Service Manual

PERSONA[10]

Hospital-Grade LCD Television Receiver

MODEL PDI-P10 LCDD

Better Solutions Are Within Reach®

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Regulatory Information

FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential or commercial installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Underwriters Laboratories

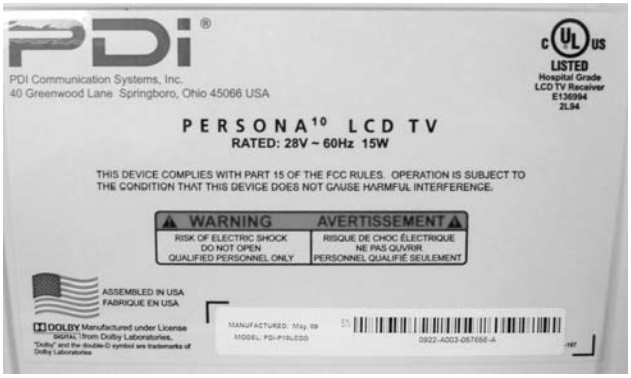
c UL us LISTED

The model PDI-P10LCDD Hospital Grade LCD TV is a specialized LCD television and should be installed to National Electrical Code specifications. This device is safety tested and listed by the Underwriters Laboratories as a product suitable for use in healthcare facilities in both the United States and Canada.

Product Identification

Product Label

The P10LCDD is easily identified using the product label located in the center of the back housing.



Serial Number

The serial number is located at the lower right corner of the product label.

Serial Number Format Explanation

a. The first two digits compose the year of manufacture. 2009 would be 09.
b. The second two digits compose the week of manufacture. 22 would be week 22.
c. The single alphabetic character represents the place of manufacturing.
d. The next three alphanumeric characters compose the unique model ID.
e. The next six digits compose the serial number starting with the first unit produced in the current year.
f. The last character is the Revision Level.

Warnings

Graphical Symbols

This lightning flash with arrow symbol, within an equilateral is intended to alert the user of the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This service manual contains various CAUTIONS and WARNINGS indicated by triangular warning symbols, which should be read and understood in order to minimize the risk of personal injury to service personnel and customers. The possibility exists that improper service methods may damage the equipment or result in property damage or user injury. It is also important to understand that these CAUTIONS and WARNINGS are not exhaustive.

PDI could not possibly know, evaluate, and advise the service industry of all conceivable methods in which service might be done or of the possible hazardous consequences of each method. Accordingly, a technician who uses a service procedure or tool which is not recommended by PDI must first satisfy themselves thoroughly that neither their safety nor the safe operation of the equipment will be compromised by the service method selected.

Product Safety Servicing Precautions

1 **MODIFICATIONS** Do not attempt to modify this product in any way without written authorization from PDI. Unauthorized modifications will not only void the warranty, but may lead to you being liable for any resulting property damage or user injury.

2 **POWER SOURCE** Use only a power source from a CSA Certified / UL Approved Class 2 Power Supply suitable for use in a healthcare facility. This TV will operate on either DC or AC voltage.

Voltage	Range
AC	18-32 volts
DC	18-32 volts

3 **X-RAYS** X-Ray radiation is not a concern since this TV does not incorporate a CRT.

4 **REPLACEMENT PARTS.** Parts critical to the safe operation of this TV are pictured in this manual.
Replace only with the part number specified.

5 **SAFETY CHECKS** This hospital grade TV requires special safety checks before returning to service. Observe and follow the “Safety Check” section (page 31) in this service manual.

Table of Contents

Picture Adjustments

The LCD display does not use magnetic deflection (like a CRT tube display) and does not require any internal adjustments. Dynamic picture adjustments to Brightness, Contrast, Color, and Tint are available using the IR Remote Control, part number PD108-420, using the SETUP / Picture menu.

Disinfecting and Cleaning

The P10LCDD should be disinfected before performing any service. The following procedure is only a recommendation. Your hospital or company may have a different procedure to follow.

CAUTION – Before using any cleaning or disinfecting agent on the P10LCDD, perform a spot check by wetting a small area of the cabinet. Verify the agent does not discolor or deteriorate the cabinet.

Disinfecting

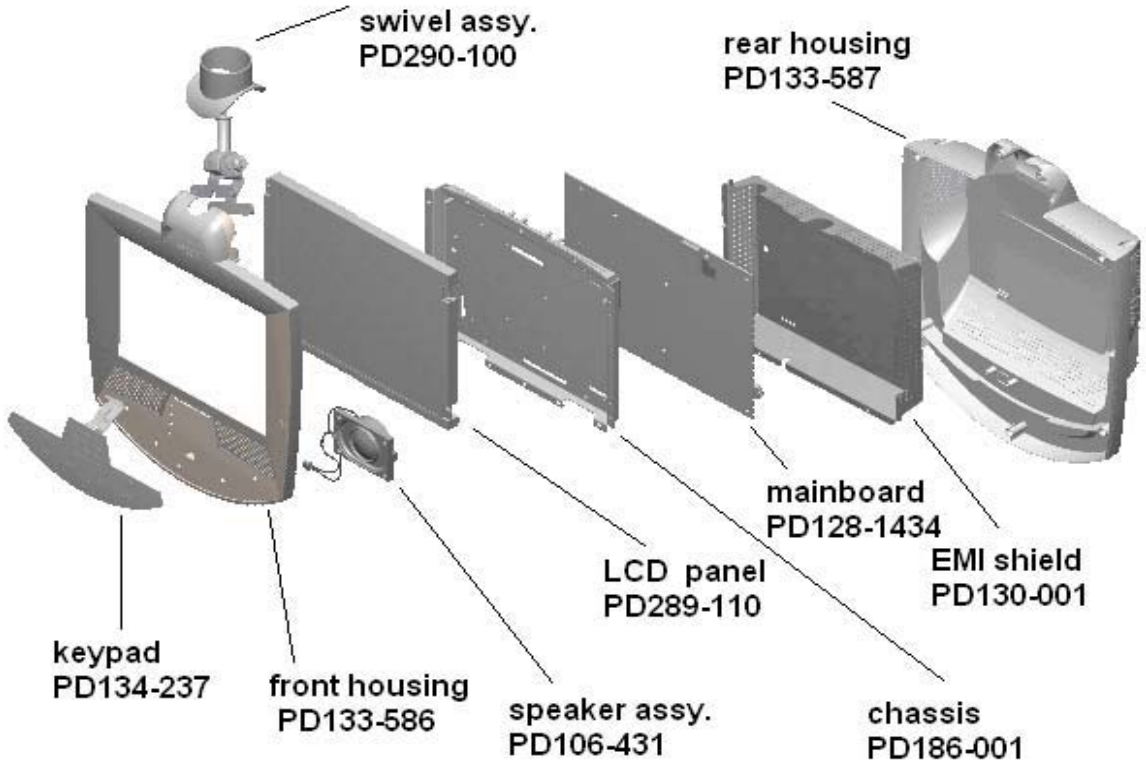
1. The P10LCDD has been designed to withstand up to a 25% chlorine based disinfectant. Many alcohol and ammonia based disinfectants have also been tested with success. However, before using any cleaner or disinfectant, spot check a small area on the cabinet.
2. Apply the cleaner or disinfectant per its recommended instructions.
   NOTE: *Most disinfectants require a waiting time following application and prior to wipe-down*.

Cleaning

Stubborn ink and other scratch type marks may prove difficult to remove. A dilute solution of Isopropyl alcohol will generally work when all else fails. However, full strength Isopropyl will remove the cabinet's paint. Use with caution!

Replaceable Parts - Exploded diagram

This diagram shows the order that the different parts of the P10LCDD fit together.



List of tools

1 Phillips screwdriver
2 3/8-inch socket wrench for four 10-32 nuts
3 7/16-inch wrench
4 Flathead screwdriver

EMI Shield

The EMI Shield mounts over the TV's main board and provides protection from electromagnetic interference.

EMI Shield
Part #: PD130-001

Housing

Components include the front with crystal clear window and foam seals, rear housing, and swivel assembly.

NOTE: *The keypad shown with the front housing is sold separately. (See page 8 for more information)*

INOVA-10 Front Housing
Part #: PD133-586

INOVA-10 Rear Housing
Part #: PD133-587

INOVA-10 Swivel Assembly
Part #: PD290-100

Keypad

The keypad fits into the cavity below the speaker vents on the front housing.

Keypad
Part #: PD134-237

LCD Panel

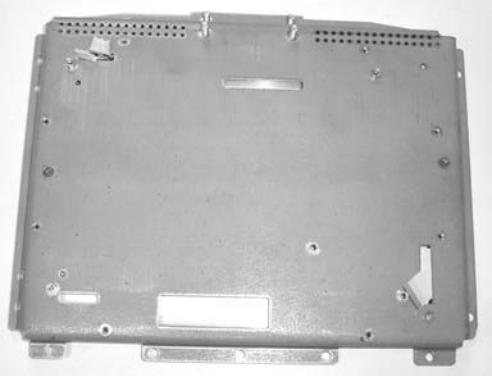
The LCD panel is what displays the images the TV receives. The panel is mounted to the chassis by 2 brackets and 4 screws. The brackets come attached to the panel.

LCD panel Part #: PD289-110

Replaceable Parts

Chassis

The circuit board and the LCD panel are attached to the chassis. It also helps give the unit rigidity.



Chassis

Part #: PD186-001

Speaker Assembly

The speaker assembly attaches to the front cabinet and is replaceable.

Speaker Assembly

Part #: PD106-431

Replaceable Parts

Swivel Assembly

The swivel assembly allows the TV to be tilted and panned. It also houses the coax and USB cables.

Swivel Assembly
Part #: PD290-100

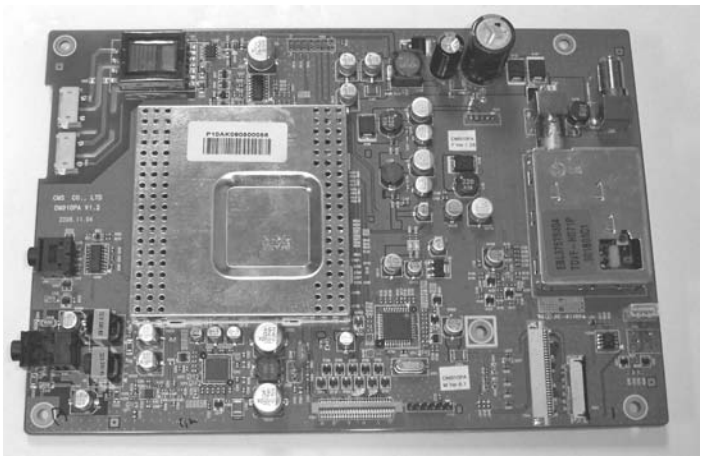
Main Coax Cable
Part #: PD106-506

USB cable for cloning
Part #: PD106-532

Replaceable Parts

Main board

This is the circuit board where the LCD panel, inverter, F-connector, and keypad are connected.

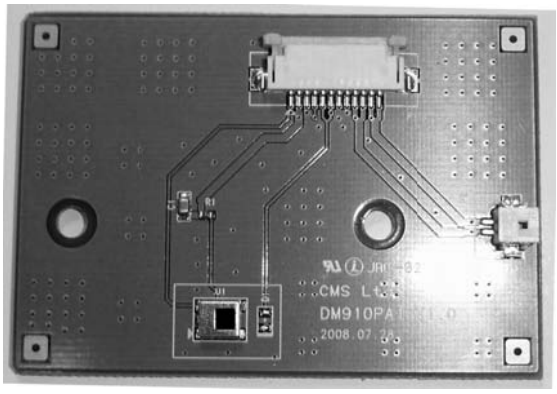


Main board

Part #: PD128-1434

IR Board

This is the circuit board where the speaker assembly and keypad are connected.



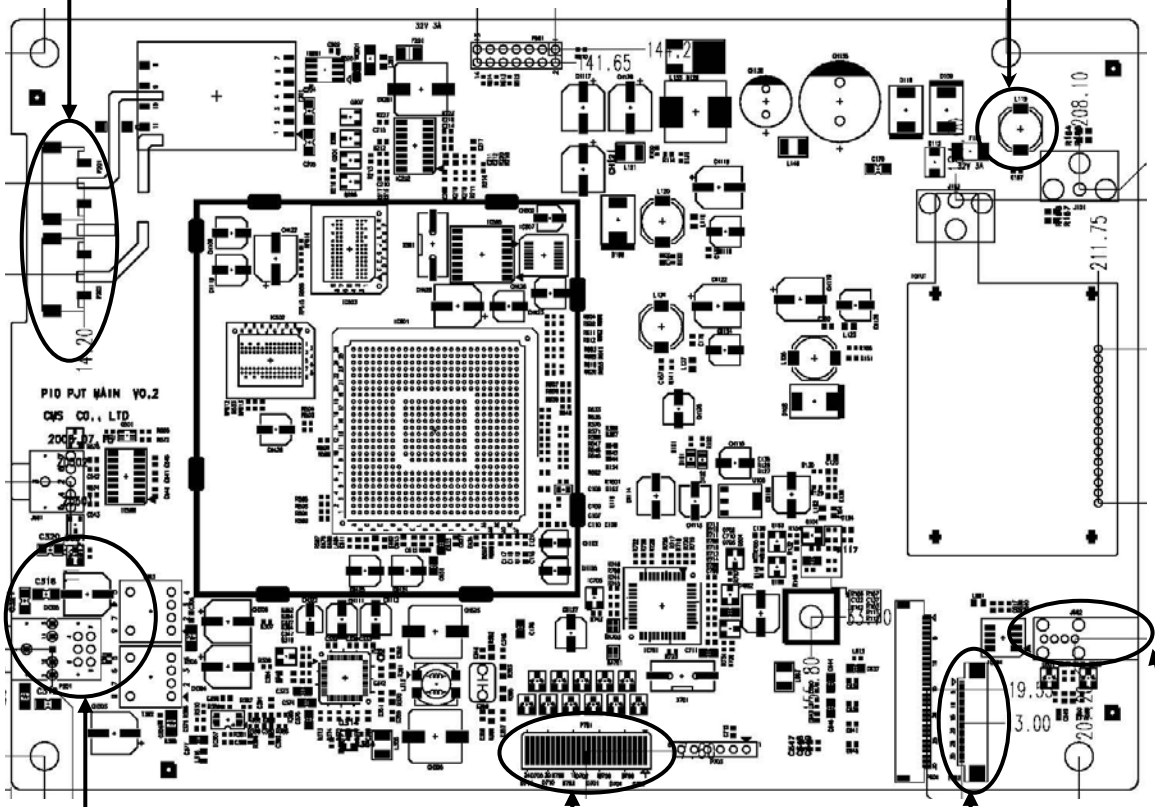
IR Board

Part #: PD128-1435

LCD backlight Connector

Coax RF Power—"F" Connector

Main circuit board layout and interconnections



Earphone jack

Keypad Connector

LCD panel Connector

USB cable Connector

Disassembling

Step 1

Picture 1D

Lay the P10LCDD face down on a soft work surface. (Picture 1D)

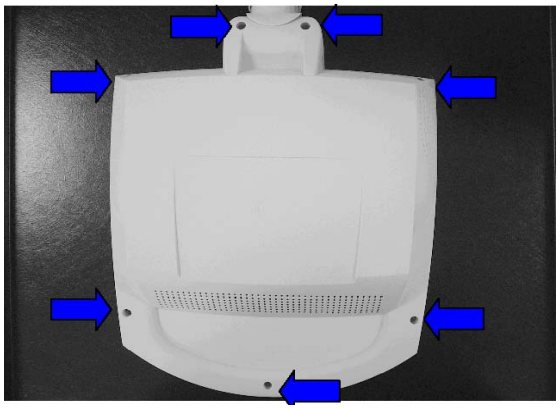
Step 2

Picture 2D

Remove the socket cap with an Allen wrench. (Picture 2D)

Disassembling

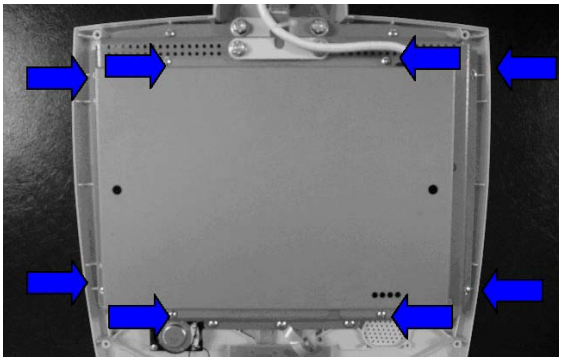
Step 3



Picture 3D

Use a Phillips screwdriver to remove the 7 screws from the rear housing. (Picture 3D) Remove the rear housing from the unit.

Step 4

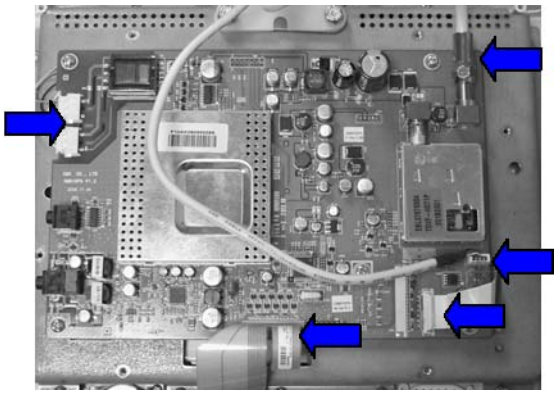


Picture 4D

Use a Phillips screwdriver to remove the 8 screws from the EMI Shield. (Picture 4D) Remove the shield from the unit.

Disassembling

Step 5

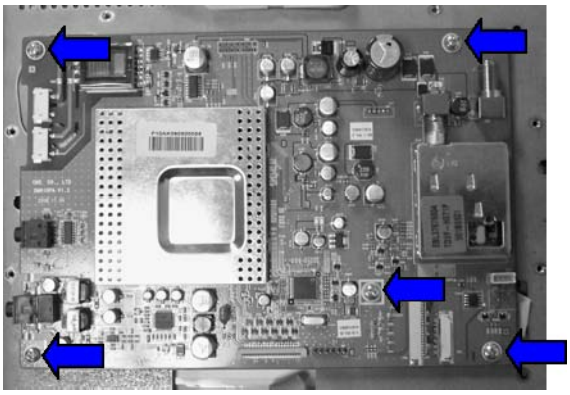


Picture 5D

Before handling the main board be sure that you have taken precautions to protect it and other the parts from Electrostatic Discharge.

There are 5 connectors on the main board that must be detached before it is removed from the chassis. They are the backlight, keypad, LCD panel, USB cable, and coax cable connectors. (Picture 5D) (See main circuit board layout and interconnections diagram on page 13) Use a 7/16-inch wrench to remove the RF connector. A small, flat screwdriver can be used to assist in the removal of the other connectors. There are locking mechanisms on the keypad and LCD connectors. These need to be pulled out before the flex cables can be disengaged.

Step 6

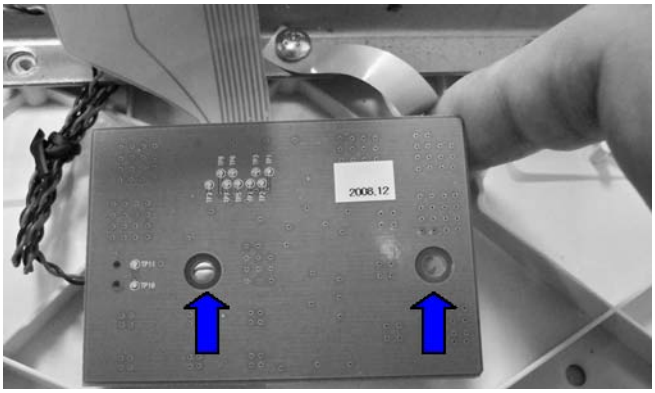


Picture 6D

Use a Phillips screwdriver to remove the 5 screws that connect the main board to the chassis. Remove the main board from the chassis. (Picture 6D)

Disassembling

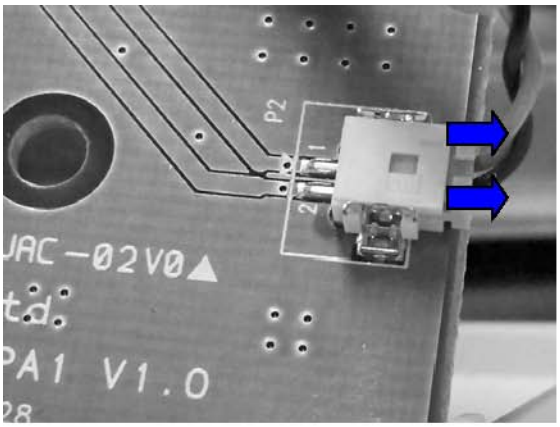
Step 7



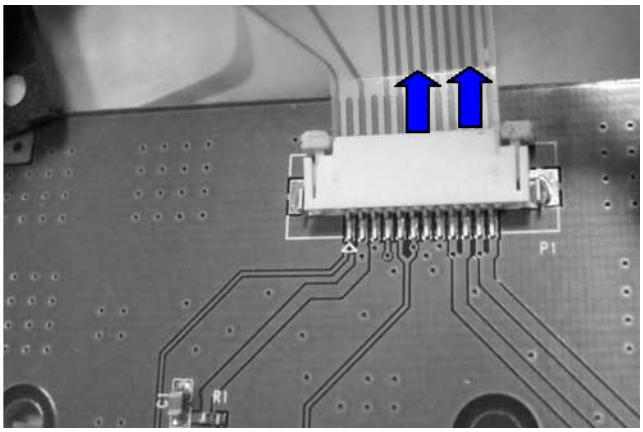
Picture 7D

Remove the IR board (PD128-1435) by pinching on each of the two prongs on the front housing that it is placed on and lifting up on the board. (Picture 7D)

Step 8



Picture 8D

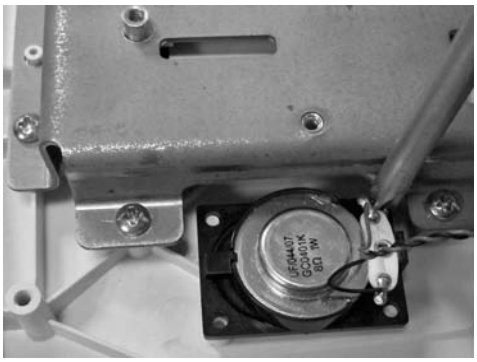


Picture 9D

Detach the speaker assembly cable from P2. (Picture 8D) Then, remove the keypad cable from P1. (Picture 9D) These are connected to the bottom of the IR board. There is a locking mechanism that slides out and must be disengaged prior to removing the keypad cable.

Disassembling

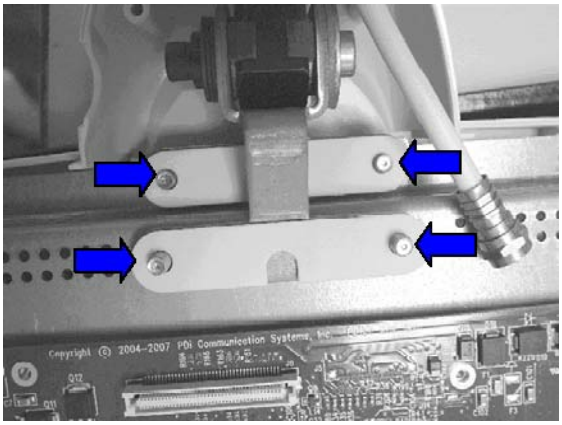
Step 9



Picture 10D

Use a Phillips screwdriver to remove the 2 screws that connect the speaker assembly to the front housing. Remove the speaker assembly from the front housing. (Picture 10D)

Step 10

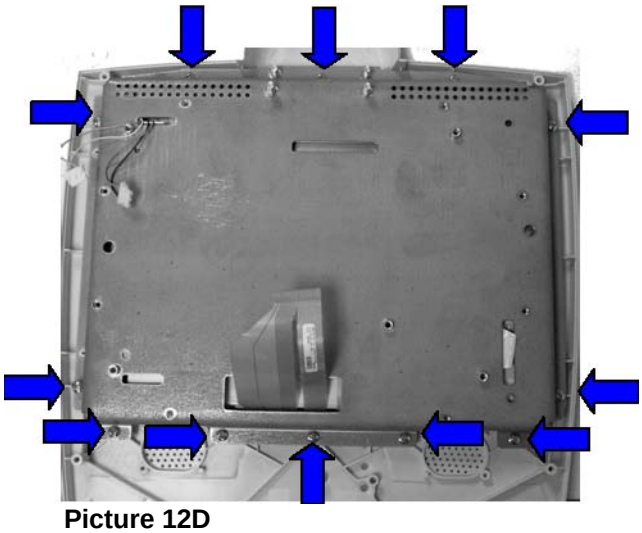


Picture 11D

Use a 3/8-inch socket wrench to remove the swivel assembly from the chassis by removing the 4 lock nuts. (Picture 11D) (To remove the main coax and USB cable extension assembly see step 14 on page 20)

Disassembling

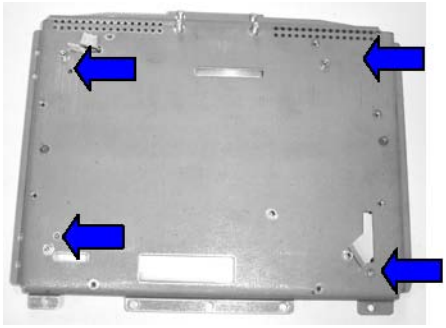
Step 11



Picture 12D

Use a Phillips screwdriver to remove the 12 screws that connect the chassis to the front housing. (Picture 12D) Lift up on the bottom end of the chassis and remove the keypad cable that is threaded through the slot on the chassis. Remove the chassis from the front housing. The LCD panel is still attached to the chassis, so be careful when lifting the chassis from the housing.

Step 12



Picture 13D

Use a Phillips screwdriver to remove the 4 screws that connect the chassis to the LCD panel. (Picture 13D) Lift up on the right side of the chassis and remove the LCD panel cable located in the slot at the bottom, right side of the chassis. Then lift up the left side of the chassis and remove the backlight cables that are threaded through the slot on top, left side. Remove the chassis from the LCD panel.

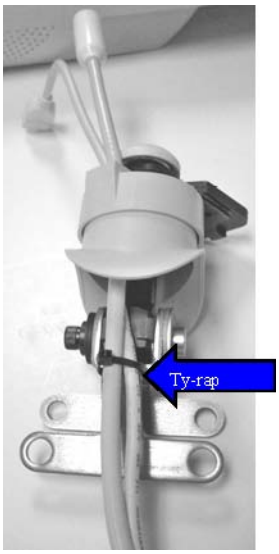
Disassembling

Step 13

Picture 14D

Remove the keypad from the front housing. If it cannot be removed from the front housing cavity, contact technical support. (Picture 14D)

Step 14

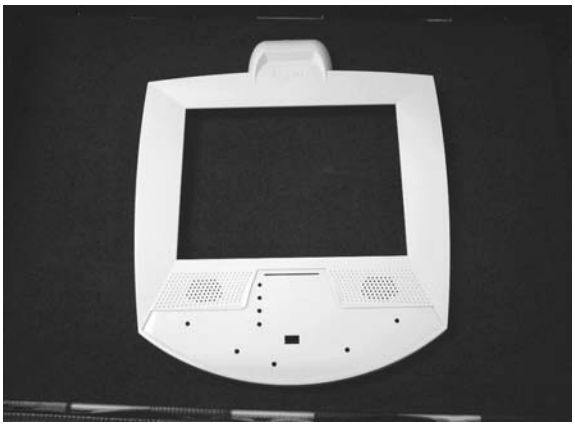


Picture 15D

Cut the Ty-rap that is around the USB cable and main coax cable extensions and slide the cables through the swivel assembly. (Picture 15D)

Reassembling

Step 1

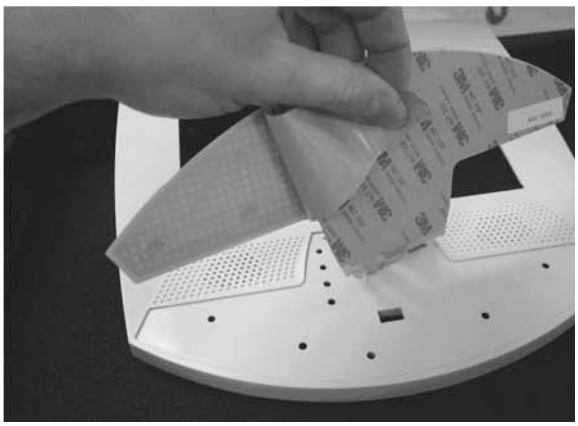


Picture 1R

Place the front housing face up on a soft working surface. (Picture 1R)

Step 2

Picture 2R

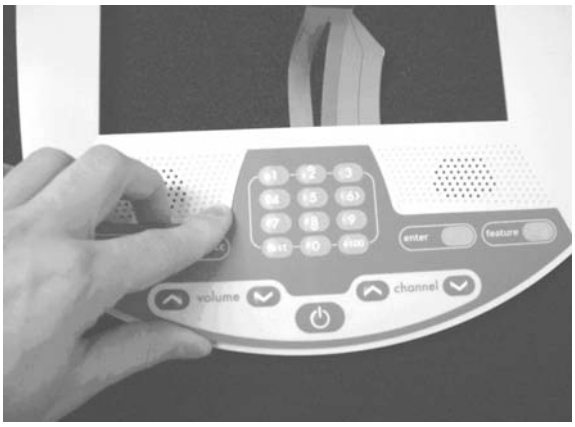


Picture 3R

If a keypad is not attached to the front housing cavity, thread the flat cable of the keypad through the slot in the front housing of the cavity. (Picture 2R)
Remove the liner from the back of the keypad. (Picture 3R)

Reassembling

Step 3

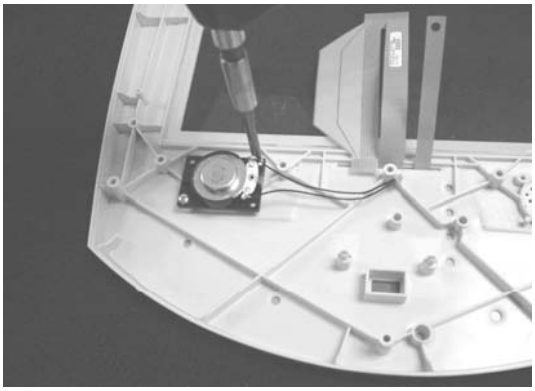


Picture 4R

Attach the keypad by abutting the top edge of the keypad to the upper edge of the cavity. The keypad must be laid in place from left-to-right. Use caution while locating the keypad to ensure that it will be approximately centered side-to-side in the cavity. Apply pressure to all the areas of the keypad to ensure proper adhesion. (Picture 4R)

CAUTION: Do not bend or flex the keypad. This may result in damage to it.

Step 4

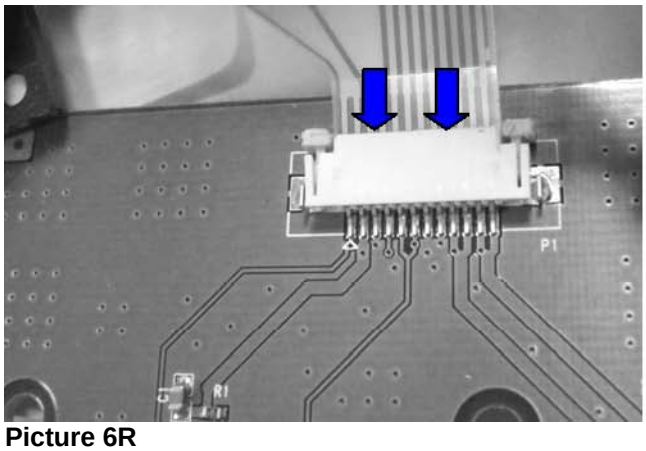


Picture 5R

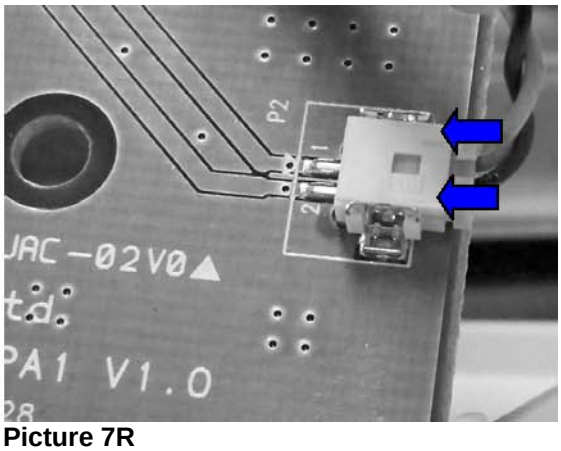
Turn the front housing over, attach the speaker assembly on the front housing and secure it with #4 screws in 2 places using 2.5-3.0 in-lbs. of torque. (Picture 5R)

Reassembling

Step 5



Picture 6R

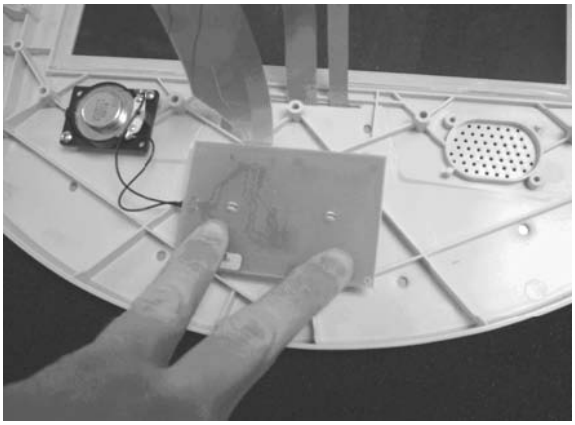


Picture 7R

IR board assembly. Connect the keyboard cable and speaker wire to the associated connectors on the IR board. The keypad cable is inserted into the P1 connector. (Picture 6R) Be sure to push in the tabs on both sides of the connector to secure the cable in it.
The speaker wire cable fits into the P2 connector. (Picture 7R)

NOTE: *The connector is polarized and only goes one way.*

Step 6



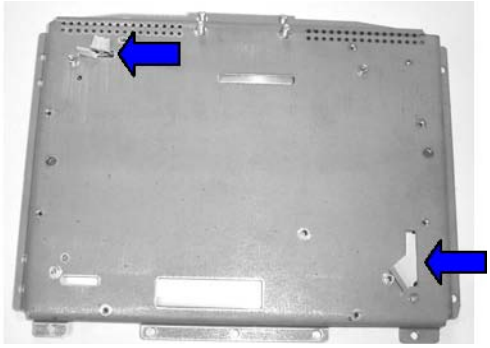
Picture 8R

Attach the IR board to the front housing by aligning it over the pins on the housing and snapping it into position by applying light pressure to the board. Make sure the connector side is facing the front housing. (Picture 8R)

Reassembling

Step 7

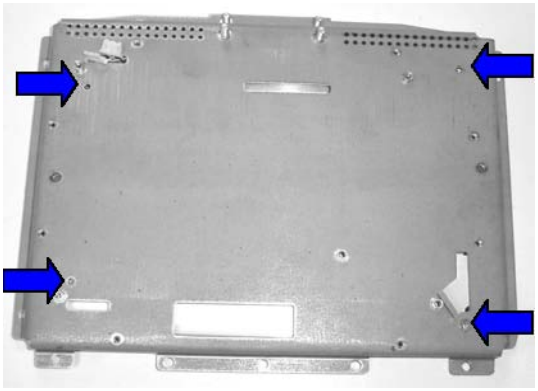
Picture 9R



Picture 10R

Place the LCD panel face down on the work surface. (Picture 9R) Place the chassis over it, and before letting the chassis rest, thread the data cable and LCD backlight cables through the slots on the chassis. The top of the chassis has rows of tiny holes. The backlight cables go through the top, left slot. The LCD data cable goes through the vertical slot on the bottom, right. (Picture 10R)

Step 8



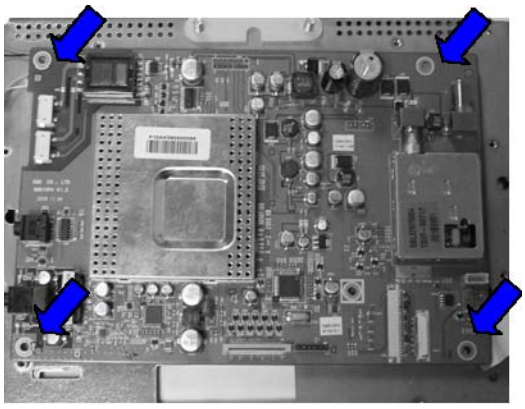
Picture 11R

Line up the LCD panel brackets with the corresponding holes on the chassis. Attach the LCD panel assembly to the chassis with a flathead undercut screws in 4 places using 4.25-4.5 in-lbs. of torque. (Picture 11R)

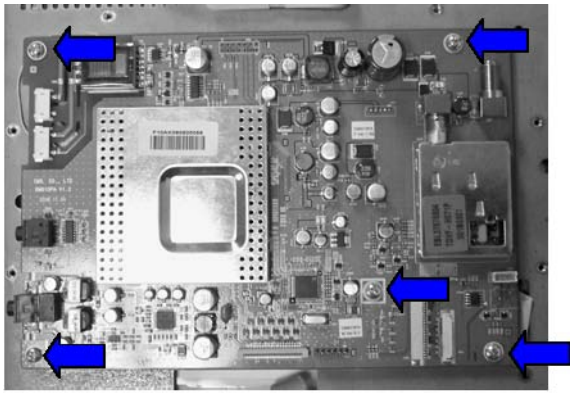
CAUTION: *Be careful not to pinch the inverter wires between the chassis and LCD brackets.*

Reassembling

Step 9



Picture 13R



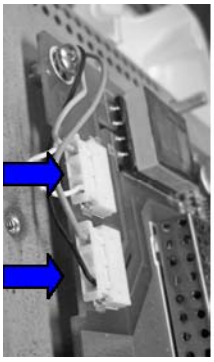
Picture 14R

Place the main board on the chassis and align the four holes near its edges with four holes that are protruding from the chassis. (Picture 13R)

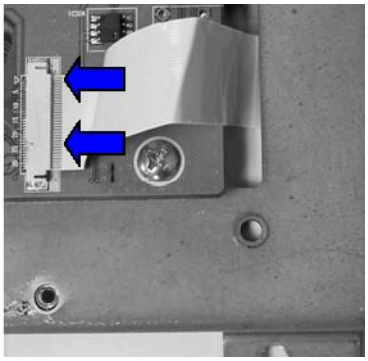
NOTE: *The chassis and the main board each have a fifth hole. They will be aligned when the other holes are aligned.*

Secure 5 screws into their respective holes on the main board to attach it to the chassis using 3.25 4.00 in-lbs. of torque. (Picture 14R)

Step 10



Picture 15R



Picture 16R

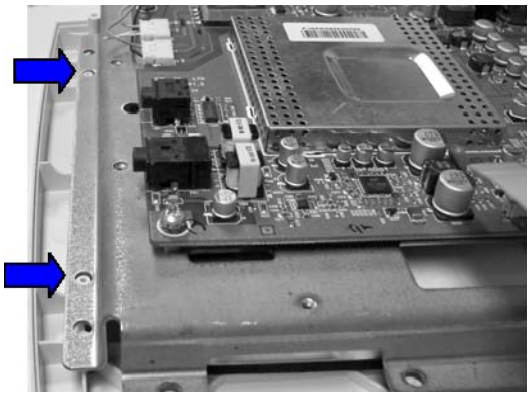
Insert the LCD backlight cables into the associated connectors on the board, at the top, left side of the board. (Picture 15R)

Insert the LCD data cable into the connector at the bottom, right of the main board. The metal band on the cable connector must face away from the main board. (Picture 16R)

NOTE: *Be sure to lock the connector latch after the cable is inserted fully. To do this press in the two black tabs on both sides of the connector.*

Reassembling

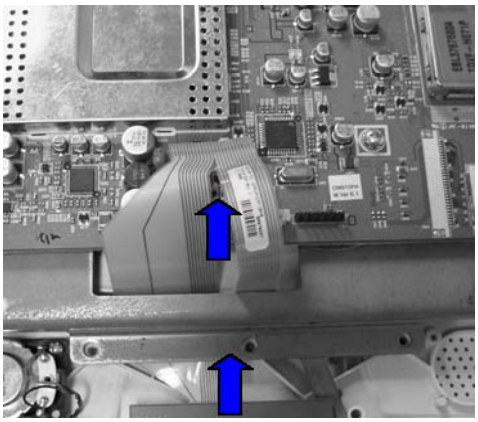
Step 11



Picture 17R

Position the chassis over the 2 alignment pins on the left side of the front housing. (Picture 17R)

Step 12

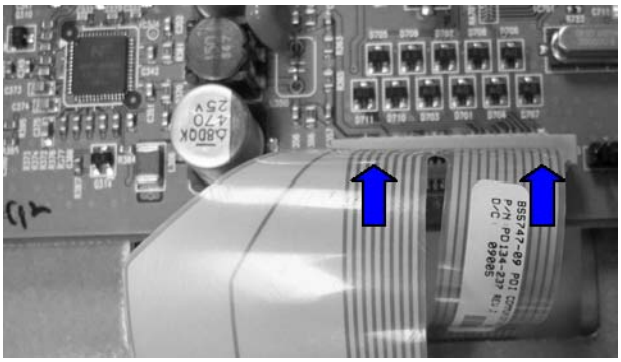


Picture 18R

Route the wide end of keypad through the slot at the bottom of the chassis. (Picture 18R)

Reassembling

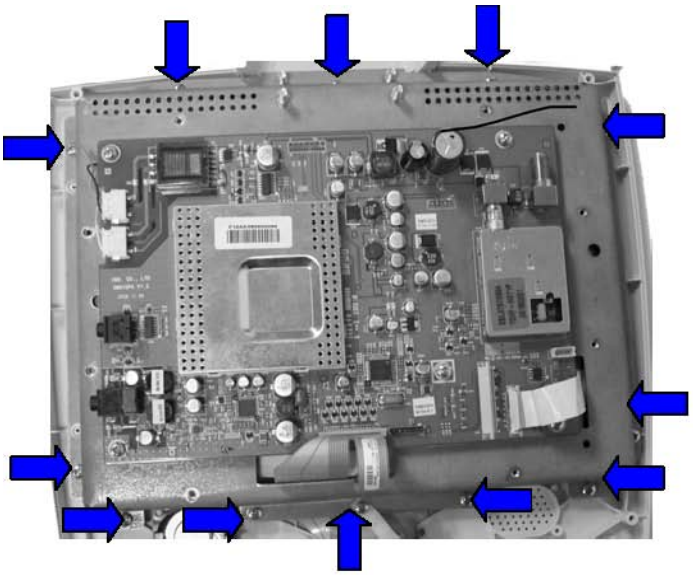
Step 13



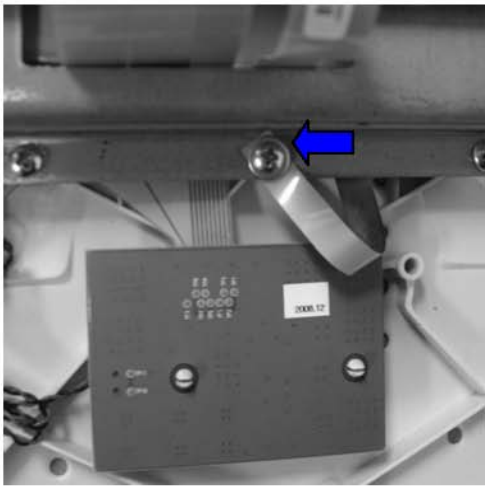
Picture 19R

Attach the wide end of the keypad cable to the associated connector at the bottom, center of the main board. Press the brown connector latch down to secure the cable into the connector. (Picture 19R)

Step 14



Picture 23R



Picture 24R

Secure the chassis to the front housing with 12 screws using 9-11 in-lbs of torque. (Picture 20R)

> **NOTE:** *Ensure that the assembly of the lower, center screw includes the ground strap from the keypad and flat washer. This ground strap must be "sandwiched" between the screw and the chassis with the washer between the strap and the screw. (Picture 21R)*

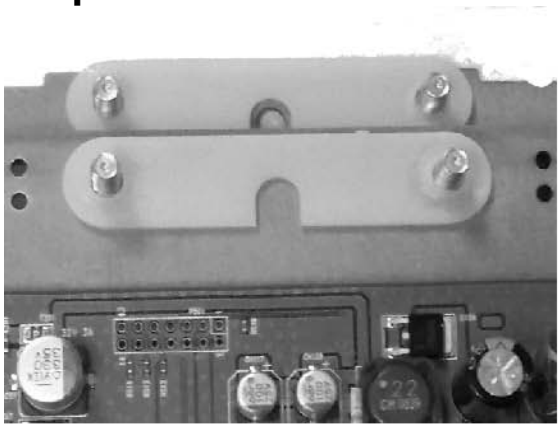
Reassembling

Step 15

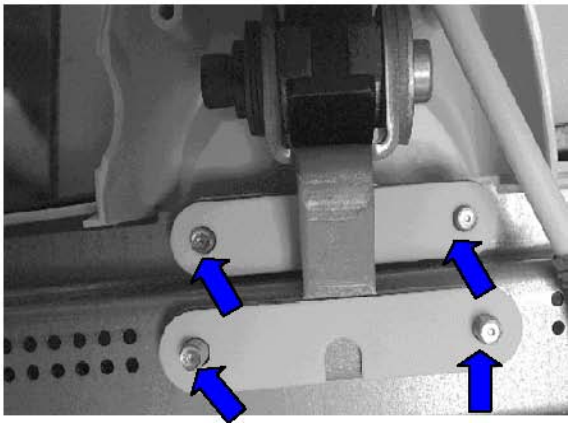
Picture 22R

Route the end of the coax and USB cables through the swivel assembly lid seal and top shroud from the top of the assembly. The white boot of the coax cable should be located at the top of the assembly. (Picture 22R)

Step 16



Picture 23R



Picture 24R

Swivel assembly and 4 swivel insulators. Place insulators on the upper and lower pairs of screws at the top of the chassis. Then place the swivel bracket over the screws, followed by the two other insulators. (Picture 23R and 24R)

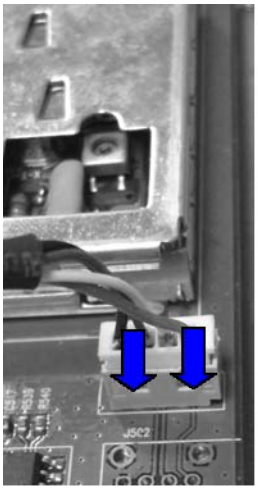
NOTE: *The top shroud must rest on the top of the front housing. (Picture 25R)*

Secure the assembly with flat washers and Nylock nuts, nut flat side down. Torque the nuts to 11-13 in-lbs. Torque the upper studs first.

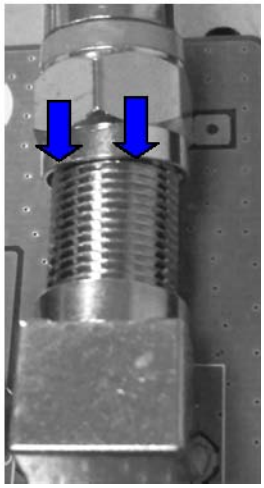
Picture 25R

Reassembling

Step 17



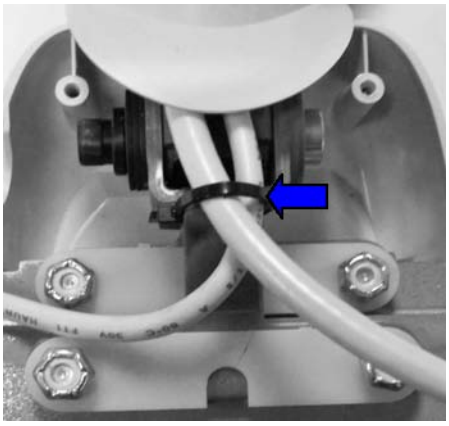
Picture 26R



Picture 27R

Insert the USB cable into the connector at the bottom, right of the main board. (Picture 26R)
Insert the coax cable into the coax connector at the top, right of the main board. Tighten with a wrench. (Picture 27R)

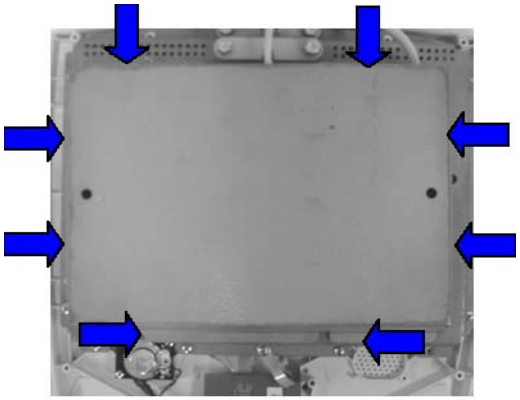
Step 18



Picture 28R

Secure the coax and USB cables with a Ty-rap. (Picture 28R) The cables must be oriented over the center and located toward the bottom of the of bracket rear flange. The Ty-rap must be attached so that the clamp is positioned to the side of the flange as shown.

Step 19



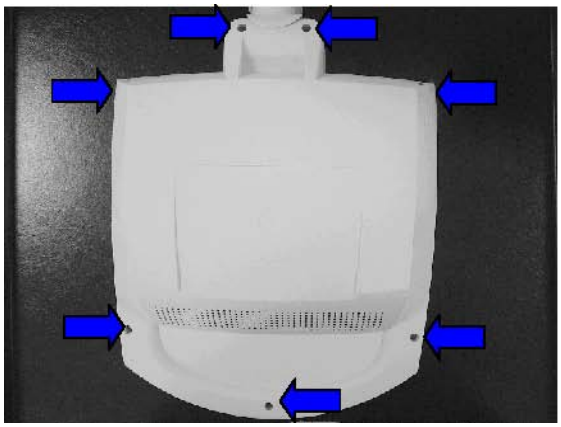
Picture 29R

NOTE: *Before attaching the EMI shield perform the Swivel Resistance safety check on page 31.*

Attach the EMI shield to chassis with screws in 8 places using 2.75 -3.25 in-lbs of torque. The cables need to run through the slots at the top of the shield. (Picture 29R)

NOTE: *Be careful not to pinch the USB and coax cables when attaching the EMI shield*.

Step 20



Picture 30R

Picture 31R

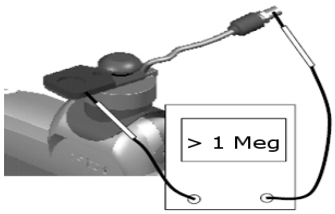
Align the rear housing to the front housing by “angling” the top of the rear housing under the top shroud and adjust to mate with alignment tabs in the front housing. Secure it with screws in 7 places using 9-11 in-lbs of torque. (Picture 30R)

Install the PD133-590 Adjustment cover. Use an Allen wrench to secure it. (Picture 31R)

Safety checks

1. Swivel Resistance

A. Value should read greater than 1 Meg. (A lesser reading indicates a possible insulation breakdown or short between the internal metal U-Bracket and chassis ground which could increase leakage currents touchable by the patient.)



B. If the reading is less than (<) 1M, remove the Nylock nuts and washers from the swivel assembly, inspect the insulators for damage, replace if necessary. Repeat Step 16 on page 28 to secure the swivel assembly and repeat the resistance measurement.

C. It is recommended that the reading of the swivel resistance be recorded as part of the service record.

2. Parts Placement

Confirm that the screws, parts, and wiring which were removed to allow servicing are put back in the original positions.

Troubleshooting

SYMPTOM	CHECK
TV DEAD	• Verify TV is connected to a coaxial powered cable. • Verify coaxial cable is securely connected to F-connector. • Verify P701 ribbon connector is seated. • Verify P1 ribbon connector is seated on IR board. • Replace main board.
NO COLOR	• Tune TV to another channel. Check for color. • Adjust color settings in Setup / Picture menu. • Verify correct voltage is used to power TV. • Verify correct Signal type is set in Setup/ Channels menu. • Perform Auto Program. • Replace main board.
CANNOT TUNE TO A DESIRED CHANNEL	• Verify channel is programmed into current Service Level. • Tune to channel with remote. • Tune to channel with TV keypad. • Verify correct Signal type is set in Setup/ Channels menu. • Verify Channel Memory Override is enabled in Setup/Channels. • Replace main board.

Troubleshooting

SYMPTOM	CHECK
TV KEYPAD INOPERATIVE	• Verify TV is powered. • Check TV operation with remote control. • Verify that ribbon is seated correctly to P701 main chassis connector. • If inoperative, replace keypad. • If still inoperative, replace main board.
SNOWY PICTURE	• Verify TV RF signal level is +10dbmv ±2dbmv. • Tune to another channel. • Verify correct Signal type is set in Setup / Channels menu. • Replace main board.
NOISY PICTURE	• Verify TV RF signal level is +10dbmv ±2dbmv. • Tune to another channel. • Turn off nearby equipment if possible and isolate noise source. • Move TV and cables to minimize or eliminate noise. • Replace main board.
PICTURE OK, NO EARPHONE SOUND	• Verify earphone is fully inserted into TV's ear-phone jack. • Try a different earphone. • Verify TV is not muted. Adjust for maximum volume. • Replace main board.
BLACK PICTURE, SOUND OK	• Check for on-screen menu and adjust for maximum brightness and contrast. • Verify P1 ribbon connector is seated on IR board. • Verify Backlight connectors are plugged in and secure. • Replace main board.
PICTURE OK, NO SPEAKER SOUND	• Verify TV is not muted. Verify cable is seated into P701 on main chassis and into P2 of IR Board. • Verify earphone is not being used. • Verify TV speaker has not been disabled for the current Service Level in the Sound/ Internal Speaker Enable. • Replace speaker. • Check sound. If there is still no sound, replace main board.