

# *Nomad*

## SERVICE BULLETIN

### HORIZONTAL STABILISER - REVISED CONTROL GEOMETRY (MODIFICATIONS N211 AND N211-24)

**1. PLANNING INFORMATION**

**A. Effectivity**

(1) Aircraft Affected

- (a) All Nomad N22-Series Aircraft whose log books do not already record the embodiment of Mod N211, or compliance with Service Bulletin NMD-27-9.
- (b) All Nomad N24-Series Aircraft whose log books do not already record the embodiment of Mod N211-24, or compliance with Service Bulletin NMD-27-9.

Pre-certification implementation of the intent of this service bulletin is recorded in the airframe log book as Mod N211 (N22) or Mod N211-24 (N24).

(2) Spares Affected

Part Number	Nomenclature	Recommended Disposition
1/N-45-953	Torque shaft assembly	Rework
2/N-45-958	Connecting rod assembly	*
1/N-47-214	Horizontal stabilizer trim indicator drum	Rework
1/N-45-888	Cable fork-end "LOWER"	Scrap

\* Retain fork-end PN 2/N-45-962 and nut PN AN315-7, scrap remainder.

**B. Reason**

To increase the margin of safety in the event of inadvertent loading of the aircraft beyond the aft cg. limit.

**C. Description**

(1) The horizontal stabiliser geometry is revised by the introduction of:

- (a) a modified torque shaft assembly at Sta 428 (N22) Sta 473 (N24)
- (b) a modified control rod between the torque shaft assembly and horizontal stabiliser.
- (c) re-marking of the horizontal stabiliser trim drum markings.

(2) Two new rigging bars are introduced, one to improve the rigging technique of the modified rear fuselage torque shaft and one to provide the revised rigging positions for the horizontal stabiliser. An alternative method of rigging the horizontal stabiliser control system torque shaft in the rear fuselage using a template and spirit level or inclinometer is provided (Ref Para 2.9).

Page No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rev No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# **Nomad**

## SERVICE BULLETIN

- (3) With the modification incorporated the horizontal stabiliser rigging angle is changed from 3 degrees 30 minutes  $\pm$ 30 minutes nose-down to 3 degrees  $\pm$ 30 minutes nose-down for N22-Series Aircraft, and to 1 degree  $\pm$  30 minutes nose-down for N24-Series Aircraft.

### NOTE

The expression "nose-down" refers to the horizontal stabiliser attitude.

#### D. Compliance

- (1) N22-Series Aircraft.

Within 300 hours Time in Service following availability of parts, but not later than 1st October, 1982.

- (2) N24-Series Aircraft.

At the operators discretion.

### NOTE

Before complying with this service bulletin the following modifications must be carried out:

N426 as detailed in Service Bulletin NMD-27-13.

N398 as detailed in Service Bulletin NMD-55-8.

In addition, Mod N63 as detailed in Service Bulletin NMD-27-15 must be incorporated concurrently with Mod N211 or N211-24.

#### E. Approval

The modification detailed herein has been approved pursuant to Air Navigation Regulation 40 and conforms with the type certification requirements.

#### F. Manpower

2 men for 4 hours (8 manhours).

#### G. Material, Price and Availability

The parts required to incorporate the modification detailed in this service bulletin are available free of charge as Kit PN NMD-27-9-1 (N22) and Kit PN NMD-27-9-2 (N24) from the operator's local distributor. Distributors are to place a "no charge" purchase order on GAF, through the normal procurement procedure. Purchase orders are to quote the aircraft serial number and service bulletin No. NMD-27-9. Kits will be available ex-factory from March 1982.

# Nomad

## SERVICE BULLETIN

### H. Tooling , Availability

- (1) The following rigging tools are required following embodiment of Mod N211 or Mod N211-24. They should be acquired through the normal procurement channels:

Rigging Bar *	1/N-88-180	
Rigging Bar	1/N-88-181	(N24-Series Aircraft only)
Rigging Bar	1/N-88-183	(N22-Series Aircraft only)
Rigging Pin	1/N-88-82	
Rigging Bar	1/N-88-99	

\* Not required for alternative method of rigging (Ref Para 2.Q.).

- (2) The following tools are also required if the alternative method of rigging (Ref Para 2.Q.) is used:

Inclinometer 0-35 degrees and graduated in degrees and minutes  
or  
Spirit level and locally manufactured template (Ref Figure 6)

### I. Weight and Balance

No change.

### J. Reference

Maintenance Manual  
Illustrated Parts Catalogue

### K. Publications Affected

Maintenance Manual  
Illustrated Parts Catalogue

## 2. ACCOMPLISHMENT INSTRUCTIONS



SUPPORT REAR OF AIRCRAFT WHILST WORKING IN REAR FUSELAGE.

- A. Assemble and install new horizontal stabiliser control rod.

- (1) Remove the horizontal stabiliser control rod PN 2/N-45-958 (Ref MM Chap 27-40-05 and IPC Chap 27-40-02 Figure 4). Discard the split pins, but retain the other attaching parts.
- (2) Remove and retain fork-end PN 2/N-45-962 and nut PN AN315-7 from the control rod (Ref Figure 1), but discard the remainder of the control rod.
- (3) Assemble fork-end PN 2/N-45-962 and nut PN AN315-7 to new control rod PN 2/N-45-1407-950 to form new fully-assembled control rod PN 2/N-45-1407. Re-part number the new rod as PN 2/N-45-1407.

# Nomad

## SERVICE BULLETIN

- (4) Install new control rod PN 2/N-45-1407 to the horizontal stabiliser only (Ref MM Chap 27-40-05 and IPC Chap 27-40-02) using the attaching parts removed and retained in Para 2.A.(1)). Fit a new split pin PN MS24665-302 at the upper attachment point. Do not connect the control rod to the torque shaft until rigging the horizontal stabiliser control system (Ref Para. 2.O.).

- B. Remove horizontal stabiliser torque shaft from rear fuselage.



ENSURE THAT THE HORIZONTAL STABILIZER CONTROL CABLES, WHEN DISCONNECTED FROM THE TORQUE SHAFT ASSEMBLY IN THE REAR FUSELAGE, ARE NOT ALLOWED TO FALL FROM THEIR ASSOCIATED PULLEYS.

- (1) Install control cable clamps at a suitable place in the rear fuselage to retain the cables in their normal positions. Mark the upper and lower cables "UPPER" and "LOWER" respectively, then disconnect the cables from the fork-ends of the torque shaft assembly, by unscrewing the turnbuckle bodies adjacent to the assembly.
- (2) Remove the horizontal stabiliser torque shaft assembly from the rear fuselage (Ref MM. Chap 27-40-06).

### NOTE

Cheek that the stencilled words "UPPER" and "LOWER" are still legible on the upper and lower fork-ends attached to the torque shaft assembly. If these stencils are partially or totally unreadable, renew the lettering as necessary.

- C. Mark the top of crank arm PN 1/N-45-808 (Ref IPC. Chap 27-40-02 Figure 4) for later identification, then remove the crank arm from the torque shaft. Retain the bolts, nuts, flat washers and spring washer. Note the position where the bonding lead is fitted and the order of assembly of attaching parts.
- D. Temporarily assemble together the original crank arm PN 1/N-45-808, the new crank arm PN 1C/N-03-621-950 and template PN 1B/N-03-621 using the attaching parts and method of assembly shown in Figure 2.

### NOTE

Ensure that the top of the original crank arm (Ref Para 2.C. is uppermost, and that bolt PN NAS1303-8 is fitted through the predrilled reference hole in the new crank arm and the bottom hole in the original crank arm. Close-tolerance bolts must be used in all positions.

# Nomad

## SERVICE BULLETIN



DO NOT ATTEMPT TO DRILL THE ATTACHMENT HOLES IN THE NEW CRANK ARM BY HAND.

- E. Using a drill press, and utilising the attachment holes in the original crank arm as a guide, drill and ream the three remaining attachment holes in the new crank arm to 0.1900/0.1908 inch dia. Disassemble the crank arms and discard template PN 1B/N-03-621 and the original crank arm PN 1/N-45-808.
- F. Assemble the new crank arm to the torque shaft assembly as shown in Figure 3. Fit the bolt through the bottom attachment (reference) hole first, then check that the three remaining attachment bolts can be fitted. DO NOT FIT THE NUTS YET.

### NOTE

If any bolt cannot be fitted due to misalignment of the crank arm holes with the holes in the mating flanges, ream the relevant holes to 0.1900/0.1920 inch dia.

- G. Check that the diameters of the holes in the crank arm and the flanges of the torque tube do not exceed the outside diameters of the bolts by more than 0.002 inch.

### NOTE

If any hole is damaged or drilled oversize, drill and ream the hole to 0.2031/0.2038 inch dia. then fit oversize bolt PN NAS6203-8X or PN NAS6203-10X to the 0.2031/0.2038 inch dia hole(s) when assembling the crank arm to the torque shaft assembly. The long bolt (PN NAS6203-10X) is used to accommodate the bonding lead. DO NOT FIT THE NUTS YET.

- H. Measure the gap between one of the flanges and the new crank arm (Ref Figure 4). Fit laminated shims PN 1D/N-03-621 (Ref. Figure 3) as required to ensure that the gap does not exceed 0.003 inch. Secure the crank arm to the torque shaft assembly using original nuts and washers, ensuring that the bonding lead terminal is correctly fitted (Ref Para 2.B.). Torque tighten the nuts to between 25 and 30 lb inches.
- I. Drill and ream the rigging hole in the torque lever assembly.
  - (1) Remove the nut PN AN316-4, washers PN AN960-416, washers PN AN960-416L and peened bolt PN AN174-11A attaching the UPPER fork-end PN 1/N-45-889 to torque shaft lever assembly PN 1/N-45-950. Discard the bolt and nut, but retain the fork-end and the washers.
  - (2) Assemble template PN 1A/N-03-621 to the upper arm of the torque shaft lever assembly (Ref Figure 5). Drill and ream the rigging hole in position illustrated. Remove the nut, washers and bolt attaching template PN 1A/N-03-621 to the torque lever assembly. Discard the template, but retain the attaching parts.

### NOTE

This rigging hole is for future use with rigging bar PN 1/N-88-180 as detailed in the rigging procedure for the horizontal stabiliser (Ref Chap MM 27-40-00).

# **Nomad**

## SERVICE BULLETIN

### WARNING

UPPER FORK-END PN 1/N-45-889 AND LOWER FORK-END PN 3/N-45-888 HAVE DIFFERENT HAND TURNBUCKLE THREADS TO PREVENT CROSS CONNECTION OF HORIZONTAL STABILIZER CONTROL CABLES. IT IS IMPERATIVE THAT FORK-END PN 1A-45-889 (LH THREAD AND MARKED "UPPER") BE FITTED TO THE UPPER ARM OF THE TORQUE SHAFT LEVER, AND THAT FORK-END PN 3/N-45-888 BE FITTED TO THE LOWER ARM OF THE TORQUE SHAFT LEVER. AFTER FITTING THE FORK-ENDS TO THE TORQUE SHAFT LEVER THE PIVOT BOLTS ARE TO BE PERMANENTLY LOCKED BY PEENING THE BOLT END. AN INDEPENDENT INSPECTION SHOULD BE PERFORMED TO CHECK THAT THE FORK-ENDS HAVE BEEN CORRECTLY CONNECTED TO THEIR RESPECTIVE ARMS OF THE TORQUE SHAFT LEVER.

- J. Connect the UPPER fork-end PN 1/N-45-889 to the upper arm of the torque shaft lever assembly using the attaching parts and method of assembly shown in Figure 1, Detail A. Torque tighten the nut to between 30 and 40 lb inches. Fit split pin and then peen bolt thread.

### NOTE

Utilise original washers, fitting thin washers PN AN960-416L as required to ensure that the fork-end will not be distorted when the nut is tightened. Use new bolt, castellated nut and split pin from kit.

- K. Fit new LOWER fork-end.
- (1) Remove the LOWER fork-end PN 1/N-45-888 from the torque shaft lever. Discard the fork-end, attaching bolt PN NAS1104-11 and nut PN AN316-4, but retain washers PN AN960-416 and AN960-416L.
  - (2) Connect new LOWER fork-end PA 3/N-45-888 to the torque shaft lever using the attaching parts and method of assembly shown in Figure 1, Detail A. Torque tighten the nut to between 30 and 40 lb inches. Fit split pin and then peen bolt thread. **DO NOT RECONNECT CONTROL CABLE YET.**

### NOTE

Utilise original washers, fitting thin washers PN AN960-416L as required to ensure that the fork-end will not be distorted when the nut is tightened. Use new bolt, castellated nut and split pin from kit.

- L. Refit modified torque shaft assembly.
- (1) Repart number the modified torque shaft assembly to 1/N-03-621 (or to 1/N-03-621/G48 if the autopilot quadrants are fitted).

# Nomad

## SERVICE BULLETIN



WHEN CONNECTING THE HORIZONTAL STABILIZER CONTROL CABLES TO THE TORQUE SHAFT LEVER FORK-ENDS, ENSURE THAT THE CABLE WITH THE LEFT HAND THREADED TURNBUCKLE IS CONNECTED TO THE FORK-END MARKED "UPPER". THE CABLE WITH THE RIGHT HAND THREADED TURNBUCKLE IS TO BE CONNECTED TO THE FORK-END MARKED "LOWER".

- (2) Refit the modified torque shaft assembly in the aircraft and reconnect the control cables to the torque shaft lever fork-ends (Ref MM Chap 27-40-06).
- M. Install the redesigned pulley mounting brackets (Mod N63) as detailed in Service Bulletin NMD-27-15 to provide the correct cable run.

### NOTES

- (1) Trim control rod PN 1/N-03-603 or PN 1/N-30-184 is a modified assembly as required by Mod N398 (Refer Service Bulletin NMD-55-8).
  - (2) Trim tabs must be modified as detailed in Service Bulletin NMD-55-8 when control rods PN 1/N-03-603 or PN 1/N-30-184 are fitted.
- N. Remove the throttle box cover to gain access to the horizontal stabiliser trim indicator drum assembly PN 1/N-47-214.
  - O. Attach new label PN 1A/N-47-214 (N22) or PN 102A/N-47-214 (N24) to the horizontal stabilizer trim indicator drum.
    - (1) Hold the label in position around the trim drum and align the zero mark on the label with the existing zero mark on the trim drum.
    - (2) Drill a 3/32 inch dia. hole in the trim drum to coincide with the punched hole near the zero mark on the label.
    - (3) Rivet the label to the trim drum using a rivet PN MS20470AD3-3 or PN CCR274SS-3-1.
    - (4) Affix the label to the trim drum using Araldite.
    - (5) Repart number the trim drum assembly to 2/N-47-214 (N22) or 102/N-47-214 (N24).
  - P. Rig the horizontal stabiliser in accordance with MM Chap 27-40-00 or alternative procedure (Ref Para 2.Q.) and the following note:

### NOTE

On completion of rigging, check controls for correct sense of operation and for full and free movement under all trim conditions. In particular ensure that positive clearance exists between the tab and the horizontal stabiliser trailing edge structure through the full range of stabiliser travel with full nose up trim selected.

# Nomad

## SERVICE BULLETIN

Q. Alternative method of rigging the Horizontal Stabiliser.

The following procedure requires the use of an inclinometer with a minimum range of 35 degrees and a scale graduated in degrees and minutes. If this type of inclinometer is not available, template NMD-27-9-3 (locally manufactured to dimensions shown in Figure 6) and a spirit level will be required.

- (1) Level the aircraft (Ref MM Chap 8-00-00).
- (2) Rig the horizontal stabiliser controls in the front fuselage (Ref. MM. Chap 27-40-00 Maintenance Practices Para. 1.M2) steps (a) to (9) inclusive).



WHEN CONNECTING THE HORIZONTAL STABILIZER CONTROL CABLES TO THE TORQUE SHAFT LEVER FORK-ENDS, ENSURE THAT THE CABLE WITH THE LEFT HAND THREADED TURNBUCKLE IS CONNECTED TO THE FORK-END MARKED "UPPER". THE CABLE WITH THE RIGHT HAND THREADED TURNBUCKLE IS TO BE CONNECTED TO THE FORK-END MARKED "LOWER".

- (3) Connect the horizontal stabiliser control cables to the fork-ends attached to the upper and lower arms of the torque shaft lever.
- (4) Set the scale on the inclinometer to 32 degrees 30 minutes and place the inclinometer on the upper arm of the torque shaft lever.

### NOTE

If an inclinometer is not available, place the template and spirit level in position on the upper arm of the torque shaft lever (Ref Figure 6).

- (5) Adjust on both horizontal stabiliser control cables until the bubble in the inclinometer or spirit level is centralised.
- (6) Tension the control cables equally (Ref MM Chap 27-00-00).
- (7) Check that after both control cables have been correctly tensioned the bubble in the inclinometer or spirit level is still centralised. Remove the inclinometer, or template and spirit level from the aircraft.
- (8) Install the turnbuckle locking clips.
- (9) Support the horizontal stabiliser and disconnect the control rod, between the modified torque shaft assembly and the horizontal stabiliser, at the crank arm of the torque shaft. Retain the bolt, nut and washer, but discard the split pin.
- (10) Remove the dorsal fin (Ref MM Chap 55-30-00).
- (11) Place the rigging bar 1/N-88-183 (N22) at the -3 degree position on the extended shaft of the horizontal stabiliser control rod connecting bolt, or rigging bar 1/N-88-181 (N24) at the -1 degree position on the connecting It and secure in position with a 1/4 inch UNF nut.
- (12) Connect the lower end of the rigging bar to the rigging bracket (Ref MM Chap 27-40-00 Figure 201 Sheet 2) with a 1/4 inch UNF nut and bolt.



# **Nomad**

## SERVICE BULLETIN

- (13) Adjust the control rod (disconnected at step (9)) if necessary, to enable the rod to be connected to the torque shaft crank arm. If adjustment in rod length was necessary, check that the rod adjustable fork-end is "in safety" then torque tighten the locknut to between 270 and 300 lb inches. Lockwire the nut to the fork-end.
- (14) Connect the control rod to the torque shaft crank arm with bolt, washer and nut. Torque tighten the nut to 40 lb inches then back-off the nut a minimum amount to enable a split pin PN MS24665-134 to be fitted. Fit the split pin.
- (15) Remove the rigging pin PN 1/N-88-82 from the horizontal stabiliser quadrant in, the front fuselage (Ref MM Chap 27-40-00 Figure 201 Sheet I).



ENSURE THAT THE HORIZONTAL STABILIZER CONTROL SYSTEM IS FREE FROM OBSTRUCTION.

- (16) Check the horizontal stabiliser range of travel and adjust as necessary (Ref MM Chap 27-40-00 Maintenance Practices Para 1(4)(1) to (r) and (t) to (w) inclusively).

### NOTE

On completion of rigging, check controls for correct sense of operation and for full and free movement under all trim conditions. In particular ensure that positive clearance exists between the tab and the horizontal stabiliser trailing edge structure through the full range of stabiliser travel with full nose up trim selected.

- (17) Lower the aircraft to the ground (Ref MM Chap 7-00-00).

### 3. MATERIALS INFORMATION

#### A. Parts Required per Aircraft

- (1) One kit PN NMD-27-9-1 (N22), or PN NMD-27-9-2 (N24) is required per aircraft. The kits for both N22-Series Aircraft and N24-Series Aircraft are identical except for the modified horizontal stabiliser trim drum indicator label. The respective labels are identified by their part numbers and also the kit in which they are included. Each kit comprises the following parts:

Item PN	Title	Qty
1/N-45-1407-950 *	Connecting rod	1
MS24665-302	Split pin	1
MS24665-134	Split pin	1
1C/N-03-621-950	Crank arm	1
1B/N-03-621	Template	1
1D/N-03-621	Shim	1
1A/N-03-621	Template	1
NAS6204-11D	Bolt	2
AN320-4	Nut, castellated	2
MS24665-153	Split pin	2

# Nomad

## SERVICE BULLETIN

3/N-45-888	Fork end, LOWER	1
1A/N-47-214	Trim drum label (Kit PN NMD-27-9-1)	1
102A/N-47-214	Trim drum label (Kit PN NMD-27-9-2)	1
MS20470AD3-3	Rivet, or	1
CCR274SS-3-1	Rivet	Alt

### NOTE

Connecting rod PN 1/N-45-1407-950 is short fitted and requires rod fork-end PN 2/N-45-962 and nut PN AN315-7 from the discarded rod assembly PN 2/N-45-958 to complete the assembly (Ref Para 2.A. and Service Bulletin NMD-27-13 (Mod N426)).

- (2) Parts modified and re-identified by the operator.

Title	Original PN	New PN
Connecting rod assembly	2/N-45-958	2/N-45-1407
Torque shaft assembly	1/N-45-953	1/N-03-621
Torque shaft assembly *	1/N-45-953/G48	1/N-03-621/G48
H/S trim indicator drum	1/N-47-214	2/N-47-214 (N22) 102/N-47-214 (N24)

\* If Option G48 or G48-24 is fitted.

### B. Parts required to modify spares

Item PN	Title	Qty per spare	
1C/N-03-621-950	Crank arm assembly	1	Torque shaft assembly 1/N-45-953 or 1/N-45-953/ G48
3/N-45-888	Fork-end	1	
NAS6204-11D	Bolt	2	
AN320-4	Nut, castellated	2	
MS24665-153	Split pin	2	

1/N-45-1407-950	Connecting rod	1	Connecting Rod assembly 2/N-45-958
2/N-45-962	Fork-end	1	
AN315-7	Nut	1	

### C. Removed Parts

Item PN	Qty	Title	Instruction/Disposition
2/N-45-958	1	Connecting rod assembly	*
1/N-45-808	1	Crank arm	Scrap

\* Retain fork-end PN 2/N-45-962 and nut PN AN315-7 but scrap connecting rod.

# *Nomad*

## SERVICE BULLETIN

### D. Special tools and Equipment Required

Item PN	Qty	Title
1/N-88-180	1	Rigging bar - horizontal stabilizer torque shaft
1/N-88-183	1	Rigging bar - horizontal stabilizer (Mod N211) (N22)
1/N-88-181	1	Rigging bar - horizontal stabilizer (Mod N211-24) (N24)

### E. Superseded Special Tools

Item PN	Qty	Title	Instruction/Disposition
1/N-88-113	1	Rigging bar - horizontal stabilizer	Scrap

### 4. RECORDING ACTION

Record compliance with Service Bulletin NMD-27-9 in the airframe log book.

# Nomad

## SERVICE BULLETIN

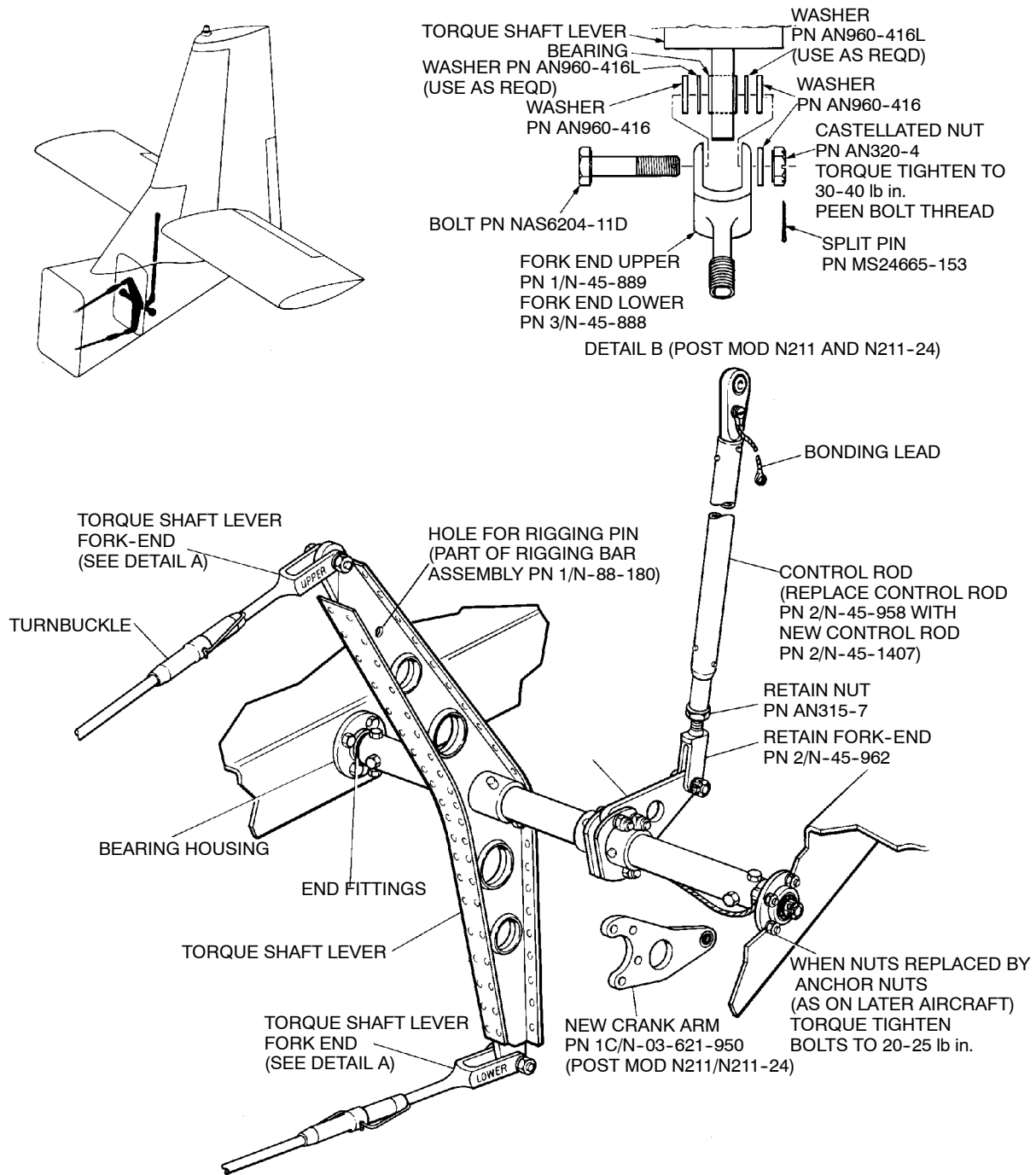
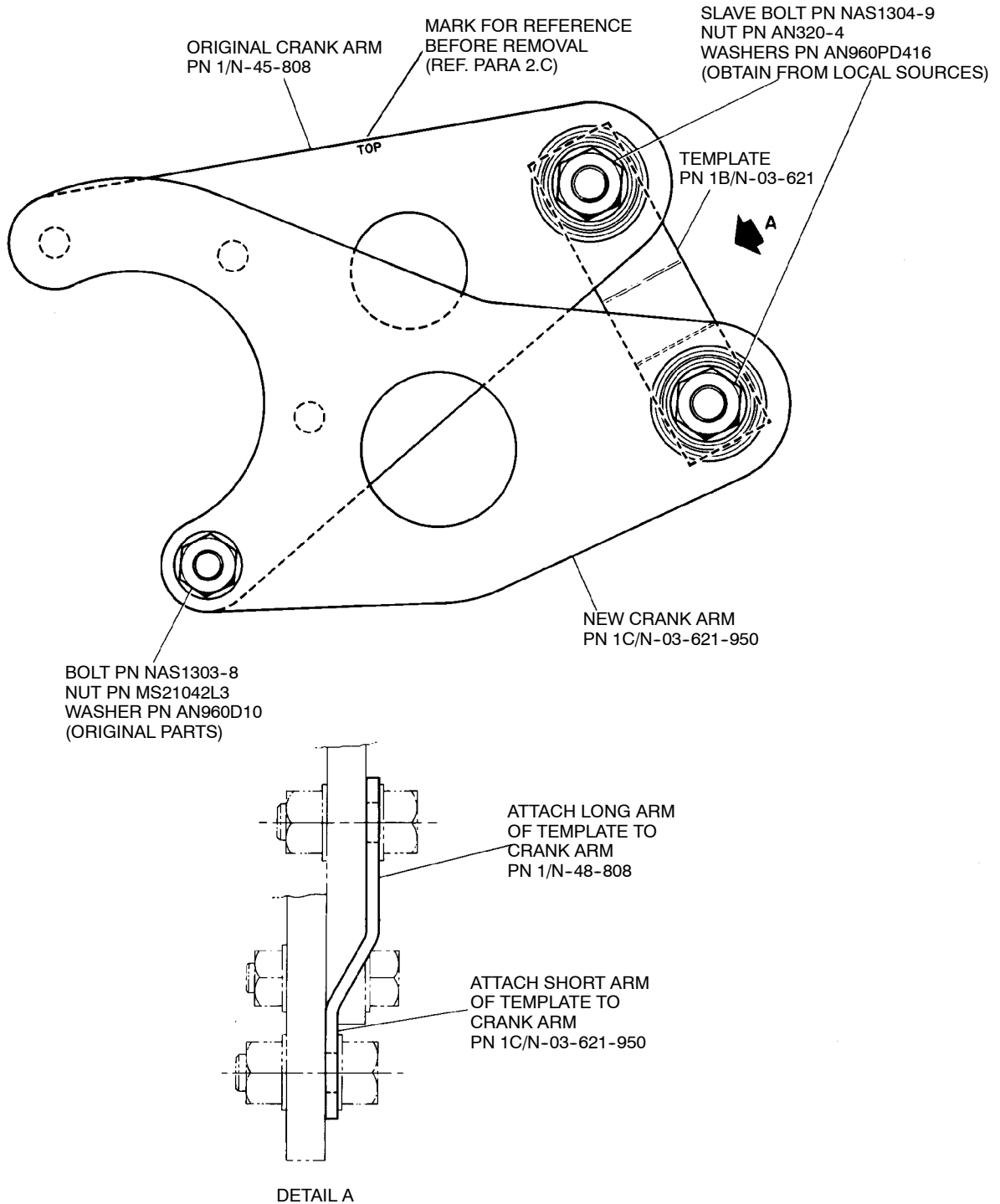


Figure 1 Horizontal Stabiliser Torque Shaft and Control Rod Linkage

10 Mar 82

# Nomad

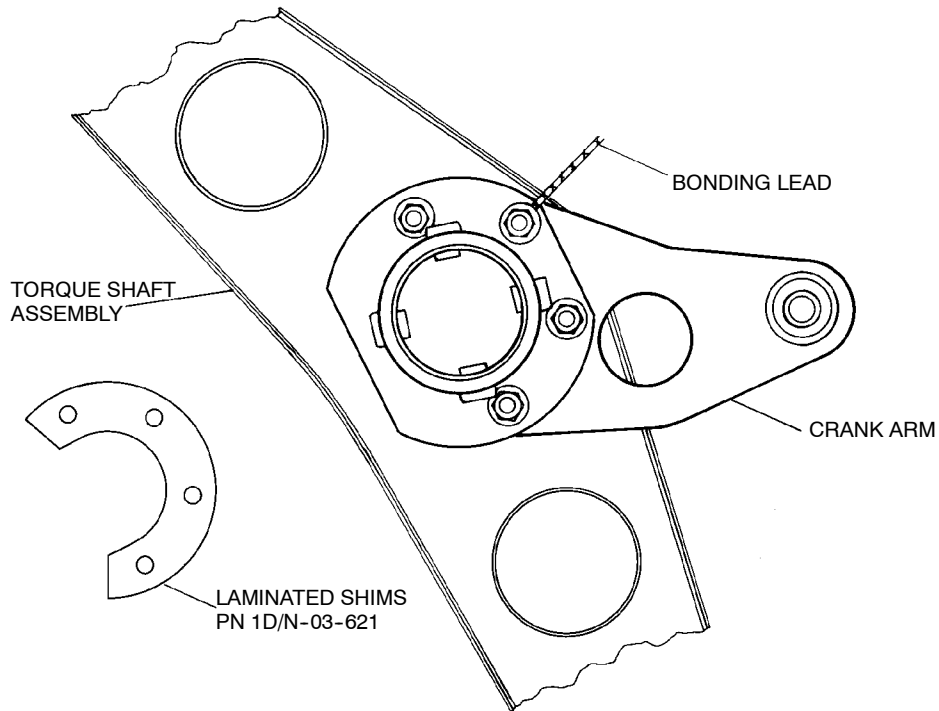
## SERVICE BULLETIN



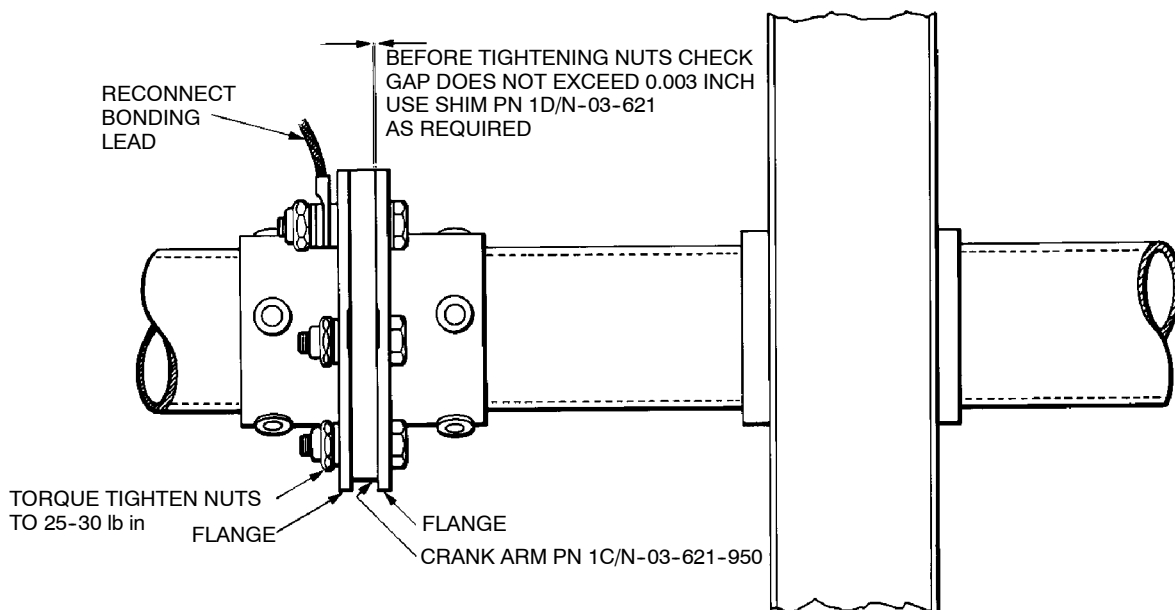
**Figure 2 Preparing the New Crank Arm for Drilling and Reaming**

# Nomad

## SERVICE BULLETIN



**Figure 3 Installation of New Crank Arm on Torque Shaft Assembly**



**Figure 4 Checking the Gap Between Crank Arm and Flanges**

# Nomad

## SERVICE BULLETIN

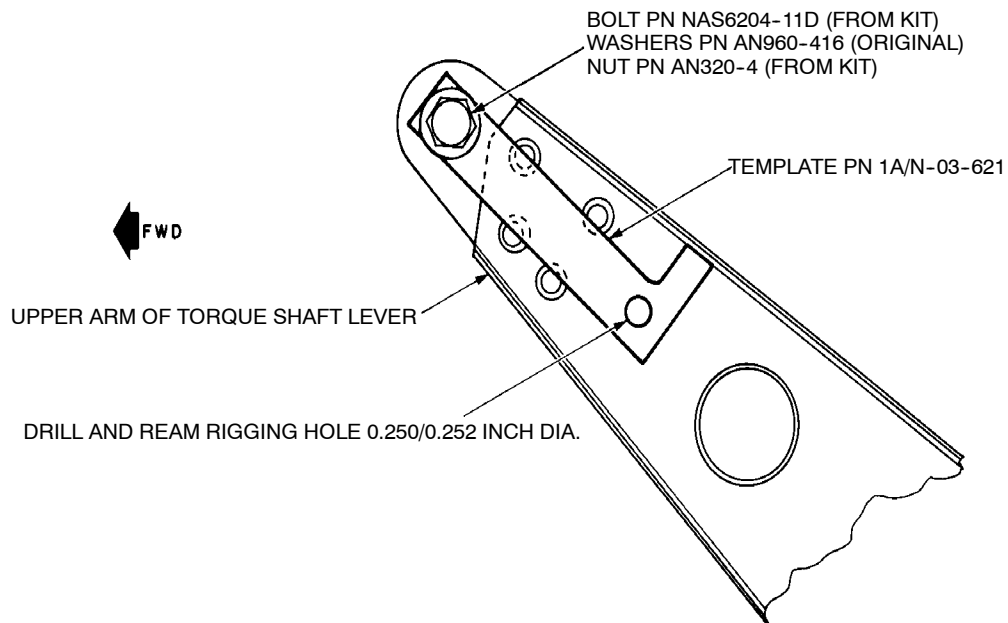


Figure 5 Locating the Rigging Hole in the Torque Shaft Lever

10 Mar 82

AEROSPACE TECHNOLOGIES OF AUSTRALIA  
A.C.N. 008 622 008  
A BOEING AUSTRALIA COMPANY

**NMD-27-9**  
Page 15 of 16

# Nomad SERVICE BULLETIN

NOT TO SCALE

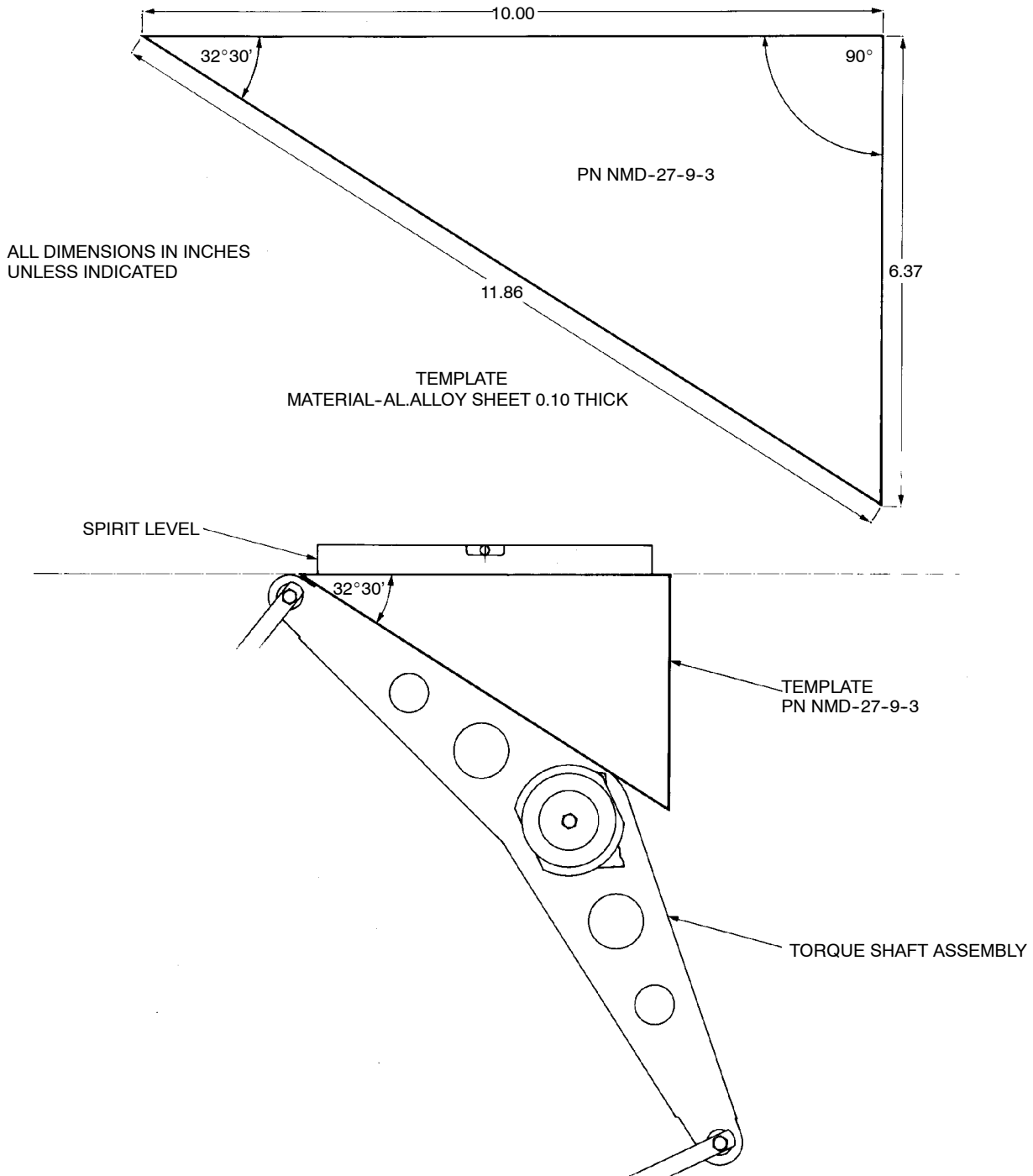


Figure 6 Template

10 Mar 82