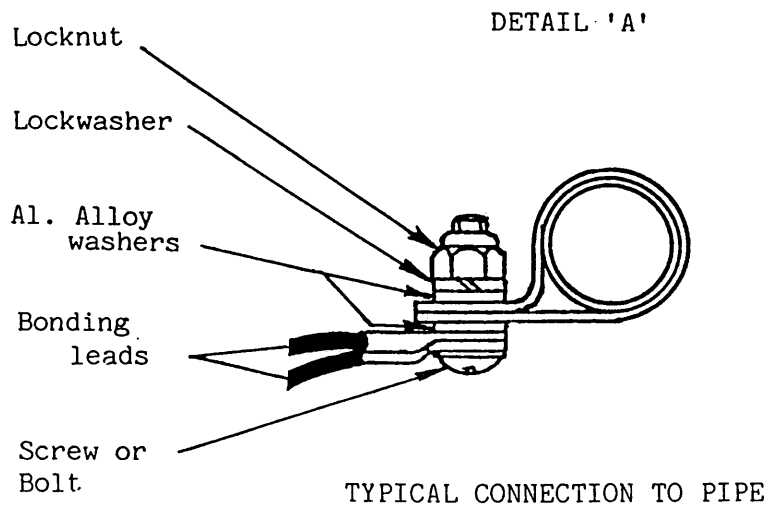


Figure 1 Installation of Bonding Leads - Details (Sheet 2)

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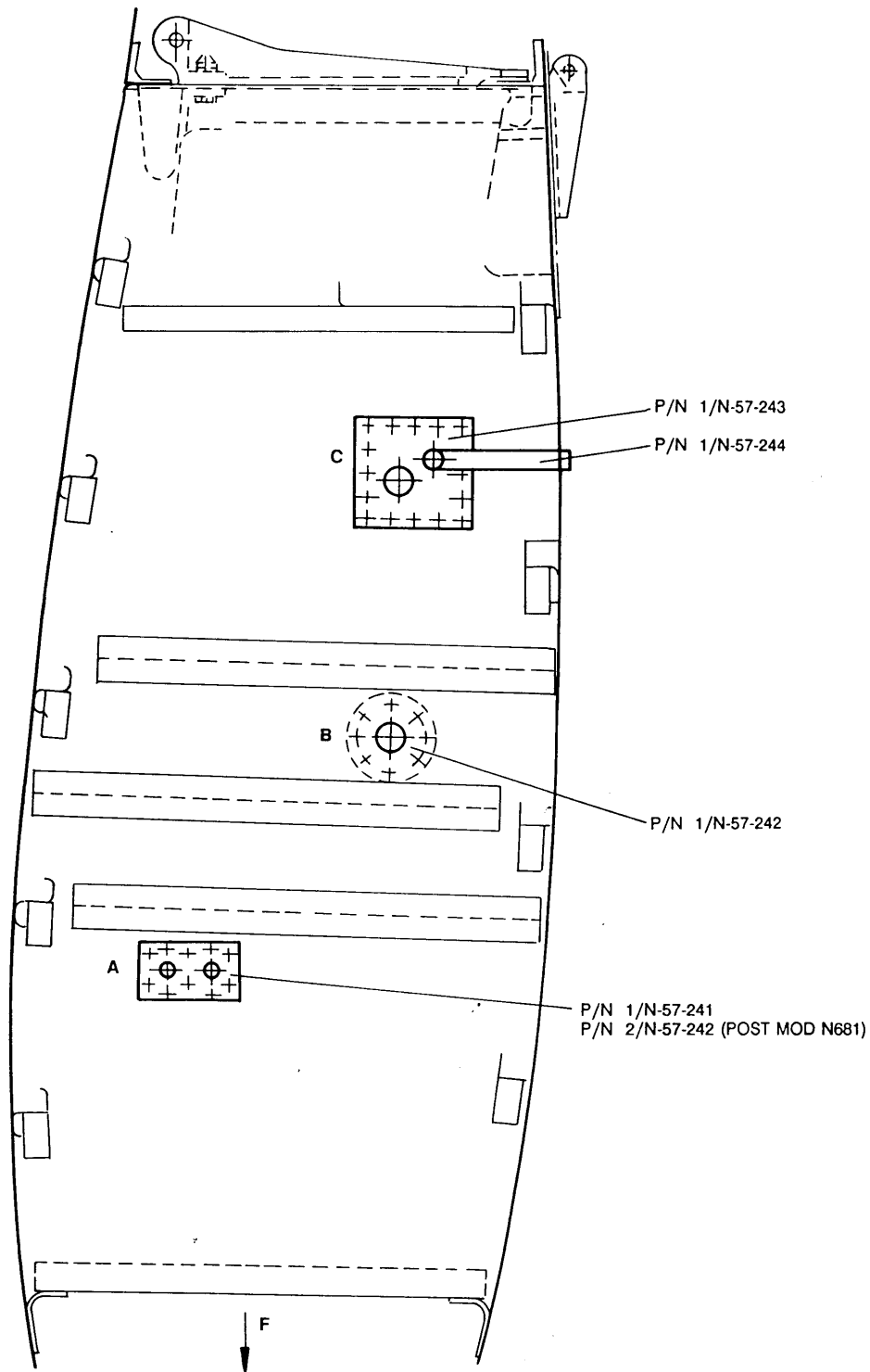


Figure 2 Pipes Removal Fuel System, Auxiliary Tank