Service Bulletin

SB 20-95-05

Issued: 10 July, 2002

MODEL:SR22

CIRRUS DESIGN

ATA 95-00
Replacement of CAPS Activation Cable

COMPLIANCE

Mandatory: Cirrus Design considers this Service Bulletin to be MANDATORY. Accomplish this Service Bulletin within the next 160 days.

Compliance with SB 20-95-03 (Replacement of CAPS Handle Access Cover) and SB 20-95-04 (Replacement of CAPS Handle Bracket) are prior or concurrent requirements for this Service Bulletin.

Caution: This Service Bulletin must be accomplished at the Cirrus Design factory or a Selected Authorized Service Center.

EFFECTIVITY

Cirrus Design SR20 serial numbers 1005 through 1195.

APPROVAL

FAA approval has been obtained on all technical data in this Service Bulletin that affects type design.

PURPOSE

Some production airplanes may exhibit a condition where the pull force required to activate the CAPS may be greater than desired.

The purpose of this Service Bulletin is to replace the CAPS cable activation system so that pull forces required for deployment of the parachute are well within the capabilities of a smaller person.

DESCRIPTION

This Service Bulletin contains parts to install an improved CAPS cable activation assembly, modify the existing rocket shield, modify the existing rocket cone (if applicable), and reroute the improved cable at a lower waterline than the current routing to minimize sharp turns.

WARRANTY INFORMATION

Cirrus Design will cover parts and labor costs for this Service Bulletin.

MANPOWER REQUIREMENTS

3.0 manhours.

WEIGHT AND BALANCE

Change is negligible.

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MATERIAL INFORMATION

The following kits, 70038-002 and 70038-003, are interchangeable and may be used on all affected airplanes. They are available from Cirrus Design Spare Part Sales:

Kit 70038-002 or 70038-003

Item No.	Part Number	Description	Quantity
1	15047-003	Cable Activation Assembly	1
2	MS24694-S53	Screw (for mounting handle)	2
3	51191-201	Shoulder Washer (for mounting handle)	2
4	NAS1149F0363P	Washer (for mounting handle)	2
5	MS21044N3	Nut (for mounting handle)	2
6	15049-001	CAPS Decal, External	1
7	50132-001	Tie Down	2
8	70038-103	Modified Tie Down	1
9	MS3367-1-9	Strap, Tie Down	7
10	51192-125	Grommet (for CAPS Bucket)	1
11	50602-001	3M Two-sided Tape Primer	A/R
12	50805-040	Aluminum Tape	50"
13	15045-001	CAPS Routing Placard	3
14	50943-025	Anti-Chafe, Corrugated Loom	42"
15	50892-001	Rub Strip	9"

ACCOMPLISHMENT INSTRUCTIONS

A. Preparation (See Figure 1)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Cable Cutter	Felco C7	Wicks Aircraft Supply Highland, Ill. 1-800-221-9425	Cutting Caps Activation Cable.
Catch Cloth	N/A	Any Source	Facilitate Removal.

2. Remove CAPS handle access cover.
3. Install CAPS handle safety pin.
4. Remove key from ignition.
5. Ensure BATTERY and AVIONICS master switches are in the OFF position.

Caution: Ensure hands are clean while working with headliners and trim pieces.

6. Remove forward seats.
7. Remove bulkhead 222 (BH 222) trim panel and carpet.
8. Remove access panels CB6 and CB7 from BH 222.
9. To prevent debris and components from falling into bottom of empennage, place catch cloth against inner wall of fuselage and below rocket and parachute assembly.

Warning: Employ extreme caution when working around non-safetied, armed rocket motor.

10. Reaching through access panel CB6, use cable cutter to cut CAPS activation cable approximately 12 inches (30.4 cm) below rocket shield.
11. Remove LH rear headliner. (Refer to AMM 25-10
12. If applicable, remove fasteners securing LH section of cabin headliner to fuselage.
13. Remove LH and RH cabin flood light assemblies. (Refer to AMM 33-10
14. Pull LH door seal away from top edge of door frames.
15. If applicable, slit tape securing LH headliner to door frame.
16. Remove LH B-pillar trim. (Refer to AMM 25-10)
17. Remove CAPS handle recess trim. (Refer to AMM 25-10)
18. Gently pull LH portion of cabin headliner down from ceiling to gain access to CAPS activation cable.

B. Remove Existing CAPS Activation Cable (See Figure 2)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Side Cutter, Short Handle	N/A	Any Source	Remove Cable Ties.
Catch Cloth	N/A	Any Source	Facilitate Removal of Adel Clamp.
Telescoping Magnet	N/A	Any Source	Retrieval.
Small Knife	N/A	Any Source	Facilitate Removal of Bracket Attach Screws.

Note: To facilitate screw removal, push attaching screws up to break filler covering screw heads and use a small knife to remove remaining filler.

2. Remove nuts, washers, and screws securing CAPS activation handle and cable assembly to fuselage and discard.
3. Locate, cut, and remove all cable ties securing activation cable to the fuselage ceiling.
4. If Service Bulletin SB 20-95-02 has not been completed, remove cable clamp behind BH 222:
   (a) Using a 1/4-inch ratchet with 1/4-inch socket, reach up through lower access panel, and place socket onto locknut. Using right hand and a long 12-point, 3/8-inch box end wrench, place wrench over head of bolt and loosen locknut until locknut can be removed by hand.
   (b) Using the telescoping magnet, remove mounting bolt, large area flat washer, flat washer, and locknut.
   (c) Spread adel clamp free of activation cable and remove clamp.
5. Remove cable grommet from BH 222.
6. Remove forward portion of activation cable from airplane.

C. Attach Improved CAPS Activation Cable Assembly (See Figure 2)

The following procedure contains instructions for attaching the improved cable assembly to the fuselage only. Routing and attachment to the rocket assembly are covered later in the Service Bulletin.

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Spot Putty	50770-001	Cirrus Design	Filler.

2. Position activation cable handle bracket over mounting holes and secure to fuselage ceiling installing new screws, washers, and nuts. Torque to 15.0 - 20.0 inch-pounds (1.7 - 2.2 Nm).

   Note: Ensure spot putty application and sanding does not extend beyond area of installed CAPS decal.

3. From outside, fill screw holes with spot putty and let dry.
4. Lightly sand spot putty covering screws holes and clean with isopropyl alcohol.

5. To prevent spot putty from bleeding through CAPS decal, apply a thin coat of white paint over spot putty.
6. Apply CAPS decal over screw holes.

D. Make 222 Bulkhead Cable Pass-Through (See Figure 1)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Hole Saw	3/4"	Any Source	Shield Modification.
5-Minute Epoxy	50080-001	Cirrus Design	Bonding.

2. Locate LH footman loop installed to BH 222.

   Note: Temporarily remove any hook and loop fastener or carpet trim that may interfere with drilling 222 Bulkhead Cable Pass-Through.

3. Locate approximate midpoint between footman loop mounting holes and mark this location.
4. Directly right of mark just made, locate BH 222 Fuselage bonding flange. Measure 0.50 inches (1.3 cm) inboard from beginning of flange radius and mark this location. Mark should be centered and outboard of footman loop mounting holes.
5. Measure 0.31 inches (7.9 cm) above mark just made and mark this location.
6. Measure 0.63 inches (1.6 cm) below mark just made and mark this location.
7. Using a 1/4-inch drill bit, drill upper and lower marks.
8. Using a 3/4-inch (1.9 cm) hole saw, final drill marks so overlapping holes make elongated cable pass-through hole.
9. Apply a thin coat of 5-Minute Epoxy around inside circumference of cable pass-through hole to seal foam core.

E. Remove Rocket Assembly, Modify Rocket Shield and Rocket Cone (See Figure 1 and 3)

Warning: Employ extreme caution when working around non-safetied, armed rocket motor.

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Cardboard	1' x 1'	Any Source	Facilitate Removal.
Die Grinder	N/A	Any Source	Shield Modification.
Sanding Band	1/2", Diamond Grit	Any Source	Shield Modification.
Silicon Sealant	50435-736	Cirrus Design	Facilitate Installation.

2. While supporting rocket assembly, remove bolts and washers securing shim(s), backing plate, and rocket motor assembly to BH 222.

   Note: To prevent rocket assembly from snagging on parachute, wedge cardboard between rocket assembly and parachute.

3. Carefully slide rocket assembly from behind BH 222 so that top of rocket assembly is exposed.
4. Remove nylon shear screws securing rocket lanyard from rocket motor launch tube and remove rocket lanyard from rocket motor.
5. Remove rocket assembly from airplane.
6. If applicable, remove silicon from bottom lip of rocket shield.
7. Remove access hole plug from rocket cone and discard.
8. Remove screw and washer securing actuation cable to firing pin actuator and discard.
9. Unscrew cone adapter and activation cable remnant from rocket cone and discard.
10. Position rocket assembly so attach bracket is up.
11. Locate maximum slot distance by measuring 1.9 inches (4.8 cm) from bottom of shield and 2.1 inches (5.3 cm) to left and mark this location.

    Caution: Control dust migration when cutting/sanding rocket shield slot.

12. Using die grinder and diamond grit sanding band, grind slot into rocket shield so bottom slot width is 1.0 inch (2.5) on center of reference line and top slot width is 0.35 inch (8.8 mm) on center of reference line.
13. Check fit between slot and activation cable grommet.
14. Modify existing rocket cone using rocket cone drill fixture:
    (a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Rocket Cone Drill Fixture	T2068	Cirrus Design	Rocket Cone Mod.
Drill Bit	No. 3	Any Source	Drilling.

    (b) Remove cotter pin securing alignment pin to drill fixture.
    (c) Position rocket cone in drill fixture, install alignment pin through existing installation hole, and install cotter pin.

    Caution: Slide rocket cone in drill fixture to ensure neck of rocket cone is pressed tightly against drill fixture before drilling.

    (d) Clamp rocket cone drill fixture to workbench.
    (e) Using a power drill and #3 drill bit, drill new installation holes.
    (f) Deburr new installation holes.

F. Install Improved CAPS Activation Cable (See Figure 4 and 5)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Sandpaper	100 Grit	Any Source	Sanding.
5-Minute Epoxy	50080-001	Cirrus Design	Bonding.
Two-Sided Tape Primer	50602-001	Cirrus Design	Facilitate Installation.

2. To determine location of forward cable tie anchor, from center of roll cage cross member, measure 3.25 inches (8.3 cm) left of airplane centerline and mark this location.
3. To determine location of middle cable tie anchor, from aft edge of roll cage cross member, measure 12.0 inches (30.4 cm) aft and mark this location. Using mark just made, measure 5.5 inches (14.0 cm) left of centerline and mark cable tie location.

   Note: If Stormscope or Skywatch installed, remove small square of foil where cable tie anchors will be placed and remove any foil adhesive with isopropyl alcohol.

4. Using 100-grit sandpaper, lightly sand area where forward and middle cable tie anchor will be placed.
5. Using 100-grit sandpaper, lightly sand base of each cable tie anchor.
6. Solvent clean forward and middle cable tie anchor locations with isopropyl alcohol.
7. Solvent clean base of forward and middle cable tie anchor with isopropyl alcohol.
8. Using 5-Minute Epoxy, install forward and middle cable tie anchors.
9. Install grommet to cable pass-through hole in CAPS bucket.

   Note: If Stormscope or Skywatch installed, route activation cable above antenna cables.

10. Route activation cable through improved BH 222 cable pass-through and up through LH cable pass-through hole in CAPS bucket.
11. Loosely attach activation cable to forward and middle cable tie anchors with cable ties.
12. To determine final installation location, temporarily position aft cable tie anchor (p/n 70038-103) to BH 222 flange. Locate aft cable tie so chamfer faces flange and cable will not bind or kink when cable tie is installed.
13. Using 100-grit sandpaper, lightly sand area where aft cable tie anchor will be placed.
14. Using 100-grit sandpaper, lightly sand base of aft cable tie anchor.
15. Solvent clean aft cable tie anchor locations with isopropyl alcohol.
16. Solvent clean base aft cable tie anchor with isopropyl alcohol.
17. Using 5-minute Epoxy, install aft cable tie anchor.
18. Between middle and aft cable ties, solvent clean with isopropyl alcohol and apply two-sided tape primer 3.0 inches (7.6 cm) either side of activation cable routing leaving the last three-inch section, just forward of aft cable tie anchor, uncovered.
19. Loosely attach activation cable to aft cable tie anchor with a cable tie.

   Caution: Verify activation cable routing is correct, is free and clear of other components, and activation cable does not contact edges of improved BH 222 cable pass-through hole.

20. Cut aluminium tape into three sections and install aluminium tape over activation cable leaving the last three-inch section of activation cable, just forward of aft cable tie anchor, uncovered.
21. Ensure activation cable is routed through shield slot, install cable grommet, and secure with silicon sealant.
22. Install CAPS routing placards along new cable route.
23. Install approximately 24.0 inches (61.0 cm) of corrugated loom to aft portion of activation cable behind BH 222 so that cable will not chafe on static lines or improved BH 222 cable pass-through hole.
24. Install approximately 18.0 inches (45.7 cm) of corrugated loom to forward portion of activation cable so that cable will not chafe on speaker or antenna installations.

G. Operational Check - CAPS Activation Cable (See Figure 6 and 7)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
CAPS Activation Cable Test Fixture	ST277	Cirrus Design	Operational Check.

2. Position bulkhead component of test fixture to BH 222 and secure with knurled nuts.
3. Insert activation cable loop into test fixture tube and position cable over test fixture hook.
4. Screw activation cable cone adapter to test fixture.
5. Route test fixture wiring forward to passenger seat.
6. Connect bulkhead component wiring to control unit.
7. Position test fixture claw over activation handle.
8. Turn control unit switch to ON.
9. Clasp both hands around T-bar on test fixture claw and pull straight out using a steady motion.
10. Verify power unit reads green indicating correct CAPS activation cable installation.
11. If power unit reads red, verify activation cable routing is correct and clear of other components.
12. Re-check CAPS Activation Cable.
13. If power unit reads red a second time, contact Cirrus Design for disposition. Otherwise, remove test fixture components from airplane.

H. Install Rocket Assembly (See Figure 4 and 5)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Sandpaper	100 Grit	Any Source	Sanding.
5-Minute Epoxy	50080-001	Cirrus Design	Bonding.
Silicon Sealant	50435-736	Cirrus Design	Facilitate Installation.
Cardboard	1' x 1'	Any Source	Facilitate Installation.

Warning: Ensure CAPS handle safety pin is installed.

Note: To prevent rocket assembly from snagging on parachute, place cardboard between rocket assembly and parachute during installation.

2. Remove screws securing rocket cone to rocket motor igniter.
3. Gently rotate firing pin actuator so that screw head attaching activation cable to firing pin actuator will be visible through rocket cone inspection hole when installed.
4. Apply thread lock and install screws securing rocket cone to rocket motor igniter.
5. Apply thread lock to screw securing CAPS activation cable to firing pin actuator.
6. Insert cable loop into firing pin actuator slot on rocket motor igniter and using a magnetized screwdriver, install screw and washer to firing pin actuator slot.

Warning: **Activation of rocket igniter requires 25 lb (11.25 kg) pull force. The following verification is meant only to ensure firing pin capture. A very slight pull force (0.25 lb (0.113 kg)) is all that is required to verify capture.**

7. Slightly pull cable projecting from rocket motor assembly base to verify firing pin capture.
8. Using thread lock, attach cone adapter to rocket cone.
9. Install access hole plug to rocket cone.

Caution: Do not overtighten nylon shear screws.

Warning: **Position rocket lanyard around top circumference of rocket motor launch tube, NOT over top of launch tube. Failure to comply will absolutely FAIL rocket deployment! Refer to Figure 5 for correct lanyard orientation.**

10. Position rocket lanyard over rocket motor launch tube and install nylon shear screws

Warning: **Ensure rocket lanyard is position around top circumference of rocket motor launch tube, NOT over top of launch tube.**

11. Position rocket motor assembly, shim, and backing plate to BH 222. Install bolts, washers, and safety wire (if applicable).
12. At BH 222 opening, install rub strip along RH edge of opening.

I. Post Installation

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Teflon Tape,1-inch	Telfease MG2A 1"	Airtech International Inc.	Sealing.
Headliner Fasteners	51158-001	Cirrus Design	Headliner Install.

2. Using a vacuum cleaner, remove all debris from fuselage floor and belly.
3. Verify no loose or missing hardware is present.
4. Position cabin headliner to ceiling and install CAPS handle recess trim.
5. Install LH B-pillar trim.
6. Install tape securing headliner to door frame.
7. Install LH and RH door seal to top edge of door frames.
8. Install LH and RH cabin flood light assemblies.
9. Install LH rear headliner.
10. Remove catch cloth from below rocket and parachute assembly.
11. Install access panels CB6 and CB7 from BH 222.
12. Install BH 222 trim panel and carpet.
13. Install forward seats.
14. Remove CAPS handle safety pin and install CAPS handle access cover.
15. Complete airplane records by recording new CAPS Activation Assembly serial number in airplane log book and noting compliance with SB 22-95-05. Send Compliance Response Card, serial number of replaced CAPS Activation Assembly, and the replaced CAPS Activation Handle to Cirrus Design as proof of compliance.

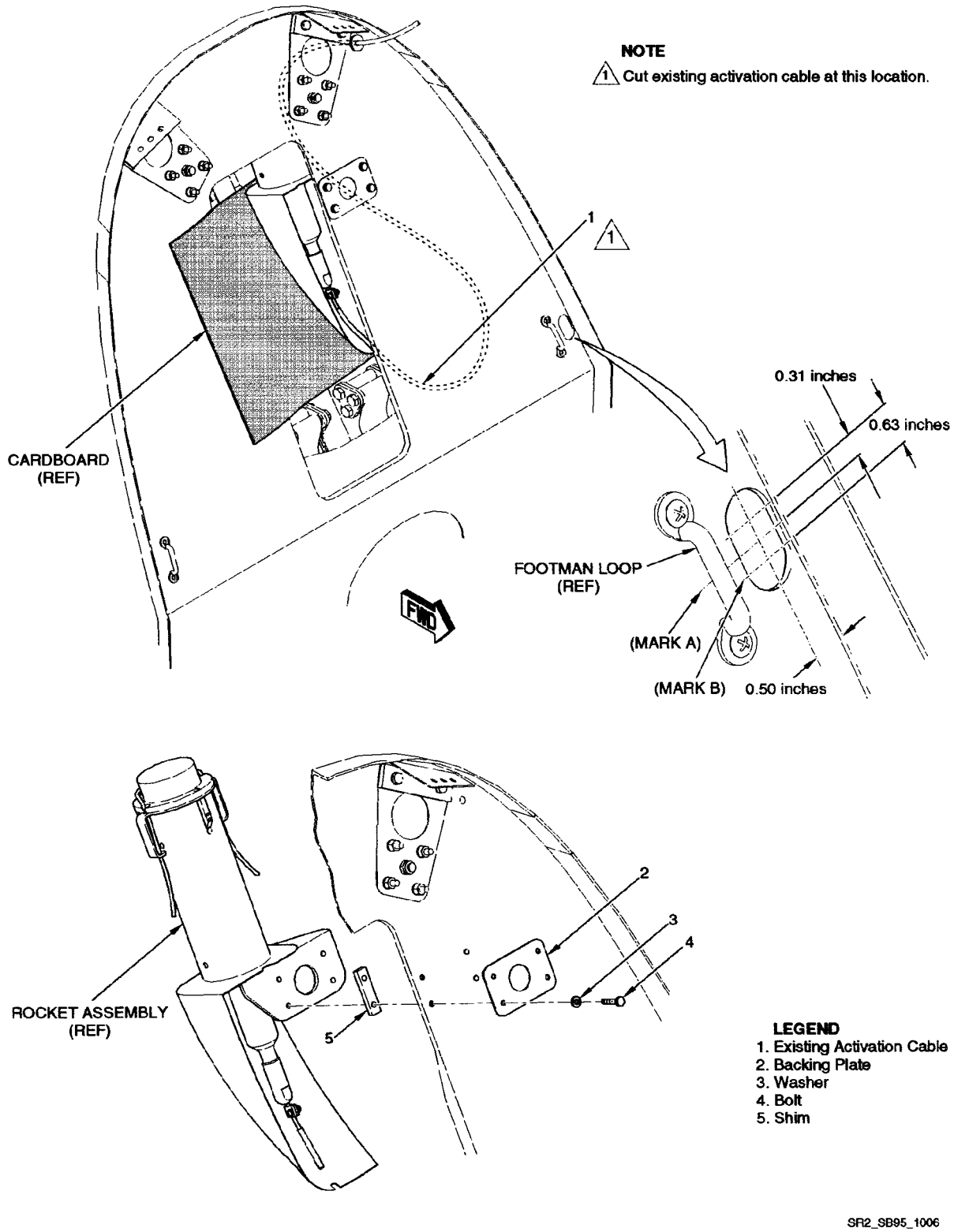
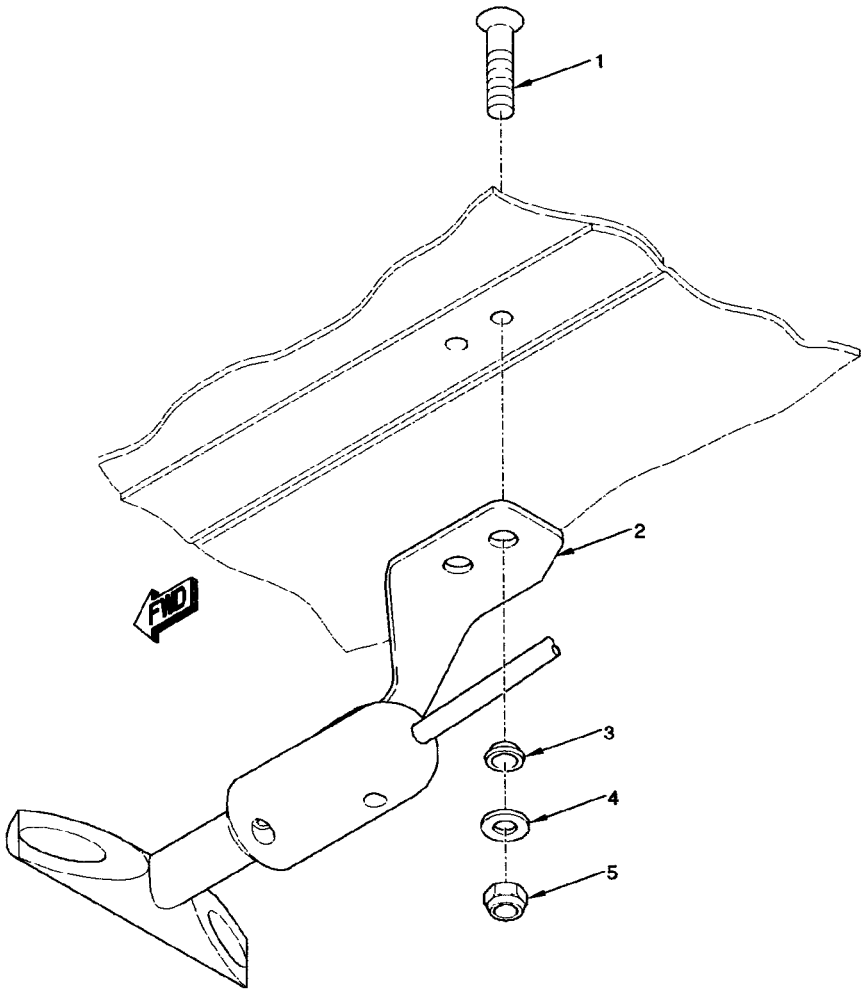

NOTE
1 Cut existing activation cable at this location.
1
1
CARDBOARD
(REF)
0.31 inches
0.63 inches
FOOTMAN LOOP
(REF)
(MARK A)
(MARK B)
0.50 inches
FWD
2
3
4
5
ROCKET ASSEMBLY
(REF)
LEGEND
1. Existing Activation Cable
2. Backing Plate
3. Washer
4. Bolt
5. Shim
SR2_SB95_1006

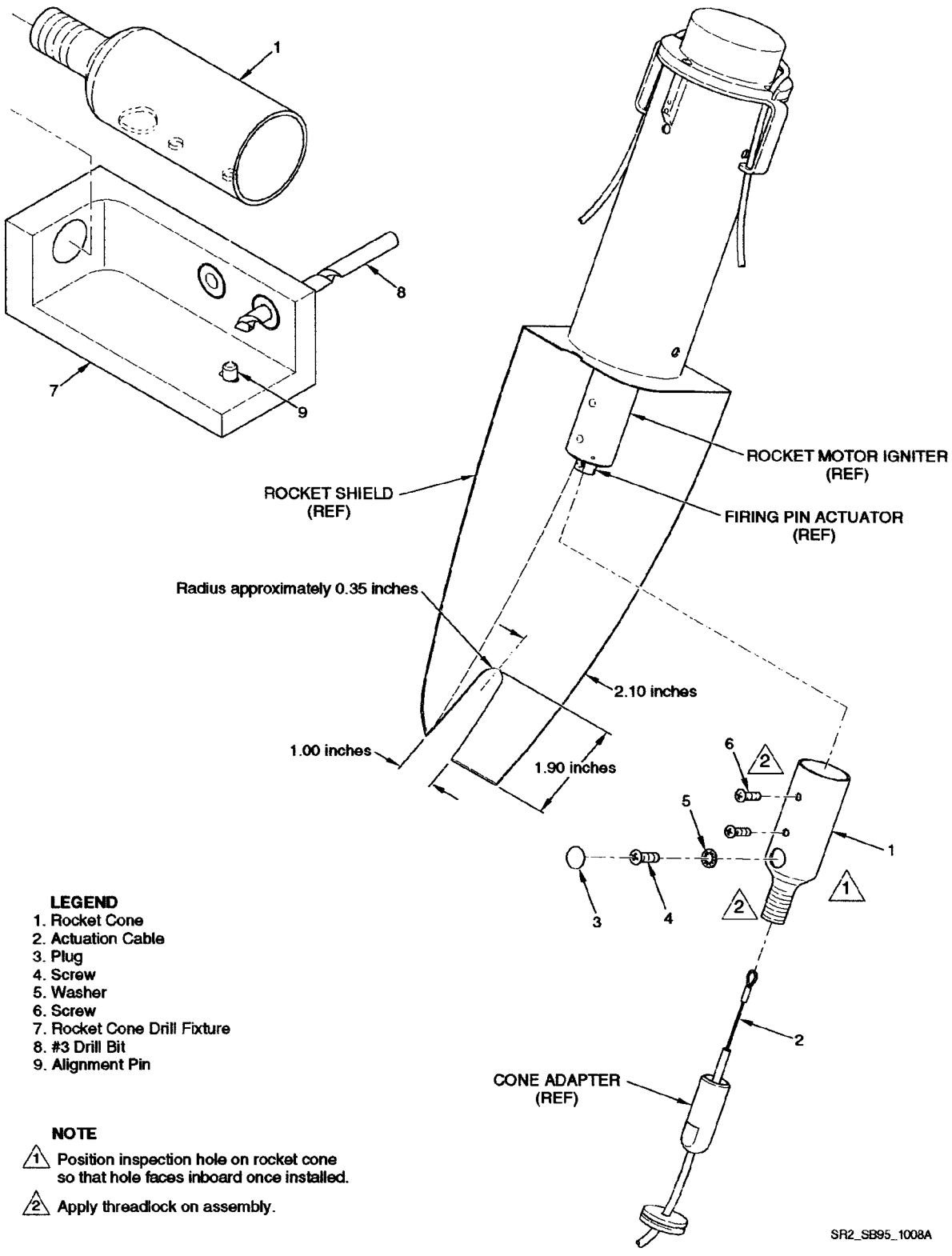
Figure 1



LEGEND
1. Screw
2. Activation Handle
3. Shoulder Washer
4. Washer
5. Nut

SR2 SB95 1011

Figure 2



LEGEND
1. Rocket Cone
2. Actuation Cable
3. Plug
4. Screw
5. Washer
6. Screw
7. Rocket Cone Drill Fixture
8. #3 Drill Bit
9. Alignment Pin

NOTE

(1) Position inspection hole on rocket cone so that hole faces inboard once installed.

(2) Apply threadlock on assembly.

Figure 3

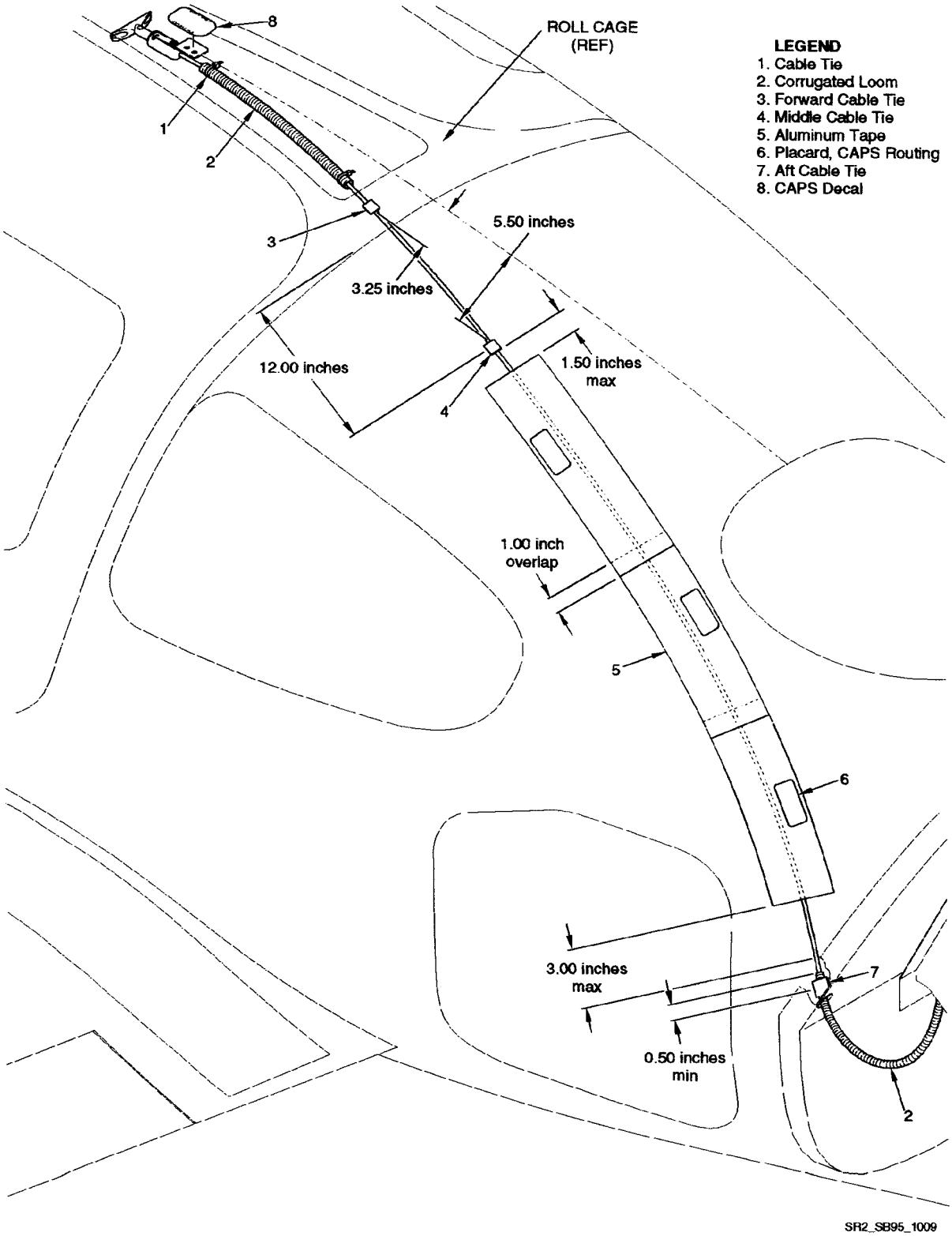
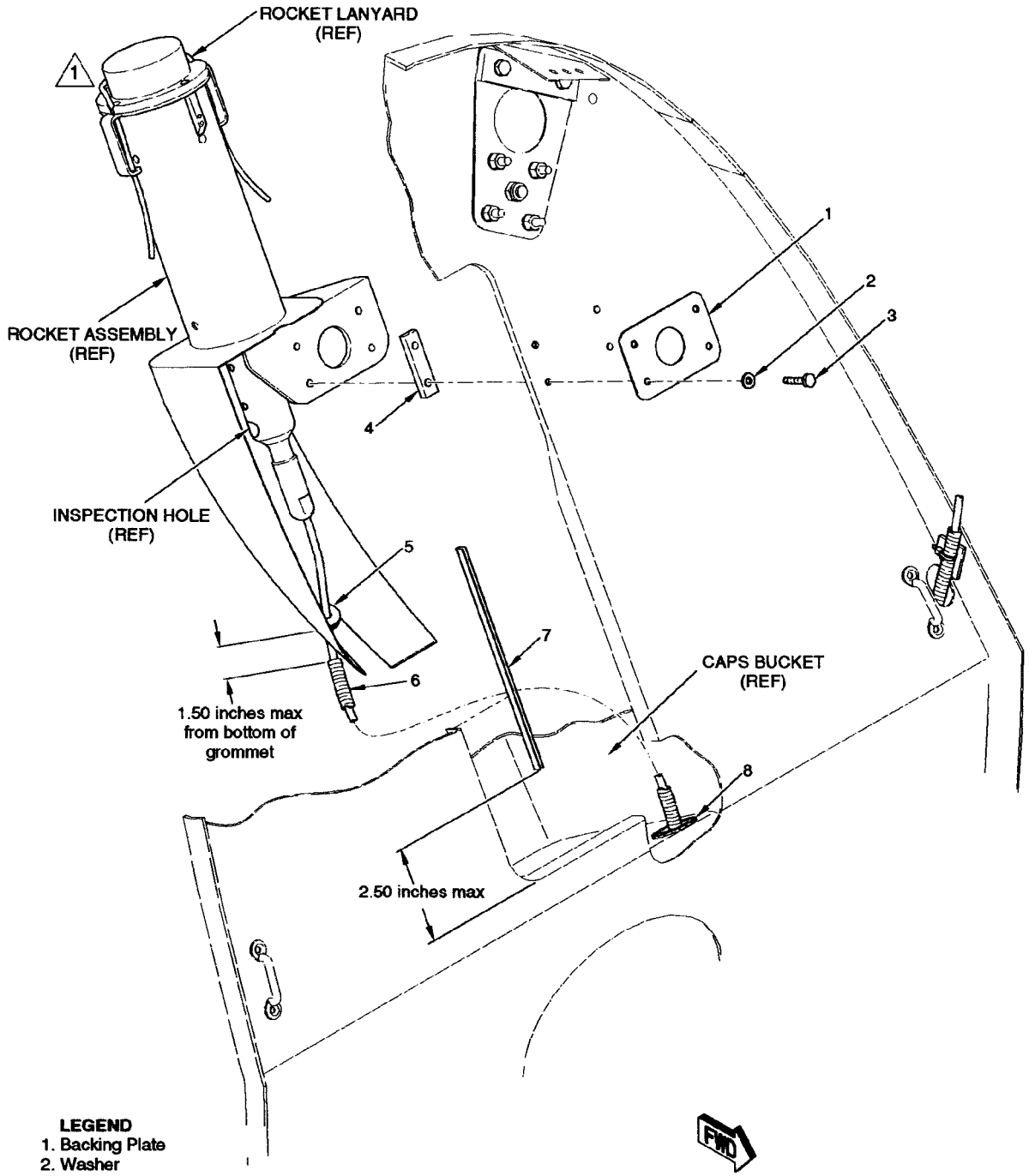

ROLL CAGE
(REF)
LEGEND
1. Cable Tie
2. Corrugated Loom
3. Forward Cable Tie
4. Middle Cable Tie
5. Aluminum Tape
6. Placard, CAPS Routing
7. Aft Cable Tie
8. CAPS Decal
5.50 inches
3.25 inches
12.00 inches
1.50 inches
max
1.00 inch
overlap
3.00 inches
max
0.50 inches
min
SR2_SB95_1009

Figure 4



LEGEND
1. Backing Plate
2. Washer
3. Bolt
4. Shim
5. Cable Grommet
6. Spiral Wrap
7. Flexible Grommet
8. Adjustable Bushing

WARNING

1 Position rocket lanyard around top circumference of rocket launch tube, not over top of launch tube.

SR2_SB95_1010

Figure 5

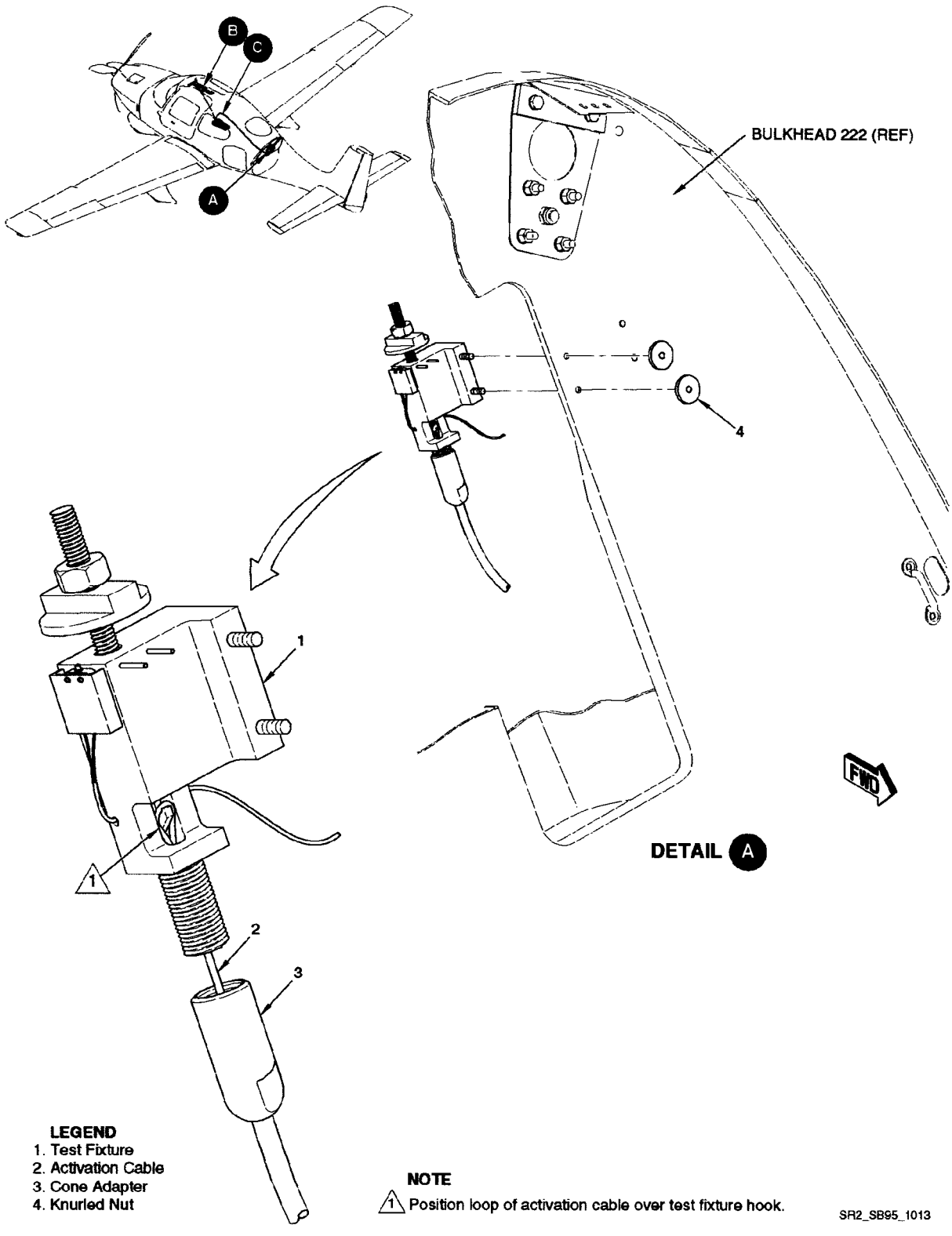
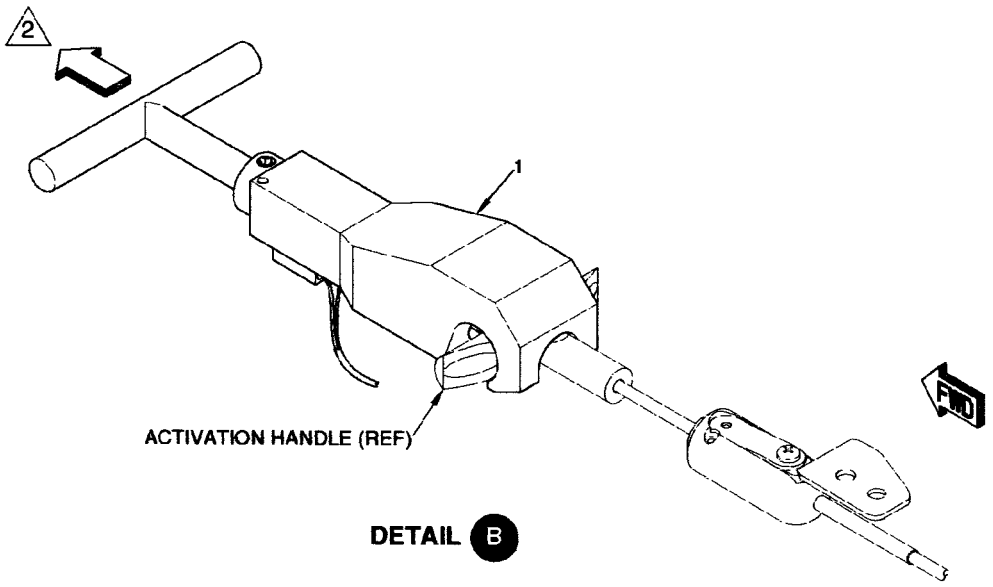
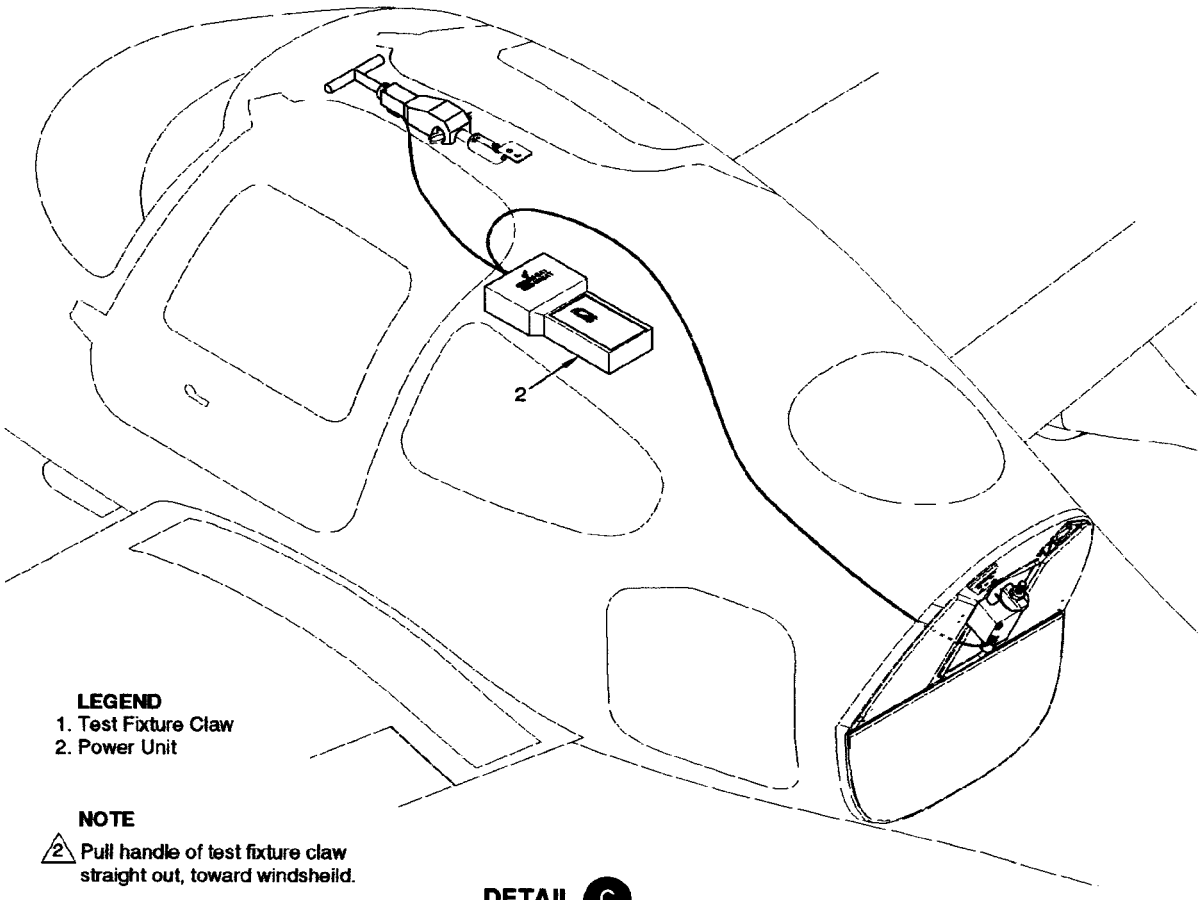

B
C
A
BULKHEAD 222 (REF)
4
1
1
2
3
FWD
DETAIL A
LEGEND
1. Test Fixture
2. Activation Cable
3. Cone Adapter
4. Knurled Nut
NOTE
1 Position loop of activation cable over test fixture hook.
SR2_SB95_1013

Figure 6



DETAIL B



LEGEND
1. Test Fixture Claw
2. Power Unit

NOTE

2 Pull handle of test fixture claw straight out, toward windsheild.

DETAIL C

SR2_SB95_1012

Figure 7