

## APPENDIX D

# WARNING INDICATORS AND MALFUNCTIONS

*Understanding the proper procedures to correct malfunctions is an essential gunner skill. There are nine different indicators on the CLU display requiring the gunner to perform some type of action. Five indications occur or can occur during normal Javelin operation. The remaining four indicate some sort of Javelin malfunction for which there are immediate action procedures for the gunner to follow.*

### Section I. WARNING INDICATORS

The warning indicators come on during normal Javelin operation. These warning indicators indicate a system failure can occur if actions are not taken to correct the warning indicator. The five warning indicators are: **NVS NOT COOL**, **NVS FOCUS ADJUSTMENT LIMIT**, **CLU BATTERY LOW**, **BCU LOW**, and **MISSILE NOT READY**.

#### D-1. NIGHT VISION SIGHT NOT COOL

The following describes what the **NVS NOT COOL** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is an amber warning indicator (Figure D-1).
- b. **Possible Reasons.** When the CLU power switch is placed in the NIGHT position during the initial power up of the Javelin, the **NVS NOT COOL** indicator comes on. It alerts the gunner that the DDC has not cooled down the NVS to its normal operating temperature. The time for the DDC to cool is normally 2.5 minutes. When the DDC has cooled down, the **NVS NOT COOL** indicator automatically turns off. If the **NVS NOT COOL** indicator comes back on after the NVS cool down, the gunner places the power switch in the DAY position and uses the day FOV to complete the mission.

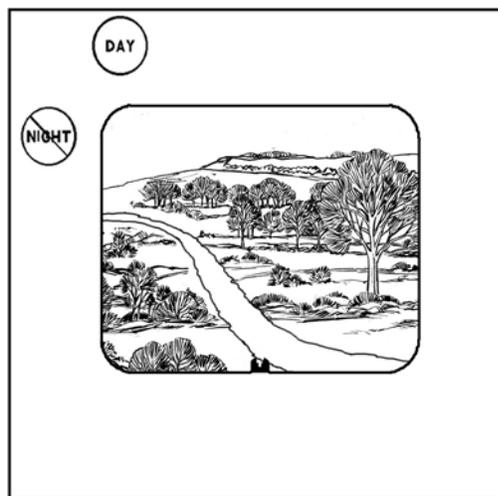


Figure D-1. Amber NVS NOT COOL indicator ON.

- c. **Gunner's Corrective Action.** See Table D-1.

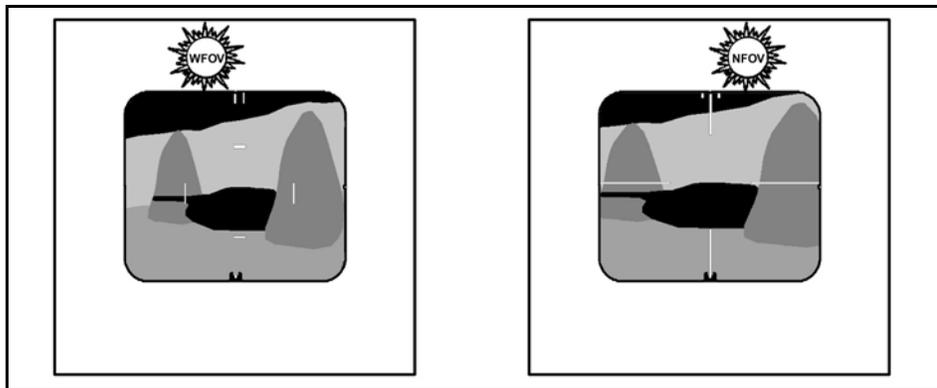
INDICATOR AMBER	MEANING	EFFECT	CORRECTIVE ACTION
ON	NVS Not Cool	WFOV and NFOV are not available for 2.5 minutes after setting power switch to NIGHT.	Use day FOV until NVS reaches cooldown.
ON	Does not go out after 2.5 minutes.	DDC not operating WFOV and NFOV not available.	Replace the CLU or use day FOV for target engagement.
OFF	Goes out after NVS reaches cooldown in 2.5 minutes.	After cooldown, WFOV and NFOV are available for use.	Use WFOV and or NFOV as desired.
ON	DDC not cooling NVS.	NVS target image may be degraded.	Place power switch in the DAY position. If problem persists, replace the CLU.

**Table D-1. Gunner corrective actions for NVS NOT cool indicator.**

**D-2. NIGHT VISION SIGHT FOCUS ADJUSTMENT LIMIT**

The following describes what the NVS focus adjustment limit indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is green and is a warning indicator (Figure D-2).
- b. **Possible Reasons.** The **WFOV** or **NFOV** flashes when the NVS reaches a focus limit (near or far).



**Figure D-2. WFOV or NFOV indicator—flashing.**

c. **Gunner's Corrective Action.** The respective **WFOV/NFOV** indicator flashes when the gunner moves the FOCUS switch in the direction of the focus limit. The gunner stops moving the switch and reverses the direction (Table D-2).

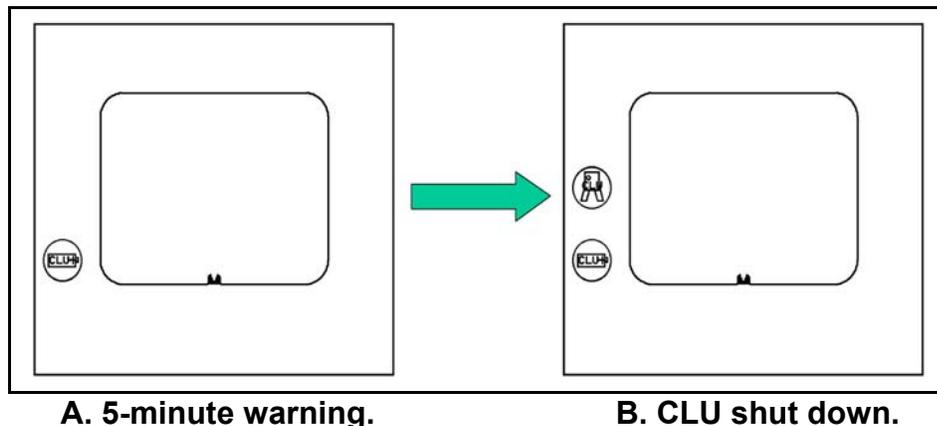
INDICATOR GREEN	MEANING	EFFECT	CORRECTIVE ACTION
Green WFOV (Flashing)	NVS Focus Limit (WFOV)	Adjust focus in the other direction.	Move the FOCUS switch in the opposite direction.
Green NFOV (Flashing)	NVS Focus Limit (NFOV)	Adjust focus in the other direction.	Move the FOCUS switch in the opposite direction.

**Table D-2. Gunner corrective action for flashing WFOV and NFOV indicators.**

### D-3. COMMAND LAUNCH UNIT BATTERY LOW

The following describes what the **CLU BATTERY LOW** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is red and is a warning indicator (Figure D-3).
- b. **Possible Reasons.** The **CLU BATTERY LOW** indicator comes on when the gunner has operated the Javelin about 4 hours. The **CLU BATTERY LOW** indicator alerts the gunner that he has about 5 minutes of operating time remaining. If the gunner continues to operate the Javelin, the CLU display automatically reverts to the day FOV.



**Figure D-3. CLU BATTERY indicator—ON.**

c. **Gunner's Corrective Action.** The gunner immediately removes the spent battery when the **CLU BIT FAILURE** indicator comes on (Table D-3).

INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
ON	CLU Battery Low  About 5 minutes until CLU power shut-down.	Seeker can be activated and missile can be launched.	Complete engagement (if in progress). If engagement is not in progress, turn CLU off, replace CLU battery, resume mission.
ON	CLU power shut-down.	CLU automatically switches to day FOV.  The CLU BIT FAILURE indicator comes on. If the spent CLU battery is not removed immediately, other indicators around the CLU display will start flashing and a clicking sound can be heard by the gunner. The missile cannot be launched.	Replace CLU battery.

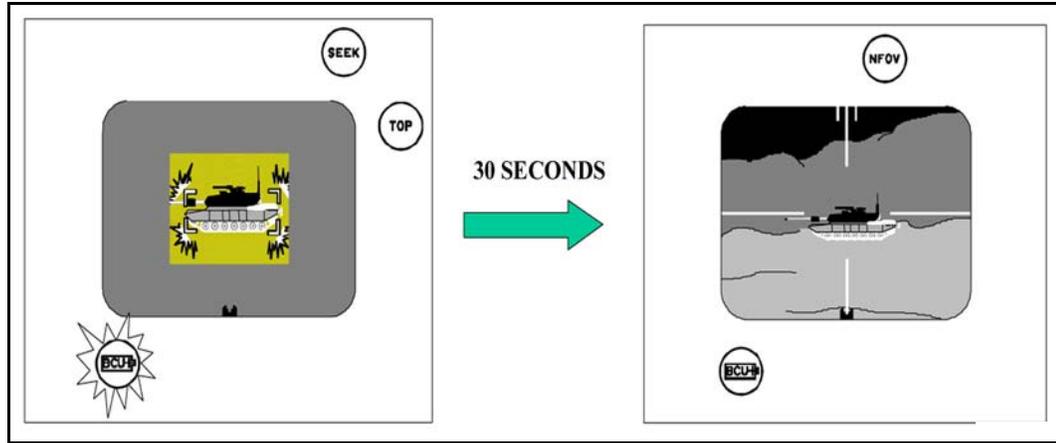
**Table D-3. CLU BATTERY LOW indicator.**

#### **D-4. BATTERY COOLANT UNIT (BCU) LOW**

The following describes what the **BCU LOW** indicator looks like (Figure D-4) and the reason the light comes on (Table D-4). The gunner takes corrective action when this light comes on.

a. **Indicator.** This light is red and is a warning indicator.

b. **Possible Reasons.** The gunner has a target in sight and is preparing to launch the missile. The gunner activates the seeker and attempts to engage the target. The BCU has about 4 minutes of life once the gunner activates it. The BCU indicator flashes when the BCU has about 30 seconds of operating time remaining. At this point, the gunner can still launch the missile. When the BCU battery is spent, the BCU indicator stops flashing and remains ON. The missile powers down, and the CLU display automatically reverts back to the previous FOV.



**Figure D-4. BCU indicator—flashing/ON.**

c. **Gunner’s Corrective Action.** See Table D-4.

INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
FLASHING	BCU Low:  BCU has about 30 seconds of operating time remaining.	Missile launch still possible before indicator stops flashing.	
ON (Solid)	BCU is expended.	Missile has no power and cannot be launched. CLU display reverts to previous FOV.	Replace the BCU. Resume the mission.

**Table D-4. BCU Low indicator—flashing and solid.**

**D-5. MISSILE NOT READY**

The following describes what the **MISSILE NOT READY** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

a. **Indicator.** This light is a multipurpose warning indicator. It can indicate a normal operation or a malfunction condition.

b. **Possible Reasons.**

(1) **Normal Operation.** When the gunner squeezes the seeker trigger and the **MISSILE NOT READY** indicator lights stays on for 10 to 15 seconds, the software download to the missile is not complete, missile BIT is not complete, seeker is not cooled down, or seeker video is not ready. After the seeker is cool and the software download is complete, the **MISSILE NOT READY** indicator goes off, and the seeker FOV is displayed on the CLU display (Figure D-5, page D-6).

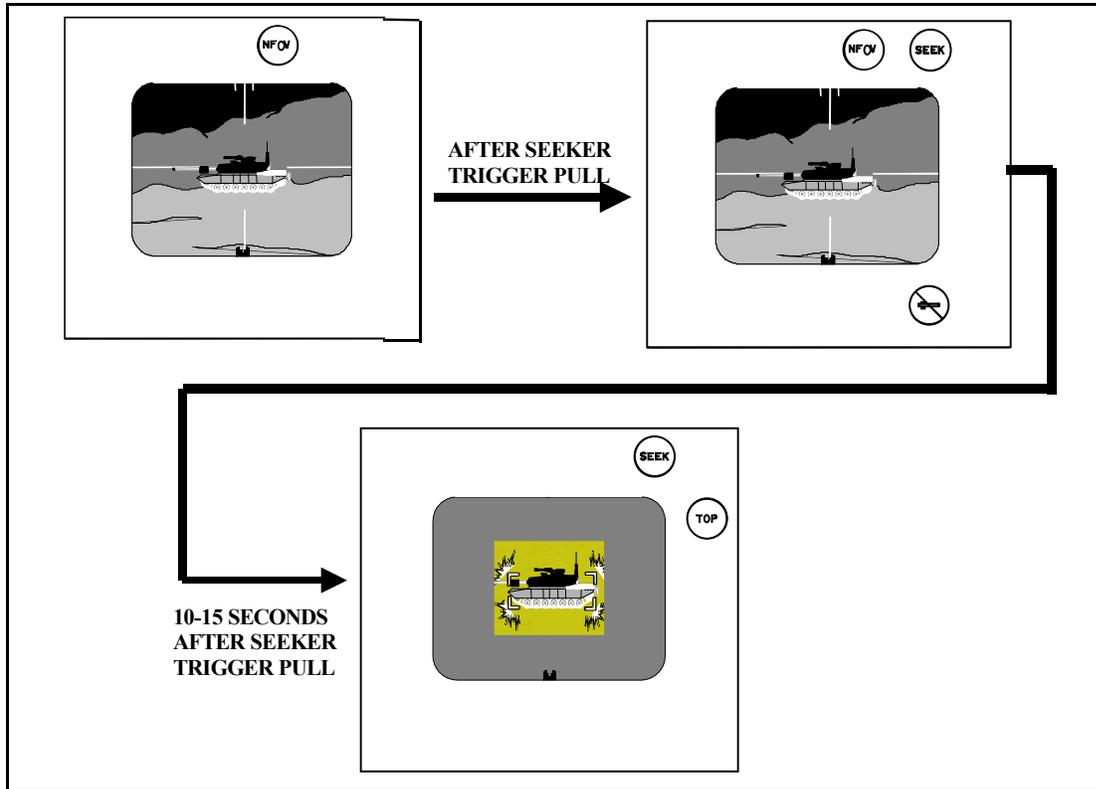


Figure D-5. NFOV to seeker FOV sequence.

(2) **Malfunctions.** If the gunner has activated the seeker and not launched the missile, it is possible that the missile will overheat when the BCU is replaced (Figure D-6).

(a) After seeker cooldown and seeker FOV is available, attempt to re-engage the target. If the BCU and the **MISSILE NOT READY** indicators start to flash, the missile is approaching an overheat condition.

(b) When the **MISSILE NOT READY** indicator goes off, the missile cannot be launched. The missile powers down, the CLU reverts to the previous FOV, and the **MISSILE BIT FAILURE** indicator comes on as a solid light.

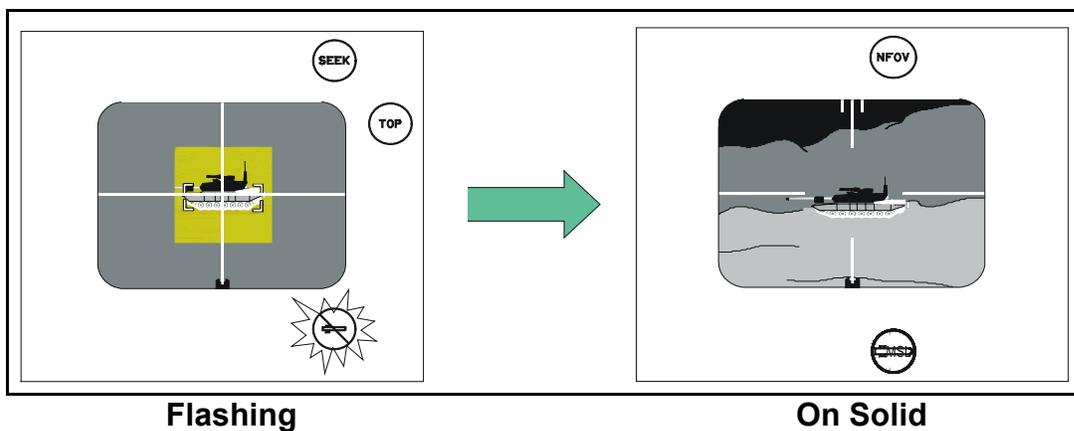


Figure D-6. MISSILE NOT READY indicator.

c. **Gunner's Corrective Action.** See Table D-5.

<b>INDICATOR AMBER/RED</b>	<b>MEANING</b>	<b>EFFECT</b>	<b>CORRECTIVE ACTIVE</b>
<p>Amber</p> <p>ON</p> <p>Stays ON</p> <p>OFF</p>	<p>Missile Not Ready</p> <p>After pulling the seeker trigger. Software download begins.</p> <p>One or all of the following may have occurred:</p> <ol style="list-style-type: none"> <li>1. Software download not completed.</li> <li>2. Missile BIT not completed.</li> <li>3. Seeker not cool.</li> <li>4. Seeker video not ready.</li> </ol> <ol style="list-style-type: none"> <li>1. Software download completed.</li> <li>2. Missile BIT completed.</li> <li>3. Seeker video available.</li> </ol>	<p>Missile cannot be launched until indicator goes off.</p> <p>Missile cannot be launched until indicator goes off.</p> <p>Missile launch available.</p>	<p>Wait for indicator to go off before attempting any track gate adjustment.</p> <p>Wait for indicator to go off before attempting any track gate adjustment.</p> <p>If indicator remains on longer than 15 seconds, replace the round.</p> <p>Track gate adjustment possible.</p>
<p>FLASHING</p> <p>OFF</p> <p>Red = (Solid)</p>	<p>After the seeker is activated, the missile begins to overheat.</p> <p>Missile has overheated.</p>	<p>Missile launch is still possible.</p> <p><b>MISSILE NOT READY</b> indicator goes off, the missile cannot be launched. Missile powers down, the CLU reverts to previous FOV, and the <b>MISSILE BIT FAILURE</b> indicator comes on solid.</p> <p>Missile cannot be launched. Missile powers down, the CLU reverts to previous FOV, and the <b>MISSILE BIT FAILURE</b> indicator comes on solid.</p>	<p>Turn off CLU. Replace the round.</p>

**Table D-5. MISSILE NOT READY indicator—ON.**

## Section II. MALFUNCTION INDICATORS

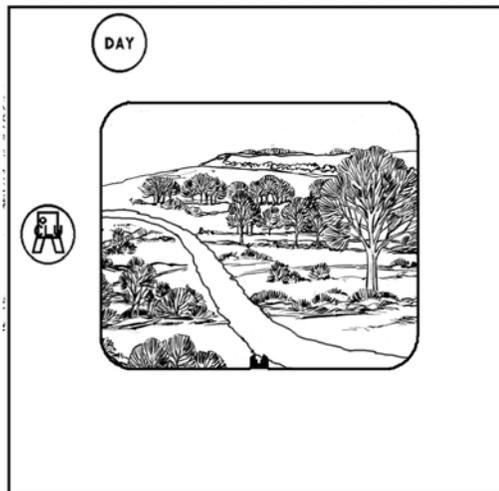
There are four malfunction indicators for which the gunner takes immediate action. These malfunction indicators are **CLU BIT FAILURE**, **MISSILE BIT FAILURE**, **MISFIRE**, and **HANGFIRE**.

### D-6. COMMAND LAUNCH UNIT BUILT-IN (CLU BIT) TEST FAILURE

The following describes what the **CLU BIT FAILURE** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is red and is a malfunction indicator.
- b. **Possible Reasons.** The **CLU BIT FAILURE** indicators light up if any or all of the following conditions exist:
  - (1) CLU fails continuous BIT.
  - (2) CLU does not initiate software download to the missile.
  - (3) CLU battery is spent and CLU reverts to day FOV (Figure D-7).

**NOTE:** If the **CLU BIT FAILURE** indicator comes on after seeker activation, attempt to launch the missile (if appropriate) and report it.



**Figure D-7. CLU BIT failure.**

c. **Gunner's Corrective Action.** If the gunner is engaging a target and has activated the seeker, complete the target engagement, if possible (Table D-6). If the gunner is not engaging a target or cannot complete the engagement, he performs the following:

- (1) Turns the power switch to the OFF position.
- (2) Removes the Javelin from the shoulder and places it on the ground with the CLU handgrips pointing up.
- (3) Keeps the Javelin pointed in the direction of the enemy target. Ensures the backblast area remains clear at all times.
- (4) Presses the latch release and disconnects the CLU from the round for use with a new CLU.
- (5) Obtains a new CLU and connects the new CLU to the round.

(6) During training situations, turns power switch, disconnects the CLU from the round, and notifies the squad leader or range safety personnel.

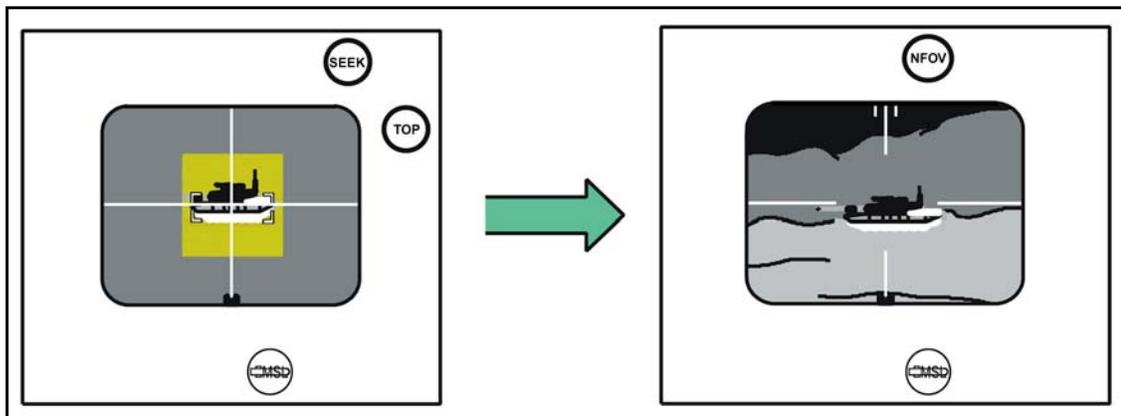
INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
ON	CLU BIT Failure  1. CLU failed continuous BIT.  2. CLU did not initiate software download to missile.  3. CLU did not complete software download to missile.  4. CLU battery spent.	Missile launch not possible.  Missile launch not possible.  Missile launch not possible.  CLU powers down and switches to day FOV.	Replace the CLU.  Replace the CLU.  Replace the CLU battery.  Replace the CLU battery.

**Table D-6. CLU BIT Failure indicator—ON.**

**D-7. MISSILE BUILT-IN TEST FAILURE**

The following describes what the **MISSILE BIT FAILURE** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is red and is a malfunction indicator.
- b. **Possible Reasons.** The missile BIT software has detected a failure in the missile (Figure D-8). When the missile fails BIT, the **MISSILE BIT FAILURE** indicator lights up, the missile powers down, and the CLU display reverts to the previous FOV. The missile must be replaced.



**Figure D-8. MISSILE BIT FAILURE indicator—solid ON.**

c. **Gunner’s Corrective Action.** See Table D-7.

INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
Red  (Solid) On	Missile BIT Failure  Missile BIT has detected a fault within the missile or CLU is not communicating with the missile.	Missile launch not possible, CLU display reverts to previous FOV.	Replace round.

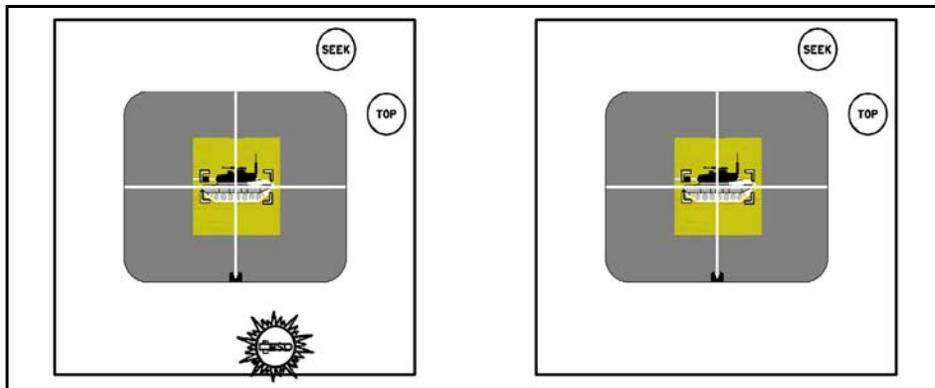
**Table D-7. MISSILE BIT FAILURE indicator—solid ON.**

**D-8. MISFIRE**

The following describes what the **BIT FAILURE** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

a. **Indicator.** This light is a red and is a malfunction indicator. The missile **BIT FAILURE** indicator may or may not be flashing.

b. **Possible Reasons.** A misfire occurs when the gunner locks onto a target, squeezes the trigger and the missile does not launch. One of two things will happen with the status indicator: no malfunction indicators or a red MSL flashes (Figure D-9). In either case the seeker FOV remains on the CLU display and the green SEEK and TOP indicators remain lit.



**Figure D-9. Misfire—with and without warning indicators.**

c. **Gunner’s Corrective Action.** (See Table D-8.) When a misfire happens after the trigger squeeze occurs with or without warning indicators, the missile does not launch. The gunner performs immediate action procedures for a misfire:

- (1) Attempts to engage the target again.
  - Releases the seeker and fire triggers.
  - Acquires the target again, if necessary.
  - Attempts to lock-on again.
  - Attempts to fire the Javelin again.

- (2) If the Javelin misfires again, the gunner:
- Turns off the CLU.
  - Places the Javelin on the ground with the CLU handgrips pointing up.
  - Keeps the Javelin pointed in the direction of the enemy target while keeping the backblast area clear.
- (3) Checks the interface connectors:
- Presses the latch release, disconnects the CLU from the round, and checks for dirt and debris.
  - Reconnects the CLU to the same round.
  - Turns ON the CLU.
- (4) Attempts to engage the target again. Repeats the procedures for step D-8c(1). If the Javelin still fails to fire:
- Turns off the CLU.
  - Grounds the Javelin, again keeping the missile pointed toward the enemy.
  - Disconnects the CLU from the round.
  - Moves at least 25 meters away from the round or moves the round 25 meters away from the firing position.
  - Stays clear of the forward and aft ends of the round at all times.
  - Obtains a replacement round and connects CLU to the new round.
  - Continues the mission.
- (5) If the misfire continues on the new round, the gunner obtains a new CLU. Always remember to replace the BCU on the round.

INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
Flashing or None			
Red (On)	Misfire	Missile may not launch.	Refer to paragraph D-8c(1).

**Table D-8. Missile Misfire indicator—with or without indicator.**

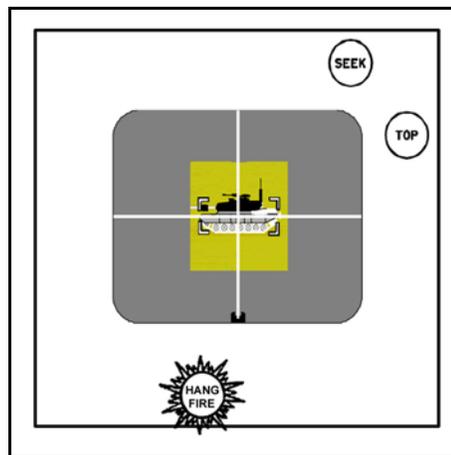
- d. **Misfire During Training Situations.** The gunner—
- (1) Announces “Misfire” loud enough for all soldiers in the immediate area to hear.
- (2) Attempts to engage the target again.
- Releases the seeker and fire triggers.
  - Acquires the target again, if necessary.
  - Attempts lock-on again.
  - Attempts to fire the Javelin again.
- (3) If the Javelin continues to misfire:
- Turns off the CLU.
  - Places the Javelin on the ground with the CLU handgrips pointing up.
  - Keeps the Javelin pointed in the direction of the enemy target while keeping the backblast area clear.

- (4) Checks the interface connectors:
- Presses the latch release and disconnects the CLU from the round.
  - Checks the CLU and round interface connector for foreign objects.
  - Connects the CLU again to the same round.
  - Turns on the CLU.
- (5) Attempts to engage the target again. Repeats the procedures for step D-8d(1). If the Javelin still fails to fire:
- Turns off the CLU.
  - Grounds the Javelin, again keeping it facing toward the target.
  - Disconnects the CLU from the round.
  - Moves the round 25 meters away from the firing position.
- (6) Notifies the range safety officer/NCO of the type of malfunction.

### D-9. HANGFIRE

The following describes what the **HANGFIRE** indicator looks like and the reason the light comes on. The gunner takes corrective action when this light comes on.

- a. **Indicator.** This light is red and is a malfunction indicator.
- b. **Possible Reasons.** A hangfire occurs when the gunner squeezes the fire trigger but the missile does not launch and the **HANGFIRE** indicator flashes on the CLU display (Figures D-10). If a hangfire occurs during a combat situation, release the fire and seeker triggers. Continue pointing the missile in the direction of the enemy target for at least 60 seconds. After waiting 60 seconds, perform the following procedures (Table D-9).



**Figure D-10. HANGFIRE indicator.**

- c. **Gunner's Corrective Action.** The gunner—
  - (1) Turns off the CLU.
  - (2) Removes the Javelin from the shoulder and places it on the ground with the CLU handgrips pointing up.
  - (3) Keeps the Javelin pointed in the direction of the enemy target. Ensures the backblast area remains clear.

(4) Removes the CLU. Presses the latch release and disconnects the CLU from the round.

(5) Moves at least 25 meters away from the round. If in a firing position, moves the round to a position at least 25 meters from the firing position. Stays clear of the forward and aft end of the round at all times.

(6) Obtains a replacement round and connects the CLU to the new round.

INDICATOR RED	MEANING	EFFECT	CORRECTIVE ACTION
Flashing	HANGFIRE  Missile does not fire.	Activated missile in LTA, could still possibly launch.	Refer to paragraph D-8c(1).

**Table D-9. HANGFIRE indicator—flashing.**

d. **Actions During Training Exercises.** The missile did not fire. The gunner—

(1) Announces “Hangfire” loud enough for everyone to hear.

(2) Keeps the missile pointed down-range. Releases the seeker and fire triggers.

(3) Waits 5 minutes before completing **HANGFIRE** procedures:

- Turns off the CLU.
- Removes the Javelin from the shoulder and places it on the ground with the CLU handgrips pointing up.

(4) Disconnects the CLU from the round.

(5) Moves at least 25 meters away from the round. If in a firing position, moves the round to a position at least 25 meters from the firing position. Stays clear of the forward end and aft end of the round at all times.

(6) Obtains a replacement round and connects the CLU to the new round.

#### **D-10. GENERAL PRACTICAL EXERCISES FOR WARNINGS AND MALFUNCTIONS**

The BST is designed to reproduce all the warning conditions and malfunctions. Trainers should include in their training exercises with as many warnings and malfunctions as time will allow. It is essential that the gunner understand exactly what is going on at all times. Battlefield conditions do not allow for hesitation; therefore, the gunner’s reaction must be automatic.