

ARMY TECHNICAL MANUAL
NAVY PUBLICATION

AIR FORCE TECHNICAL ORDER

TM 5-6350-264-14&P-5
NAVELEX EE 181-AA-
OMI-060/E121 SA-1955
T.O. 31S9-2FSS9-1-5

TECHNICAL MANUAL

**OPERATOR'S ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL
TOOLS LIST)**

**SWITCH, BALANCED MAGNETIC
SA-1955 /FSS-9(V)
NSN 6350-00-228-2500**

**DEPARTMENT OF THE ARMY, THE NAVY, AND THE AIR FORCE
14 SEPTEMBER 1982**

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DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

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CHANGE

HEADQUARTERS
DEPARTMENTS OF THE ARMY, NAVY and AIR FORCE
WASHINGTON, D.C., 27 June 1986

No. 1

Operator 's, Organizational, Direct Support, and General Support
Maintenance Manual
(Including Repair Parts and Special Tools List)

SWITCH, BALANCED MAGNETIC SA-1955/FSS-9(V)
NSN 6350-00-228-2500

TM 5-6350-264-14&P-5/NAVELEX EE 181-AA-OMI-060/E121 SA-1955/T.O. 31S9-2FSS9-1-5, 14 September 1982, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert Pages
Table of Contents	i and ii	i and ii
Chapter 1	1-1 and 1-2	1-1 and 1-2
Appendix A	A-1 through A-3/A-4	A-1and A-2
Appendix B	B-3/B-4	B-3/B-4
Appendix C	C-1 through C-5/C-6	C-1 through C-10

2. New or changed material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

3. Retain these sheets in front of manual for reference purposes.

By Order of the Secretaries of the Army, the Navy, and the Air Force:

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator, Organizational, Direct Support and General Support Maintenance requirements for Detection System, Joint Service, Interior Intrusion (JSIIDS).

WARNING

NOISE HAZARD

The Audible Alarm presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Authorized protective equipment must be worn by all personnel in the work area. If the Audible Alarm is installed, it must be disabled **BEFORE** any troubleshooting procedures are attempted. Disable the alarm by setting the key operated switch on Control Unit to TEST/RESET position, opening Audible Alarm, removing faceplate, and turning off power switch. After troubleshooting the Audible Alarm must be reactivated. Activate the Alarm by setting the key-operated switch on Control Unit to TEST/RESET position, turn Alarm power switch on, replace faceplate, close and lock Audible Alarm door. Turn key-operated switch on Control Unit to **SECURE** or **ACCESS**.

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HEADQUARTERS
 DEPARTMENTS OF THE ARMY, NAVY and AIR FORCE
 WASHINGTON, D.C. 14 September 1982

Operator's Organizational, Direct Support, and General Support
 Maintenance Manual
 (Including Repair Parts and Special Tools List)

SWITCH, BALANCED MAGNETIC SA-1955/FSS-9(V)
 NSN 6350-00-228-2500

Current as of 17 April 1984

REPORTING OF ERRORS

You can help improve this manual if you find any mistakes or if you know of a way to improve the procedures, please let us know. ARMY: Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), should be mailed to: Commander, U. S. Army Troop Support Command, A=N: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. AIR FORCE: Completed AFTO Form 22 (Technical Order Publication Improvement Report and Reply) should be forwarded to: HQ, SA-ALC/MMEDT, Kelly AFB, TX 78241. NAVY: Completed DA Form 2028 (Recommended Changes to Publications and Blank Forms), User Activity Technical Manual Comment Sheet, Feedback Report, or other suitable reporting forms should be mailed to: Naval Electronics Systems Command Training and Publications Management Office, ATTN: ELEX. Code 8122, Washington, DC 20360.

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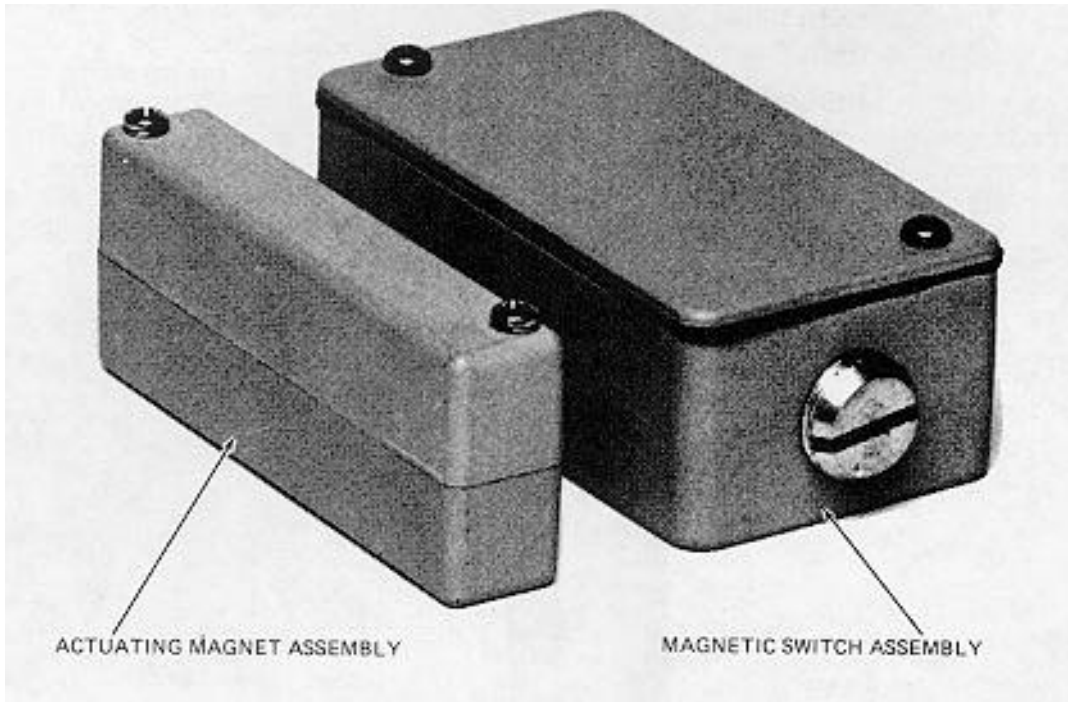


Figure 1-1. Balanced Magnetic Switch

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. SCOPE. This manual is for your use in operating and maintaining the Balanced Magnetic Switch (BMS) Model SA-1955/FSS-9(V) in its operational environment. The BMS is an integral part of the Joint-Services Interior Intrusion Detection System (J-SIIDS). For information on the major assemblies of J-SIIDS, refer to the applicable manuals listed in appendix A.

1-2. MAINTENANCE FORMS AND RECORDS. Equipment maintenance forms and procedures for their use are contained in DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS).

1-3. ADMINISTRATIVE STORAGE. Instructions for administrative storage are contained in TM 740-90-1.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Instructions for the destruction of Army materiel to prevent enemy use are contained in TM 750-244-3.

1-5. QUALITY ASSURANCE/QUALITY CONTROL. There are no Quality Assurance/Quality Control technical manuals applicable to this equipment.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). EIR's will be prepared on Standard Form 368, Quality Deficiency Report. Instructions for preparing EIR's are provided in DA Pamphlet 738-750. EIR's should be mailed directly to Commander, U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, Missouri 63120-1798. A reply will be furnished directly to you.

1-7. EQUIPMENT SERVICEABILITY CRITERIA (ESC). This equipment is not covered by an ESC.

Section II. DESCRIPTION AND DATA

1-8. DESCRIPTION. The BMS (fig. 1-1) consists of two major components: a Magnetic Switch Assembly and an Actuating Magnet Assembly. The Magnetic Switch Assembly consists of a housing which contains a printed circuit board (PC board) on which are mounted a biasing magnet, a reed witch, a tamper alum switch (TAS), and a terminal strip. The Actuating Magnet Assembly is a housing containing two magnets.

1-9. TABULATED DATA

a. Identification Data.

(1) There are two identification plates on the alarm switch assembly. One is located inside the

cover (fig. 1-2, view A) and one inside the alarm switch box (fig. 1-2, view B).

b. Equipment Characteristics.

(1) Switch assembly.

Weight 14 ounces (0.4 kg)

Dimensions

Height..... 1.68 inches (4.3 cm)

Width..... 2.50 inches (6.4 cm)



A.



B.



C.

Figure 1-2. Identification Plates

Color (housing)..... Gray per Federal Standard 595,
color chip 36440, MIL-C-22751

(2) Magnet.

Weight 12 ounces (0.3 kg)

Dimensions

Height1.74 inches (4.4 cm)

Width0.88 inches (2.2 cm)

Length.....4.51 inches (11.5 cm)

Color (housing).....Gray per Federal Standard
595, color chip 36440 MIL-C-22751

Environmental (operational)

Temperature range -650 to +1600 F (-54°
to +710C)

Environmental (nonoperational and storage)

Temperature range -80° to +1650 F (-620
to 740 C)

Relative humidity Up to 95%

Shock..... 20 g, 11-ms duration plus bench
handling shock

Vibration Withstands transportation con-
ditions

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

2-1. CONTROLS AND INDICATORS. There are no operator controls or indicators applicable to this equipment.

2-2. NORMAL OPERATING PROCEDURES. The BMS is operational after the magnet and switch assembly are installed, tested, and hooked up to the J-SIIDS Control Unit.

2-3. EMERGENCY OPERATION. Operation with incomplete surveillance coverage or faulty tamper circuit should be held to a minimum.

Section II. THEORY OF OPERATION

2-4. FUNCTIONAL DESCRIPTION. The BMS is basically a magnetically-operated switch. The BMS is activated by movement of a permanent magnet, which moves along with the magnet holder, and provides an intrusion alarm to the J-SIIDS Control Unit. Serving as part of J-SIIDS, the BMS is installed on doors, windows, skylights, or like routes of access to secure areas. The magnet holder is mounted on the moving part of the access route (door or window itself), while the switch assembly is mounted on the frame so that it is located between 1/4 (0. 635) and 1/2 inch (1. 27 cm) from the magnet holder when the door, window, etc, are closed.

During installation, an adjustable biasing magnet is physically positioned within the switch assembly. This allows the switch assembly to stay within an inch (2. 5 cm) of the magnet holder without generating an alarm signal and still cause the signal to be activated if the door or window moves beyond established limits. The switch assembly includes a tamper switch that provides an alarm signal to the Control Unit any time the lid is removed from the switch assembly. Since the reed switch is magnetically activated, no electrical power is required at the BMS installation (fig. 2-1).

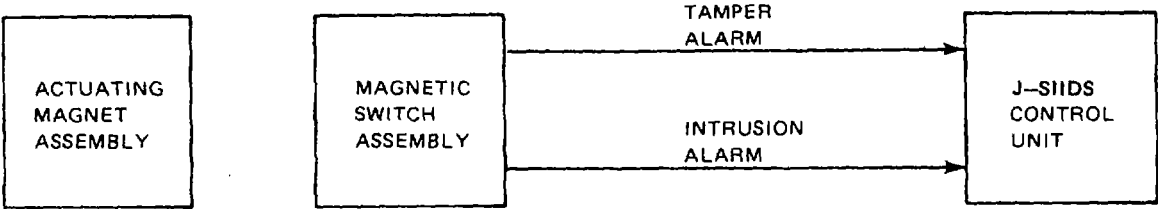


Figure 2-1. Balanced Magnetic Switch Simplified Block Diagram

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

This section is not applicable.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-1. PMCS PROCEDURES. The BMS requires minimum operator maintenance. The necessary PMCS to be performed are listed in table 3-1. Any defects occurring during operation will be noted

for correction during equipment shutdown. Record all deficiencies and corrective actions on DA Form 2404 .

Table 3-1. Operator Preventive Maintenance Checks and Services

Sequence no	Item to be inspected	Procedure
1.	Housing exterior surface	<p style="text-align: center;">CAUTION Do not use TRICHLOROETHANE or other hydrocarbon cleaning compounds.</p> <p>Visually inspect for dents, cracks, nicks, burrs, scratched or chipped paint. Clean exterior surface using a cloth dampened in a solution of mild detergent and water. Rinse with a cloth dampened in cold water and dry thoroughly. Touch up with paint, MIL-C-22751, color no. 36440.</p>

Section III. TROUBLESHOOTING

This section is not applicable.

Section IV. MAINTENANCE PROCEDURES

This section is not applicable.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

This chapter is not applicable to this equipment.

4-1/(4-2 blank)

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

5-1. SPECIAL TOOLS. No special tools are required for the Balanced Magnetic Switch.

5-2. REPAIR PARTS. Repair parts are listed and illustrated in the repair parts and special tools list covering direct and general support maintenance for this equipment in Appendix C of this manual.

Section II. TROUBLESHOOTING

5-3. TROUBLESHOOTING PROCEDURES.

WARNING

The Audible Alarm presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Authorized protective equipment must be worn by all personnel in the work area.

NOTE

If the Audible Alarm is installed, it must be disabled **BEFORE** any troubleshooting procedures are attempted. Disable the Alarm by setting the key-operated switch on Control Unit to **TEST/RESET** position. Open Audible Alarm, remove faceplate, and turn off power switch. After troubleshooting, the Audible Alarm must be reactivated. Activate the Alarm by setting the key-operated switch on Control Unit to **TEST/RESET** position. Turn Alarm power switch on, replace faceplate, close and lock Audible Alarm door. Turn key-

operated switch on Control Unit to **SECURE** or **ACCESS**.

NOTE

Before you use table 6-1, be sure you have performed all applicable operating checks.

- a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the Balanced Magnetic Switch. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take. You should perform the tests/inspections in the corrective actions column in the order listed.
- b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.
- c. The table lists the common malfunctions which you may find during the operation or maintenance of the Balanced Magnetic Switch.

Magnetic Switch or its components. You should perform the test/inspections in the corrective actions column in the order listed.

- d. Check all available information on the equipment for aid in diagnosing problems.
- e. Make a visual inspection of the equipment.
 - (1) Inspect the equipment for evidence of physical damage.
 - (2) Inspect the terminal strips for clean and secure connections.
 - (3) Inspect all wiring and cabling for worn or frayed insulation and broken wires.
 - (4) Inspect all resistors for discoloration due to over heating.

- (5) Inspect the complete subsystem for the presence of dirt, corrosion, moisture, and bits of wire or solder inside the housings.

NOTE

Touchup paint is recommended instead of refinishing whenever practical.

- (6) Inspect all metal surfaces intended to be painted for condition of finish and legibility of panel lettering.
- f. Refer to figure 5-1 for all test points found in the troubleshooting table. Step-by-step troubleshooting procedures, including Trouble, Probable Cause, and Corrective Action, are listed in table 5-1.

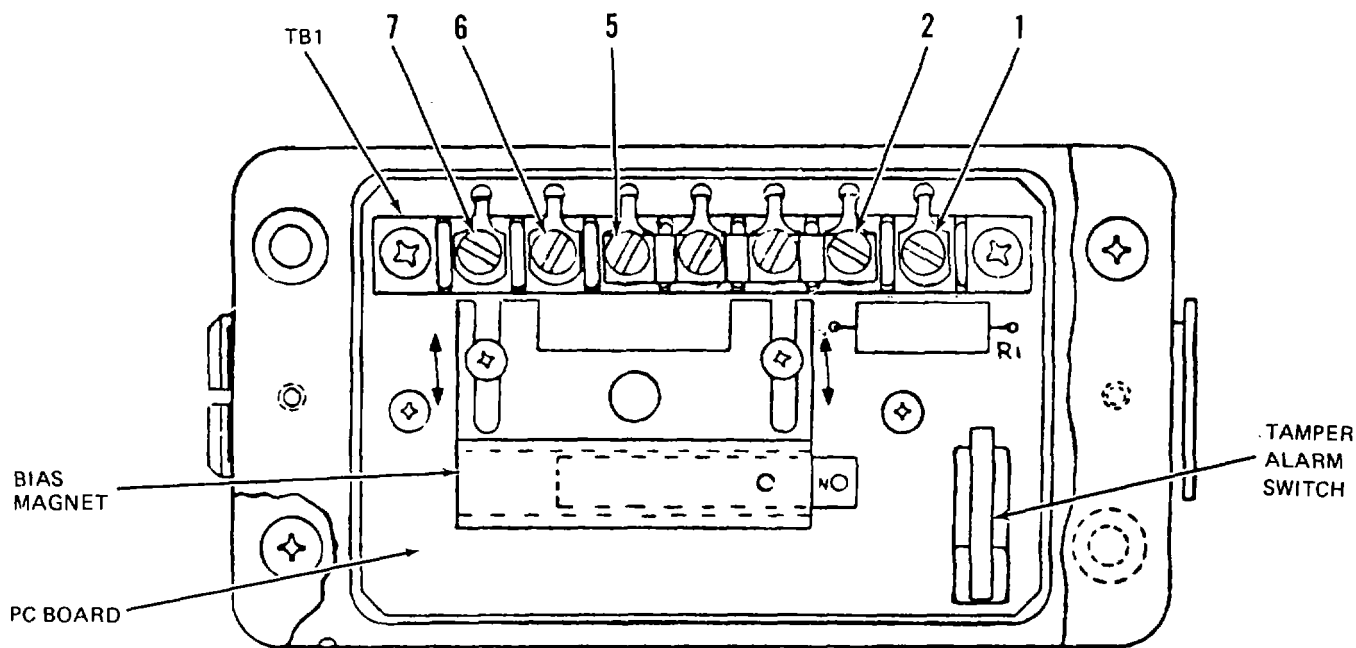


Figure 5-1. Balanced Magnetic Switch, with Troubleshooting Test Points

NOTE

Troubleshooting procedures listed in table 5-1 may require more than one person to perform corrective action.

Covers should be removed as necessary to perform troubleshooting procedures.

Never disconnect a wire without first marking that wire to assure proper reconnection.

Table 5-1. Troubleshooting Procedures

Trouble	Probable cause	Corrective action
1. Constant alarm	a. Bad PC board in Magnetic Switch Assembly.	a. With door or window closed, disconnect wires from TB1-1 and TB1-2. Set multimeter to ohms and connect leads to TB1-1 and TB1-2. Meter should indicate less than 50 ohms. b. If the meter indicates over 100,000 ohms across TB1-1 and TB1-2 with door or window closed, adjust the bias magnet inside the Magnetic Switch Assembly. c. To adjust the bias magnet, loosen the two screws that secure it to the PC board, and slide it back and forth. d. If the meter indication does not change to less than 50 ohms or if the operation appears to be erratic, replace the PC board. e. To remove the PC board, tag and disconnect the wires from TBI. Remove two screws that secure the bias magnet and two screws that secure PC board to the housing. Remove the PC board. f. To install new PC board, orient the board so that the terminal strip is on the side away from the

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
1. (cont.)	a. (cont.)	Activating Magnet. Secure the board to the housing with two screws. Put the bias magnet in place, and start the two screws that secure it; but leave these screws loose so the bias magnet can be calibrated. Connect the wires to TBI.
-	b. Bias magnet out of calibration.	<p>a. If the wiring is good and the meter indication drops to less than 50 ohms when the bias magnet is moved, calibrate the bias magnet.</p> <p>b. To calibrate the bias magnet, set the meter to ohms and connect the leads to TB1-1 and TB1-2. Loosen the two screws that secure the bias magnet to the PC board. Close the door or window. Slide the bias magnet back and forth until the meter indicates less than 50 ohms.</p> <p>c. Open the door or window 1/2 inch (1.27 cm). The meter should indicate less than 50 ohms.</p> <p>d. If the meter indicates more than 50 ohms, reposition the bias magnet until the meter does indicate less than 50 ohms.</p> <p>e. Open the door or window 1 1/4 inch (3.175 cm). The meter should indicate over 100,000 ohms.</p> <p>f. Repeat these steps until the meter indicates less than 50 ohms with the door or window open 1/2 inch (1.27 cm) or less, and indicates over 100,000 ohms when the door or window is opened more than 1 1/4 inch (3.175cm).</p>

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
1. (cont.)	c. Bad tamper alarm switch.	<p>a. Remove cover, and disconnect wire from TB1-6. Set multimeter to ohms; and check TB1-5 and TB1-6. Meter should indicate over 100,000 ohms</p> <p>b. Depress tamper alarm switch (TAS) arm. Meter indication should change to less than 50 ohms</p> <p>c. If these indications are not correct, replace PC board.</p> <p>d. To remove the PC board, tag and disconnect the wires from TB1. Remove two screws that secure the bias magnet and two screws that secure PC board to the housing. Remove the PC board,</p> <p>e. To install new PC board, orient the board so that the terminal strip is on the side away from the Actuating Magnet. Secure the board to the housing with screws. Put the bias magnet in place, and start the screws that secure it; but leave these screws loose so the bias magnet can be calibrated. Connect the wires to TBI.</p> <p>f. To calibrate the bias magnet, set the meter to ohms and connect the leads to TB1-1 and TB1-2. Loosen the two screws that secure - the bias magnet to the PC board. Close the door or window. Slide the bias magnet back and forth until the meter indicates less than 50 ohms.</p> <p>g. Open the door or window 1/2 inch (1.27 cm). The meter should indicate less than 50 ohms.</p>

Table 5-1. Troubleshooting Procedures Continued

Trouble	Probable cause	Corrective action
1. (cont.)	b. (cont.)	<ul style="list-style-type: none"> h. If the meter indicates more than 50 ohms, reposition the bias magnet until the meter does indicate less than 50 ohms i. Open the door or window 1 1/4 inch (3.175 cm). The meter should indicate over 100,000 ohms. j. Repeat these steps until the meter indicates less than 50 ohms with the door or window open 1/2 inch(1.27 cm) or less, and indicates over100,000 ohms when the door or window is opened more than 1 1/4 inche (3.175 cm).
2. No alarm.	a. Bad PC board in Magnetic Switch Assembly.	<ul style="list-style-type: none"> a. With door or window open, disconnect wires from TB1-1 and TB1-2. Set multimeter to ohms and connect leads to TB1-1 and TB1-2. Meter should indicate over 100,000 ohms b. If the meter indicates less than 50 ohms across TB1-1 and TB1-2 with the door or window open, adjust the bias magnet inside the Magnetic Switch Assembly. c. To adjust the bias magnet, loosen the two screws that secure it to the PC board, and slide it back and forth. d. If the meter indication does not change to infinity or if the operation appears to be erratic, replace the PC board. e. To remove the PC board, tag and disconnect the wires from TB1. Re- move two screws that secure the bias magnet and two screws that secure PC board to the housing. Remove the PC board

Table 5-1. Troubleshooting Procedures Continued

Trouble	Probable cause	Corrective action
2. (cont.)	a. (cont.)	<p>f. To install new PC board, orient the board so that the terminal strip is on the side away from the Actuating Magnet. Secure the board to the housing with two screws. Put the bias magnet in place, and start the two screws that secure it; but leave these screws loose so the bias magnet can be calibrated. Connect the wires to TB1.</p>
	b. Bias magnet out of calibration. -	<p>a. If the wiring is good and the meter indication changes to infinity when the bias magnet is moved, calibrate the bias magnet</p> <p>b. To calibrate the bias magnet, set the meter to ohms and connect the leads to TB1-1 and TB1-2. Loosen the two screws that secure the bias magnet to the PC board. Close the door or window. Slide the bias magnet back and forth until the meter indicates less than 50 ohms</p> <p>c. Open the door or window 1/2 inch (1.27 cm). The meter should indicate less than 50 ohms.</p> <p>d. If the meter indicates more than 50 ohms, reposition the bias magnet until the meter does indicate less than 50 ohms.</p> <p>e. Open the door or window 1 1/4 inch (3.175 cm). The meter should indicate over 100,000 ohms.</p> <p>f. Repeat these steps until the meter indicates less than 50 ohms with the door or window open 1/2 inch (1.27 cm) or less, and indicates over 100,000 ohms when the door or window is opened more than 1 1/4 inch (3.175 cm).</p>

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
2. (cont.)	c. Bad tamper alarm switch.	<p>a. Remove cover, and disconnect wire from TB1-6. Set multimeter to ohms and check TB1-5 and TB1-6. Meter should indicate over 100,000 ohms.</p> <p>b. Depress tamper alarm switch (TAS) arm. Meter indication should change to less than 50 ohms.</p> <p>c. If these indications are not correct, replace PC board.</p> <p>d. To remove the PC board, tag and disconnect the wires from TB1. Remove two screws that secure the bias magnet and two screws that secure PC board to the housing. Remove the PC board.</p> <p>e. To install new PC board, orient the board so that the terminal strip is on the side away from the Actuating Magnet. Secure the board to the housing with two screws. Put the bias magnet in place, and start the two screws that secure it; but leave these screws loose so the bias magnet can be calibrated. Connect the wires to TB1.</p> <p>f. To calibrate the bias magnet, set the meter to ohms and connect the leads to TB1-1 and TB1-2. Loosen the two screws that secure the bias magnet to the PC board. Close the door or window. Slide the bias magnet back and forth until the meter indicates less than 50 ohms.</p> <p>g. Open the door or window 1/2 inch (1.27 cm). The meter should indicate less than 50 ohms.</p>

Table 5-1. Troubleshooting Procedures Continued

Trouble	Probable cause	Corrective action
2. (cont)	c. (cont)	<p>h. If the meter indicates more than 50 ohms, reposition the bias magnet until the meter does indicate less than 50 ohms.</p> <p>i. Open the door or window 1 1/4 inch (3.175 cm). The meter should indicate over 100,000 ohms.</p> <p>j. Repeat these steps until the meter indicates less than 50 ohms with the door or window open 1/2 inch (1.27 cm) or less, and indicates over 100,000 ohms when the door or window is opened more than 1-1/4 inch (3.175 cm).</p>

Section III. GENERAL MAINTENANCE

5-4. MAINTENANCE ACTION. The extent of direct and general support maintenance is governed by the Maintenance Allocation Chart (MAC), Appendix B. The MAC provides for on-site test and replacement of the PC board, Actuating Magnet Assembly and Bias Magnet Assembly. On-site test and adjustment are made on

the Actuating Magnet Assembly and the Bias Magnet Assembly. Inspection and service are provided for the enclosure. Periodic testing of the Balanced Magnetic Switch is not scheduled because the J-SIIDS is maintained in continuous operation.

Section IV. REMOVAL AND REPLACEMENT OF MAJOR COMPONENTS AND ASSEMBLIES

5-5. REMOVAL AND INSTALLATION PROCEDURES.

- a. To remove the PC board, tag and disconnect the wires from TB1. Remove two screws that secure PC board to the housing. Remove the PC board.
- b. To install new PC board, orient the board so that the terminal strip is on the side away from the Actuating Magnet. Secure the board to the housing with two screws. Connect the wires to TB1.
- c. To remove the Bias Magnet Assembly, remove the two screws that secure the Bias Magnet Assembly to the PC board. Remove the Bias Magnet Assembly.
- d. To install a new Bias Magnet Assembly, put it in place on the PC board. Start the two screws that secure it, but leave these screws loose so the bias magnet can be calibrated.
- e. To remove the Actuating Magnet Assembly, remove the two screws from the outer half of the assembly. Remove the outer half of the assembly. Remove and keep the two screws that secure the inner half of the Actuating Magnet Assembly to the mounting surface. Remove the inner half of the assembly.
- f. To install a new Actuating Magnet Assembly, turn the assembly so the notches in the end of the housing face the same direction as the notch in the Magnetic Switch Assembly housing. Align the screw holes in the inner half of the Actuating Magnet Assembly with the screw holes in the mounting surface. Insert and tighten two screws to secure this half of the assembly to the mounting surface. Place the outer half of the Actuating Magnet Assembly over the inner half. Ensure that the notches in the housing are aligned. Insert and tighten two screws to secure the outer half of the assembly.
- g. After removal and replacement of major components or assemblies, calibrate the BMS for proper operation. Disconnect wires from TB1-1 and 2. Set multimeter to ohms and connect leads to TB1-1 and 2. With door or window closed, meter should indicate less than 50 ohms. Open the door or window 1 1/4 inch (3.175 cm) or more. Meter indication should change to an open circuit or infinity. Connect the meter leads to TB1-5 and 6. Meter should indicate more than 100,000 ohms. Depress the TAS arm. The meter indication should change to less than 50 ohms. Connect the wires to TB1 and install the cover.

CHAPTER 6

REPAIR OF BALANCED MAGNETIC SWITCH

This chapter is not applicable to this equipment.

6-1/(6-2 blank)

APPENDIX A

REFERENCES

- | | |
|--|--|
| 1. DEMOLITION
TM 750-244-3 | Procedures for Destruction of Equipment
to Prevent Enemy Use |
| 2. FIRE PROTECTION
TB5-4200-200-10 | Hand Portable Fire Extinguishers
Approved for Army Users |
| 3. MAINTENANCE
DA Pamphlet 738-750 | The Army Maintenance
Management System |
| 4. TRI-SERVICE MANUALS | |
| DMWR 5-6350-264
NAVELEX EE181-AA-MMD-010/E121
J-SIIDS MWR
AIR FORCE T.O. 31S9-4-1-213 | Depot Maintenance Work Requirement |
| TM 5-6350-264-14-1
NAVELEX EE181-AA-INM-020/E121
J-SIIDS INS
AIR FORCE T.O. 31S9-4-1-201 | Installation, Operation and Checkout
Procedures |
| TM 5-6350-264-14&P-2
NAVELEX EE181-AA-OMI-030/E121
RT1161 M9443
AIR FORCE T.O. 31S9-2FSS9-1-2 | Transceiver, Ultrasonic Signal and Processor,
Ultrasonic Motion Signal |
| TM 5-6350-264-14&P--3
NAVELEX EE181-AA-OMI-040/E121
R1860 M9443
AIR FORCE T.O. 31S9-2FSS9-1-3 | Receiver Passive Signal, Ultrasonic and
Processor, Passive Signal, Ultrasonic |
| TM 5-6350-264-14&p-4
NAVELEX EE181-AA-OMI-050/E121
DT546 M9442
AIR FORCE T.O. 31S9-2FSS9-1-4 | Detector, Vibration Signal and Processor,
Vibration Signal |
| TM 5-6350-264-14&P-5
NAVELEX EE181-AA-OMI-060/E121
SA-1955
AIR FORCE T.O. 31S9-2FSS9-1-5 | Switch, Balanced Magnetic |
| TM 5-6350-264-14&P-6
NAVELEX EE181-AA-OMI-070/E121
DT-545
AIR FORCE T.O. 3159-2FS59-1-6 | Sensor, Grid Wire |
| TM 5-6350-264-14&P-7
NAVELEX EE181-AA-OMI-080/E121
DT-548
AIR FORCE T.O. 3159-2FSS9-1-7 | Sensor, Capacity Proximity |

TM 5-6350-264-14&P-8 NAVELEX EE181-AA-OMI-090/E121 SA-1954 AIR FORCE T.O. 3159-2FSS9-1-8	Switch, Alarm Latching
TM 5-6350-264-14&P-9 NAVELEX EE181-AA-OMI-100/E121 DZ-204 AIR FORCE T.O. 3159-2FSS9-1-9	Alarm, Audible
TM 5-6350-264-14&P-10 NAVELEX EE181-AA-OMI-110/E121 C-9412 AIR FORCE T.O. 31S9-2FSS9-1-10	Control Unit, Alarm Set
TM 5-6350-264-14&P-II NAVELEX EE1BI-AA-OMI-120/E121 C-7359-60-1 AIR FORCE T.O. 31S9-2FSS9-1-11	Cabinet, Monitor, Type A, Type B, Type C and Monitor Module, Status, Monitor Module, Alarm
TM 5-6350-264-14&P-12 NAVELEX EE181-AA-OMI-130/E121 R1861-T1257 AIR FORCE T.O. 31S9-2FSS9-1-12	Receiver, Data and Transmitter, Data
TM 5-6350-264-14&P-13 NAVELEX EE181-AA-OMI-140/E121 DT-547 AIR FORCE T.O. 31S9-2FtS9-1-13	Sensor, Magnetic Weapons (DT-547)
TB 5-6350-264 NAVELEX EE181-AB-OMI-010/E121 J-SIIDS AIR FORCE TO. 31S941- 111	Selection and Application of Joint Services Interior Intrusion Detection System
5. PAINTING SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronic Equipment
TM 43-0139	Painting Instructions for Field Use
6. RADIOACTIVE MATERIAL TB 43-0141	Instructions for Safe Handling, Maintenance, Storage, and Disposal of Radio- active Commodities
7. SHIPMENT AND STORAGE TM 740-90-1	Administrative Storage of Equipment

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

- a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.
- b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.
- c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.
- d. Section IV contains supplemental instructions or explanatory notes for a particular maintenance function. (Not Applicable)

B-2. MAINTENANCE FUNCTIONS: Maintenance functions are defined as follows:

- a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.
- b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.
- c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.
- d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by

setting the operating characteristics to specified parameters.

- e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

- f. Calibrate. To determine and cause corrections to be made, or to be adjusted on instruments for test, measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

- g. Install. The act of emplacing, seating, or fixing into position an item, part, or module in a manner to allow the proper functioning of an equipment or system.

- h. Replace. The act of substituting a serviceable like part, subassembly, or module for an unserviceable counterpart.

- i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module, end item or system.

- j. Overhaul. That maintenance effort (service/ actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. COLUMN ENTRIES.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the a active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different

maintenance levels, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

- C..... Operator or crew
- O Organization maintenance
- F..... Direct support maintenance
- H..... General support maintenance
- D..... Depot maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, test, and sup- port equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

Section II. MAINTENANCE ALLOCATION CHART

for

Balanced Magnetic Switch (SA-1955)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
01	Balanced Magnetic Switch Printed Wiring Board Assy	Test Replace			0.5 1.0			1	
	Actuating Magnet Assy	Test Service Replace			0.5 0.5 0.5				
	Enclosure	Inspect Service	0.5 0.5						
	Magnet Assy, Bias	Test Adjust Replace			0.5 0.5 0.5				

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

for

Balanced Magnetic Switch (SA-1955)

(1) Reference code	(2) Maintenance category	(3) Nomenclature	(4) National stock number (NSN)	(5) Tool number
1.	F	Multimeter	6625-00-019-0815	Vom

APPENDIX C

ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope.

This manual lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the Balanced Magnetic Switch. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

2. General.

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National Item Identification Number (NIIN) sequence, of all National Stock Numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

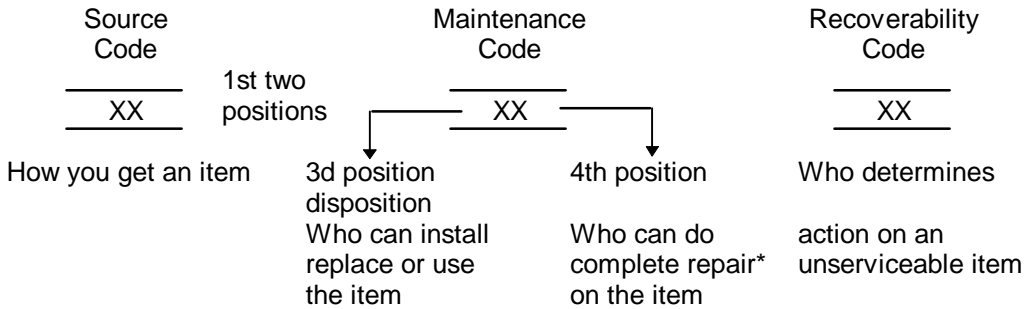
3. Explanation of Columns.

a. Illustration (Column (1)). This column is divided as follows:

(1) ((a) FIG NO.) Figure Number. Indicates the figure number illustrating an exploded view of a functional group.

(2) ((b) ITEM NO.) Indicates the number used to identify items called out in the illustration.

b. SMR CODE (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all the corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Source codes are always the first two positions of the SMR code. Explanations of source codes follow:

Code	Explanation
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code. <p>.....</p>
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied. <p>.....</p>
MO-(Made at org/ AVUM Category) MF-(Made at DS/ AVIM Category) MH-(Made at GS Category) MD-(Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by NSN in the Description column and listed in the Bulk Material group in the repair parts list in this manual. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher category, order the item from the higher category of maintenance. <p>.....</p>

Explanation

- AO** - (Assembled by org/
AVUM Category)

AF - (Assembled by DS/
AVIM Category)

AH - (Assembled by
GS Category)

AD - (Assembled by
Depot)

Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the category of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher category, order the item from the higher category of maintenance.

- XA** - Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
- XB** - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
- XC** - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
- XD** - Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

(2) Maintenance Code. Maintenance codes tell you the category(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following categories of maintenance.

Code	Application/Explanation
C	- Crew or operator maintenance done within organizational or aviation unit maintenance.
O	- Organizational or aviation unit category can remove, replace, and use the item.
F	- Direct support or aviation intermediate category can remove, replace, and use the item.
H	- General support category can remove, replace, and use the item.
L	- Specialized repair activity can remove, replace, and use the item.
D	- Depot category can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
0	- Organizational or aviation unit is the lowest category that can do complete repair of the item.
F	- Direct support or aviation intermediate is the lowest category that can do complete repair of the item.
H	- General support is the lowest category that can do complete repair of the item.
L	- Specialized repair activity (designate the specialized repair activity) is the lowest category that can do complete repair of the item.
D	- Depot is the lowest category that can do complete repair of the item.
Z	- Nonreparable. No repair is authorized.
B	- No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Definition
Z	- Nonreparable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in 3rd position of SMR Code.
0	- Repairable item. When uneconomically repairable, condemn and dispose of the item at organizational or aviation unit category.
F	- Repairable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate category.
H	- Repairable item. When uneconomically repairable, condemn and dispose of the item at the general support category.

Recoverability Codes	Definition
D	- Reparable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.
L	- Reparable item. Condemnation and disposal not authorized below specialized repair activity.
A	- Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. National Stock Number (Column (3)). Lists the National Stock Number (NSN) assigned to the item. Use the NSN for requests/requisitions.

d. FSCM (Column (4)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

e. Part Number (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE: When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered, but go ahead and use or furnish it as the replacement part.

f. Description (Column (6)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation, e.g., Phy Sec C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (T) -Top Secret).

(3) Items that are included in kits and sets are listed below the name of the kit or set.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) NSN's for bulk materials are referenced in the description column in the line item entry for the item to be manufactured/fabricated.

(6) When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description.

(7) The USABLE ON CODE, when applicable (see paragraph 4, Special Information).

(8) In the Special Tools List section, the Basis of Issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

g. U/M (Column (7)). The Unit of Measure (U/M) indicates the measure (e.g., foot, gallon, pound) or count (e.g., each, dozen, gross) of a listed item. A two-character alpha code (e.g., FT, GL, LB, EA, DZ, GR) appears in this column to indicate the measure or count. If the U/M code appearing in this column differs from the Unit of Issue (U/I) code listed in the Army Master Data File (AMDF), request the lowest U/I that will satisfy your needs.

h. QTY INC IN UNIT (Column (8)). The Quantity Incorporated in Unit (QTY INC IN UNIT) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable (e.g., shims, spacers).

4. Special Information. (Not applicable)

5. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Not Known:

(1) First. Using the table of contents, determine the functional group or subfunctional group to which the item belongs. This is necessary since figures are prepared for functional groups and subfunctional groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the functional group or subfunctional group to which the item belongs.

(3) Third. Identify the item on the figure and note the item number of the item.

(4) Fourth. Refer to the Repair Parts List for the figure to find the line item entry for the item number noted on the figure.

b. When National Stock Number or Part Number is Known:

(1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN)* sequence. The part numbers in the Part Number index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

*The NIIN consists of the last 9 digits of the NSN (i.e., $\frac{5305-01-674-1467}{\text{NIIN}}$).

(2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

6. Abbreviations.

<u>Abbreviations</u>	<u>Explanation</u>
cd-or	Cadmium-ore
zn-pltd	zinc-plated
MOD	Model
opng	opening
NIIN	National Item Identification Number (consists of the last 9 digits of the NSN)
RPSTL	Repair Parts and Special Tools List

Change 1 C-7

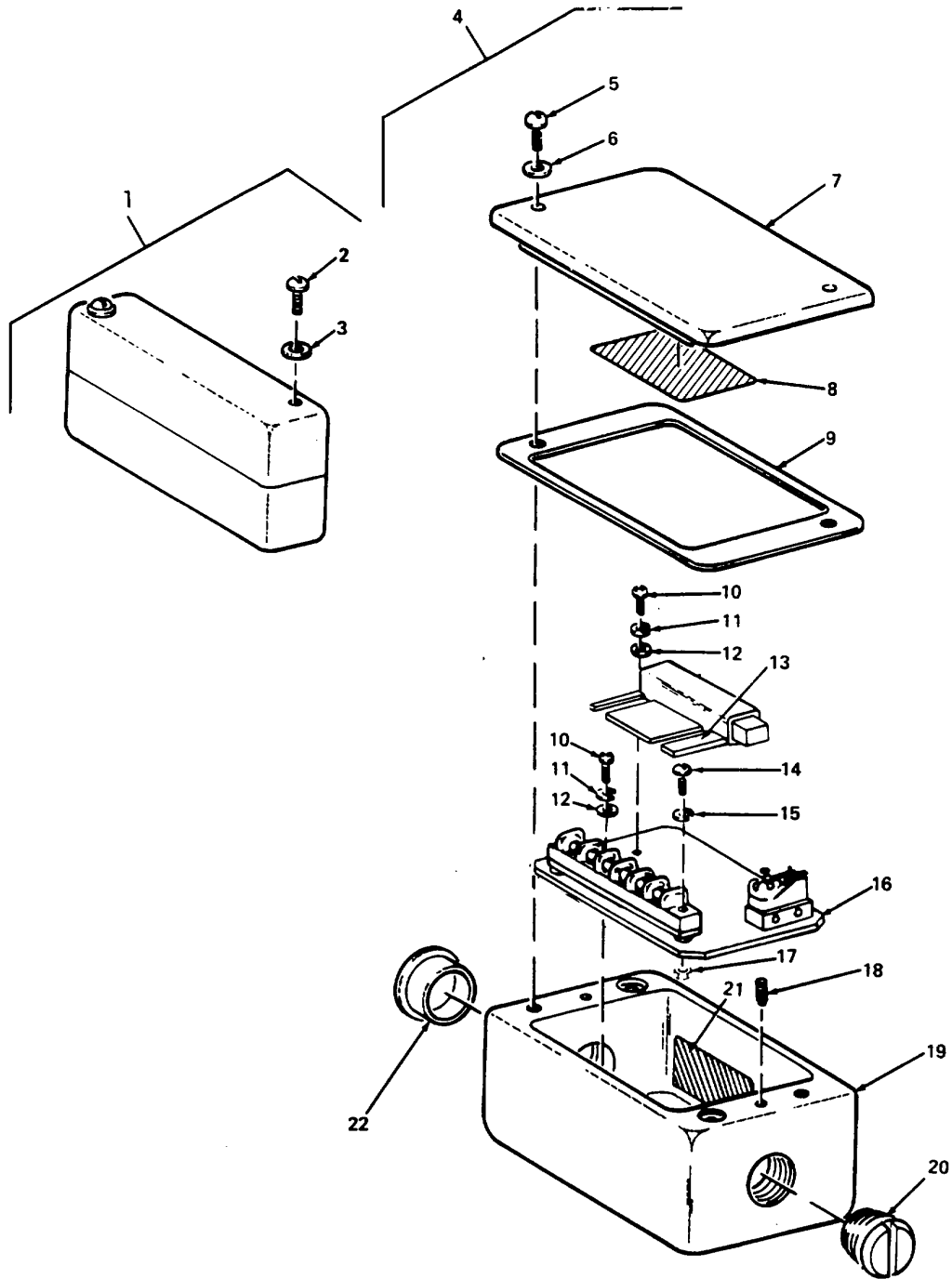


Figure C-1. Balanced Magnetic Switch SA-1955/FSS9(V)

Change 1 C-8

Section II. REPAIR PARTS LIST

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION <i>USABLE ON CODE</i>	U/M	QTY INC IN UNIT
C-1	1	PAFZZ	6350-00-360-7755	97403	13220E3301	MAGNETASSEMBLY.ACT	EA	1
C-1	2	PAFZZ	5305-00-984-6198	96906	MS35206-250	*SCREW,MACHINE	EA	2
C-1	3	PAFZZ	5310-00-045-3299	96906	MS35338-42	*WASHER,LOCK	EA	2
C-1	4	PAFZZ	6350-01-115-5231	97403	13220E3325	SWITCH, BALANCED MAG	EA,	1
C-1	5	PAFZZ	5305-00-984-6193	96906	MS35206-245	*SCREW, MACHINE	EA	2
C-1	6	PAFZZ	5310-00-045-3299	96906	MS3533&42	*WASHER,LOCK	EA	2
C-1	7	XBFZZ		97403	13220E3302	*COVER	EA	1
C-1	8	XDFZZ		97403	13220E3319	*PLATE	EA	1
C-1	9	XBFZZ		97403	13220E3303	*GASKET	EA	1
C-1	10	PAFZZ	5305-00-889-2997	96906	MS352015215	*SCREW,MACHINE	EA	4
C-1	11	PAFZZ	5310-00-543-2410	96906	MS3533840	*WASHER,LOCK	EA	4
C-1	12	PAFZZ	5310-00-950-1310	96906	MS271S3-4	*WASHER,FLAT	EA	4
C-1	13	PAFZZ	5999-01-012-7526	97403	13220E3305	*MAGNETICSIASASSY	EA	1
C-1	14	PAFZZ	5305-00-984-4993	96906	MS35206-233	*SCREW,MACHINE	EA	2
C-1	15	PAFZZ	5310-00-045-4007	96906	MS3533541	*WASHER,LOCK	EA	2
C-1	16	PAFZZ	6350-00-368-8207	97403	13220E3304	*PRINTED WIRING BOARD	EA	1
C-1	17	PAFZZ	5310-00-934-9747	96906	M54-9262	*NUT,PLAIN,HEXAGON	EA	2
C-1	18	PAFZZ	5305-00-719-5338	96906	MS51923	*SETSCREW	EA	1
C-1	19	XAFZZ		97403	13220E3306	*HOUSING	EA	1
C-1	20	XBFZZ		97403	13220E3324	*PLUG	EA	1
C-1	21	XDFZZ		97403	13220E3320	*PLATE	EA	1
C-1	22	XBFZ		97403	13220E3323	*CAPPLUG	EA	1

Section III. SPECIAL TOOLS LIST

This section is not applicable.

Section IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5310-00-045-3299	C-1	3	5310-00-934-9747	C-1	17
5310-00-045-3299	C-1	6	5310-00-950-1310	C-1	12
5310-00-045-4007	C-1	15	5305-00-984-4993	C-1	14
6350-00-360-7755	C-1	1	5305-00-984-6193	C-1	5
6350-00-368-8207	C-1	16	5305-00-984-6198	C-1	2
5310-00-543-2410	C-1	11	5999-01-039-9563	C-1	13
5305-00-719-5338	C-1	18	6350-01-115-5231	C-1	4
5305-00-889-2997	C-1	10			

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
96906	MS27183-4	C-1	12	97403	13220E3301	C-1	1
96906	MS35206-215	C-1	10	97403	13220E3302	C-1	7
96906	MS35206-233	C-1	14	97403	13220E3303	C-1	9
96906	MS35206-245	C-1	5	97403	13220E3304	C-1	16
96906	MS35206-250	C-1	2	97403	13220E3305	C-1	13
96906	MS35338-40	C-1	11	97403	13220E3306	C-1	19
96906	MS35338-41	C-1	15	97403	13220E3319	C-1	8
96906	MS35338-42	C-1	3	97403	13220E3320	C-1	21
96906	MS35338-42	C-1	6	97403	13220E3323	C-1	22
96906	MS35649-262	C-1	17	97403	13220E3324	C-1	20
96906	MS51963-23	C-1	18	97403	13220E3325	C-1	4

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Change 1 C-10

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inches
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigram = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. ft.
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. Inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pounds-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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PIN: 051455-001