

TB 9-4940-565-40

**Shop Equipment, General Support  
Electrical Modifications  
To  
S280 Non-expandable Shelter  
NSN 5411-01-425-5949**

**DISTRIBUTION STATEMENT A. Approved for public release:distribution is unlimited.**

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**26 JUNE 1998**

## Electrical Modification

### **WARNING**

The electrical system contains voltages that are dangerous if contacted. Before connecting or disconnecting power cables, or beginning maintenance on the grounding stud, ensure the circuit breaker on the power distribution panel connected to the power source is in **OFF** position and then disconnect 120/208V cable assembly from shelter.

Ensure grounding rod is installed and connected before energizing shop set.

Circuit breakers in panel box must be turned to OFF position before removing fluorescent lamp.

Turn power supply off before removing electrical cable assembly.

Open circuit breakers before removing/installing wiring on the power supply\*

A minimum of four personnel is required when moving or lifting the environmental control unit (ECU), as each weighs approximately 270 lb. (122 kg).

Ventilation fan and mounting panel should be removed from shelter wall prior to removal of fan blackout cover.

### FIRST AID

For first aid information refer to FM 21-11

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## **Introduction**

The purpose of this manual is to enable a qualified General Support Technician or a locally hired electrician to maintain or repair the majority of items in this electrical modification.

In most instances parts can be obtained on the local economy. Local purchase authority is granted.. If parts are not available locally, contact the Armament and Chemical Acquisition and Logistics Activity, AMSTA-AC-CTTS, Rock Island, IL 61299-7630. Phone: DSN 782-5289

This electrical modification supports the following Supply Catalogs (SC) and shelter configurations

**DISTRIBUTION STATEMENT A:** Approved for public release: distribution is unlimited.

- SC 4940-95-A57 (NSN 4940-00-209-6232) Shop Equipment, Small Equipment Repair, Shelter Loaded
- SC 4940-95-A59 (NSN 4940-00-209-6235) Shop Equipment, Artillery Repair, Shelter Mounted
- SC 4940-95-A60 (NSN 4940-00-209-6236) Shop Equipment, Small Arms Repair, Shelter Mounted
- SC 4940-95-A61 (NSN 4940-00-209-6237) Shop Equipment, Instrument and Fire Control Repair, Shelter Mounted
- SC 4940-95-A87 (NSN 4940-00-089-5279) Transmission Line, Power, Power Line Team
- SC 4940-95-A80 (NSN 4940-00-089-5280) Service Kit, Power Line Maintenance: Operating and Maintenance Team 06HF

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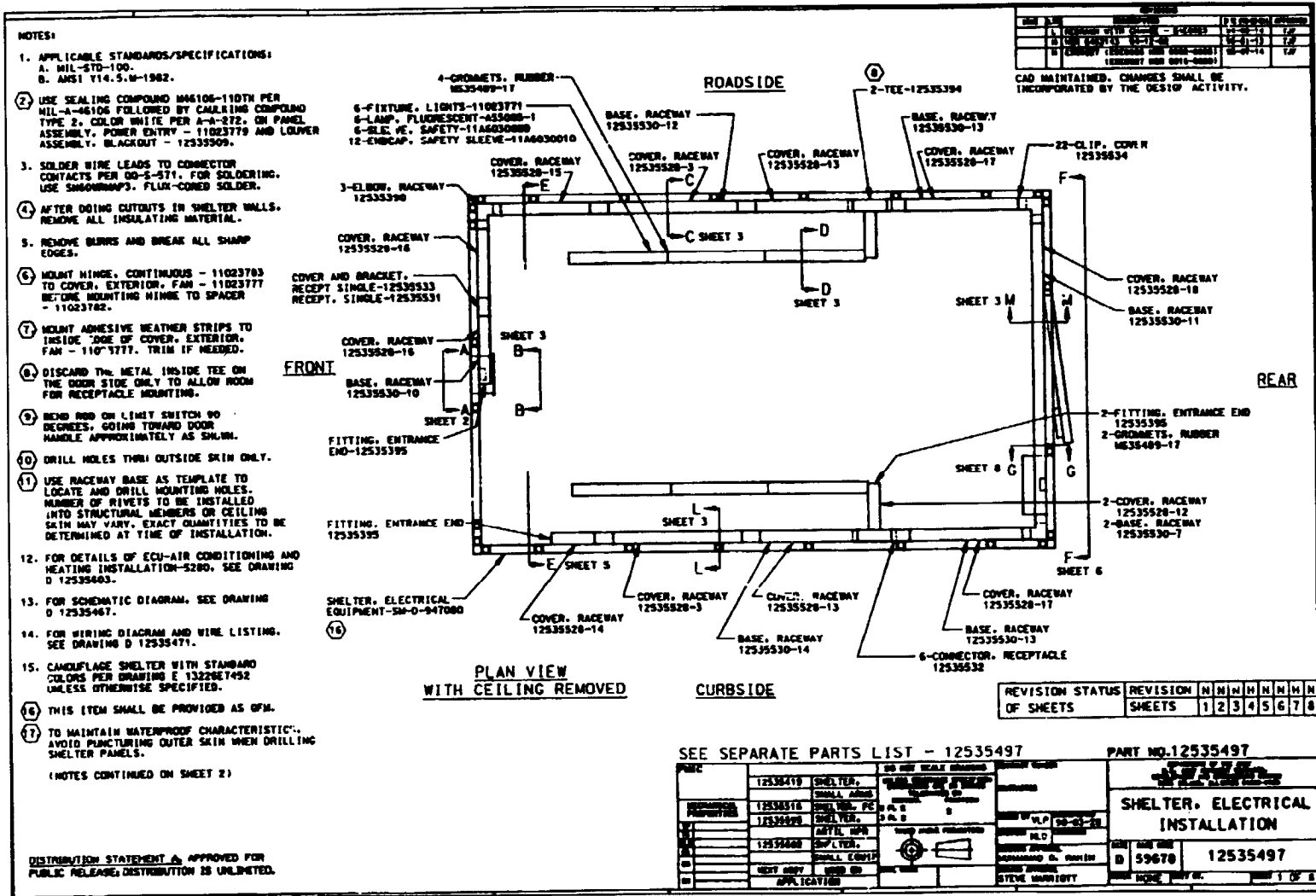


Figure 1 Raceway and Lighting Diagram

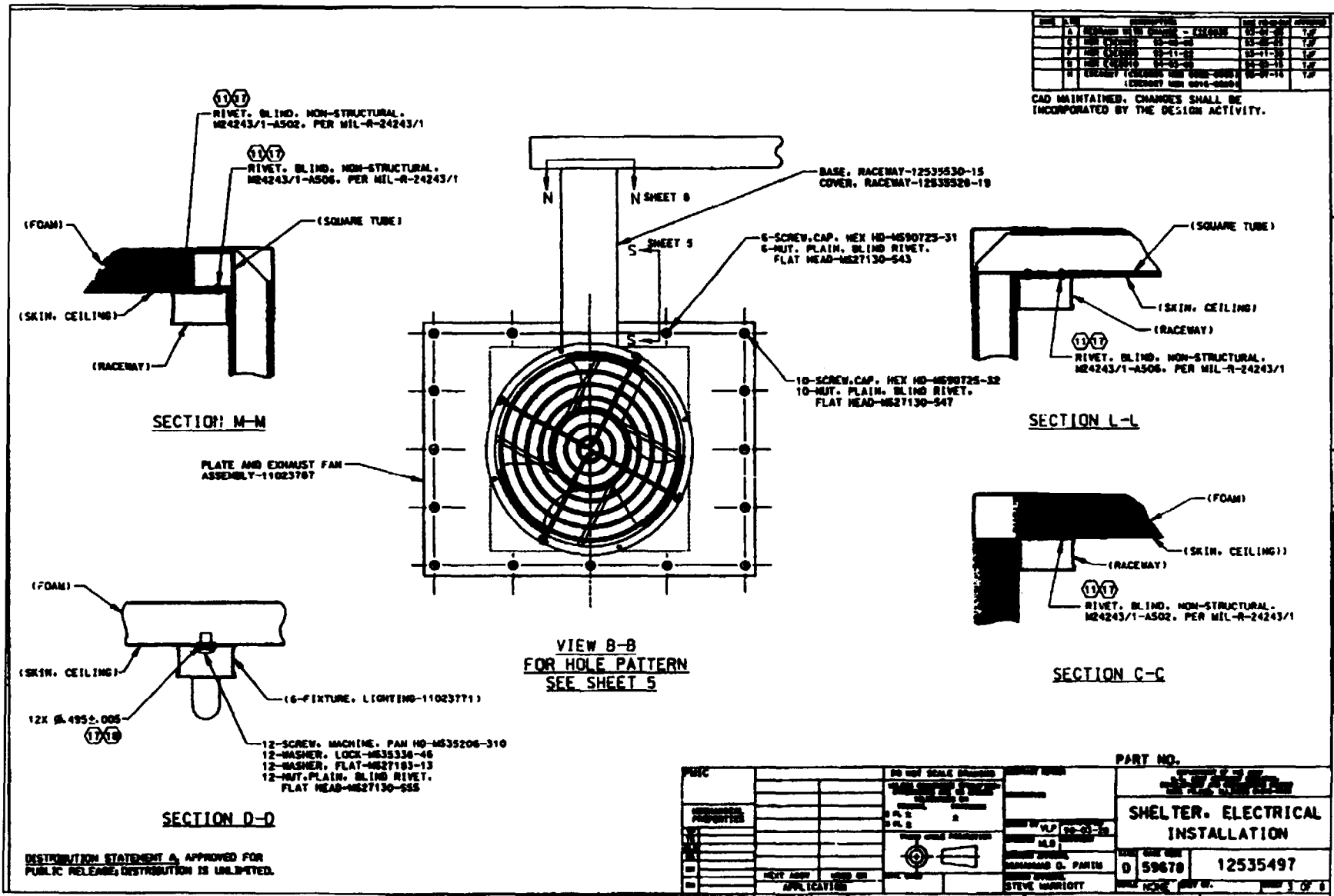


Figure 2 Ventilating Fan

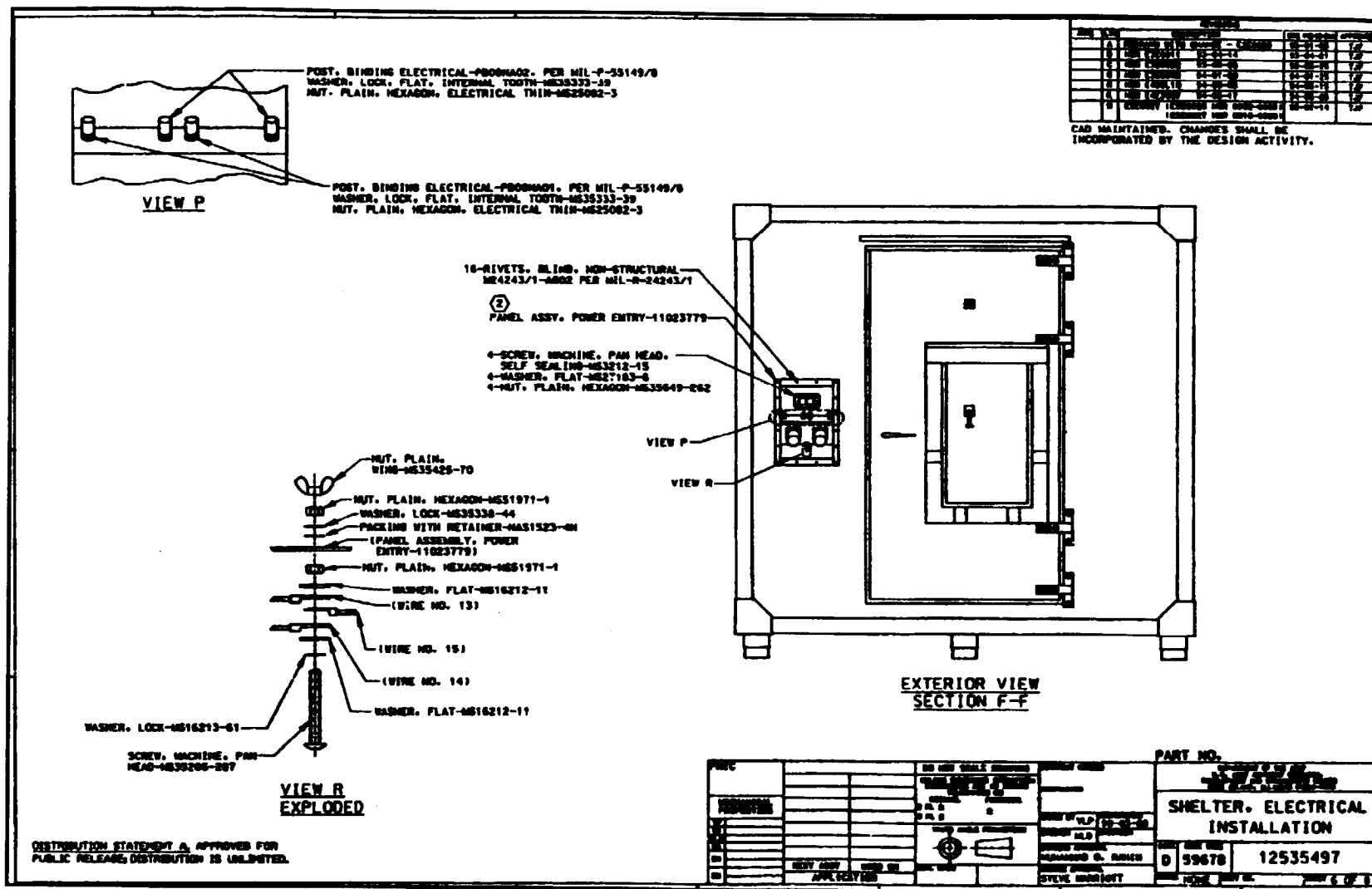


Figure 3. Power Entry Panel Assembly-I

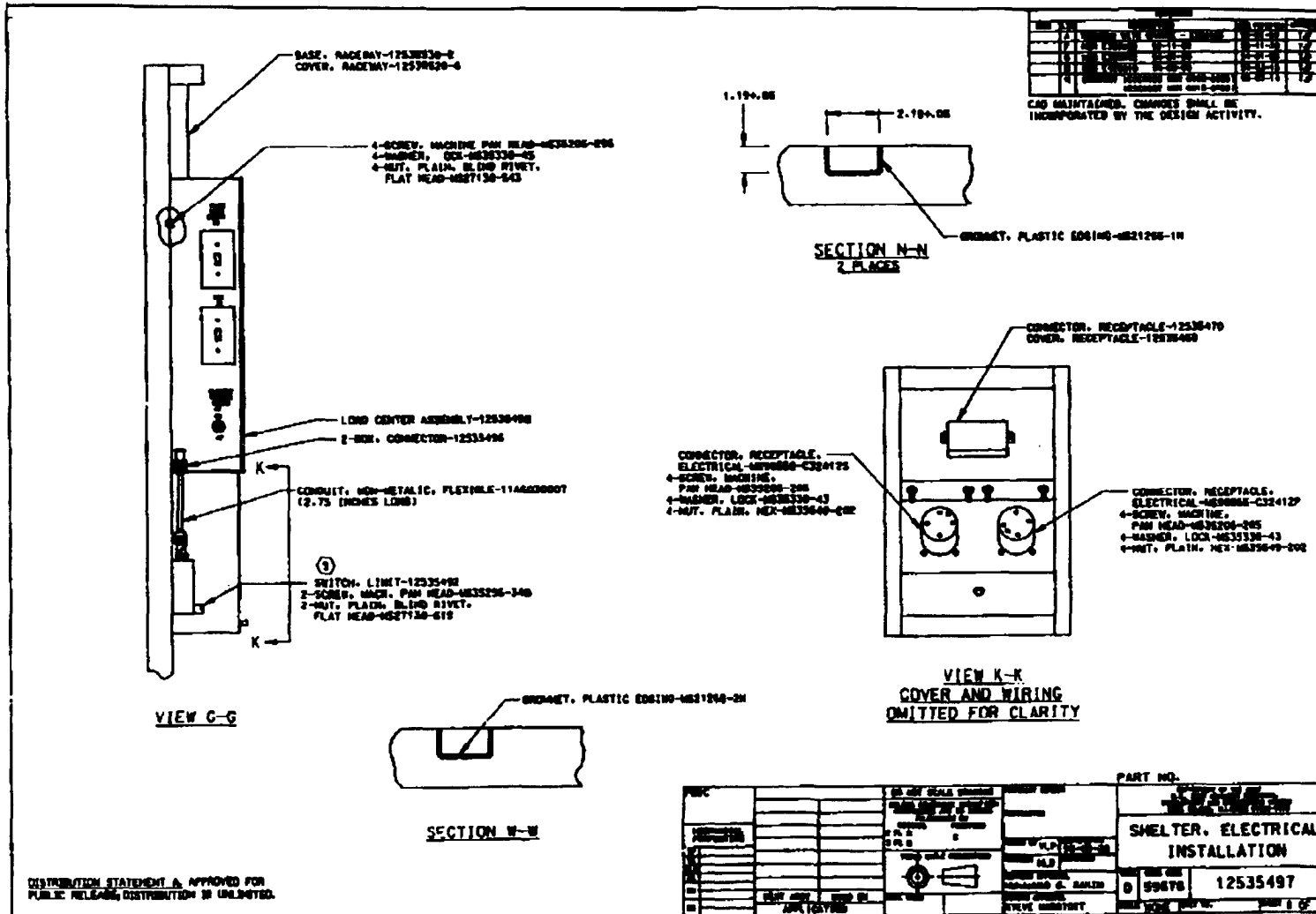


Figure 4 Power Entry Panel Assembly 2



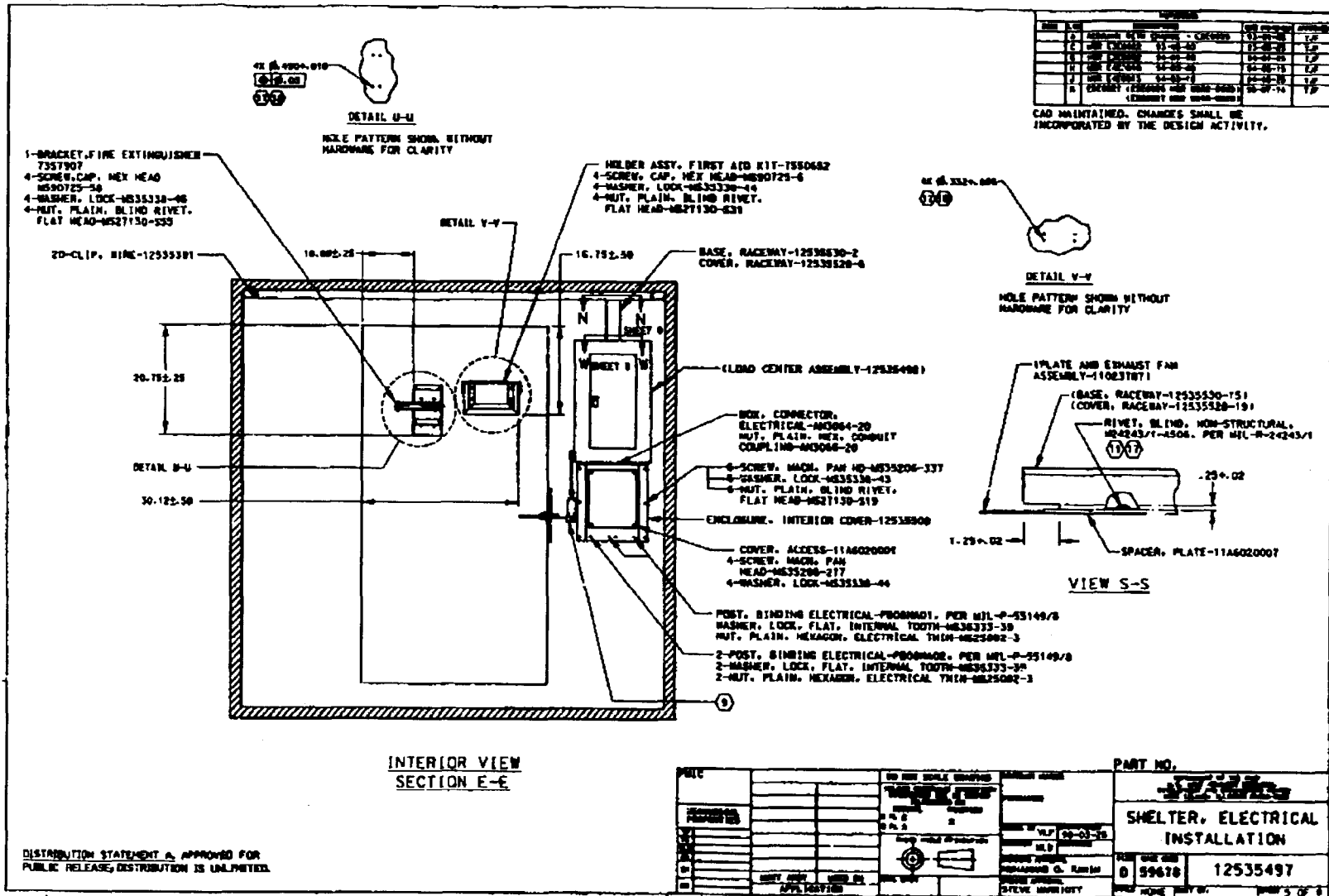


Figure 5. Load Center Assemblies

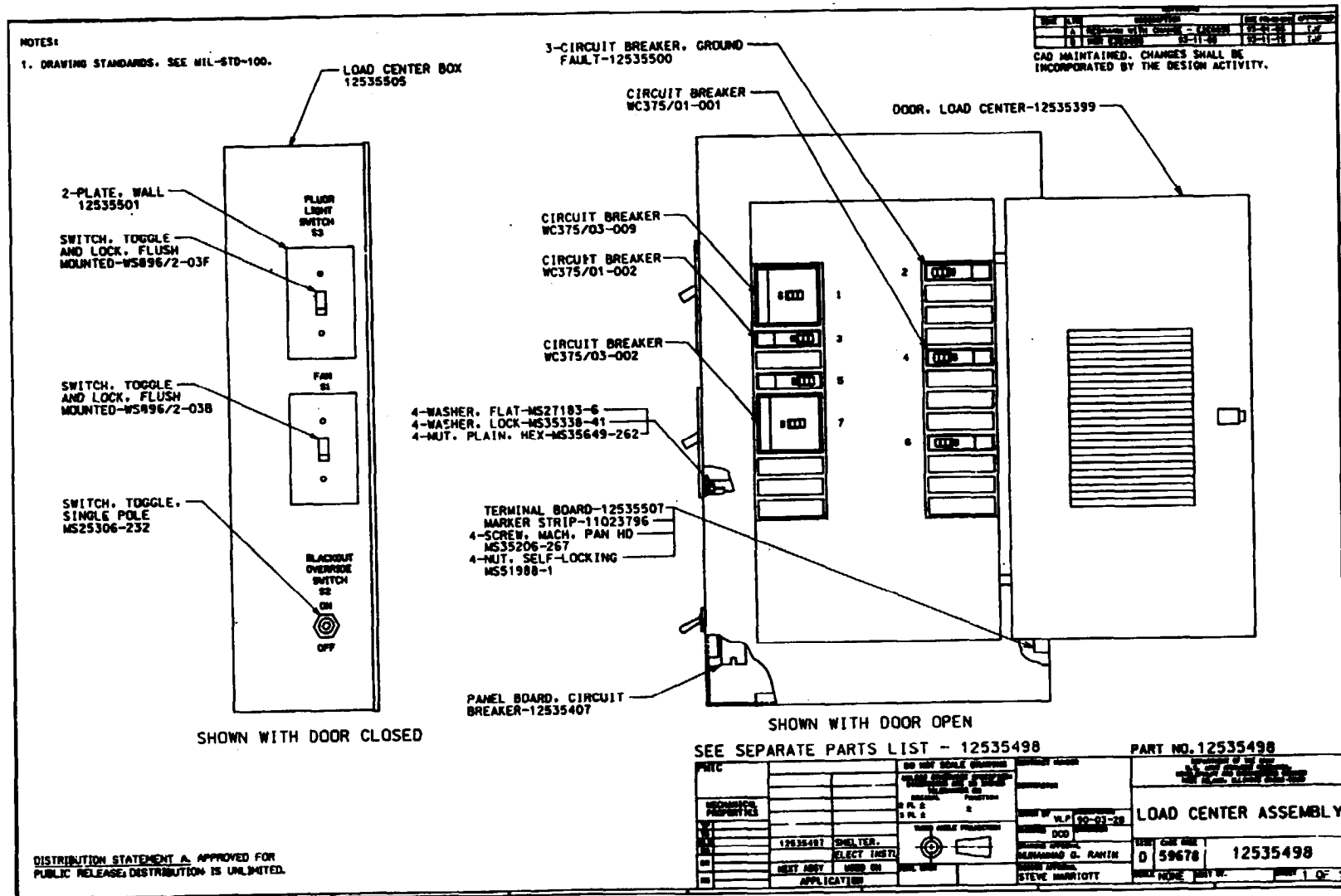


Figure 6. Load Center Assemblies-2

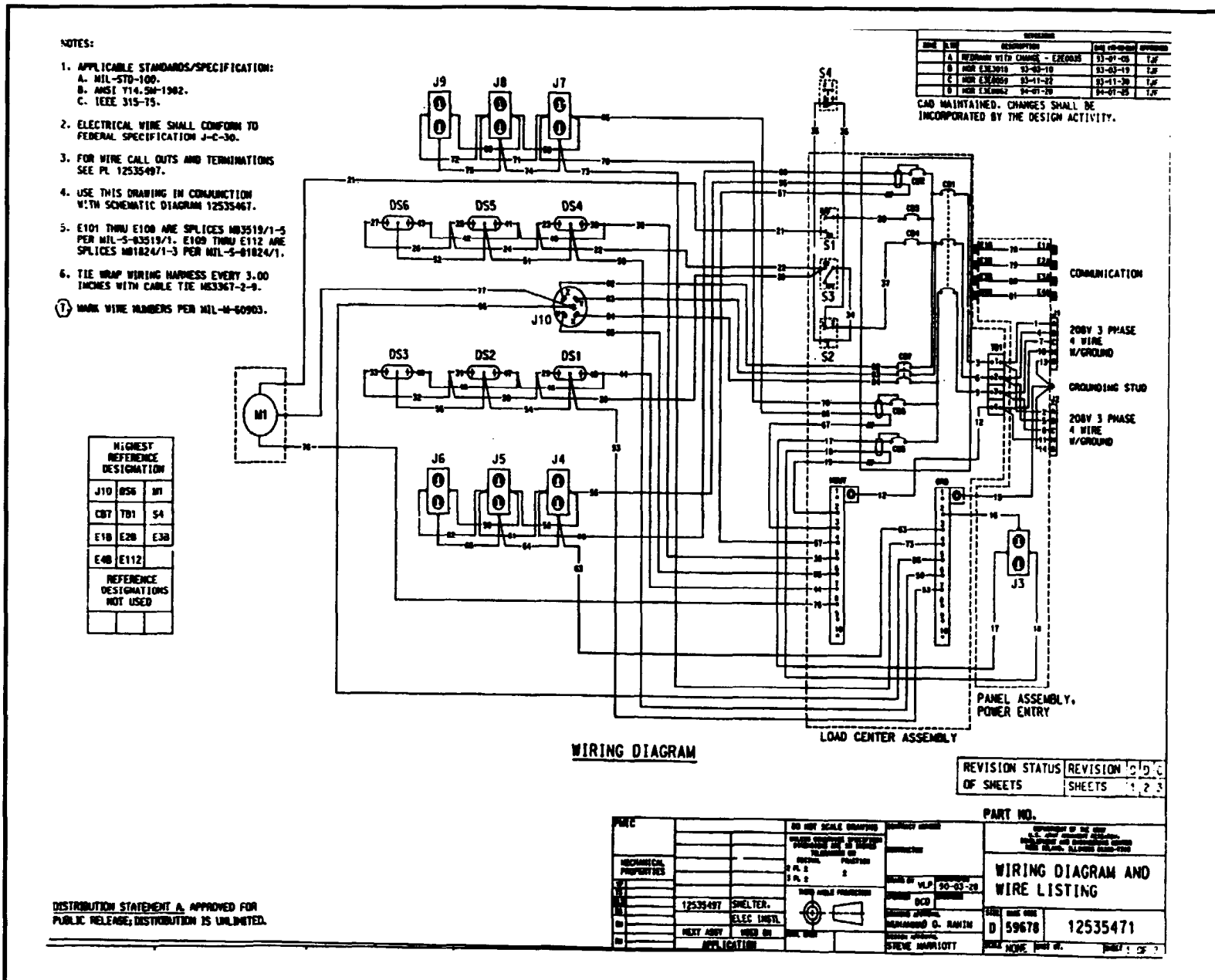


Figure 7. Wiring Diagram

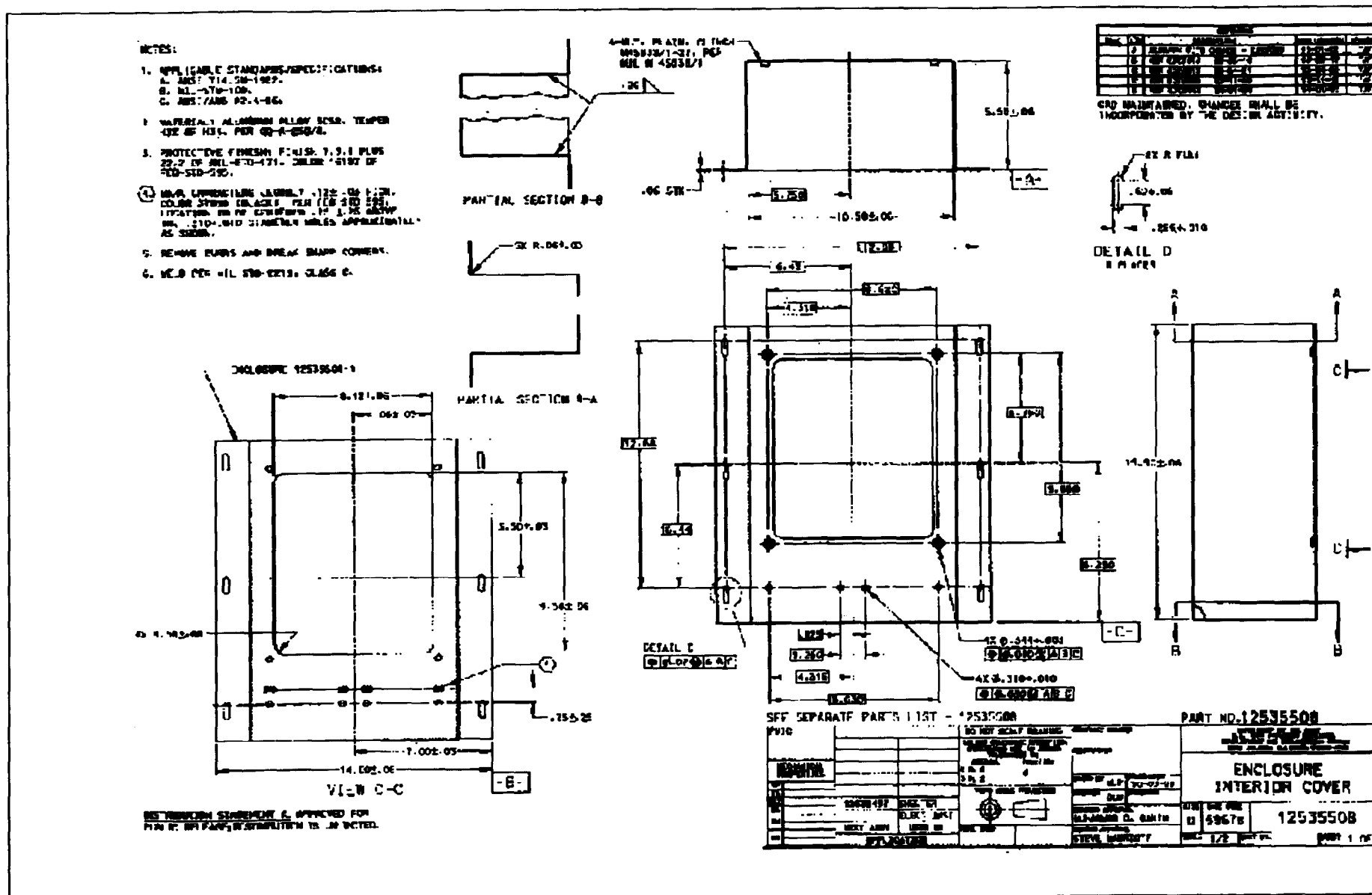


Figure 8 Interior Cover Enclosure

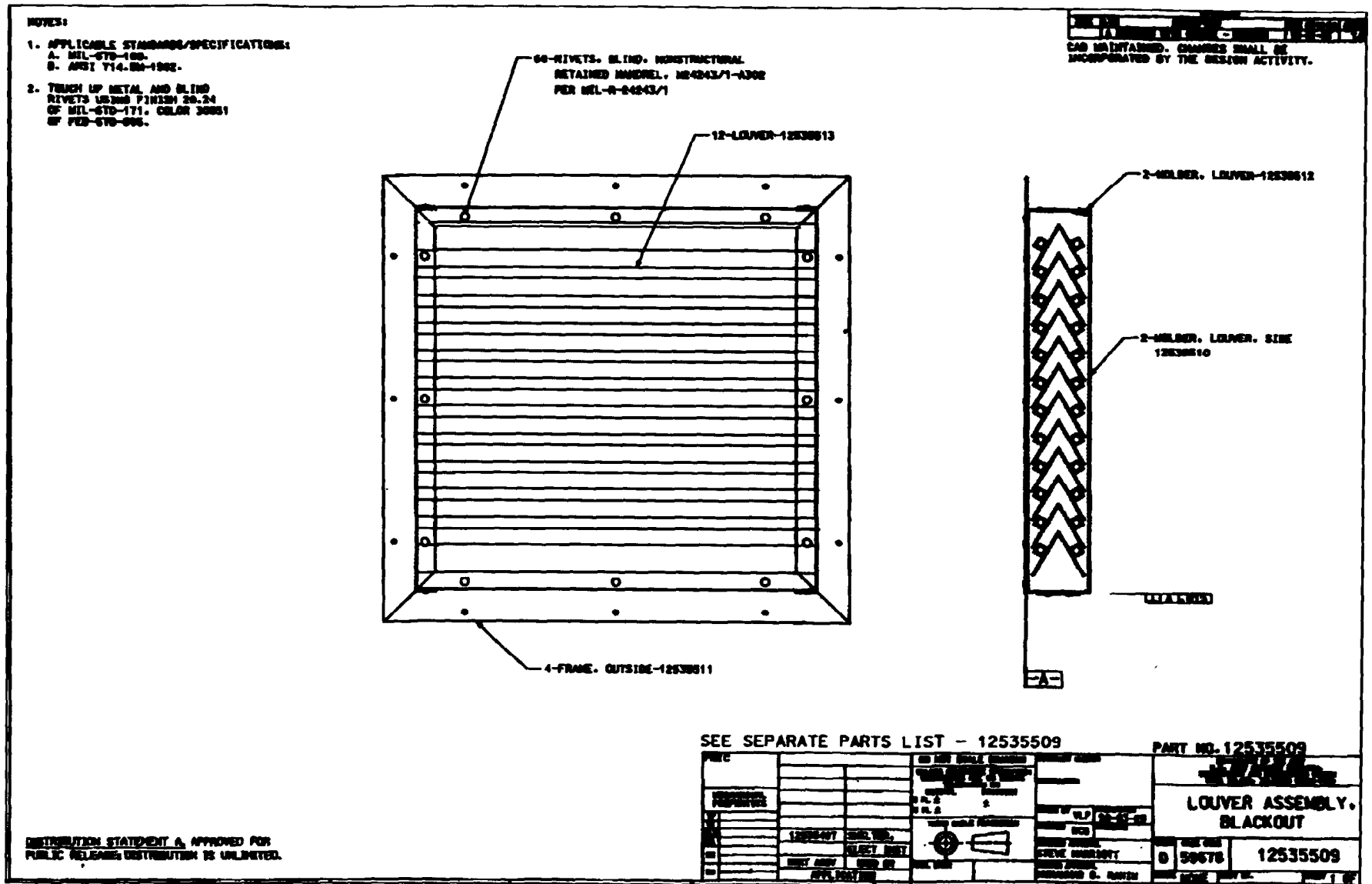


Figure 9 Louver Assembly

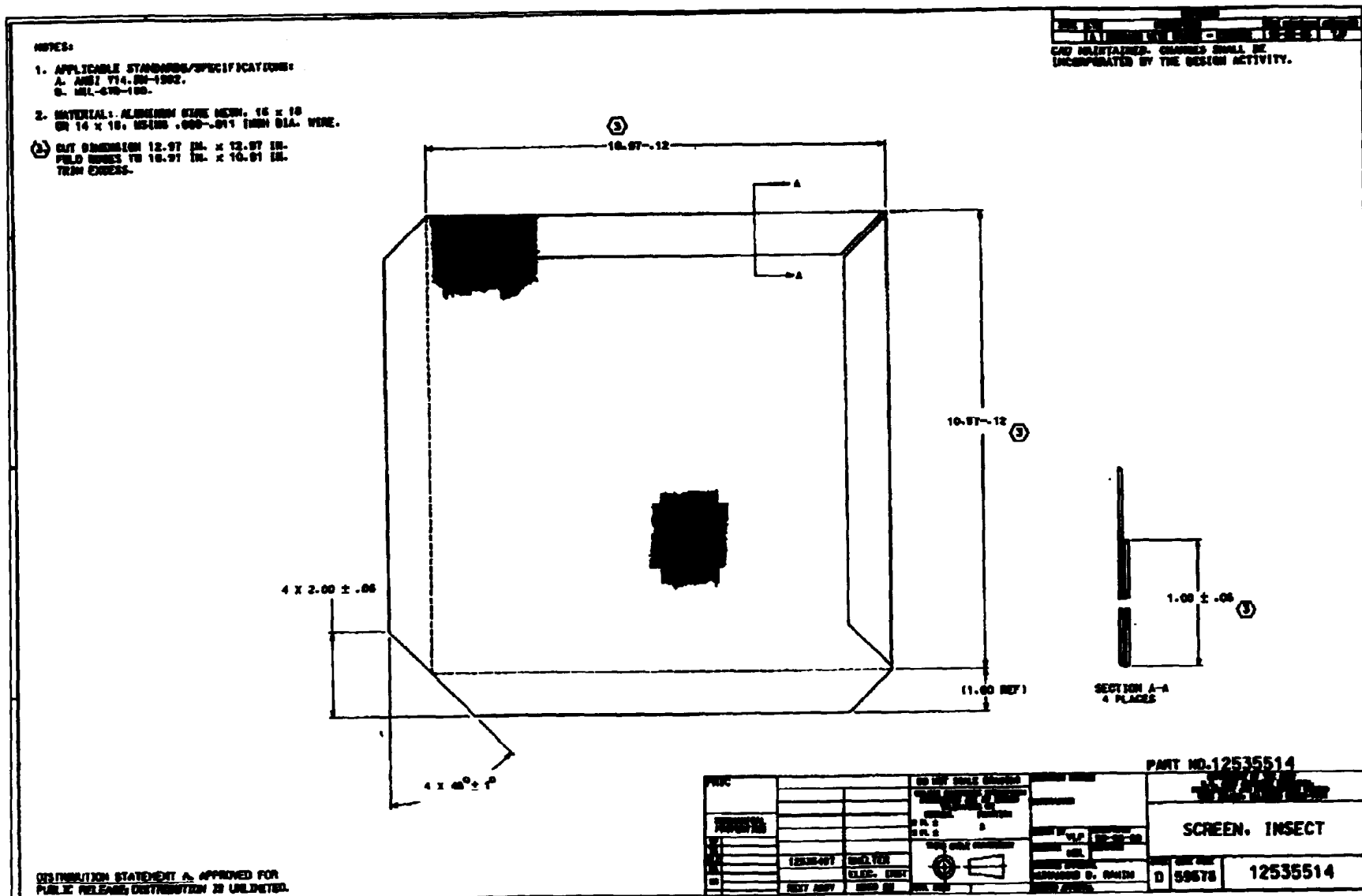


Figure 10 Insect Screen

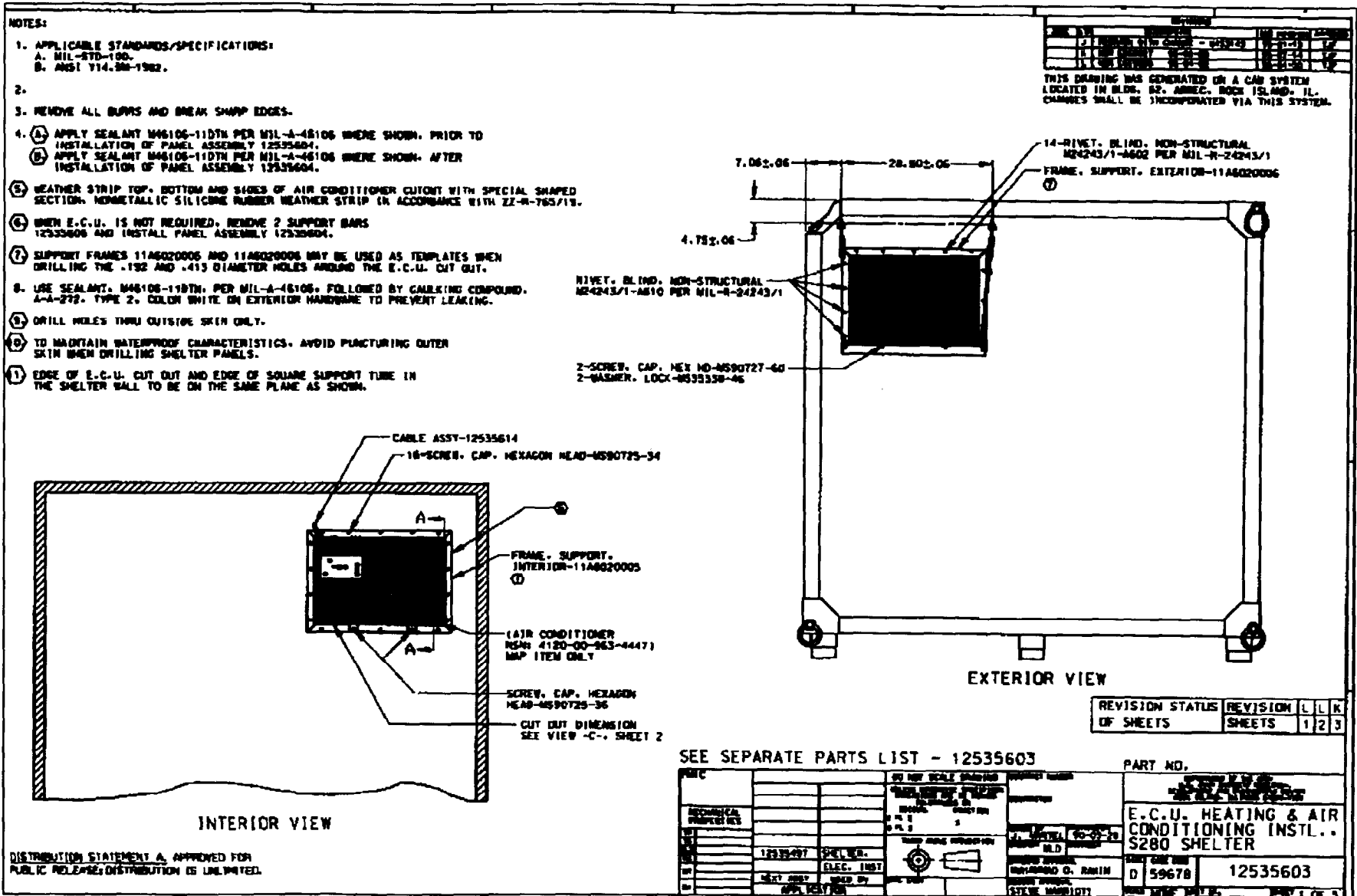
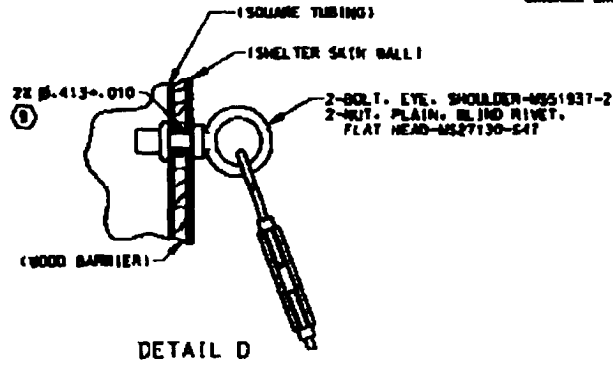
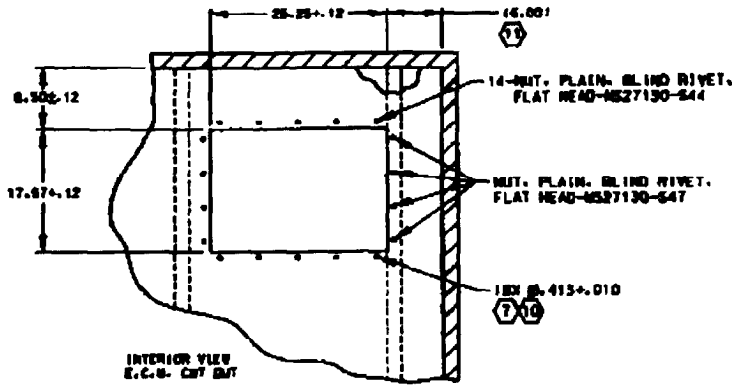


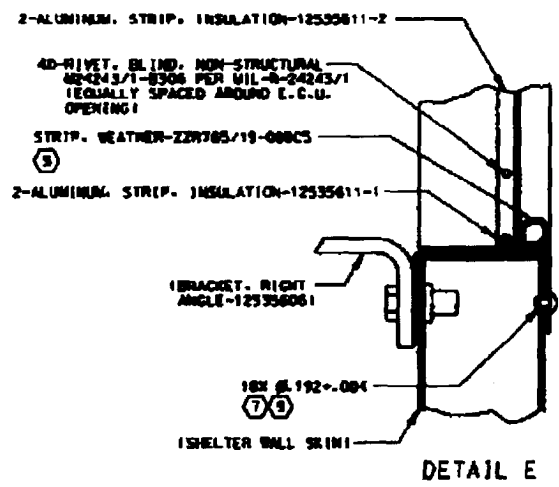
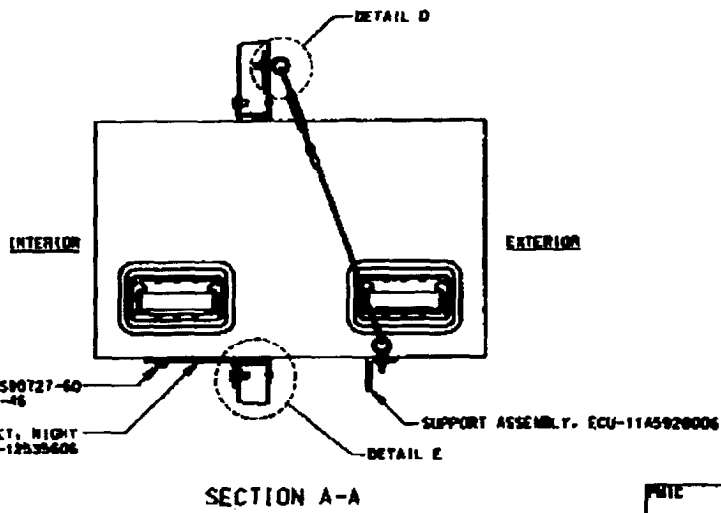
Figure 11 Heating and Air Conditioning 1

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THIS DRAWING WAS GENERATED ON A CAD SYSTEM LOCATED IN BLDG. 63, ANSEC, ROCK ISLAND, IL. CHANGES SHALL BE INCORPORATED VIA THIS SYSTEM.



VIEW C



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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

Figure 12 Heating and Air Conditioning 2



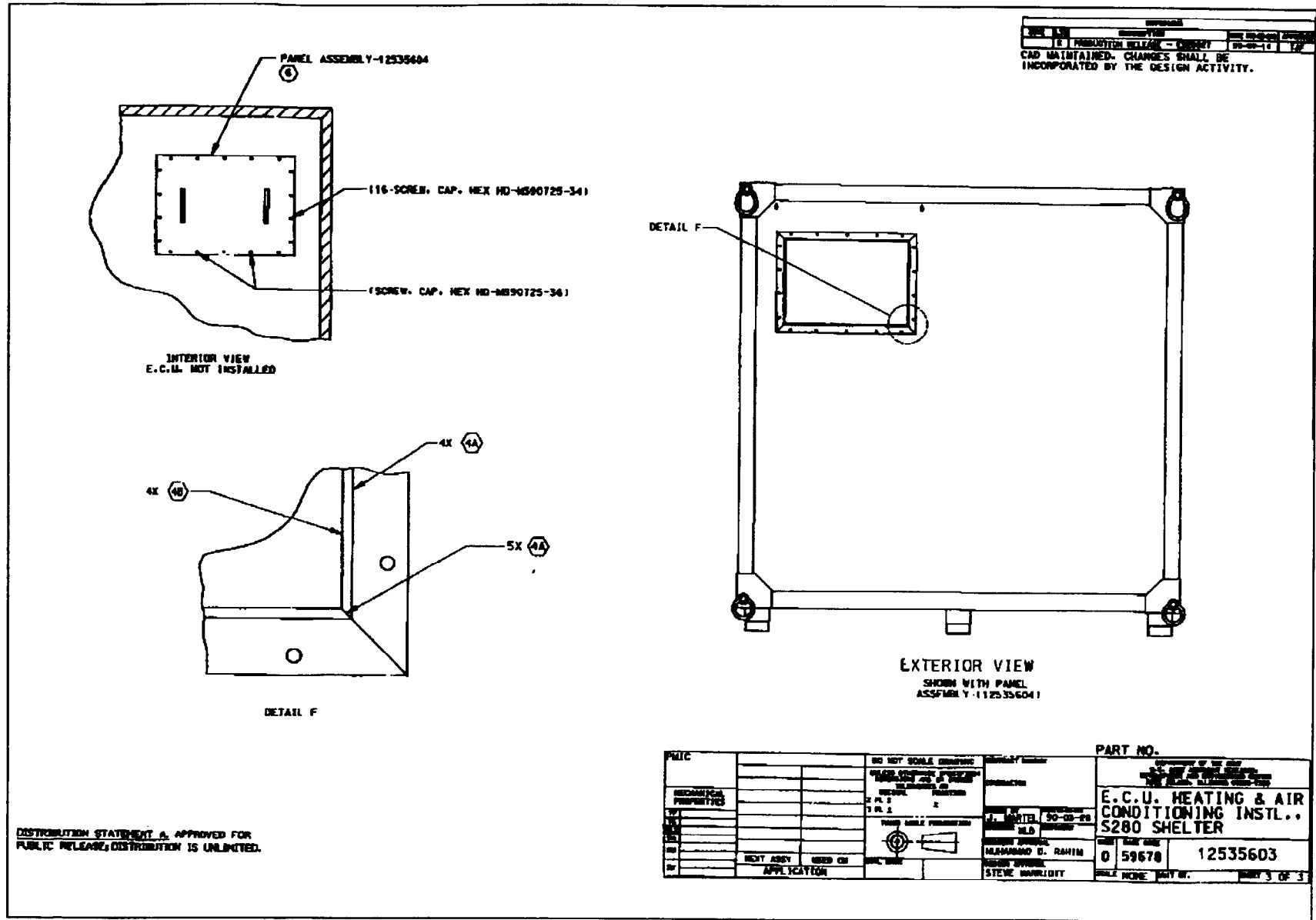


Figure 13 Heating and Air Conditioning 3

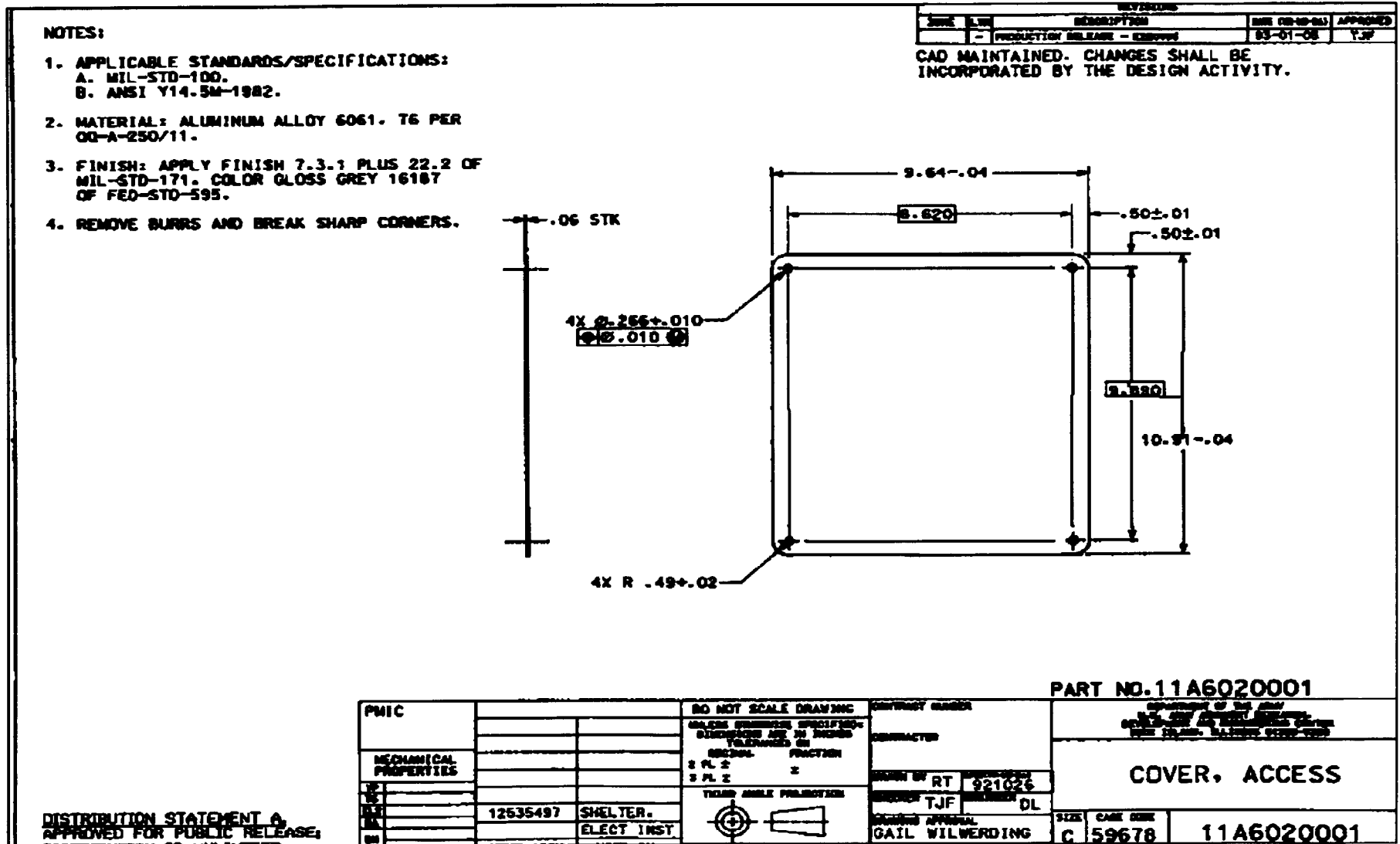


Figure 14 Access Cover

## Parts List

| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER   | NOMENCLATURE OR<br>DESCRIPTION | VENDOR  | CAGE  | PART<br>NUMBER  |
|--------------|--------------|--|--------------------------------|---|-------|---|
| 3            | 59670        | 1253590  | ELBOW, RACEWAY                 | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | G-3011 E  |
| 20           | 59678        | 12535391   | CLIP, WIRE                     | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | G-3000WC  |
| 2            | 59678        | 12535394   | TEE                            | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | G-3015E   |
| 4            | 59678        | 12535395   | FITTING, ENTRANCE END          | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | G-3010AE4   |
| 63           | 59678        | 12535468-1<br>12535468-2<br>12535468-3<br>12535468-4<br>12535468-5<br>12535468-6 | TERMINAL LUG                   | Thomas and Betts Corps<br>Highway 218S<br>Iowa City, IA 52240                               | 59730 | 10RC-10FLX<br>14RB-10FLX<br>14RB-6FLX<br>10RC-14FLX<br>10RC-6FLX<br>18RA-8FLX |
| 1            | 59678        | 12535469   | COVER, RECEPTACLE              | Hubbell Inc.<br>State & Thomas<br>Bridgeport, CT 06602                                      | 75545 | CWP8H   |
| 1            | 59678        | 12535470   | CONNECTOR,<br>RECEPTACLE       | General Elec. Co.<br>Wiring Device Dept.<br>225 Service Ave.<br>Warwick, RI 02886           | 25795 | GE5262-C  |

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| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER | NOMENCLATURE OR<br>DESCRIPTION  | VENDOR   | CAGE  | PART<br>NUMBER |
|--------------|--------------|----------------|---|--|-------|----------------|
| 1            | 59678        | 12535492       | SWITCH, LIMIT   | Honeywell, Inc.<br>Micro-switch Division<br>11 W. Spring St.<br>Freeport, IL 61032           | 91929 | LSP1A4M2       |
| 2            | 59678        | 12535496       | BOX, CONNECTOR  | Kellems Div.,<br>Hubbess, Inc. 11 Lords Hill Rd.<br>PO Box 901<br>Sionington, CT. 06378-0901 | 81992 | PS0509N6Y      |
| 1            | 59678        | 12535508       | ENCLOSURE, INTERIOR<br>COVER  | Dianne Swinford<br>AMSTA-AC-CTTS<br>DSN 793-8969<br>Corn 309-782-6969                        |       | see Figure 8   |
| 1            | 59678        | 12535509       | LOUVER ASSEMBLY,<br>BLACKOUT  | Dianne Swinford<br>AMSTA-AC-CTTS<br>DSN 793-6969<br>Corn 309-782-6969                        |       | see Figure 9   |
| 1            | 59678        | 12535514       | material aluminum, wire<br>mesh, 16x18" or 14x18".<br>using .0009-.0111" dia. wire,<br>cut dimension<br>12.97"x12.97",fold edges to<br>10.91 k10.91" trim edges | Dianne Swinford<br>AMSTA-AC-CT-TS<br>DSN 793-6969<br>Corn 309-782-6969                       |       | see figure 10  |
|              | 59678        | 12535528-3     | COVER, RACEWAY  | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811  | 30538 | 6-3000CE       |
|              | 59678        | 12535530       | BASE, RACEWAY   | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811  | 3D538 | 6-3000B        |

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| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER | NOMENCLATURE OR<br>DESCRIPTION                  | VENDOR  | CAGE  | PART<br>NUMBER |
|--------------|--------------|----------------|---|---|-------|----------------|
| 1            | 59678        | 12535531       | RECEPTACLE, SINGLE                              | General Electric Co.<br>Wiring Devices, Dept.<br>225 Service Ave.<br>Warwick, RI 02886      | 41326 | 6L2120         |
| 6            | 59678        | 12535532       | CONNECTOR,<br>RECETACLE                         | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | 6-30436E       |
| 1            | 59678        | 12535533       | \COVER AND BRACKET,<br>RECEPTACLE SINGLE        | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | 6-3033JE       |
| 22           | 59678        | 12545534       | CLIP, COVER                                     | Crescent Electric Supply Co.<br>511 N. Pershing Ave.<br>Davenport, IA 52801<br>319-323-1811 | 30538 | 6-3006E        |
| 1            | 59678        | 12535603       | ECU HEATING & AIR<br>CONDITIONING INST.<br>S280 | Dianne Swinford<br>AMSTA-AC-CT-TS<br>DSN 793-6969<br>Corn 309-782-6969                      |       | see Figure 11  |
| 1            | 59678        | 11A6020001     | COVER. ACCESS                                   | Dianne Swinford<br>AMSTA-AC-CT-IS<br>DSN 793-6969<br>Corn 309-782-6969                      |       | see Figure 12  |
| 1            | 59678        | 11A6020007     | SPACER, PLAT                                    | Dianne Swinford<br>AMSTA-AC-CITS<br>DSN 793-6969<br>Corn 309-782-6969                       |       | see Figure 13  |

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| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER   | NOMENCLATURE OR<br>DESCRIPTION                | VENDOR  | CAGE  | PART<br>NUMBER |
|--------------|--------------|------------------|---|---|-------|----------------|
| AR           | 59678        | 11A6030007       | CONDUIT, NON-<br>METALLIC, FLEXIBLE (4<br>IN) | Hubbel Inc.<br>Kellems Div<br>14 Lords Hill Rd.<br>Stonington, CT 06378 | 81992 | 61050          |
| 15           | 59678        | 11A6030008       | TERMINAL LUG                                  | AMP Inc.<br>470 Friendship Rd.<br>Hanisburg, PA 17111                   | 00779 | 53946-1        |
| 6            | 59676        | 11A6030009       | SLEEVE<br>SAFETY                              | Neways Ind.<br>2300 Maryland Rd<br>Willow Grove, PA 19090-1799          | 06034 | 4001690        |
| 12           | 59678        | 11A6030010       | ENDCAP, SAFETY<br>SLEEVE                      | Neways Ind.<br>2300 Maryland Rd<br>Willow Grove, PA 19090-1799          |       |                |
| 4            | 96906        | MS3212-15        | SCREW, MACHINE, PAN<br>HEAD, SELF SEALING     | NSN 5305-00-798-0862  |       |                |
| AR           | 96906        | MS3367-2-9       | STRAP, TIEDOWN,<br>ELECTRICAL<br>COMPONENT    | NSN 5975-00-156-3253  |       |                |
| 1            | 96906        | MS-16213-61      | WASHER, LOCK                                  | NSN 531-00-894-2353   |       |                |
| 1            | 96906        | MS16633-<br>1018 | RING, RETAINING                               | NSN 5325-00-282-1633  |       |                |
| AR           | 96906        | MS21266-1N       | GROMMET, PLASTIC<br>EDGING                    | NSN 5325-00-960-2410  |       |                |
| 1            | 96906        | MS21316-27       | THUMBSCREW                                    | NSN 5305-00-296-4036  |       |                |
| 8            | 96906        | MS25082-3        | NUT, PLAIN, HEXAGON,<br>ELECTRICAL THIN       | NSN 5310-00-655-6930  |       |                |

## Parts List

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|--------------|--------------|---|---------------------------------------|--|------|----------------|
| 9            | 96908        | MS27130-S19   | NUT, PLAIN, BLIND RIVET,<br>FLAT HEAD | NSN 5310-01-085-1731   |      |                |
| 4            | 96906        | MS27130-S31   | NUT, PLAIN, BLIND RIVET,<br>FIAT HEAD | NSN 5310-01-015-1021   |      |                |
| 10           | 96996        | MS27130S43  | NUT, PLAIN, BLIND RIVET,<br>FLAT HEAD | NSN 5310-00-080-2411   |      |                |
| 10           | 96906        | MS27130-S47   | NUT, PLAIN, BLIND RIVET,<br>FLAT HEAD | NSN 5310-01-038-9577   |      |                |
| 16           | 96966        | MS27130-S55   | NUT, PLAIN, BLIND RIVET,<br>FLAT HEAD | NSN 5310-01-134-5769   |      |                |
| 4            | 96906        | MS27183-6   | WASHER, FLAT                          | NSN 5310-00-082-1404   |      |                |
| 12           | 96906        | MS35206-13  | WASHER, FLAT                          | NSN 5305-00-059-7664   |      |                |
| 1            | 98908        | MS35206-262<br>MS35206-280<br>MS35206-267<br>MS35206-259<br>MS35206-264 | SCREW, MACHINE, PAN<br>HEAD           | Chrysler Corp.<br>Amplex Wisconsin Mfg. OPNS<br>151 Industrial Drive<br>Beaver Dam, WI 53916<br>414-887-1791 |      |                |
| 8            | 98908        | MS35206-265   | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-00-984-6212   |      |                |
| 4            | 96906        | MS35206-277   | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-00-988-1721   |      |                |
| 1            | 96906        | MS35206-287   | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-00-988-1728   |      |                |
| 4            | 96908        | MS35206-296   | SCREW, MACHINE, PAN<br>HEAD           | NSN 5395-00-984-5676   |      |                |

## Parts List

| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER    | NOMENCLATURE OR<br>DESCRIPTION        | VENDOR               | CAGE | PART<br>NUMBER |
|--------------|--------------|-------------------|---------------------------------------|----------------------|------|----------------|
| 12           | 96906        | MS35206-310       | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-00-984-5690 |      |                |
| 6            | 98906        | MS35206-337       | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-00-406-6695 |      |                |
| 2            | 98906        | MS35206-340       | SCREW, MACHINE, PAN<br>HEAD           | NSN 5305-01-027-6395 |      |                |
| 8            | 98906        | MS35338-39        | WASHER, LOCK, FLAT,<br>INTERNAL TOOTH | NSN 5310-00-543-5060 |      |                |
| 14           | 96906        | ms35338-39        | WASHER LOCK                           | NSN 5310-00-045-3296 |      |                |
| 9            | 96906        | MS35338-44        | WASHER, LOCK                          | NSN 5310-00-582-5965 |      |                |
| 4            | 96906        | MS35338-45        | WASHER, LOCK                          | NSN 5310-00-407-9566 |      |                |
| 16           | 98908        | MS35336-46        | WASHER, LOCK                          | NSN 5310-00-637-9541 |      |                |
| 1            | 98908        | MS35425-70        | NUT, PLAIN, WING                      | NSN 5310-01-064-8787 |      |                |
| 6            |              | MS35489-17        | GROMMET, RUBBER                       | NSN 5325-01-242-7083 |      |                |
|              | 81349        | M24243/1-<br>A502 | RIVET, BLIND, NON-<br>STRUCTURAL      | NSN 5320-01-067-7082 |      |                |
| 5            | 81349        | M24243/1-<br>A502 | RIVET, BLIND, NON-<br>STRUCTURAL      | NSN 5320-01-067-7082 |      |                |
| AR           | 81349        | M24243/1-<br>A506 | RIVET, BLIND, NON-<br>STRUCTURAL      | NSN 5320-00-850-3267 |      |                |
| 5            | 81349        | M24243/1A508      | RIVET, BLIND, NON-<br>STRUCTURAL      | NSN 5320-01-079-6817 |      |                |
| 5            | 81349        | M24243/1A512      | RIVET, BLIND, NON-<br>STRUCTURAL      | NSN 5320-01-015-0699 |      |                |



## Parts List

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|--------------|--------------|-----------------|-----------------------------------|--------|-------------------|----------------|
| 16           | 61349        | M24243/1-A602   | RIVET, BLIND, NON-STRUCTURAL      | NSN    | 5320-00-850-3266  |                |
| 2            | 81349        | M24243/1-A804   | RIVET, BLIND, NON-STRUCTURAL      | NSN    | 5940-00-850-3267  |                |
| 6            | 81349        | M81824/1-3      | SPLICE, ELECTRICAL, CRIMP STYLE   | NSN    | 5940-01-266-8425  |                |
| 8            | 81349        | M83519/1-5      | SHIELD TERMINATION, SOLDER STYLE  | NSN    | 5940-01-135-7079- |                |
| 8            | 96906        | MS35649-202     | Nut, plain, Hexagon               |        | 5310-00-934-9758  |                |
| 4            | 96908        | MS51 865-5      | NUT, PLAIN, HEXAGON               | NSN    | 5310-01-311-7940  |                |
| 1            | 96906        | MS51865-5       | NUT, SELF LOCKING, CAP            | NSN    | 5310-01-311-7940  |                |
| 2            | 96906        | MS51971-1       | NUT, PLAIN, HEXAGON               | NSN    | 5310-00-903-5966  |                |
| 1            | 96908        | MS90558-C32412S | CONNECTOR, RECEPTACLE, ELECTRICAL | NSN    | 5935-00-114-9740  |                |
| 1            | 96908        | MS90558-C32412P | CONNECTOR, RECEPTACLE, ELECTRICAL | NSN    | 5935-00-114-8708  |                |
| 4            | 96908        | MS90725-6       | SCREW, CAP, HEXAGON HEAD          | NSN    | 5305-00-069-0502  |                |
| 6            | 96908        | MS90725-32      | SCREW, CAP, HEXAGON HEAD          | NSN    | 5306-00-226-4825  |                |
| 10           | 96906        | MS90725-34      | SCREW, CAP, HEXAGON HEAD          | NSN    | 5306-00-225-8499  |                |
| 4            | 96908        | MS90725-58      | SCREW, CAP, HEXAGON HEAD          | NSN    | 5305-00-115-9526  |                |
| AR           | 58536        | AA-A-272        | CAULKING COMPOUND TYPE 2          | NSN    | 6030-01-075-1156  |                |

## Parts List

| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER                | NOMENCLATURE OR<br>DESCRIPTION                 | VENDOR   | CAGE | PART<br>NUMBER |
|--------------|--------------|-------------------------------|--|--|------|----------------|
|              |              |                               | COLOR WHITE                                    |  |      |                |
| 6            | 58536        | A55005-1                      | LAMP, FLUORESCENT                              | NSN 6240-00-152-2996   |      |                |
| 1            | 88044        | AN3064-20                     | BOX, CONNECTOR,<br>ELECTRICAL                  | NSN 5975-00-548-9557   |      |                |
| 1            | 88044        | AN3066-20                     | NUT, PLAIN, HEXAGON,<br>CONDUIT COUPLING       | NSN 5975-00-280-6083   |      |                |
| 1            | 80205        | NA3066-20                     | PACKING WITH<br>RETAINER                       | Dianne Swinford<br>AMSTA-AC-CITS<br>DSN 793-696<br>Corn 309-782-6969 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CF/GTTJO | CABLE ANS WIRE,<br>ELECTRICAL<br>(BLACK 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CF/GTTJ2 | CABLE ANS WIRE,<br>ELECTRICAL<br>(RED 6 AWG)   | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CFGITJ5  | CABLE ANS WIRE,<br>ELECTRICAL<br>(GREEN 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CF/GTTJG | CABLE ANS WIRE,<br>ELECTRICAL<br>(BLUE 6 AWG)  | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CF/6TTJ9 | CABLE ANS WIRE,<br>ELECTRICAL<br>(WHITE 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | J-C-<br>30BTHHNO6<br>CF/6TTJ0 | CABLE ANS WIRE,<br>ELECTRICAL<br>(BLACK 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |

## Parts List

| QTY<br>REQ'D | CAGE<br>CODE | PART<br>NUMBER                | NOMENCLATURE OR<br>DESCRIPTION                 | VENDOR   | CAGE | PART<br>NUMBER |
|--------------|--------------|-------------------------------|--|--|------|----------------|
| AR           | 14153        | J-C-<br>30BTHHNO6             | CABLE ANS WIRE,<br>ELECTRICAL<br>(RED 6 AWG)   | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | CF/GTTJ2<br>J-C-<br>30BTHHNO6 | CABLE ANS WIRE,<br>ELECTRICAL<br>(GREEN 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | CF/6TTJ5<br>J-C-<br>30BTHHNO6 | CABLE ANS WIRE,<br>ELECTRICAL<br>(BLUE 6 AWG)  | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 14153        | CF/6TTJG<br>J-C-<br>30BTHHNO6 | CABLE ANS WIRE,<br>ELECTRICAL<br>(WHITE 6 AWG) | Defense Industrial Supply Center<br>(DISC)<br>Philadelphia, PA 19111 |      |                |
| AR           | 81349        | M46106-<br>11DTN              | SEALANT, SILICONE                              | NSN 8040-01-438-7061   |      |                |
| ar           | 81349        | M23053/5-106-<br>9            | INSULATION SLEEVIING                           | NSN 5970-00-814-2878   |      |                |
| 4            | 81349        | PB08NA01                      | POST, BINDING<br>ELECTICAL (BLACK)             | NSN 5940-00-937-5237   |      |                |
| 4            | 81349        | PB08NA02                      | POST, BINDING<br>ELECTICAL<br>(RED)            | NSN 5940-00-926-8162   |      |                |
| 12           | 81349        | M24243/1-<br>A302             | RIVET, BLIND, NON-<br>STRUCTURAL               | NSN 5320-00-860-6605   |      |                |

By Order of the Secretary of the Army:

DENNIS J. REIMER  
*General, United States Army*  
*Chief of Staff*

Official:

  
**JOEL B. HUDSON**  
*Administrative Assistant to the*  
*Secretary of the Army*  
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# THE METRIC SYSTEM AND EQUIVALENTS

## WEIGHT MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

## WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

## CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

## TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

## APPROXIMATE CONVERSION FACTORS

| TO CHANGE              | TO                   | MULTIPLY BY |
|------------------------|----------------------|-------------|
| Inches                 | Centimeters          | 2.540       |
| Feet                   | Meters               | 0.305       |
| Yards                  | Meters               | 0.914       |
| Miles                  | Kilometers           | 1.609       |
| Square Inches          | Square Centimeters   | 6.451       |
| Square Feet            | Square Meters        | 0.093       |
| Square Yards           | Square Meters        | 0.836       |
| Square Miles           | Square Kilometers    | 2.590       |
| Acres                  | Square Hectometers   | 0.405       |
| Cubic Feet             | Cubic Meters         | 0.028       |
| Cubic Yards            | Cubic Meters         | 0.765       |
| Fluid Ounces           | Milliliters          | 29.573      |
| its                    | Liters               | 0.473       |
| arts                   | Liters               | 0.946       |
| allons                 | Liters               | 3.785       |
| Ounces                 | Grams                | 28.349      |
| Pounds                 | Kilograms            | 0.454       |
| Short Tons             | Metric Tons          | 0.907       |
| Pound-Feet             | Newton-Meters        | 1.356       |
| Pounds per Square Inch | Kilopascals          | 6.895       |
| Miles per Gallon       | Kilometers per Liter | 0.425       |
| Miles per Hour         | Kilometers per Hour  | 1.609       |

| TO CHANGE          | TO                     | MULTIPLY BY |
|--------------------|------------------------|-------------|
| Centimeters        | Inches                 | 0.394       |
| Meters             | Feet                   | 3.280       |
| Meters             | Yards                  | 1.094       |
| Kilometers         | Miles                  | 0.621       |
| Square Centimeters | Square Inches          | 0.155       |
| Square Meters      | Square Feet            | 10.764      |
| Square Meters      | Square Yards           | 1.196       |
| Square Kilometers  | Square Miles           | 0.386       |
| Square Hectometers | Acres                  | 2.471       |
| Cubic Meters       | Cubic Feet             | 35.315      |
| Cubic Meters       | Cubic Yards            | 1.308       |
| Milliliters        | Fluid Ounces           | 0.034       |
| Liters             | Pints                  | 2.113       |
| Liters             | Quarts                 | 1.057       |
| ers                | Gallons                | 0.264       |
| ms                 | Ounces                 | 0.035       |
| ograms             | Pounds                 | 2.205       |
| Metric Tons        | Short Tons             | 1.102       |
| Newton-Meters      | Pounds-Feet            | 0.738       |
| Kilopascals        | Pounds per Square Inch | 0.145       |
| ometers per Liter  | Miles per Gallon       | 2.354       |
| ometers per Hour   | Miles per Hour         | 0.621       |



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