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# **SERVICE BULLETIN**

Replacement of Obsolete Single Channel Smoke Detectors

## **TFA10-26-0012**

March 25, 2013

Revision IR

### Record of Revisions

<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Approval</b>
IR	Initial Release	03-25-13	W.A. Enk Sr.

**SUBJECT:**

Cargo Smoke Detection and Fire Suppression System

**MODEL:**

B737-200, -300, -400, -500

**APPLICABILITY:**

Aircraft with AAE Supplemental Type Certificate (STC) ST01674AT/ST01114WI Installed

**COMPLIANCE:**

Recommended

**APPROVAL:**

The data referenced by the written AAE Installation Instructions for accomplishment of this SB are FAA approved

**DEFINITIONS:**

The following definitions apply to terms used in this service bulletin.

Single Channel Smoke Detector: A smoke detector with a single smoke detection channel contained in each smoke detector Line Replaceable Unit (LRU). AAE Ltd. part numbers TFC13-0023-1 or TFC13-0023-2.

Dual Channel Smoke Detector: A smoke detector with two smoke detection channels contained in each smoke detector LRU. AAE Ltd. part number TFC13-0024-3

**BACKGROUND:**

AAE's Cargo Fire Protection System (FPS) designs are installed in the lower cargo compartments of transport category aircraft, including those models listed above.

AAE's designs include configurations that are approved by the FAA and EASA where the smoke detection systems were certified using pairs of Single Channel Smoke Detectors in two loops (A loop and B loop) located in enclosures in the cargo compartment to detect smoke in the cargo compartment and send a signal to the flight deck within one minute of a fire beginning.

AAE's designs also include configurations that are approved by the FAA and EASA where the smoke detection systems were certified using individual Dual Channel Smoke Detectors that contain two loops (A loop and B loop) in each unit located in enclosures in the cargo compartment. The smoke detection systems in these configurations also detect smoke in the cargo compartment and send a signal to the flight deck within one minute of a fire beginning in the cargo compartment.

AAE's designs also add a Cargo Detection and Suppression Control Panel (CDSCP), or Cargo Detection Control Panel (CDCP) in aircraft equipped with Detection Only FPS, to the flight deck of the aircraft. The CDSCP, or CDCP, provide visual annunciation of smoke detected by any single loop in the cargo compartment, and provide visual and aural alarm when smoke is detected by any combination of an A loop and a B loop in the same cargo compartment (alarm will also be activated by detection of one loop if the other loop is inoperative within the same detector enclosure, if system is operating in single loop mode).

Single Channel Smoke Detectors are no longer available and are not eligible for overhaul or repair by any repair station.

AAE has an engineering order that will convert FPS that have been using Single Channel Smoke Detectors to use Dual Channel Smoke detectors

**PURPOSE:**

This SB recommends upgrading those configurations that use Single Channel Smoke Detectors to configurations that use Dual Channel Smoke Detectors.

This SB also provides information to the operator to assist them in determining what configuration is currently installed on the aircraft and to identify which upgrade kit part number is applicable (See Table 1).

**DISCUSSION:**

On the 737-200, -300 and -500, the FWD Cargo Compartment has two detector enclosures and the B737-400 has three detector enclosures. On the -200, -300, -400, and -500 the AFT Cargo Compartment has three detector enclosures. Each enclosure contains either two Single Channel Smoke Detectors or one Dual Channel Smoke Detector. The two channels in each enclosure are assigned, one each, to Loop A and Loop B.

The status of the detector channels in a cargo compartment is indicated on the CDSCP or CDCP by one DET LED and one FAIL LED for each channel.

When a detector senses smoke, the appropriate cargo compartment Loop (A or B) DET LED on the CDSCP or CDCP will illuminate.

When a detector fails, the appropriate cargo compartment Loop (A or B) FAIL LED on the CDSCP or CDCP will illuminate and the system automatically operates the affected enclosure in single loop mode.

A cargo fire warning will occur when any Loop A detector and any Loop B detector in the same compartment detect smoke. When operating in single loop mode, a cargo fire warning will occur if the operating detector in the affected enclosure detects smoke.

Dual Channel Smoke Detectors (AAE part number TFC13-0024-3) have been found to be highly reliable and respond more quickly to smoke in the cargo compartment than Single Channel Smoke Detectors.

Single Channel Smoke Detectors (AAE part number TFC13-0023-1 and TFC13-0023-2) are now obsolete and no longer available, and are not eligible for overhaul or repair by any repair station.

The obsolete Single Channel Smoke Detectors are approaching 15 years in service and the cost to continue to support these detectors in the AAE designs has become uneconomical. AAE has found from review of some operators' maintenance records that there are an increasing number of smoke detector failures and resultant flight interruptions and unscheduled maintenance events. AAE has found from an inspection of a sample of the affected detectors that some do not conform to AAE's type design and have been found to be defective.

For these and other reasons it is AAE's opinion that these Single Channel Smoke Detectors have reached the end of their useful life in the AAE design where their proper operation is essential for reliability and safety.

**Therefore, implementation of this Service Bulletin is highly recommended.**

**RECOMMENDED OWNER/OPERATOR ACTION:**

Identify the installed detector enclosure and, using the Table 1 below; determine which FPS Kit Upgrade is required for your aircraft. Contact AAE for confirmation of the applicable FPS Upgrade Kit Part Number; and for pricing and lead time details.

The upgrade kit(s) will include the following items:

1. New Dual Channel Smoke Detectors part number TFC13-0024-3
  2. New wire harnesses TFC03-0290-101 or Y-Harness Adapters part number TFC13-0025-101
  3. AAE Service Letter 26-3
  4. Service Letter 26-3 kit
  5. New 3 Year Warranty on upgrade parts
  6. Applicable Installation Instructions and its FAA Approved Drawings
  7. Continued Airworthiness Data Package
- Note: All core units removed and returned to AAE, LTD.

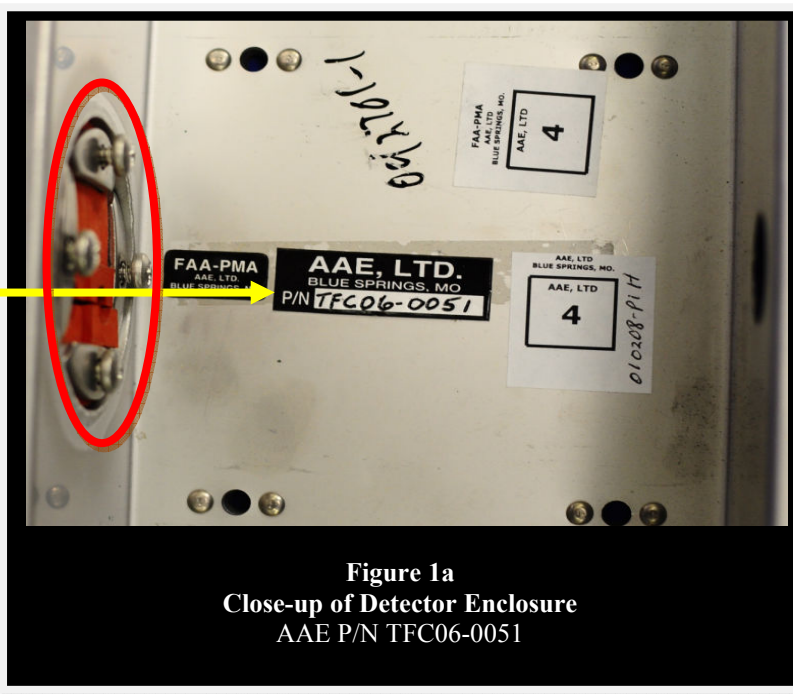
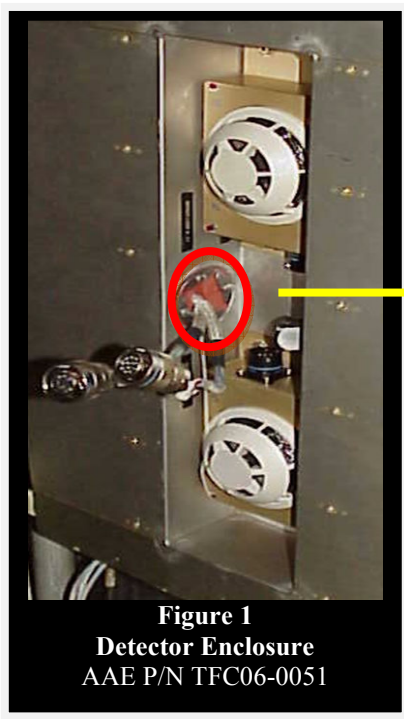
**TIME OF COMPLIANCE:**

Recommended at next scheduled maintenance check.

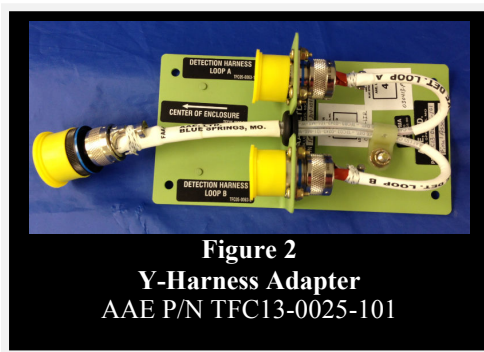
**Identification of installed Smoke Detectors and Detector Enclosures:**

The Upgrade Kits required to convert systems that are using Single Channel Smoke Detectors to systems that use Dual Channel Smoke Detectors will depend on the type of detector enclosure originally installed in the aircraft cargo compartment.

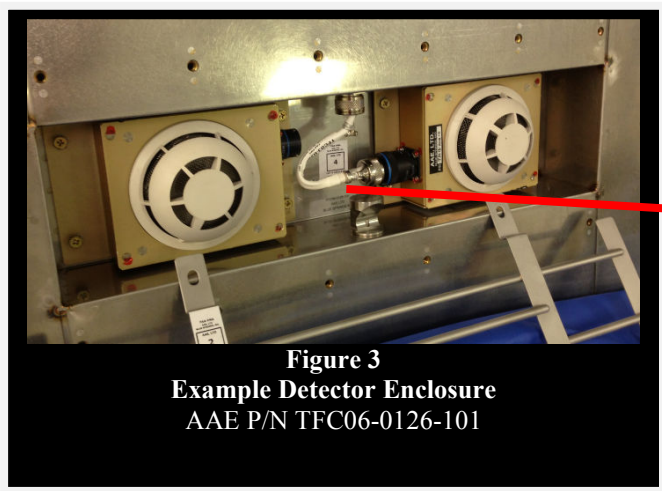
The Detector Enclosure can be identified as shown in figures 1 through 4. From the cargo compartment looking up at the center of the detector enclosure, identify the detector enclosure part number. Use Table 1 to identify the appropriate Upgrade kit for your aircraft.



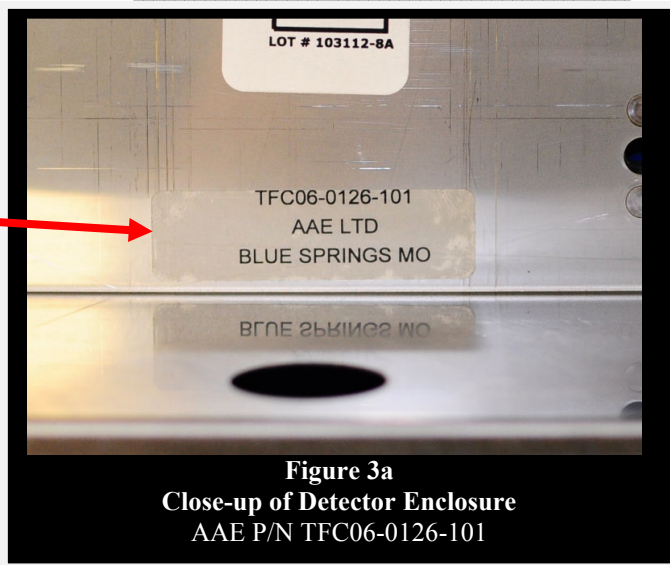
When the Detector enclosure p/n TFC06-0051 (see Figure 1 above) is installed a Y-Harness adapter, p/n TFC13-0025-101 (Figure 2) will be installed in place of one of the removed Single Channel Smoke detectors to step down the enclosure's two connectors and provide proper electrical connection to the new Dual Channel Smoke Detector.



**Figure 2**  
**Y-Harness Adapter**  
 AAE P/N TFC13-0025-101

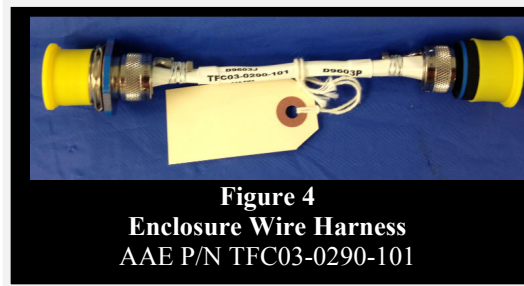


**Figure 3**  
**Example Detector Enclosure**  
 AAE P/N TFC06-0126-101



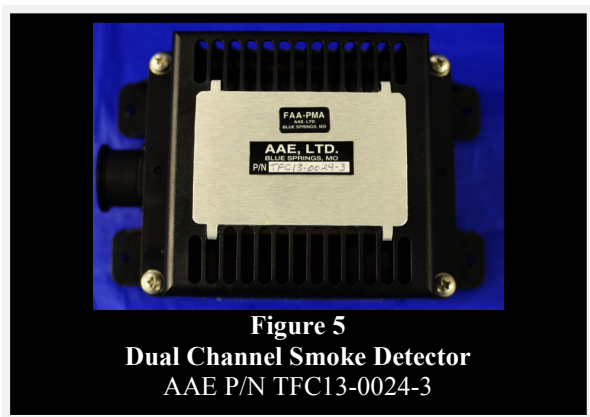
**Figure 3a**  
**Close-up of Detector Enclosure**  
 AAE P/N TFC06-0126-101

When the Detector enclosure p/n TFC06-0126-101 (see Figure 3 above) is installed a new Enclosure Wire Harness, p/n TFC03-0290-101 (Figure 4) will be installed in place of the old Y-Harness to provide proper electrical connection to the new Dual Channel Smoke Detector.



**Figure 4**  
**Enclosure Wire Harness**  
 AAE P/N TFC03-0290-101

Figures 5 and 6 below show the Dual Channel Smoke Detector and Single Channel Smoke Detectors respectively. When looking into the detector enclosure you will see either one Dual Channel Smoke Detector or two Single Channel Smoke Detectors.



**Figure 5**  
**Dual Channel Smoke Detector**  
 AAE P/N TFC13-0024-3



**Figure 6**  
**Single Channel Smoke Detector**

**TABLE 1**

Aircraft Model	Installed Detector Enclosure P/N	Required Enclosure Harness Assembly	Cargo Compartments	Required number of Dual Channel Smoke Detectors	Dual Channel Smoke Detector Upgrade Kit P/N
B737-200 Series	TFC06-0051	TFC13-0025-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG51
B737-200 Series	TFC06-0126	TFC03-0290-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG52
B737-300 Series	TFC06-0051	TFC13-0025-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG51
B737-300 Series	TFC06-0126	TFC03-0290-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG52
B737-400 Series	TFC06-0051	TFC13-0025-101	FWD/AFT	3 FWD/3 AFT	TFK B737 UG53
B737-400 Series	TFC06-0126	TFC03-0290-101	FWD/AFT	3 FWD/3 AFT	TFK B737 UG54
B737-500 Series	TFC06-0051	TFC13-0025-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG51
B737-500 Series	TFC06-0126	TFC03-0290-101	FWD/AFT	2 FWD/3 AFT	TFK B737 UG52

**MAN-HOURS:**

Time to accomplish 'UG51' Upgrade Kit is approximately 2 man/hours  
Time to accomplish 'UG52' Upgrade Kit is approximately 2 man/hours  
Time to accomplish 'UG53' Upgrade Kit is approximately 2 man/hours  
Time to accomplish 'UG54' Upgrade Kit is approximately 2 man/hours

The times shown above are estimated, actual times may vary.

**TEST EQUIPMENT**

Upon completion of this Service Bulletin, use only the Smoke Alarm & Fault Test Box **TFC20-0004A** to verify proper operation and continued airworthiness requirements. If not already in your inventory, please contact AAE for pricing and availability.

Smoke Alarm & Fault Test Box TFC20-0004 is no longer applicable and should not be used.

**CAUTION: THE USE OF SMOKE ALARM & FAULT TEST BOX TFC20-0004 ON AAE FIRE PROTECTION SYSTEMS DESIGNED TO USE TFC13-0024-3 DUAL CHANEL SMOKE DETECTORS MAY CAUSE DAMAGE TO THE SYSTEM AND CONTROL PANEL.**

**THE USE OF SMOKE ALARM & FAULT TEST BOX TFC20-0004A ON AAE FIRE PROTECTION SYSTEMS DESIGNED TO USE SINGLE CHANNEL SMOKE DETECTORS MAY CAUSE DAMAGE TO THE SYSTEM AND CONTROL PANEL.**