Manual No: **576013-637** ● Revision: **M**

TLS-350 Series Consoles

Board and Software Replacement

VEEDER-ROOT

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FCC INFORMATION

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Introduction

This manual contains instructions for replacing the following TLS-350 series console components:

- ECPU board
- Software modules and memory modules (ECPU)
- ECPU board TLS Setup Storage Device
- ECPU board backup battery
- ECPU board software module

This manual does not provide troubleshooting information.

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Installer (Level 1) Certification: Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

ATG Technician (Level 2/3 or 4) Certification: Contractors holding valid ATG Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. In addition, Contractors with the following sub-certification designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

- Wireless 2
- Tall Tank

Warranty Registrations may only be submitted by selected Distributors.

Related Manuals

576013-879 TLS-3XX Series Consoles Site Prep Manual

576013-818 TLS-3XX Series Consoles Troubleshooting Guide

Before You Begin

Before you begin component replacement, read the following guidelines:

- To avoid electrical shock, be sure AC power to the console is Off when performing the procedures in this manual.
- Failure to comply with these requirements could result in death, serious personal injury, property loss, or equipment damage.

Safety Precautions

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions.

	ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.		TURN POWER OFF Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.
	INJURY Careless or improper handling of tools can cause bodily injury.		STATIC SENSITIVE COMPONENTS Wear grounded anti-static wrist strap before handling the printed circuit board.
	WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury.		READ ALL RELATED MANUALS Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does

⚠ WARNING

This system operates on 115 Vac power. Serious injury or death from electrical shock could occur if the power ON/OFF warnings in this manual are not heeded.

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

1. **Read and follow all instructions in this manual, including all safety warnings.**
2. **Remove rings from hands, metal watch bands and bracelets, and loose hanging neck jewelry before performing these procedures.**
3. **Do not modify or use service parts other than those provided by Veeder-Root.**

Precautions Against Static Electricity

Before removing electronic components from their antistatic bags read the following static electricity precautions.

1. Before handling any components, discharge your body's static electric charge by touching a grounded surface.
2. Do not remove parts from their antistatic bags until you are ready to install them.
3. Do not lay parts on the antistatic bags! Only the insides are antistatic.
4. When handling parts, hold them by their edges and their metal mounting brackets.
5. Avoid touching components or edge connectors that plug into slots.
6. Never slide parts over any surface.
7. Avoid plastic, vinyl, and styrofoam in your work area.
8. Wear the antistatic wrist strap included in your component replacement kit.
9. The antistatic caution icon shown to the left appears in several places in this manual to remind you to wear an antistatic wrist strap (Part No. 576013-908) when handling static sensitive devices.

Before Turning Off Power - All Procedures

1. If you have a printer and it is usable, from the Operations Mode press the PRINT key to print out a copy of the system status [active alarms (if any), and in-tank inventory].
2. From the Setup Mode press the PRINT key to print out a copy of the system setup.
3. From the Diagnostic Mode press FUNCTION then PRINT for each of the Diagnostic Mode functions to print out copies of all of the system diagnostic reports.

Archiving the System Setup

1. Enter the Setup Mode and press the FUNCTION key until the display reads:

   ARCHIVE UTILITY
   PRESS <STEP> TO CONTINUE

2. Press the STEP key until the display reads:

   ARCHIVE UTILITY
   SAVE SETUP DATA: NO

3. Press the CHANGE key:

   ARCHIVE UTILITY
   SAVE SETUP DATA: YES

4. Press the ENTER key:

   SAVE SETUP DATA: YES
   PRESS <STEP> TO CONTINUE

5. Press the STEP key:

   SAVE SETUP DATA: YES
   ARE YOU SURE?: NO

6. Press the CHANGE key:

   SAVE SETUP DATA: YES
   ARE YOU SURE?: YES

7. Press the ENTER key:

   ARE YOU SURE?: YES
   PRESS <STEP> TO CONTINUE

8. Press the STEP key and the printer prints:

```
ARCHIVE UTILITY

SAVE SETUP DATA:
START TIME:
MMM DD, YYYY HH:MM:SS XM
```

9. And the front panel display reads:

   ARCHIVE UTILITY
   SAVE SETUP DATA: BUSY

10. The console is now writing the current system setup to the TLS Setup Storage Device. After this task is completed, the printer prints:

```
ARCHIVE UTILITY
SAVE SETUP DATA:
END TIME:
MMM DD, YYYY HH:MM:SS XM
BYTES: XXXX
```

11. And the front panel display reads:

ARCHIVE UTILITY **PRESS <STEP> TO CONTINUE**

Replacing the ECPU Board

CAUTION! All operating, setup and historical data will be lost when the console is turned off and the ECPU2 board is replaced if you do not archive the system setup programming.

1. Perform the “Archiving the System Setup” on page 4.
2. Switch Off power to the Console. Open the left front door of the console. Follow the steps in Figure 1 to remove the ECPU board.
3. Place old and new ECPU boards side by side on a clean work surface. Make sure that the Battery Backup switches on both boards are turned Off.
4. Using a chip removal tool similar to the one shown (IC Extraction tool, Digikey Part No. K158-ND, or equivalent), follow the steps outlined in Figure 4 remove the TLS Setup Storage Device from the old ECPU board and install it the identical socket on the new board reversing the procedure shown in Figure 4. Observe chip orientation as shown in Figure 5.
5. Remove the SEM module from the old board and install it in the SEM socket of the new board (ref Figure 13 on page 20). Note: Either type SEM will only plug in one way.
6. Remove the software module from the old ECPU board and install it on the new board (ref Figure 9 on page 15). If present, also remove the memory module from the old ECPU board and install it on the new board.

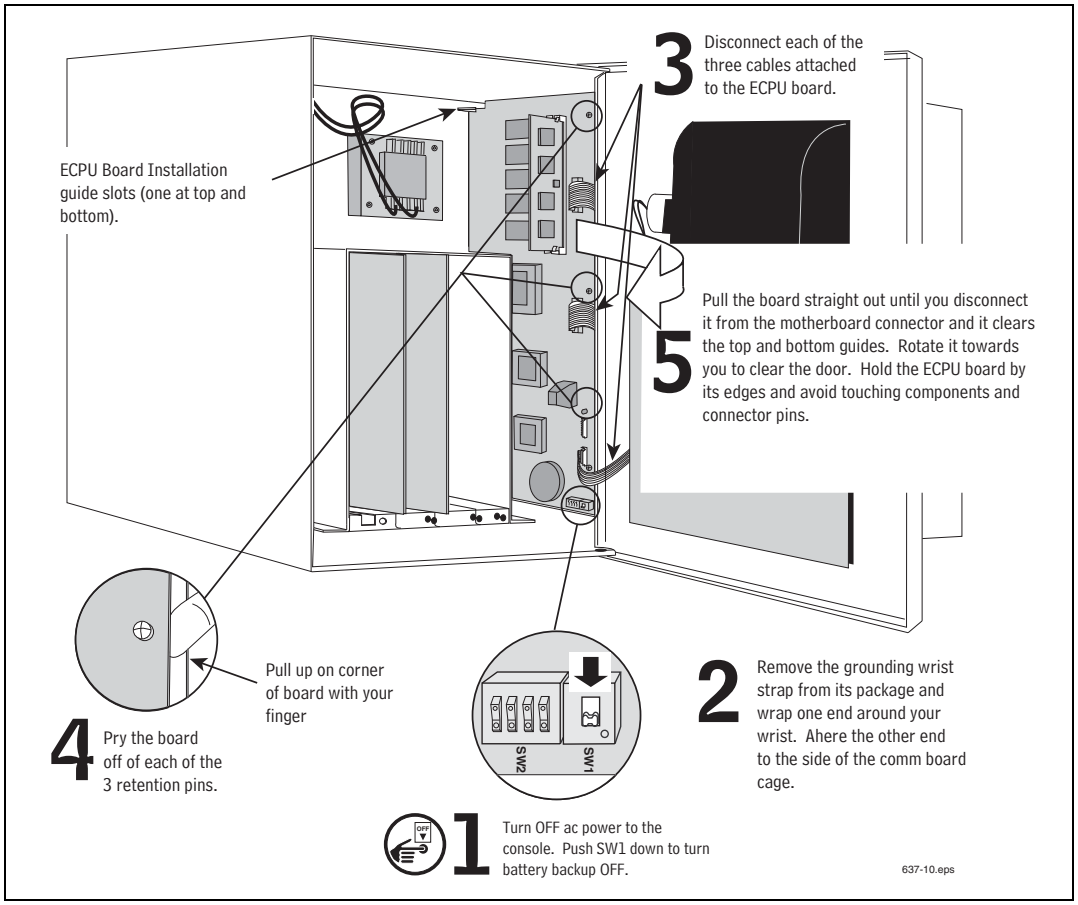

Figure 1. Removing the ECPU Board

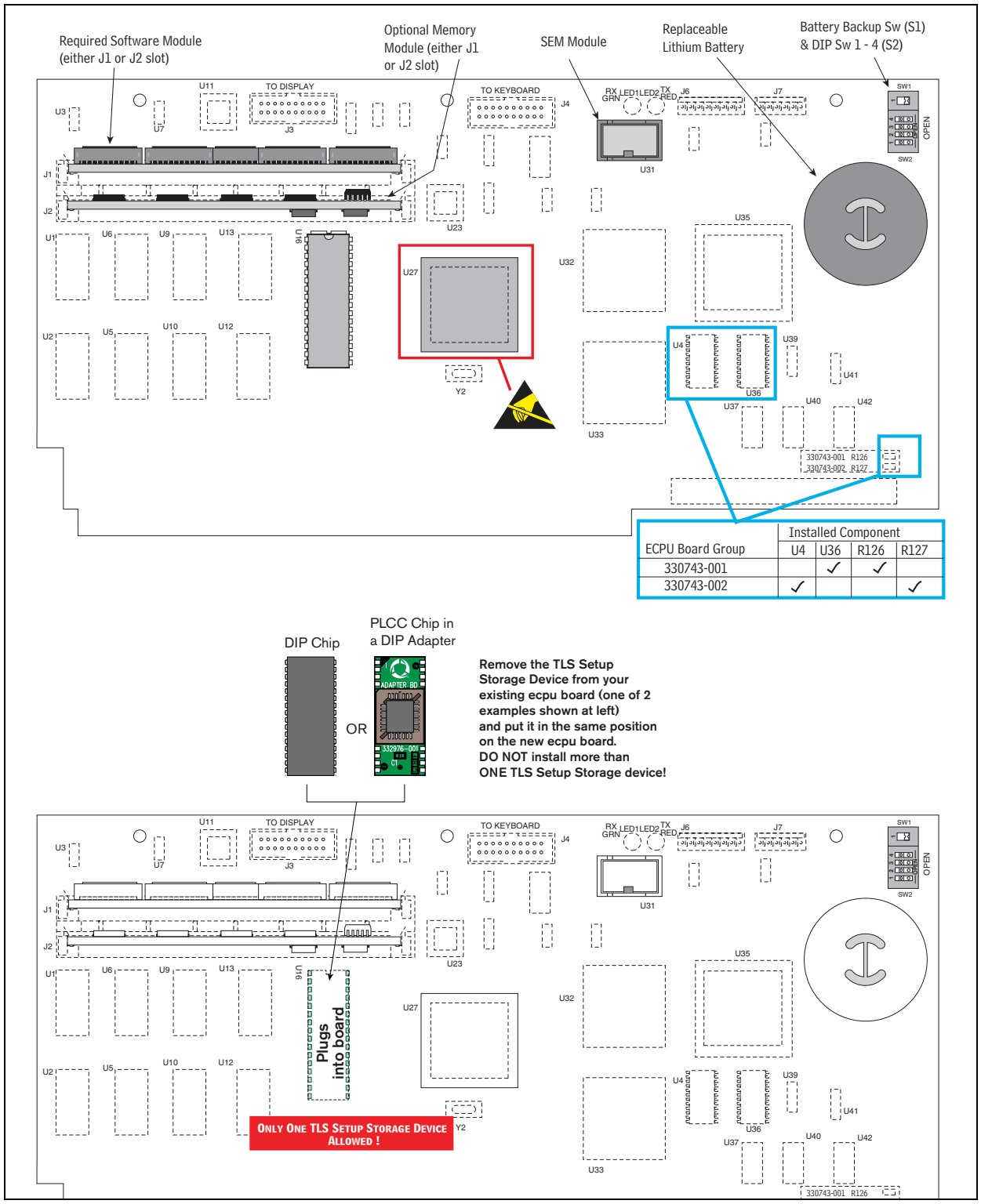

Figure 2. ECPU Board Layout with Surface Mounted Components

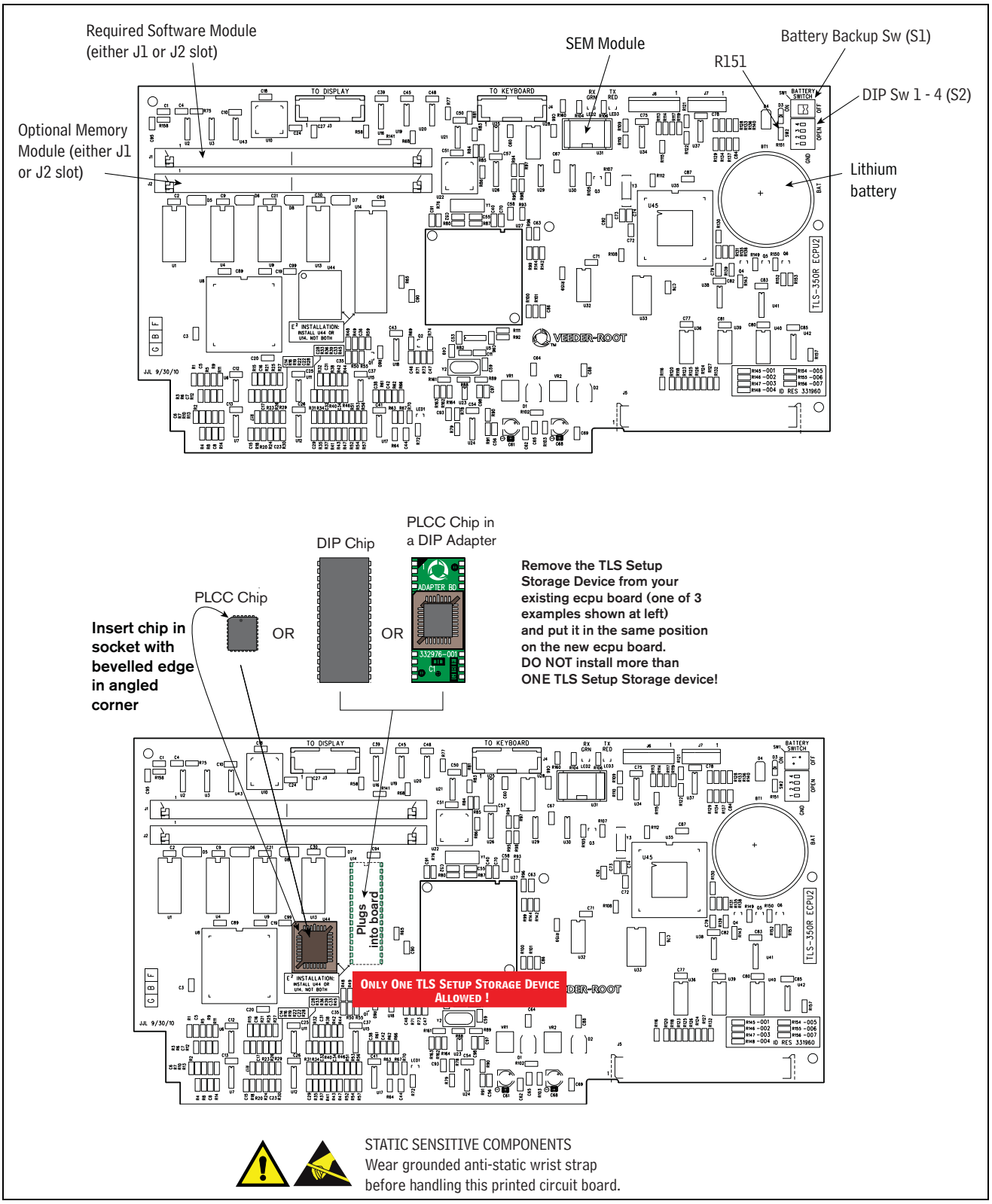

Figure 3. ECPU2 Board Layout

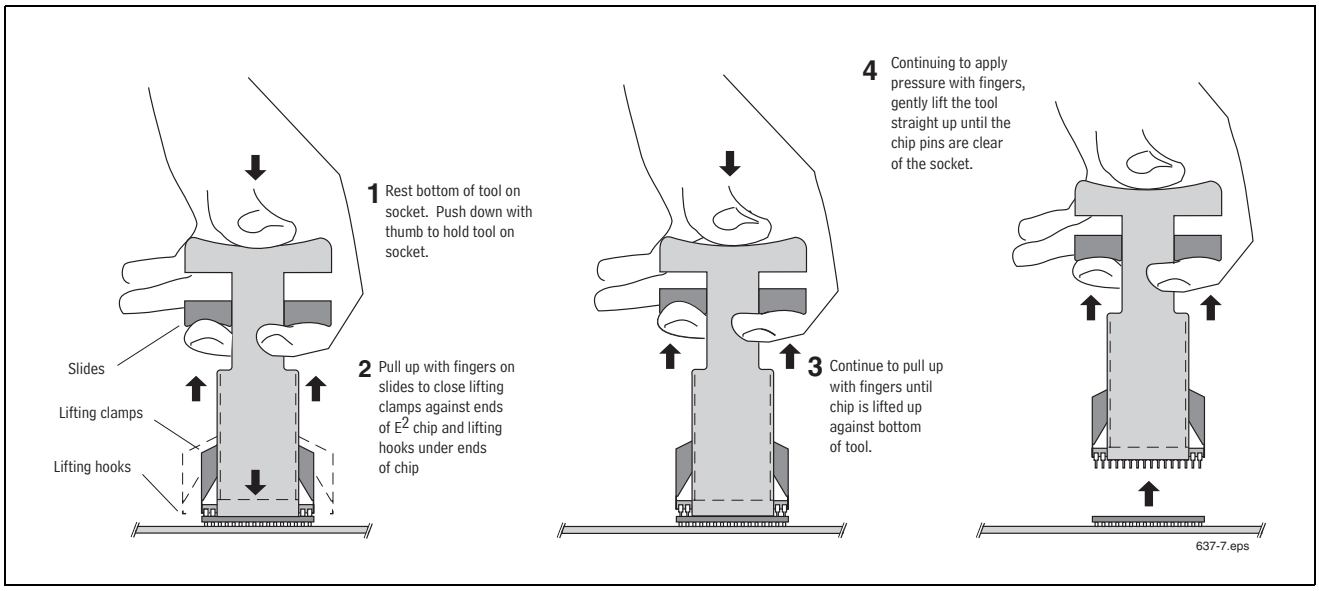

Figure 4. Removing the DIP Type TLS Storage Device from the ECPU Board

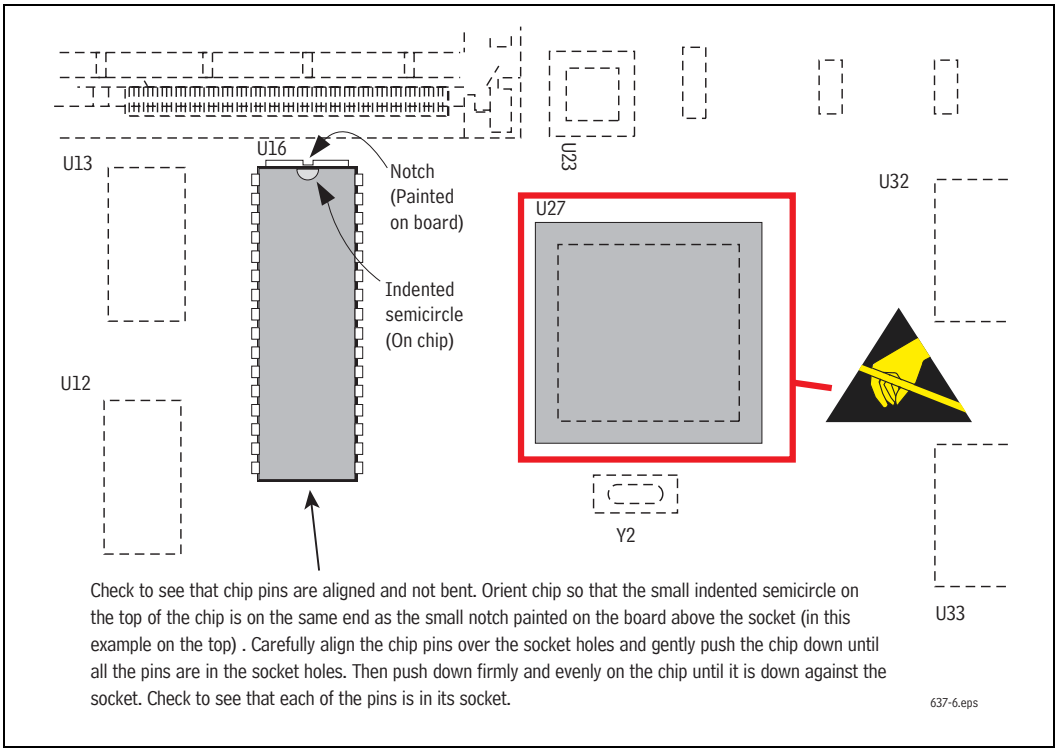

Figure 5. Orienting TLS Setup Storage Device DIP Type Prior to Installation

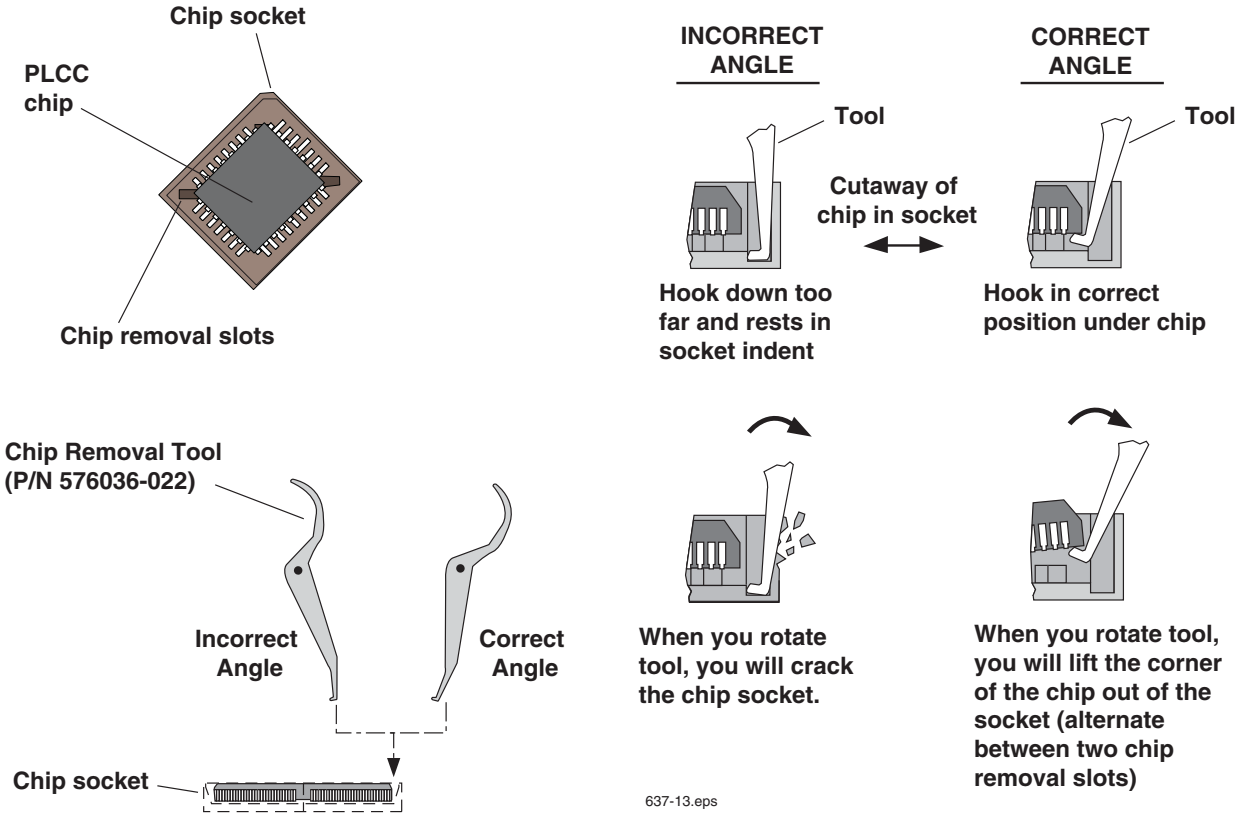

Figure 6. Removing the PLCC type TLS Setup Storage Device

Installing the ECPU Board

1. Turn off AC power to the console.
2. Install the new ECPU board in the console following the steps outlined in Figure 7.

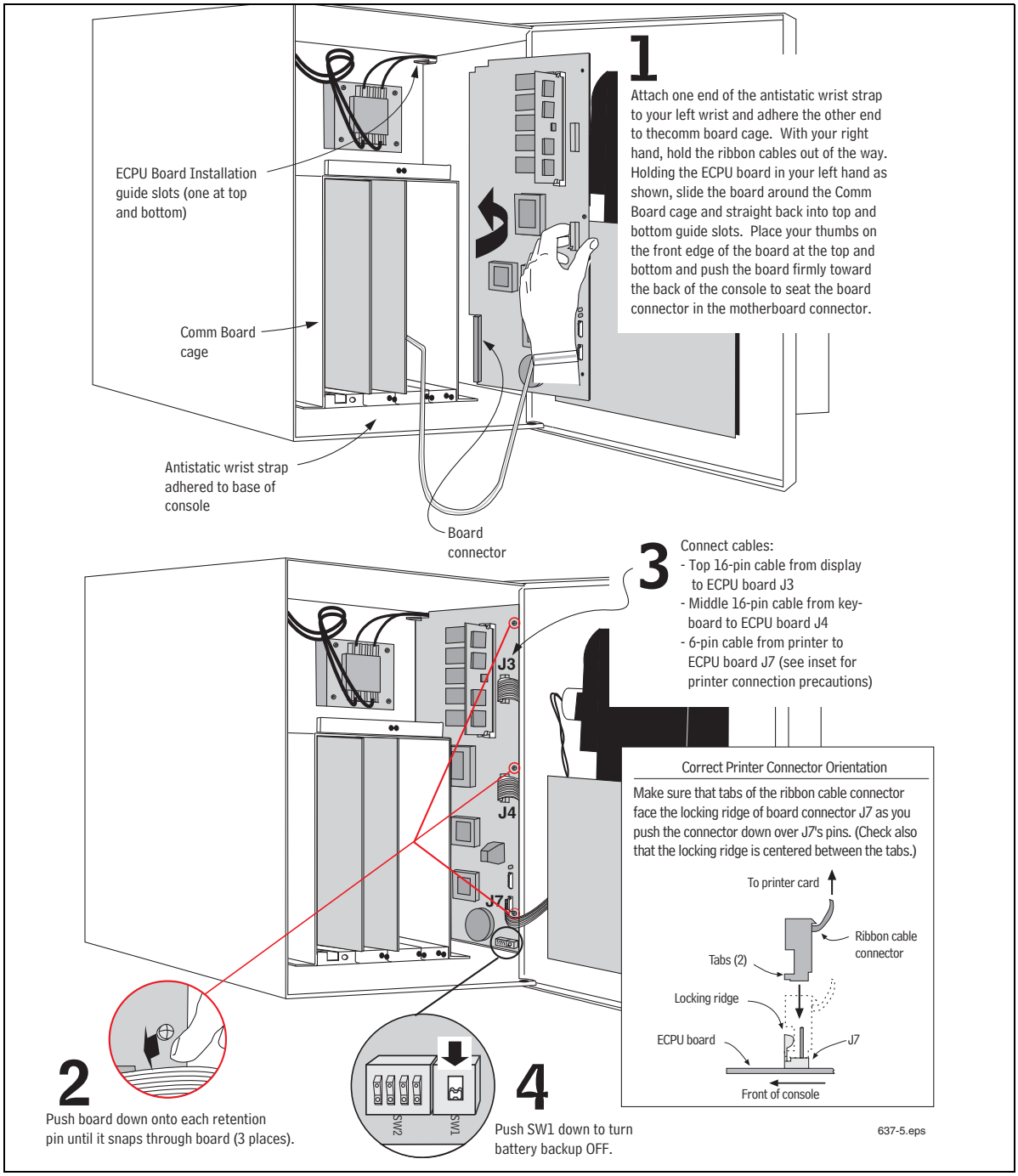

Figure 7. Installing the ECPU Board

3. Perform a cold boot as described in “Performing a Cold Boot” on page 12.

Performing a Cold Boot

IMPORTANT! All operating, setup and historical data will be lost, including data on the NVMEM card if applicable, when the TLS console is cold booted.

1. Push the Battery Backup switch (SW1) down to the OFF position (ref. step 4 in Figure 7).
2. Restore AC power to the console. The console front panel display will cycle through the following screens:

   CLEARING ALL RAM

   SYSTEM COLD START

   SYSTEM SELF TEST

   SYSTEM STARTUP COMPLETE

   Wait until the printer prints:

   ```
   *** SYSTEM RESET ***
   MMM DD, YYYY HH:MM XM
   ```

   and the front panel display reads:

   MMM DD, YYYY HH:MM:SS XM
   RESTORE SETUP DATA: NO

3. Push the Battery Backup switch (SW1) up to the ON position.
4. Press the CHANGE key:

   MMM DD, YYYY HH:MM:SS XM
   RESTORE SETUP DATA: YES

5. Press the ENTER key:

   RESTORE SETUP DATA: YES
   PRESS <STEP> TO CONTINUE

6. Press the STEP key and the printer prints:

   ```
   ARCHIVE UTILITY
   RESTORE SETUP DATA
   START TIME:
   MMM DD, YYYY HH:MM XM
   ```

The console begins the restoring process of copying the system setup data you archived in the E^2 chip into the new ECPU board's RAM. Depending on how complicated your system setup data is, this procedure could last for several minutes. When the restoring process is complete the printer prints out:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
END TIME:
MMM DD, YYYY HH:MM XM
SYSTEM SETUP
MMM DD, YYYY HH:MM XM
```

This information is followed by a complete printout of the system setup. The front panel display should read:

MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF

7. Press the ALARM/TEST key to acknowledge the alarm. The printer prints:

```
MMM DD,YYYY HH:MM XM
SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL
```

And the front panel display reads:

MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL

8. Close and secure the left front door.
9. If necessary, refer to your System Setup manual to make any corrections or additions to your system setup. It is good practice to archive your system setup to the E^2 chip after you have made any additions or corrections to the setup.

Replacing Software/Memory Modules on the ECPU Board

1. Perform the “Archiving the System Setup” on page 4.
2. Switch Off power to the console.
3. Open the front door of the console and locate the ECPU board Figure 1 on page 6. Figure 8 shows the layout of software module and the two memory modules (NVMEM-201 and NVMEM-203).

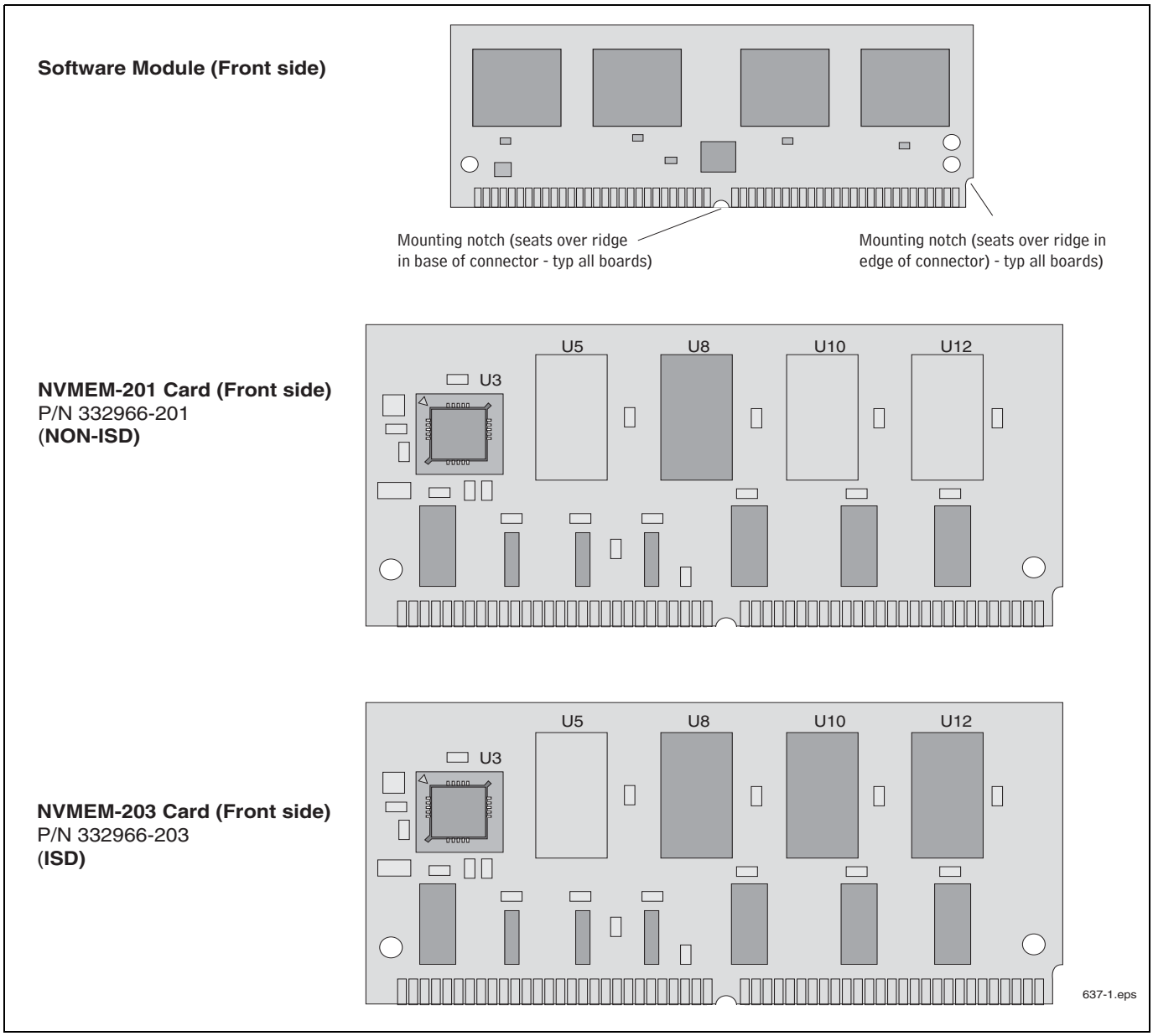

Figure 8. Software and Memory Module Component Layouts

4. Follow the instructions in Figure 9 to install or replace these modules.

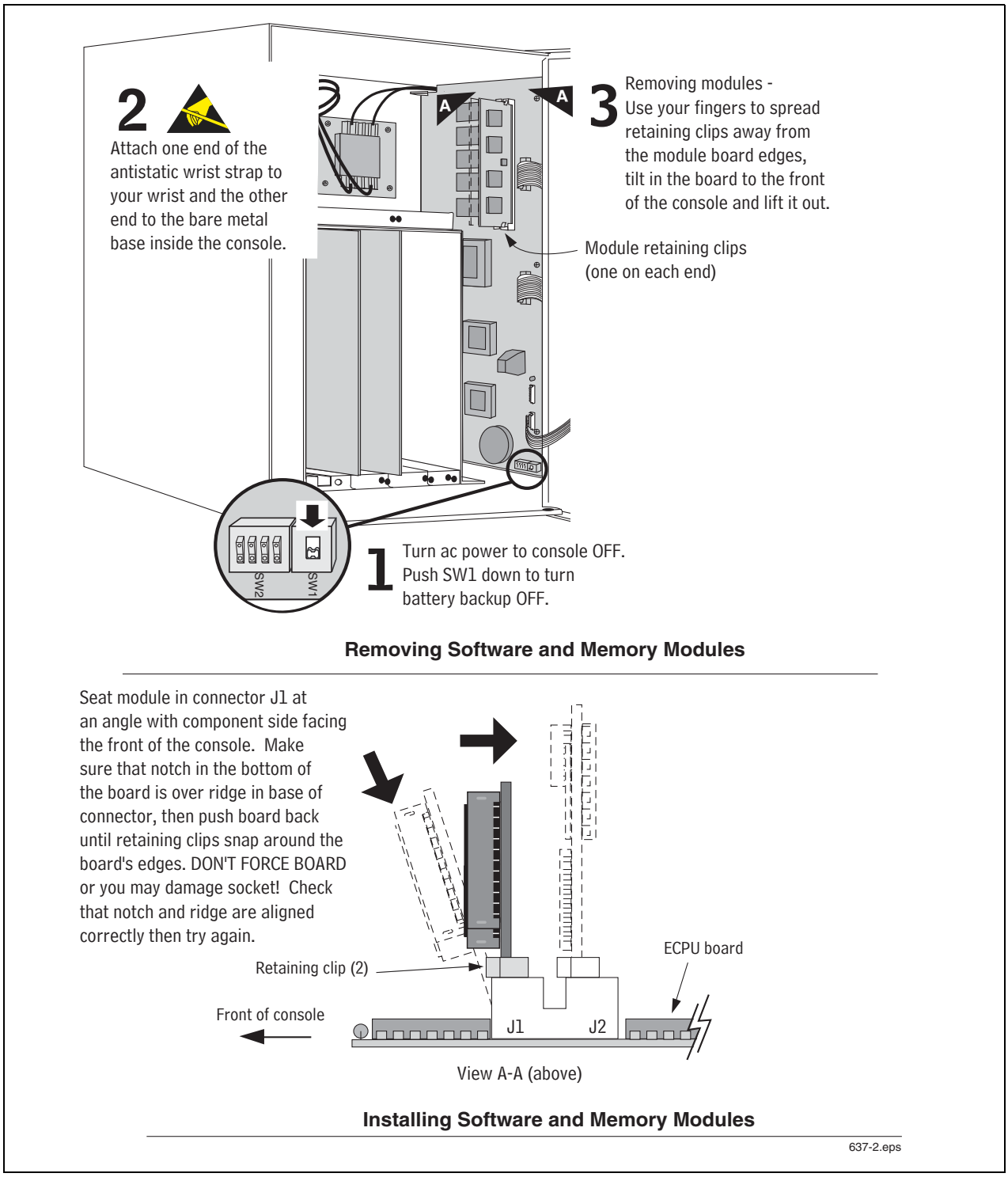

Figure 9. Removing and Installing a Software or Memory Module

5. Perform a cold boot as described in “Performing a Cold Boot” on page 12.

Replacing the TLS Setup Storage Device

This procedure assumes you are changing the TLS Setup Storage Device, but not the ECPU board.

1. Switch Off power to the console. Open the left front door of the console and locate the ECPU board [reference Figure 1 on page 6].

2. Remove the ECPU board following the instructions in “Replacing the ECPU Board” on page 6 with one exception - **DO NOT turn the Battery Backup switch OFF as instructed in that procedure.**
3. Locate the TLS Setup Storage device on your ECPU board (see Figure 2 on page 7 or Figure 3 on page 8) as appropriate.
4. Remove the TLS Setup Storage device following the instructions shown in Figure 4 on page 9 or Figure 6 on page 10 as appropriate.
5. Replace the TLS Setup Storage device following the instructions shown in Figure 5 on page 9.

6. Replace the ECPU board following the instructions shown in Figure 7 on page 11 **with one exception -** you can ignore step 4 in Figure 7 since you did not turn off battery backup when you removed the board.
7. Close the left front door of the console and restore AC power to the console.

   The display will cycle through the following warm boot screens:

   SYSTEM WARM START

   SYSTEM SELF TEST

   SYSTEM STARTUP COMPLETE

   At this point front panel display reads:

   MMM DD, YYYY HH:MM:SS XM
   ALL FUNCTIONS NORMAL

8. You should archive the current system setup data in the blank TLS Setup Storage device following instructions in “Archiving the System Setup” on page 4.

Circuit Board Types - ECPU1/ECPU2 - Battery Replacement

NOTE Veeder-Root recommends conducting the following procedure prior to any Annual Certification or Operability test. This procedure will help assist in identifying the operational status of the backup battery before removing power to the ATG system. During this procedure the TLS power should remain on at all times unless specified.

1. Print out the System Setup.
2. Perform the “Archiving the System Setup” on page 4.
3. Again print out System Setup and verify that the Archived Setup matches the setup printed in Step 1.

NOTE 4. For easier access to the ECPU and Battery, you may want to remove the printer door group.

5. Carefully remove printer ribbon cable between the printer and ECPU. Do NOT shut the Battery Switch off (Down Position).
6. Using a Volt Meter, verify battery voltage for the applicable console by putting the positive lead on Resistor 151 shown in Figure 10) and the negative lead on any exposed metal of the console’s chassis. Use the battery test pads for voltage measurement, if available.

   NOTE: TLS-350/350R ECPU boards manufactured after January 19th 2011 have Battery Test points located below the dip switch area. The figure below shows the location of both the battery test pads and R151.

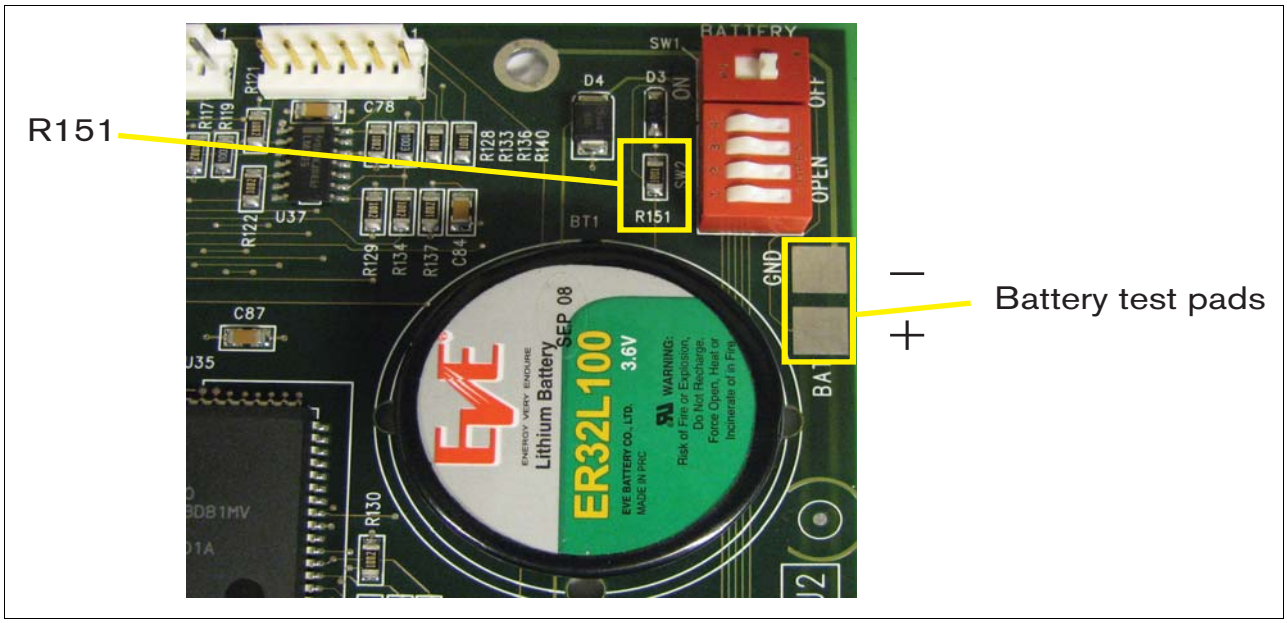

Figure 10. Battery voltage test locations on ECPU board

7. Does the volt meter read 3.4 to 3.6 Vdc? If Yes, Do not remove Battery. Battery is not defective do not remove it, go to Step 14. If No, go to Step 8.
8. Using an insulated screw driver, push down and pull away on the battery cover that is attached to the ECPU board. You may want to use your finger tips to help remove the battery cover. Please be careful you don’t touch any other circuits on the board (see Figure 11, A). After the top of the battery cover has dislodged, you can pull the cover off with you finger tips (see Figure 11, B).

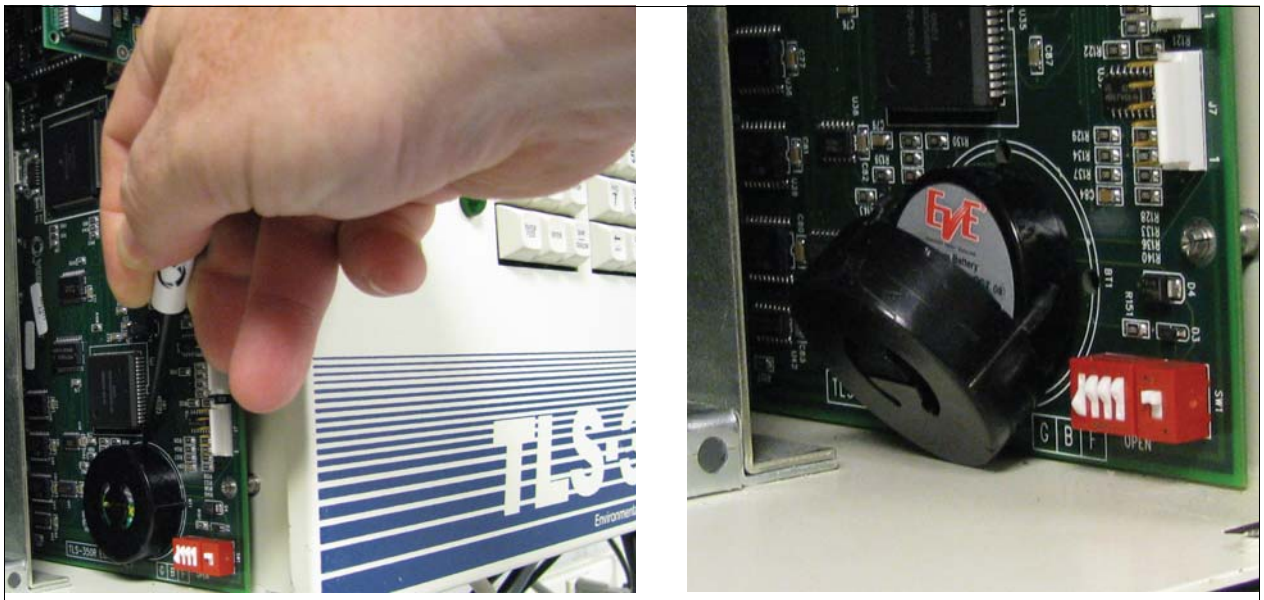

Figure 11. Removing Battery Cover

9. When removing battery, please ensure that you do not disconnect the ECPU board from the mother board (Back Plane).

10. Check new battery before installing on ECPU board. Confirm it reads 3.4 to 3.6 Vdc.

11. Install new battery (see Figure 12).

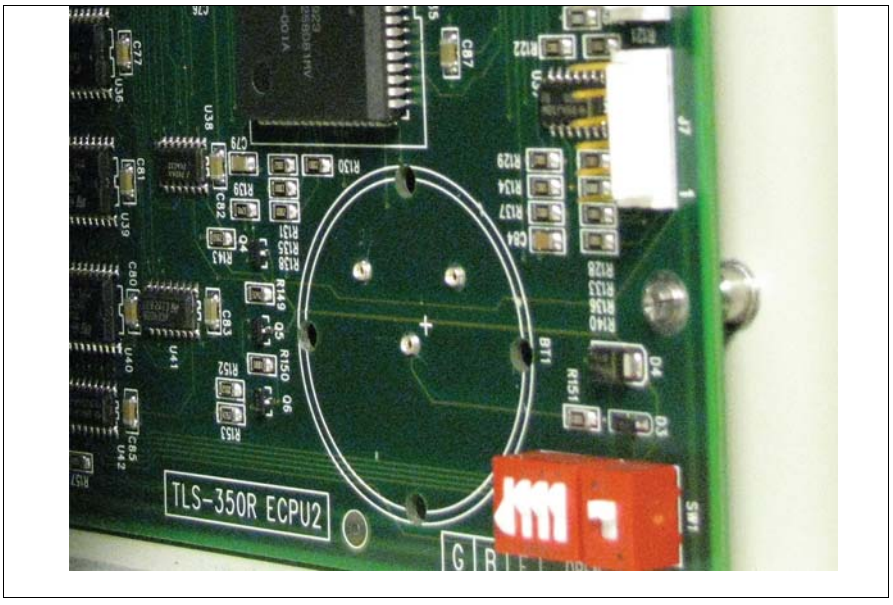

Figure 12. Install New Battery

12. Verify Voltage using the procedure in Step 6.

13. Re-install battery cover and printer door group.

Do not reconnect the Printer Ribbon Cable until you remove power from the TLS system. Doing so before power is removed, may cause damage to the ECPU or Printer.

14. If an annual ATG certification is being performed at this time, you can safely remove power to the TLS via the assigned dedicated circuit breaker so the fail safe procedure or annual certification procedure can be completed.

15. If the TLS produces an H8 or “UNRECOVERABLE DATA ERROR” while performing Step 14, please contact Technical Support for further assistance.

Replacing the SEM Module

Important! When replacing or installing a new SEM - the TLS Console must be cold-booted (initialized).

1. Perform the “Archiving the System Setup” on page 4.

1. Remove AC power to the console.
2. Open the front door of the console and locate the ECPU board [Figure 1 on page 6].
3. Replace the SEM as shown in Figure 13. Note: Either type SEM will only plug in one way.

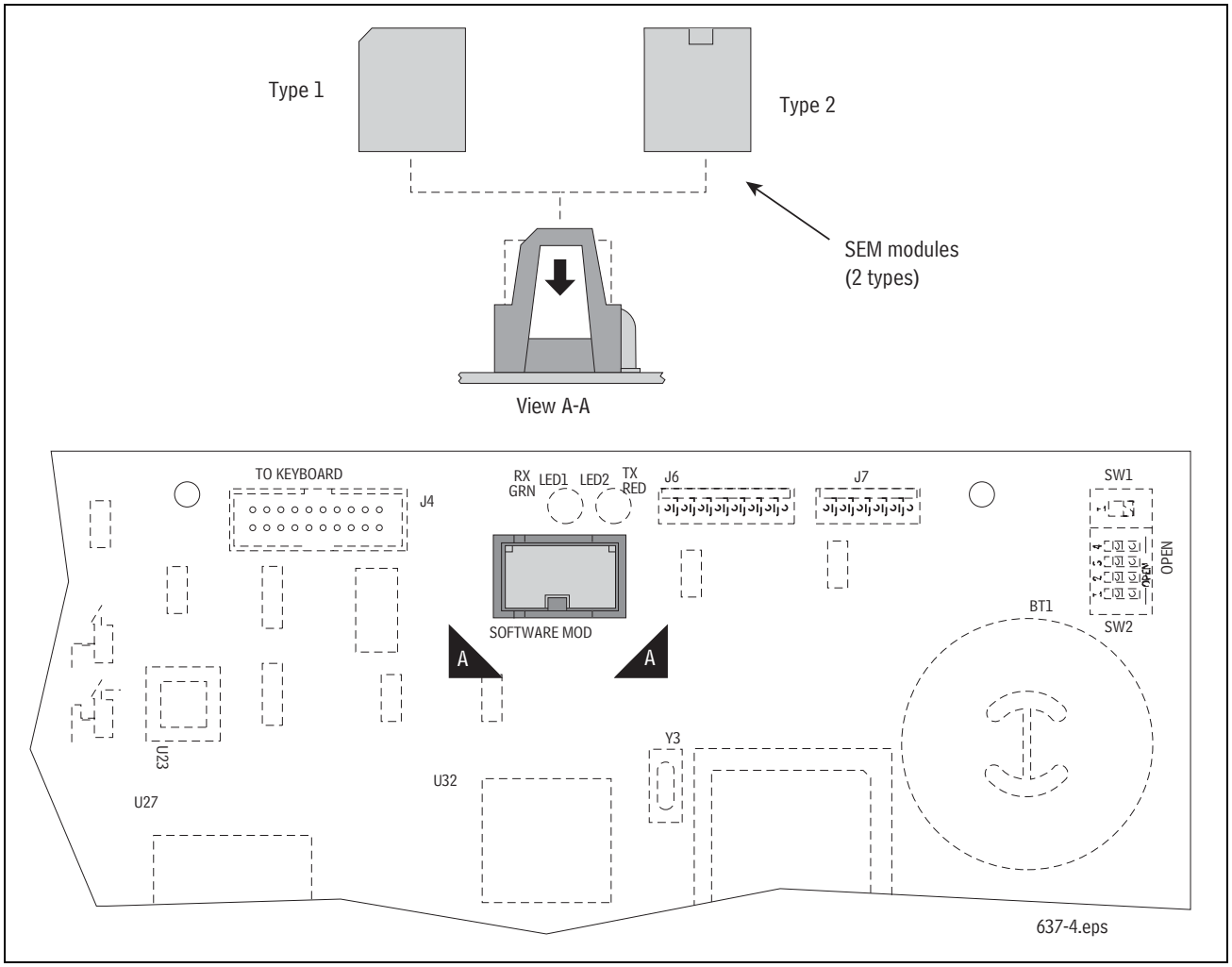

Figure 13. Replacing SEM Module

4. Restore AC power to the console.
5. Perform a cold boot as described in “Performing a Cold Boot” on page 12.

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For technical support, sales or other assistance, please visit:
www.veeder.com