FOR ERRATA

AD 406916

THE FOLLOWING PAGES ARE CHANGES

TO BASIC DOCUMENT

# ACTIVE PAGE RECORD

| SECTION | ORIG REL PAGE NO. | REV SYM | ADDED PAGES PAGE NO. | REV SYM | PAGE NO. | REV SYM | PAGE NO. | REV SYM | SECTION | ORIG REL PAGE NO. | REV SYM | ADDED PAGES PAGE NO. | REV SYM | PAGE NO. | REV SYM | PAGE NO. | REV SYM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | | | 49 | A | | | | |
| | 2 | F | 2.1 | F | | | | | | | | 50 | A | | | | |
| | 3 | F | | | | | | | | | | 51 | A | | | | |
| | 4 | D | 4.1 | D | 4.2 | F | 4.3 | F | | | | 52 | D | | | | |
| | 5 | | | | | | | | | | | 53 | D | | | | |
| | 6 | D | | | | | | | | | | 54 | D | | | | |
| | 7 | | | | | | | | | | | 55 | D | | | | |
| | 8 | | | | | | | | | | | 57 | D | | | | |
| | 9 | | | | | | | | | | | 58 | D | | | | |
| | 10 | | | | | | | | | | | 59 | D | | | | |
| | 11 | | | | | | | | | | | 60 | D | | | | |
| | 12 | | | | | | | | | | | 61 | D | | | | |
| | 13 | | | | | | | | | | | 62 | D | | | | |
| | 14 | | | | | | | | | | | 63 | D | | | | |
| | 15 | | | | | | | | | | | 64 | D | | | | |
| | 16 | | | | | | | | | | | 65 | D | | | | |
| | 17 | | | | | | | | | | | 66 | D | | | | |
| | 18 | | | | | | | | | | | 67 | D | | | | |
| | 19 | | | | | | | | | | | 68 | D | | | | |
| | 20 | | | | | | | | | | | 69 | D | | | | |
| | 21 | | | | | | | | | | | 70 | D | | | | |
| | 22 | | | | | | | | | | | 71 | D | | | | |
| | 23 | | | | | | | | | | | 72 | D | | | | |
| | 24 | | | | | | | | | | | 73 | D | | | | |
| | 25 | | | | | | | | | | | 74 | D | | | | |
| | 26 | | | | | | | | | | | 75 | D | | | | |
| | 27 | | | | | | | | | | | 76 | D | | | | |
| | 28 | | | | | | | | | | | 77 | D | | | | |
| | 29 | | | | | | | | | | | 78 | D | | | | |
| | 30 | | | | | | | | | | | 79 | D | | | | |
| | 31 | | | | | | | | | | | 80 | D | | | | |
| | 32 | | | | | | | | | | | 81 | D | | | | |
| | 33 | | 34 | B | | | | | | | | 82 | D | | | | |
| | | | 35 | B | | | | | | | | 83 | D | | | | |
| | | | 36 | B | | | | | | | | 84 | D | | | | |
| | | | 37 | B | | | | | | | | 85 | D | | | | |
| | | | 38 | B | | | | | | | | 86 | D | | | | |
| | | | 39 | B | | | | | | | | 87 | D | | | | |
| | | | 40 | B | | | | | | | | 88 | D | | | | |
| | | | 41 | B | | | | | | | | 89 | D | | | | |
| | | | 42 | B | | | | | | | | 90 | D | | | | |
| | | | 43 | A | | | | | | | | 91 | D | | | | |
| | | | 44 | A | | | | | | | | 92 | D | | | | |
| | | | 45 | A | | | | | | | | 93 | D | | | | |
| | | | 46 | A | | | | | | | | 94 | D | | | | |
| | | | 47 | A | | | | | | | | 95 | D | | | | |
| | | | 48 | A | | | | | | | | 96 | D | | | | |

406916

US 4801 0600 ORIG. 8/62

2-5142-2

REV SYM 2

BOEING NO. D2-13943-2

SECT. PAGE 2

# ACTIVE PAGE RECORD

| SECTION | ORIG REL PAGE NO. | REV SYM | ADDED PAGES | | | | | | SECTION | ORIG REL PAGE NO. | REV SYM | ADDED PAGES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAGE NO. | REV SYM | PAGE NO. | REV SYM | PAGE NO. | REV SYM | | | | PAGE NO. | REV SYM | PAGE NO. | REV SYM | PAGE NO. | REV SYM |
| | | | 97 | D | | | | | | | | 145 | E | | | | |
| | | | 98 | D | | | | | | | | 146 | E | | | | |
| | | | 99 | D | | | | | | | | 147 | E | | | | |
| | | | 100 | D | | | | | | | | 148 | E | | | | |
| | | | 101 | D | | | | | | | | 149 | E | | | | |
| | | | 102 | D | | | | | | | | 150 | E | | | | |
| | | | 103 | D | | | | | | | | 151 | E | | | | |
| | | | 104 | D | | | | | | | | 152 | E | | | | |
| | | | 105 | D | | | | | | | | 153 | E | | | | |
| | | | 106 | D | | | | | | | | 154 | E | | | | |
| | | | 107 | D | | | | | | | | 155 | E | | | | |
| | | | 108 | D | | | | | | | | 156 | F | | | | |
| | | | 109 | D | | | | | | | | 157 | F | | | | |
| | | | 110 | D | | | | | | | | 158 | F | | | | |
| | | | 111 | D | | | | | | | | 159 | F | | | | |
| | | | 112 | D | | | | | | | | 160 | F | | | | |
| | | | 113 | E | | | | | | | | 161 | F | | | | |
| | | | 114 | E | | | | | | | | 162 | F | | | | |
| | | | 115 | E | | | | | | | | 163 | F | | | | |
| | | | 116 | E | | | | | | | | 164 | F | | | | |
| | | | 117 | E | | | | | | | | 165 | F | | | | |
| | | | 118 | E | | | | | | | | 166 | F | | | | |
| | | | 119 | E | | | | | | | | 167 | F | | | | |
| | | | 120 | E | | | | | | | | 168 | F | | | | |
| | | | 121 | E | | | | | | | | 169 | F | | | | |
| | | | 122 | F | | | | | | | | 170 | F | | | | |
| | | | 123 | F | | | | | | | | 171 | F | | | | |
| | | | 124 | F | | | | | | | | 172 | F | | | | |
| | | | 125 | F | | | | | | | | 173 | F | | | | |
| | | | 126 | F | | | | | | | | 174 | F | | | | |
| | | | 127 | F | | | | | | | | 175 | F | | | | |
| | | | 128 | F | | | | | | | | 176 | F | | | | |
| | | | 129 | F | | | | | | | | 177 | F | | | | |
| | | | 130 | F | | | | | | | | 178 | F | | | | |
| | | | 131 | D | | | | | | | | 179 | F | | | | |
| | | | 132 | D | | | | | | | | 180 | F | | | | |
| | | | 133 | D | | | | | | | | 181 | F | | | | |
| | | | 134 | D | | | | | | | | 182 | F | | | | |
| | | | 135 | D | | | | | | | | 183 | F | | | | |
| | | | 136 | D | | | | | | | | 184 | F | | | | |
| | | | 137 | D | | | | | | | | 185 | F | | | | |
| | | | 138 | D | | | | | | | | 186 | F | | | | |
| | | | 139 | D | | | | | | | | 187 | F | | | | |
| | | | 140 | E | | | | | | | | 188 | F | | | | |
| | | | 141 | E | | | | | | | | 189 | F | | | | |
| | | | 142 | E | | | | | | | | 190 | F | | | | |
| | | | 143 | E | | | | | | | | 191 | F | | | | |
| | | | 144 | E | | | | | | | | | | | | | |

| REVISIONS | | | |
|---|---|---|---|
| SYM | DESCRIPTION | DATE | APPROVED |
| A | **Revised Page 4**<br>**Added Pages** 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51<br>**Added Sections** 4.0 and 5.0 to the document. , | 6-17-63 | D. Brenden<br>D. Brenden |
| B | **Revised Pages** 34, 35, 36, 37, 38, 39, 40, 41, 42 | 7-17-63 | D. Brenden<br>D. Brenden |
| C | Revised Pages 2, 3, 4<br>Added Pages 4.1, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, | 8-16-63 | D. Brenden<br>D. Brenden |
| D | Revised Pages 2, 3, 4, 4.1, 6, 52, 53, 54, 55, 61, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76.<br>Added Pages 2.1, 4.2, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139. | 10-16-63 | D. Brenden<br>D. Brenden |
| E | Revised Pages 2, 2.1, 3, 4.2, 114, 115, 116, 117, 118, 119, 120, 121, 113<br>Added Pages 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155. | 11-18-63 | D. Brenden<br>D. Brenden |
| F | Revised Pages 2, 2.1, 3, 4.2, 122, 123, 124, 125, 126, 127, 128, 129, 130<br>Added Pages 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 4.3, 183, 184, 185, 186, 187, 188, 189, 190, 191. | 12-18-63 | D. Brenden<br>D. Brenden |
| | | | |

US 4007 5025 ORIG. 8/62 2-5142-2

TABLE OF CONTENTS (Cont.)


| | | PAGE |
|---|---|---|
| 13.0 | CTLI SECTION, S/N 0000045 | |
| 13.1 | DISCUSSION | 122 |
| 13.2 | WEIGHT AND BALANCE SUMMARY | 123 |
| 13.3 | MISSILE SECTION SUMMARY CHECK LISTS | 126 |
| 13.4 | SECTION 39 DATA | 127 |
| 13.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 130 |
| 14.0 | CTLI SECTION, S/N 0000046 | |
| 14.1 | DISCUSSION | 131 |
| 14.2 | WEIGHT AND BALANCE SUMMARY | 132 |
| 14.3 | MISSILE SECTION SUMMARY CHECK LISTS | 135 |
| 14.4 | SECTION 39 DATA | 136 |
| 14.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 139 |
| 15.0 | CTLI SECTION, S/N 0000047 | |
| 15.1 | DISCUSSION | 140 |
| 15.2 | WEIGHT AND BALANCE SUMMARY | 141 |
| 15.3 | MISSILE SECTION SUMMARY CHECK LISTS | 144 |
| 15.4 | SECTION 39 DATA | 152 |
| 15.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 155 |
| 16.0 | CTLI SECTION, S/N 0000048 | |
| 16.1 | DISCUSSION | 156 |
| 16.2 | WEIGHT AND BALANCE SUMMARY | 157 |
| 16.3 | MISSILE SECTION SUMMARY CHECK LISTS | 160 |
| 16.4 | SECTION 39 DATA | 161 |
| 16.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 164 |
| 17.0 | CTLI SECTION, S/N 0000049 | |
| 17.1 | DISCUSSION | 165 |
| 17.2 | WEIGHT AND BALANCE SUMMARY | 166 |
| 17.3 | MISSILE SECTION SUMMARY CHECK LISTS | 169 |
| 17.4 | SECTION 39 DATA | 170 |
| 17.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 173 |
| 18.0 | CTLI SECTION, S/N 0000050 | |
| 18.1 | DISCUSSION | 174 |
| 18.2 | WEIGHT AND BALANCE SUMMARY | 175 |
| 18.3 | MISSILE SECTION SUMMARY CHECK LISTS | 178 |
| 18.4 | SECTION 39 DATA | 179 |
| 18.5 | ENGINEERING CHANGE PROPOSAL SUMMARY | 182 |

TABLE OF CONTENTS (Cont.)


| | | PAGE |
|---|---|---|
| 19.0 | CTLI SECTION, S/N 0000051 | |
| 19.1 | DISCUSSION | 183 |
| 19.2 | WEIGHT AND BALANCE SUMMARY | 184 |
| 19.3 | MISSILE SECTION SUMMARY CHECK LISTS | 187 |
| 19.4 | SECTION 39 DATA | 188 |
| 19.5 | ENGINEERING CHANGE PROPOSAL | 191 |

## CTLI SECTION, S/N 0000045

13.1 This section of the document describes the data changes created by converting a production line Minuteman missile into a CTL missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consist of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 123 summarizes the complete installation mass properties and consists of data from page 124 (average mass properties of downstage components), page 125 (predicted sealant changes), and page 129 (actual weight of CTLI section S/N 0000045). In addition, page 126 presents summary check lists by production section as backup data for page 124. Page 130 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DR-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/ACDS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, BMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

13.2 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAFER S/N 0000045

REPORT NO. _____
DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG.* | LAT. | VERT. | INERTIA SLUG FT²x10-3 ROLL | PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 147.81 | 54.8 | 99.7 | 100.1 | .004 | .002 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | O&C Section | | | 5.56 | 67.9 | 111.7 | 114.7 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.65 | 85.9 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.32 | 56.3 | 109.8 | 117.7 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.32 | | 56.3 | 109.8 | 117.7 | | |
| 22 | 45 | Interstage 2-3 | | | 18.64 | 64.7 | 111.8 | 120.2 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 25.26 | 74.0 | 114.8 | 125.2 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 26.70 | 117.2 | 117.7 | 130.1 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.78 | 74.5 | 118.1 | 129.6 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 272.10 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Boeing Section Stations (See Missile Station Diagram)

| 13.2 WEIGHT & BALANCE SUMMARY CTLI (AVERAGE WEIGHT COMPONENTS) | | | | | | REPORT NO. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DATE | | | | |
| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY | | | INERTIA SLUG FT2x10-3 | |
| | | | | | | LONG. | LAT. | VERT. | ROLL | PITCH |
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 3.42 | 56.9 | 108.4 | 112.4 | 0 | 0 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.16 | 68.1 | 111.8 | 114.8 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.45 | 86.0 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.52 | 55.9 | 109.9 | 117.6 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.52 | | 55.9 | 109.9 | 117.6 | | |
| 22 | 45 | Interstage 2-3 | | | 18.44 | 64.8 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 24.76 | 73.6 | 115.1 | 125.6 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 25.90 | 115.8 | 117.7 | 130.2 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.58 | 73.8 | 118.1 | 129.5 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 125.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

13.2 BMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

| LINE | SIZE | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT²x10-3 ROLL | INERTIA SLUG FT²x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | .2 | 54.5 | 111.5 | 111.5 | | |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | .4 | 65.4 | 110.5 | 113.5 | | |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | .2 | 80.9 | 109.3 | 116.2 | | |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | .2 | | 53.6 | 110.8 | 116.7 | | |
| 22 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 0 | - | - | - | | |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | 0 | - | - | - | | |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | | | | | | | |
| 37 | 42 | Interstage 1-2 | | | .5 | 94.7 | 102.0 | 103.4 | | |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | .8 | 161.3 | 116.2 | 128.0 | | |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | .2 | 101.3 | 119.2 | 133.9 | | |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 2.7 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Reference D2-13954-534

| CHECK LIST NO. | 13.3 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) |
|---|---|---|
| DATE | MODEL _____ FINAL ASSEMBLY DRAWING NO. _____ | Mo / Day / Yr |

SECTION 39 THRU 49 MISSILE NO. _____

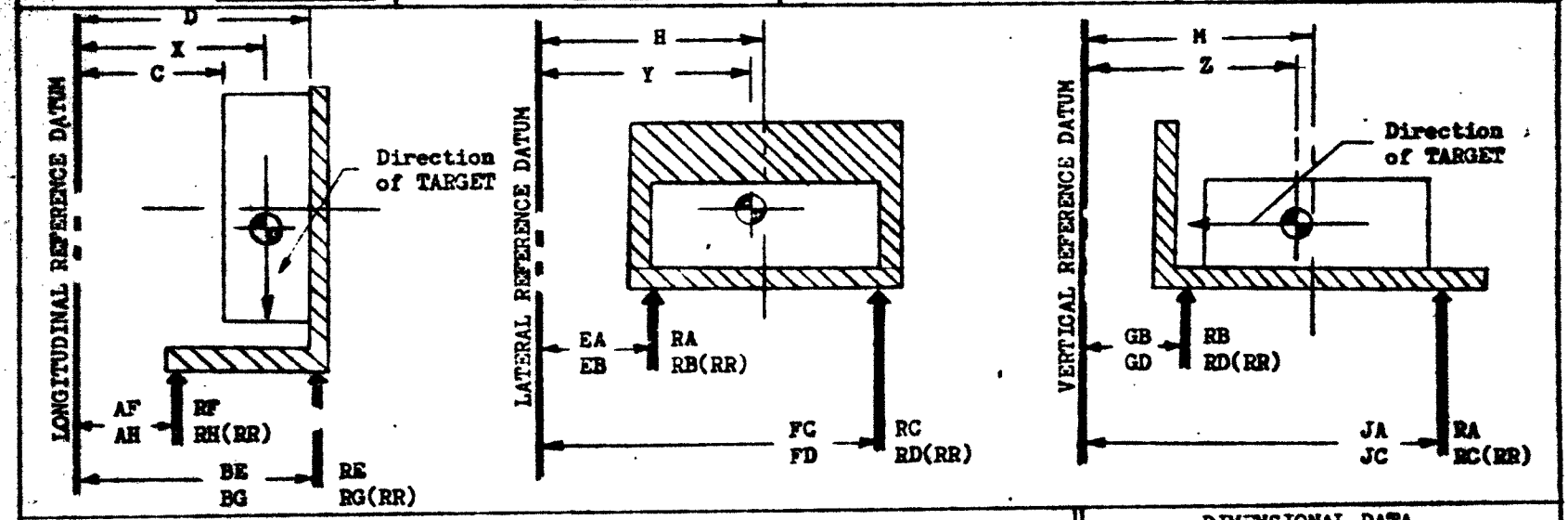
MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUMMARY CHECK LISTS FOR SECTIONS 39 THROUGH 49 ARE IDENTICAL TO THOSE FOUND ON PAGES 144 THROUGH 151. | | | | | | | | | | | | |

13.4.1

## ACTUAL WEIGHT RECORD - CTLI SECTION

| | | | |
|---|---|---|---|
| U/O MISSILE 0000045 | DRAWING NO. 25-37501-9 | CHECK LIST NO. 39 | REPORT NO. WTS-1128-045 |
| MISSILE MODEL WS-133A | DCN B | REPORTED BY CB-RH | PAGE NO. |
| CONFIGURATION | ADCN | CHECKED BY BW | DATE 11-18-63 |




### WEIGHING DATA

| REACTION | GR. WT. | TARE | CORR. | NET WT. | REACTION | GR. WT. | TARE | CORR. | NET WT. |
|---|---|---|---|---|---|---|---|---|---|
| RF | 56.30 | 22.60 | | 33.70 | RC | 64.30 | 26.65 | | 37.65 |
| RH | 53.90 | 29.80 | | 24.10 | RD | 90.00 | 62.20 | | 27.80 |
| RE | 104.80 | 64.80 | | 40.00 | RA | 85.80 | 42.00 | | 43.80 |
| RG | 101.20 | 59.35 | | 41.85 | RB | 76.20 | 45.80 | | 30.40 |
| TOTAL | 316.20 | 176.55 | | 139.65 | TOTAL | 316.30 | 176.65 | | 139.65 |

### DIMENSIONAL DATA

| DIM. | INCHES | DIM. | INCHES | DIM. | INCHES |
|---|---|---|---|---|---|
| AF | 42.007 | EA | 84.510 | GB | 77.478 |
| AH | 42.023 | EB | 84.505 | GD | 77.481 |
| BE | 62.996 | FC | 115.490 | JA | 115.500 |
| BG | 62.999 | FD | 115.495 | JC | 115.500 |
| C | 50.000 | H | 100.000 | M | 100.000 |
| D | 60.000 | | | | |

### LONGITUDINAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RF | 33.70 | 42.007 | |
| RH | 24.10 | 42.023 | |
| RE | 40.00 | 62.996 | |
| RG | 41.85 | 62.999 | |
| AS WGD | 139.65 | 54.31 | 7,584.8 |

### LATERAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RA | 43.80 | 84.510 | |
| RB | 30.40 | 84.505 | |
| RC | 37.65 | 115.490 | |
| RD | 27.80 | 115.495 | |
| AS WGD | 139.65 | 99.03 | 13,829.4 |

### VERTICAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RB | 30.40 | 77.478 | |
| RD | 27.80 | 77.481 | |
| RA | 43.80 | 115.500 | |
| RC | 37.65 | 115.500 | |
| AS WGD | 139.65 | 99.65 | 13,916.8 |

(RR) = Rear Reaction

SERIAL NUMBER: 0000045

CHECK LIST NO. 39

DATE

13.4.2 MISSILE WEIGHING CHECK LIST

MODEL WS-133A FINAL ASSEMBLY DRAWING NO. 25-35701-9

| RECORD OF CHECKING (DATE) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mo | | 11 | | | | | |
| Day | | 18 | | | | | |
| Yr | | 63 | | | | | |

SECTION 39 MISSILE NO. _____

MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Instrumentation Group, Trainer-Test | 25-37501-9 | | | | | - | - | | | | | |
| 39a | CTLI Structure Assembly | 25-25403-11 | | | | | - | - | | | | | |
| | Support Structure | 25-29094-45 | | | | | x | x | | | | | |
| | Primary Structure | 25-29093-15 | | | | | x | x | | | | | |
| | Insulation & External Markings | 25-29095-3 | | | | | x | x | | | | | |
| | Antenna & Spacer | 25-29096-3 | | | | | x | x | | | | | |
| | Plate - Identification | 21-51600-329 | | | | | x | x | | | | | |
| 39b | Cable & Equipment Installation | 25-25404-15 | | | | | - | - | | | | | |
| | Battery, Squib | 10-20942-4 | | | | | x | x | | | | | |
| | Battery, Squib | 10-20942-2 | | | | | x | x | | | | | |
| | Cable Set SE-35B | 55018-106 | | | | | - | - | | | | | |
| | Cable | AN37192-315 | | | | | x | x | | | | | |
| | Cable | AN37194-315 | | | | | x | o | | | | | |
| | Cable | AN37196-315 | | | | | x | o | | | | | |

13.4.3

## WEIGHT AND BALANCE CHANGE RECORD

| | | | | | |
|---|---|---|---|---|---|
| ASSOCIATE CONTRACTOR | BOEING | CONTRACT NO. | | REPORT NO. | WTS-1128-045 |
| COMPONENT | SECTION 39 | LOT NO. | | DATE | 11-12-63 |
| MODEL NO. | WS-133A | DRAWING NO. | 25-37501-9 | PREPARED | CB/RH |
| SERIAL NO. | 0000045 | U.O. MISSILE | | APPROVED | GO |

| LINE | EQUIPMENT CHANGE RECORD | | WEIGHT AND BALANCE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | WEIGHT | X AXIS | | Y AXIS | | Z AXIS | |
| | PART NO. | DESCRIPTION OF EQUIPMENT | | ARM | MOMENT | ARM | MOMENT | ARM | MOMENT |
| 1 | | | | | | | | | |
| 2 | 25-37501-9 | Instr. Group Trainer (As Weighed) | 139.65 | 54.31 | 7,584.8 | 99.03 | 13,829.4 | 99.65 | 13,916.8 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | ADD: | | | | | | | |
| 6 | AN37194-315 | Cable-Autonetics | 3.20 | 74.2 | | 115.5 | | 102.8 | |
| 7 | AN37196-315 | Cable-Autonetics | 1.34 | 50.4 | | 106.9 | | 111.4 | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | 25-37501-9 | Instr. Group Trainer (Complete) | 144.19 | 54.72 | 7,889.8 | 99.47 | 14,342.2 | 99.83 | 14,395.0 |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |

## 13.5 ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION APPLICABLE TO CTLI SECTION S/N 0000045 AND INSTALLATION KIT

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

| ECP NO. (WS-133A-BO-) | ECP TITLE | STAGE | WEIGHT CHANGE | WEIGHT CHANGE INCORPORATED IN THIS REPORT |
|---|---|---|---|---|
| 540 | Potting & Bonding Deletions for Vandenberg Air Force Base Missiles | All | - | No* |
| 606 | Revision to CTLI Umbilical Bracket-Section 49 | 1 | Negl. | Yes |
| 620 | Addition of Static Dissipators on 47 Section & Section 49 | 1 | Negl. | Yes |
| 635 | PCM R/F Section Digital Data Programmer | 3 | Negl. | Yes |
| 639 | Prevent Interference of Linear Shape Charge with Cable Strap | 3 | Negl. | Yes |
| 657 | Revision of Ordnance Supports in Interstage 2-3 | 2 | Negl. | Yes |
| 660 | Wing III G&C Section & Raceway Revisions | 3 | Negl. | Yes |

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

## CTLI SECTION, S/N 0000048

16.1 This section of the document describes the data changes created by converting a production line Minuteman missile into a CTL missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consists of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 157 summarizes the complete installation mass properties and consists of data from page 158 (average mass properties of downstage components), page 159 (predicted sealant changes), and page 163 (actual weight of CTLI section S/N 0000048). In addition, page 160 presents summary check lists by production section as backup data for page 158. Page 164 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DR-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, BMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

16.2 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAFER S/N 0000048

REPORT NO. _____
DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG.* | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT2x10-3 ROLL | INERTIA SLUG FT2x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 147.24 | 54.7 | 99.7 | 100.1 | .004 | .002 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.56 | 67.9 | 111.7 | 114.7 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.65 | 85.9 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.32 | 56.3 | 109.8 | 117.7 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.32 | | 56.3 | 109.8 | 117.7 | | |
| 22 | 45 | Interstage 2-3 | | | 18.64 | 64.7 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 25.26 | 74.0 | 114.8 | 125.2 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 26.70 | 117.2 | 117.7 | 130.1 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.78 | 74.5 | 118.1 | 129.6 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 271.53 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Boeing Section Stations (See Missile Station Diagram)

16.2 WEIGHT & BALANCE SUMMARY CTLI
(AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT$^2$x10-3 ROLL | INERTIA SLUG FT$^2$x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 3.42 | 56.9 | 108.4 | 112.4 | 0 | 0 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.16 | 68.1 | 111.8 | 114.8 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.45 | 86.0 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.52 | 55.9 | 109.9 | 117.6 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.52 | | 55.9 | 109.9 | 117.6 | | |
| 22 | 45 | Interstage 2-3 | | | 18.44 | 64.8 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 24.76 | 73.6 | 115.1 | 125.6 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 25.90 | 115.8 | 117.7 | 130.2 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.58 | 73.8 | 118.1 | 129.5 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 125.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

16.2 BMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT$^2$x10-3 ROLL | INERTIA SLUG FT$^2$x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | .2 | 54.5 | 111.5 | 111.5 | | |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | .4 | 65.4 | 110.5 | 113.5 | | |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | .2 | 80.9 | 109.3 | 116.2 | | |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | .2 | | 53.6 | 110.8 | 116.7 | | |
| 22 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 0 | - | - | - | | |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | 0 | - | - | - | | |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | | | | | | | |
| 37 | 47 | Interstage 1-2 | | | .5 | 94.7 | 102.0 | 103.4 | | |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | .8 | 161.3 | 116.2 | 128.0 | | |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | .2 | 101.3 | 119.2 | 133.9 | | |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 2.7 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Reference D2-13954-534

| CHECK LIST NO. | 16.3 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Mo | | | | | | |
| DATE | MODEL _____ FINAL ASSEMBLY DRAWING NO. _____ | Day | | | | | | |
| | | Yr | | | | | | |

SECTION 39 THRU 49 MISSILE NO. _____

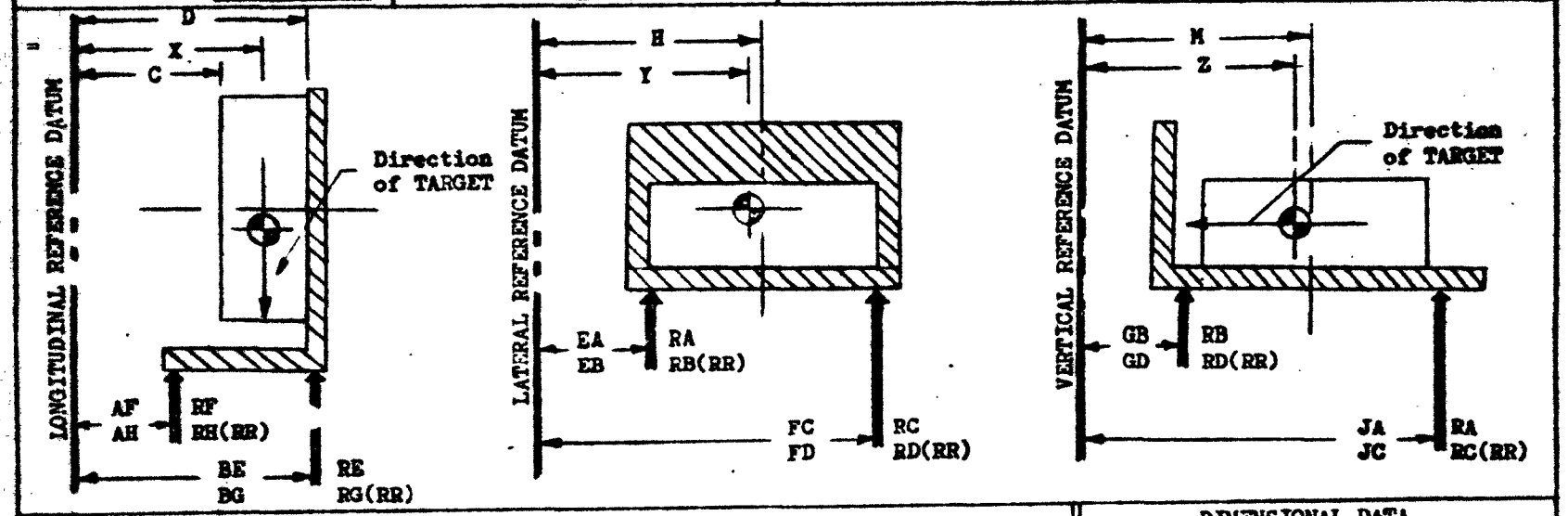
MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUMMARY CHECK LISTS FOR SECTIONS 39 THROUGH 49 ARE IDENTICAL TO THOSE FOUND ON PAGES 144 THROUGH 151. | | | | | | | | | | | | |

16.4.1

## ACTUAL WEIGHT RECORD - CTLI SECTION

| | | | |
|---|---|---|---|
| U/O MISSILE 0000048 | DRAWING NO. 25-37501-9 | CHECK LIST NO. 39 | REPORT NO. WTS-1129-048 |
| MISSILE MODEL WS-133A | DCN B | REPORTED BY GB/RH | PAGE NO. |
| CONFIGURATION | ADCN | CHECKED BY BW | DATE 11-18-63 |




### WEIGHING DATA

| REACTION | GR. WT. | TARE | CORR. | NET WT. | REACTION | GR. WT. | TARE | CORR. | NET WT. |
|---|---|---|---|---|---|---|---|---|---|
| RF | 59.55 | 30.70 | | 28.85 | RC | 58.05 | 26.80 | | 31.25 |
| RH | 50.35 | 21.90 | | 28.45 | RD | 95.75 | 61.90 | | 33.85 |
| RE | 101.35 | 56.80 | | 44.55 | RA | 91.55 | 41.75 | | 49.80 |
| RG | 104.40 | 67.20 | | 37.20 | RB | 70.30 | 46.15 | | 24.15 |
| TOTAL | 315.65 | 176.60 | | 139.05 | TOTAL | 315.65 | 176.60 | | 139.05 |

### DIMENSIONAL DATA

| DIM. | INCHES | DIM. | INCHES | DIM. | INCHES |
|---|---|---|---|---|---|
| AF | 42.007 | EA | 84.510 | GB | 77.478 |
| AH | 42.023 | EB | 84.505 | GD | 77.481 |
| BE | 62.996 | FC | 115.490 | JA | 115.500 |
| BG | 62.999 | FD | 115.495 | JC | 115.500 |
| C | 50.000 | H | 100.000 | M | 100.000 |
| D | 60.000 | | | | |

### LONGITUDINAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RF | 28.85 | 42.007 | |
| RH | 28.45 | 42.023 | |
| RE | 44.55 | 62.996 | |
| RG | 37.20 | 62.999 | |
| AS WGD | 139.05 | 54.35 | 7,557.5 |

### LATERAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RA | 49.80 | 84.510 | |
| RB | 24.15 | 84.505 | |
| RC | 31.25 | 115.490 | |
| RD | 33.85 | 115.495 | |
| AS WGD | 139.05 | 99.01 | 13,768.0 |

### VERTICAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RB | 24.15 | 77.478 | |
| RD | 33.85 | 77.481 | |
| RA | 49.80 | 115.500 | |
| RC | 31.25 | 115.500 | |
| AS WGD | 139.05 | 99.64 | 13,855.1 |

(RR) = Rear Reaction

SERIAL NUMBER: 0000048

| CHECK LIST NO. 39 | 16.4.2 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) |
|---|---|---|
| DATE | MODEL WS-133A FINAL ASSEMBLY DRAWING NO. 25-35701-9 | Mo 11 / Day 18 / Yr 63 |

SECTION 39 MISSILE NO. _____

MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Instrumentation Group, Trainer-Test | 25-37501-9 | | | | | - | - | | | | | |
| 39a | OTLI Structure Assembly | 25-25403-11 | | | | | - | - | | | | | |
| | Support Structure | 25-29094-45 | | | | | x | x | | | | | |
| | Primary Structure | 25-29093-15 | | | | | x | x | | | | | |
| | Insulation & External Markings | 25-29095-3 | | | | | x | x | | | | | |
| | Antenna & Spacer | 25-2909693 | | | | | x | x | | | | | |
| | Plate - Identification | 21-51600-329 | | | | | x | x | | | | | |
| 39b | Cable & Equipment Installation | 25-25404-15 | | | | | - | - | | | | | |
| | Battery, Squib | 10-20942-4 | | | | | x | x | | | | | |
| | Battery, Squib | 10-20942-2 | | | | | x | x | | | | | |
| | Cable Set SE-35B | 55018-106 | | | | | x | - | | | | | |
| | Cable | AN37192-315 | | | | | x | x | | | | | |
| | Cable | AN37194-315 | | | | | x | o | | | | | |
| | Cable | AN37196-315 | | | | | x | o | | | | | |

16.4.3

# WEIGHT AND BALANCE CHANGE RECORD

| | | | | | |
|---|---|---|---|---|---|
| ASSOCIATE CONTRACTOR | BOEING | CONTRACT NO. | | REPORT NO. | WTB-1129-048 |
| COMPONENT | SECTION 39 | LOT NO. | | DATE | 11-18-63 |
| MODEL NO. | WS-133A | DRAWING NO. | 25-37501-9 | PREPARED | CB/RH |
| SERIAL NO. | 0000048, | U.O. MISSILE | | APPROVED | GO |

| LINE | EQUIPMENT CHANGE RECORD | | WEIGHT AND BALANCE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | WEIGHT | X AXIS | | Y AXIS | | Z AXIS | |
| | PART NO. | DESCRIPTION OF EQUIPMENT | | ARM | MOMENT | ARM | MOMENT | ARM | MOMENT |
| 1 | | | | | | | | | |
| 2 | 25-37501-9 | Instr. Group Trainer (As Weighed) | 139.05 | 54.35 | 7,557.5 | 99.01 | 13,768.0 | 99.64 | 13,855.1 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | ADD: | | | | | | | |
| 6 | AN37194-315 | Cable-Autonetics | 3.21 | 74.2 | | 115.5 | | 102.8 | |
| 7 | AN37196-315 | Cable-Autonetics | 1.36 | 50.1 | | 106.9 | | 111.4 | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | 25-37501-9 | Instr. Group Trainer (Complete) | 143.62 | 54.76 | 7,864.2 | 99.46 | 14,284.1 | 99.82 | 14,336.6 |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |

17.2 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAFER S/N 0000049

REPORT NO. _____
DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. * | LAT. | VERT. | INERTIA SLUG FT2x10-3 ROLL | PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 146.92 | 54.8 | 99.7 | 100.1 | .004 | .002 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.56 | 67.9 | 111.7 | 114.7 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.65 | 85.9 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.32 | 56.3 | 109.8 | 117.7 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.32 | | 56.3 | 109.8 | 117.7 | | |
| 22 | 45 | Interstage 2-3 | | | 18.64 | 64.7 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 25.26 | 74.0 | 114.8 | 125.2 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 26.70 | 117.2 | 117.7 | 130.1 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.78 | 74.5 | 118.1 | 129.6 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 271.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Boeing Section Stations (See Missile Station Diagram)

## 17.2 WEIGHT & BALANCE SUMMARY CTLI (AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT2x10-3 ROLL | INERTIA SLUG FT2x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 3.42 | 56.9 | 108.4 | 112.4 | 0 | 0 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.16 | 68.1 | 111.8 | 114.8 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.45 | 86.0 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.52 | 55.9 | 109.9 | 117.6 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.52 | | 55.9 | 109.9 | 117.6 | | |
| 22 | 45 | Interstage 2-3 | | | 18.44 | 64.8 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 24.76 | 73.6 | 115.1 | 125.6 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 25.90 | 115.8 | 117.7 | 130.2 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.58 | 73.8 | 118.1 | 129.5 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 125.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

17.2 BMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT$^2$x10-3 ROLL | INERTIA SLUG FT$^2$x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | .2 | 54.5 | 111.5 | 111.5 | | |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | .4 | 65.4 | 110.5 | 113.5 | | |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | .2 | 80.9 | 109.3 | 116.2 | | |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | .2 | | 53.6 | 110.8 | 116.7 | | |
| 22 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 0 | - | - | - | | |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | 0 | - | - | - | | |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | | | | | | | |
| 37 | 47 | Interstage 1-2 | | | .5 | 94.7 | 102.0 | 103.4 | | |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | .8 | 161.3 | 116.2 | 128.0 | | |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | .8 | 101.3 | 119.2 | 133.9 | | |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 2.7 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Reference D2-13954-534

| CHECK LIST NO. | 17.3 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) |
|---|---|---|
| DATE | MODEL _____ FINAL ASSEMBLY DRAWING NO. _____ | Mo / Day / Yr |

SECTION 39 THRU 49 MISSILE NO. _____

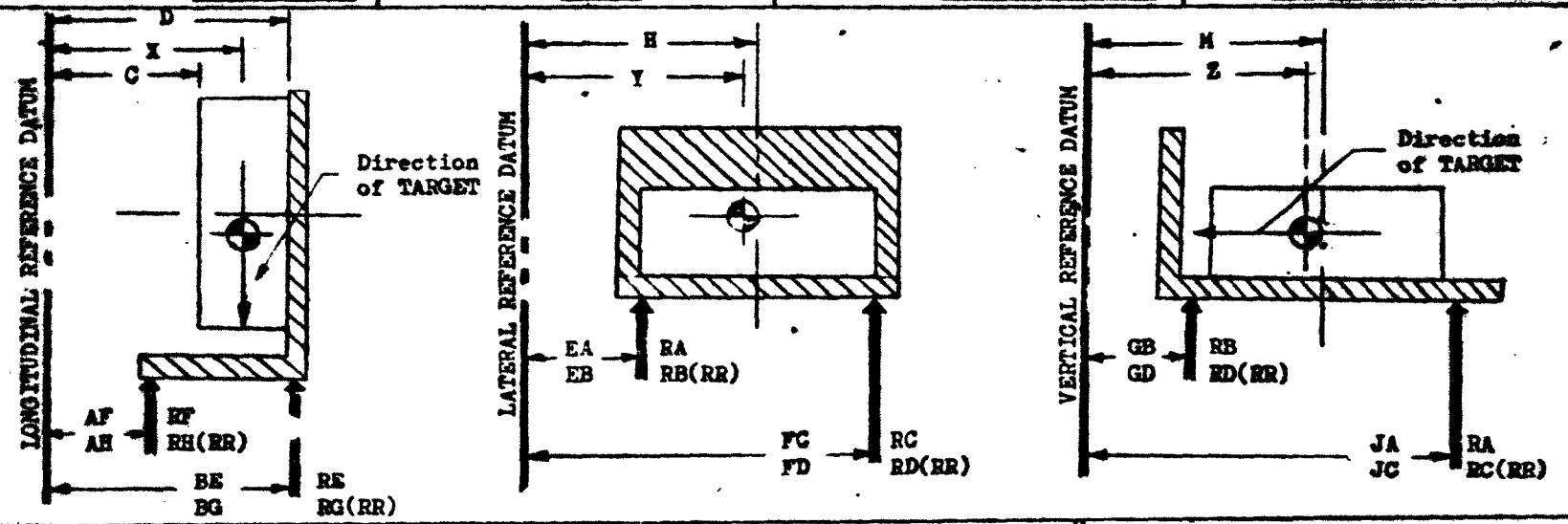
MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUMMARY CHECK LISTS FOR SECTIONS 39 THROUGH 49 ARE IDENTICAL TO THOSE FOUND ON PAGES 144 THROUGH 151. | | | | | | | | | | | | |

17.4.1

# ACTUAL WEIGHT RECORD - CTLI SECTION

| | | | |
|---|---|---|---|
| U/O MISSILE 0000049 | DRAWING NO. 25-37501-9 | CHECK LIST NO. 39 | REPORT NO. WTS-1130-049 |
| MISSILE MODEL WS-133A | DCN B | REPORTED BY RH/CB | PAGE NO. |
| CONFIGURATION | ADCN | CHECKED BY BW | DATE 11-18-63 |




## WEIGHING DATA

| REACTION | GR. WT. | TARE | CORR. | NET WT. | REACTION | GR. WT. | TARE | CORR. | NET WT. |
|---|---|---|---|---|---|---|---|---|---|
| RF | 48.75 | 22.30 | | 26.45 | RC | 70.00 | 36.15 | | 33.85 |
| RH | 61.85 | 30.70 | | 31.15 | RD | 83.95 | 52.60 | | 31.35 |
| RE | 110.90 | 64.65 | | 46.25 | RA | 79.45 | 32.40 | | 47.05 |
| RG | 93.90 | 59.00 | | 34.90 | RB | 81.80 | 55.30 | | 26.50 |
| TOTAL | 315.40 | 176.65 | | 138.75 | TOTAL | 315.20 | 176.45 | | 138.75 |

## DIMENSIONAL DATA

| DIM. | INCHES | DIM. | INCHES | DIM. | INCHES |
|---|---|---|---|---|---|
| AF | 42.007 | EA | 84.510 | GB | 77.478 |
| AH | 42.023 | EB | 84.505 | GD | 77.481 |
| BE | 62.996 | FC | 115.490 | JA | 115.500 |
| BG | 62.999 | FD | 115.495 | JC | 115.500 |
| C | 50.000 | H | 100.000 | M | 100.000 |
| D | 60.000 | | | | |

## LONGITUDINAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RF | 26.45 | 42.007 | |
| RH | 31.15 | 42.023 | |
| RE | 46.25 | 62.996 | |
| RG | 34.90 | 62.999 | |
| AS WGD | 138.75 | 54.29 | 7,532.3 |

## LATERAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RA | 47.05 | 84.510 | |
| RB | 26.50 | 84.505 | |
| RC | 33.85 | 115.490 | |
| RD | 31.35 | 115.495 | |
| AS WGD | 138.75 | 99.07 | 13,745.7 |

## VERTICAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RB | 26.50 | 77.478 | |
| RD | 31.35 | 77.481 | |
| RA | 47.05 | 115.500 | |
| RC | 33.85 | 115.500 | |
| AS WGD | 138.75 | 99.65 | 13,826.1 |

(RR) = Rear Reaction

SERIAL NUMBER: 0000049

| CHECK LIST NO. 39 | 17.4.2 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DATE | MODEL WS-133A FINAL ASSEMBLY DRAWING NO. | Mo | | 11 | | | | |
| | | Day | | 18 | | | | |
| | | Yr | | 63 | | | | |

SECTION 39 MISSILE NO.

MISSILE COMPONENT COMPONENT PART NO.

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Instrumentation Group, Trainer-Test | 25-37501-9 | | | | | - | - | | | | | |
| 39a | CTLI Structure Assembly | 25-25403-11 | | | | | - | - | | | | | |
| | Support Structure | 25-29094-45 | | | | | x | x | | | | | |
| | Primary Structure | 25-29093-15 | | | | | x | x | | | | | |
| | Insulation & External Markings | 25-29095-3 | | | | | x | x | | | | | |
| | Antenna & Spacer | 25-29096-3 | | | | | x | x | | | | | |
| | Plate - Identification | 21-51600-329 | | | | | x | x | | | | | |
| 39b | Cable & Equipment Installation | 25-25404-15 | | | | | - | - | | | | | |
| | Battery, Squib | 10-20942-4 | | | | | x | x | | | | | |
| | Battery, Squib | 10-20942-2 | | | | | x | x | | | | | |
| | Cable Set SE-35B | 55018-106 | | | | | - | - | | | | | |
| | Cable | AN37192-315 | | | | | x | x | | | | | |
| | Cable | AN37194-315 | | | | | x | o | | | | | |
| | Cable | AN37196-315 | | | | | x | o | | | | | |

17.4.3

# WEIGHT AND BALANCE CHANGE RECORD

| | | | | | |
|---|---|---|---|---|---|
| ASSOCIATE CONTRACTOR | BOEING | CONTRACT NO. | | REPORT NO. | WTS-1130-049 |
| COMPONENT | SECTION 39 | LOT NO. | | DATE | 11/18/63 |
| MODEL NO. | WS-133A | DRAWING NO. | 25-37501-9 | PREPARED | RC/CB |
| SERIAL NO. | 0000049 | U.O. MISSILE | | APPROVED | BW |

| LINE | EQUIPMENT CHANGE RECORD | | WEIGHT AND BALANCE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | WEIGHT | X AXIS | | Y AXIS | | Z AXIS | |
| | PART NO. | DESCRIPTION OF EQUIPMENT | | ARM | MOMENT | ARM | MOMENT | ARM | MOMENT |
| 1 | | | | | | | | | |
| 2 | 25-37501-9 | Instr. Group Trainer (As Weighed) | 138.75 | 54.29 | 7,532.3 | 99.07 | 13,745.7 | 99.65 | 13,826.1 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | ADD: | | | | | | | |
| 6 | AN37194-315 | Cable-Autonetics | 3.21 | 74.2 | | 115.5 | | 102.8 | |
| 7 | AN37196-315 | Cable-Autonetics | 1.34 | 50.4 | | 106.9 | | 111.4 | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | 25-37501-9 | Instr. Group Trainer (Complete) | 143.30 | 54.70 | 7,838.0 | 99.51 | 14,259.7 | 99.83 | 14,305.4 |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |

17.5 ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION APPLICABLE TO CTLI SECTION S/N 0000049 AND INSTALLATION KIT

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

| ECP NO. (WS-133A-BO-) | ECP TITLE | STAGE | WEIGHT CHANGE | WEIGHT CHANGE INCORPORATED IN THIS REPORT |
|---|---|---|---|---|
| 540 | Potting & Bonding Deletions for Vandenberg Air Force Base Missiles | All | - | No* |
| 606 | Revision to CTLI Umbilical Bracket-Section 49 | 1 | Negl. | Yes |
| 620 | Addition of Static Dissipators on 47 Section & Section 49 | 1 | Negl. | Yes |
| 635 | PCM R/F Section Digital Data Programmer | 3 | Negl. | Yes |
| 639 | Prevent Interference of Linear Shape Charge with Cable Strap | 3 | Negl. | Yes |
| 657 | Revision of Ordnance Supports in Interstage 2-3 | 2 | Negl. | Yes |
| 660 | Wing III G&C Section & Raceway Raceway Interface Revisions | 3 | Negl. | Yes |

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

## CTLI SECTION, S/N 0000050

18.1. This section of the document describes the data changes created by converting a production line Minuteman missile into a CTL missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consist of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 175 summarizes the complete installation mass properties and consists of data from page 176 (average mass properties of downstage components), page 177 (predicted sealant changes), and page 181 (actual weight of CTLI section S/N 0000050). In addition, page 178 presents summary check lists by production section as backup data for page 176. Page 182 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DR-MMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev H 6-10-63.
21-52900, Missile Instl., Rev K 9-19-63.
25-25406, BMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy. DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63 ADCN S-6 9-5-63.

18.1 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAFER S/N 0000050

REPORT NO. _____
DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG.* | LAT. | VERT. | INERTIA SLUG FT$^2$x10$^{-3}$ ROLL | PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 146.97 | 54.8 | 99.7 | 100.1 | .004 | .002 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.56 | 67.9 | 111.7 | 114.7 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.65 | 85.9 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.32 | 56.3 | 109.8 | 117.7 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.32 | | 56.3 | 109.8 | 117.7 | | |
| 22 | 45 | Interstage 2-3 | | | 18.64 | 64.7 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 25.26 | 74.0 | 114.8 | 125.2 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 26.70 | 117.2 | 117.7 | 130.1 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.78 | 74.5 | 118.1 | 129.6 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 271.26 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Boeing Section Stations (See Missile Station Diagram)

18.2 WEIGHT & BALANCE SUMMARY CTLI
(AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

| LINE | STA. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT2x10-3 ROLL | INERTIA SLUG FT2x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 3.42 | 56.9 | 108.4 | 112.4 | 0 | 0 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.16 | 68.1 | 111.8 | 114.8 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.45 | 86.0 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.52 | 55.9 | 109.9 | 117.6 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.52 | | 55.9 | 109.9 | 117.6 | | |
| 22 | 45 | Interstage 2-3 | | | 18.44 | 64.8 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 24.76 | 73.6 | 115.1 | 125.6 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 25.90 | 115.8 | 117.7 | 130.2 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.58 | 73.8 | 118.1 | 129.5 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 125.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

18.2 BMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT$^2$x10-3 ROLL | INERTIA SLUG FT$^2$x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | .2 | 54.5 | 111.5 | 111.5 | | |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | .4 | 65.4 | 110.5 | 113.5 | | |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | .2 | 80.9 | 109.3 | 116.2 | | |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | .2 | | 53.6 | 110.8 | 116.7 | | |
| 22 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 0 | - | - | - | | |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | 0 | - | - | - | | |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | | | | | | | |
| 37 | 47 | Interstage 1-2 | | | .5 | 94.7 | 102.0 | 103.4 | | |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | .8 | 161.3 | 116.2 | 128.0 | | |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | .2 | 101.3 | 119.2 | 133.9 | | |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 2.7 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Reference D2-13954-534

| CHECK LIST NO. | 18.3 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Mo | | | | | | |
| DATE | MODEL _____ FINAL ASSEMBLY DRAWING NO. _____ | Day | | | | | | |
| | | Yr | | | | | | |

SECTION 39 THRU 49 MISSILE NO. _____

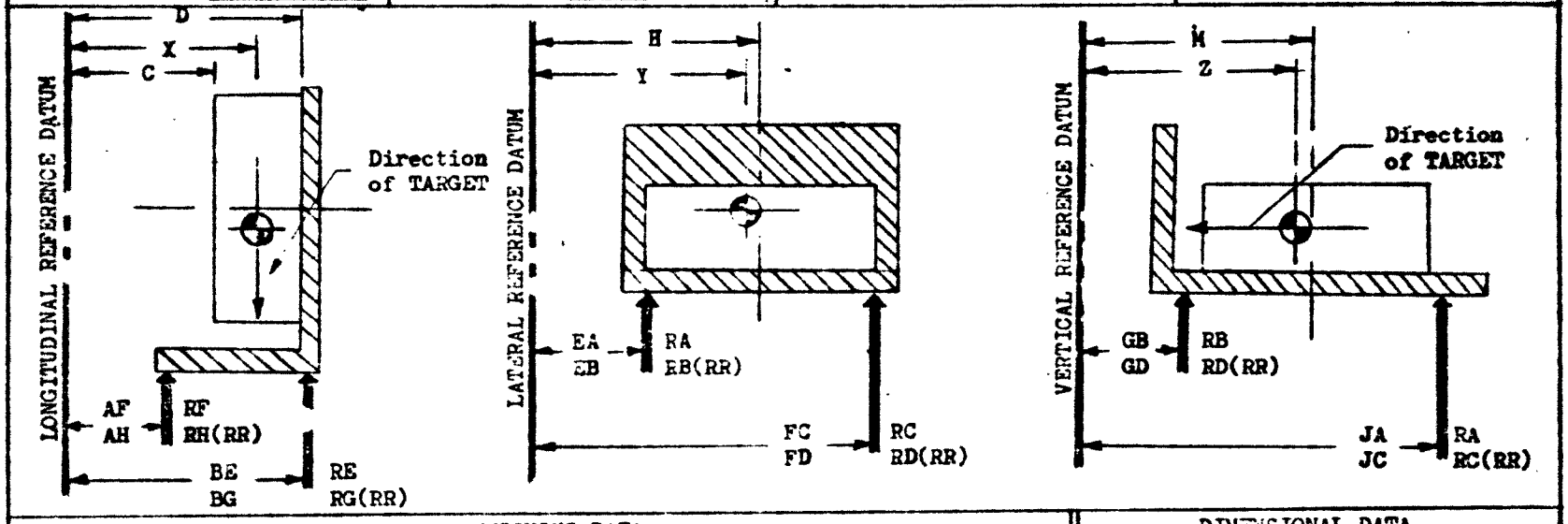
MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | COMPONENT: | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUMMARY CHECK LISTS FOR SECTIONS 39 THROUGH 49 ARE IDENTICAL TO THOSE FOUND ON PAGES 144 THROUGH 151. | | | | | | | | | | | | |

18.4.1

## ACTUAL WEIGHT RECORD - CTLI SECTION

| | | | |
|---|---|---|---|
| U/O MISSILE 0000050 | DRAWING NO. 25-37501-9 | CHECK LIST NO. 39 | REPORT NO. WTS-1132-050 |
| MISSILE MODEL WS-133A | DCN "B" | REPORTED BY CB | PAGE NO. |
| CONFIGURATION | ADCN | CHECKED BY BW | DATE 12/2/63 |




### WEIGHING DATA

| REACTION | GR. WT. | TARE | CORR. | NET WT. | REACTION | GR. WT. | TARE | CORR. | NET WT. |
|---|---|---|---|---|---|---|---|---|---|
| RF | 31.30 | 9.00 | | 22.30 | RC | 105.85 | 60.35 | | 45.50 |
| RH | 78.70 | 43.50 | | 35.20 | RD | 48.00 | 28.40 | | 19.60 |
| RE | 129.35 | 78.45 | | 50.90 | RA | 43.50 | 8.25 | | 35.25 |
| RG | 76.00 | 45.60 | | 30.40 | RB | 118.00 | 79.55 | | 38.45 |
| TOTAL | 315.35 | 176.55 | | 138.80 | TOTAL | 315.35 | 176.55 | | 138.80 |

### DIMENSIONAL DATA

| DIM. | INCHES | DIM. | INCHES | DIM. | INCHES |
|---|---|---|---|---|---|
| AF | 42.007 | EA | 84.510 | GB | 77.478 |
| AH | 42.023 | EB | 84.505 | GD | 77.481 |
| BE | 62.996 | FC | 115.490 | JA | 115.500 |
| BG | 62.999 | FD | 115.495 | JC | 115.500 |
| C | 50.000 | H | 100.000 | M | 100.000 |
| D | 60.000 | | | | |

### LONGITUDINAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RF | 22.30 | 42.007 | |
| RH | 35.20 | 42.023 | |
| RE | 50.90 | 62.996 | |
| RG | 30.40 | 62.999 | |
| AS WGD | 138.80 | 54.31 | 7,537.6 |

### LATERAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RA | 35.25 | 84.510 | |
| RB | 38.45 | 84.505 | |
| RC | 45.50 | 115.490 | |
| RD | 19.60 | 115.495 | |
| AS WGD | 138.80 | 99.04 | 13,746.7 |

### VERTICAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RB | 38.45 | 77.478 | |
| RD | 19.60 | 77.481 | |
| RA | 35.25 | 115.500 | |
| RC | 45.50 | 115.500 | |
| AS WGD | 138.80 | 99.60 | 13,824.3 |

(RR) = Rear Reaction

SERIAL NUMBER: 0000050

CHECK LIST NO. 39

DATE

MISSILE WEIGHING CHECK LIST

MODEL WS-133A FINAL ASSEMBLY DRAWING NO. 25-35701-9

| RECORD OF CHECKING (DATE) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mo | | 12 | | | | | |
| Day | | 2 | | | | | |
| Yr | | 63 | | | | | |

SECTION 39 MISSILE NO.

MISSILE COMPONENT COMPONENT PART NO.

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Instrumentation Group, Trainer-Test | 25-37501-9 | | | | | - | - | | | | | |
| 39a | CTLI Structure Assembly | 25-25403-11 | | | | | - | - | | | | | |
| | Support Structure | 25-29094-45 | | | | | x | x | | | | | |
| | Primary Structure | 25-29093-15 | | | | | x | x | | | | | |
| | Insulation & External Markings | 25-29095-3 | | | | | x | x | | | | | |
| | Antenna & Spacer | 25-29096-3 | | | | | x | x | | | | | |
| | Plate - Identification | 21-51600-329 | | | | | x | x | | | | | |
| 39b | Cable & Equipment Installation | 25-25404-15 | | | | | x | - | | | | | |
| | Battery, Squib | 10-20942-4 | | | | | x | x | | | | | |
| | Battery, Squib | 10-20942-2 | | | | | x | x | | | | | |
| | Cable Set SE-35B | 55018-106 | | | | | - | - | | | | | |
| | Cable | AN37192-315 | | | | | x | x | | | | | |
| | Cable | AN37194-315 | | | | | x | o | | | | | |
| | Cable | AN37196-315 | | | | | x | o | | | | | |

18.4.3

# WEIGHT AND BALANCE CHANGE RECORD

| | | | | | |
|---|---|---|---|---|---|
| ASSOCIATE CONTRACTOR | BOEING | CONTRACT NO. | | REPORT NO. | WTS-1132-050 |
| COMPONENT | SECTION 39 | LOT NO. | | DATE | 11/2/63 |
| MODEL NO. | WS-133A | DRAWING NO. | 25-37501-9 | PREPARED | CB |
| SERIAL NO. | 0000050 | U.O. MISSILE | | APPROVED | GO |

| LINE | EQUIPMENT CHANGE RECORD | | WEIGHT AND BALANCE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | WEIGHT | X AXIS | | Y AXIS | | Z AXIS | |
| | PART NO. | DESCRIPTION OF EQUIPMENT | | ARM | MOMENT | ARM | MOMENT | ARM | MOMENT |
| 1 | | | | | | | | | |
| 2 | 25-37501-9 | Instr. Group Trainer (As Weighed) | 138.80 | 54.31 | 7,537.6 | 99.04 | 13,746.7 | 99.60 | 13,824.3 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | ADD: | | | | | | | |
| 6 | AN37194-315 | Cable-Autonetics | 3.22 | 74.2 | | 115.5 | | 102.8 | |
| 7 | AN37196-315 | Cable-Autonetics | 1.33 | 50.4 | | 106.9 | | 111.4 | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | 25-37501-9 | Instr. Group Trainer (Complete) | 143.35 | 54.72 | 7,843.6 | 99.48 | 14,260.8 | 99.78 | 14,303.5 |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |

## 18.5 ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION APPLICABLE TO CTLI SECTION S/N 0000050 AND INSTALLATION KIT

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

| ECP NO. (WS-133A-BO-) | ECP TITLE | STAGE | WEIGHT CHANGE | WEIGHT CHANGE INCORPORATED IN THIS REPORT |
|---|---|---|---|---|
| 540 | Potting & Bonding Deletions for Vandenberg Air Force Base Missiles | All | - | No* |
| 606 | Revision to CTLI Umbilical Bracket-Section 49 | 1 | Negl. | Yes |
| 620 | Addition of Static Dissipators on 47 Section & Section 49 | 1 | Negl. | Yes |
| 635 | PCM R/F Section Digital Data Programmer | 3 | Negl. | Yes |
| 639 | Prevent Interference of Linear Shape Charge with Cable Strap | 3 | Negl. | Yes |
| 657 | Revision of Ordnance Supports in Interstage 2-3 | 2 | Negl. | Yes |
| 660 | Wing III G&C Section & Raceway Interface Revisions | 3 | Negl. | Yes |

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

## CTLI SECTION, S/N 0000051

19.1 This section of the document describes the data changes created by converting a production line Minuteman missile into a CTL missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consists of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 184 summarizes the complete installation mass properties and consists of data from page 185 (average mass properties of downstage components), page 186 (predicted sealant changes), and page 190 (actual weight of CTLI section S/N 0000051). In addition, page 187 presents summary check lists by production section as backup data for page 185. Page 191 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DR-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, RMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-13-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

19.2 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAFER S/N 0000051

REPORT NO. _____
DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG.* | LAT. | VERT. | INERTIA SLUG FT2x10-3 ROLL | PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 146.61 | 54.7 | 99.7 | 100.1 | .004 | .002 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | 5.56 | 67.9 | 111.7 | 114.7 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.65 | 85.9 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.32 | 56.3 | 109.8 | 117.7 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.32 | | 56.3 | 109.8 | 117.7 | | |
| 22 | 45 | Interstage 2-3 | | | 18.64 | 64.7 | 111.8 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 25.26 | 74.0 | 114.8 | 125.2 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 26.70 | 117.2 | 117.7 | 130.1 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.78 | 74.5 | 118.1 | 129.6 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 270.90 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Boeing Section Stations (See Missile Station Diagram)

## 19.2 WEIGHT & BALANCE SUMMARY CTLI (AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

| LINE | ITEM | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT$^2$x10-3 ROLL | INERTIA SLUG FT$^2$x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | 3.42 | 56.9 | 108.4 | 112.4 | 0 | 0 |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | O&C Section | | | 5.16 | 68.1 | 111.8 | 114.8 | 0 | 0 |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | 16.45 | 86.0 | 108.5 | 117.0 | 0 | .002 |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | - 1.52 | 55.9 | 109.9 | 117.6 | 0 | 0 |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | - 1.52 | | 55.9 | 109.9 | 117.6 | | |
| 22 | 45 | Interstage 2-3 | | | 18.44 | 64.8 | 111.3 | 120.2 | 0 | .001 |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 26.00 | 99.9 | 112.7 | 121.8 | 0 | .009 |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | - .98 | 58.2 | 113.6 | 123.8 | 0 | 0 |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | - .98 | | 58.2 | 113.6 | 123.8 | | |
| 37 | 47 | Interstage 1-2 | | | 24.76 | 73.6 | 115.1 | 125.6 | 0 | .002 |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | 25.90 | 115.8 | 117.7 | 130.2 | 0 | .023 |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | 7.58 | 73.8 | 118.1 | 129.5 | 0 | 0 |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 125.21 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

19.2 BMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

| LINE | SEC. | DESCRIPTION | DATA | EXPENDED WEIGHT (LB) | TOTAL WEIGHT (LB) | CENTER OF GRAVITY LONG. | CENTER OF GRAVITY LAT. | CENTER OF GRAVITY VERT. | INERTIA SLUG FT2x10-3 ROLL | INERTIA SLUG FT2x10-3 PITCH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 41 | RV Spacer | | | | | | | | |
| 2 | | | Silo | | | | | | | |
| 3 | | | Aero | | | | | | | |
| 4 | 39 | CTLI Section | | | .2 | 54.5 | 111.5 | 111.5 | | |
| 5 | | | Silo | | | | | | | |
| 6 | | | Aero | | | | | | | |
| 7 | 42 | G&C Section | | | .4 | 65.4 | 110.5 | 113.5 | | |
| 8 | | | Silo | | | | | | | |
| 9 | | | Aero | | | | | | | |
| 10 | 44 | 3rd Stage Engine | | | .2 | 80.9 | 109.3 | 116.2 | | |
| 11 | | | Silo | | | | | | | |
| 12 | | | Aero | | | | | | | |
| 13 | | | Base | | | | | | | |
| 14 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 15 | | (Fwd) | Silo | | | | | | | |
| 16 | | | Aero | | | | | | | |
| 17 | | | Base | | | | | | | |
| 18 | | | Silo | | | | | | | |
| 19 | | Jettisoned | Aero | | | | | | | |
| 20 | | Portion | Base | | | | | | | |
| 21 | | | Jett | .2 | | 53.6 | 110.8 | 116.7 | | |
| 22 | 45 | Interstage 2-3 | | | .2 | 53.6 | 110.8 | 116.7 | | |
| 23 | | (Aft) | Silo | | | | | | | |
| 24 | | | Aero | | | | | | | |
| 25 | 46 | 2nd Stage Engine | | | 0 | - | - | - | | |
| 26 | | | Silo | | | | | | | |
| 27 | | | Aero | | | | | | | |
| 28 | | | Base | | | | | | | |
| 29 | 47 | Interstage 1-2 | | | 0 | - | - | - | | |
| 30 | | (Fwd) | Silo | | | | | | | |
| 31 | | | Aero | | | | | | | |
| 32 | | | Base | | | | | | | |
| 33 | | | Silo | | | | | | | |
| 34 | | Jettisoned | Aero | | | | | | | |
| 35 | | Portion | Base | | | | | | | |
| 36 | | | Jett | | | | | | | |
| 37 | 47 | Interstage 1-2 | | | .5 | 94.7 | 102.0 | 103.4 | | |
| 38 | | (Aft) | Silo | | | | | | | |
| 39 | | | Aero | | | | | | | |
| 40 | 48 | 1st Stage Engine | | | .8 | 161.3 | 116.2 | 128.0 | | |
| 41 | | | Silo | | | | | | | |
| 42 | | | Aero | | | | | | | |
| 43 | | | Base | | | | | | | |
| 44 | 49 | Skirt | | | .2 | 101.3 | 119.2 | 133.9 | | |
| 45 | | | Silo | | | | | | | |
| 46 | | | Aero | | | | | | | |
| 47 | | | Base | | | | | | | |
| 48 | | MISSILE | | | 2.7 | | | | | |
| 49 | | | Silo | | | | | | | |
| 50 | | | Aero | | | | | | | |
| 51 | | | Base | | | | | | | |
| 52 | | | Jett | | | | | | | |

* Reference D2-13954-534

| CHECK LIST NO. | 19.3 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Mo | | | | | | |
| DATE | MODEL _____ FINAL ASSEMBLY DRAWING NO. _____ | Day | | | | | | |
| | | Yr | | | | | | |

SECTION 39 THRU 49 MISSILE NO. _____

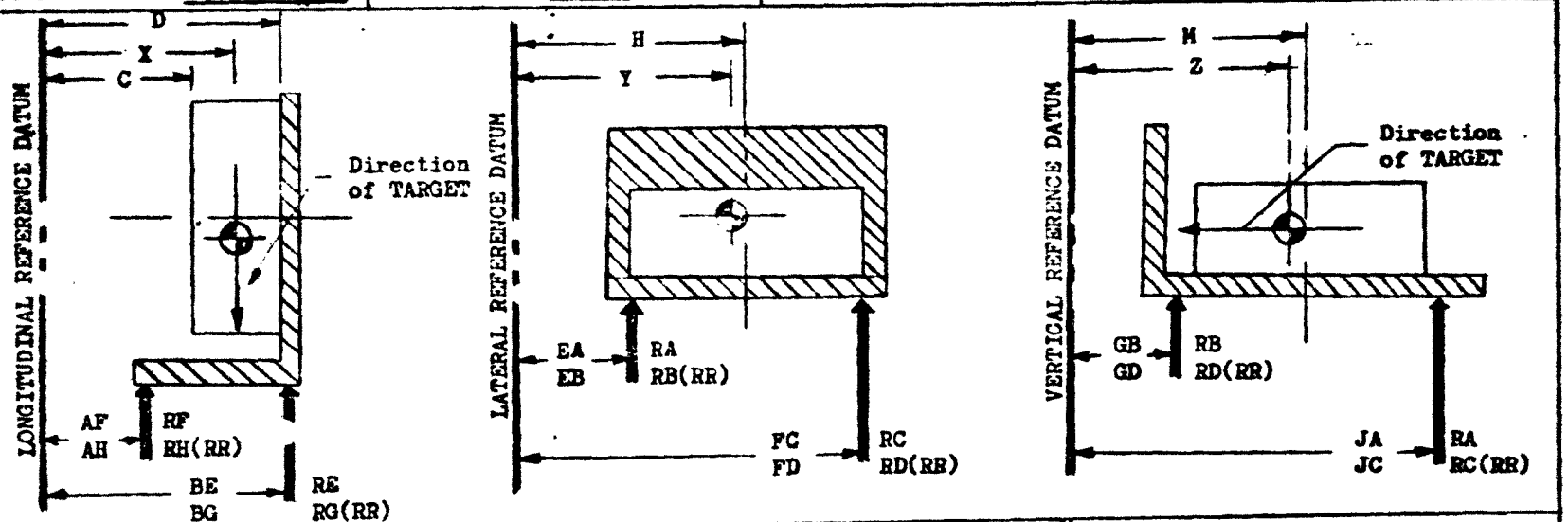
MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUMMARY CHECK LISTS FOR SECTIONS 39 THROUGH 49 ARE IDENTICAL TO THOSE FOUND ON PAGES 144 THROUGH 151. | | | | | | | | | | | | |

19.4.1

## ACTUAL WEIGHT RECORD - CTLI SECTION

| | | | |
|---|---|---|---|
| U/O MISSILE 0000051 | DRAWING NO. 25-37501-9 | CHECK LIST NO. 39 | REPORT NO. WTS-1147-051 |
| MISSILE MODEL WS-133A | DCN • B | REPORTED BY OB/GJ | PAGE NO. |
| CONFIGURATION | ADCN | CHECKED BY BW | DATE 12/10/63 |




### WEIGHING DATA

| REACTION | GR. WT. | TARE | CORR. | NET WT. | REACTION | GR. WT. | TARE | CORR. | NET WT. |
|---|---|---|---|---|---|---|---|---|---|
| RF | 43.65 | 18.60 | | 25.05 | RC | 73.15 | 40.15 | | 33.00 |
| RH | 66.25 | 33.60 | | 32.65 | RD | 80.30 | 48.45 | | 31.85 |
| RE | 116.85 | 68.70 | | 48.15 | RA | 76.00 | 28.35 | | 47.65 |
| RG | 88.20 | 55.60 | | 32.60 | RB | 85.55 | 59.60 | | 25.95 |
| TOTAL | 314.95 | 176.50 | | 138.45 | TOTAL | 315.00 | 176.55 | | 138.45 |

### DIMENSIONAL DATA

| DIM. | INCHES | DIM. | INCHES | DIM. | INCHES |
|---|---|---|---|---|---|
| AF | 42.007 | EA | 84.510 | GB | 77.478 |
| AH | 42.023 | EB | 84.505 | GD | 77.481 |
| BE | 62.996 | FC | 115.490 | JA | 115.500 |
| BG | 62.999 | FD | 115.495 | JC | 115.500 |
| C | 50.000 | H | 100.000 | M | 100.000 |
| D | 60.000 | | | | |

### LONGITUDINAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RF | 25.05 | 42.007 | |
| RH | 32.65 | 42.023 | |
| RE | 48.15 | 62.996 | |
| RG | 32.60 | 62.999 | |
| AS WGD | 138.45 | 54.25 | 7,511.4 |

### LATERAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RA | 47.65 | 84.510 | |
| RB | 25.95 | 84.505 | |
| RC | 33.00 | 115.490 | |
| RD | 31.85 | 115.495 | |
| AS WGD | 138.45 | 99.02 | 13,709.5 |

### VERTICAL C.G.

| REACTION | NET WT. | ARM | MOMENT |
|---|---|---|---|
| RB | 25.95 | 77.478 | |
| RD | 31.85 | 77.481 | |
| RA | 47.65 | 115.500 | |
| RC | 33.00 | 115.500 | |
| AS WGD | 138.45 | 99.63 | 13,793.4 |

(RR) = Rear Reaction

SERIAL NUMBER: 0000051

| CHECK LIST NO. 39 | 19.4.2 MISSILE WEIGHING CHECK LIST | RECORD OF CHECKING (DATE) |
|---|---|---|
| DATE | MODEL WS-133A FINAL ASSEMBLY DRAWING NO. 25-35701-9 | Mo 12 / Day 10 / Yr 63 |

SECTION 39 MISSILE NO. _____

MISSILE COMPONENT _____ COMPONENT PART NO. _____

| ITEM NUMBER | DESCRIPTION | PART NO. | WEIGHT | X ARM | Y ARM | Z ARM | COMPONENT: BASIC WEIGHT | COMPONENT: AS WEIGHED | | COMPONENT: REMOTE SITE SHIPMENT | COMPONENT: AS RECEIVED REMOTE SITE | MISSILE: AS WEIGHED REMOTE SITE | MISSILE: LAUNCH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Instrumentation Group, Trainer-Test | 25-37501-9 | | | | | - | - | | | | | |
| 39a | CTLI Structure Assembly | 25-25403-11 | | | | | - | - | | | | | |
| | Support Structure | 25-29094-45 | | | | | x | x | | | | | |
| | Primary Structure | 25-29093-15 | | | | | x | x | | | | | |
| | Insulation & External Markings | 25-29095-3 | | | | | x | x | | | | | |
| | Antenna & Spacer | 25-29096-3 | | | | | x | x | | | | | |
| | Plate - Identification | 21-51600-329 | | | | | x | x | | | | | |
| 39b | Cable & Equipment Installation | 25-25404-15 | | | | | - | - | | | | | |
| | Battery, Squib | 10-20942-4 | | | | | x | x | | | | | |
| | Battery, Squib | 10-20942-2 | | | | | x | x | | | | | |
| | Cable Set SE-35B | 55018-106 | | | | | - | - | | | | | |
| | Cable | AN37192-315 | | | | | x | x | | | | | |
| | Cable | AN37194-315 | | | | | x | o | | | | | |
| | Cable | AN37196-315 | | | | | x | o | | | | | |

19.4.3

# WEIGHT AND BALANCE CHANGE RECORD

| | | | | | |
|---|---|---|---|---|---|
| ASSOCIATE CONTRACTOR | BOEING | CONTRACT NO. | | REPORT NO. | WTS-1147-051 |
| COMPONENT | SECTION 39 | LOT NO. | | DATE | 12/10/63 |
| MODEL NO. | WS-133A | DRAWING NO. | 25-37501-9 | PREPARED | CB |
| SERIAL NO. | | U.O. MISSILE | 0000051 | APPROVED | GO |

| LINE | EQUIPMENT CHANGE RECORD | | WEIGHT AND BALANCE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | WEIGHT | X AXIS | | Y AXIS | | Z AXIS | |
| | PART NO. | DESCRIPTION OF EQUIPMENT | | ARM | MOMENT | ARM | MOMENT | ARM | MOMENT |
| 1 | | | | | | | | | |
| 2 | 25-37501-9 | Instr. Group Trainer (As Weighed) | 138.45 | 54.25 | 7,511.4 | 99.02 | 13,709.5 | 99.63 | 13,793.4 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | ADD: | | | | | | | |
| 6 | AN37194-315 | Cable-Autonetics | 3.19 | 74.2 | | 115.5 | | 102.8 | |
| 7 | AN37196-315 | Cable-Autonetics | 1.35 | 50.4 | | 106.9 | | 111.4 | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | 25-37501-9 | Instr. Group Trainer (Complete) | 142.99 | 54.66 | 7,816.1 | 99.46 | 14,222.3 | 99.81 | 14,271.7 |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |

## 19.5 ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION APPLICABLE TO CTLI SECTION S/N 0000051 AND INSTALLATION KIT

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

| ECP NO. (WS-133A-BO-) | ECP TITLE | STAGE | WEIGHT CHANGE ± | WEIGHT CHANGE INCORPORATED IN THIS REPORT |
|---|---|---|---|---|
| 540 | Potting & Bonding Deletions for Vandenberg Air Force Base Missiles | All | - | No* |
| 606 | Revision to CTLI Umbilical Bracket Section 49 | 1 | Negl. | Yes |
| 620 | Addition of Static Dissipators on 47 Section & Section 49 | 1 | Negl. | Yes |
| 635 | PCM R/F Section Digital Data Programmer | 3 | Negl. | Yes |
| 639 | Prevent Interference of Linear Shape Charge with Cable Strap | 3 | Negl. | Yes |
| 657 | Revision of Ordnance Supports in Interstage 2-3 | 2 | Negl. | Yes |
| 660 | Wing III G&C Section & Raceway Interface Revisions | 3 | Negl. | Yes |

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

AD 406916

END CHANGE PAGES