EFFECTIVITY
MODEL: LINE NOS. 1 THRU 315 SSI DOCUMENT (D6-44860) REFERENCE: SSD 52-A00-01 52-A00-02 52-A10-02 52-A20-02 52-A30-02B 52-A40-02B

BOEING COMMERCIAL JET

NONDESTRUCTIVE TEST

PART 6 - EDDY CURRENT

FUSELAGE - MAIN CARGO DOOR

1. Purpose

   A. To detect cracks in the skin of the upper deck cargo door at fasteners in the upper row of fasteners common to S-10 skin lap.

2. Equipment

   A. Refer to Part 6, 51-00-00, Fig. 6.

3. Prepare for Inspection

   A. Wipe skin surface clean at inspection areas. See Details I and II.

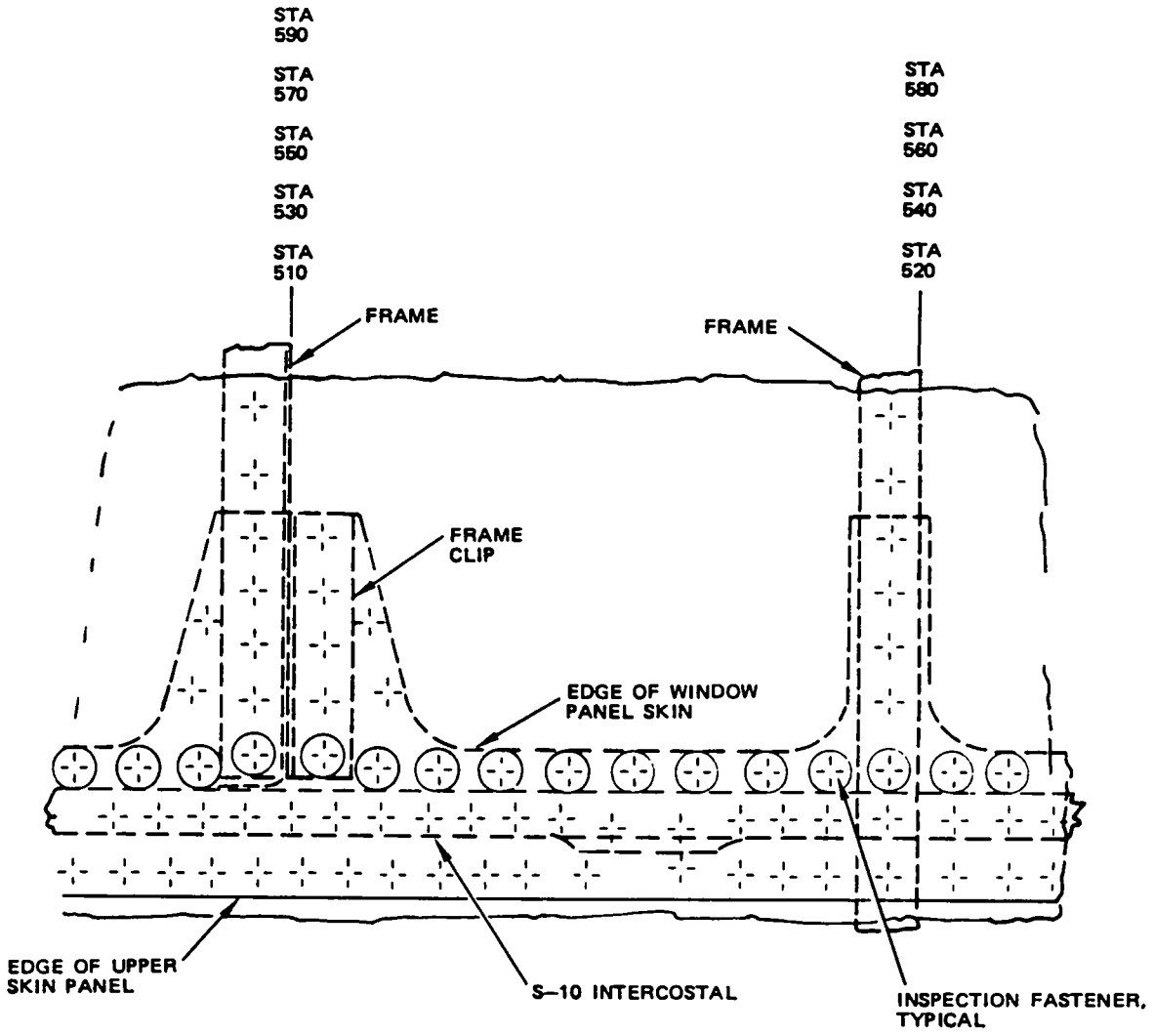
4. Calibrate Instrument

   A. Refer to Part 6, 51-00-00, Fig. 4.

5. Inspection Procedure

   A. Scan the pencil probe around fasteners in the top fastener row common to the skin lap joint at S-10, (BS 480-BS 600D). Perform scan per Part 6, 51-00-00, Fig. 6. See Details I and II.

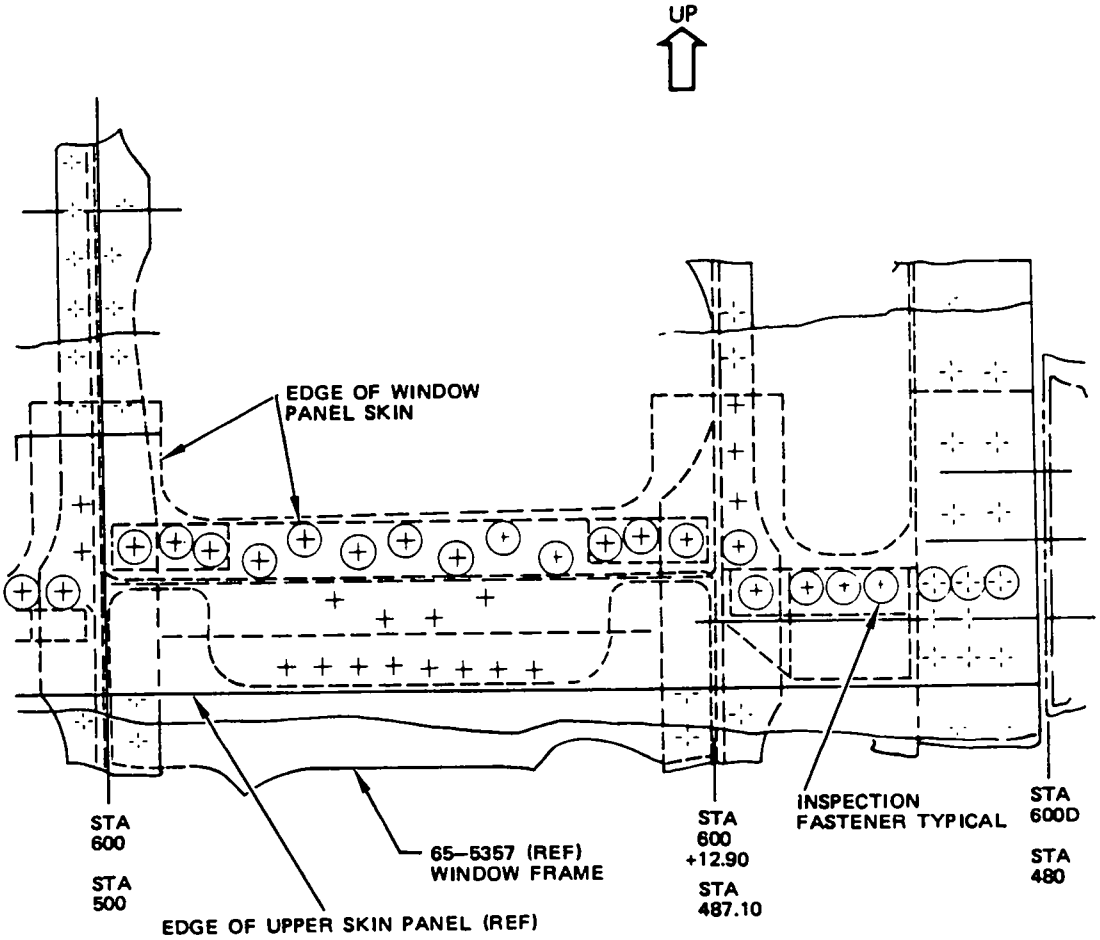
Main Cargo Door Upper Deck S-10 Skin Lap
Figure 1 (Sheet 1)



(TYPICAL FOR S-10 FRAMES
FROM STA 510-STA 590)

DETAIL I

Main Cargo Door Upper Deck S-10 Skin Lap
Figure 1 (Sheet 2)



NOTES

- ● SCAN PENCIL PROBE AROUND INSPECTION FASTENER
- ⊕ INSPECTION FASTENER

S-10 FRAMES FROM STA 600 TO 600D AND STA 480 TO 500

DETAIL II

Main Cargo Door Upper Deck S-10 Skin Lap
Figure 1 (Sheet 3)

EFFECTIVITY
MODEL: 707-300B/300C
CUM LINE NOS 332 THRU
866 MODIFIED PER
SERVICE BULLETIN 2999
SSD DOCUMENT
REFERENCE:
SSD 52-A35-02
52-A45-02

PART 6 - EDDY CURRENT

FUSELAGE MAIN CARGO DOOR

1. Purpose

   A. To detect cracks in the skin of the upper deck cargo door at selected fasteners common to the hinge and S-10 skin lap doublers installed per SB 2999.

2. Equipment

   A. Instrument - Any eddy current instrument that will satisfy the requirements of this procedure is acceptable. The following instrument was used during development of this procedure:

      (1) MIZ-10
      Zetec, Inc.
      1320 N.W. Mall
      Issaquah, WA 98027

   B. Probe - Any probe of this size which will satisfy the requirements of this procedure is acceptable. The following probe was used in the development of this procedure:

      (1) Spot probe, 0.31-inch OD with external shielding, usable at 5K on aluminum, Nortect P/N SPO 1284.

      (2) Probe listed is available from:

      Nortec, Inc.
      421 N. Quay
      Kennewick, WA 99336

      NOTE: Specify instrument with which probe is to be used or instrument connector required when ordering probes.

   C. Manufacture Reference Standard per Detail 1.

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 1)

3. Prepare for Inspection

A. Wipe skin surface clean.

4. Calibrate Instrument

A. Calibrate for inspection of Code A fasteners. See Details III and IV.

(1) Connect probe to instrument.

(2) Set frequency to 5 KHz.

(3) Place probe adjacent to the unnotched reference standard hole, Detail II, Position 1.

(4) Balance instrument per manufacturer's instructions.

(5) Adjust liftoff control per manufacturer's instructions to obtain the same response when the probe is on the bare standard as when the probe is lifted off the part by 0.006 inch (approximately the thickness of two sheets of paper).

NOTE: Probe is located at Position 1 during liftoff calibration.

(6) With the probe adjacent to the unnotched hole in Position 1, adjust meter response to read 20% of full scale with meter position control.

(7) Position probe adjacent to the notched reference standard hole, Position 2. Response should be upscale. Maintain probe-to-fastener spacing established for Position 1.

(8) Adjust instrument sensitivity to obtain a 50% of full scale meter response difference between the notched and unnotched holes (Positions 1 and 2).

(9) Reposition probe at position 1 and check null and liftoff. If readjustments are made, recheck sensitivity per par. (7).

NOTE: Cracks will be indicated by a higher meter response.

B. Calibrate for inspection of Code B fastener. See Details III and IV.

(1) Repeat par. 4. using calibration Positions III and IV, unnotched and notched Reference Standard holes. See Detail II.

5. Inspection Procedure

NOTE: Cracks are expected to propagate between fastener holes in a fore and aft direction.

A. Inspect Code A fasteners.

(1) Note on airplane the location of fasteners having inspection Code A. See Details III and IV.

(2) Calibrate instrument per 4.A.

(3) Establish airplane baseline response by placing probe adjacent to several inspection fasteners.

(a) Establish a baseline for Detail III fasteners with probe position below fasteners.

(b) Establish baseline for Detail IV fasteners wih probe above the fasteners.

(c) Select a representative fastener from the group and set instrument response to 20% of full meter scale.

(d) Do not change instrument sensitivity when establishing airplane baseline response.

(5) Inspect each Code A fastener by scanning around the fore and aft side of fasteners using the probe-to-fastener spacing established during calibration.

(a) Refer to Details III and IV for special notes concerning inspection of fasteners closest to the edge of doublers.

(6) Any location which gives a response 30% of full meter scale higher than the baseline response should be investigated further.

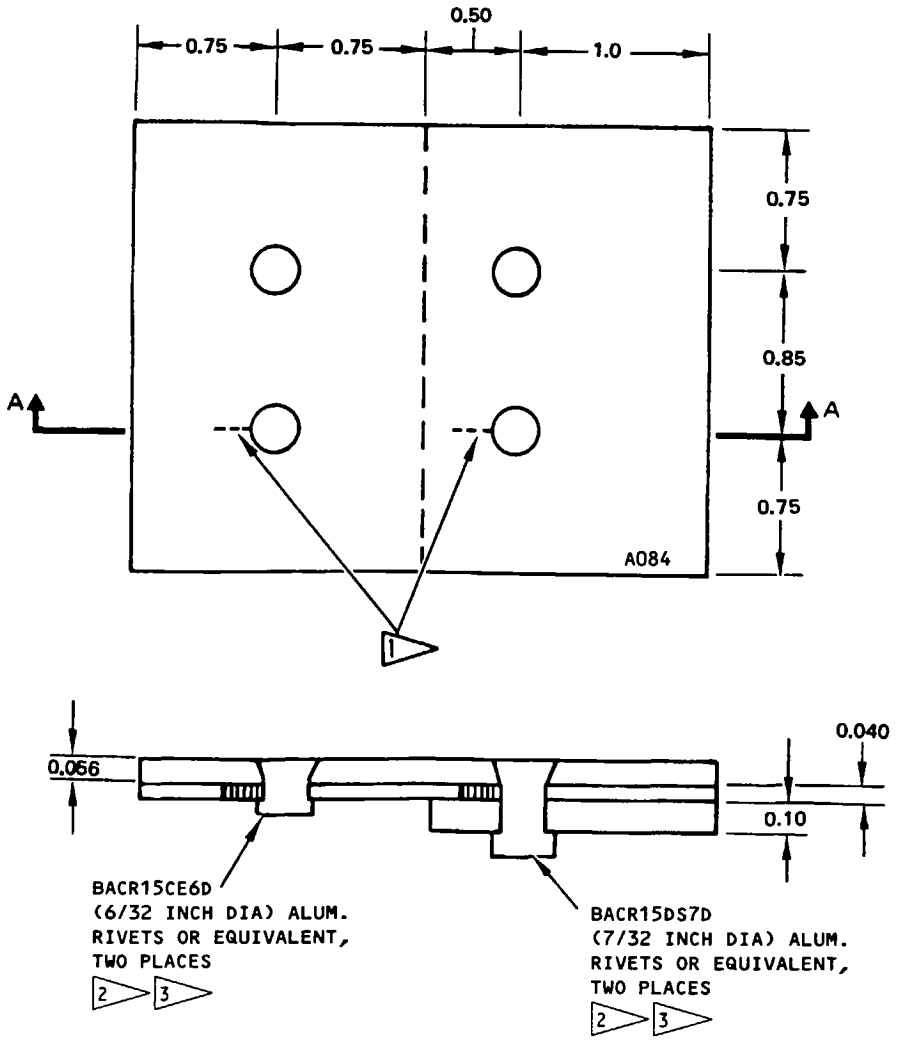
B. Inspect Code B fasteners.

(1) Note on airplane the location of fasteners having inspection Code B. See Details III and IV.

(2) Calibrate instrument per par. 4.B.

(a) Note on the airplane the location of fasteners having inspection code B.

(3) Repeat steps 5.A.(2) thru 5.A.(5) for all Code B fasteners.



A-A

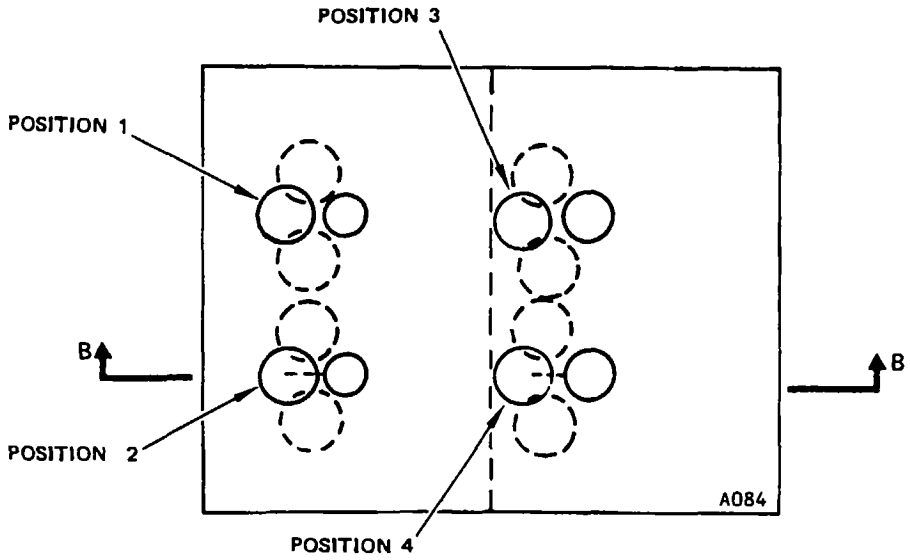
NOTES:

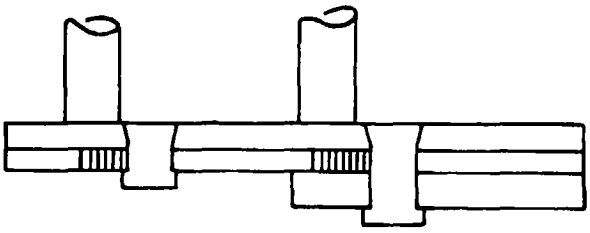
- ALL DIMENSIONS ARE IN INCHES
- MATERIAL: CLAD 2024-T3 ALUMINUM ALL LAYERS
- TOLERANCE: X.XXX = ±0.005
  X.XX = ±0.02
  X.X = ±0.05
- ETCH OR STEEL STAMP WITH A084

1. JEWELER'S SAWCUT 0.030 MAX WIDTH 0.25 LONG (2 PLACES) PER SECTION A-A
2. THESE RIVETS MUST HAVE A CONVERSION COATED (ALODINED) FINISH. TO MAKE SURE THE FINISH IS ALODINE, REFER TO PART 1, 51-06-01. INSTALL THE RIVETS AS SPECIFIED IN PART 1, 51-01-04.
3. PUT A LETTER "A" IN FRONT OF THE REFERENCE STANDARD NUMBER TO SHOW THAT IT HAS ALODINED RIVETS. SEE FLAGNOTE 2.

REFERENCE STANDARD A084
DETAIL I
Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 4)

666964



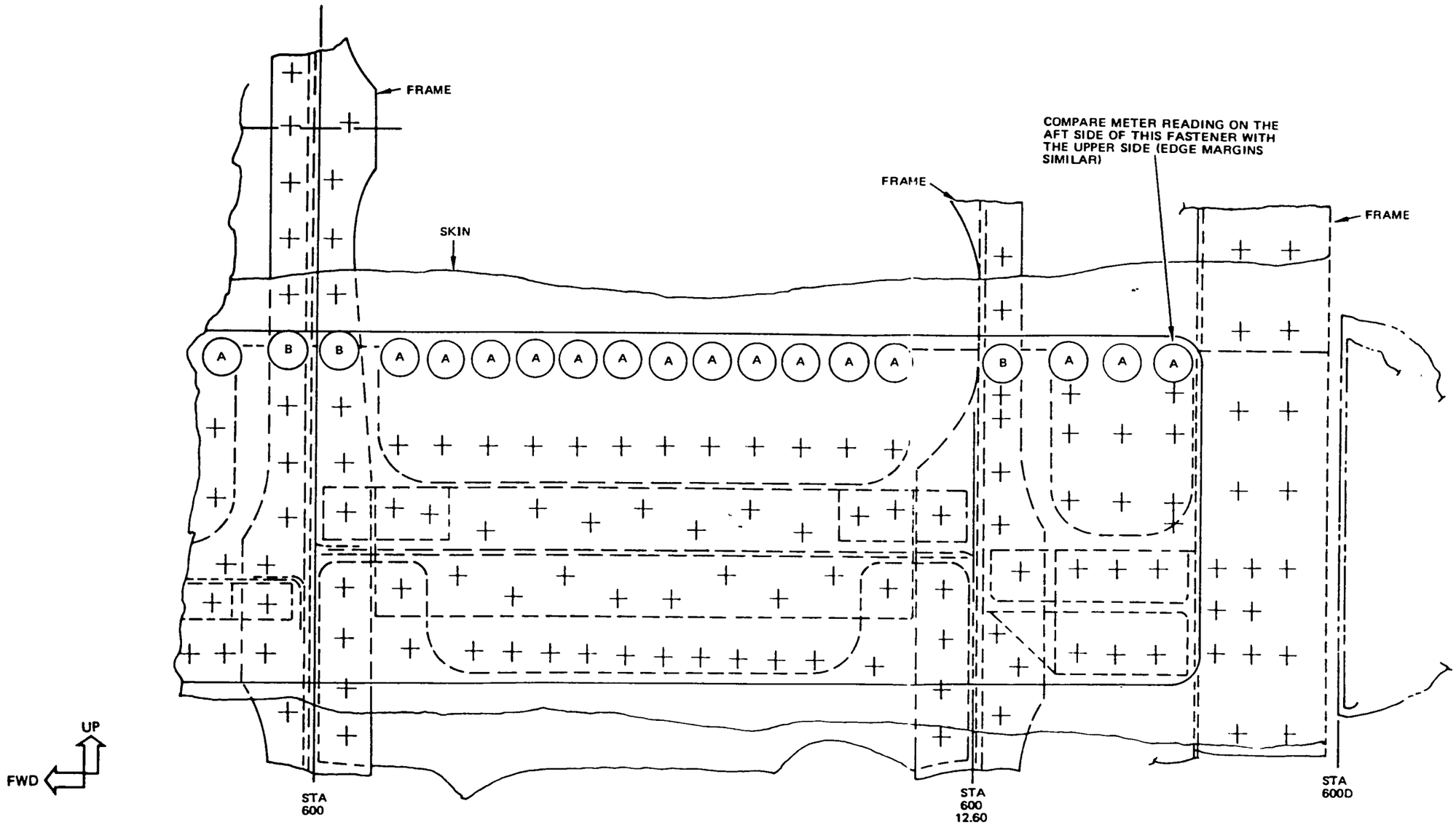


B-B

PROBE POSITION FOR CALIBRATION
ON REFERENCE STANDARD A084

DETAIL II

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 5)



NOTES

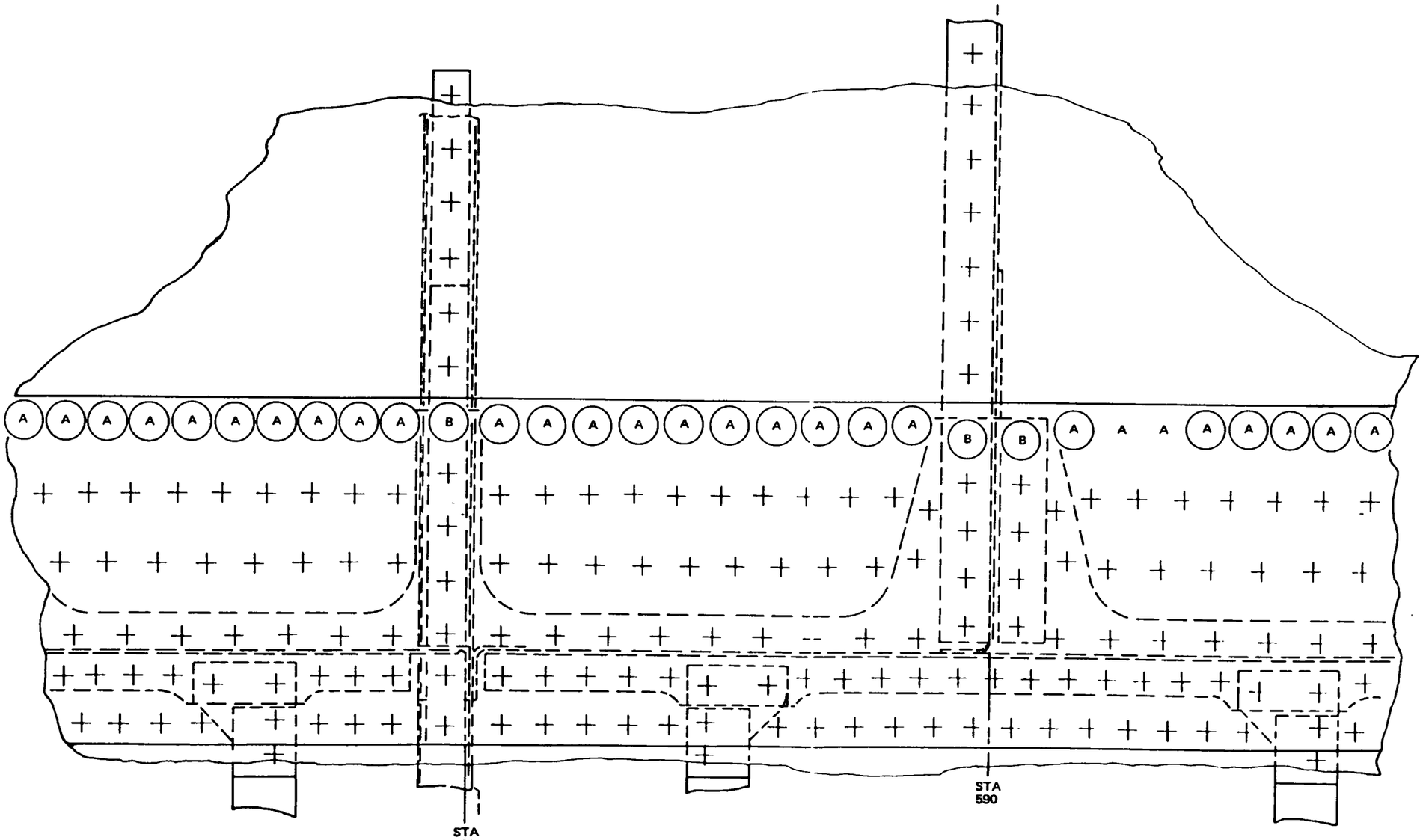
(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR
S-10 SKIN LAP
(MODIFIED PER SB 2999)

DETAIL III

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 6)



NOTES

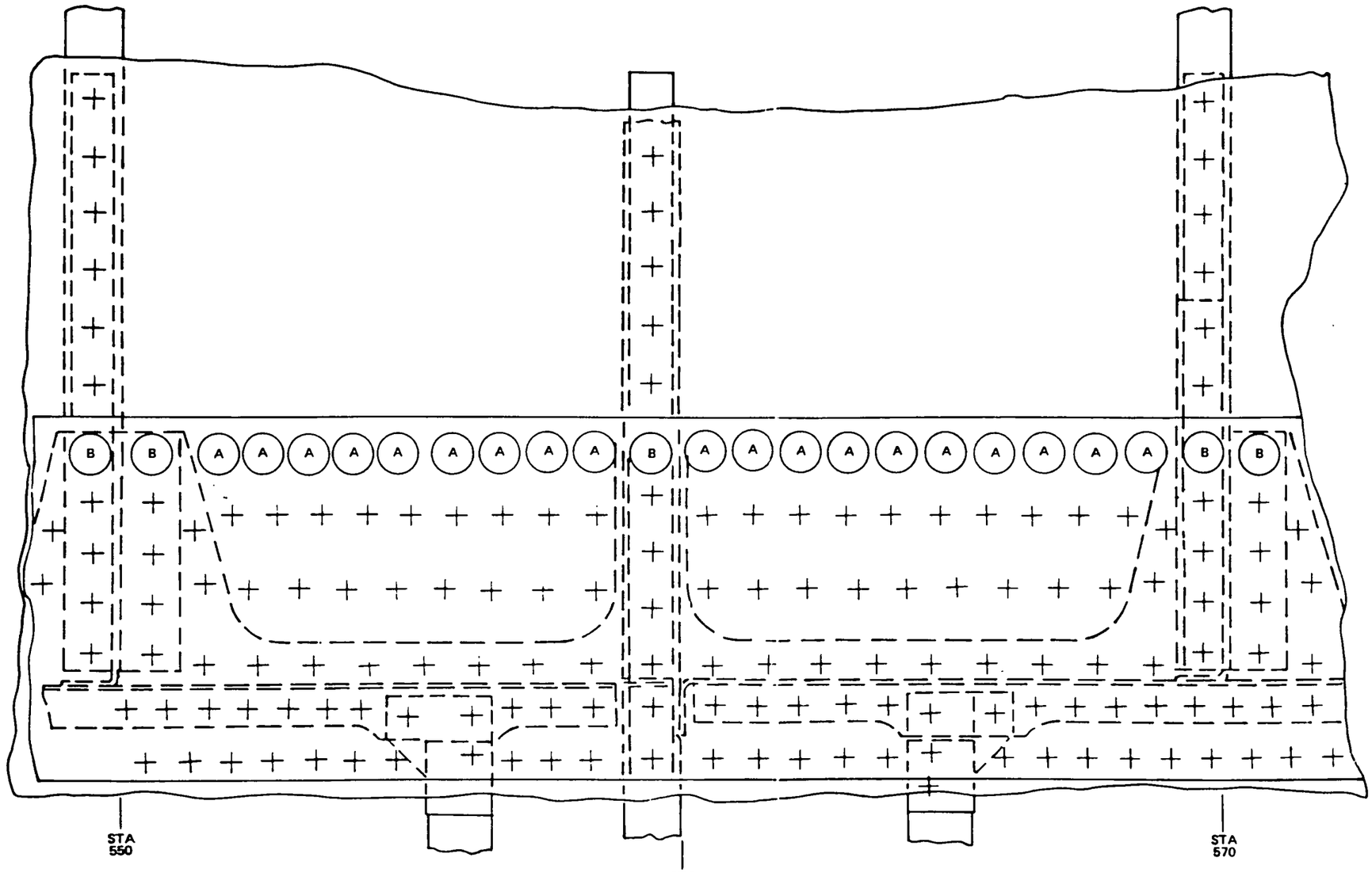
(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR
S-10 SKIN LAP (MODIFIED PER SB 2999)

DETAIL III (CONT)

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 7)



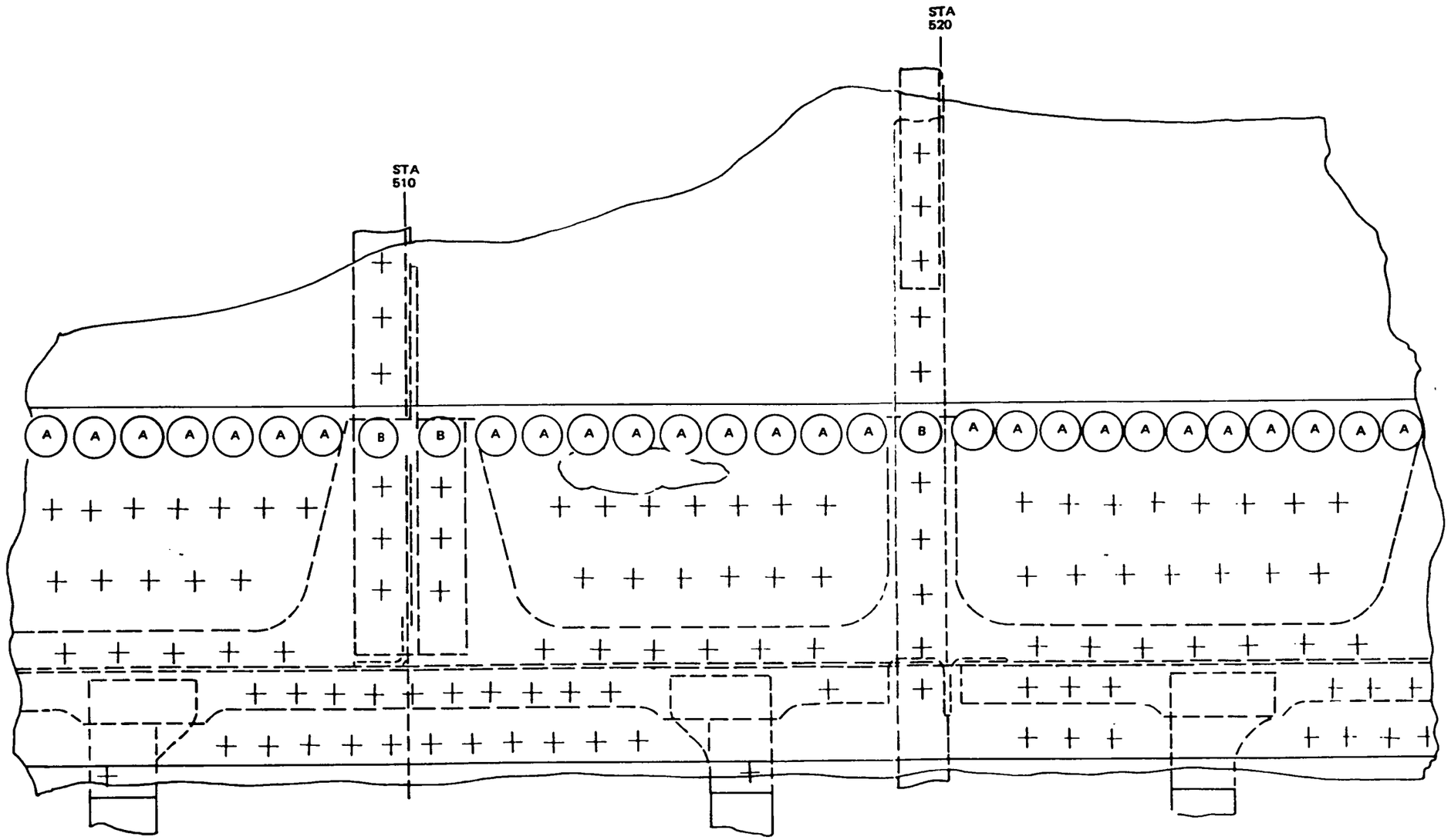
NOTES

(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR
S-10 SKIN LAP (MODIFIED PER SB 299[illegible])
DETAIL III (CONT)

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 8)



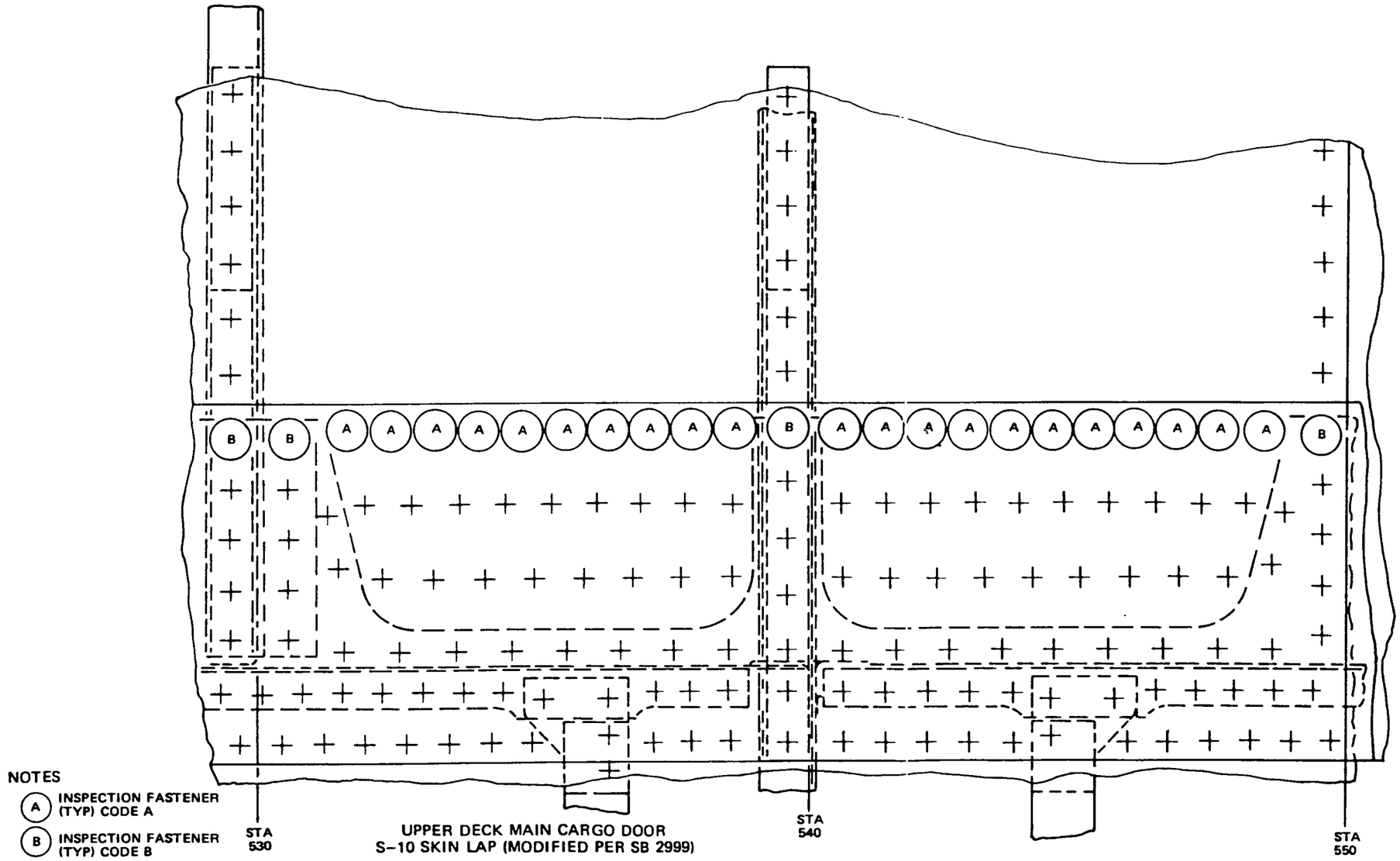
NOTES

(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

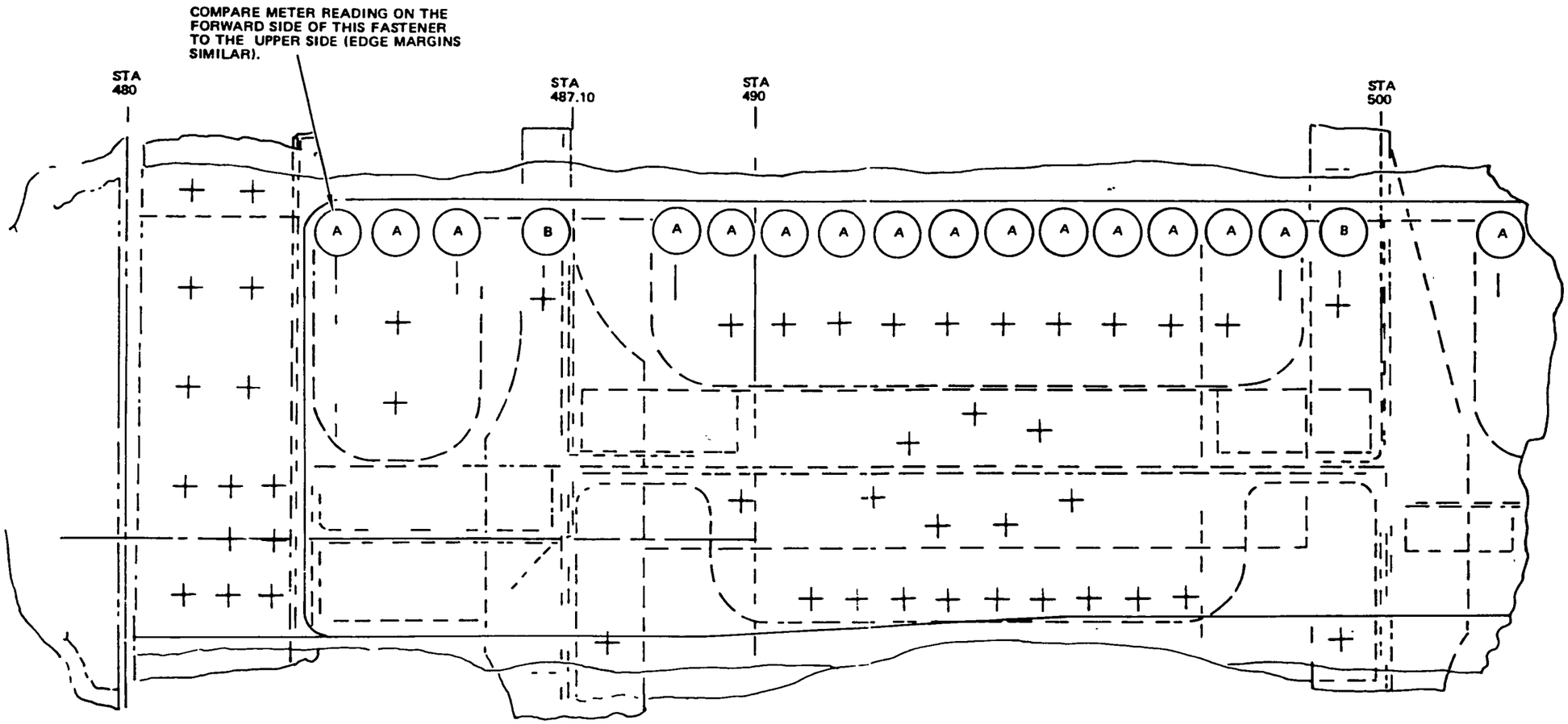
UPPER DECK MAIN CARGO DOOR
S-10 SKIN LAP (MODIFIED PER SB 299(!)

DETAIL III (CONT)



DETAIL III (CONT)

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 10)

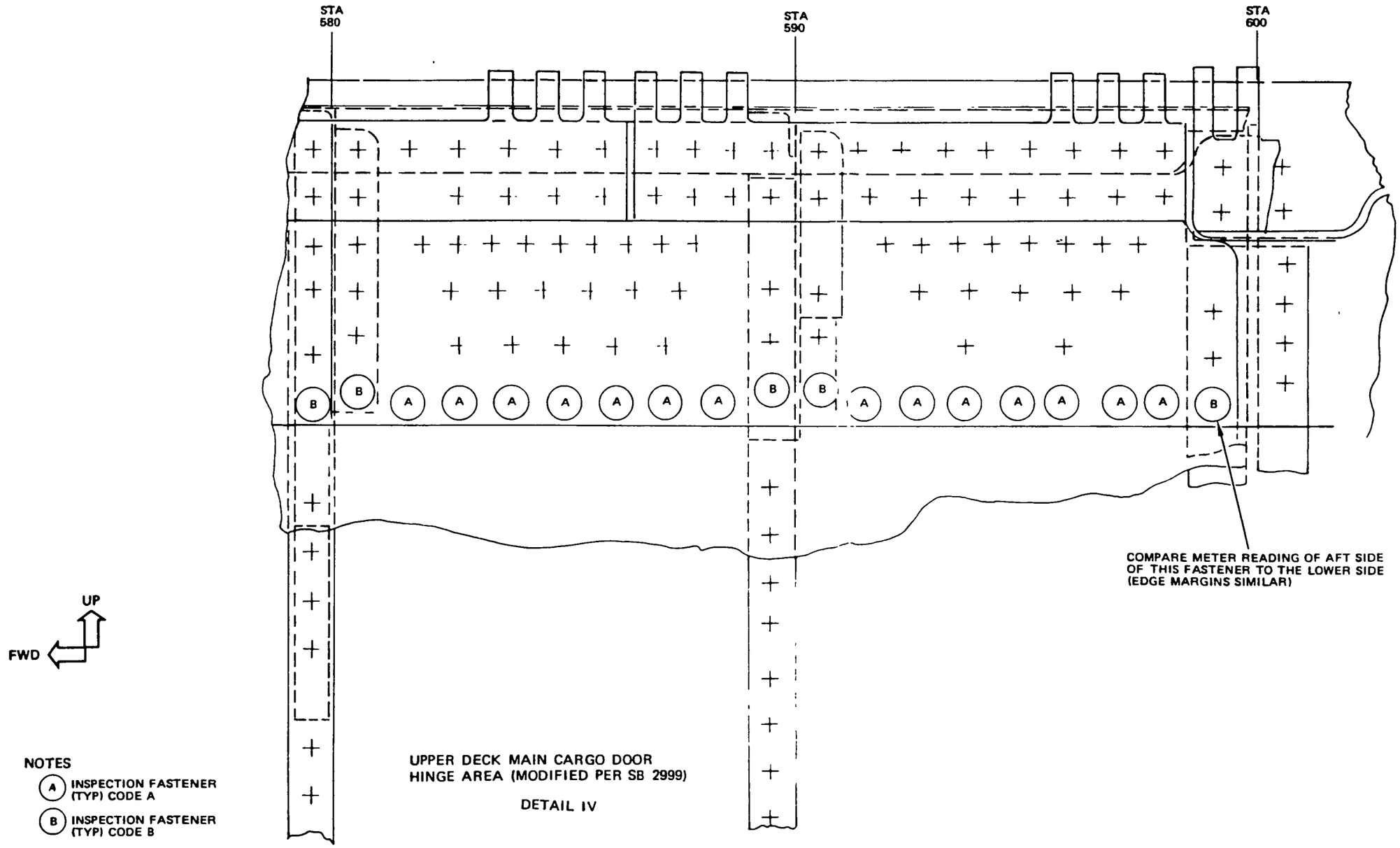


UPPER DECK MAIN CARGO DOOR
S-10 SKIN LAP (MODIFIED PER SB 29990)

NOTES
(A) INSPECTION FASTENER (TYP) CODE A
(B) INSPECTION FASTENER (TYP) CODE B

DETAIL III

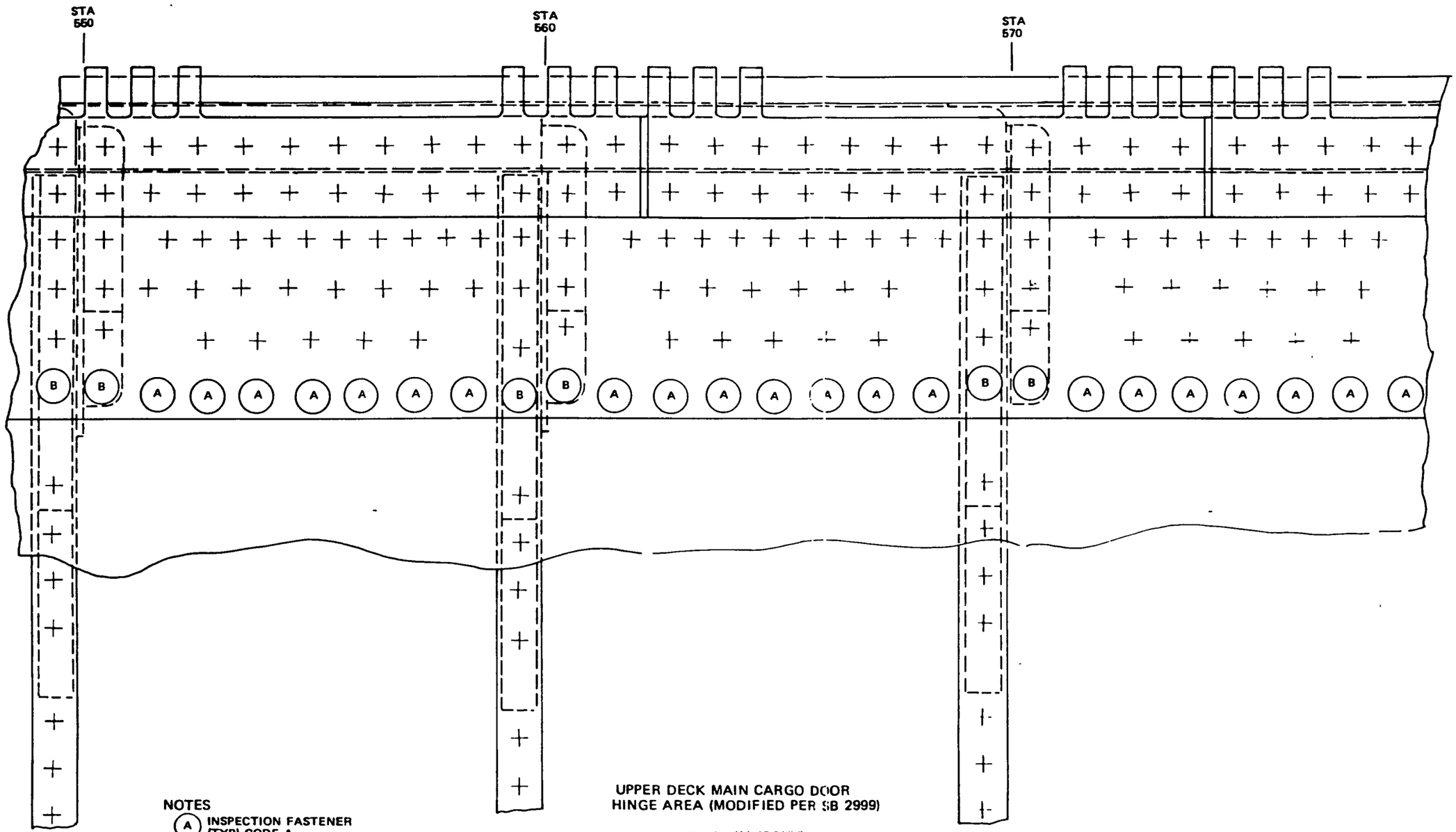
Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 11)



UPPER DECK MAIN CARGO DOOR
HINGE AREA (MODIFIED PER SB 2999)

DETAIL IV

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 12)

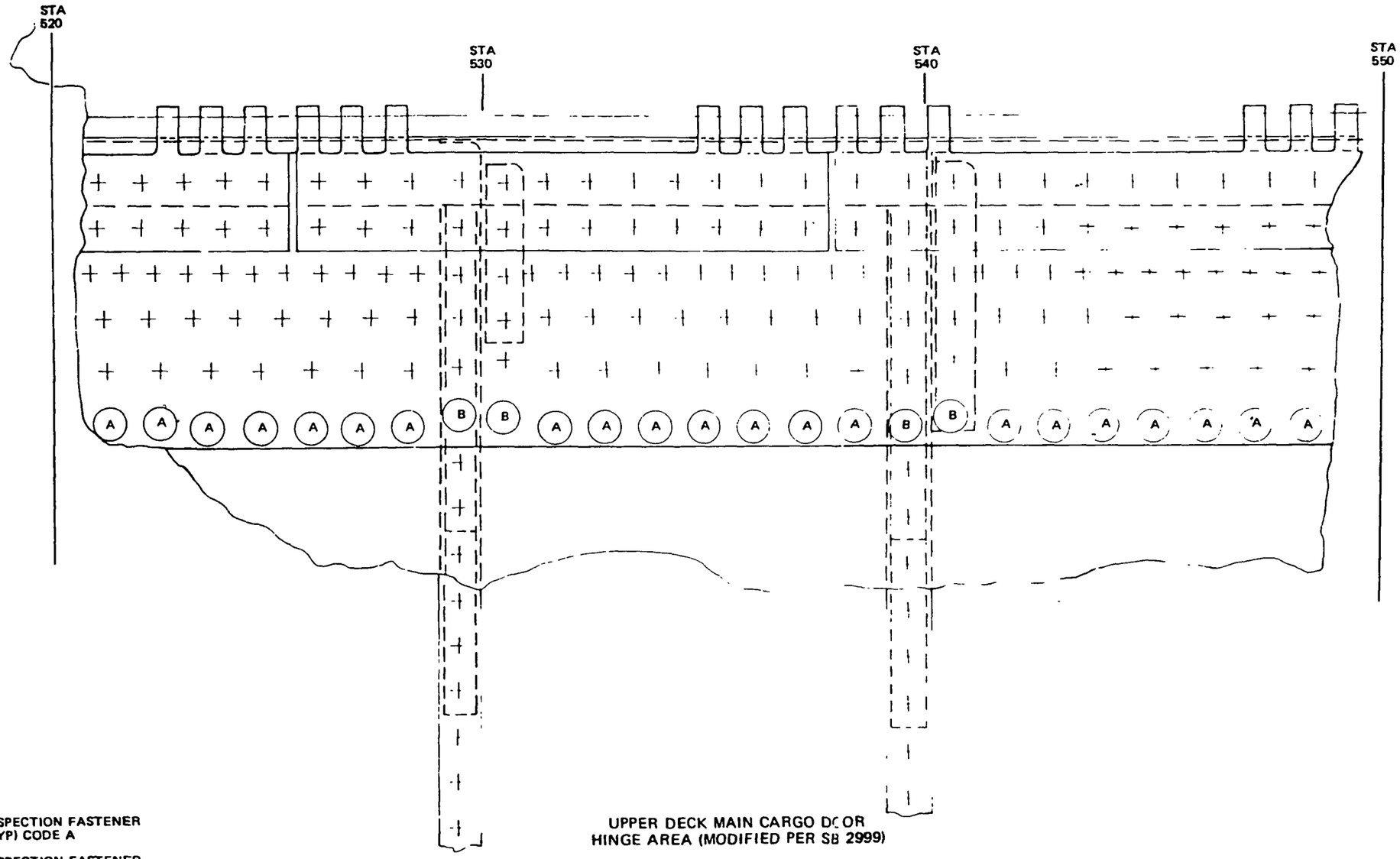


NOTES
- (A) INSPECTION FASTENER (TYP) CODE A
- (B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR
HINGE AREA (MODIFIED PER SB 2999)

DETAIL IV (CONT)

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 13)



NOTES

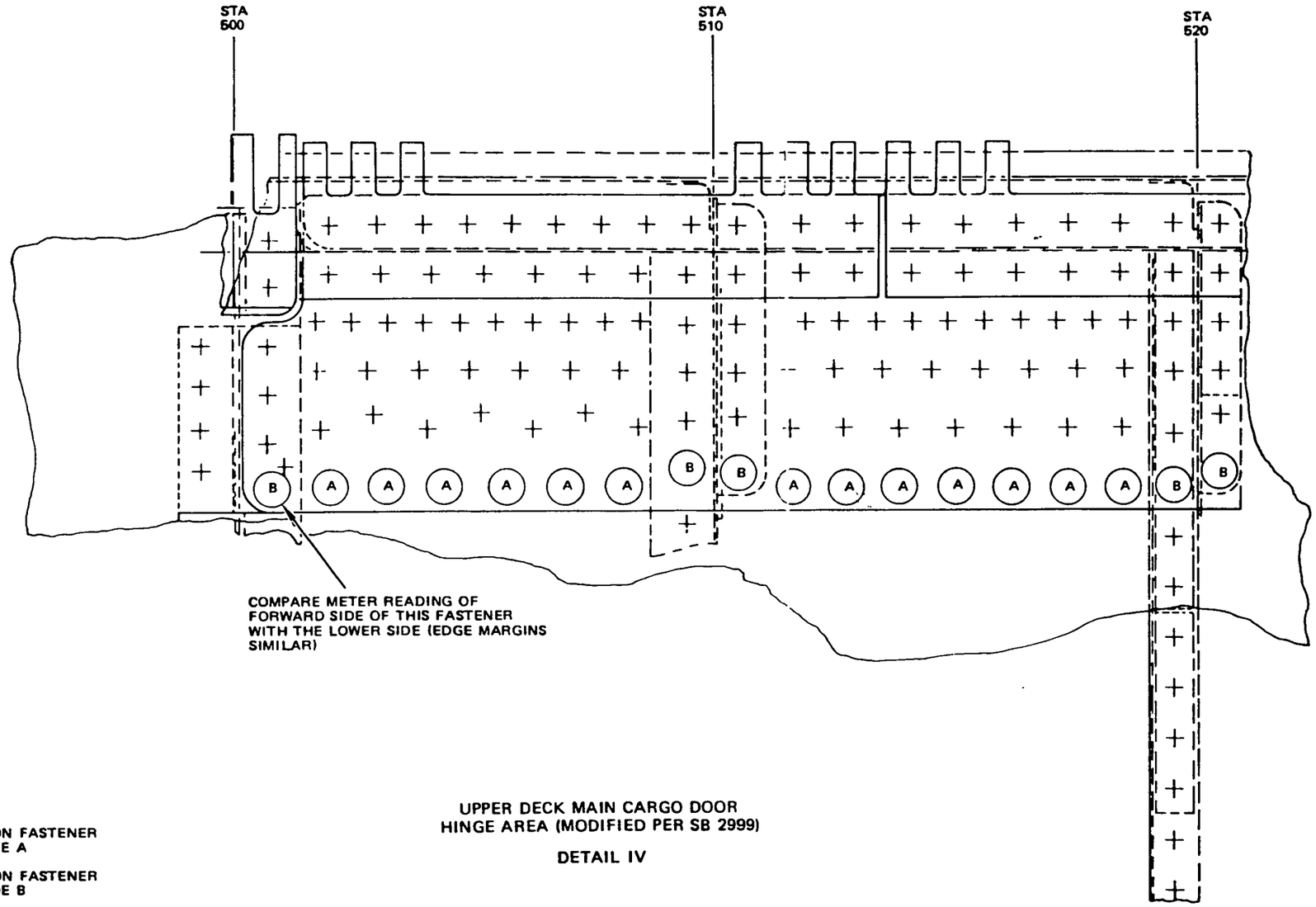
(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR HINGE AREA (MODIFIED PER SB 2999)

DETAIL IV (CONT)

Main Cargo Door Upper Deck S-10 Skin Lap Doublers and Hinge
Figure 2 (Sheet 14)



NOTES

(A) INSPECTION FASTENER (TYP) CODE A

(B) INSPECTION FASTENER (TYP) CODE B

UPPER DECK MAIN CARGO DOOR HINGE AREA (MODIFIED PER SB 2999)

DETAIL IV

EFFECTIVITY
MODEL: ALL MODELS WITH MAIN CARGO DOOR EXCEPT 707-300B LINE NOS. 343, 345 348 & 352 SSD DOCUMENT (D6-44860) REFERENCE: SSD 52-A00-02 52-A10-02 52-A20-02 52-A30-02B 52-A40-02

PART 6 - EDDY CURRENT

FUSELAGE MAIN CARGO DOOR

1. Purpose

   A. To detect cracks in the skin and doubler of the upper deck cargo door out of selected fasteners common to the hinge doubler using low frequency eddy current.

2. Equipment

   A. Instrument - Any eddy current instrument that will satisfy the requirements of this procedure is acceptable. The following instrument was used during development of this procedure:

      (1) MIZ-10
      Zetec, Inc.
      1320 N.W. Mall
      Issaquah, WA 98027

   B. Probe - Any probe which will satisfy the requirements of this procedure is acceptable. The following probe was used in the development of this procedure:

      (1) Spot probe, 0.31 OD with external shielding, usable at 4 kHz on aluminum, Nortect P/N SPO 1284. Probe listed is available from:

      Nortec, Inc.
      421 N. Quay
      Kennewick, WA 99336

      NOTE: Specify instrument with which probe is to be used or instrument connector required when ordering probes.

   C. Manufacture Reference Standards per Detail 1.

3. Prepare for Inspection

   A. Wipe skin surface clean.

Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 1)

666969

4. Calibrate Instrument

A. Connect probe to instrument.

B. Set frequency to 4 kHz.

C. Place probe adjacent to the unnotched reference standard hole, Position 1, on reference standard A083. See Detail II.

D. Balance instrument per manufacturer's instructions.

E. Adjust liftoff control per manufacturer's instructions to obtain the same response when the probe is on the bare standard as with the probe lifted off the part by 0.006 inch (approximately the thickness of two sheets of paper).

NOTE: Probe is located at Position 1 during liftoff calibration.

F. With the probe adjacent to the unnotched hole (Position 1) adjust meter response to read 20% of full scale with meter position control. Scan probe around side of fastener to the extent indicated. Note the distance required between probe and fastener to minimize noise while scanning.

NOTE: Distance should be approximately ±1/32 inch.

G. Position probe adjacent to the notched reference standard hole, (Position 2). Response should be upscale. Scan probe over the notch at the same distance established in par. F.

H. Adjust instrument sensitivity to obtain 50% of full scale meter response difference between the notched and unnotched holes (Positions 1 and 2).

I. Reposition probe at Position 1 and check null and liftoff. If readjustments are made, recheck sensitivity per par. H.

J. Cracks will be indicated by a higher meter response.

5. Inspection Procedure

NOTE: Cracks are expected to propagate out of fastener holes in a fore and aft direction.

Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 2)

A. Calibrate the instrument per par. 4.

B. Establish baseline response for an uncracked area by scanning around the upper side of several fasteners.

   (1) Select a representative fastener from this group and set instrument response to 20% of full meter scale.

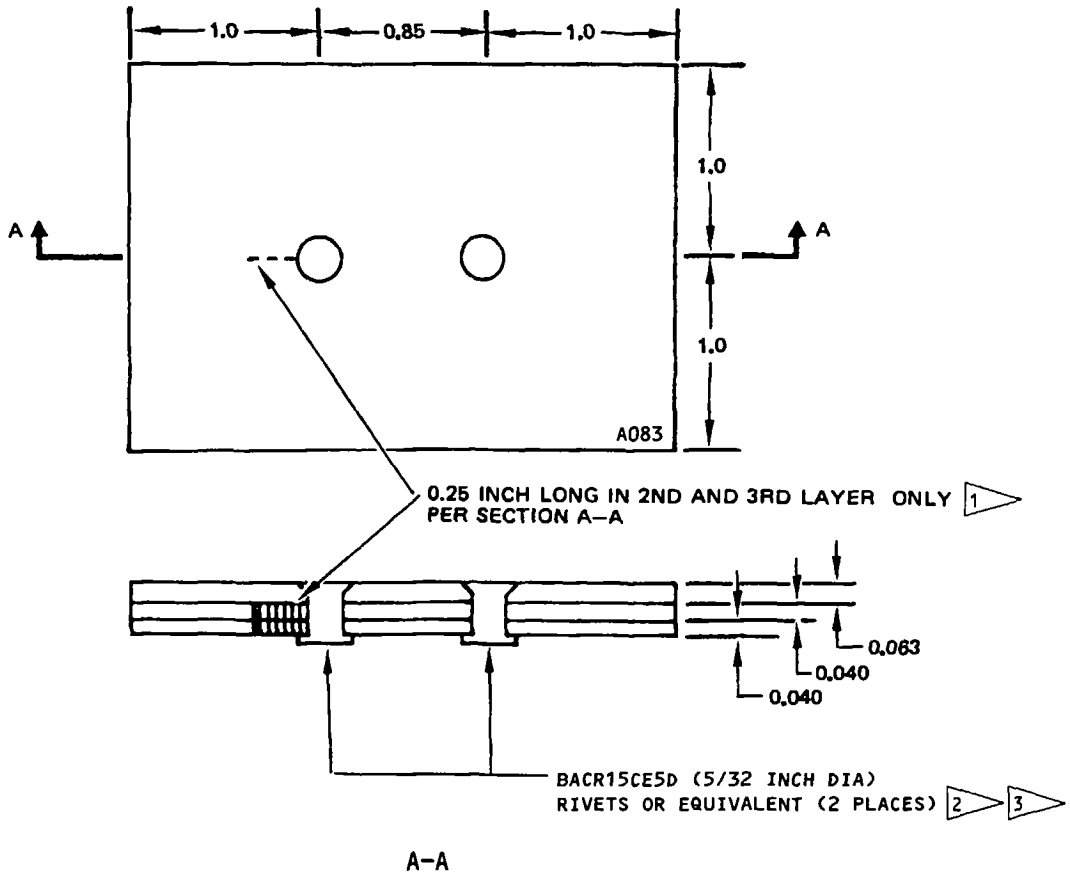
   (2) Do not change instrument sensitivity when establishing airplane baseline response.

C. Inspect each fastener by scanning around the fore and aft side at the distance established during calibration.

   (1) Observe Details III and IV special notes concerning inspection of fasteners closest to BS 500 and 600.

D. Any location which gives a response which is 30% of full meter scale higher than the baseline response should be investigated further.

Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 3)



A–A

NOTES:

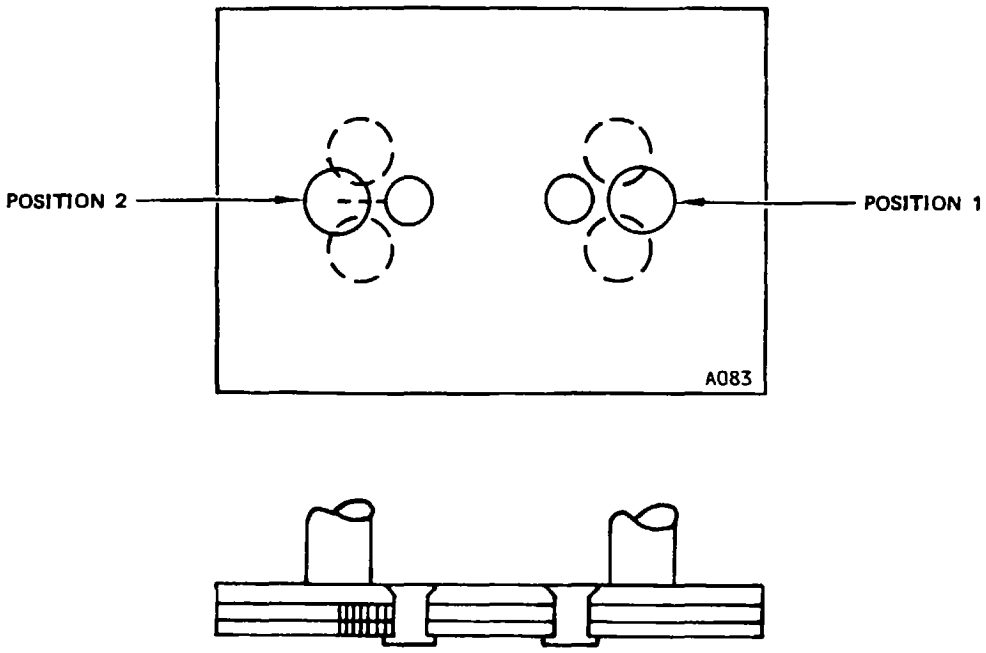
- ALL DIMENSIONS ARE IN INCHES
- MATERIAL: CLAD 2024-TD ALUMINUM, ALL LAYERS
- TOLERANCE: X.X ± 0.05
  X.XX ± 0.02
  X.XXX ± 0.005
- ETCH OR STEEL STAMP WITH A083

1 JEWELER'S SAWCUT 0.030 MAX WIDTH

2 THESE RIVETS MUST HAVE A CONVERSION COATED (ALODINED) FINISH. TO MAKE SURE THE FINISH IS ALODINE, REFER TO PART 1, 51-06-01. INSTALL THE RIVETS AS SPECIFIED IN PART 1, 51-01-04.

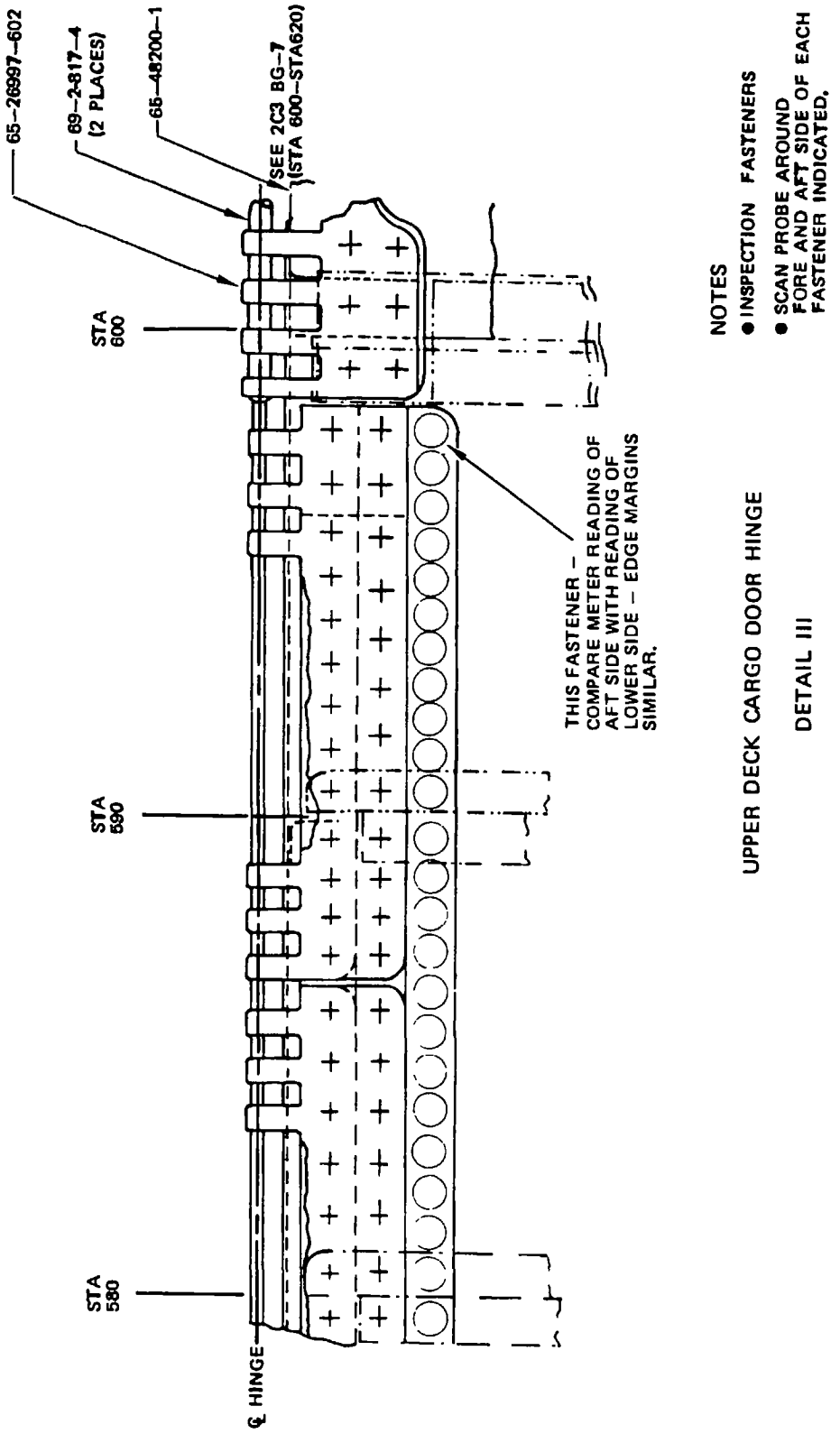
3 PUT A LETTER "A" IN FRONT OF THE REFERENCE STANDARD NUMBER TO SHOW THAT IT HAS ALODINED RIVETS. SEE FLAGNOTE 2.

REFERENCE STANDARD A083
DETAIL I
Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 4)

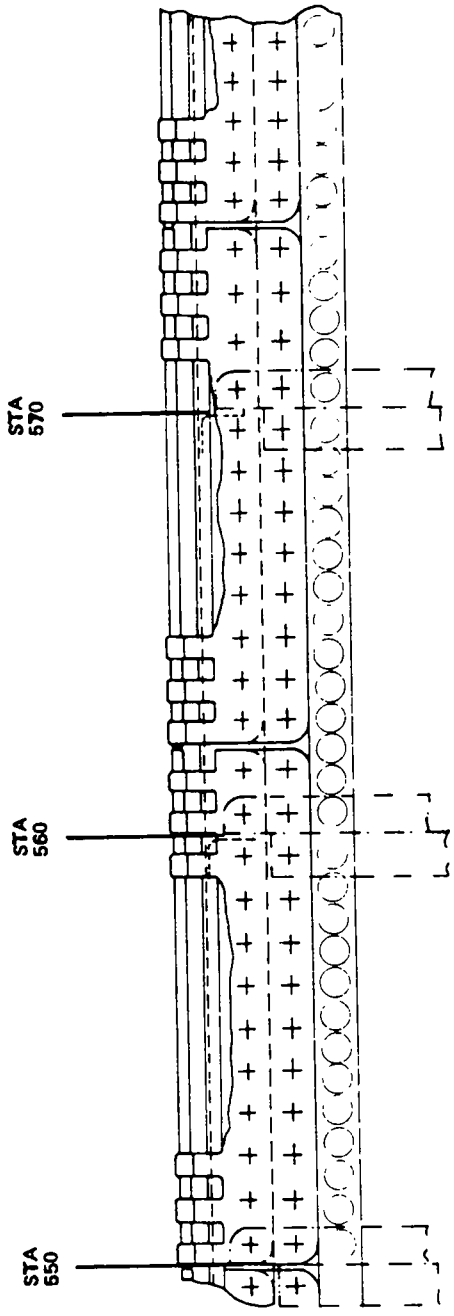


PROBE POSITION FOR CALIBRATION ON REFERENCE
STANDARD A083
DETAIL II

Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 5)



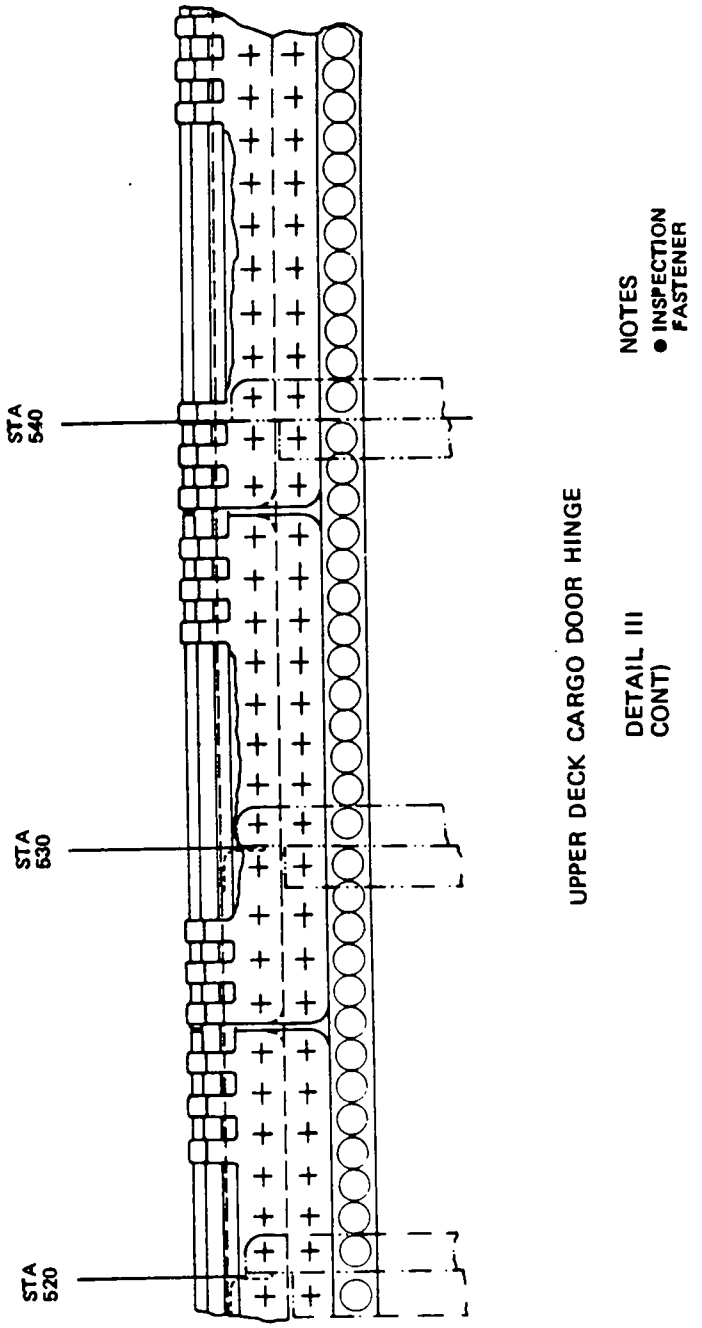
Main Cargo Door Upper Deck Hinge Doublers
Figure 3 (Sheet 6)



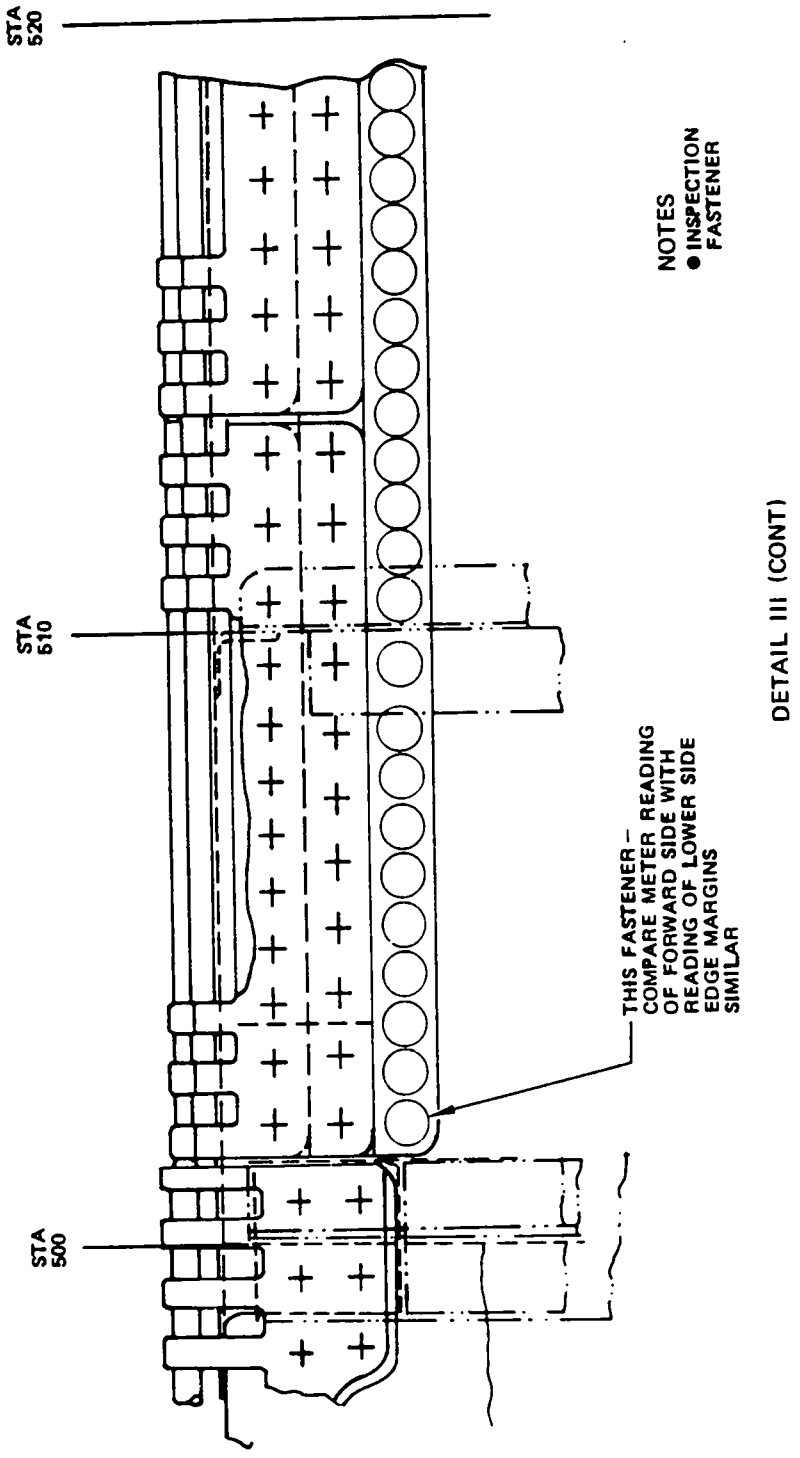
NOTES
● INSPECTION FASTENER

UPPER DECK CARGO DOOR HINGE
DETAIL III (CONT)

Main Cargo Door Upper Deck Hinge Doubler
Figure 3 (Sheet 7)



Main Cargo Door Upper Deck Hinge Doubler
Figure 3 (Sheet 8)



Main Cargo Door Upper Deck Hinge Doubler
Figure 3 (Sheet 9)

PART 6 - EDDY CURRENT

DOORS - CARGO

1. Purpose

   A. To detect cracks out of fastener holes in the upper deck cargo door skin and hinge between B.S. 505 and 595.

2. Equipment

   A. Refer to Part 6, 51-00-00, Figure 6.

3. Prepare for Inspection

   A. Wipe skin surface clean at inspection areas. See Detail I.

4. Calibrate Instrument

   A. Refer to Part 6, 51-00-00, Figure 4.

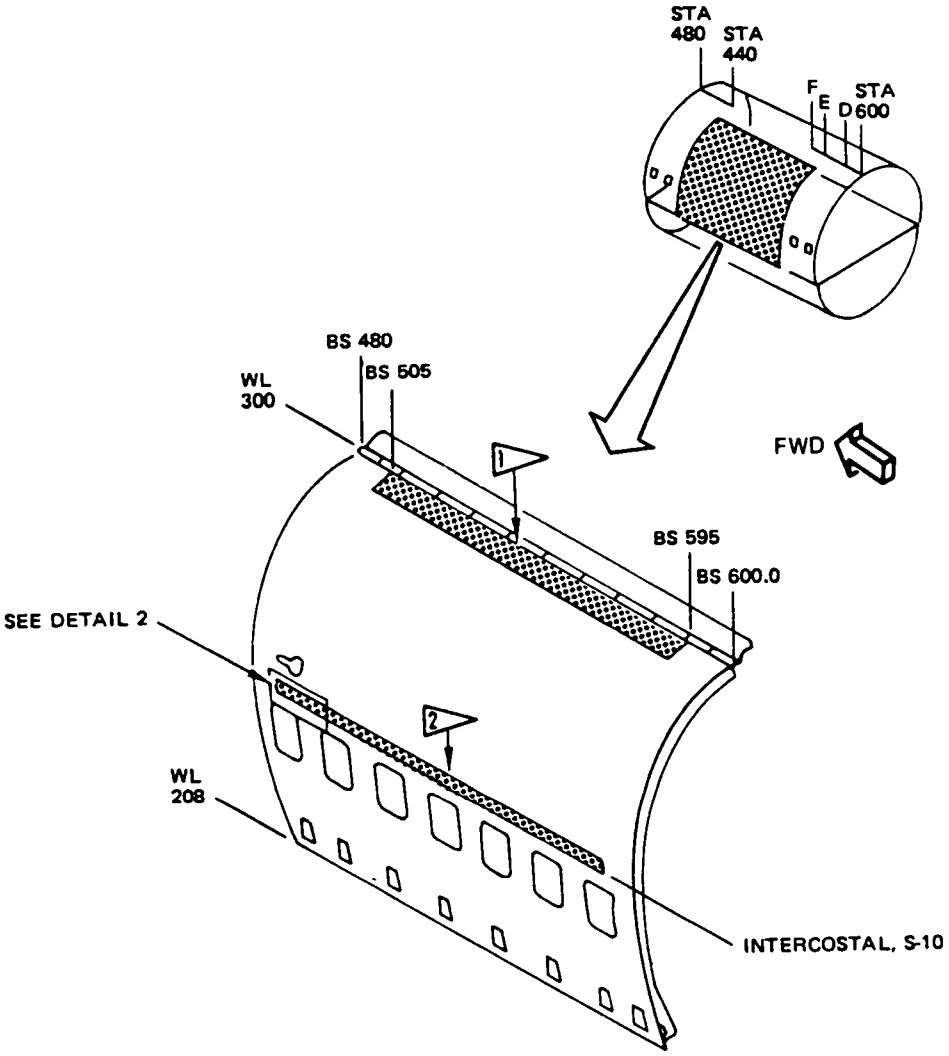
5. Inspection Procedure

   A. Perform scan per Part 6, 51-00-00, Figure 6, per Detail I and II.

   B. Scan pencil probe around fasteners in bottom fastener row parallel to the hinge (approximately) 1.5 inches below edge of cargo door hinge.

   C. Scan the pencil probe around the top fastener row common to the skin lap joint at Stringer 10 and the vertical fastener row at each frame for six inches above Stringer 10 between BS 505 and 595.

Upper Deck Cargo Door Skin and Hinge BS 505 and BS 595
Figure 4 (Sheet 1)

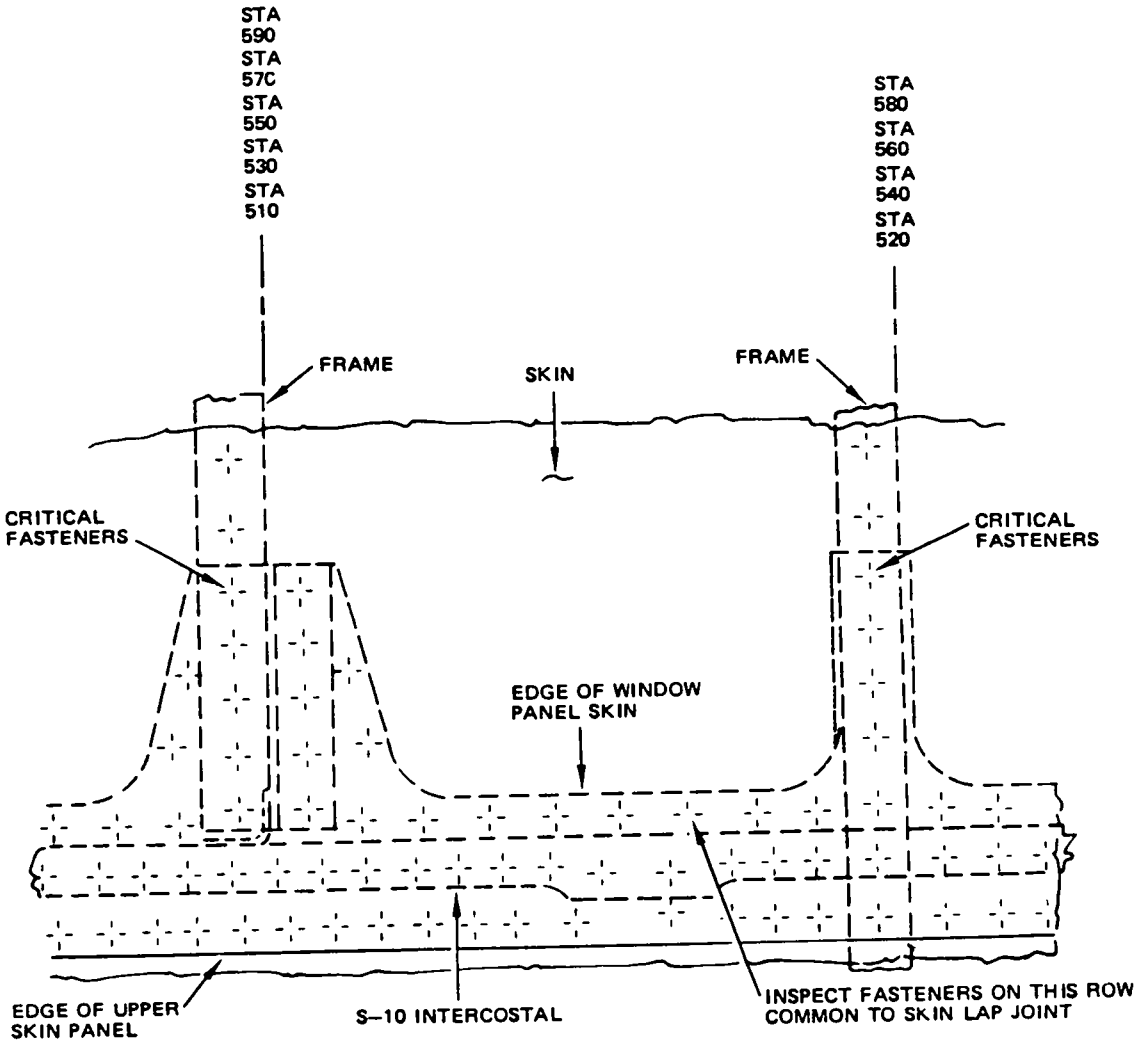


NOTES

1. SCAN AROUND FASTENERS IN BOTTOM ROW COMMON TO HING (APPROXIMATELY 1-1/2 INCHES BELOW HINGE). DETAIL 3
2. SCAN AROUND FASTENERS IN TOP ROW COMMON TO SKIN LAP AND IN THE VERTICAL ROW AT EACH FRAME FOR 6 INCHES ABOVE S-10 SEE DETAIL 2

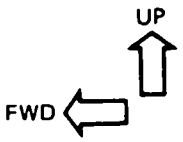
MAIN CARGO DOOR SKIN INSPECTION
DETAIL I

Upper Deck Cargo Door Skin and Hinge BS 505 and BS 595
Figure 4 (Sheet 2)

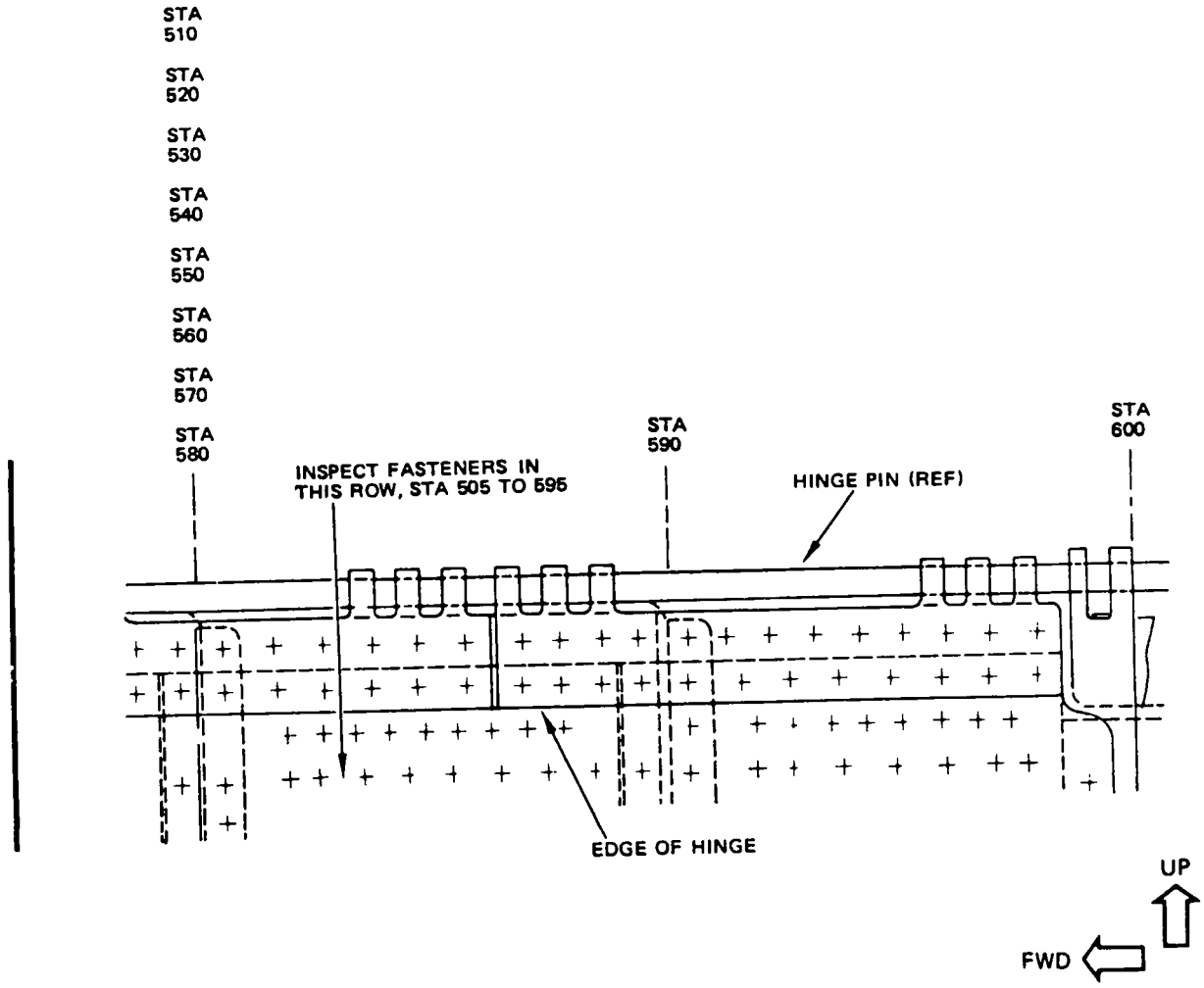


MAIN CARGO DOOR SKIN INSPECTION
(TYPICAL FOR ALL S-10 FRAMES)

DETAIL II



Upper Deck Cargo Door Skin and Hinge BS 505 and BS 595
Figure 4 (Sheet 3)



MAIN CARGO DOOR INSPECTION HINGE AREA
DETAIL III

Upper Deck Cargo Door Skin and Hinge BS 505 and BS 595
Figure 4 (Sheet 4)