MDF

MILD DETONATING FUSE

UNIQUE DOCUMENT # SAC20011883000 0

MILD 1/28/66

Pg 1 of 7

ENC. 19

DESCRIPTION OF NORMAL OPERATION

The general shape and dimensions of the unit are shown on yellow sheet 1.

After release, a timer fires the 2 ea dets to remove the tail plate, as shown on yellow sheet 2. The dets are mounted in the ring forging and the cables are strung through the double skin of the afterbody. When the MDF fires it pushes the tail plate back which shears out in the counter bore area around the 8 ea 1/4" bolts which bolt the tail plate to the ring forging.

The tail plate has an eye bolt in the center, to which is attached a lanyard to the 4 ft pilot chute pack. The 4 ft pilot chute then pulls out the 16 ft chute which opens and remains attached for about 3 seconds.

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW

1ST REVIEW-DATE: 6/97
AUTHORITY: ☐ DC ☒ DD
NAME: BILL LOWRENCE
2ND REVIEW-DATE: 1/12/99
AUTHORITY: 4
NAME: [illegible]

DETERMINATION (CIRCLE NUMBER(S))
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO:
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH: AF
5. CLASSIFICATION CANCELED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY): 7+1 = 8 PAGES

USAF 5/11/99 unclassified

97SA20C000190

(References to parts of release mechanism in the following refer to parts shown on yellow sheet 1)

A timer fires the 16 ft release MDF, which forces the 16 ft release spider back against the plate holding the 30 inch drogue pack. This action allows the 16 ft flip pins to rotate, releasing the 16 ft chute lines in 8 places.

A loop on the 16 ft lines is attached to the 64 ft pack, so that when the 16 ft chute is released, the 64 ft parachute is deployed with the 16 ft acting as an extraction chute.

When the 30 inch drogue chute option is desired, the 16 ft and 64 ft release MDF are both fired. The 16 ft then pulls out the 64 ft, still in the packed configuration. One of the 64 ft lines is attached to the 30 inch pack which is then deployed. This 30 inch chute

gives a C_DS of 5.45 ft^2, which keeps the velocity below 0.8 Mach in order to obtain good baro fuzing pressures.

Some Notes on Abnormal Operations

1. If the MDF for release of the parachutes were fired, the release spiders should hit against the plate holding the 30 inch pack and would not transmit force through the packs to the tail plate. The release of gases is fairly well contained, so that no gas pressure should act on the tail plate.

2. The release MDF will not normally fire except through the SAFE-READY SWITCH which is a pretty good switch. So the premature MDF firing above would have to come through shock or from explosion. The Dets

are fairly shock sensitive, as can be seen by the requirement that the 16 ft release MDF must fire and the 64 ft MDF (which is very close by) must <u>not</u> fire during the normal system operation.

3. It is hard for anyone here to explain how the rivets on the aft ring forging sheared before the counter bores around the 1/4" bolts sheared. The counter bores are a design weak point that does fail in normal operation. A check for any signs of a load applied directly to the ring forging may be in order. A piece of shrapnel may have pierced the skin and hit the ring forging itself.

4. Any force from forward of the release spider area, in order to be transmitted through the parachute pack, would almost have to shear through the spiders, which would leave the parachutes connected to nothing at all.

PARACHUTE DESCRIPTION

The packing order, T.O. 14D1-4-101, is enclosed, which has a description of all components and several pictures showing how the packs go together and the bags, clevises, knives, etc that are used.

A brief description of the parachutes follows:

4 ft pilot chute, 8 gore, 7oz material, 6000 lb lines.

16.5 ft ribbon chute, 24 gores, 3000 & 1000 lb ribbon, 6000 lb lines

(ft cont)
21 ft long.

64 ft chute, 64 gore, 2.25 oz and 4.75 oz cloth, 1000 lb lines, 51 ft long, then into 8 ea 6000 lb risers, 11 ft long.

A 5 ft diameter guide surface canopy is attached to the apex of the 64 ft chute. This is 10 gores, 4.75 oz cloth, 1500 lb lines, 77 inches long, then on a 10 foot bridle to the 64 ft canopy.

The 30 inch chute is covered by another packing order, so its description is not in the present T.O. But it is a six gore guide surface parachute, 7 oz material, 1000 lb lines, 45 inches long, attached to a riser of 4000 lb tubular, 135 inches long

The 30 inch deployment bag is about 12 inches in diameter.

This bag (the 30 inch chute bag) is attached to the plate shown on yellow sheet 1 in four places. A riser is attached to one line of the 64 ft parachute.

The 16 ft, 64 ft package is designated as the MC-1150.

The 30 inch pack is designated the MC 1475.

(Correction to above write up - the 30 inch description and pack is included with the T.O. - is near the end, identified as TO 14D1.-4-101C)

Note: Personnel chutes are red (or orange) and white. The chutes described above are all white.

40 FT/SEC CROSSWIND
54 FT/SEC HEADWIND

$\frac{W}{C_D A} = K_1 V = 11.5 \times 10^{-4} V$

$\frac{W}{C_D A} = (K_1)_{AVE} V_{AVE}^2 = 6.15 \times 10^{-4} V^2$

RATIO 1.37

COMPARISON OF $W/C_D A$ FOR DIFFERENT SYSTEMS

WT = 2248# W (#4 TAIL PLATE) = 45#

1. 16' CHUTE WITH #4, $W/C_D A = 21$, 186.1 SECONDS V = 135
2. 64' CHUTE STREAMING WITH #4, $W/C_D A = 18.8$, 196.5 SECONDS V = 128
3. STABLE FREE FALL WITH #4, $W/C_D A = 1102$, 49.2 SECONDS V = 979
4. 15° CONING, FREE FALL WITH #4, $W/C_D A = 1095$, 49.7 SECONDS V = 976
5. 30° CONING, " " " ", $W/C_D A = 728$, 53.5 SECONDS V = 797
6. 45° CONING, " " " " $W/C_D A = 445$, 59.28 SECONDS V = 622
7. #4 TAIL PLATE, TUMBLING (INFLATED AREA/4 = C_D), $W/C_D A = 21.5$, 163 SEC. V = 137 (18 AVG)
   " " SAILING ($C_D = 1$, FRONTAL AREA), $W/C_D A = 66.7$, 72 SEC V = 241 (32 AVG)
   SC USED 13.8 FT²
8. TUMBLING BAGS ($C_D S = 20$), $W/C_D S = 112.4$, 72.7 SEC. V = 306 (42
9. STREAMING 16' CHUTE ($C_D S = 12$), $W/C_D S = 187$ 55.2 SEC. V = 403 (55
   ($C_D S = 24$), $W/C_D S = 93$ 78.3 " V = 285 (39
10. 64' CHUTE $C_D S = 1600$, W = 500, $W/C_D S = 3.13$ V = 16.5 (22
    W = 1500, $W/C_D S = 9.39$ V = 28.3 (38
    W = 2248, $W/C_D S = 14$ V = 35 (48)
11. #3 TAIL PLATE (15#) TUMBLING, $W/C_D S = 7$ (100)

$\frac{30500'}{21} = 1450$ SEC. (68) = 98,500' = 18.6 MI.