

TOSHIBA

NTDVT006BK

Service Training

"Customer Satisfaction Through Knowledge"

**TOSHIBA
DVD
SERVICE GUIDE**

**TOSHIBA AMERICA CONSUMER PRODUCTS,
INC. NATIONAL SERVICE DIVISION
NATIONAL TRAINING DEPARTMENT
1420-B TOSHIBA DRIVE
LEBANON, TN 37087**

TOSHIBA AMERICA CONSUMER PRODUCTS, INC.

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INTRODUCTION

1. This book supplements video tape NTDVT006, Toshiba DVD Servicing. It covers the mechanical disassembly and reassembly of a DVD player, and how to diagnose a problem to the board level. For more detailed information and drawings refer to service manual 810-9601. For connector locations and pin identification, refer to the drawings in the back of this book.
2. The DVD player is very static sensitive, so always use a static mat and wrist strap when servicing the player. Failure to take these precautions could destroy or reduce the life of the laser and many other components.

DISASSEMBLY

1. Retract the 5 screws holding the cover in place.
2. Lift off the cover.
3. If a disc is stuck in the player it can be manually removed by pushing the eject level with a long screwdriver.
4. After the tray pops out, pull it completely open and remove the disc.
5. To place the unit in the service position, remove the shield covering the main board.
6. Remove the 4 screws on the main board and

- the 2 self tapping screws on the back panel.
7. Remove the top portion of the shield and set it aside.
 8. Unclip the wires leading to the power supply.
 9. Lift the main board and remove the bottom portion of the shield. Then rest the main board in the built-in holders.
 10. Align the notch in the board with the bottom of the built-in holder to avoid damaging the main board.
 11. Before unplugging the flex cables, the laser pickup must be shorted to prevent static damage to the laser.
 12. To access the laser pc board, remove the safety shield covering the laser assembly.
 13. Remove the 2 screws holding the disc clamp and lift it off the laser assembly.
 14. Cut the cable tie that holds the power supply cable to the cross bracket.
 15. Remove the 2 screws holding the cross bar and lift the cross bar off the player.
 16. Remove the 2 screws holding the disc tray in the player.
 17. Pull the tray out of the player.
 18. Carefully solder the pad with a small tipped soldering iron.
 19. Remove the main board by gently unplugging the flex cables and the power supply connector.
 20. Lift the main board out of the holders.

21. Remove the 4 screws holding the power supply.
22. Lift the power supply board out of the cabinet.
23. Remove the 3 screws holding the laser mechanical assembly.
24. Lift the assembly out of the cabinet.
25. Remove the component video output board by retracting 2 screws on the back of the cabinet.
26. Remove the front panel by retract 4 screws, 1 on each side and 2 on the top.
27. Releasing the tabs and pull the panel away from the cabinet.
28. The front panel circuit boards are remove by retracting 6 screws, and lifting the circuit boards out of the front panel.

LASER DISASSEMBLY

1. Unplug the flex cable attached to the laser slide assembly.
2. Remove the 4 screws and washers holding the laser slide assembly in place.
3. Lift the laser slide assembly out and set it aside.
4. Retract 2 screws at the rear of the mechanical assembly.
5. Remove the lift assembly.
6. Remove the loading motor by first taking off the loading belt.

7. Retract the 2 screws on either side of the motor pulley.
8. Turn the mechanical assembly over and release the 3 tabs holding the loading motor PC board.
9. Lift the pc board out of the mechanical assembly and gently detach the flex cable.
10. The laser slide assembly is replaced as a whole; however, the feed motor, 3 gears, and 2 hall switches can be replaced individually.
11. Remove these parts by first taking off the cut washer and the gear that drives the slide.
12. Next, remove the middle gear.
13. The final gear is pressed onto the motor shaft, and has a ring magnet on its lower side to provide slide position information along with the hall switches. Never try to remove or replace this gear with the other 2 gears in place, because you risk breaking the ring magnet.
14. To safely remove the gear, turn it so a solid center portion is facing the outside of the assembly. Then place a very small screwdriver under the gear until the blade contacts the motor shaft and gently push down.
15. Remove the 2 screws holding the feed motor.
16. Unsolder the red and black wires and remove the feed motor.

LASER REASSEMBLY

1. Start the laser reassembly by reinstalling the feed motor. Be sure the red wire is attached to the number 2 terminal, and the black wire to the number 1 terminal.
2. Push the feed motor gear onto the shaft of the feed motor.
3. Check the distance between the ring magnet and the hall switches with a 0.5mm feeler gauge, and adjust the height of the gear as necessary.
4. Reinstall the center gear making sure that the small gear is on top.
5. Rotate the upper and lower portions of the last gear until the alignment holes match.
6. Once the holes are aligned, position the slide against the stops near the feed motor.
7. Position the gear over the shaft and gently push it down while slightly pushing the rack gear with your thumb until the gear slides easily into place.
8. Install the cut washer to hold the gear in place.
9. Position the loading motor circuit board on the mechanical assembly and snap it back into place. Then attach the flex cable to the bottom of the assembly.
10. Turn the mechanical assembly over and make sure the tray position switch is in the cut out

portion of the lever.

11. Push the slider back and forth to confirm the operation of the opening and closing gears.
12. Replace the 2 screws holding the loading motor in place.
13. Replace the loading belt.
14. Slide the lift assembly into place, and replace the 2 holding screws.
15. Manually operate the tray loading and lift mechanisms to ensure they operate properly.
16. Set the laser slide assembly into the mechanical assembly, and replace the 4 screws and washers.
17. Insert the flex cable into the connector on the laser slide assembly, and lock it in place.
18. Move the slide assembly back and forth to ensure the flex cable doesn't interfere with its operation.
19. If the flex cable doesn't allow the slide assembly to easily reach the end of its travel, push the flex cable down so it slides under the metal plate of the slide assembly.

DVD REASSEMBLY

1. Reinstall the front panel circuit boards back in the front panel.
2. Attach the front panel to the unit and replace the screws.
3. Reinstall the component video output board.

4. Replace the laser mechanical assembly.
5. Replace the power supply.
6. Place the main board in the service position and connect all of the flex cables.
7. Remove the solder from the shorting pad.
8. Install the disc clamp and the cross bar.
9. Replace the safety shield.
10. Slide the disc tray in and replace the locking screws.
11. Place the main board in its normal position with the shield surrounding it and fasten them in place.
12. Install the cover.

TROUBLESHOOTING

Introduction

1. This section of the book covers troubleshooting the DVD player to the board level. When voltages or waveforms are shown refer to the appropriate connector in the service manual or the back of this book.
2. Before removing any connectors in the player, always remove AC power first. Failure to do so will severely damage the player.
3. Before you take the player apart, thoroughly check its operation and note all symptoms.
4. Be sure the audio selector switch is in the proper position when you check out the audio. In the left position you get AC-3 audio and no

left and right analog audio. In the right position you get left and right analog audio and no AC-3 audio. If you change the position of the audio selector switch, you must **cycle** the power so the change is recognized by the microprocessor.

5. Be sure the video selector switch on the SD3006 is in the proper position when you check out the video outputs. In the left position you get composite and S video. In the right position you get component video.
6. If the color difference cables are reversed the picture information is present, but the color has a blue tint.
7. Putting the luminance cable in the wrong connector causes a very visible sync problem.
8. A dirty disc can cause playability problems, .so be sure the disc is clean. Use a soft cloth to clean a disc. Refer to the cleaning instructions in the service manual.

Power Supply Checks

1. Push the power button and see if the red power led comes on.
2. Check the dc voltages on pins 2, 3, 4, 5, 6, 7, 8, 12, 13, and 14 of CN801.
3. If any of these voltages are improper or missing, or the power LED does not come on, unplug the power supply from the main board and jumper pins 2 and 3 on CN801.

4. Recheck the dc voltages on pins 2, 3, 4, 5, 6, 7, 8, 12, 13, and 14.
5. If the voltages are still improper or missing there is a problem with the power supply. However, if the voltages are normal the power supply is alright, and there is most likely a problem on the main board or 1 of the other boards that is loading down the power supply.
6. For a loading problem on a board other than the main board, remove AC power and reconnect the power supply to the main board. Remove the connector to the front panel and apply AC power. Check the voltages supplied to the front board. Repeat this process for each board, and when the board causing the problem is disconnected the power supply voltages should return to normal.

Front Panel Checks

1. Using a meter check pin 2 for the ever 5 volts, pin 8 for the -24 volts, pin 9 for the F+, and pin 10 for the F-.
2. Using a scope, check the front panel reset signal at pin 1 of CN602 when AC is applied to the player. The signal goes high when power is applied to the player.
3. To check the communications between the main board and the front panel, connect channel 1 of the scope to the FSTBX signal on pin 7 of CN602. Communications be-

tween the 2 boards occur during low transitions.

4. Using pin 7 as the reference, monitor the clock signal on pin 6 of CN602. There are eleven negative clock pulses during 1 low cycle of the FSTBX signal.
5. Check the DSPSO signal on pin 5 of CN602. This is the serial information going to the front panel.
6. Check the DSPSI signal on pin 4 of CN602. This is the serial information coming from the front panel. Again, notice how it changes when a disc is playing.
7. If the signals are missing or improper, remove power from the player, and gently pull the flex cable out of CN602.
8. Measure the clock signal, the DSPSO signal, and the DSPSI signal using the FSTBX signal as a reference. All of the signals are present except the DSPSI signal.

Laser Checks

1. Check the DVD RF signal at TP502. The signal should look like a normal eye pattern with a peak to peak voltage of about 2.7 volts or higher. This peak to peak measurement varies from player to player and decreases as the laser ages.
2. Check the differential RF signals at pins 16 and 17 of CN501. They should be about 0.5

volts peak to peak.

3. Clean the objective lens with a cotton swab and alcohol if the signal is low.
4. Recheck the RF signal, and if it is still low replace the laser slide assembly.
5. Another way to check the power of the laser is with a laser power meter. A new laser should measure about 0.2 milliwatts.
6. You can also visually check the laser during power on. However, be sure not to look directly into the laser.
7. The RF signal for a CD is checked at TP501. It also looks like normal eye pattern, but its frequency is lower than that of the DVD. Normally it is about 1.6 volts peak to peak.

Focus and Tracking Checks

1. For a focus problem, check the focus error signal at TP504. Cycle the power off then on to see the operation of the focus error signal. Gently tap the side of the player to check the operation of the signal. If the signal is missing or improper, the main board is most likely at fault.
2. Play a CD and check the focus error signal at TP504.
3. For a tracking problem, check the tracking error signal at TP507. Cycle the power off then on to see the operation of the tracking error signal. Gently tap the side of the player

to check the operation of the signal. If the signal is missing or improper, the main board is most likely at fault.

4. Play a CD and check the tracking error signal at TP507
5. Check for a focus or tracking problem at pins 1, 2, 3, and 4 of CN501. These are the focus and tracking drive signals going to the laser slide assembly. You should see an ac signal riding on about 4 volts dc.
6. If the drive signals are being loaded down, remove power from the player and unplug the flex cable to CN501.
7. Plug the player in and turn on the power while monitoring pin 1 of CN501. The drive signal rises to 4 volts dc if it's good. This also applies to the other drive signals on pins 2, 3, and 4.
8. For DVD tracking problems check the tracking error signals going to the main board on pins 12, 13, 14, and 15 of CN501.
9. For CD tracking problems check the tracking error signals going to the main board on pins ten and eleven of CN501.
10. If the focus coil does not move up and down or the laser does not come on, check for plus 5 volts on pin 19 of CN501 and plus 2 volts on pin 20 of CN501.
11. If the voltages are missing or improper, unplug the flex cable and measure them

unloaded.

12. For problems associated with the feed motor or the spindle motor check the signals on connector CN502.
13. Check the feed motor drive signals at pins 1 and 2 of CN502. They are easiest to see when the power is cycled on and the player is put in the times 8 scan speed.
14. These signals can also be checked unloaded; however, the drive signal goes to 4 volts DC when AC is applied and power is turned on. If the dc signal is present, the drive signal from the main board is good.
15. To check the feedback from the feed motor hall switches, monitor pins 5, 6, 7, and 8 of CN502 while cycling power and playing a disc in times 8 scan.
16. If a disc won't play you can still check the hall switches, turn the power off and push the slide away from the spindle motor. Then turn the power on and monitor the signals as the slide moves back to its default position.
17. The dc drive voltage for the feed motor hall switches is monitored at pin 3.
18. The spindle motor drive signals are checked at pins 17, 18, and 19. They are easiest to see when the power is cycled on and the player is put in the times 8 scan speed.
19. These signals can also be checked unloaded; however, you can only see a momentary

- attempt at the drive signal coming on.
20. Check the feedback from the spindle motor hall switches by monitoring pins 9 through 13 and pin 15 while cycling power and playing a disc in times 8 scan.
 21. Check the spindle motor hall switches manually by rotating the spindle motor with your finger while monitoring pins 9 through 13 and pin 15.
 22. The dc drive voltages for the spindle motor hall switches are checked at pins 14 and 16.

Loading Motor Checks

1. Loading motor operation is checked at CN503.
2. The loading motor drive signal on pin 1 drives the tray out, and the loading motor drive signal on pin 2 pulls the tray in.
3. The tray position switch signal at pin 3 is high when the tray is out, and low when the tray is in.
4. The tray position switch signal at pin 4 is low when the tray is out, and high when the tray is in.

Color Difference Output Checks (CN302 - SD3006 Only)

1. Play a test disc with a straight color bar pattern.
2. Place the player in pause and switch to the

color difference outputs on the back of the player.

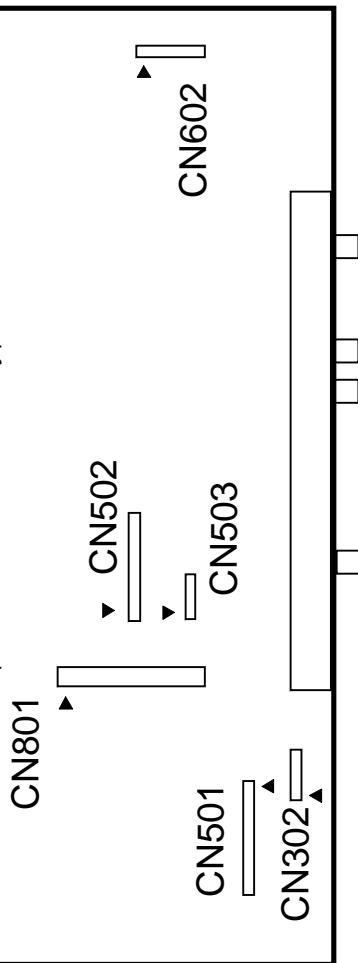
3. Connect channel 1 of the scope to the luminance output on pin 1 of CN302.
4. Connect channel 2 of the scope to the Cr signal output on pin 3, and ensure it is in sync with the luminance signal and the proper peak to peak voltage.
5. Connect channel 2 of the scope to the Cb signal output on pin 5, and ensure it is in sync with the luminance signal and the proper peak to peak voltage.
6. If the player won't switch video modes, monitor pin 7 while moving the switch. The pin is high in the composite video mode, and low in the component video mode.

Summary

1. If the problem is isolated to the main board or the laser slide assembly, replace the board or the slide assembly.
2. Some parts on the laser slide assembly are replaced. These include the feed motor, the feed motor drive gears, and the hall switches.
3. If the problem is isolated to any of the other boards, repair them to the component level.

MAIN BOARD COMPONENT SIDE

▼ Indicates Pin One
(CN302 - SD3006 Only)



CN801	
1	NC
2	EVER 5V
3	POWER ON
4	+5V
5	+9V
6	+8V
7	+5V
8	+3V
9	GND
10	GND
11	GND
12	-24V
13	F-
14	F+

CN502	
1	FMP
2	FMN
3	ADL
4	GND
5	HO2N
6	HO1N
7	HO1P
8	HO2P
9	V+
10	W+
11	U+
12	W-
13	V-
14	H-
15	U-
16	H+
17	U
18	V
19	W

CN302	
1	Y/R OUT
2	GND
3	Cr OUT
4	GND
5	Cb OUT
6	GND
7	NT/RGBX
8	GND

CN602	
1	DSP - RESET
2	EVER 5V
3	GND
4	DSPSI
5	DSPSO
6	DSPCK
7	FSTBX
8	-24V
9	F+
10	F-

CN503	
1	LDMN
2	LDMP
3	TCLS
4	TCPN
5	GND

CN501	
1	T+
2	F+
3	F-
4	T-
5	CDPD
6	GND
7	LD
8	MON
9	VOR
10	FO
11	EO
12	AO
13	BO
14	CO
15	DO
16	RFP
17	RFN
18	GND
19	VCC
20	VREF
21	LAYER

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