

Fix a1708 820-00875 Hard Drive Not Recognized Issue on MacBook Pro

TechRounder PDF Edition

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Quick answer

The MacBook Pro A1708 won't recognize a replacement SSD because Apple pairs SSDs to logic boards by serial number at the factory for security, so a mismatched drive is ignored by macOS even though it has power.

If you've recently replaced the SSD in your MacBook Pro, you may run into an issue where the new drive is not showing up or being recognized in Disk Utility. This can be a frustrating problem, especially if you need to get your Mac up and running again quickly. Let's take a detailed look at why this happens and the steps you can take to troubleshoot.

Understanding the Issue

The specific problem described in the iFixit post is that after replacing the logic board and Hard Disk on a MacBook Pro A1708 (EMC 2978), the used replacement SSD is not recognized by macOS. Disk Utility does not show the drive, and Terminal commands like 'diskutil list' and 'diskutil cs list' do not detect it either. This is a common issue that can occur when replacing SSDs in newer MacBook Pro models. The underlying cause has to do with how Apple pairs SSDs to the logic board at the factory for security.

Apple's SSD Pairing Security

Starting with the 2016 MacBook Pro models, Apple began pairing SSDs to the logic board by their serial numbers. This pairing happens at the factory when the Mac is manufactured. The purpose is security - it makes it difficult for someone to physically remove the SSD and access its data on another machine. The drive will only be fully readable by the original paired logic board. While this is a good security measure, it introduces a big challenge when repairing Macs and replacing components like the logic board or SSD. If you put in a different SSD than the one originally paired to that logic board, macOS will not recognize it.

Symptoms of an Unrecognized SSD

If your MacBook Pro has an unpaired or unrecognized SSD, you'll typically see the following symptoms:

- The drive does not show up in Disk Utility
- Terminal commands like 'diskutil list' do not list the internal drive
- Booting to internet recovery may work but the internal SSD is not found for reinstalling macOS
- The drive may get warm indicating it has power but still isn't readable by the system

Basically, to macOS it's like the SSD doesn't exist, even though it's installed correctly and getting power. This is due to the SSD not being cryptographically paired to the logic board.

Troubleshooting Steps To Try

Unfortunately, getting an unpaired SSD working in a newer MacBook Pro is not straightforward. But here are a few things you can try:

1. First, double check that the replacement SSD is the correct part number for your exact MacBook Pro model. Using the wrong SSD will prevent it from being recognized.
2. Make sure the SSD is properly connected to the logic board. Inspect the connector for any damage or debris and reseat the drive. If it's not making a solid connection it won't be detected.
3. Reset the SMC and NVRAM on your MacBook Pro. This can sometimes jolt the system into recognizing a new drive:
 - For the SMC, shut down your Mac, press and hold Control+Option+Shift for 7 seconds, then press the power button while still holding those keys for another 7 seconds. Release all keys and wait a few seconds before powering on.
 - For NVRAM, shut down, power on and immediately press and hold Option+Command+P+R until you hear the startup chime a second time.
4. Try booting into Internet Recovery Mode by powering on and holding Option+Command+R. See if Disk Utility will recognize the SSD in this mode.
5. If you have access to another Mac, put your MacBook Pro in target disk mode (press T while booting) and connect it to the other Mac with a USB-C cable. See if the other Mac will recognize the drive. This can help determine if it's a hardware or software issue.

The Underlying Cause: SSD Pairing

In most cases, an unrecognized SSD after a replacement is due to Apple's SSD pairing security feature. The new SSD's serial number doesn't match what the logic board is expecting, so the drive is ignored. Ideally, you should use an SSD that was originally paired with your MacBook Pro's logic board. But this isn't always feasible, especially when buying used parts. Some independent repair shops have found workarounds to circumvent SSD pairing, but they aren't simple and require specialized tools and knowledge. For the average user, it's not really a DIY fix.

Alternative Solutions

If you find yourself with an unrecognized SSD that you can't get working due to the pairing issue, here are some alternative solutions to consider:

1. Use an external drive instead. You can install macOS on an external SSD and boot from that. Performance won't be quite as good as an internal drive but it's a usable workaround.
2. Replace the logic board again with one that is paired to your SSD. This is expensive but is the most reliable solution.
3. Take your MacBook Pro to an independent repair shop that is familiar with SSD pairing issues. They may be able to get your new SSD paired.
4. As a last resort, sell your MacBook Pro for parts and put the money towards a new machine. Dealing with SSD pairing can be more trouble than it's worth on the 2016 and later models.

Final Thoughts

It's frustrating when a MacBook Pro won't recognize a new Hard Disk after a logic board or drive replacement. In most cases, this is due to a mismatch between the SSD and logic board serial numbers, which disables the drive for security reasons. Troubleshooting this issue is difficult and often requires specialized tools and knowledge to get around the SSD pairing. For many users, using an external boot drive or replacing the entire machine may be the most practical solution. Hopefully in the future Apple creates a way for users and independent repair shops to more easily re-pair SSDs and logic boards. But for now, it's an issue that can really complicate MacBook Pro repairs. The key takeaways are:

- Always try to use an SSD that was originally paired with your MacBook Pro's logic board
- Thoroughly check connections and try SMC/NVRAM resets if an SSD is not recognized
- Be aware that SSD pairing makes replacements difficult on 2016 and later models
- Have a backup plan like an external boot drive in case you can't get an SSD paired
- Consider the cost/benefit of professional repair vs replacement for unrecognized SSDs

Dealing with an unrecognized Hard Disk is a pain, but hopefully this information gives you a better understanding of the issue and your options for working around it. Let me know if you have any other questions!