Service Source

iPod nano (5th generation)
Testing Procedures

General Information

These procedures apply to the iPod nano (5th generation)

These procedures contain the following headings:

What's New

- iPod nano (5th generation) is tested in the same manner as previous iPod nano's, but adds tests for the following new features:
    - Video camera
    - FM radio

About the Procedures

The following are testing instructions for iPod nano (5th generation).

Screen shots and other graphics are for illustration purposes only and may not show current or observed dialog boxes, wordings, values, versions, models, capacities, and may be for a different model than you are testing.

What You Need

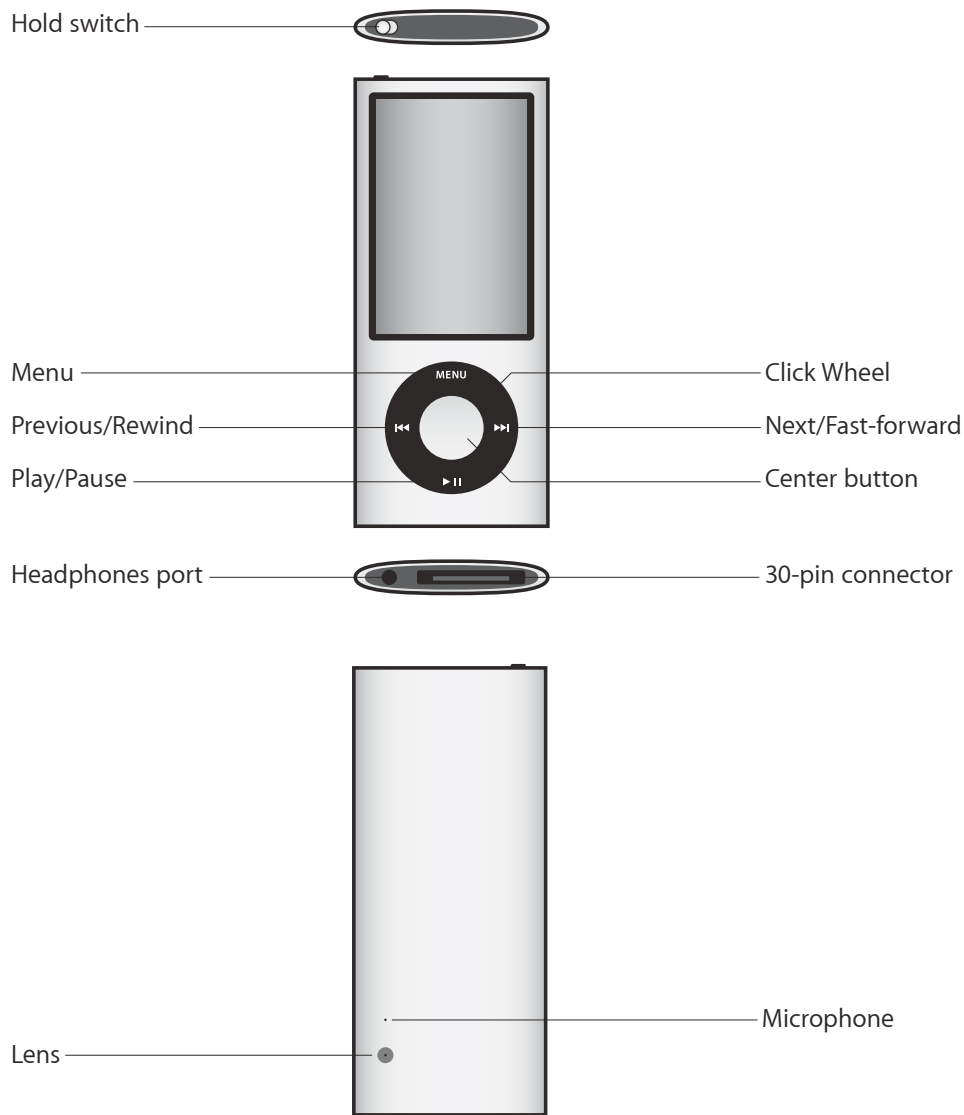Refer to **http://service.info.apple.com/ipod-tp.html** for other needed documents, procedures, and resources, such as:

- Field service keys
- iPod testing station setup
- How to identify counterfeit and modified iPods
- iPod visual and mechanical inspection document

iPod nano (5th generation) At A Glance

Controls and locations.

Hold switch

Menu — — Click Wheel

Previous/Rewind — — Next/Fast-forward

Play/Pause — — Center button

Headphones port — — 30-pin connector

— Microphone

Lens —

System Requirements

These are the minimum system requirements for a customer to use iPod nano (5th generation):
*   A Mac or a PC with a USB 2.0 port and one of the following operating systems:
*   Mac OS X version 10.4.11 or later
*   Windows XP Home or Professional with Service Pack 3 or later
*   Windows Vista
*   iTunes 9.0 or later, available at **www.itunes.com/download**
*   An iTunes Store account (for purchases from the iTunes Wi-Fi Music Store or App Store)
*   A computer Internet connection (broadband recommended)

Visual Inspection

A visual inspection is performed before troubleshooting to protect test cables and identify external causes that may affect warranty coverage.

Use the iPod Visual and Mechanical Inspection document, available from:
http://service.info.apple.com/ipod-tp.html, which inlcudes:
• Liquid Submersion Indicator inspection
• Debris or corrosion inspection and examples
• Headphone port cleaning instructions
• Warranty classifications
• iPod Damage Specifications chart
• iPod Dent Inspection Tool instructions
• Photo examples of damage

Restore Notes

• **Important:** A restore to factory settings must always be performed on the iPod (if possible) before a hardware failure can be verified.
• Make sure the customer understands that restoring the iPod reinstalls the iPod software, default settings are restored, and data stored on the iPod is deleted, including downloaded applications, songs, videos, contacts, photos, calendar information, and any other data.
  Note: Deleted data is no longer accessible via the iPod user interface, but is not permanently erased from the iPod until it is overwritten by new data.
• All media (music, movies, TV shows, podcasts, photos), contacts, calendar information, and bookmarks that are on their computer can be re-synced back onto their iPod when reconnecting to their computer.
• All media purchased from the iTunes store that has not been synced will be downloadable again from the iTunes store onto their computer by choosing Store > Check for Purchases.

Testing

iPod nano (5th generation) Testing Notes

- **Important:** A restore to factory settings must always be performed on the iPod (if possible) before a hardware failure can be verified.
- Note the format (Mac or PC) of the iPod or ask the customer. If later returning the iPod to the customer, it should be restored to the format as received, if possible.
- If the iPod will be returned to the customer, a final restore procedure must be performed to remove all test media (see **How to Return iPod to Customer**).

Customer's Setup and Reported Issue

1. Try to determine the customer's computer setup and whether their software is up-to-date?

2. Try to duplicate or verify the issue reported by the customer.

Serial Number Locations

There are several ways to get the serial number of the iPod nano (5th generation).

1. On the back of iPod

2. In the iPod About Screen (Settings > About), (press the Center button, or Previous or Next button to advance to the Serial Number screen).

3. In iTunes, from the iPod Summary tab.

   Note: You can choose Edit > Copy to put the serial number on the Clipboard.

Verify Battery Charge

iPod nano must have power to proceed with testing.

1. Check the battery icon in the upper right corner of the screen to verify that there is enough battery charge to continue testing.

2. If the iPod screen is blank, do the following:
    *   Verify that the Hold switch is off, then press any button to attempt to wake the iPod.

3. If it does not wake up, or if there is not enough battery charge, or one of the low-battery images (below) appears, connect iPod nano to a USB power adapter for up to 10 minutes before continuing.
    *   If it does not wake up after 3 minutes, fail the iPod. (AASP: failure code E07)
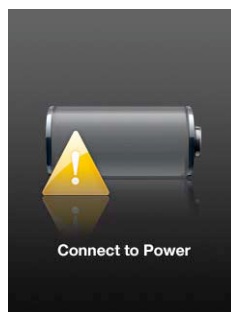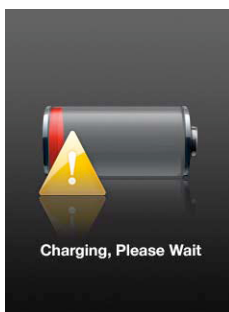
Warning: If after charging 5 minutes the iPod is unusually hot, disconnect and fail the iPod. Do not leave these units unattended overnight. (AASP: failure code E07)

Battery Charging Complaint

For iPod nano with a battery charging complaint, do the following:
*   If the iPod nano screen is blank and it does not wake up or you cannot turn iPod nano on, connect it to an Apple iPod USB power adapter. If it does not wake up after 3 minutes, fail the iPod. (AASP: failure code E07)
*   If iPod nano wakes up, perform a USB Charge Current Test (below).
    Note: When performing a USB Charge Current Test, put the iPod to sleep by pressing and holding the Play/Pause button.

For Battery Life Testing

If only battery life testing will be performed, refer to the Battery Life Test section for requirements.

USB Charge Current Test

This test measures the current being received by the iPod from the USB adapter to determine whether the USB charging circuit is working properly.

Ideally, perform this test when the iPod has less than a 75% battery charge. Do not perform this test if the battery is fully charged, as the test will not give usable results.

Tools Required

- iPod USB Charge Current Cable (922-7872)
- Multimeter with a 10 Amp Direct Current setting (such as Caltek Instrument CM2400A)
- Apple iPod USB power adapter

Setup

Connect the Charge Current Test Cable to the meter as shown, below.
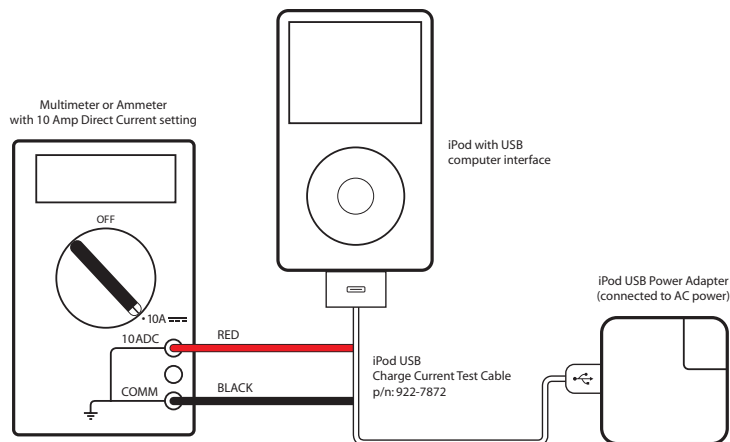
Testing

Follow these instructions to avoid equipment damage.

1. Plug the power adapter to an AC power outlet.

2. Set the meter to measure 10 Amps Direct Current (DC)(10A ▬▬▬).

   Important: Due to issues measuring milliamps on meters, do NOT use the milliamp (mA) setting, even if your meter has a millamp selection.

   Note: 1A = 1000mA, 1mA = 0.001A

3. Connect the cable's dock connector plug to an iPod for testing and note the existing battery charge level on the iPod (see chart below)—passing meter readings depend upon the existing level of battery charge.

   Important: If the iPod does not have enough battery charge to boot, the screen will be blank. The battery charge can be assumed to be in the less than 75% category in the chart below. The iPod screen may continue to be blank, due to low battery charge, even if the iPod passes the test.

4. Put the iPod to sleep (press and hold the Play button). Skip this if the screen is blank.

5. Read the meter.

6. Use the chart below to determine Pass/Fail. (AASP: failure code E03)

Meter Readouts (in Amps) to Pass (with iPod off)	
If battery charge is:	
Greater than 75 percent:	0.03A (30mA) or higher
Less than 75 percent:	0.10A (100mA) or higher = Pass

   * If the readout is 0.00 or 0.01, the reading is less than 0.02A (20mA), and the iPod fails.

Note: As the battery approaches fully charged, the charging current reduces dramatically.
• If the USB Charge Current Test fails, fail the iPod.
• If the iPod passes the test, continue testing.

After the test, turn the meter's selection dial to off to conserve the meter's battery power.
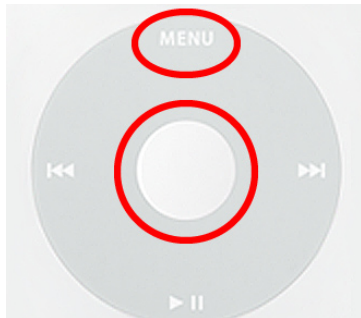
Put the iPod into Disk Mode

Before continuing to the initial restore procedure, place the iPod into Disk Mode if possible. Disk Mode allows the restore process to access the iPod flash drive directly and bypass the iPod interface for a more effective firmware update.

Notes:
- Disk Mode is not the same as enabling disk use for the iPod.
- It may take several attempts to enter Disk Mode.
- If entering Disk Mode is unsuccessful, skip to the Restore iPod Software section to perform a restore. Disk Mode will be attempted again later (at which time it must be successful to pass).

1. Verify that the iPod has enough battery charge to proceed.

2. With the iPod NOT connected to the computer, reset the iPod.
   - Simultaneously press and hold the Center and Menu buttons.

   - When the Apple icon appears, put the iPod into Disk Mode by immediately and simultaneously pressing and holding the Center and Play buttons...,
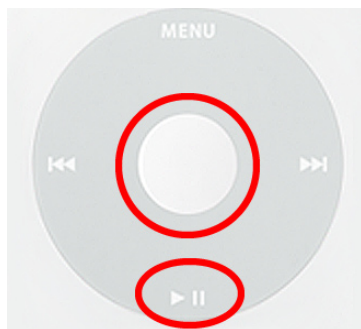

   - ...until you see the Disk Mode screen.

Restore iPod Software

Warning: The iPod must have enough charge to complete the entire restore process during any disconnects, or irreversible damage may occur.

1. Launch the latest release of iTunes.

2. Put the iPod into Disk Mode, if not already. If unable to enter Disk Mode, skip this step for now, it will be attempted again later.

3. Connect the iPod to the computer.

4. You may see the following, or similar, dialog box. Click Cancel.
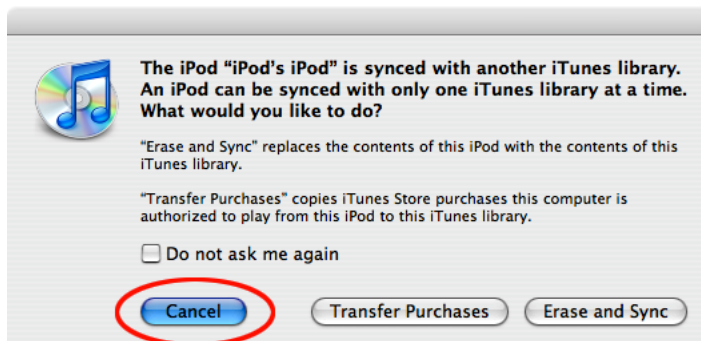
5. You may also see this dialog box. Click No.
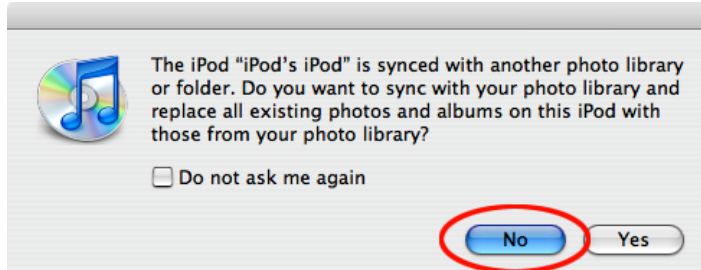
6. Select the iPod icon in the source list, if necessary, to display the iPod Summary screen. Click Restore.

7. Click Restore again on the next dialog box to approve.

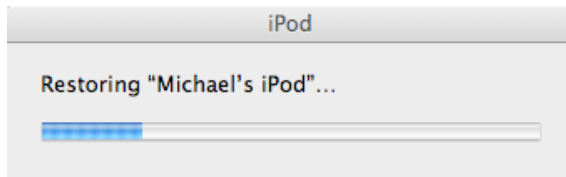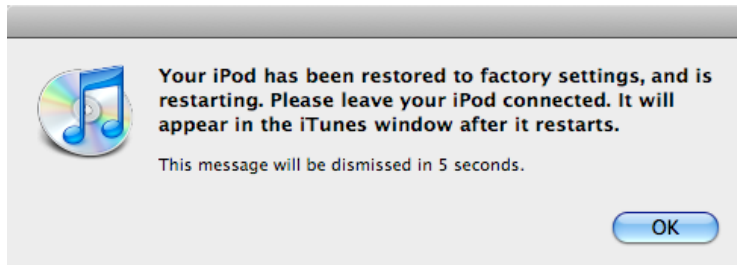8. Enter your Admin name and password in the Authenticate screen.
   A progress bar appears.

9. When complete, the following message appears. Click OK to clear the dialog box.

10. If you were not successful in the "Put the iPod into Disk Mode" section, disconnect the iPod when the progress bar appears (but only if the iPod has enough charge or it is connected to an adapter). If you were successful, or you are only performing battery life testing, skip this step.

    Wait for the iPod to finish resetting and the language selection screen to appear, then try again to put it into Disk Mode (see the Put the iPod into Disk Mode heading, earlier).
    • If you again are not able to get the iPod into Disk Mode—fail the iPod.
      (AASP: failure code E08)
    • If you are successful, reset the iPod and while it is resetting, connect it back to the computer and continue.

11. After the iPod resets a "Connected, Eject Before Disconnecting" message will appear on its screen...
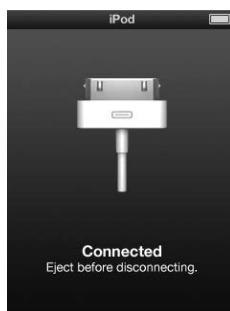
...the iPod's icon will appear in the source list of iTunes, and the Set Up Your iPod screen will display.

iTunes Synchronization Test

(AASP: failure code E05)

This section tests syncing and loads the media for later tests. It is based upon just completing the restore process and completing the steps in the iPod Testing Station Setup document from http://service.info.apple.com/ipod-tp.html

For dedicated testing systems:

This method is for test computers that have only test media installed in iTunes and iPhoto.

1. In the the "Set Up Your iPod" screen, make the check box selections below, to automatically sync songs and photos (movies must be synced manually).

2. Select the language if necessary.

3. Click Done.

4. Wait for the "iPod sync is complete." message to appear in iTunes.

5. To sync test movies, select the iPod icon in the Source pane, and then the Movies tab, and make the checkbox selections, shown below. (Make sure the iPod Video testing playlist is selected, under the "Include Movies from Playlists:" heading.)
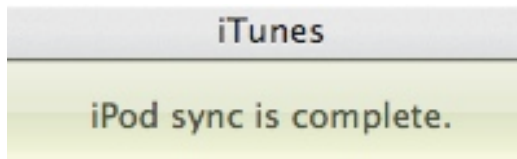
6. Click Apply.
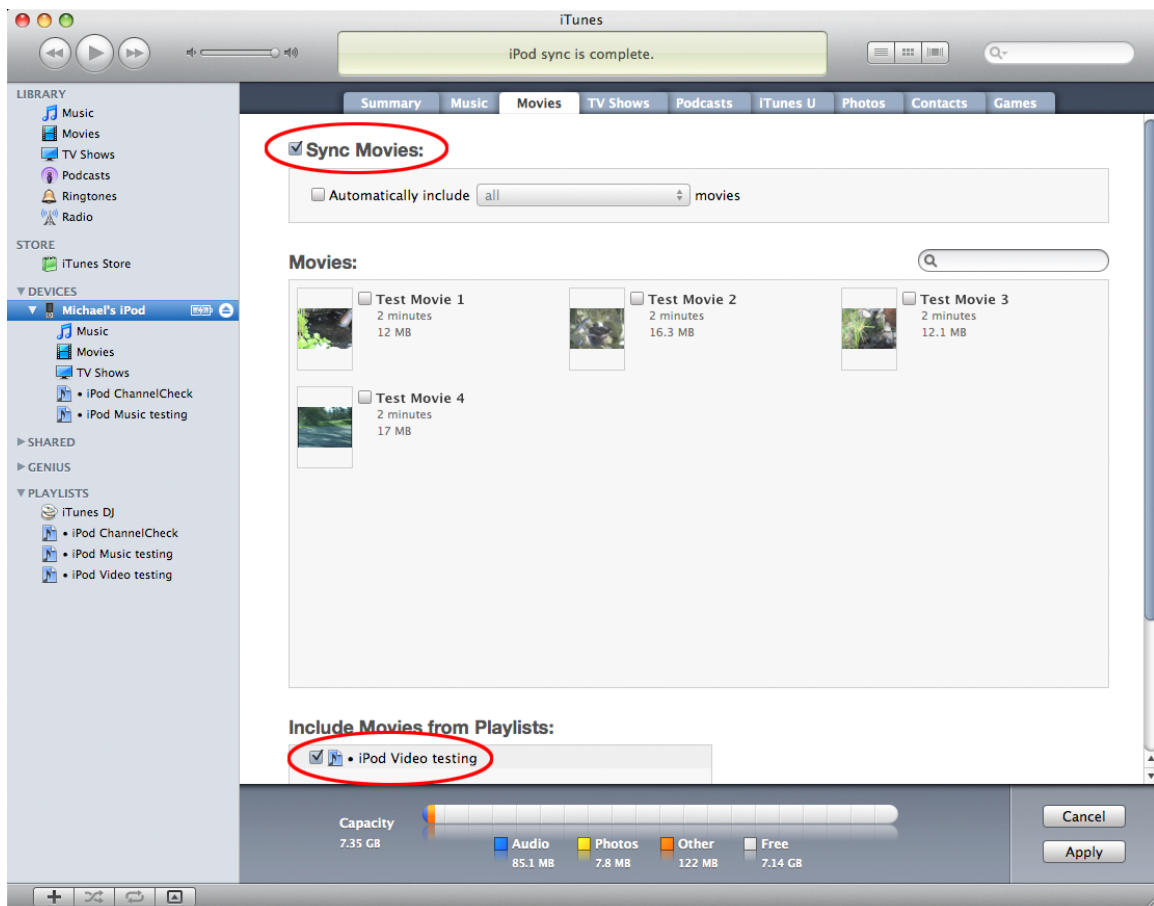
For non-dedicated testing systems:

This method is for test computers that have other media installed other than test media.

1. In the "Set Up Your iPod" screen, deselect all checkboxes so that music and photos will not sync. (Music, photos, and movies will be manually synced, later.) Click Done.
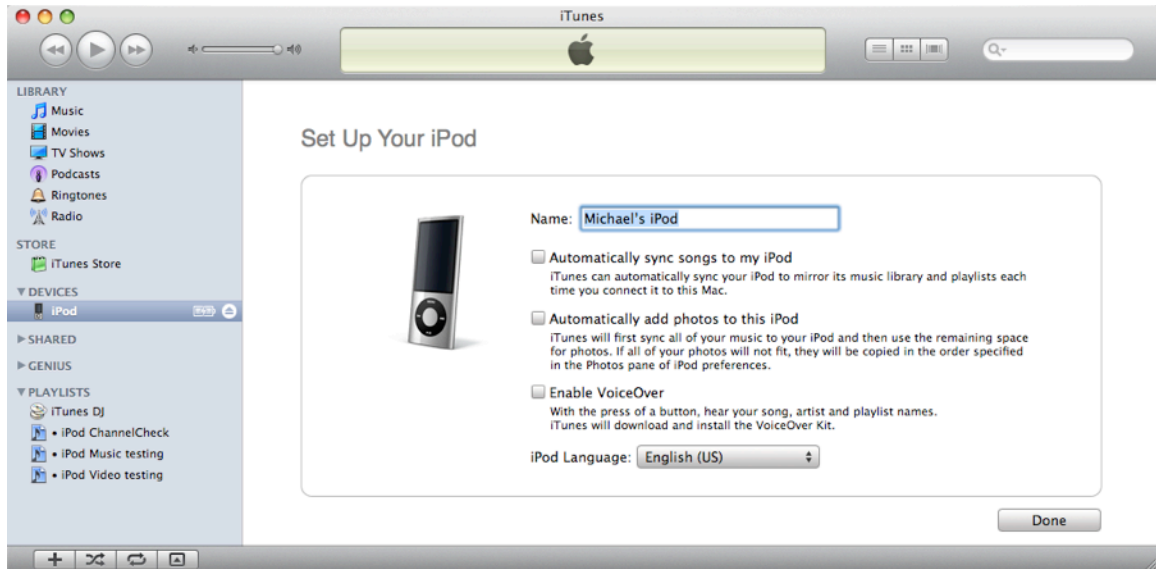
2. Select the iPod icon in the source list, if necessary, then select the Music tab and make the selections shown below.
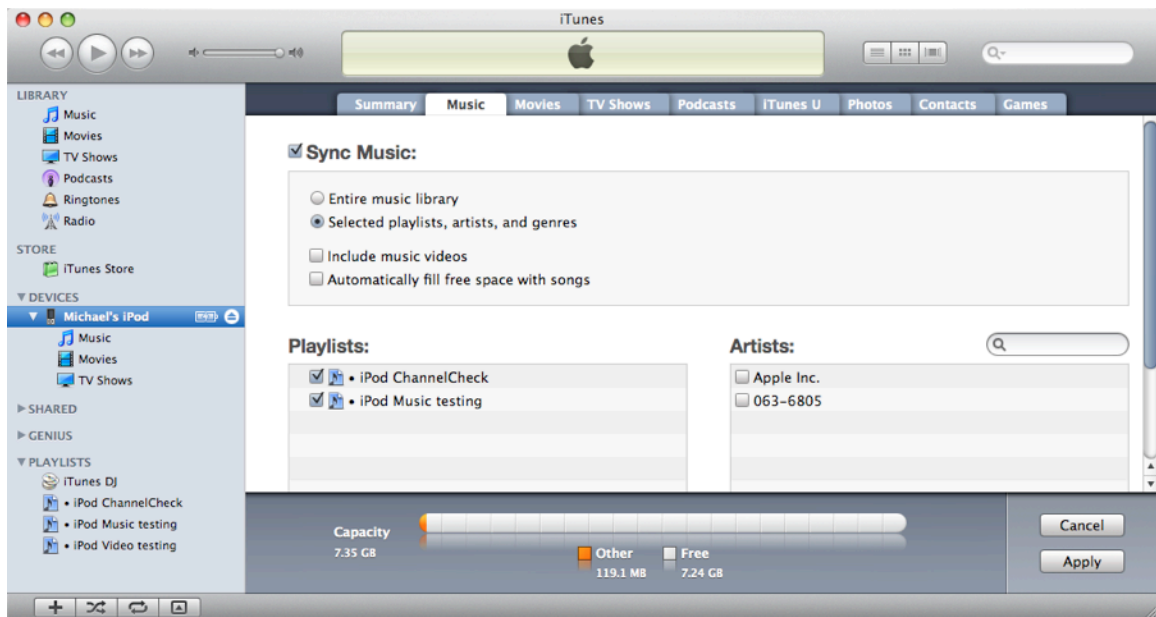
3. Select the Movies tab, and make the selections shown below. (Make sure the iPod Video testing playlist is selected, under the "Include Movies from Playlists:" heading.)
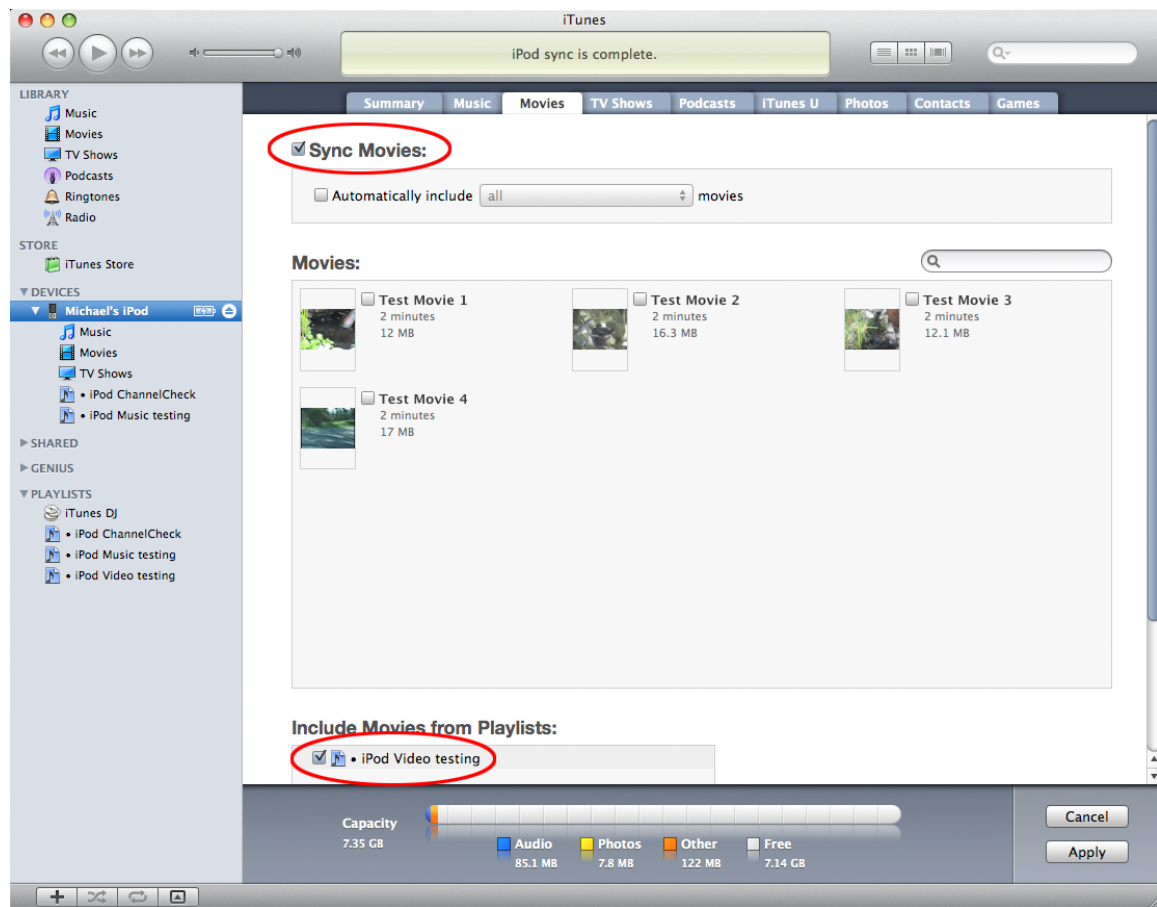
4. Select the Photos tab, and make the selections shown below.

5. Click Apply.

6. Wait for the "iPod sync is complete." message to appear in iTunes.
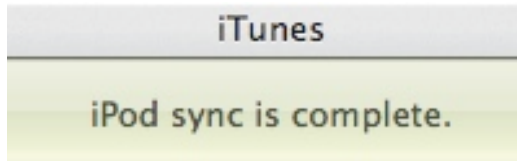
Eject the iPod

1. Eject the iPod, if necessary, by clicking the iPod eject icon in the source list.

2. Disconnect the iPod from the computer.

Battery Life Tips

Battery life depends upon iPod settings and use. To conserve battery power, the customer might try any of the following:

Update software: Use iTunes to install the latest iPod software to ensure that you have the latest battery conservation features.

Reduce backlight on time: (Settings > General > Backlight and choose a shorter time period).

Adjust brightness down: (Settings > General > Brightness and scroll the dial to the left).

Turn off EQ: (Settings > Playback > EQ and choose Off, or Flat (if you've added EQ to songs in iTunes)).

Hold, pause or turn off iPod: If not listening to music, pause it, or turn off iPod by pressing the play button for two seconds. To prevent iPod controls from inadvertently waking up iPod, set the Hold switch.

**Charge cycle per month:** For proper lithium-based battery maintenance, be sure to go through at least one charge cycle per month (charging the battery to 100% and then completely running it down).

Also see Knowledge Base article: **About iPod batteries**

Battery Life Test

This test is only required for iPods with a customer complaint of short battery life.

iPod Battery Life Testing Policy:

(Refer to the iPod Visual and Mechanical Inspection document from
http://service.info.apple.com/ipod-tp.html)

An iPod under warranty with a battery life complaint qualifies to proceed to a battery life test, even if there is other evident damage, as long as the iPod does not have:
- excessive damage (broken or open enclosure, or in pieces)
- testing-prohibitive damage (dock connector damage or port corrosion)
- a cracked LCD or cover, **unless** a single hairline crack with no contributing damage.

If the iPod FAILS the battery life test, replace the iPod. (AASP: failure code E03)

If the iPod PASSES the battery life test,
- Return the iPod to the customer, unless there is another issue complaint, in which case, perform standard troubleshooting and visual inspection procedures.

Battery Life Testing General Information:

Refer to the iPod Testing Station Setup document from **http://service.info.apple.com/ipod-tp.html** for tools, media, and computer setup, before beginning.

Important: For battery testing, a visual inspection, restore, and test-media sync must be performed, and a full battery charge must be performed just before starting a test. (Refer to the appropriate documents and heading for instructions.)

Note: Putting the iPod into Disk Mode during the restore process is not required.

The playback test times required to pass are 100% of original published playback times. This includes all warranty coverage periods or programs, and so applies to each of the following:
• 1st year iPod warranty
• 2nd year iPod Apple Protection Plan coverage
• iPod Battery Replacement Program warranty

Important: BOTH music and video playback tests must be performed (unless the first test fails). Both tests must pass for the iPod to pass.

Use these specifications for battery life testing:

iPod Model:	Playback test time must be greater than or equal to these specifications:
iPod nano (5th generation)	24 hours Audio; 5 hours Video

Battery Life Tests: (AASP: failure code E03)

Restore and sync test-media just before charging for a test.

Important: Plan the start time of the tests carefully to ensure that the iPod will be checked at the times needed. The iPod is initially checked after the length of the playlist to verify that the Repeat All function is working, then checked again at the playback test time.

1. Before the test, connect the iPod to an iPod compatible Apple USB power adapter.

2. Allow the iPod to charge for at least 4 hours. You should also see the icon, below (or its equivalent):

3. If the iPod is not fully charged after 5 hours, fail the iPod. (AASP: failure code E03)

Battery Life Music Test: (AASP: failure code E03)

1. Connect a set of earbud headphones to the iPod.

2. From the main Settings menu, select Repeat > All (to play the playlist continuously). Verify that Shuffle is Off. All other settings are left unchanged (default settings).

3. Disconnect the iPod from the power adapter.

4. From Music > Playlists, select and play the "iPod Music testing" playlist.

5. Record the start time on a piece of paper.

6. Set the Hold button to On, to prevent accidental button activation.

7. Let the iPod play past the length of the music playlist, then check that the iPod is still playing and that the playlist has started over (this is to verify that the Repeat All function is working).

8. Recheck the iPod at the music playback test time.

9. If the iPod is still playing music, the battery is OK, and passes the test.

10. If the iPod has stopped playing because the battery depleted, fail the iPod.
    (AASP: failure code E03)

Battery Life Video Test: (AASP: failure code E03)

1. Connect a set of Earbud headphones to the iPod.

2. From the main Settings menu, select Repeat>All (to play the playlist continuously). Verify that Shuffle is Off. All other settings are left unchanged (default settings).

3. From Video > Settings, ensure that TV Out is set to Off.

4. Disconnect the iPod from the power adapter.

5. From the Videos > Video Playlists menu, select the "iPod Video testing" playlist, select the first video in the list and press the Play button to start playing.

6. Record the start time on a piece of paper.

7. Set the Hold button to On, to prevent accidental button activation.

8. Let the iPod play past the length of the video playlist, then check that the iPod is still playing and that the playlist has started over (to verify that the Repeat All function is working).

9. Recheck the iPod at the video playback test time.

10. If the iPod is still playing video, the battery is OK, and passes the test.

11. If the iPod has stopped playing because the battery depleted, fail the iPod.
    (AASP: failure code E03)

iPod Functional Testing

Control Buttons, Audio, Auto-Pause, Speaker, & Shake Test

AASP: failure codes:
- Control Buttons, Auto-Pause (E02)
- Audio, Speaker (E05)

1. If a restore was just done, the Language screen appears. Select the language that you prefer and press the Center button to select it. The iPod menu screen appears.

2. Use the click-wheel to scroll up and down the menu. Make sure that you hear the clicker sound through the iPod speaker when rotating the click-wheel.

3. Connect known-good headphones to the iPod, and orient the left and right sides correctly.

4. Navigate to the "iPod ChannelCheck" playlist (this contains the downloaded "ipod_ChannelCheck" file), and press the Center button.

5. Make sure the ipod_ChannelCheck audio file is selected, then press the Play button and play the entire track.
   - Make sure the left and right channel messages are heard on the appropriate side.

6. Navigate to the "iPod Music testing" playlist, and start playing the songs. Listen to the first song for about 5 to 10 seconds.
   - Listen for any distortion.
   - Use the scroll wheel to vary the volume.

7. Disconnect the headphones and verify that the song paused.

8. Press the Play/Pause button to start the song again. Listen to the music from the internal speaker and verify that there is no distortion.

9. Press the Next button to play the next song, and play it for about 5 to 10 seconds.

10. Press the Previous button twice to go back to the first song (the first press goes back to the beginning of the song). Play it for about 5 to 10 seconds.

11. Press the Play/Pause button to pause the playback.

12. Slide the Hold button on (to reveal the orange color). Scroll the click-wheel and press all five buttons to make sure they are deactivated and nothing happens.

13. Slide the Hold button off (to cover the orange color) (all buttons will be active).

14. Pause the music.

15. Press the Menu button several times to go back to the iPod menu screen.

Microphone/Voice Recording Test (AASP: failure code E05)

Voice recording in the iPod nano (5th generation) can be done through the internal microphone or an external microphone, such as headphones with a microphone. The "Voice Memos" menu is accessed under the "Extras" menu.

Follow these steps to test the voice recording capabilities:

1. Connect known good iPod Headphones with Mic.

2. Turn the iPod on and navigate to Extras > Voice Memos and press the Center button to reveal the microphone and VU meter screen.

3. Press Play/Pause or the Center button to start recording.

4. Speak into the microphone for four to five seconds and watch the VU meter to see if it registers the sound from the microphone.

5. Press Play/Pause or Menu to stop recording and then select "Stop and Save."
    (**Note:** The Center button inserts chapter markers)

6. Navigate to and select "Voice Memos," then select the just recorded memo, press the Center button to select it.

7. Select Play, adjust the volume as needed, and listen through the speaker or headphones to verify the recording. Make sure there is no static or noise.

8. **Important:** Delete any test recordings before returning the iPod to the customer. Be careful to select only a test recording, then press and hold the Center button until a menu displays. Select Delete, and confirm.

LCD Visual Check (AASP: failure code E04)

While in the iPod menu screen, make sure the LCD screen displays properly. Fail the iPod if you see any abnormal features such as lines, shadows, white spots, dark spots, any pixel defects (such as stuck, or bright, or dark pixels), or other defects.

Photos and Slideshow Test (AASP: failure code E05)

1. From the Photos > Settings menu, select Music and choose the "iPod Music testing" playlist.

2. Under the Settings menu, verify TV Out is Off.

3. Press Menu to return to the Photos screen and select the iPod Slideshow testing playlist to display its photo thumbnails.

4. Connect headphones to the iPod.

5. Press the Center button to display the first photo in full screen.

6. Press Center button again to start the slideshow.

7. Let the slideshow run for approximately 20 seconds. Verify that the photos change properly and are not distorted or jittery, and the music plays without distortion.

8. Press the Menu button to stop the slideshow.

Video Test

The video display function is tested in two ways:
• on the iPod
• on a TV, using Apple Composite AV cables

On the iPod: (AASP: failure code E05)

1. Make sure headphones are *not* connected to the iPod.

2. From the main menu select Videos > Settings.

3. Ensure TV Out is set to Off.

4. Press Menu to return to the Videos menu screen, select Video Playlists and press the Center button.

5. Select the iPod Video testing playlist and press the Center button.

6. Choose the first video to play and press the Center button to start the video.

7. Watch the video on the iPod screen for a few seconds and look for defects in playback.

8. Verify that the audio plays clean from the iPod internal speaker.

9. Connect headphones to the iPod and listen to the audio. Ensure the sound is clear and without noise or distortion.

10. Advance to the next video and back to the original.

11. Press Menu until you return to the Videos menu.

On a TV: (AASP: failure code E05)

1. Connect Apple Composite AV cables 30-pin connector to the iPod, and the composite video and audio connectors to the TV (see the television's manual)

2. Set the TV to display from these input ports (see the television's manual).

3. From the iPod's Videos > Settings menu, set the TV Out setting to On.

4. Set the TV Signal to NTSC or PAL, depending upon the TV format.

5. Press Menu to return to the Videos menu screen, select Video Playlists and press the Center button.

6. Select the iPod Video testing playlist and press the Center button.

7. Choose the first video to play and press the Center button to start the video.

8. On the TV screen, watch the video for a few seconds and look for defects in playback.

9. Verify that the audio plays clean from the TV speakers.

10. Advance to the next video and back to the original.

11. Press Menu until you return to the main menu.

Video Camera Test (AASP: failure code E05)

The iPod nano (5th generation) can record high-quality video and sound.

Follow these steps to test the video camera and recording capabilities:

1. Select Video Camera in the iPod menu and press the Center button.

2. Wait for the screen to be active, then press the Center button to start recording.
   - Record about 8 seconds:
     - 4 seconds holding the iPod still, then
     - 4 seconds moving the iPod slowly

3. Press the Center button to stop recording.

4. Press Menu to go to the Camera Roll, scroll to highlight the newly recorded video, and press the Center button to begin playing the video.

5. Check for video quality. Fail the iPod if there is any distortion, freezing, or wavy lines.

6. To delete the recording you just recorded:
   - Press Menu to go to the Camera Roll screen, then scroll to select the video.
   - Press and hold the Center button until a menu appears.
   - Choose Delete.

FM Radio Test (AASP: failure code E05)

The iPod nano (5th generation) FM radio uses the earphones or headphones cord as the radio antenna. The earphones or headphones must be connected in order to receive an FM signal. The radio will not play through the iPod nano speaker.

1. Connect headphones to the iPod.

2. Move to a location with known good radio reception.

3. Select Radio from the iPod menu and press the Center button.

4. Press the Center button until the frequecy dial appears.

5. Use the clickwheel to select a popular radio station with a strong radio signal.

6. Check that the radio quality is clear with no noise or distortion in the audio.

7. Unplug the headphones and a message "No Radio Signal, Please plug in headphones for radio reception" appears.

8. Press Menu to go to the Radio menu and select "Stop Radio."

9. Press Menu to return to the main iPod menu.

Sleep/Wake-up Test (AASP: failure code E02)

1. Press and hold the Play/Pause button for a few seconds to put the iPod into sleep mode. The iPod screen goes blank.

2. Wait 5 seconds, then press any button to wake-up the iPod.

Accelerometer Testing (AASP: failure code E02)

To test the accelerometer without entering the internal diagnostics, launch the Maze game (Extras > Games > Maze). Hold iPod horizontally, and verify that the ball moves as expected when moving the iPod.

If testing other accelerometer functions, remember that videos display in wide-screen orientation only, and when testing photos, or Cover Flow, hold iPod in a vertical plane, not flat.

Built-In Diagnostics

Built-in Diagnostic Tests (AASP: failure code E08)

iPod nano (5th generation) has built-in diagnostics that can be used to determine proper function. Only the tests indicated should be used.

Note: You may need to try several attempts to activate the Diagnostics.

Pass/Fail: If the iPod does not behave as indicated, fail the iPod.

1. With the iPod NOT connected to the computer, reset the iPod.
    - Simultaneously press and hold the Menu and Center buttons.
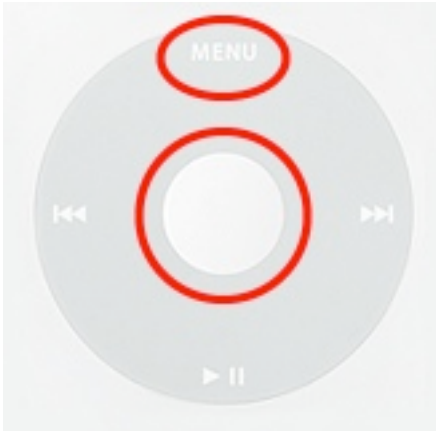
    - When the Apple icon appears on the iPod screen, immediately, and simultaneously, press and hold the Previous and Center buttons.
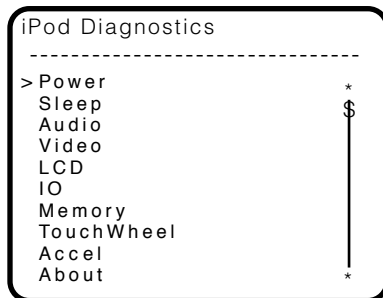

    - Release the buttons when the Apple icon disappears from the screen.
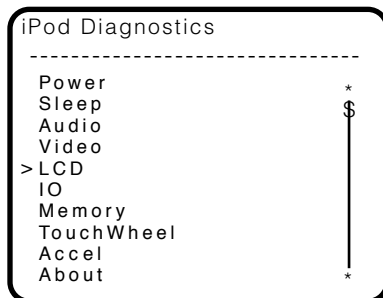
Navigation Notes:

- Navigate by pressing the Next and Previous buttons to move the selection pointer ">" up or down the list.
- Start a test by pressing the Center button (also referred to as ACTION key).
- Press the Menu button to continue or return to previous diagnostics menu screens.
- The example diagnostic screens in these procedures are approximations, and italics text in parenthesis is used for information, only.
- To leave the diagnostics, Reset the iPod.

iPod Diagnostics Menu

```
iPod Diagnostics
--------------------------------
>Power                        *
 Sleep                        $
 Audio
 Video
 LCD
 IO
 Memory
 TouchWheel
 Accel
 About                        *
```

LCD (Backlight test)

1. In the main menu choose LCD and press the Center button.

```
iPod Diagnostics
--------------------------------
 Power                        *
 Sleep                        $
 Audio
 Video
>LCD
 IO
 Memory
 TouchWheel
 Accel
 About                        *
```

2. Select Backlight in the next screen and press the Center button.

```
iPod Diagnostics
--------------------------------
 ColorPattern
>Backlight
```
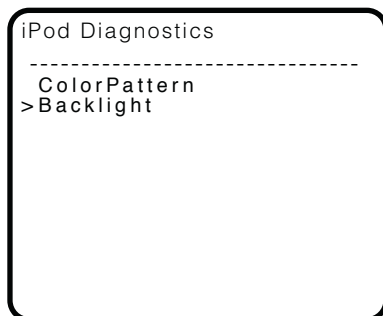
3. The following window appears.

```
Back Light Test
 --------------------------------
Next to Higher
Prev to Lower
```
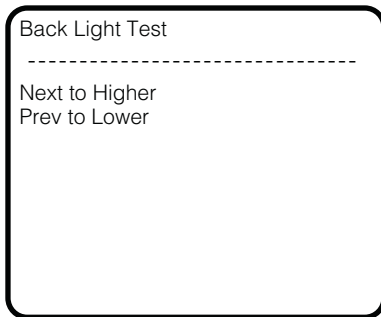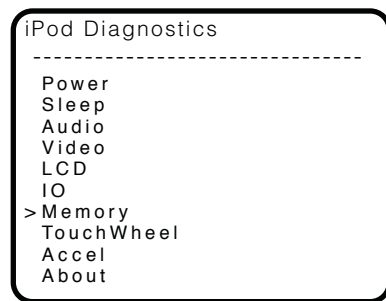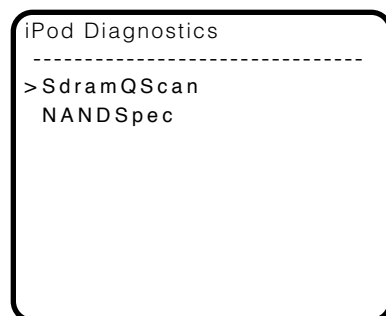
4. Press the Next button successively to increase backlight brightness.

5. Press the Previous button successively to decrease backlight brightness (then return to a normal level).

6. Press the Menu button to return to the main menu.

Memory

1. Choose the Memory menu heading and press the Center button.

```
iPod Diagnostics
 --------------------------------
  Power
  Sleep
  Audio
  Video
  LCD
  IO
> Memory
  TouchWheel
  Accel
  About
```

2. Choose SdramQScan and press the Center Button.

```
iPod Diagnostics
 --------------------------------
> SdramQScan
  NANDSpec
```

Pass Condition: pass!

```
Sdram scan test
 --------------------------------
pass!
```
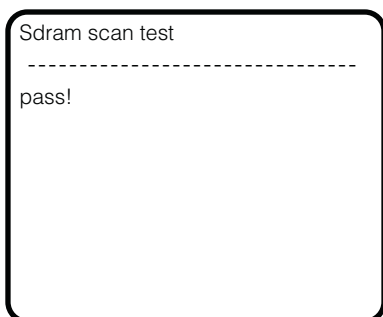
3. Press the Menu button twice to return to the main menu.

TouchWheel Test

1. Choose the TouchWheel menu heading and press the Center button.

```
iPod Diagnostics
 ------------------------------
   Power
   Sleep
   Audio
   Video
   LCD
   IO
   Memory
 > TouchWheel
   Accel
   About
```
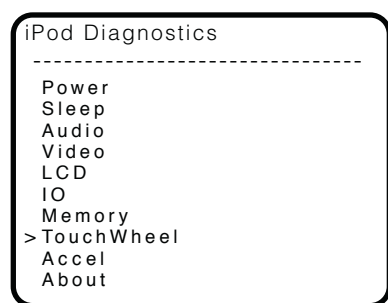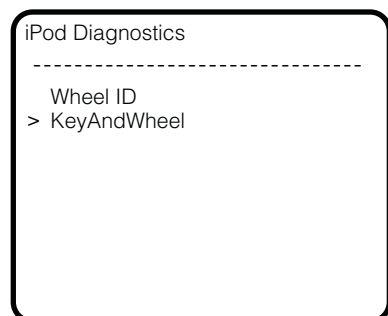
2. Choose WheelAndKey and press the Center Button.

```
iPod Diagnostics
 --------------------------------
   Wheel ID
 > KeyAndWheel
```

3. Use a finger to slowly scroll around the click-wheel (about 2 inches per second).
   Pass Condition: After one full rotation all sectors (numbers and letters) must change to an asterisk (*).
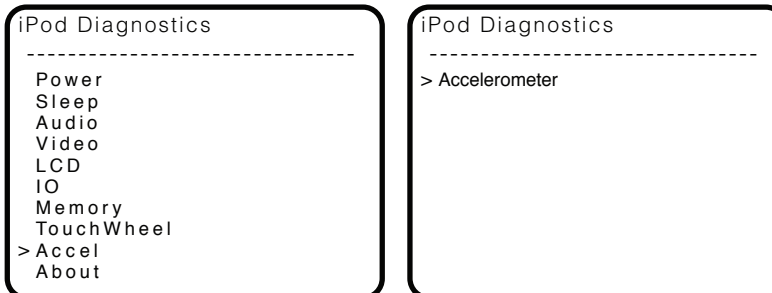
4. Press each clickwheel button once.
   Pass Condition: The value should change from "0" to "1" (or the number of times the key was pressed).

```
WheelAndKey Test              WheelAndKey Test


0  1  2  3  4  5  6  7         *  *  *  *  *  *  *  *
8  9  A  B  C  D  E  F         *  *  *  *  *  *  *  *
Menu Key 0                    Menu Key  1
Next Key  0                   Next Key  1
Prev Key  0                   Prev Key  1
Play Key  0                   Play Key  1
Action Key  0                 Action Key  1
```
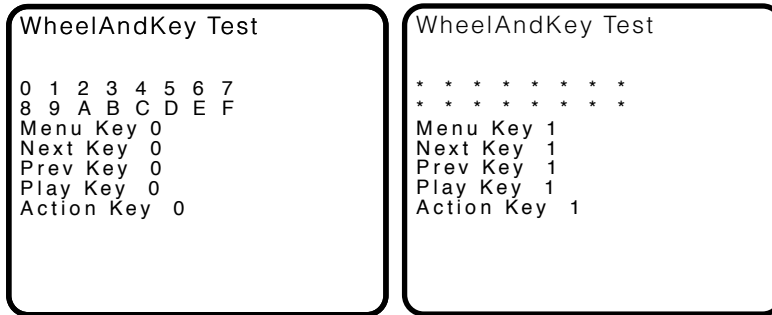
5. Press Menu until you return to the main menu.

6. Reset the iPod by pressing the Center and Menu buttons simultaneously and holding them until the iPod screen goes blank, then release.

Accelerometer Test

1. Choose the Accel menu heading and press the Center button, then again to select Accelerometer.

```
iPod Diagnostics              iPod Diagnostics

 ------------------------------   ------------------------------
  Power                        > Accelerometer
  Sleep
  Audio
  Video
  LCD
  IO
  Memory
  TouchWheel
> Accel
  About
```

2. Hold the iPod flat, then tilt it in all directions. Verify that the X, Y, Z readings change.

Reset to Exit

1. Reset the iPod to exit the diagnostics. Press and hold the Menu button and Center simultaneously until the Apple logo appears.

How to Return iPod to Customer

Final Restore, Charge and Clean

If all tests show that the issue has been resolved or that the iPod is working normally, and if the iPod will be returned to the customer, if any media sync was done, a final restore procedure must be performed (to remove test media) and the iPod charged and cleaned, using the following procedures.

Restore to Customer's Format

Ideally, restore the iPod to the customer's format as received (or desired by customer).
• For Windows—restore using an Intel Mac (with Boot Camp and Windows), or a Windows PC (if available).
• If the format is unknown or a Windows PC is not available—restore on a Mac.
• For Mac—restore on a Mac.

Notes:
• A USB cable is used to restore.
• If an iPod is restored for a Mac, iTunes will prompt Windows PC users to restore their iPod before continuing.

Windows PC restoring:

This step removes all media and data on the iPod and restores it for a Windows PC.
Refer to the Restore iPod Software procedures described earlier, to perform the following:

1. Launch the latest release of iTunes.

2. Connect the iPod to the USB 2.0 port on the computer.

3. Select the iPod icon in the source list, if necessary, to display the iPod Summary screen, click Restore, and follow the on-screen prompts.

4. A progress bar appears. When the progress bar completes, a message "Your iPod has been restored..., and is restarting." appears.

5. The iPod screen will display the Apple and, in a moment, a progress bar will begin.

6. At this point you can disconnect the iPod from the computer ONLY if the iPod has enough charge to complete the restore, or it is connected to an adapter with a USB/FireWire splitter cable. (Otherwise it could be irreversibly corrupted.) Once the progress bar completes and the iPod resets, it is restored.
   Important: Or, leave it connected to the computer until the Setup Assistant opens. Select Cancel, eject the iPod if necessary, and disconnect.

Mac restoring:

This step removes all media and data on the iPod and restores it, optimized for Mac.
Refer to the Restore iPod Software procedures described earlier, to perform the following:

1. Launch the latest release of iTunes.

2. Connect the iPod to the USB 2.0 port on the computer.

3. Select the iPod icon in the source list, if necessary, to display the iPod Summary screen, and click Restore.

4. Click Restore again on the next dialog box to approve.

5. Enter your Admin name and password in the Authenticate screen.
   A progress bar appears.
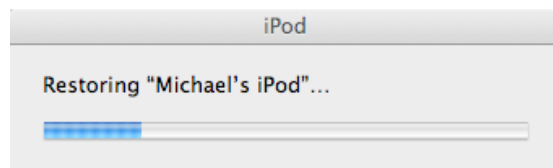
6. When complete, the following message appears. Click OK to clear the dialog box.
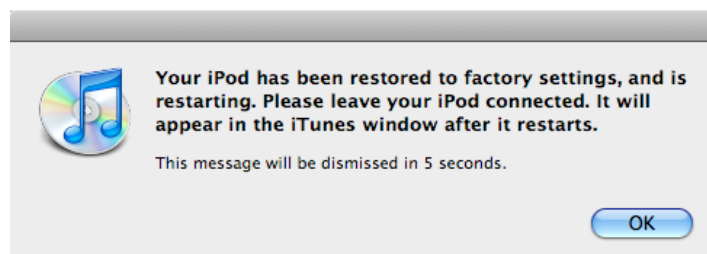
7. At this point you can disconnect the iPod from the computer ONLY if the iPod has enough charge to complete the restore, or it is connected to an adapter with a USB/FireWire splitter cable. (Otherwise it could be irreversibly corrupted.) Once the progress bar completes and the iPod resets, it is restored.
   Important: Or, leave it connected to the computer until the Setup Assistant opens. Select Cancel, eject the iPod if necessary, and disconnect.

Charge the Battery

If the tested iPod has passed all the tests so far, charge the battery before returning an iPod to a customer.

1. Put the iPod to sleep (press and hold the Play button), and set the Hold button to on, to avoid iPod activation during charging.

2. Connect an iPod power adapter to the iPod and charge it to at least a 75% charge on the battery level indicator.

3. If the iPod fails to charge or cannot reach a 75% charge level, fail the iPod. (AASP: failure code E03)

Clean the iPod

To clean an iPod before returning it to a customer, unplug all cables and cords and set the Hold switch to Hold. Use a soft, slightly damp, lint-free cloth. Avoid getting moisture in openings. Do NOT use window cleaners, household cleaners, aerosol sprays, solvents, ammonia or products containing ammonia, or abrasives to clean iPod.