



ECCN
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TECHNICAL BULLETIN TB NO. AA-07126

SUBJECT: **Bell Helicopter Vibration Monitor (BHVM) Kit**
P/N 412-262-001 / 412-262-002

Bell Helicopter Vibration Monitor (BHVM) Kit w/Smartcycle+
P/N 412-262-003 / 412-262-004

MODELS AFFECTED: Bell Helicopter Textron model 412 and 412EP helicopters with subject BHVM installed in accordance with STC SR09373RC-D.

COMPLIANCE: At customer option. AAI strongly recommends the incorporation of this Technical Bulletin to improve corrosion resistance of the sensors in harsh environments.

DESCRIPTION: This Technical Bulletin is being issued to allow existing kits to be upgraded to the current configuration. The modifications aid in minimizing corrosion of the BHVM sensors and connectors.

APPROVAL: The engineering aspects of this Technical Bulletin are DAS approved.

MANPOWER: Approximately 12 Man-hours.
(Man-hours are based on hands-on time, and may vary with personnel and facilities available)

IF OWNERSHIP OF AIRCRAFT HAS CHANGED, PLEASE FORWARD THIS BULLETIN TO NEW OWNER

1.0 MATERIALS REQUIRED:

The following kit is required to comply with this bulletin and is available from Aeronautical Accessories, Inc.:

TABLE 1 – PARTS LIST
412-263-001 BHVM RETROFIT KIT

<u>Qty</u>	<u>Part Number</u>	<u>Description</u>
1	412-260-213	Tailboom Disconnect Bracket
1	412-260-235	Decal
1	412-260-237	Decal
1	412-263-121	Heat Shrink Tubing
1	412-263-123	Heat Shrink Tubing
2	412-263-125	Heat Shrink
2	412-263-127	Braid Sock
2	129-4JW8	Shrink Boot
2	CR3213-4-04	Rivet
2	CR3213-4-02	Rivet

The following documents are required to comply with this bulletin:

TABLE 2 – DOCUMENTATION REQUIRED

<u>Qty</u>	<u>Document Number</u>	<u>Description</u>
1	SB002	Dytran Service Bulletin, (Rev A, dated 11/7/07)
1	AA-04049 (Rev. D)	Instructions for Continued Airworthiness

2.0 CUSTOMER SUPPLIED MATERIALS:

The following customer supplied materials are needed to comply with this bulletin:

TABLE 3 – CUSTOMER SUPPLIED MATERIALS

<u>Qty</u>	<u>Description</u>
1	Pro-Seal P/S 890, Class B-2 – Sealant (8oz)
1	D-5015NS – Zip Chem Corrosion Preventer Compound (8oz aerosol) Product of: Zip Chem Products 400 Jarvis Drive Morgan Hill, CA 95037
1	Acid Brush (A-A-289, style optional) (Alt: Toothbrush, soft bristle; A-A-59 or A-A-123)
AR	Isopropyl Alcohol (TT-I-735)

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TABLE 3 – CUSTOMER SUPPLIED MATERIALS – CONT'D

<u>Qty</u>	<u>Description</u>
AR	Polyethylene Gloves
AR	200/300-Grit Paper
AR	Kimwipes
AR	Nonabrasive Pad (MIL-C-83957) (Alt: Abrasive Nylon Mat; MIL-A-9962, Type I)
AR	Pipe Cleaner
AR	Applicator Sticks

NOTE

If any of the required materials are unable to be obtained, contact Aeronautical Accessories, Inc.

3.0 REQUIRED TOOLS:

- Hot air type heat gun (minimum temperature setting of +194 F (+90 C))
- "Vibration exciter" (for accelerometer check) – A hand-held engraver or device capable of exciting an accelerometer to 95Hz or greater.
- Insertion/Extraction Tool, M81969/14-01

4.0 WEIGHT AND BALANCE:

Not affected

5.0 PUBLICATIONS AFFECTED:

AA-04048 Installation Instructions
AA-04049 Instructions for Continued Airworthiness

6.0 ACCOMPLISHMENT INSTRUCTIONS**WARNING**

DISCONNECT BATTERY AND EXTERNAL POWER FROM AIRCRAFT PRIOR TO PERFORMING TECHNICAL BULLETIN INSTRUCTIONS.

NOTE

Refer to Bell Helicopter Model 412 Maintenance Manual and all applicable maintenance manuals and/or ICAs for disassembly/reassembly instructions not specifically addressed in this document.

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GENERAL NOTES

- A. Verify accelerometer cable assemblies require the recommended procedure by referencing the part numbers in Table 4. If the revision level of the respective cable on the aircraft precedes the one shown below, rework the accelerometer cable per Steps 6.1 thru 6.12. If accelerometer cable assembly is the same or later, no rework is required.

TABLE 4 – ACCELEROMETER CABLE ASSEMBLIES

<u>Part Number</u>	<u>Description/Location</u>
1209-3224-CA-01-REV3	Sensor Cable Assembly / 42° Gear Box
1209-3225-CA-01-REV5	Sensor Cable Assembly / Tail Rotor Radial
1209-3226-CA-01-REV4	Sensor Cable Assembly / Tail Rotor Axial
1209-3229-CA-01-REV3	Sensor Cable Assembly / #1 Engine G/B Left Side
1209-3230-CA-01-REV3	Sensor Cable Assembly / #2 Engine G/B Right Side
1209-3231-CA-01-REV3	Sensor Cable Assembly / Hanger Bearing #1
1209-3232-CA-01-REV3	Sensor Cable Assembly / Hanger Bearing #2
1209-3233-CA-01-REV3	Sensor Cable Assembly / Hanger Bearing #3
1209-3234-CA-01-REV3	Sensor Cable Assembly / Hanger Bearing #4
1209-3235-CA-01-REV3	Sensor Cable Assembly / Xmsn T/R Quill
1209-3236-CA-01-REV3	Sensor Cable Assembly / Xmsn Top Case
1209-3237-CA-01-REV3	Sensor Cable Assembly / Rotor Brake
1209-3247-CA-01-REV3	Sensor Cable Assembly / #1 CBox, Left Side
1209-3248-CA-01-REV3	Sensor Cable Assembly / #2 CBox, Right Side

* Revision level of a cable assembly is depicted as the last character of the part number.

- B. Ensure that all electrical and hydraulic power is removed from the aircraft.
- C. Disconnect aircraft battery power.
- D. Protect open connectors with conductive plastic or metal caps.
- E. BHVM connector inspection, corrosion removal and cleaning:
1. External surface/s of connector
 - a. Visually inspect outside of connector for evidence of corrosion.
 - b. Remove any corrosion from connector by scrubbing with a nonabrasive pad, conforming to MIL-C-83957, or an abrasive nylon mat, conforming to MIL-A-9962, Type I. Ensure connector mating surface threads, shell, and mounting plate, if installed, are clean.

NOTE

If corrosion cannot be fully removed, replacement of connector may be necessary. Refer to General Note J for termination of connectors.

- c. Remove any residue using a clean cloth or cheesecloth.
 - d. Apply Isopropyl Alcohol with an acid brush or toothbrush. Scrub connector mating areas, threads, shell and mounting plates.
 - e. Remove isopropyl alcohol and residue with a clean cloth or cheesecloth. Allow all parts to air dry.
2. Internal surface/s of connector
- a. Clean internal areas of the connector, wiring and pins with Isopropyl Alcohol and an acid brush or toothbrush.

NOTE

On most connectors, it is difficult to clean and remove corrosion from the receptacle (female) contacts. If corrosion is noted, the most practical solution is to replace the pin.

- b. Wipe excess isopropyl alcohol and residue with a clean cloth or cheesecloth. Use a pipe cleaner, as required, to remove isopropyl alcohol from the pin area.
- F. Application of corrosion preventor to connector
1. After corrosion removal and cleaning, apply Isopropyl Alcohol liberally to internal and external sections of male or female connector using an acid brush. Connect and disconnect connector several times to clean. Thoroughly rinse the connector with Isopropyl Alcohol. Shake out excess solvent and wipe connector with a clean cloth or cheesecloth. Allow connector to air dry.
 2. Spray a thin coating of Zip Chem D-5015NS Corrosion Preventer Compound, conforming to MIL-C-81309, Type III, Class 2, Grade 134A to the internal sections of connector. Avoid excessive application or overspray.
 3. If possible, tilt or rotate connector down and around to drain excess corrosion preventer compound. Wipe off any additional Zip Chem D-5015NS with a clean cloth or cheesecloth.
 4. Prior to connecting the threaded sections of the connector, treat threaded areas with Zip Chem D-5015NS Corrosion Preventer Compound.

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- 5. Mate connector sections ensuring connector is fully engaged, tight and secure. Wipe off excessive Zip Chem D-5015NS with a clean cloth or cheesecloth.
- 6. Apply a film of Zip Chem D-5015NS Corrosion Preventer Compound to exterior surfaces of connector plugs and receptacles.
- G. Lockwire per NASM33540.
- H. Never perform a continuity check on accelerometers. Some test instruments may exceed the maximum allowable accelerometer current.
- I. Do not shrink connector boots over connectors until the MSPU Operational Check and Accelerometer Check have been performed and verified.
- J. Terminate connectors per the following procedure:
 - 1. Cut cable to appropriate length and strip end. The cable should be "layered" starting with bare wire, then the wire jackets, next the shield braid then finally the cable jacket. Ensure Braid Sock will extend onto the connector when installed.
 - 2. Lightly tin the end of the Braid Socks with solder to prevent unraveling. Slide the Shrink Tubing, Shrink Boot and Braid Sock on to the cable followed by the Spring Adapter.
 - 3. If replacement of connector pins is required, crimp connector pins on wires using Crimping Hand Tool, M22520/2-01, and Die, M22520/2-07. Install pins into connector using Insertion/Extraction Tool, M81969/14-01 – see Figure 4 for wiring terminations.
 - 4. Prior to connecting the threaded sections of the connector, plug or receptacle backshell, treat threaded areas with Zip-Chem D-5015NS Corrosion Preventer Compound, conforming to MIL-C-81309, Type III, Class 2, Grade 134A. Torque with strap wrench according to the following table:

Shell Size	Torque (±5 in-lbs)
11	95
13	135
15	145
19	145

- 5. Terminate twisted pair shields per Figure 5 – BHVM Wiring Schematic in ICA AA-04049.
- 6. Install the Spring Band over the portion of Braid Sock that has been slid over the Spring Adaptor.

6.1 42° GEAR BOX ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.1.1 Refer to Figure 1 for location of 1209-3224-CA-01-REV3 Sensor Cable Assembly / 42°Gear Box referenced in Table 4.
- 6.1.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.20, Step 1.
- 6.1.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.1.4 Reinstall accelerometer, if removed, per ICA AA-04049 Section 5.2.17, Steps 1-2.

6.2 TAIL ROTOR RADIAL ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.2.1 Refer to Figure 1 for location of 1209-3225-CA-01-REV5 Sensor Cable Assembly / Tail Rotor Radial referenced in Table 4.
- 6.2.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.21, Step 2.
- 6.2.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.2.4 Reinstall accelerometer, if removed, after completing Step 6.3 per ICA AA-04049 Section 5.2.18, Step 3.

6.3 TAIL ROTOR AXIAL ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.3.1 Refer to Figure 1 for location of 1209-3226-CA-01-REV4 Sensor Cable Assembly / Tail Rotor Axial referenced in Table 4.
- 6.3.2 Remove accelerometer from mounting position per ICA AA-04049 Section 5.1.21, Step 1.
- 6.3.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.3.4 Reinstall accelerometer per ICA AA-04049 Section 5.2.18, Step 2, ensuring orientation of accelerometer is oriented downward as shown in Figure 2.

6.4 ENGINE GEARBOX ACCELEROMETERS (LH/RH) ACCOMPLISHMENT INSTRUCTIONS

- 6.4.1 Refer to Figure 1 for location of 1209-3229-CA-01-REV3 Sensor Cable Assembly /#1 Engine Gearbox (Left Engine) referenced in Table 4.

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- 6.4.2 Remove accelerometer from Left Engine mounting position, if preferred, by removing Nut (3016606) and Washer (NAS1149F0332P).
- 6.4.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.4.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.12, Steps 1-3.
- 6.4.5 Refer to Figure 1 for location of 1209-3230-CA-01-REV3 Sensor Cable Assembly / #2 Engine Gearbox (Right Engine) referenced in Table 4.
- 6.4.6 Remove accelerometer from Right Engine mounting position, if preferred, by removing Nut (3016606) and Washer (NAS1149F0332P).
- 6.4.7 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.4.8 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.12, Steps 4-5.

6.5 HANGER BEARING #1 ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.5.1 Refer to Figure 1 for location of 1209-3231-CA-01-REV3 Sensor Cable Assembly / Hanger Bearing #1 referenced in Table 4.
- 6.5.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.16, Step 1.
- 6.5.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.5.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.15, Steps 1-2.

6.6 HANGER BEARING #2 ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.6.1 Refer to Figure 1 for location of 1209-3232-CA-01-REV3 Sensor Cable Assembly / Hanger Bearing #2 referenced in Table 4.
- 6.6.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.17, Steps 1-2.
- 6.6.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.6.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.16, Steps 1 and 3.

6.7 HANGER BEARING #3 ACCELEROMETER ACCOMPLISHMENT INSTRUCTION

- 6.7.1 Refer to Figure 1 for location of 1209-3233-CA-01-REV3 Sensor Cable Assembly / Hanger Bearing #3 referenced in Table 4.
- 6.7.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.18, Steps 1-2.
- 6.7.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.7.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.16, Steps 4 and 6.

6.8 HANGER BEARING #4 ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.8.1 Refer to Figure 1 for location of 1209-3234-CA-01-REV3 Sensor Cable Assembly / Hanger Bearing #4 referenced in Table 4.
- 6.8.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.19, Steps 1-2.
- 6.8.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.8.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.16, Steps 7 and 9.

6.9 TAIL ROTOR QUILL ACCELEROMETER ACCOMPLISHMENT INSTRUCTION

- 6.9.1 Refer to Figure 1 for location of 1209-3235-CA-01-REV3 Sensor Cable Assembly / Tail Rotor Quill referenced in Table 4.
- 6.9.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.10.
- 6.9.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.
- 6.9.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.11, Steps 1 and 3.

6.10 TRANSMISSION TOP CASE ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

- 6.10.1 Refer to Figure 1 for location of 1209-3236-CA-01-REV3, Sensor Cable Assembly / Transmission Top Case referenced in Table 4.
- 6.10.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.9.

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6.10.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.

6.10.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.9.

6.11 ROTOR BRAKE ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

6.11.1 Refer to Figure 1 for location of 1209-3237-CA-01-REV3, Sensor Cable Assembly / Rotor Brake reference in Table 4.

6.11.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.6.

6.11.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.

6.11.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.6.

6.12 COMBINING GEARBOX (LH/RH) ACCELEROMETER ACCOMPLISHMENT INSTRUCTIONS

6.12.1 Refer to Figure 1 for location of 1209-3247-CA-01-REV3 / Sensor Cable Assembly / #1 CBox, Left Side referenced in Table 4.

6.12.2 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.14, (Left Engine) Steps 1-2.

6.12.3 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.

6.12.4 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.13, Steps 1,2 and 4.

6.12.5 Refer to Figure 1 for location of 1209-3248-CA-01-REV3 / Sensor Cable Assembly / #2 CBox, Right Side referenced in Table 4.

6.12.6 Remove accelerometer from mounting position, if preferred, per ICA AA-04049 Section 5.1.1, (Right Engine) Steps 1-2.

6.12.7 Apply Proseal to accelerometer rubber boot per Dytran Service Bulletin SB002, Rev A, or later approved revision.

6.12.8 Reinstall accelerometer, if removed, per ICA AA-04049, Section 5.2.13, Steps 5-8.

6.13 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO TAIL ROTOR DISCONNECT BHVM P14 / BHVM J14 ACCOMPLISHMENT INSTRUCTIONS

6.13.1 Disconnect connector BHVM J14 from connector BHVM P14 on Tail Rotor Bracket Assembly.

- 6.13.2 Clean BHVM P14 connector per General Note E and apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connector and backshell per General Note F.
- 6.13.2 Carefully unpin D38999/20WB35PN Connector from BHVM J14 end of cable assembly. Remove Shrink Boot, ISO8EHSNF1104H3 Backshell, Spring Band, Braid Sock, and Heat Shrink Tubing from same end of cable. Retain D38999/20WB35PN Connector, ISO8EHSNF1104H3 Backshell and Spring Band.
- 6.13.3 Clean BHVM J14 Connector, Backshell and Spring Band per General Note E and apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of Connector, Backshell, and Spring Band per General Note F.
- 6.13.4 Slide 412-263-123 Heat Shrink Tubing, 129-4JW8 Shrink Boot, 412-263-127 Braid Sock, and 412-263-125 Heat Shrink over cable assembly end. DO NOT SHRINK AT THIS TIME.
- 6.13.5 Install previously removed Spring Band, ISO8EHSNF1104H3 Backshell and D38999/20WB35PN Connector per General Note J.

NOTE

Do not shrink connector boots or heat shrink tubing until the MSPU Operation Check and Accelerometer Check have been performed and verified.

- 6.13.6 Overlap 412-263-123 Heat Shrink Tubing .5-1.0 inches over end of 129-4JW8 Shrink Boot after boot is shrunk in place. Trim 412-263-123 Heat Shrink Tubing, if required, to provide maximum coverage of cable assembly.
- 6.13.7 Connect connector BHVM J14 to BHVM P14 and apply ProSeal P/S 890, Class B-2 Sealant where 412-263-123 Heat Shrink Tubing terminates. Allow Sealant to cure 48 hours at 77°F.
- 6.14 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO TAIL ROTOR OPTICAL TACH SENSOR DISCONNECT BHVM J17 / BHVM P17 ACCOMPLISHMENT INSTRUCTIONS**
- 6.14.1 Disconnect 1209-3241-CA-REV4 Optical Tach Sensor connector BHVM P17 from 1209-3217-CA Tail Rotor Disconnect Cable Assembly, if installed.
- 6.14.2 Visually inspect and clean both connectors externally and internally per General Note E.

- 6.14.3 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F or cap for storage after system checks are complete.

NOTE

1209-3241-CA-REV4 Optical Tach Sensor Cable Assembly must be removed from aircraft after completion of system operation checks and stored. Failure to remove can result in damage to the Optical Tach.

6.15 INSTALLATION OF TAILBOOM DISCONNECT BRACKET AND HEAT SHRINK TUBING AND APPLICATION OF CORROSION PREVENTER TO BHVM J13 / BHVM P13 ACCOMPLISHMENT INSTRUCTIONS

(Refer to Figure 3)

- 6.15.1 Disconnect cable labeled BHVM P13 from the aft side of the 412-260-147 Bracket
- 6.15.2 Disconnect connector J13 on 1209-3211-CA Tailboom Disconnect Cable Assembly from the forward side of 412-260-147 Bracket (see Figure 3) by removing the four MS35206-216 Screws and NAS1149DN416J Washers from the M85049/95-16A Mounting Flange that attaches the connector to the Bracket. Retain parts.
- 6.15.3 Visually inspect and clean connector J13 externally and internally per General Note E.
- 6.15.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connector J13 per General Note F.
- 6.15.5 Carefully remove CR3213-4-04 Rivets retaining the 412-260-147 Bracket. Remove Bracket.
- 6.15.6 Locate 412-260-213 Bracket as shown in Figure 3. Carefully remove two rivets from 212-030-106-002 Stiffener (ref.) in aircraft in area under 412-260-213 Bracket location.
- 6.15.7 Transfer .127/.133 diameter holes from Stiffener to Bracket. Coat mating surfaces of Bracket and aircraft with Sealant AMS-S-8802 and install Bracket using CR3213-4-04 Rivets. Install rivets wet with Sealant AMS-S-8802.
- 6.15.8 Fill holes left from 412-260-147 Bracket using CR3213-4-02 Rivets. Install rivets wet with Sealant AMS-S-8802.
- 6.15.9 Brush Alodine bare aluminum per MIL-DTL-5541.

NOTE

For easier installation, remove the forward most access cover on the underside of the tailboom and carefully pull Cable Assembly connector BHVM P13 aftward thru the bulkhead.

- 6.15.10 Carefully unpin D38999/26WD35PN Connector from BHVM P13 end of cable assembly. Remove Shrink Boot, ISO8EHSNF1504H3 Backshell, Spring Band, Braid Sock, and Heat Shrink Tubing from same end of cable. Retain D38999/26WD35PN Connector, ISO8EHSNF1504H3 Backshell and Spring Band.
- 6.15.11 Clean BHVM P13 Connector, Backshell and Spring Band per General Note E and apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of Connector, Backshell, and Spring Band per General Note F.
- 6.15.12 Slide 412-263-121 Heat Shrink Tubing, 129-4JW8 Shrink Boot, 1209-9201-PF Braid Sock, and TAT125-3/8-0 Heat Shrink over cable assembly end. DO NOT SHRINK AT THIS TIME.
- 6.15.13 Install previously removed Spring Band, ISO8EHSNF1504H3 Backshell and D38999/26WD35PN Connector at BHVM P13 per General Note J.

NOTE

Do not shrink connector boots or heat shrink tubing until the MSPU Operation Check and Accelerometer Check have been performed and verified.

- 6.15.14 Overlap 412-263-121 Heat Shrink Tubing .5-1.0 inches over end of 129-4JW8 Shrink Boot after boot is shrunk in place.
- 6.15.15 Re-install connector J13 on end of 1209-3211-CA Tailboom Disconnect Cable Assembly to the forward side of 412-260-213 Bracket with the M85049/95-16A Mounting Flange, four MS35206-216 Screws and four NAS1149DN416J Washers previously removed.
- 6.15.16 Apply 412-260-235 Decal to forward side of 412-260-213 Bracket and 412-260-237 Decal to aft side of Bracket (see note above and Figure 3).
- 6.15.17 Carefully feed the cable assembly thru the bulkhead hole and reattach D38999/26WD35PN Connector, with ISO8EHSNF1504H3 Backshell, to the connector on the 1209-3211-CA Tailboom Disconnect Cable Assembly installed in step 6.15.15, ensuring connector is fully engaged, tight and secure.

6.15.18 Installation of Tailboom disconnect bracket and Heat Shrink Tubing and application of corrosion preventer to BHVM J13 / BHVM P13 connector complete.

6.16 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO TRANSMISSION DISCONNECT BHVM J10 / BHVM P10 ACCOMPLISHMENT INSTRUCTIONS

- 6.16.1 Locate Transmission Disconnect Connectors BHVM J10 / BHVM P10 aftward of STA 142.13 at RBL. 15.25.
- 6.16.2 Disconnect Connector BHVM J10 from Connector P10.
- 6.16.3 Visually inspect and clean both connectors externally and internally per General Note E.
- 6.16.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F.

6.17 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO ENGINE CBOX DISCONNECT BHVM J11 / BHVM P11 ACCOMPLISHMENT INSTRUCTIONS

- 6.17.1 Locate Engine CBox Disconnect Connectors BHVM J11 / BHVM P11 aftward of STA 205.89 on Right Side Firewall Support.
- 6.17.2 Disconnect Connector BHVM J11 from Connector P11.
- 6.17.3 Visually inspect and clean both connectors externally and internally per General Note E.
- 6.17.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F.

6.18 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO LEFT SIDE ENGINE GEARBOX DISCONNECT BHVM J9 / BHVM P9 ACCOMPLISHMENT INSTRUCTIONS

- 6.18.1 Locate Left Side Engine Gearbox Disconnect Connectors BHVM J9 / BHVM P9 below aircraft connector 1J1.
- 6.18.2 Disconnect Connector BHVM J9 from Connector P9.
- 6.18.3 Visually inspect and clean both connectors externally and internally per General Note E.

- 6.18.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F.

6.19 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO RIGHT SIDE ENGINE GEARBOX DISCONNECT BHVM J18 / BHVM P18 ACCOMPLISHMENT INSTRUCTIONS

- 6.19.1 Locate Right Side Engine Gearbox Disconnect Connectors BHVM J18 / BHVM P18 below aircraft connector 1J2.
- 6.19.2 Disconnect Connector BHVM J18 from Connector P18.
- 6.19.3 Visually inspect and clean both connectors externally and internally per General Note E.
- 6.19.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F.

6.20 CORROSION INSPECTION AND APPLICATION OF CORROSION PREVENTER TO MSPU CONNECTORS J1, J2, J5, J6, J7 ACCOMPLISHMENT INSTRUCTIONS

- 6.20.1 Locate MSPU in the right rear avionics bay.
- 6.20.2 Disconnect Connectors J1, J2, J5, J6, J7.
- 6.20.3 Visually inspect and clean connectors externally and internally per General Note E.
- 6.20.4 Apply Zip-Chem D-5015NS Corrosion Preventer Compound to internal and external surfaces of connectors and reconnect per General Note F.

7.0 MSPU OPERATIONAL CHECK

- 7.1 Connect P1 to MSPU (1209-3100-FA).
- 7.2 On Control Head (1209-3300-FA) set the **MODE** switch to **AUX** and set the **STATE** switch to **FPG**.
- 7.3 Close BHVM Circuit Breaker (MS26574-5) and wait at least 2 minutes for the MSPU to boot.

NOTE

The **BIT** light on the Control Head (1209-3300-FA) will flash during the latter part of the boot cycle. The boot cycle is complete when the **RDY** lamp is illuminated.

- 7.4 Verify the **RDY** light is illuminated on Control Head (1209-3300-FA). If **RDY** light is on , proceed to Step 7.6, if not, troubleshoot as outlined in Step 7.5.
- 7.5 If lights are not illuminated on Control Head (1204-3300-FA):
- 7.5.1 Verify Pedestal Dimming is at full bright and the **MODE** switch is not in the **OFF** position.
- 7.5.2 Press the **DO** button to illuminate all lights.
- 7.5.3 Locate and observe the power LED on the side of the MSPU:

LED Status	MSPU Condition
Steady Flashing	Currently In Boot Process
Steady Illumination	Successful Boot Process
Flashing S.O.S. In Morse Code	Failed Boot Process
No Illumination	Failed MSPU Or No Power Applied

- 7.6 Check CCH Lighting as follows:
- 7.6.1 Ensure MSPU is fully booted and operational.
- 7.6.2 Position aircraft **PED** Dim switch to fully counterclockwise position (**OFF**).
- 7.6.3 Position **MODE** switch to **AUX** and **STATE** switch to **FPG**. **RDY** light on **DO** pushbutton switch should be on at full brightness.
- 7.6.4 Position aircraft **PED** Dim switch to full clockwise position (Full Bright). Note that **RDY** light is full bright and that CCH edge lit panel is fully illuminated.
- 7.6.5 Vary aircraft **PED** Dim switch position between (Full Bright) and (Full Dim).

NOTE

Both the pushbutton **RDY** light and edge lit panel vary in brightness. If brightness does not change, troubleshoot CCH lighting to **PED** Dimming wiring for proper connection.

- 7.6.6 Return **PED** Dim switch to OFF.
- 7.7 Connect the Ethernet port of a portable computer with PC-GBS Release 4.0 service pack 2a or greater using Ethernet Adaptor Cable Assembly, 1209-2094-CA and Ethernet Cable Assembly (1209-2095-CA) to BHVM J15.
- 7.8 Turn on computer and open PC-GBS.
- 7.9 Set the tail number of the aircraft as instructed in PC-GBS Help section "GBS Management Functions/Setting the Aircraft Tail Number".

NOTE

Use the five digit aircraft serial number (i.e., "33xxx" or "36xxx") in place of the aircraft registration number when setting the aircraft tail number. This helps ensure that data archived over time will continue to be associated with the aircraft if the aircraft registration number changes.

NOTE

The PC-GBS will ask to confirm the local time when connected to the BHVM. The local time should match the time piece used for the Accelerometer Check.

- 7.10 The MSPU will reboot when the tail number has been set. Disconnect Ethernet Adapter Cable Assembly (1209-2094-CA) from BHVM J15 during reboot.
- 7.11 Perform a download check:
- 7.11.1 On Control Head (1209-3300-FA) set the **MODE** switch to **XFR**.
 - 7.11.2 Insert memory stick into USB Data Port (1209-3250-SA/1209-3250-SA-2). Press the **DO** button on Control Head (1209-3300-FA) to transfer data from MSPU (1209-3100-FA), to the memory stick.
 - 7.11.3 When the **FIN** light on Control Head (1209-3300-FA) illuminates remove the memory stick.
- 7.12 Download data from the memory stick to the ground-based station.
- 7.13 Open the PC-GBS software and review the HVM component icon.
- 7.13.1 If the HVM component icon is green, proceed with accelerometer verification check.

7.13.2 If the HVM component icon is a yellow exclamation mark, double click icon and review the Corrective Action dialog box for the Sensor Results. Replace the faulty sensor or correct wiring as required.

7.13.3 If the HVM component icon is a red "X", replace MSPU.

7.14 MSPU Operational Check complete.

8.0 ACCELEROMETER CHECK

NOTE

This accelerometer check procedure requires the use of a portable computer with PC-GBS installed. If a portable computer with PC-GBS is not available, follow 9.0 Alternate Method for Accelerometer Check.

- 8.1 Turn aircraft battery power ON and wait until **RDY** light on CCH illuminates or verify that the MSPU light is on steady.
- 8.2 Connect a portable computer with PC-GBS (release 4.0 service pack 2a or greater) installed using the supplied Ethernet Adapter Cable Assembly, 1209-2094-CA, and Ethernet Cable Assembly, 1209-2095-CA to BHVM J15.
- 8.3 Start PC-GBS and press the "Collect Data" button (refer to Figure 8) to begin a data acquisition.
- 8.4 The system will prompt you for "Time Check". Verify date, time, and time zone information is correct. Select "Next" to continue. The system prompts for "Cable Connection Type". Select "Ethernet" then "Next" to continue.
- 8.5 Select Mode = AUX (refer to Figure 6), then select "Next" to continue.
- 8.6 Perform accelerometer check as follows:

NOTE

The accelerometer check is to be performed using the States and Modes in Tables 5 and 6 starting with the accelerometer at the rear of the aircraft and working forward.

NOTE

Accelerometer check requires use of "vibration exciter" – a hand-held engraver, or device capable of exciting an accelerometer to 95 Hz or greater.

CAUTION

WHEN TESTING AN ACCELEROMETER USING A HAND-HELD ENGRAVER, DO NOT ALLOW THE HARDENED ENGRAVING PORTION OF THE ENGRAVER TO COME IN CONTACT WITH THE ACCELEROMETER BODY. THIS WILL RESULT IN DAMAGE TO THE ACCELEROMETER. USE THE PLASTIC PORTION OF THE ENGRAVER CLOSEST TO THE ENGRAVING TIP TO CONTACT THE ACCELEROMETER. (REFERENCE FIGURE 10)

- 8.6.1 Select accelerometer to perform the test per the sequence specified in Table 5. Refer to Figure 5 for accelerometer surface to apply vibration source.
- 8.6.2 Hold selected sensor to the side of the vibration exciter case and turn exciter ON.
- 8.6.3 Select the acquisition State per Table 5.
- 8.6.4 Press "Measure". (Refer to Figure 7)
- 8.6.5 When the **DONE** indication is shown next to the "State" on the PC-GBS: (Refer to Figure 8)
 - 8.6.5.1 Turn vibration exciter OFF.
 - 8.6.5.2 On PC-GBS select the State previously measured.
 - 8.6.5.3 Press the display button, and then press "Spectrum"
 - 8.6.5.4 Select the sensor just tested using the "Sensor" drop down menu.
 - 8.6.5.5 View Spectrum plot to determine if sensor under test was excited. (Refer to Figure 8)

NOTE

The spectral plot should look similar to Figure 8. If not, then repeat the test or verify correct installation of wiring. Do not perform continuity tests on accelerometers due to the possibility of accelerometer damage.

- 8.6.5.6 Review downloaded spectral plot and record the peak vibration value of the sensor under test in Table 5.

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8.6.5.7 Return back to the measurement menu.

- 8.7 Select the next "State" and "Sensor" combination as outlined in Table 5 and repeat steps 8.6.1 through 8.6.5 for each accelerometer installed.
- 8.8 When you have reached the last test State and Sensor combination in Table 5; press "Finish" then "Done Measuring" to save the test data into the PC-GBS database. (Refer to Figure 9)
- 8.9 To test the remaining accelerometers listed in Table 6, perform steps 8.3 through 8.8 above.
- 8.10 Accelerometer check is completed.

TABLE 5 – ACCELEROMETER CHECK

Check Complete	Sensor	Mode	State	Spectral Peak Value
()	Tail Rotor Axial	AUX	FPG100	
()	Tail Rotor Radial	AUX	CRU	
()	42 G/B	AUX	IDLE	
()	Hanger #4	AUX	TQ	
()	Hanger #3	AUX	HOVER	
()	Hanger #2	AUX	CLIMB	
()	Hanger #1	AUX	97%	
()	#1 C-Box	AUX	VNE	
()	#2 C-Box	AUX	DES	

Note: The Accelerometer Check utilizes the States specified in this Table to prevent data from being overwritten.

TABLE 6 – ACCELEROMETER CHECK

Check Complete	Sensor	Mode	State	Spectral Peak Value
()	#1 Eng. Acc. G/B	AUX	FPG100	
()	#2 Eng. Acc. G/B	AUX	CRU	
()	XMSN T/R Quill	AUX	IDLE	
()	XMSN Top Case	AUX	TQ	
()	XMSN Rotor Brake	AUX	HOVER	
()	XMSN Input Quill	AUX	CLIMB	
()	Lat	AUX	97%	
()	Vert	AUX	VNE	
()	F/A	AUX	DES	

Note: The Accelerometer Check utilizes the States specified in this Table to prevent data from being overwritten.

9.0 ALTERNATE METHOD FOR ACCELEROMETER CHECK**NOTE**

Accelerometer check requires use of "vibration exciter" – a hand-held engraver, or device capable of exciting an accelerometer to 95 Hz or greater.

CAUTION

WHEN TESTING AN ACCELEROMETER USING A HAND-HELD ENGRAVER, DO NOT ALLOW THE HARDENED ENGRAVING PORTION OF THE ENGRAVER TO COME IN CONTACT WITH THE ACCELEROMETER BODY. THIS WILL RESULT IN DAMAGE TO THE ACCELEROMETER. USE THE PLASTIC PORTION OF THE ENGRAVER CLOSEST TO THE ENGRAVING TIP TO CONTACT THE ACCELEROMETER. (REFERENCE FIGURE 10)

- 9.1 Synchronize a watch or time piece with the PC-GBS.
- 9.2 On Control Head (1209-3300-FA) set the **MODE** switch to **AUX** and set the **STATE** switch to **FPG100**.
- 9.3 Verify the **RDY** light is illuminated on Control Head (1209-3300-FA).
- 9.4 Locate an accelerometer to check and remove if necessary.
- 9.5 Perform accelerometer check as follows:

NOTE

If more than one accelerometer is to be checked, indicate in Table 7, Accelerometer Check, the order in which sensors are excited.

- 9.5.1 Hold sensor to the side of the vibration exciter case and turn exciter ON (refer to Figure 5 for surface to apply vibration source).
- 9.5.2 On Control Head (1209-3300-FA) press **DO** button on control head and simultaneously record time in Table 7.
- 9.5.3 When the **FIN** light on Control Head (1209-3300-FA) illuminates proceed as follows:
 - 9.5.3.1 Turn vibration exciter OFF.
 - 9.5.3.2 On Control Head (1209-3300-FA) turn the **STATE** switch to the **NEW** position.

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- 9.5.3.3 On Control Head (1209-3300-FA) press the **DO** button.
- 9.6 Repeat steps 1 through 5 for each accelerometer installed.
- 9.7 On Control Head (1209-3300-FA) set the **MODE** switch to **XFR**.
- 9.8 Insert memory stick into USB Data Port (1209-3250-SA/1209-3250-SA-2). On Control Head (1209-3300-FA) press the **DO** button to transfer data from MSPU (1209-3100-FA), to the memory stick.
- 9.9 When the **FIN** light on Control Head (1209-3300-FA) illuminates remove the memory stick.
- 9.10 Download data from the memory stick to the ground-based station.
- 9.11 Open the PC-GBS software and review the accelerometer icons:
- 9.11.1 Right click the aircraft serial number icon and select "Plot Data".
- 9.11.2 Review the sensor order listed at the far right. Verify that the order listed matches the order in which the sensors were excited.
- 9.11.3 If the order listed does not match the excitation order, verify accelerometer connector pin locations at MSPU (1209-3100-FA).
- 9.11.4 Verify "Spectrum" is selected as the Graph Type and select the flight data, state and sensor to check.
- 9.11.5 Click "Plot" to create the spectral plot.
- 9.11.6 Review downloaded spectral plot. Note the time that each sensor was excited and the peak vibration in Table 7. The Peak Spectral Value for each accelerometer should have a defined peak around 60 Hz.
- 9.12 Accelerometer check completed.

TABLE 7 – ALTERNATE METHOD ACCELEROMETER CHECK

Check Complete	Sensor	Mode	State	On-A/C Time	GBS Time	Peak Spectral Value
()	Instrument Panel, Lateral	AUX	FPG100			
()	Instrument Panel, Vertical	AUX	FPG100			
()	Instrument Panel, Fore/Aft	AUX	FPG100			
()	42 Degree Gearbox	AUX	FPG100			
()	Tail Rotor, Radial	AUX	FPG100			
()	Tail Rotor, Axial	AUX	FPG100			
()	#1 (Left) Combining Gearbox, Vertical	AUX	FPG100			
()	#2 (Right) Combining Gearbox, Vertical	AUX	FPG100			
()	#1 (Left) Engine Accessory Gearbox	AUX	FPG100			
()	#2 (Right) Engine Accessory Gearbox	AUX	FPG100			
()	#1 Hanger Bearing (Most Forward)	AUX	FPG100			
()	#2 Hanger Bearing (First on Tailboom)	AUX	FPG100			
()	#3 Hanger Bearing (Mid-Tailboom)	AUX	FPG100			
()	#4 Hanger Bearing (Most Aft on Tailboom)	AUX	FPG100			
()	XMSN T/R Output Quill	AUX	FPG100			
()	XMSN Top Case	AUX	FPG100			
()	XMSN Rotor Brake	AUX	FPG100			
()	XMSN Input Quill	AUX	FPG100			

10.0 MAKE A NOTATION IN THE AIRCRAFT'S LOG TO INDICATE THAT TECHNICAL BULLETIN TB NO. AA-07126 HAS BEEN ACCOMPLISHED.

Any questions regarding this bulletin should be addressed to:

AERONAUTICAL ACCESSORIES, INC.
P.O. Box 3689
Bristol, TN 37625-3689
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techsupport@aero-access.com

AERONAUTICAL ACCESSORIES, INC.

TECHNICAL BULLETIN
BELL HELICOPTER VIBRATION MONITOR (BHVM)

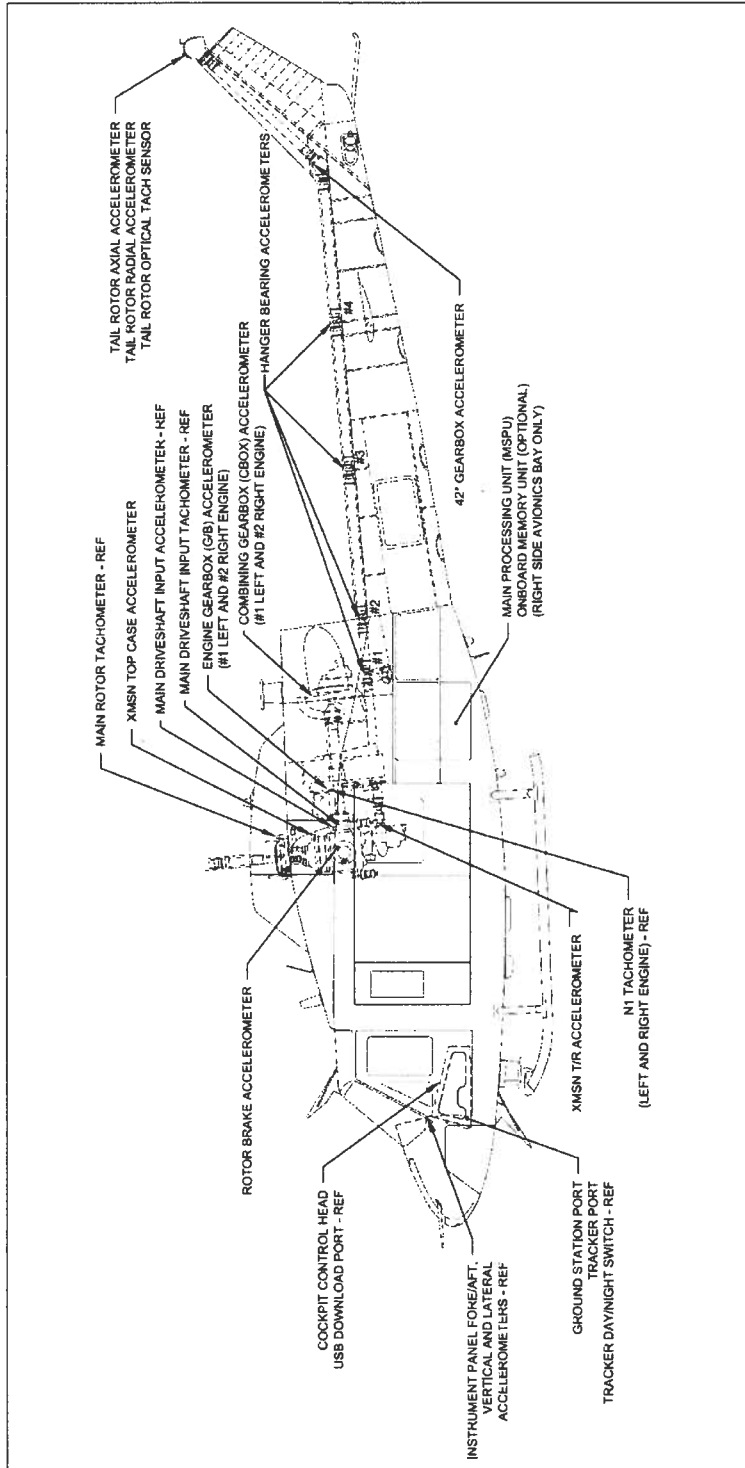


FIGURE 1 COMPONENT LOCATIONS

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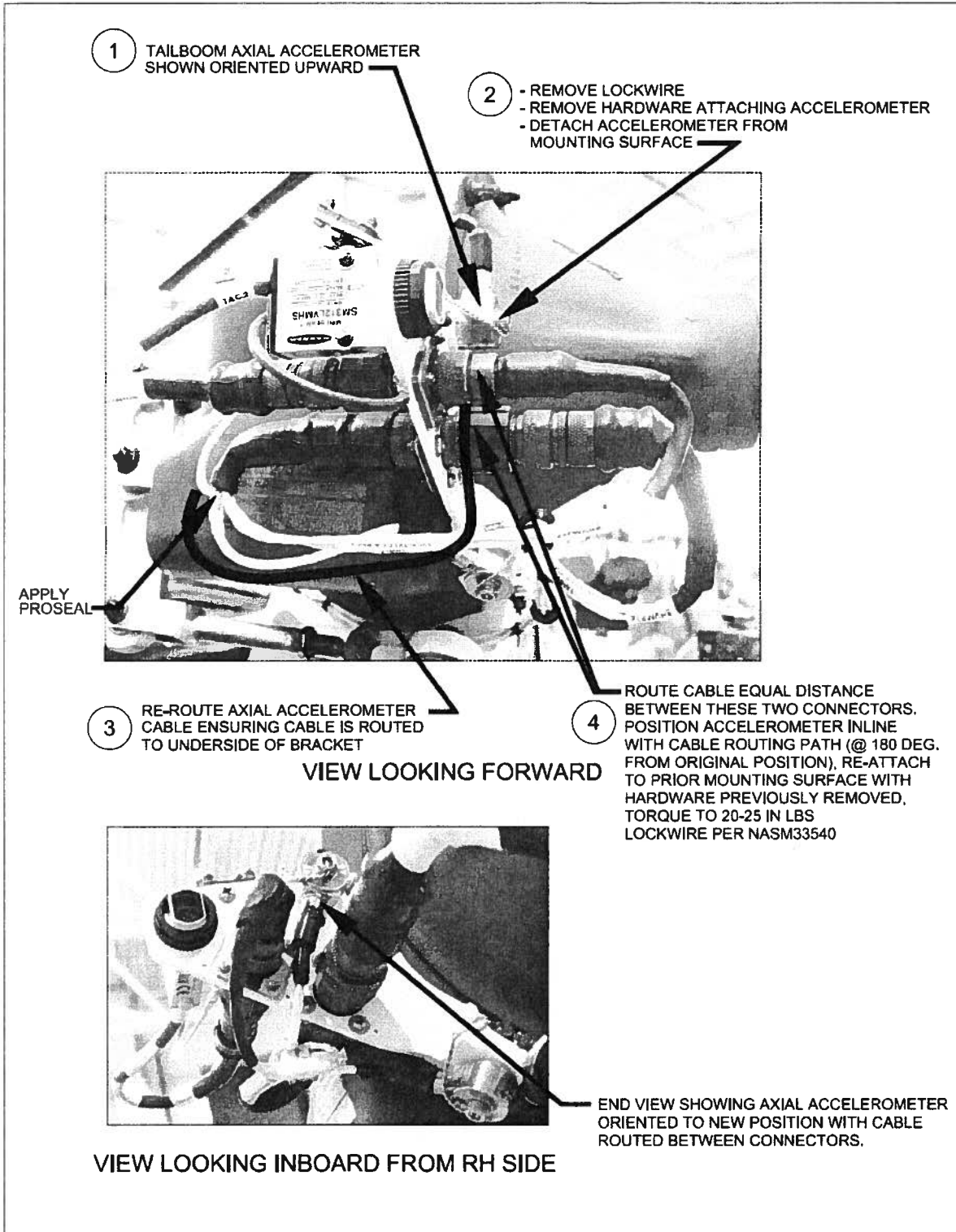


FIGURE 2 – REORIENTATION OF TAIL ROTOR AXIAL ACCELEROMETER

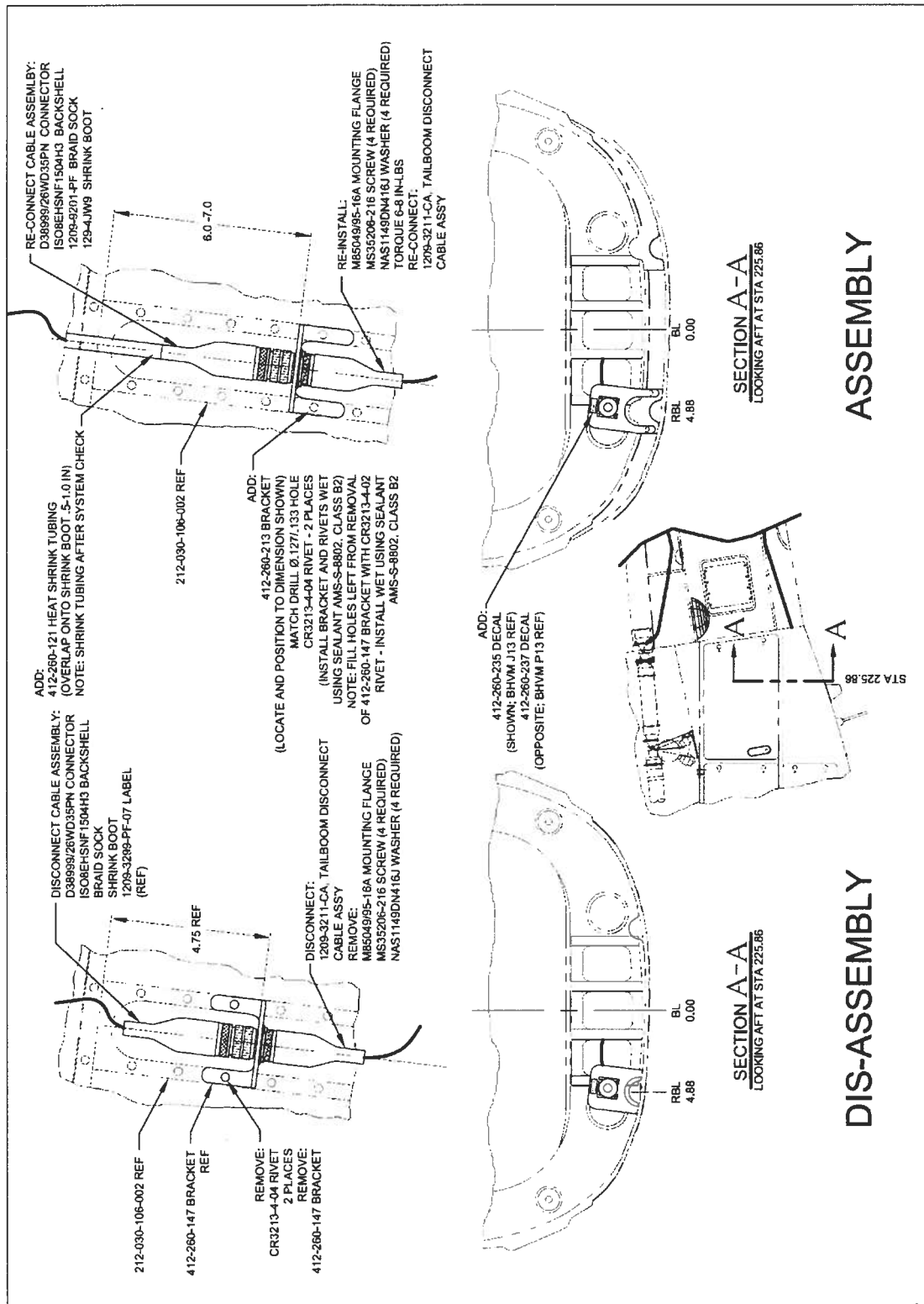


FIGURE 3 – TAILBOOM DISCONNECT BRACKET REPLACEMENT

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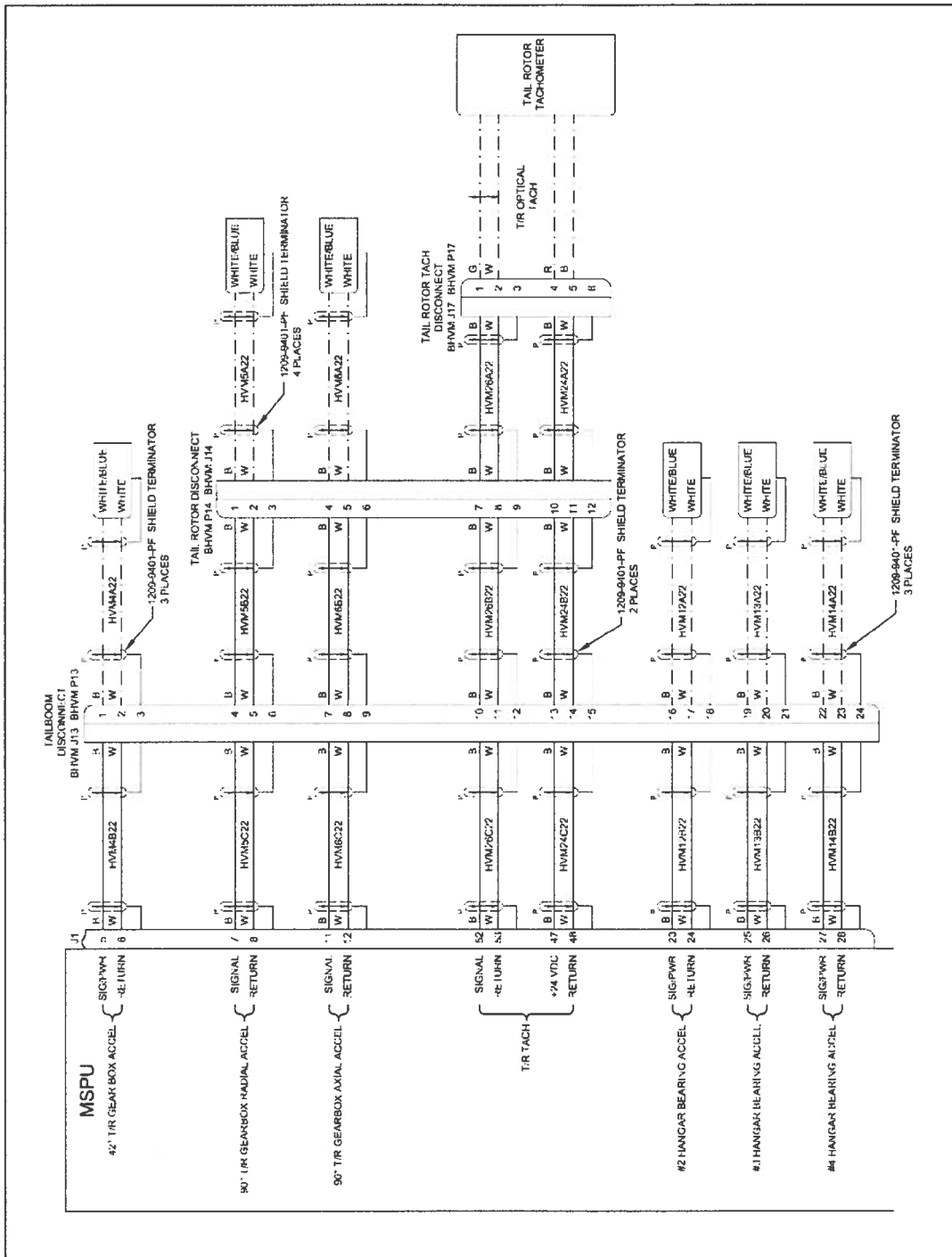


FIGURE 4 - TAILBOOM WIRING SCHEMATIC

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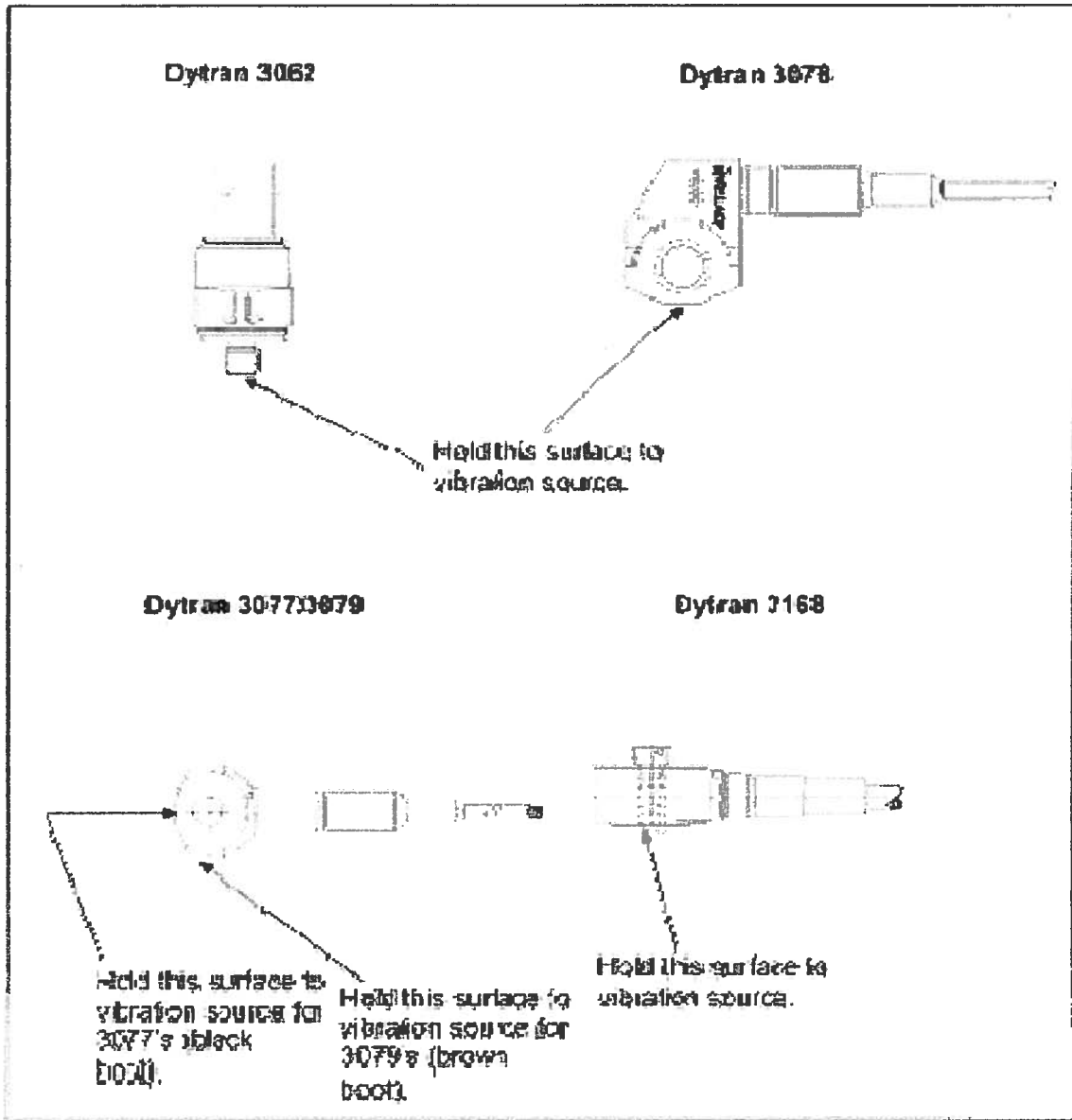


FIGURE 5 - ACCELEROMETER EXCITER ORIENTATION

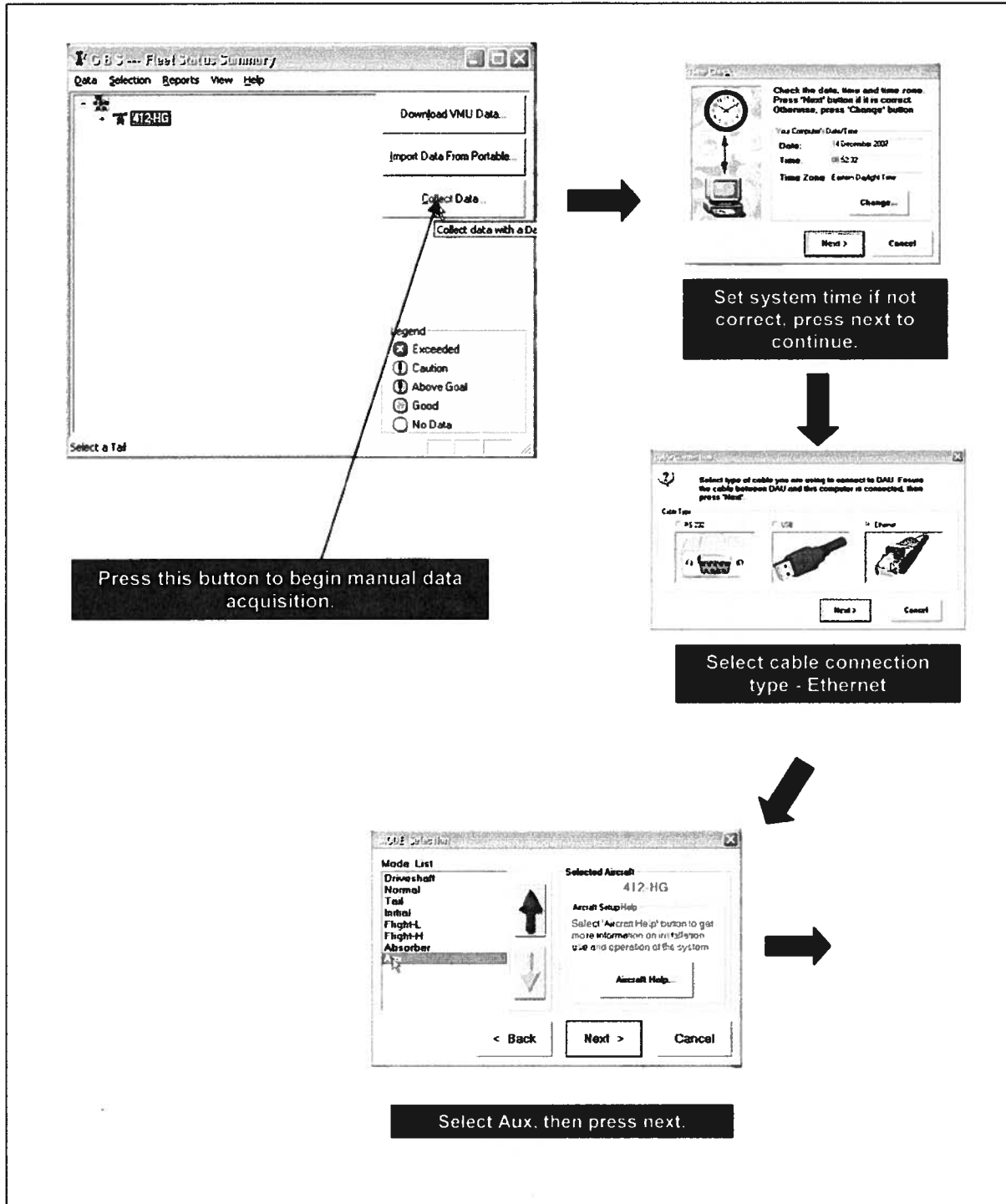


FIGURE 6 – ACCELEROMETER CHECK PROCEDURE

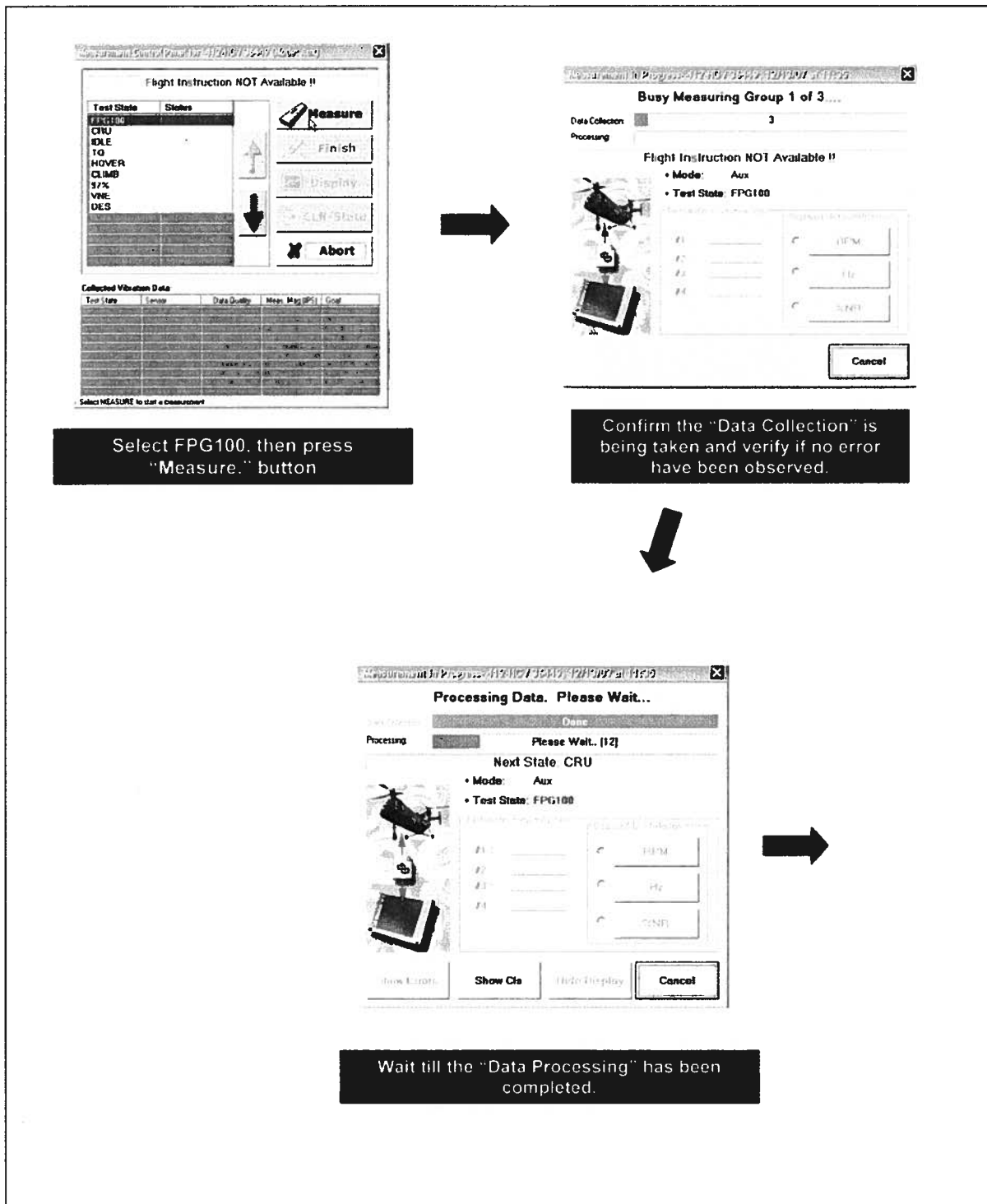
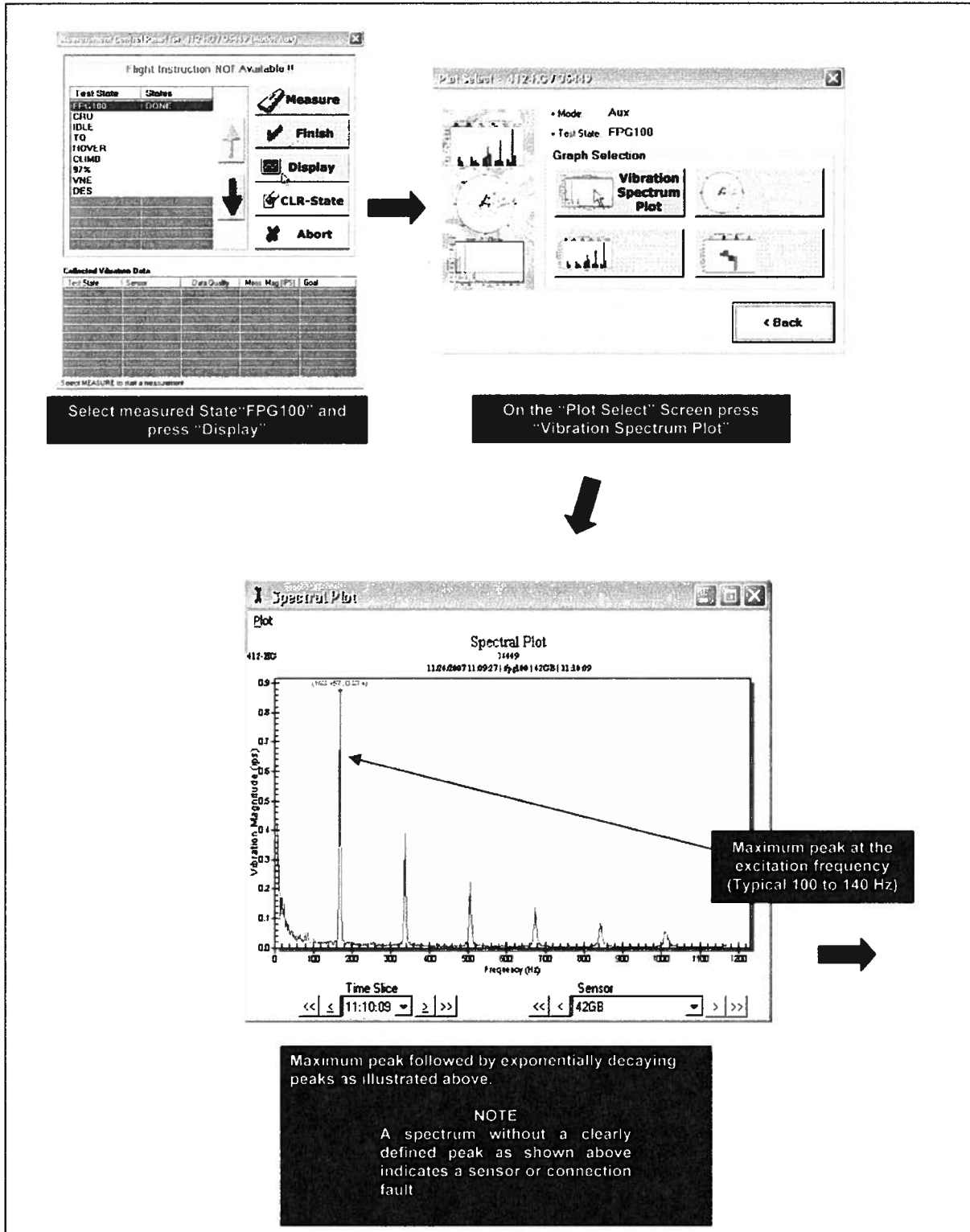


FIGURE 7 – ACCELEROMETER CHECK PROCEDURE



**FIGURE 8 – ACCELEROMETER CHECK PROCEDURE
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