



How to install a different operating system on an Android Phone

A custom ROM (aka aftermarket firmware) is a...

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INTRODUCTION

A [custom ROM](#) (aka aftermarket firmware) is a modified version of an existing operating system, that is not officially supported by the manufacturer of a device. Some custom ROMs are based on existing mobile OSs, like Android, and some are based on PC operating systems, such as [Manjaro](#) or [Ubuntu](#). They're different from devices that use stock firmware in that they can offer features and enhancements not found in stock versions of Android, do not contain bloatware, and do not depend on the devices manufacturer for software updates.

The most popular custom ROMs include [LineageOS](#), [LineageOS for microG](#), [Paranoid Android](#), [ProtonAOSP](#), [GrapheneOS](#) and [CalyxOS](#).

Some custom ROMs, like GrapheneOS and ProtonAOSP, offer a [WebUSB](#)-based installer that is easier to use for most users, but in this guide, I will be covering the command-line based installation as it is the more traditional and universal approach to installing custom ROMs.

Warnings

- Unlocking the bootloader will reset your phone, so make sure you have all your data backed up!
- This process may void your warranty with some manufacturers.
- A modified device will trip the [Play Integrity API \(formerly SafetyNet Attestation API\)](#) which can cause some services like GPay to stop working.
- This will make your device vulnerable against hackers with physical access to your device, so do not unlock the bootloader on a device that you intend to carry state/company secrets on.
- Flashing a custom ROM can be risky and may cause unexpected issues or even brick your device. It is recommended to only flash a custom ROM if you are experienced with Android.
- Always use caution and read the instructions carefully when unlocking your device's bootloader or flashing a custom ROM. Improperly following the steps can cause irreversible damage to your device.
- Before flashing a custom ROM, make sure it is compatible with your device and check for any known issues or bugs reported by other users.
- If you encounter any issues during the unlocking or flashing process, do not hesitate to seek help from experienced users on forums or support channels provided by the custom ROM developer.

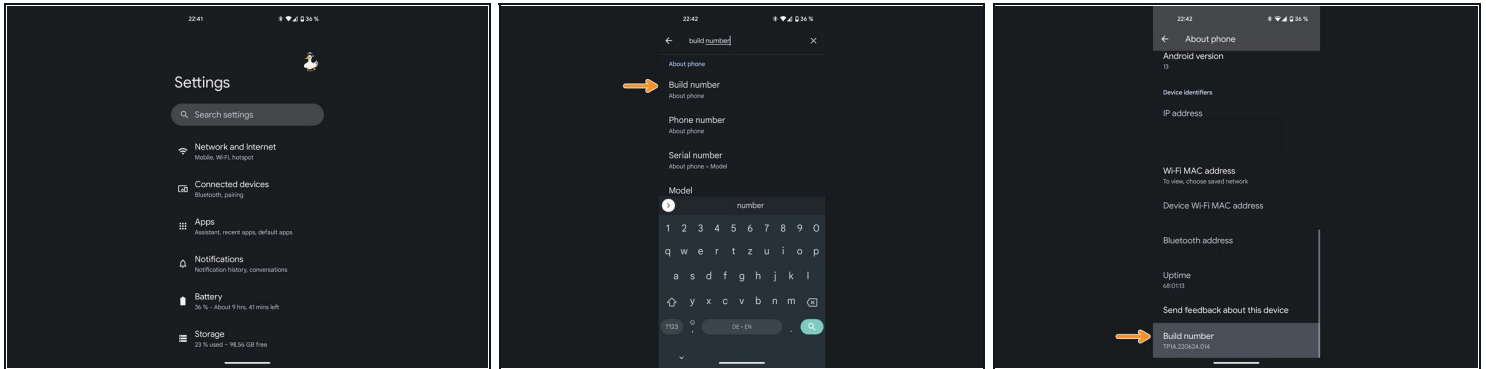
TOOLS:

SDK Platform Tools (1)
Personal Computer (1)
USB-C to USB-A 2.0 Cable (1)
TeamWin TWRP (1)

PARTS:

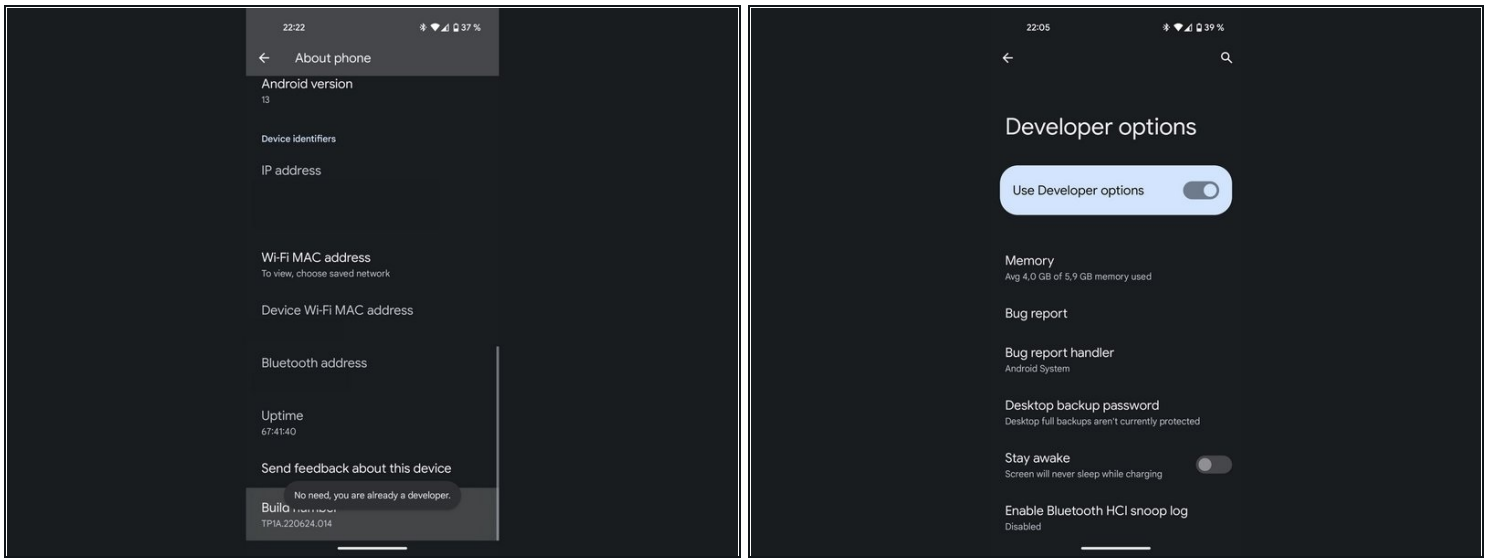
OS Image (1)
GApps package (1)

Step 1 — Finding the Build Number



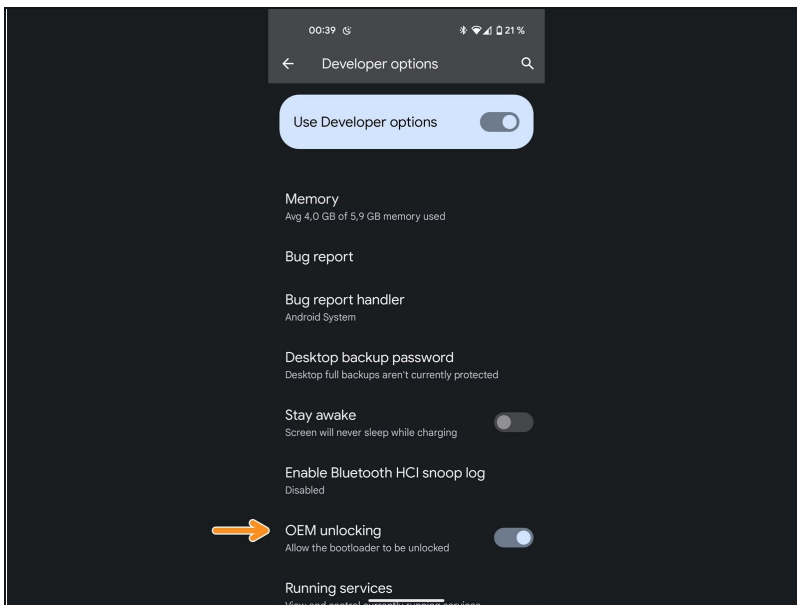
- First, we need to find the **Build Number**.
 - ① Usually you can find it under **About Phone > Build Number** or **System > About Phone > Build Number**, but since it varies from device to device using the search function is usually the easiest way.

Step 2 — Unlocking developer options



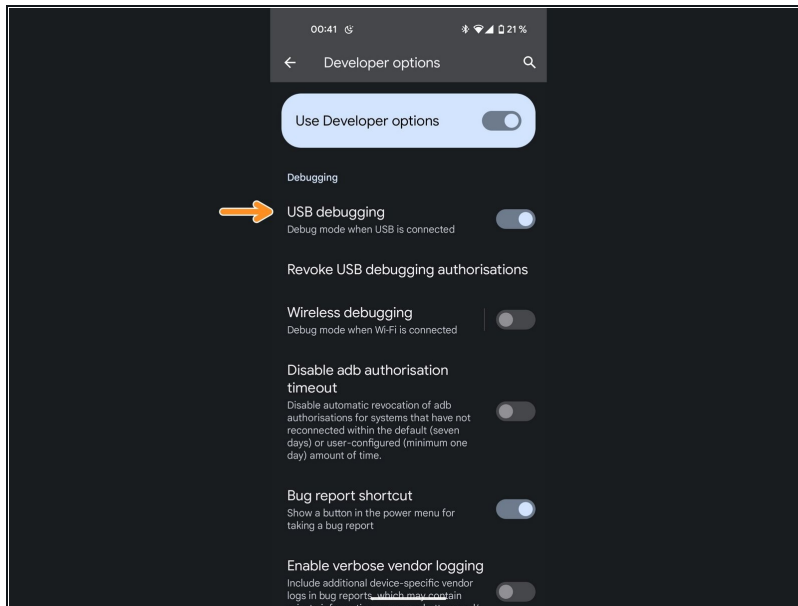
- Now you just need to tap the Build number repeatedly, until you get a confirmation message saying *"You are now a developer!"*. I already enabled developer options on my device, so I don't need to do it again.
 - ① You might be prompted to enter your lock screen password, if you have one set up.

Step 3 — Allowing OEM unlocking



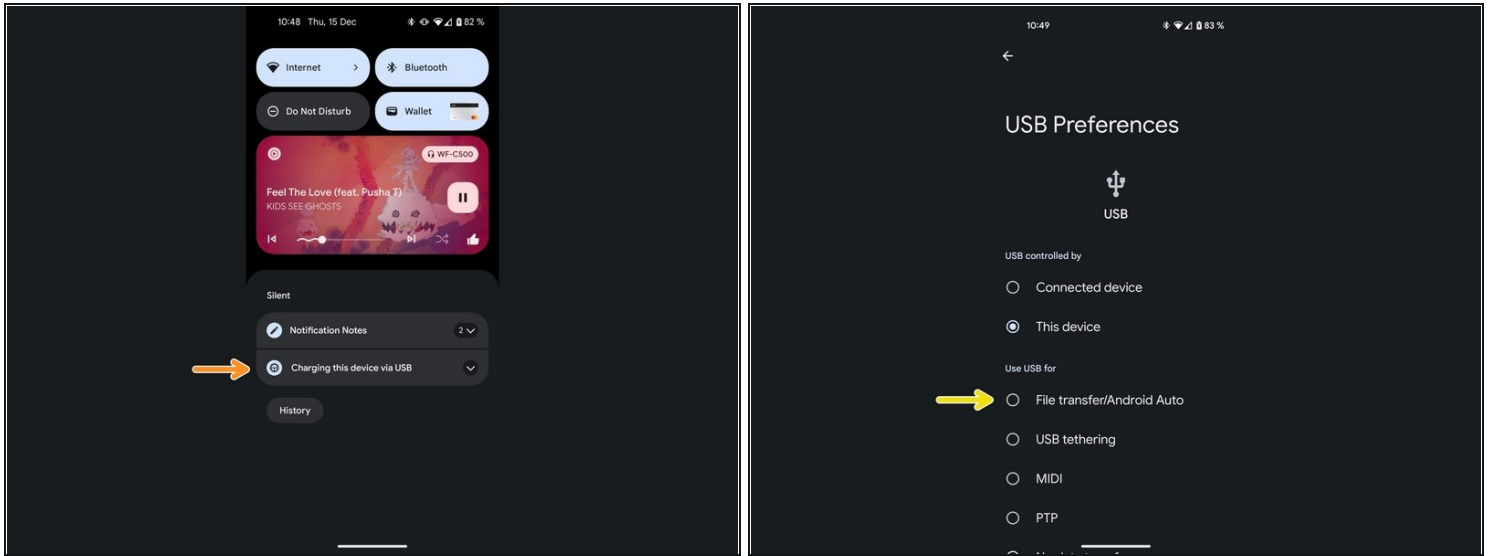
- In the developer options, find the **OEM unlocking** option and enable it.
 - ① You might be prompted to enter your lock screen password, if you have one set up.

Step 4 — Enable USB debugging



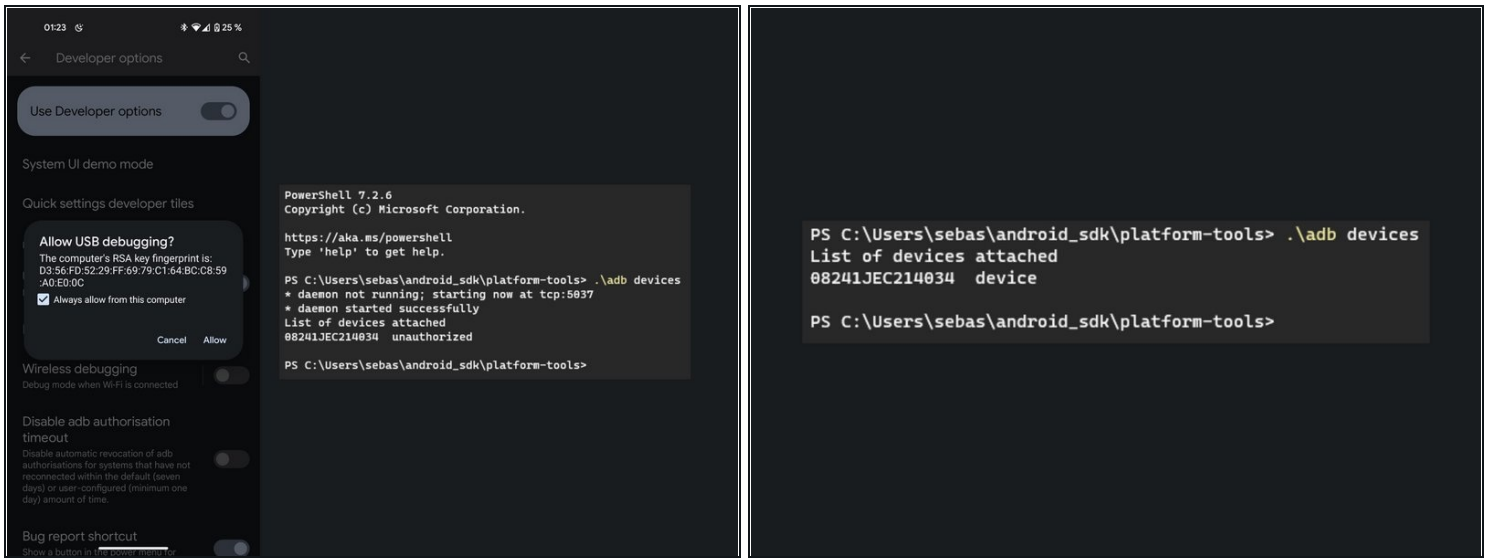
- In the developer options, find the **USB debugging** option and enable it.

Step 5 — Connect your phone to your computer



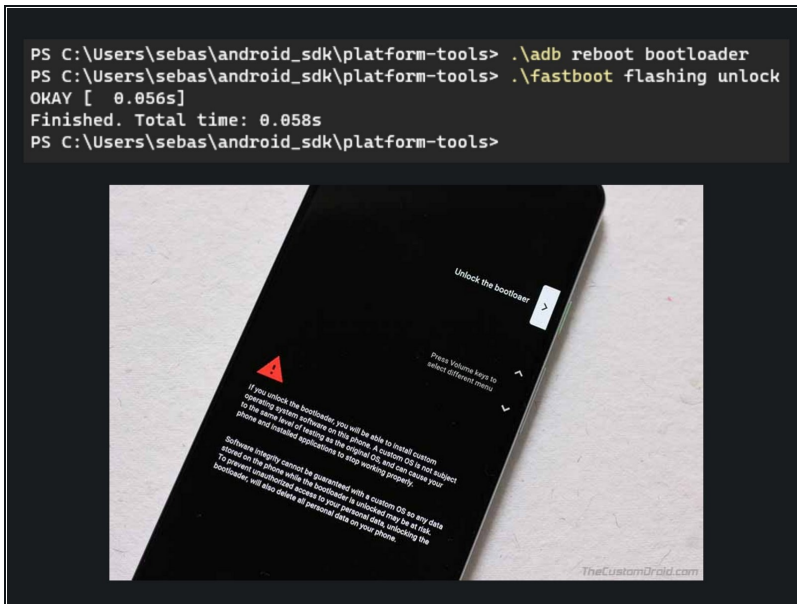
- Plug your phone into your computer via a [USB-C to USB-A Cable](#).
 - ① If you have a bad cable you might encounter some problems. Some older devices also dislike USB 3 in fastboot mode.
- Pull down the notification shade and select **Charging this device via USB**.
- Select the option **File transfer/Android Auto**.
 - ① On some older devices this option might be called **MTP** instead.

Step 6 — Allowing your computer to run ADB commands on your device



- Open the terminal application on your computer with the SDK Platform Tools installed and enter **adb devices**
 - This should trigger a popup on your device. Make sure to have the checkmark ticked and click **Allow**.
 - ① I haven't added the *platform-tools*-folder to PATH. That's why I need to open my terminal window in the *platform-tools*-folder and enter `.\` as a prefix to my commands.
- You can run the command again to check if it worked. It should now say device instead of unauthorized.

Step 7 — Unlocking the bootloader



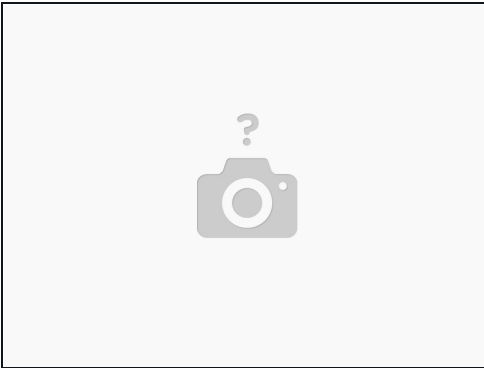
- Enter the command **adb reboot bootloader**
- Wait a couple seconds until your device rebooted into the bootloader, then enter the command **fastboot flashing unlock**
 - ❗ Some devices might use the command **fastboot oem unlock** instead.
 - ❗ If you receive an error message along the lines of **FAILED (remote: 'Failed to unlock, decrypt failed!')**, your phone has a locked bootloader and needs an unlock code from the manufacturer.
 - ❗ If you're stuck at **< waiting for any device >** and have already confirmed that your connection is stable, you may need to update your phone's USB driver.
- You should now see a prompt similar to the one shown in the picture. Use the volume rocker to choose the *Unlock the bootloader*-option and confirm by pressing the power button.

Step 8 — Boot into the bootloader



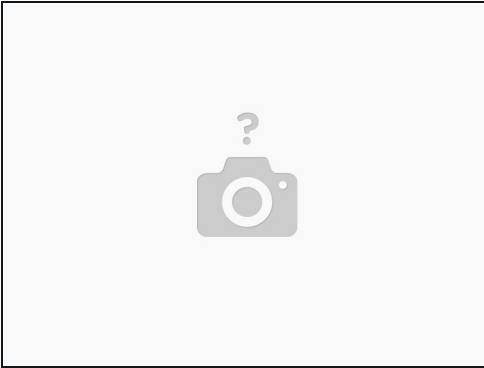
- If your device rebooted after unlocking the bootloader, boot into the bootloader again by pressing and holding the *power-* and *volume-down-* button until the device has rebooted into the bootloader.

Step 9 — Boot into recovery



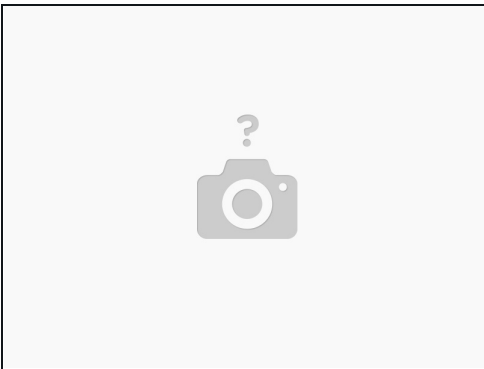
- Download the TWRP Recovery for your device or the recovery that came with your custom ROM.
 - Enter the command **fastboot boot [directory]\[filenameOfTheRecovery].img** and wait until your device has rebooted into recovery mode.
- ① On some devices you might need to enter the command **fastboot flash boot [directory]\[filenameOfTheRecovery].img** and **fastboot reboot recovery** instead.

Step 10 — Enable the ADB sideload feature



- On TWRP press **Advanced** > **ADB sideload**
- ① With other recoveries, like the LineageOS recovery, the option might be similar to **Apply Update** > **Apply Update from ADB**

Step 11 — Sideload the OS Image



- Download the OS image for the custom rom you want to install.
- Enter the command **adb sideload [directory]\[filenameOfTheOsImage].zip**

Step 12 — Sideload GApps



① You only need to do this if you want/need to use Google services and your OS image does not already include GApps.

⚠ This will not work if you already rebooted your device.

Step 13 — Sideload GApps



- Download the GApps package you want to install.
 - Repeat step 10 to reenable ADB sideload.
 - Enter the command **adb sideload [directory]\[filenameOfTheAppsPackage].zip**
- ① If the script tells you that the API level does not match even though you are using the correct GApps package for your version, you can typically resolve this by rebooting into recovery.
- ⚠ Do not boot into the system before flashing all the extra packages you want to install.
- ① Some recoveries might tell you that verification failed. You can ignore this and continue anyways.
- ① For some devices you might run into space problems. You can typically resolve these problems by choosing a smaller GApps package and later installing what you need through the Play Store.

Step 14 — Reboot



- This might take some time, but as long as the phone is not boot looping (repeatedly rebooting), everything should be fine.
- ① If it didn't work, you can just try again, starting from step 8.

To restore your device to its factory condition, follow these instructions with an OS image provided by your device manufacturer.