FUEL-QUANTITY TRANSMITTERS-CORROSION INSPECTION AND REWORK (POST MOD N3 AND OPTION G99, G99F AND G99M)

1. PLANNING INFORMATION

A. Effectivity

(1) Aircraft Affected

(a) All Nomad N22-series and N24-Series aircraft with Mod N3 embodied and whose log books do not record the embodiment of Mod N540 or compliance with Service Bulletin NMD-28-13 or Service Bulletin NMD-28-13 Revision 1.

(b) All Nomad N22-series or N24-Series aircraft fitted with Option G99, G99F or G99M and whose log books do not record the embodiment of Mod N541 or compliance with Service Bulletin NMD-28-13 or Service Bulletin NMD-28-13 Revision 1.

(c) Spares Affected

Item P/N	Title	Recommended Disposition
VT 081	Transmitter, Fuel Quatity (Post Mod N3)	Rework (Ref Para 2A) or replacement (Ref Para 2B)
VT 080	Transmitter, Fuel Quantity (Option G99, G99F or G99M)	Rework (Ref Para 2A) or replacement (Ref Para 2B)

NOTE

1. Fuel quantity transmitters previously reworked by GAF will be identified as follows:

   VT 081 to 1/N-03-710

   VT 080 to 2/N-03-710

2. Replacement fuel quantity transmitters will be identified as follows:

   VT 081-1 in place of VT 081

   VT 080-1 in place of VT 080

B. Reason

Under certain operating conditions water may collect in the base of the fuel quantity transmitters and produce corrosion. This can cause inaccurate fuel quantity readings at the indicators if sufficient corrosion is present to produce a high resistance in the earth return of the fuel quantity indicating circuit.

Reason for Revision 2

To clarify compliance requirements and checks after rework or replacement.

Page No	1	2	3	4	5	6	7	8	9
Rev No	2	2	2	2	2	2	2	2	2

C. **Description**

The fuel quantity transmitters P/N VT 080 (Option G99. G99F and G99M) and VT 081 (Post Mod N3) are modified to provide an improved internal earth return circuit and the inside surface of the base of the transmitter is coated to prevent corrosion. The modifications may be incorporated by reworking existing transmitters as described in Para 2 Part A of this Service Bulletin. Alternatively. modified fuel transmitters P/Ns VT 080-1 and VT 081-1 are now available from the fuel quantity transmitter manufacturer which incorporate a direct earth return circuit with an external termination and a water drain plug in addition to improved corrosion resistance. Fitment of the manufacturer modified transmitters is described in Para 2 Part B of this Service Bulletin. The installations of the VT 081-1 and the VT 081 transmitters are identical. For installation of VT 080-1 transmitters (Option G99. G99F and G99M) the earth terminal lugs require changing (Ref Para 2 Part B).

D. **Compliance**

Compliance with this Service Bulletin is MANDATORY.

Part A or Part B of Para 2 of this Service Bulletin shall be incorporated within the specified time constraints as follows:

(1) All N22-Series and N24-Series aircraft which do not have Mod N540 or N541 (as appropriate) embodied and with less than 600 hours Time in Service or less than six months old - before 700 hours Time in Service or within seven months after delivery.

(2) All N22-Series and N24-Series aircraft which do not have Mod N540 or N541 (as appropriate) embodied and with more than 600 hours Time in Service or more than six months old - within the next 100 hours Time in Service following receipt of this Service Bulletin.

(3) Fuel quantity transmitters P/N VT 081-1 and VT 080-1 may be fitted (by way of Mods N540 or N541) at any time convenient to the operator as a replacement for fuel quantity transmitters P/N VT 081 and VT 080 respectively or VT 081-NMD-28-13/10 and VT 080-NMD-28-13/10 respectively.

(4) Following rework or replacement as above, carry out the provisions of para 2.C. (Part C) of this Service Bulletin.

E. **Approval**

The requirement detailed herein has been approved by a person authorised under Civil Aviation Regulation 35 and conforms with the type certification requirements.

F. **Manpower**

(1) Rework of VT 081 and VT 080 fuel quantity transmitters -16 manhours plus curing time for PR Sealant (Ref Para 2 Table 1).

(2) Replacement of VT 081 or VT 080 transmitters with VT 081-1 or VT 080-1 transmitters respectively - 4 manhours per transmitter.

G. **Material - Price and Availability**

Refer to Para 3.A.

H. **Tooling - Price and Availability**

None required.

I. **Weight and Balance**

Negligible effect.

J. **References**

MM – Maintenance Manual and Maintenance Manual Supplements for Options G99, G99F or G99M.

K. **Publications Affected**

IPC – Illustrated Parts Catalogue.

IRM – Inspection Requirements Manual.

2. **ACCOMPLISHMENT INSTRUCTIONS**

A. **Part A – Rework of Fuel Quantity Transmitters**

(1) Drain the fuel tanks (Ref MM 12-10-00).

(2) Remove the fuel quantity transmitter from each tank (Ref MM 28-40-00).(For aircraft fitted with Option G99, G99F or G99M refer G99, G99F or G99M MM Supplements) .

(3) Remove the nut and washer securing the fuel quantity transmitter tubular cover and remove the cover taking care not to damage the resistance wires.

(4) Move the float to its end of travel furthest from the base and temporarily secure in this position.

CAUTION

TAKE CARE TO AVOID DAMAGING THE TRANSMITTER RESISTANCE WIRE OR TENSIONING SPRING WHEN REMOVING CORROSION AT STEP 5.

(5) Remove any corrosion from the inside surfaces of the base of the transmitter by scraping with a knife or suitable alternative and a piece of scotchbrite pad.

(6) Clean the tensioning spring and the inside surfaces of the base by wiping with Methyl Ethyl Ketone (MEK) solvent and allow to dry.

CAUTION

THE SOLDERING TO BE DONE IN STEP 7 MUST BE COMPLETED AS QUICKLY AS POSSIBLE AND WITHOUT EXCESSIVE HEAT INPUT TO AVOID MELTING THE SOLDER HOLDING THE RESISTANCE WIRE. THE USE OF A HEAT SHUNT IS RECOMMENDED.

(7) Solder a piece of braided copper bonding lead, one centimetre in length, between the resistance wire tensioning spring and the float guide rod. Take care to keep the bonding lead as low as possible so that the float range of travel is not reduced. Also solder the resistance wire tag to the terminal rivet (Ref Figure 1).

NOTE

To ensure a satisfactory soldered connection scrape the plating away from the area to be soldered on the guide rod. Clean with soldering flux suitable for steel and then tin the rod. Remove any residue of flux with alcohol.

CAUTION

WHEN APPLYING THE FUEL TANK SEALANT AS DIRECTED IN STEP 8, ENSURE THAT THE OPERATION OF THE TENSIONING SPRING IS NOT IMPEDED.

(8) Using a small stiff-bristled artist's brush, apply a thin coating of fuel tank sealant (Ref Table 1) thinned with 20% MEK by weight, onto the inner surface of the transmitter base and over the fixed terminal for the resistance wire. Work the sealant under the tensioning spring as much as possible to seal the interface between the tensioning spring and the base.

NOTE

1. Curing times for the sealants are given in Table 1, these times may be reduced to six hours if a heat source (oven) is available with a controlled temperature of 50° C Max.

2. Step 8 is recommended but not mandatory. If none of the fuel sealants listed in Table 1 are obtainable at short notice Step 8 may be omitted, or complied with at a convenient time such as when the transmitters are removed for checking and cleaning as recommended in this service bulletin (Ref Part C).

SEALANT	MIN APPLICATION LIFE (HOURS)	MAX TACK FREE TIME(HOURS) AT ROOM TEMP	TACK FREE TIME (HOURS) AT 50°C
PR1422-A1/2	0.5	10	6
PR1422-A2	2.0	36	6
PR1221-A1/2	0.5	10	6
PR1221-A2	2.0	24	6

Table 1 Acceptable Sealants – to be thinned down with 20% by weight MEK

(9) Allow the sealant to cure for the time specified in Table 1 and then release the float from its temporarily secured position. Check that the float moves freely over its full range of travel.

(10) Carry out a resistance and continuity check on the reworked transmitter as follows:

(a) Continuity check

1 Connect an ohmmeter between the resistance wire termination on the tensioning spring and the base of the transmitter. The resistance indicated should be zero ohms.

2 Disconnect the ohmmeter from the transmitter.

(b) Resistance check

1 Connect an ohmmeter between the power supply terminal and the base of the transmitter.

2 Simulate the installed attitude of the transmitter in the aircraft, allow the float to freely take up its lowest position on the guide rod, that is, do not force the float further downwards than its freely adopted position. The resistance indicated should be 2.2 + 0.7 ohms for both types of transmitters.

3 Disconnect the ohmmeter.

4 Refit the transmitter cover and secure with washer and nut.

(11) Re-identify the fuel quantity transmitter by altering the part number from VT 081 to VT 081-NMD-28-13/10 (Post- Mod N3) or from VT 080 to VT 080-NMD-28-13/10 (Option G99, G99F or G99M) if reworked completely in accordance with Para 2 Part A of this service bulletin. If Step 8 (Sealing the transmitter base) has not been complied with, re-identify the fuel quantity transmitters by altering the part number from VT 081 and VT 080 to VT 081-NMD-28-13 and VT 080-NMD-28-13 respectively.

NOTE

The fuel quantity transmitters must be re-identified as per this Service Bulletin. If Step 8 is to be complied with at a later date, re-identify the fuel quantity transmitter from VT 081-NMD-28-13 to VT 081-NMD-28-13/10 or from VT 080-NMD-28-13 to VT 080-NMD-28-13/10 at the time of compliance.

(12) Refit the fuel quantity transmitters to the aircraft fuel tanks and calibrate the fuel quantity indicators (Post Mod N3 - Ref MM 28-40-00, Option G99, G99F or G99M - Ref G99, G99F or G99M MM Supplements) .

B. **PART B - Replacement of Fuel Quantity Transmitters**

Replacement of Pre-Mod N540 or N541 fuel quantity transmitters with Post-Mod N540 or N541 transmitters is accomplished as follows:

(1) Select the BATTERY switch on the overhead console to OFF.

(2) Drain the fuel tanks in which the fuel quantity transmitter(s) are to be replaced (Ref MM Chap 12 and, if necessary, Option G99, G99F or G99M MM Supplements).

(3) Remove the fuel quantity transmitter to be replaced with modified transmitter (Ref MM Chap 28-40-00). For aircraft fitted with Option G99, G99F or G99M refer to the MM Supplements of these Options. Retain the transmitter attaching parts.

(4) Option G99, G99F or G99M ONLY. - Identify earth lead Q48A22N (LH wing) or Q57A22N (RH Wing) and remove the terminal lug from the transmitter end of lead. Crimp terminal lug P/N MS25036-149 to the transmitter end of earth lead Q48A22N and/or Q57A22N.

CAUTION

ENSURE THAT THE TRANSMITTER FLOAT LOCKING PIN AND ADHESIVE LABEL ARE REMOVED FROM THE REPLACEMENT TRANSMITTER BEFORE INSTALLATION.

(5) Fit the replacement transmitter P/N VT 081-1 to the aircraft's main fuel tank or transmitter P/N VT 080-1 to the wing-tip auxiliary fuel tank (if fitted) using the attaching parts retained at Step (3). Torque tighten the attaching bolts to between 20 and 25 lb in.

(6) Connect the positive and negative electrical leads to their respective terminals on the transmitter (Ref Figure 2) .

(7) Calibrate the fuel quantity indicators of the newly installed transmitters (Ref MM 28-40-00 or MM Supplements of Option G99, G99F or G99M as appropriate) .

C. **PART C**

Checks after rework or incorporation of Mods N540 and N541.

(1) Fuel quantity transmitters with Part numbers VT 081-NMD-28-13 or VT 080-NMD-28-13 (ie not incorporating the requirements of Para 2 Part A sub para (8) of this Service Bulletin) shall be removed and dismantled for cleaning per SB NMD-28-13 at least once every year, or every 600 hours Time in Service.

(2) Fuel quantity transmitters with Part numbers VT 081-NMD-28-13/10 or VT 080-NMD-28-13/10 (ie incorporating the requirements of Para 2 Part A sub para (8) of this Service Bulletin) shall be removed and inspected once every year, or every 600 hours Time in Service. Cleaning and re-sealing in accordance with SB NMD-28-13 shall be performed as required.

(3) Post Mod N540 or N541 fuel quantity transmitters are fitted with a drain plug. A water drain check shall be carried out every 100 hours. Upon compliance with this requirement, no removal and inspection requirements are anticipated.

3. **MATERIALS INFORMATION**

A. **Parts Required per Aircraft**

(1) Rework in accordance with Para 2 Part A.

The following items required to rework fuel quantity transmitters (Ref Para 2 Part A) are to be obtained from the 0perator' s stock or local sources.

Item	Qty
Scotchbrite Pad	A/R
Methyl Ethyl Ketone (MEK) Solvent	A/R
Braided copper bonding lead (1/32 in x 3/32 in tinned flat copper braid - commercial	A/R
Alcohol	A/R
Small stiff-bristled artist's brush	1
Fuel Resistant Sealant (Ref Para 2 Table 1)	A/R

(2) Replacement of Manufacturer Modified Transmitters (Ref Para 2 Part B)

Post Mod N540 and N541 fuel quantity transmitters, P/N's VT 081-1 and VT 080-1 respectively, may be obtained from: V.D.O. Luftfahrtgerate Werk Adolf Schindling GMBH, Frankfurt, Germany, their local distributors or agents, or Boeing Aircraft Systems - ASTA, Nomad Support Customer Spares.

B. **Parts Reworked and Re-identified by Operator**

Refer to Para 2 Part A (11).

C. **Parts Required to Modify Spares**

None.

D. **Removed Parts**

Fuel quantity transmitters P/N's VT 081 or VT 080 if being replaced by Post Mod N540 or N541 transmitters, P/N's VT 081-1 or VT 080-1 respectively (Ref Para 2.B. (Part B) of this Service Bulletin).

E. **Special Tools and Equipment**

None.

4. **RECORDING ACTION**

Record compliance with Service Bulletin NMD-28-13 Revision 2 Para 2 Part A or Part B, as appropriate in the airframe log book.

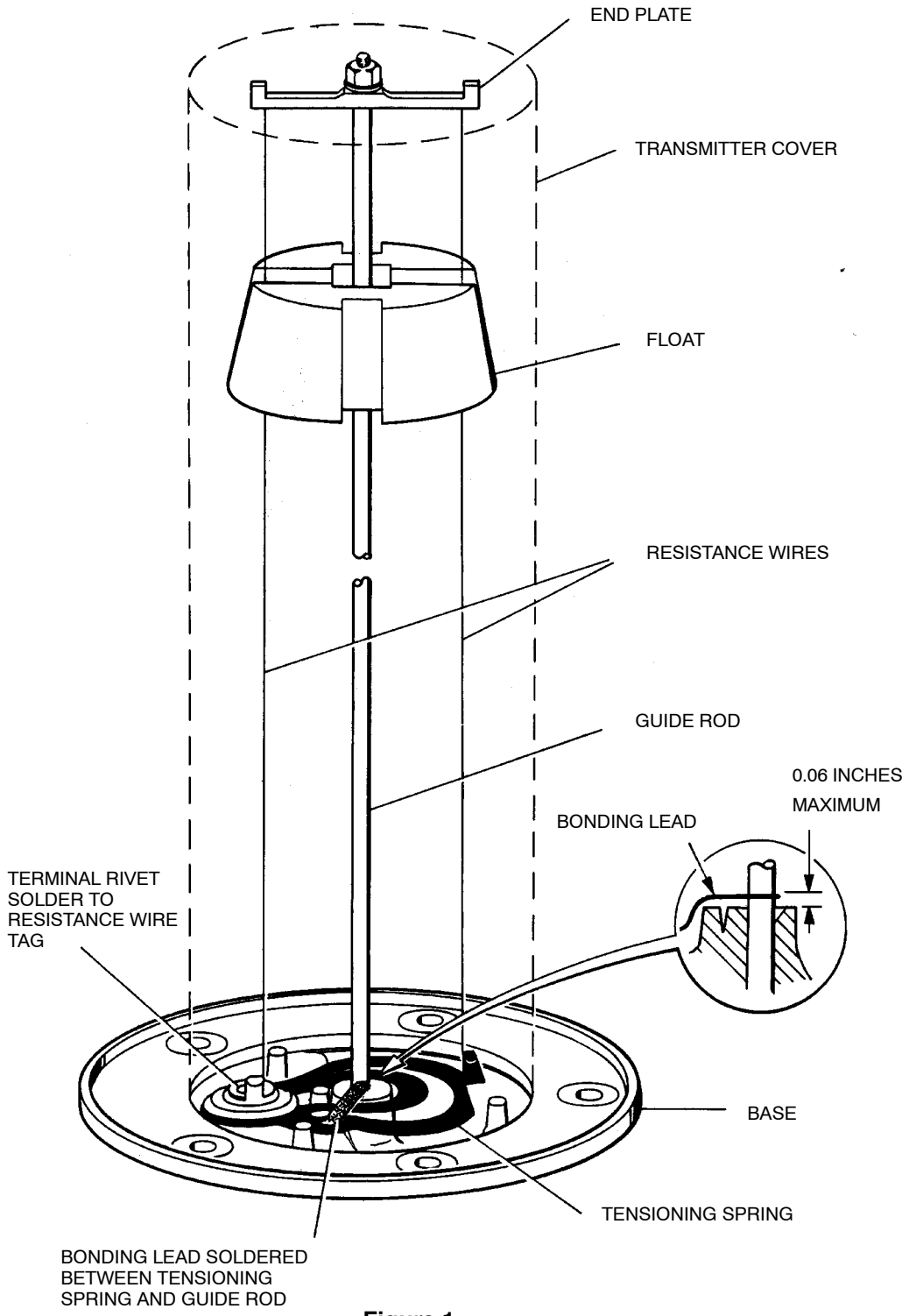
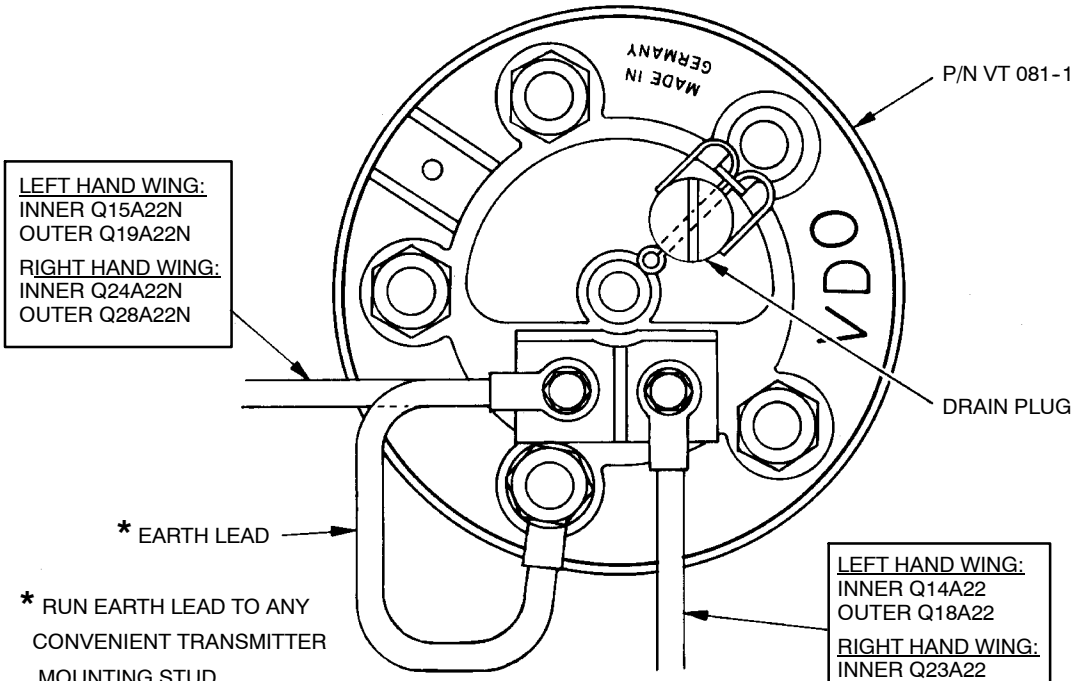
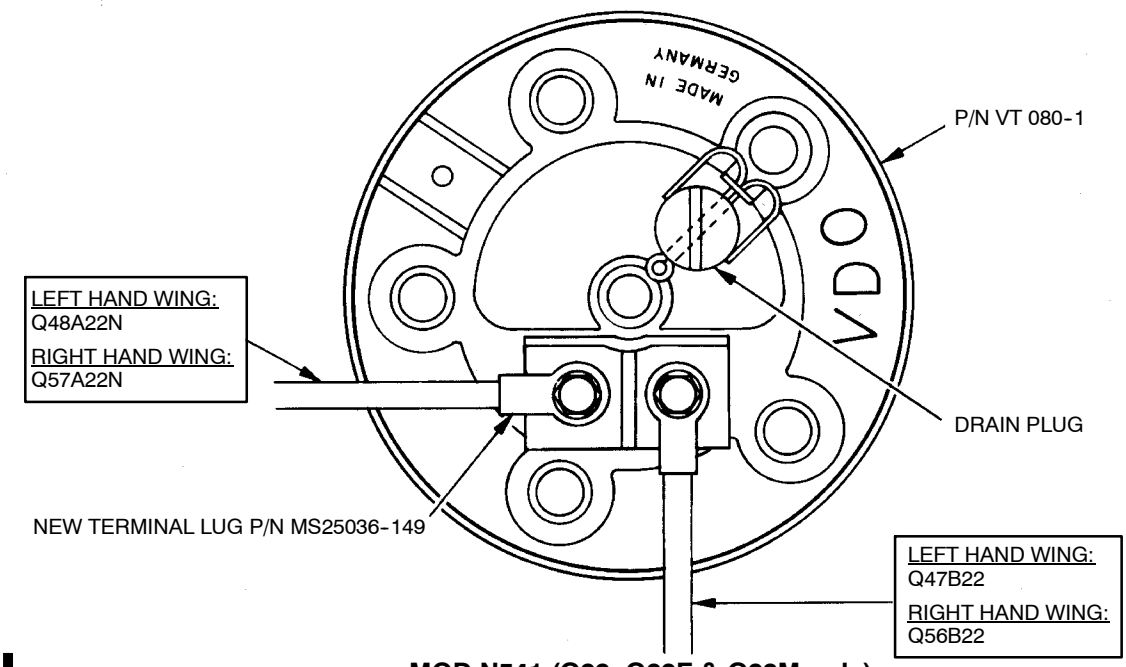

END PLATE
TRANSMITTER COVER
FLOAT
RESISTANCE WIRES
GUIDE ROD
0.06 INCHES
MAXIMUM
BONDING LEAD
TERMINAL RIVET
SOLDER TO
RESISTANCE WIRE
TAG
BASE
TENSIONING SPRING
BONDING LEAD SOLDERED
BETWEEN TENSIONING
SPRING AND GUIDE ROD

Figure 1



MOD N540 (Main Tanks)



MOD N541 (G99, G99F & G99M only)

Figure 2 Wiring of Fuel Quantity Transmitters