# HIRDLS

**SP-MMS-455**
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Issue 2

**HIGH RESOLUTION DYNAMICS LIMB SOUNDER**

Originator: N Crossland Date. 19 November, 1999

Subject/Title: **FM Structure Thermal Subsystem Assembly and Disassembly Handbook**

Description/Summary/Contents

The purpose of this document is to define the following -

a) The method for assembling and disassembling the component parts of the Flight Model (FM) Structure Assembly
b) The method for attaching the Space View Aperture, and Sunshield Door and Aperture Plate Assemblies to the FM structure

It is intended that the Customer and the Instrument Integrator shall use this document for the above purposes

**The document is intended to address the minimum assembly and disassembly requirements for the FM Structure Thermal Subsystem only and is not intended to cover other subsystem unit integration requirements. The Instrument Integrator is responsible for STH and Unit integration.**

Keywords FM, STH, Assembly, Handbook

Purpose of this Document Definition of FM Structure Assembly Instructions

| | | | |
|---|---|---|---|
| Reviewed/Approved by | | | |
| Date (yy-mm-dd) | 99-12-02 | | |

**Matra Marconi Space**
**Anchorage Road**
**Portsmouth**
**Hampshire PO3 5PU**
**England**

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# FM STRUCTURE THERMAL SUBSYSTEM ASSEMBLY AND DISASSEMBLY HANDBOOK

## SP-MMS-455

Responsible Engineer. N Grossbond ..... Date: 30th Nov 1999

Quality Assurance ..... Date. 3-12-99

Project Manager: ..... Date 2 Dec 99

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## 1. SCOPE

**This document is intended to address the minimum assembly and disassembly requirements for the FM Structure Thermal Subsystem only and is not intended to cover other subsystem unit integration requirements. The Instrument Integrator is responsible for STH and Unit integration.**

This handbook is applicable to the HIRDLS Flight Model (FM) Structure Thermal Subsystem Assembly.

It defines the instructions for ,

assembling and disassembling the component parts of the HIRDLS Structure Assembly,
integration of the Space View Aperture Assembly, and
integration of the Sunshield Door and Aperture Plate Assembly

These three main assembly activities form a logical division of this handbook as follows -

| | |
|---|---|
| Sections 6, 7 and Appendix A - | Assembly and disassembly of the STH Structure Assembly |
| Section 8 and Appendix B - | Integration of the Space View Aperture Assembly |
| Section 9 and Appendix C - | Integration of the Sunshield Door and Aperture Plate Assembly |

For integration of the Thermal Subsystem (BOM 3164-TH001-02-F), refer to Installation Handbook SP-MMS-471

## 2. DOCUMENTS

The latest issue of the following documents is applicable at the date of issue of this document

### 2.1 Applicable Documents

| | | |
|---|---|---|
| AD1 | Structure/Thermal Subsystem Specification Document | SP-HIR-031 |
| AD2 | Sunshield Subsystem Specification Document | SP-HIR-050 |
| AD3 | Turnover Stand Assembly Instructions | TC-RAL-094 |
| AD4 | Turnover Stand Assembly Drawing | A0-KE-0124-380-01 |
| AD5 | Lifting Frame Assembly and Operating Instructions | TC-RAL-144 |
| AD6 | Lifting Frame Assembly Drawing | A0-KE-0124-100-00 |
| AD7 | Electrical Bonding Resistance Test Procedure | TP-MMS-335 |

### 2.2 Reference Documents

| | | |
|---|---|---|
| RD1 | Internal Interface Control Document (System Section) | SP-HIR-200 |
| RD2 | Flight Model (FM) Structure Assembly Drawing Tree and List | DW-MMS-435 |
| RD3 | Flight Model (FM) Sunshield/HDA Assembly Drawing Tree and List | DW-MMS-436 |
| RD4 | Flight Model (FM) Space View Aperture Assembly Drawing Tree and List | DW-MMS-437 |

### 2.3 Drawings

| | | |
|---|---|---|
| DG1 | Structure/Thermal Subsystem ICD | DW-MMS-254 |
| DG2 | Sunshield Subsystem ICD | DW-MMS-307 |
| DG3 | Space View Albedo Assembly ICD | DW-MMS-268 |
| DG4 | Structure/Thermal Subsystem General Assembly | DW-MMS-213 |

## 3. KIT OF PARTS

The following is the list of parts used for assembly of the Structure / Thermal Subsystem (3164-SS001-02-F)

| ITEM NO. | PART NUMBER | DESCRIPTION | NO. OFF |
|---|---|---|---|
| 100 | 3164-SX001-05-F | STRUCTURE ASSEMBLY | 1 |
| 200 | 3164-ST001-05-F | THERMAL HARDWARE(1) | 1 |
| 300 | HR2L040 | SPACE VIEW ALBEDO ASSEMBLY | 1 |
| 400 | HR1L100 | SUNSHIELD & HDA ASSEMBLY | 1 |
| 500 | 3164-SS031-05-F | STRUCTURE / THERMAL ASSEMBLY KIT | 1 |

(1) Thermal Hardware comprises blanket pins and grounding studs which are incorporated on structure panels, i.e they are not delivered as a separate item

**TABLE 3-1 PARTS LISTING OF THE STRUCTURE / THERMAL SUBSYSTEM ASSEMBLY**

The following is the list of parts used for assembly of the Structure Assembly (3164-SX001-05-F).

| ITEM NO. | PART NUMBER | DESCRIPTION | NO. OFF |
|---|---|---|---|
| 1 | 3164-SX002-05-F | BASEPLATE | 1 |
| 2 | 3164-SX003-05-F | -X OUTER PANEL | 1 |
| 3 | 3164-SX005-05-F | +X OUTER PANEL | 1 |
| 4 | 3164-SX005-05-F | MID PANEL | 1 |
| 5 | 3164-SX006-05-F | -Y OUTER PANEL | 1 |
| 6 | 3164-SX007-05-F | +Y OUTER PANEL | 1 |
| 7 | 3164-SX008-05-F | +Y SUNSHIELD LIP | 1 |
| 8 | 3164-SX009-05-F | MEZZANINE PANEL | 1 |
| 9 | 3164-SX010-05-F | ELECTRONICS SHELF | 1 |
| 10 | 3164-SX012-05-F | EU TOP PANEL | 1 |
| 11 | 3164-SX013-05-F | FIXED SUNSHIELD | 1 |
| 12 | 3164-SX017-05-F | SUNSHIELD SUPPORT PANEL | 1 |
| 13 | 3164-SX031-05-F | -X SUNSHIELD LIP | 1 |
| 15 | SF105-0001-019N | M4 x 0,7 TITANIUM TORX HEAD SCREW 14 LONG | 136 |
| 16 | SF105-0001-018N | M4 x 0,7 TITANIUM TORX HEAD SCREW 12 LONG | 46 |
| 17 | SF400-0001-006N | M4 STAINLESS STEEL WASHER | 182 |

**TABLE 3-2 PARTS LISTING OF THE STRUCTURE ASSEMBLY**

## 4. MECHANICAL GROUND SUPPORT EQUIPMENT (MGSE)

4 1 All assembly, disassembly, and lifting operations performed during the Structure / Thermal Subsystem Assembly shall utilise the following support equipment.

| | |
|---|---|
| HIRDLS Turnover Stand Assembly | Part No. A0-KE-0124-380-01 |
| HIRDLS Lifting Frame Assembly | Part No. A0-KE-0124-100-00 |

4.2 Operating instructions are defined in both AD3 and AD5 respectively

## 5. GENERAL ASSEMBLY INSTRUCTIONS

5 1 Due to the complexity of this assembly, it is advised that this procedure is thoroughly read and the assembly sequence fully understood, before any assembly or disassembly operations are undertaken.

5 2 Unless otherwise stated, loosely assemble the structure using torque values not to exceed 50% of the full value specified for panel fixings Ensure that there is no distortion or twisting of the panels and that the structure is in a stress free state prior to the final torque being applied

5 3 Tolerance on maximum torque values shall be ± 10% of applied torque up to a maximum tolerance of ± 0 1 Nm

5 4 Gaps exceeding 0 05mm between cleat / panel interfaces, and mating panel edges should be shimmed prior to torquing the relevant fixings

## 6. STH STRUCTURE ASSEMBLY PROCEDURE

Numbers in Brackets (x) refer to the item numbers shown in Table 3 1

Appendix A1-1 shows an exploded view of the structures' component parts for clarification

### 6.1 Attaching the +X Outer panel (Item 3)

6 1 1 Appendix A1-2 shows the minimum build requirement for attaching the +X Outer Panel

6 1 2 Assemble the +X Outer Panel (3) to the Baseplate (1) using 8 off screws (15) and 8 off washers (17) Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the panel

6 1 3 Attach the grounding straps to the grounding points between the +X Outer Panel and Baseplate grounding studs (2 off) Torque fixings supplied to 2Nm, ensuring grounding straps do not rotate on tightening

### 6.2 Attaching the +Y Outer Panel (Item 6)

6 2.1 Appendix A1-3 shows the minimum build requirement for attaching the +Y Outer Panel However, an alternative minimum build is to attach the Mid Panel (4) as defined in Section 6 3 instead of the +X Outer Panel (3).

6 2.2 Attach the +X Outer Panel (or Mid Panel (4)) as described in Section 6 1 (or 6 3).

6 2 3 Assemble the +Y Outer Panel (6) to the Baseplate (1) and to the +X Outer Panel (3) using 12 off Screws (15) and 12 off Washers (17) Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the panel.

6 2.4 Attach the grounding strap on the panel to the grounding point on the +X Outer Panel Torque fixing supplied to 2Nm, ensuring grounding strap does not rotate on tightening

### 6.3 Attaching the Electronics Compartment Sub-assembly (Items 2, 4, 9 and 10)

6 3.1 Appendix A1-4 shows the minimum build requirement for attaching the Electronics Compartment Sub-assembly

6 3 2 Assemble the Electronics Panel (9) to the Mid Panel (4) and the -X Outer Panel (2) using 14 off Screws (15) and 14 off Washers (17). Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the panels

6 3 3 Assemble the EU Top Panel (10) to the Mid Panel (4) and the -X Outer Panel (2) using 13 off Screws (15) and 13 off Washers (17) Attach the two cleats on the EU Top Panel to the -X Outer Panel using 4 off Screws (16) and 4 off Washers (17) Torque fixings to 6 0 Nm. Refer to Section 5 2 prior to fitting the panels

6 3 4 Fit the completed Sub-Assembly to the Baseplate (1) using 13 off Screws (15) and 13 off Washers (17) Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the assembly.

6 3 5 Attach grounding straps between the following grounding points:-

-X Panel (2) and Baseplate (1)
-X Panel (2) and EU Top Panel (10)
-X Panel (2) and Electronics Panel (9)
Mid Panel (4) and +Y Outer Panel (6)

Torque fixings supplied to 2Nm, ensuring grounding straps do not rotate on tightening

**6.4 Attaching the Mezzanine Panel (Item 8)**

6 4 1 Appendix A1-5 shows the minimum build requirement for attaching the Mezzanine Panel.

6 4 2 The +Y Outer Panel (6) and Mid Panel (4) should be attached and torqued to the values provided in Sections 6.2 and 6.3, respectively

6 4 3 Assemble the Mezzanine Panel (8) to the +Y Panel (6) and the Mid Panel (4). Use 2 off Screws (15) and 2 off Washers (17) for attachment to the +Y panel and attach the seven cleats on the Mezzanine Panel to the Mid Panel using 14 off Screws (16) and 14 off Washers (17) Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the panels

6 4 5 Attach the grounding strap on the Mezzanine Panel to the +Y Outer Panel grounding point Torque fixings supplied to 2Nm ensuring grounding strap does not rotate on tightening

**6.5 Attaching the -Y Outer Panel (Item 5)**

6.5 1 Appendix A1-6 shows the minimum build requirement for attaching the -Y Outer Panel

6 5 2 Attach the +X and +Y Outer Panels, the Electronics Compartment Sub-assembly and the Mezzanine Panel as shown in Sections 6.1 to 6 4

6 5 3 Assemble the -Y Outer Panel (5) to the Baseplate (1) using 10 off screws (15) and 10 off Washers (17). Torque fixings to 6 0 Nm Refer to Section 5.2 prior to fitting the panel

6 5 4 Assemble the -Y Outer Panel to the Mezzanine Panel (8), Mid Panel (4), -X Outer Panel (2), +X Outer Panel (3), and Electronics Shelf (9) using 22 off Screws (15) and 22 off Washers (17) Torque fixings to 6 0 Nm. Refer to Section 5 2 prior to fitting the panels

6 5 5 Attach the grounding straps between the -Y Outer Panel and the Baseplate, the -Y Outer Panel and the Mezzanine Panel, and the -Y Outer Panel and the Mid Panel Torque fixings supplied to 2Nm, ensuring grounding straps do not rotate on tightening

**6.6 Attaching the Sunshield Support Panel (Item 12)**

6 6 1 Appendix A1-7 shows the minimum build requirement for attaching the Sunshield Support Panel

6 6 2 Attach the Electronics Compartment Sub-assembly as shown in Section 6 3.

6 6 3 Attach the Sunshield Support Panel (12) to the EU Top Panel (10) using 12 off Screws (16) and 12 off Washers (17) Torque fixings to 6 0 Nm Refer to Section 5 2 prior to fitting the panels

6 6 4 Attach the -X Sunshield Lip (13) to the Sunshield Support Panel and the -X Outer Panel using 8 off Screws (16) and 8 off Washers (17) Torque fixings to 6 0 Nm. Refer to Section 5 2 prior to fitting the panels

6 6.5 Attach the grounding straps between the EU Top Panel and Sunshield Support and the -X Sunshield Lip and the -X Outer Panel. Torque fixings supplied to 2Nm, ensuring grounding straps do not rotate on tightening.

### 6.7 Attaching the Fixed Sunshield Panel (Item 11)

6 7 1 Appendix A1-8 shows the minimum build requirement for attaching the Fixed Sunshield Panel

6.7 2 Attach the structure panels as shown in Sections 6 1 to 6 6

6 7.3 Assemble the Fixed Sunshield Panel (11) to the -X Outer Panel (2), -Y and +Y Outer Panels (5 and 6), and the Sunshield Support Panel (12) using 15 off Screws (15) and 15 off Washers (17) Torque fixings to 6 0 Nm. Refer to Section 5.2 prior to fitting the panels Note that the interface to the sunshield support panel (12) requires shims at each of the 3 fixing positions – refer to Section 10 for details.

6 7 4 Attach the grounding straps between the Fixed Sunshield Panel and the +Y Outer and the -Y Outer Panels Torque fixings supplied to 2Nm, ensuring grounding straps do not rotate on tightening

### 6.8 Attaching the +Y Sunshield Lip (Item 7)

6.8 1 Appendix A1-9 shows the minimum build requirement for attaching the +Y Sunshield Lip

6 8 2 Attach the +X and +Y Outer panels as shown in Sections 6 1 and 6 2.

6 8 3 Assemble the +Y Sunshield Lip (7) to the +Y Outer Panel (6) using 4 off Screws (16) and 4 off Washers (17) Torque fixings to a value of 6 0 Nm. Refer to Section 5 2 prior to fitting the lip

6 8 4 Attach the grounding strap from the +Y Outer Panel to the nearest fixing on the +Y Sunshield Lip (7) using 1 off Screw (16) and 1 off Washer (17), ensuring grounding strap does not rotate on tightening.

## 7. STH STRUCTURE DISASSEMBLY PROCEDURE

### 7.1 Removing the Sunshield Lips

7.1 1 Remove the grounding straps from the Sunshield lips. Only one end of each strap need be removed.

7 1 2 Remove the +Y Sunshield Lip (Item 7) from the +Y Panel (Item 6). Bag and tag the screws (16) and the washers (17)

7 1 3 Remove the -X Sunshield lip (13) from the Sunshield Support Panel (12) and the -X Outer Panel (2). Bag and tag the screws (16) and the washers (17).

### 7.2 Removing the Fixed Sunshield and Sunshield Support Panel

7 2 1 Remove the grounding straps from the -Y Outer Panel (5), the +Y Outer Panel (6) and the EU Top Panel (10) Only one end of each strap need be removed Bag and tag all screws and washers.

7.2 2 Remove the Fixed Sunshield (11) from the -Y Outer Panel (5), +Y Outer Panel (6), +X Outer Panel (3) and the Sunshield Support Panel (12) Bag and tag the screws (15), washers (17), and shim packs

7 2.3 Remove the Sunshield Support Panel (12) from the EU Top Panel (10) Bag and tag the screws (16) and the washers (17).

### 7.3 Removing the -Y panel

7 3 1 Remove the grounding straps from the grounding points on the Baseplate (1), the Mezzanine Panel (8), and the Mid Panel (4). Only one end of each strap need be removed. Bag and tag all the screws and washers

7 3.2 Disconnect the -Y Outer Panel (5) from the +X Outer Panel (3) and the -X Outer Panel (2) Bag and tag the screws (15) and the washers (17)

7 3 3 Disconnect the -Y panel (5) from the Mezzanine Panel (8), the Mid Panel (4), and the Electronics Shelf (9) Bag and tag the screws (15) and the washers (17)

7 3 4 Remove the -Y Panel (5) from the Baseplate (1) Bag and tag the screws (15) and the washers (17)

### 7.4 Removing the Mezzanine Panel

7 4 1 Remove the grounding strap from the grounding point between the Mezzanine Panel (8) and the +Y Outer Panel (6) Only one end of the strap need be removed Bag and tag all the screws and washers

7 4 2 Remove the Mezzanine Panel (8) from the +Y Panel (6), and the Mid Panel (4) Bag and tag the screws (15 and 16) and the washers (17)

### 7.5 Removal of the Electronics Compartment Sub-assembly

7 5 1 Remove the grounding straps (Item 27) from the grounding points between the following panels -

-X panel (2) and the Baseplate (1)
-X panel (2) and the EU Top Panel (10)
-X panel (2) and the Electronics Shelf (9)
Mid Panel (4) and the +Y Panel (6)

Only one end of each strap need be removed Bag and tag all the screws and washers

7 5 2 Remove from the Baseplate (1) and the +Y Panel (6), the Electronics Compartment subassembly, which comprises the EU Top Panel (10), the Mid Panel (4), the Electronics Shelf (9), and the -X Panel (2) Bag and tag the screws (15) and the washers (17)

7 5 3 Remove the EU Top Panel (10) from the Mid Panel (4) and the -X Panel (2) Bag and tag the screws (15 and 16) and the washers (17)

7 5 4 Remove the Electronics Shelf (9) from the Mid Panel (4) and the -X Panel (2) Bag and tag the screws (15) and the washers (17).

### 7.6 Removing the +Y Outer Panel

7 6 1 Remove the grounding strap from the grounding points between the +Y panel (6) and the +X Panel (3) Only one end of the strap need be removed. Bag and tag all the screws and washers

7 6 2 Remove the +Y Panel (6) from the Baseplate (1) and the +X Panel (3). Bag and tag the screws (15) and the washers (17)

### 7.7 Removing the +X Outer Panel

7 7 1 Remove the two grounding straps between the +X Panel (3) and the Baseplate (1) One end of each strap need only be removed. Bag and tag all the screws and washers

7 7 2 Remove the +X panel (3) from the Baseplate (1) Bag and tag the screws (15) and the washers (17)

## 8. INTEGRATION OF THE SPACE VIEW APERTURE ASSEMBLY (SVA)

### 8.1 Introduction

Numbers in brackets (x) refer to item numbers shown in Tables 3 1 and 3 2

8 1 1 The Space View Aperture (SVA) Assembly (300) is fixed to the +Y Outer Panel (6) using special for purpose fixings These are included in the Structure / Thermal Subsystem Assembly Kit (500).

### 8.2 Attaching the SVA to the structure.

8 2 1 Appendix B1-1 shows the minimum build requirement for attaching the SVA to the structure

8 2 2 Attach the +X Outer Panel (3), +Y Outer Panel (6) and Mid Panel (4) to the Baseplate (1) as shown in Sections 6 1 to 6.3

8 2 3 The Structure Assembly Kit for the SVA comprises the following -

| ITEM NO. | PART NUMBER | DESCRIPTION | NO OFF |
|---|---|---|---|
| B1 | HR2L031 | BOLT SPECIAL | 5 |
| B2 | HR2L032 | WASHER BRACKET SPECIAL | 5 |
| B3 | HR2L033 | SPACER | 5 |
| B4 | MN50014 | DISC SPRING | 10 |
| B5 | F844329-001 | MJ4 TITANIUM STD. SKT SCREW 16 LONG | 1 |
| B6 | F834292-001 | M4 ALUMINIUM WASHER | 1 |

8.2 4 Remove the Albedo Shield from the SVA Assembly by unscrewing the 'C' hole screws shown in Appendix B1-2

8 2 5 Assemble 5 off fixing assemblies. Each fixing assembly must be assembled in the following sequence - Bolt Special (B1), followed by Spacer (B3), followed by Disc Spring (B4), and finally by Washer Bracket Special (B2)

8.2.6 Attach the SVA to the +Y Outer Panel (6) using the 5 off assemblies described in Section B 2 5 at positions 'A' and items B5 and B6 at Position 'B', as shown in Appendix B1-2. Torque fixings to the following values.

Position 'A' 0,4 to 0,5 Nm
Position 'B' 2,1 to 2,2 Nm

8.2 7 Re-attach the Albedo Shield using supplied screws and torque fixings to 0,45 to 0,55 Nm.

8 2 8 Removal is the reverse of the above Bag and Tag all screws and washers

## 9. INTEGRATION OF THE SUNSHIELD DOOR AND APERTURE PLATE ASSEMBLY

### 9.1 Introduction

Numbers in brackets (x) refer to item numbers shown in Tables 3 1 and 3 2

9 1 1 The Sunshield Door and Aperture Plate Assembly (400) is attached to four panels of the structure assembly; +Y Outer Panel (6), -Y Outer Panel (5), Mezzanine Panel (8) and the Fixed Sunshield (11) Special for purpose fixings are included in the Structure / Thermal Subsystem Assembly Kit (500)

### 9.2 Attaching the Sunshield Aperture Plate to the structure.

9 2 1 Appendix C1-1 shows the minimum build requirement for attaching the Sunshield Aperture Plate to the structure

9 2.2 The Structure Assembly must be complete apart from the Fixed Sunshield (11) before attachment of the Aperture Plate can take place This is defined in Sections 6 1 to 6 6 and 6.8

9 2 3 Loosely attach the Sunshield Aperture Plate to the +Y Outer Panel (6), -Y Outer Panel (5) and Mezzanine panel (8) using 26 off M4 x 0,7 x 12 long Titanium Torx Head screws (Part No SF105-0001-018N) contained in the Structure / Thermal Subsystem Assembly Kit (500) The removable cleats at the -Y edge of the aperture plate should be released to allow adjustment of the aperture plate between the +Y and –Y panels. Once adjusted, the cleats shall be refitted and the nuts re-torqued to 2 4 Nm Note that the interface to the +Y panel (6) requires shims at each of the 8 fixing positions – refer to Section 10 for details.

9 2 4 Loosely attach the Fixed Sunshield (11) to the adjoining panels as described in Section 6 7.

9 2 5 Loosely attach the Aperture Plate to the Fixed Sunshield (11) using the 10 off remaining M4 x 0,7 x 12 long screws Note that the interface to the Fixed Sunshield requires shims at 9 of the 10 fixing positions – refer to Section 10 for details

9 2 6 Refer to Appendix C 1-2 Unlatch the Sunshield door by inserting an M5 socket head drive into the raised bolt head, located on the top surface of the latch body Rotate the drive slowly clockwise until the latch roller disengages from the door plate and the catch engages.

**Warning: Under no circumstances shall the drive be rotated anti-clockwise whilst the catch is engaged. This will result in damage to the latch spring mechanism.**

9.2 7 Torque all 36 off fixings on the Aperture Plate to 6,0 Nm

9 2 8 Refer to Appendix C 1-2 Re-latch the Sunshield door by reinserting the drive into the raised bolt head Rotate the drive slowly clockwise until the catch can be disengaged from the spring mechanism Gently pull the spring mechanism clear of the catch, and allow the roller to roll back over the door plate

9.2 9 Unlatch the door prior to removing the Aperture Plate from the structure Re-latch the door on completion Bag and Tag all screws, washers, and shim packs

## 10. SHIM DETAILS

Shims were required at the following interfaces ·-

- Fixed Sunshield to Sunshield Support Panel
- Sunshield Door and Aperture Plate Assembly to +Y Panel
- Sunshield Door and Aperture Plate Assembly to Fixed Sunshield

The general philosophy adopted was to shim gaps exceeding 0 05mm The shims were produced from peelable shim packs comprising 0 05mm thick layers **Failure to implement a shim strategy may result in damage to the interface hardware.**

Shim thickness details for the delivered Structure / Thermal Subsystem are provided in the Tables below and with reference to the Figures in Appendix D. Shim gaps should be measured during each build sequence as it is likely that there will be some variation due to the build-up of tolerances

| Shim Position (See Appendix D1-1) | Shim thickness (mm) |
|---|---|
| A1 | 2,00 |
| A2 | 1,60 |
| A3 | 1,25 |

**Table 10-1 Fixed Sunshield to Sunshield Support Panel Shim Details**

| Shim Position (See Appendix D1-2) | Shim thickness (mm) |
|---|---|
| B1 | 0,00 |
| B2 | 0,30 |
| B3 | 0,25 |
| B4 | 0,30 |
| B5 | 0,35 |
| B6 | 0,40 |
| B7 | 0,35 |
| B8 | 0,35 |
| B9 | 0,25 |
| B10 | 0,25 |

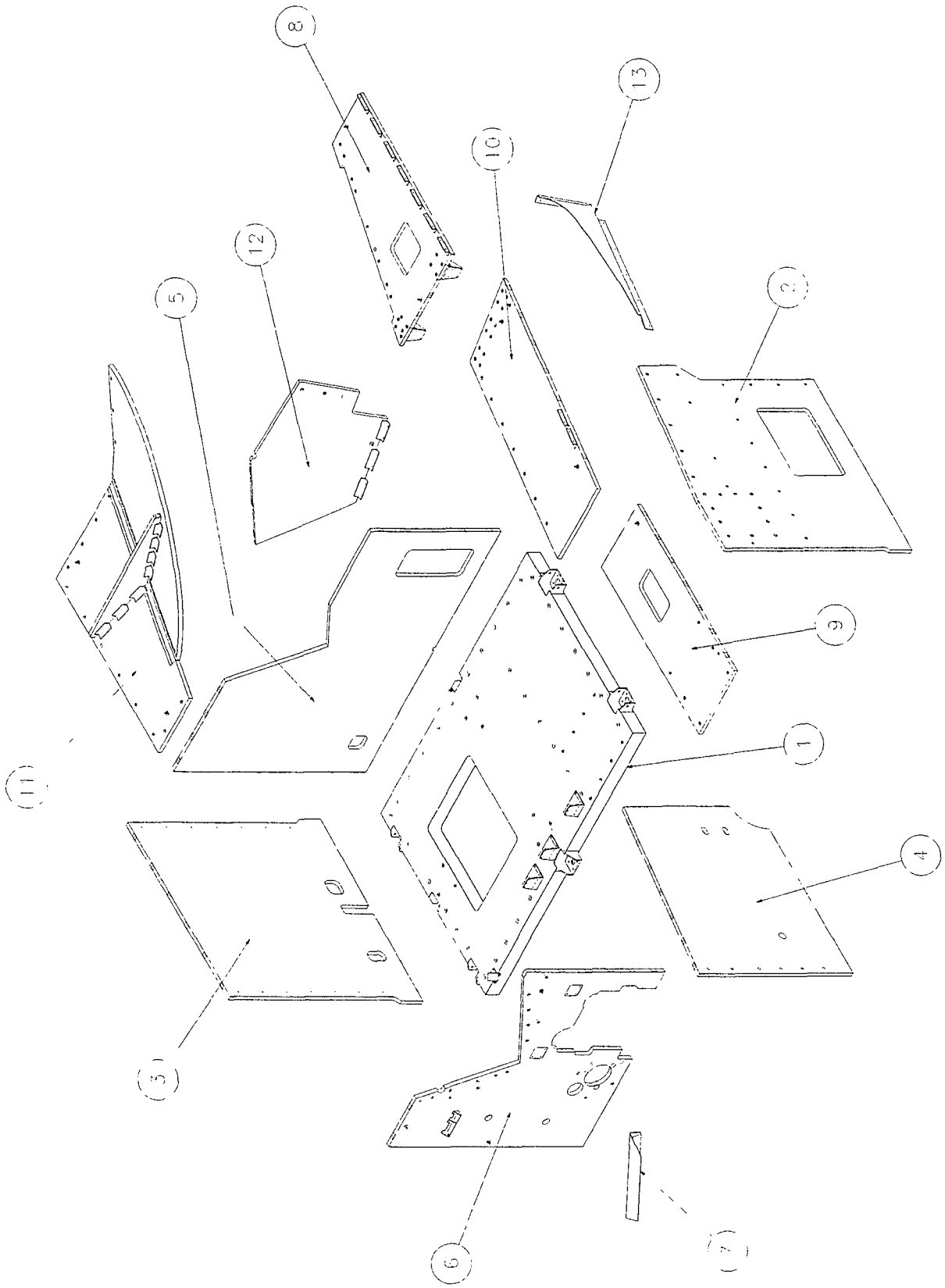
**Table 10-2 Fixed Sunshield to Sunshield Aperture Plate Shim Details**

| Shim Position (See Appendix D1-3) | Shim thickness (mm) |
|---|---|
| C1 | 1,25 |
| C2 | 1,25 |
| C3 | 1,30 |
| C4 | 1,00 |
| C5 | 1,30 |
| C6 | 0,95 |
| C7 | 1,15 |
| C8 | 1,10 |

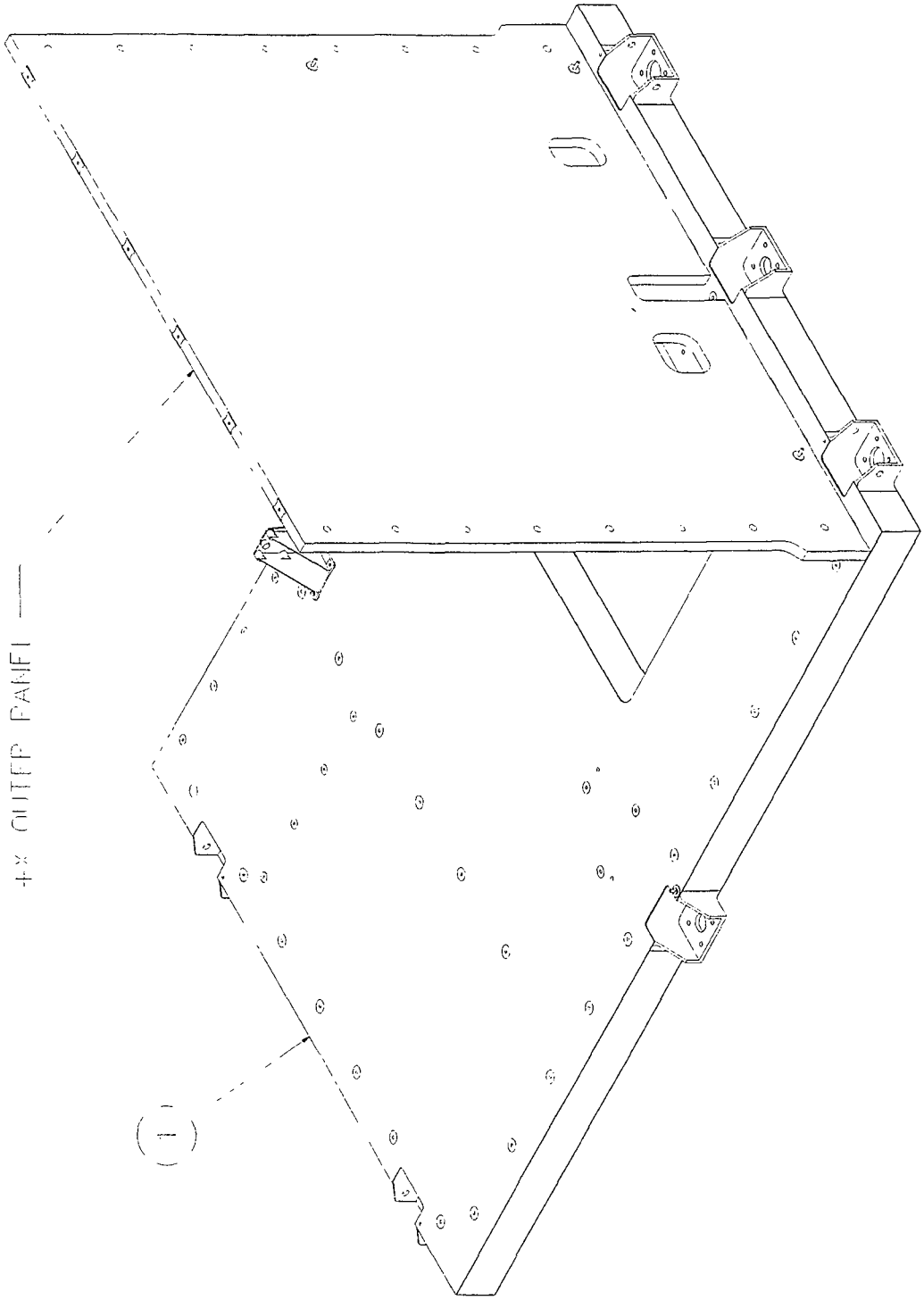
**Table 10-2 +Y Panel to Sunshield Aperture Plate Shim Details**

# APPENDIX A

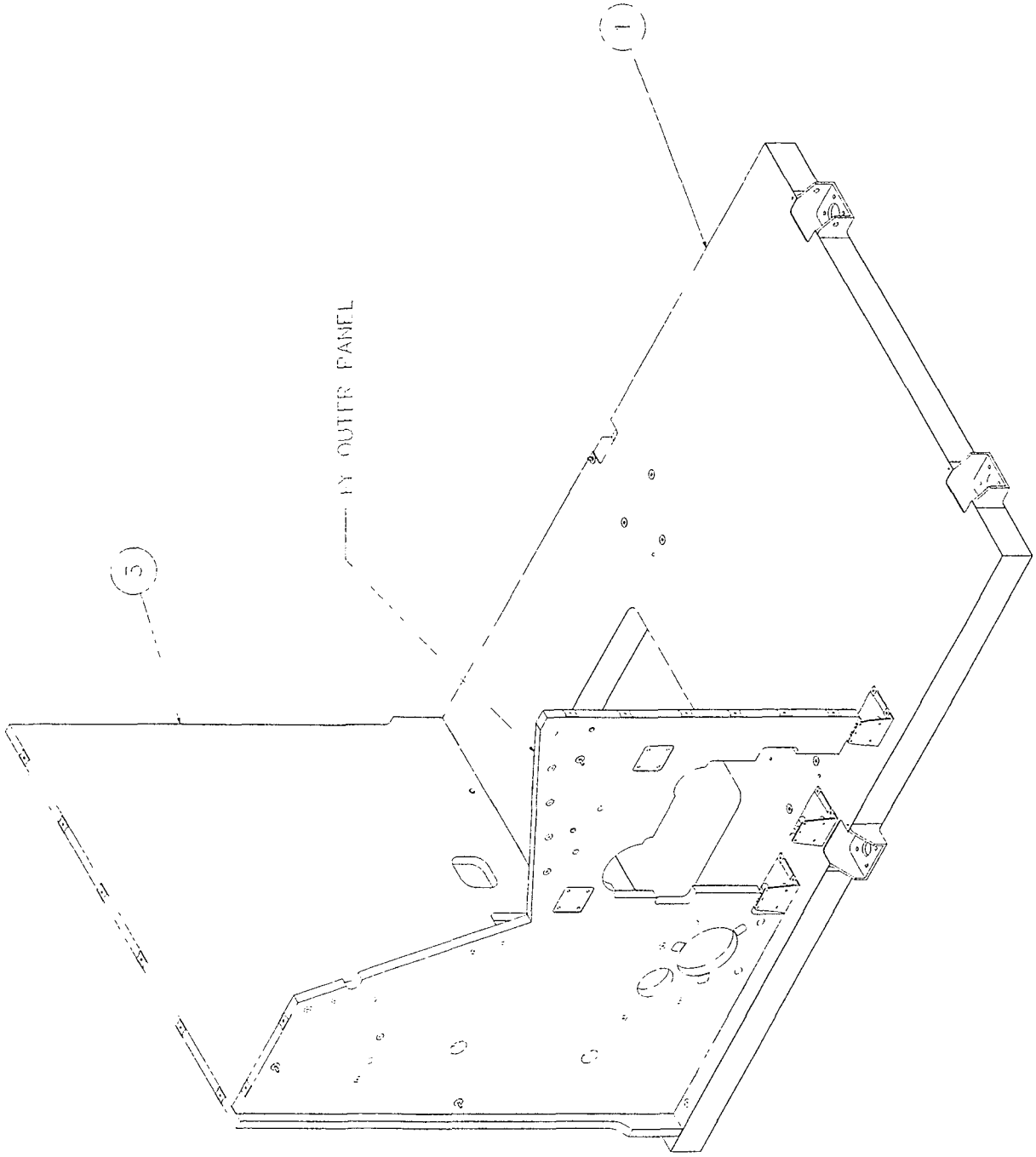
## INTEGRATION OF THE STH STRUCTURE ASSEMBLY



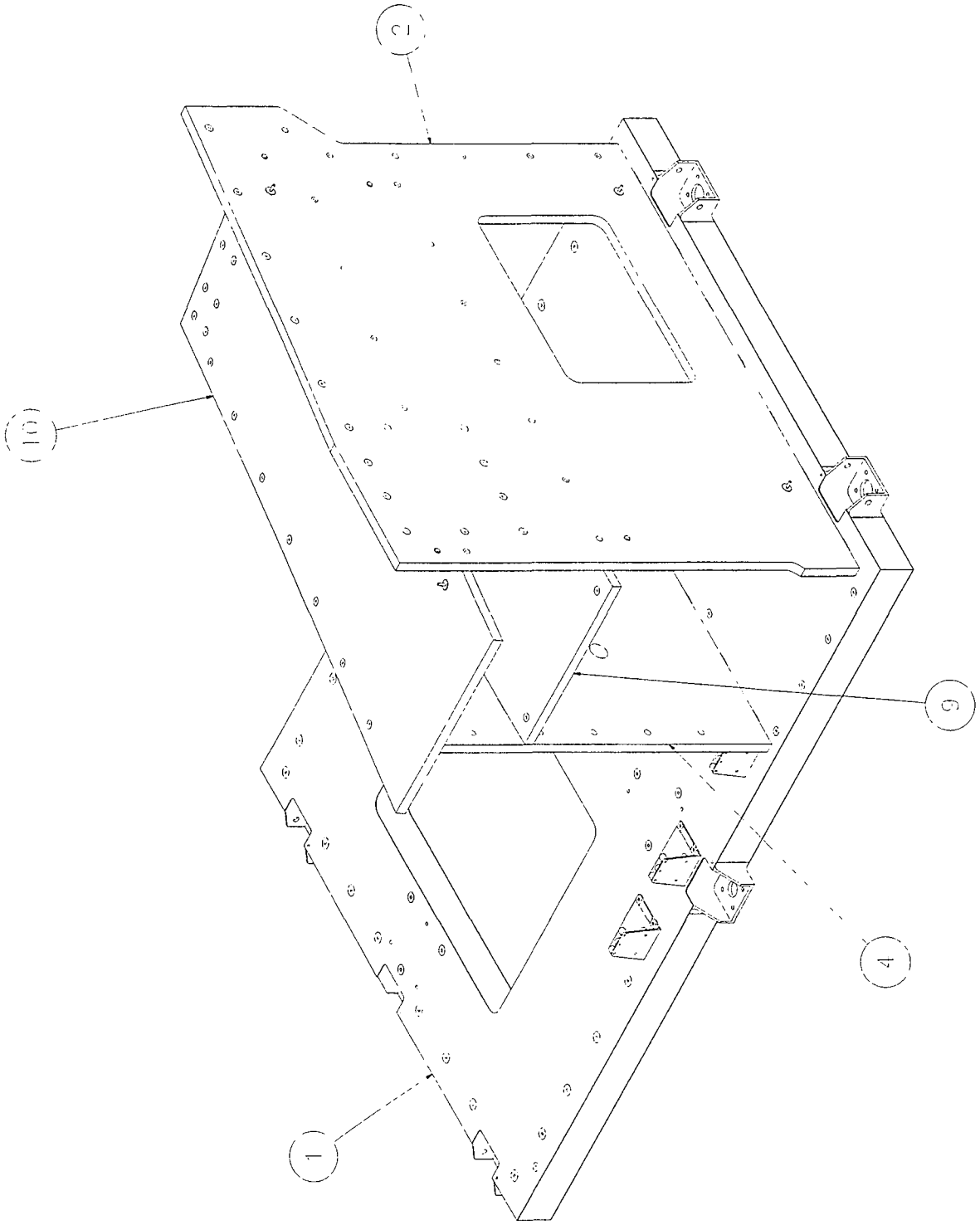

APPENDIX A1-1 EXPLODED VIEW OF STRUCTURE ASSEMBLY



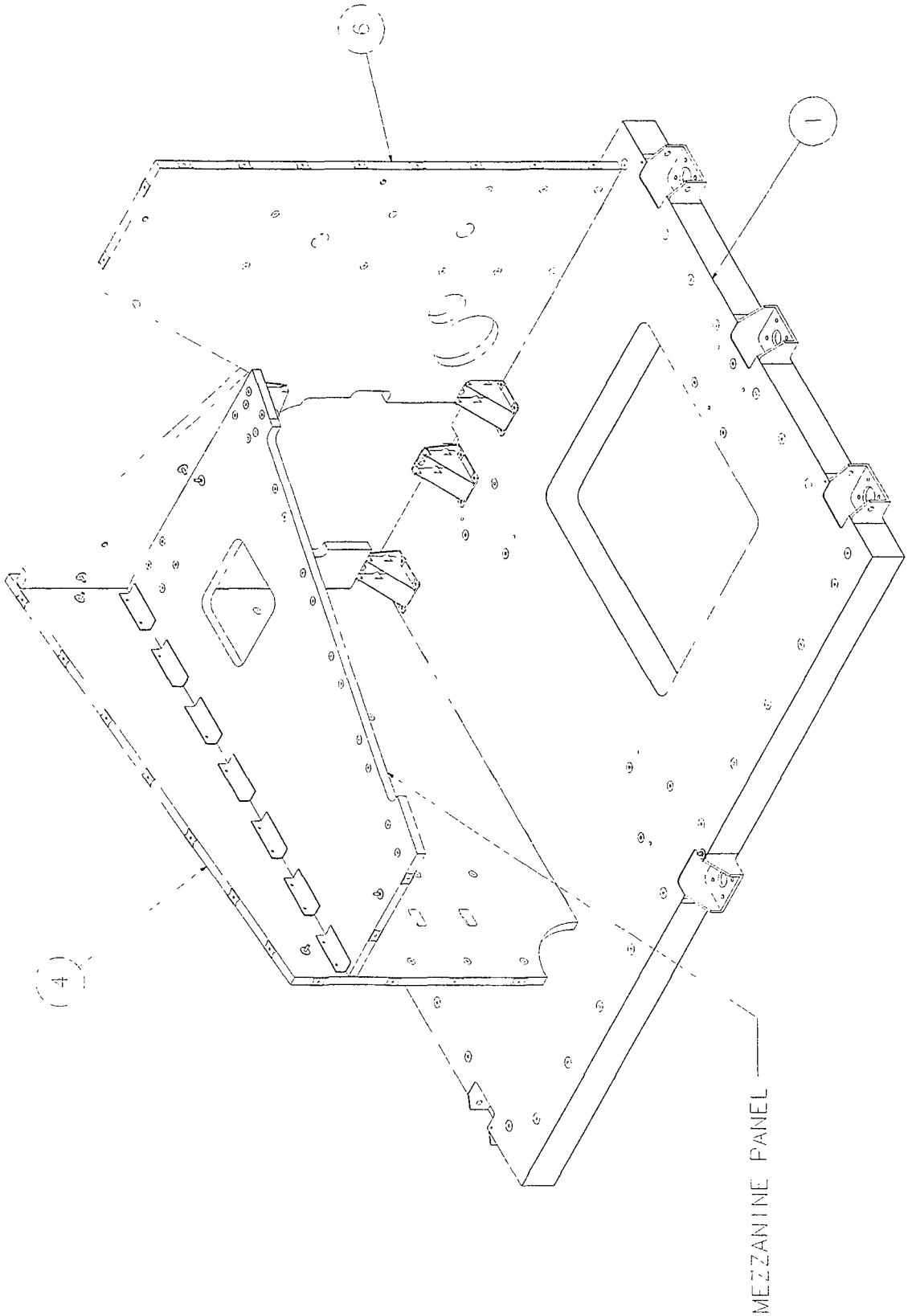

APPENDIX A1-2 ASSEMBLY OF +X OUTER PANEL TO BASEPLATE



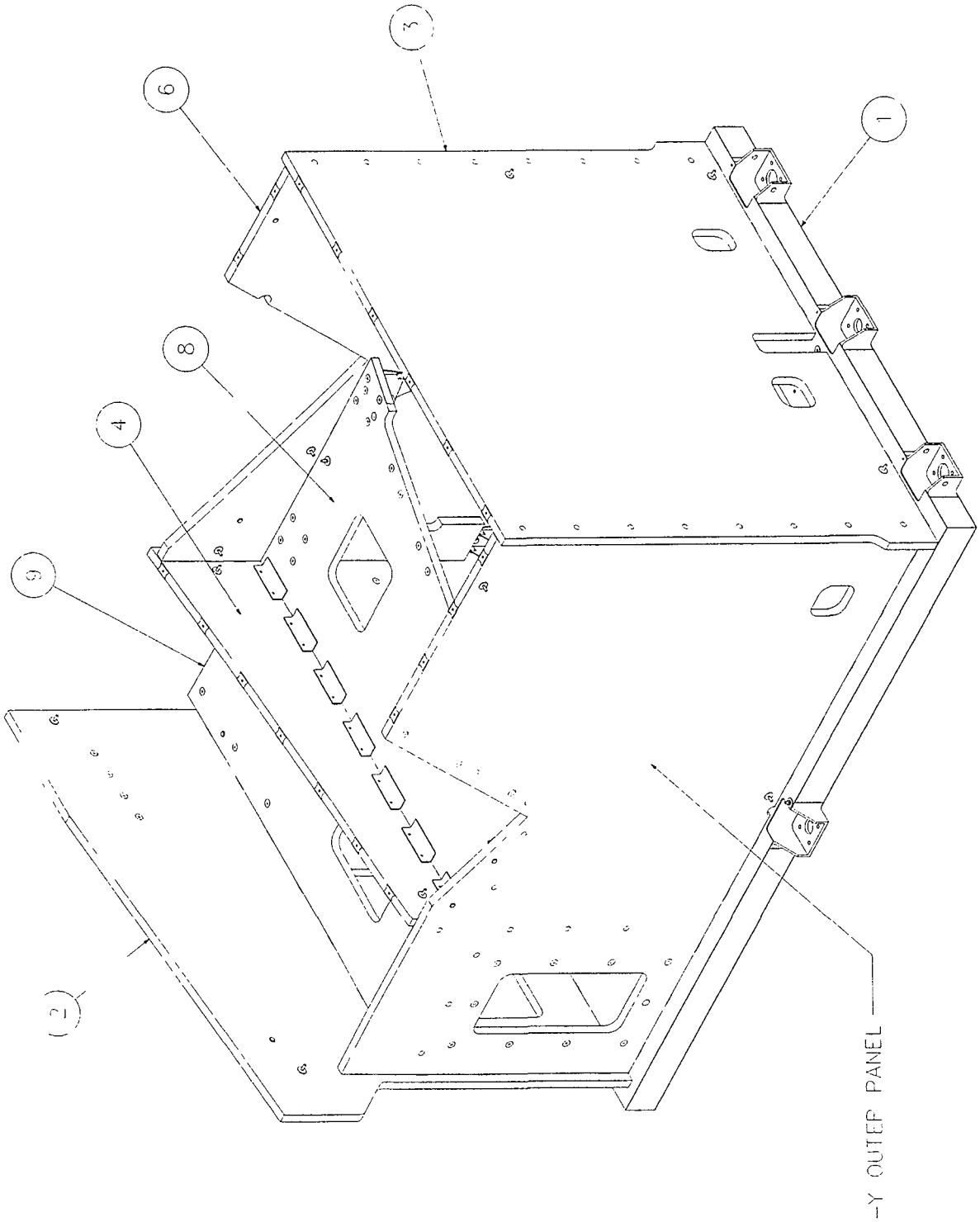

APPENDIX A1-3 ASSEMBLY OF THE +Y OUTER PANEL TO BASEPLATE



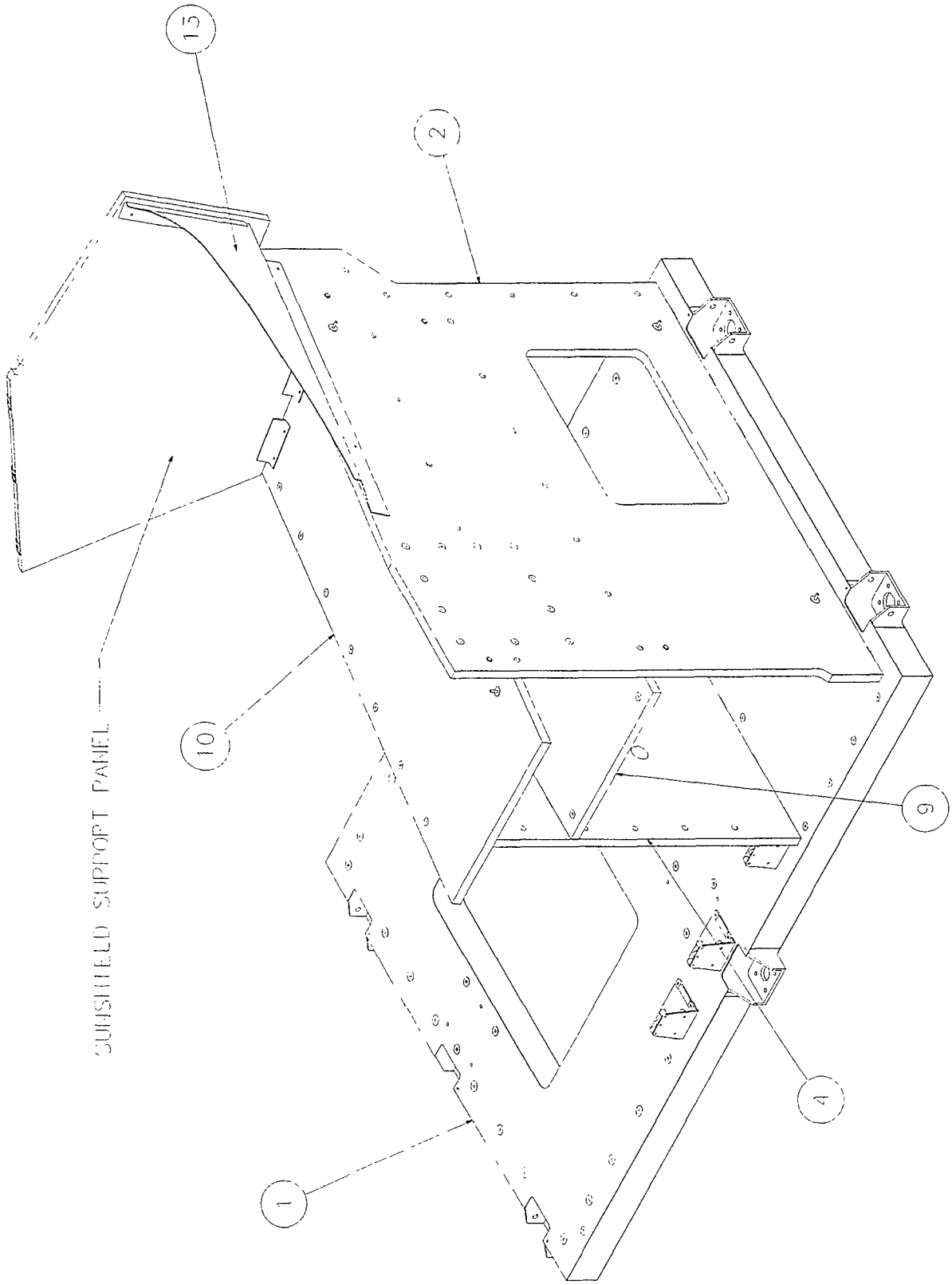

APPENDIX A1-4 ASSEMBLY OF ELECTRONICS COMPARTMENT SUBASSEMBLY



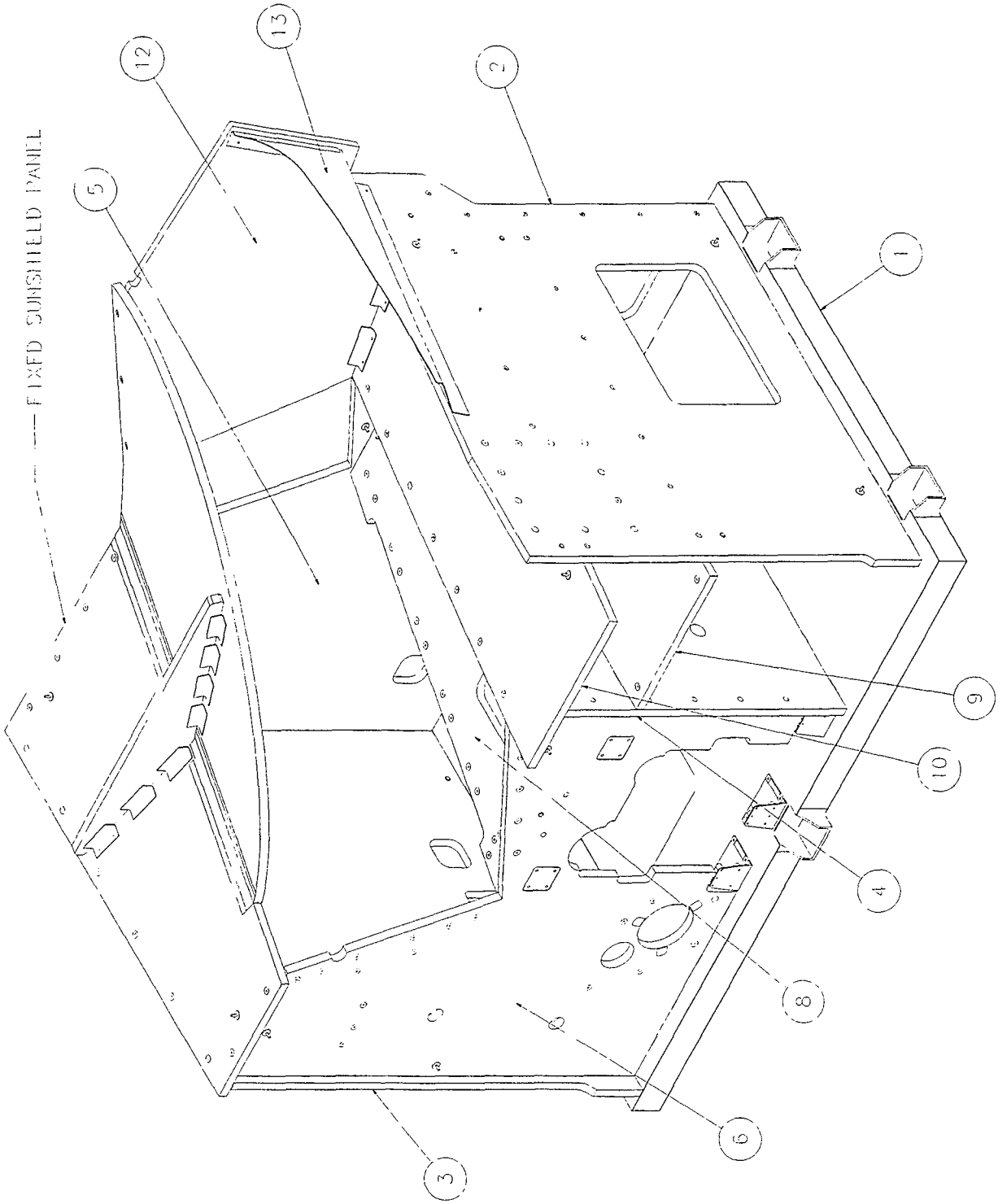

APPENDIX A1-5 ASSEMBLY OF THE MEZZANINE PANEL



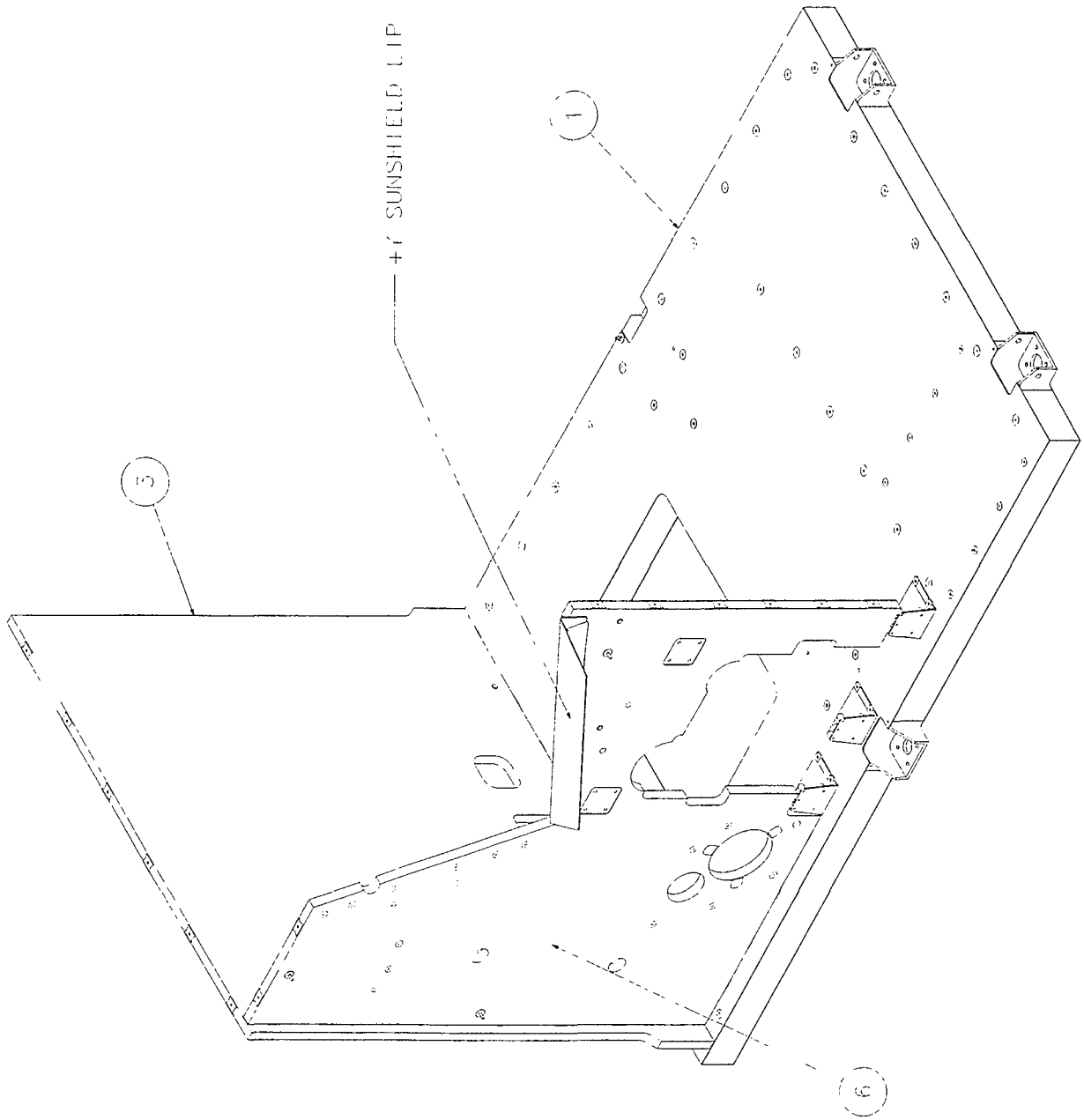

APPENDIX A1-6 ASSEMBLY OF THE -Y OUTER PANEL




APPENDIX A1-7 ASSEMBLY OF THE SUNSHIELD SUPPORT PANEL



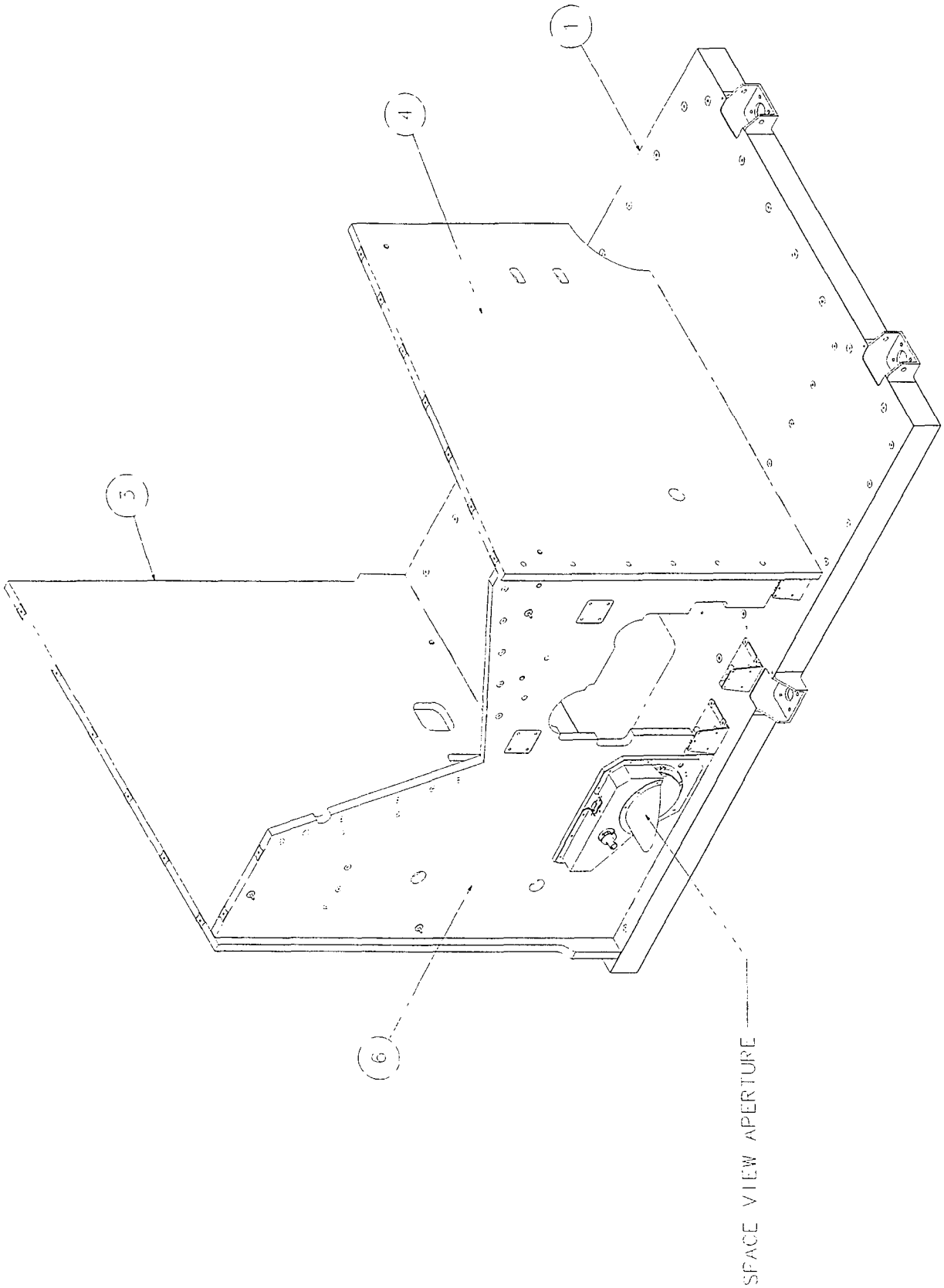

APPENDIX A1-8 ASSEMBLY OF FIXED SUNSHIELD PANEL



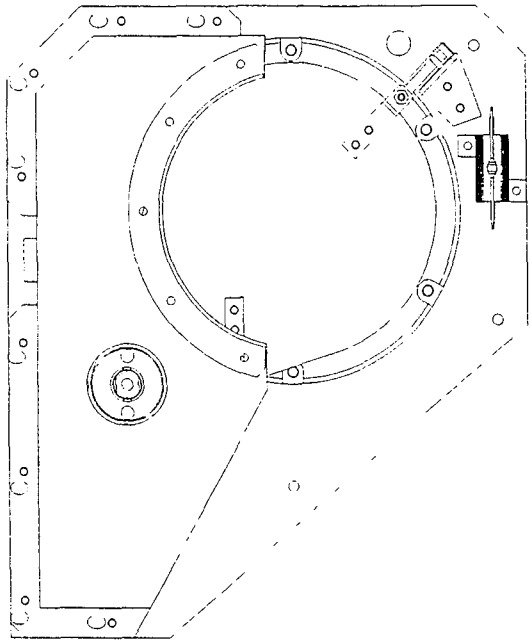

APPENDIX A1-9 ASSEMBLY OF THE +Y SUNSHIELD LIP

# APPENDIX B

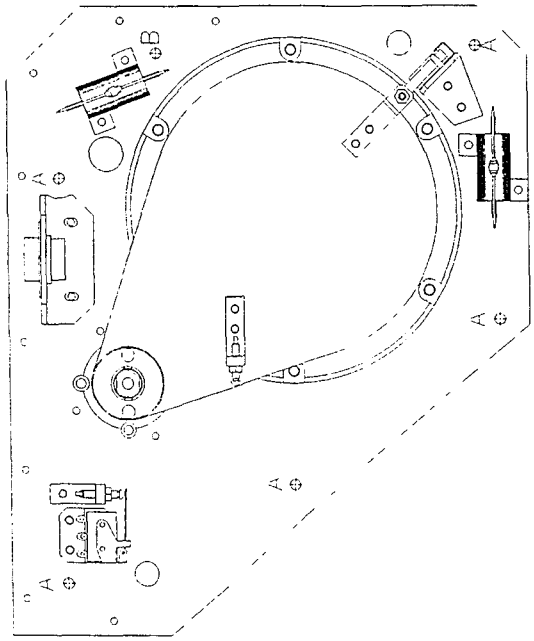
## INTEGRATION OF THE SPACE VIEW APERTURE ASSEMBLY




APPENDIX B1-1 ASSEMBLY OF THE SPACE VIEW APERTURE



ASSEMBLY OF ALBEDO SHIELD

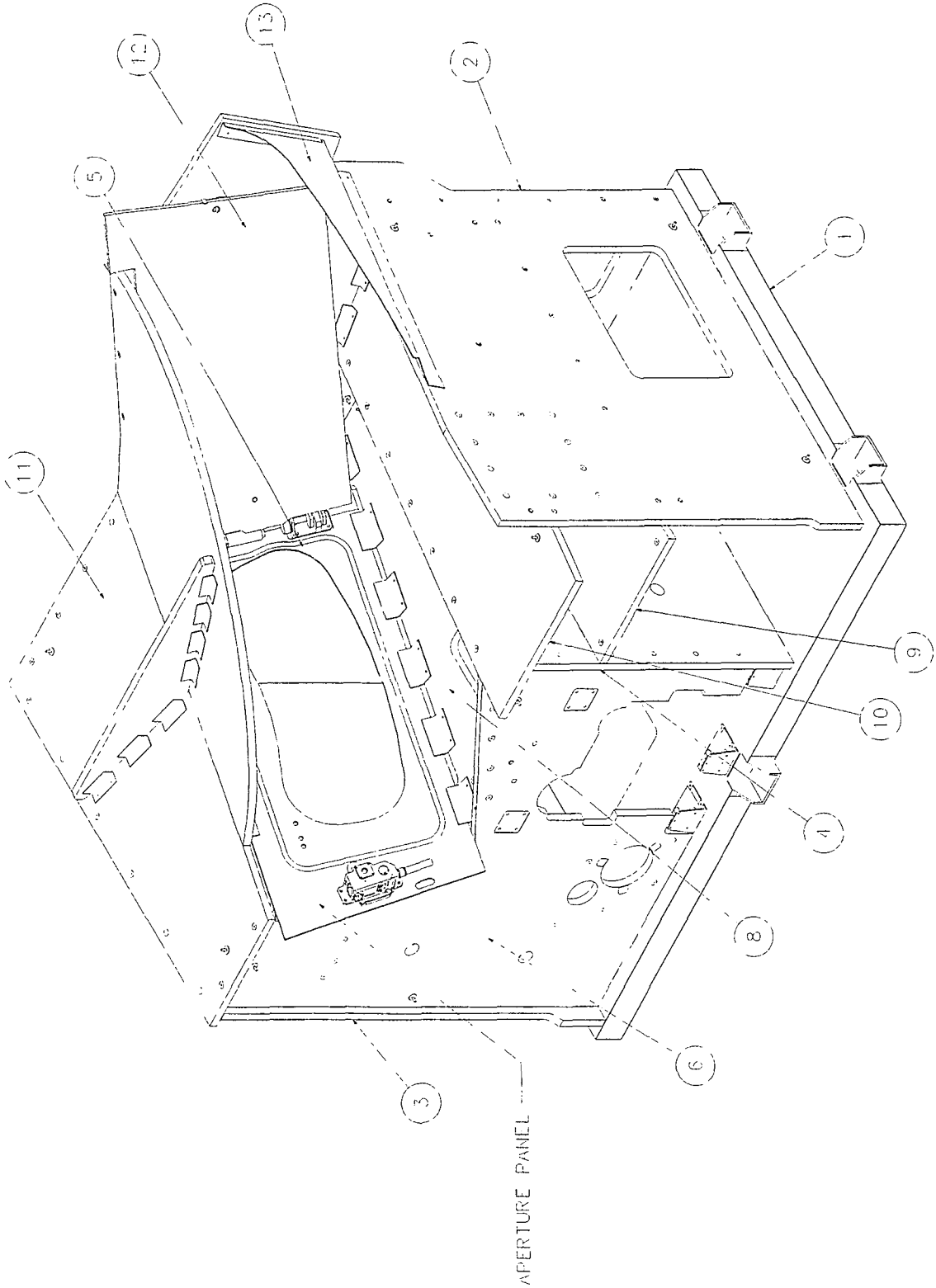



ASSEMBLY OF SVA

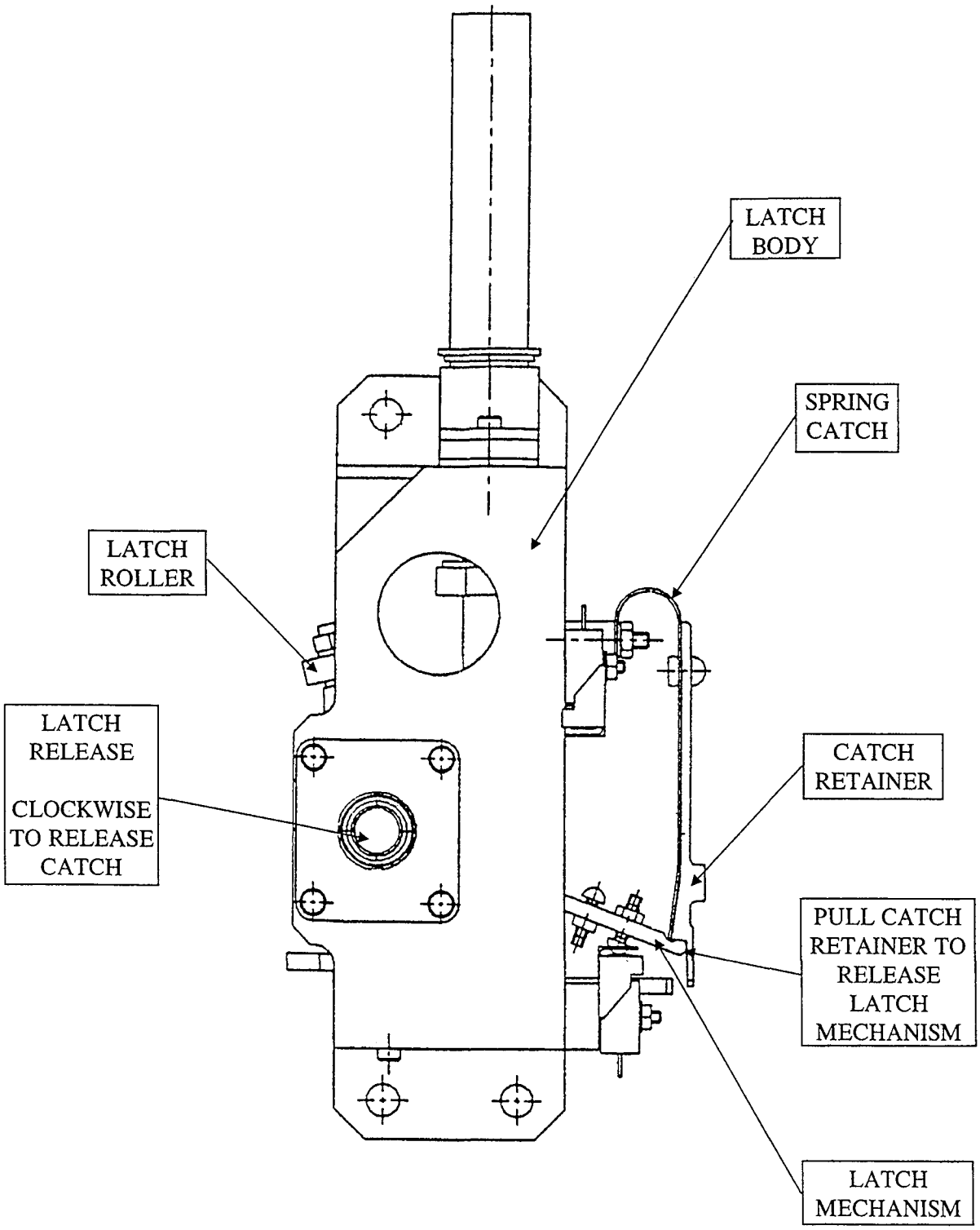
APPENDIX B1-2 ASSEMBLY OF SVA AND ALBEDO SHIELD

# APPENDIX C

## INTEGRATION OF THE SUNSHIELD DOOR AND APERTURE PLATE ASSEMBLY



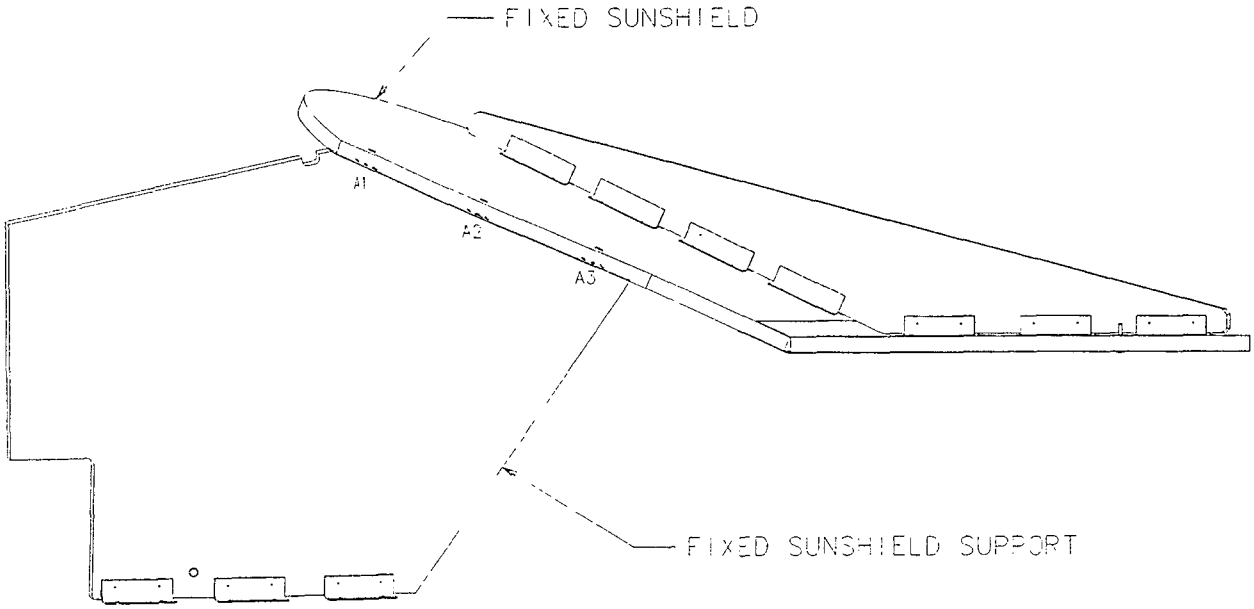

APPENDIX C1-1 ASSEMBLY OF THE APERTURE PLATE



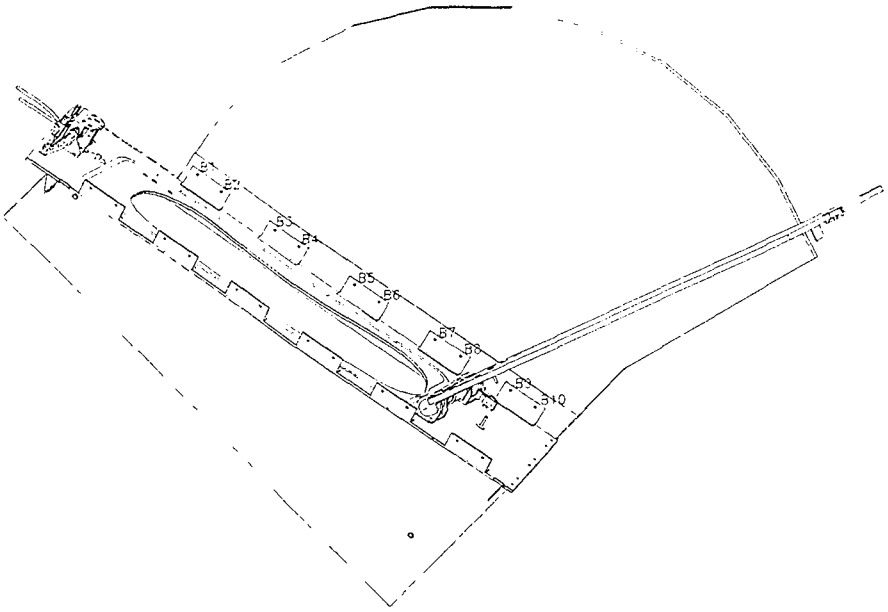

**APPENDIX C1-2 VIEW OF DOOR LATCHING MECHANISM (SHOWN IN UNLATCHED POSITION**

# APPENDIX D

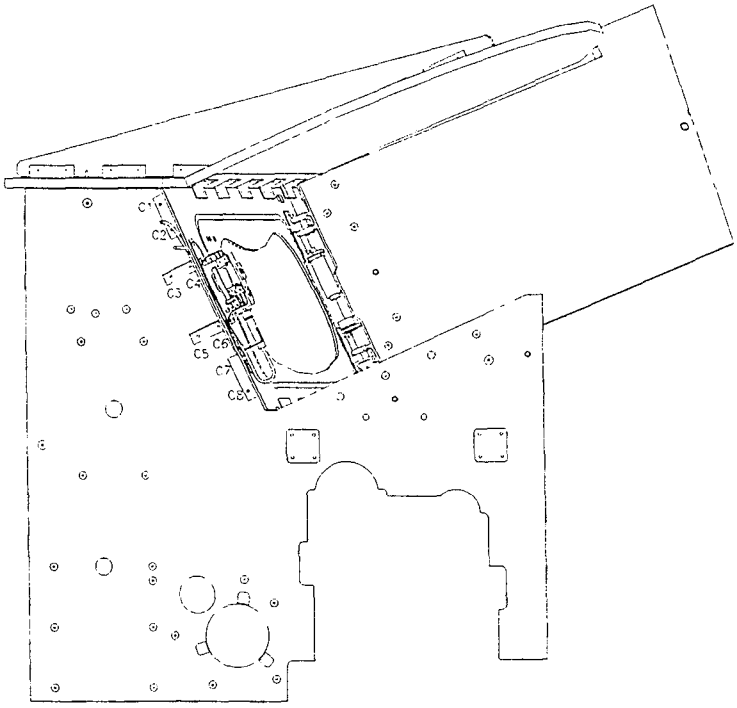
# SHIM DETAILS




**APPENDIX D1-1 SHIM DETAILS – FIXED SUNSHIELD SUPPORT**



**APPENDIX D1-2 SHIM DETAILS – SUNSHIELD APERTURE PLATE (VIEWED ON UNDERSIDE OF FIXED SUNSHIELD)**




**APPENDIX D1-3 SHIM DETAILS – SUNSHIELD APERTURE PLATE (VIEWED ON +Y PANEL SIDE)**

## DISTRIBUTION LIST

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| I K Stewart | N Morris (RAL) (2) |
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| A J Stewart | |
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## CHANGE RECORD

| CHANGE NUMBER | CLASS | CHANGE DETAILS | ISSUE |
|---|---|---|---|
| 3164-00315 | - | First Issue | 1 |
| 3164-00347 | II | Thermal hardware installation moved to a separate document and shim details added | 2 |