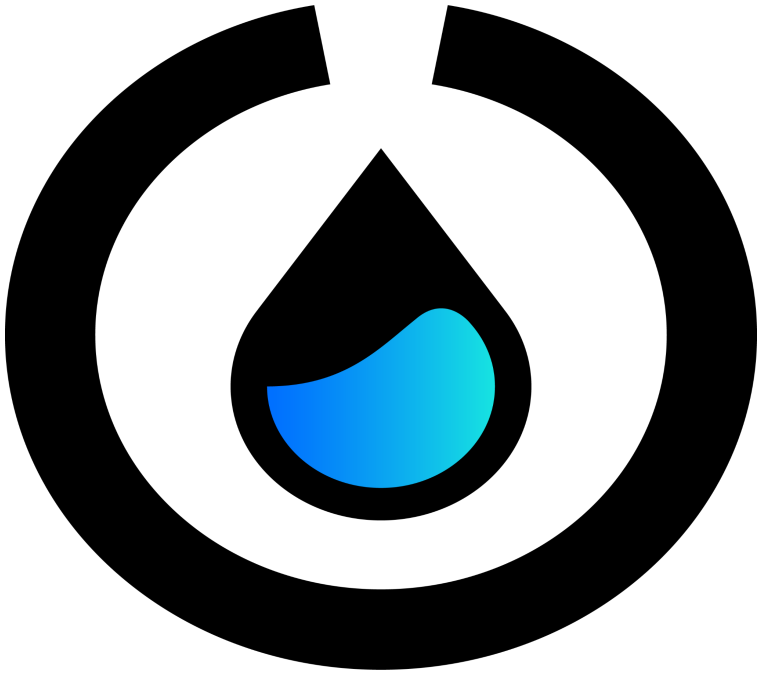

Opentrons OT-2 Preventative Maintenance Document

20 Jay Street, Brooklyn NY 11201 www.Opentrons.com

Version 1.3.1

1. Maintenance Work Overview

1. By performing maintenance at specified intervals, it can be validated that the OT-2 liquid handler is performing as intended for all desired liquid handling activities.
2. After lengthy amounts of time, it is important to check for risks of wear and tear for any moving or similar frequently used systems within the OT-2 as described in this document.
3. Cleaning at regular intervals will reduce the risk of contamination within assays performed in the OT-2.
4. OT-2 operators are able to perform these maintenance activities.

Maintenance Materials

Self Supplied

Protective gloves (and any other appropriate PPE for your lab)
Clean, lint-free, dry towels
Deionized water

Opentrons Supplied

PTFE grease
Spare pipette O-rings
O-Ring replacement tool

2. Maintenance Schedule

Below is a recommended schedule for routine maintenance based on average usage.
Average usage is estimated to include 4 hours per day, 5 days per week.

a. 20 hours/week
b. 80 hours/month
c. 1000 hours/year

Note that depending on actual usage, these steps may be desired more or less frequently.

Maintenance Definitions and Schedule

Daily

Empty Trash Bin

Remove the trash bin, discard used pipette tips, and return the empty trash bin within OT-2.

Inspect the deck

Check metal labware clips are not damaged and clear the deck of any debris, liquid, and non protocol critical labware/modules.

Weekly

Pipette visual check

Visually inspect the pipette nozzles for any deformations or rubber o-ring notches.

OT-2, Pipette, and Module Cleaning

OT-2

Clean OT-2 as specified in the cleaning documentation. **Do not clean linear bearing rails** or electronics.

Pipette

Clean pipette as specified in the cleaning documentation. Please make sure to remove the pipette from OT-2 before starting.

Module

Clean module as specified in the cleaning documentation. Please make sure the module is unplugged from its power source and the OT-2.

Monthly

Check Single Channel Pipette's Ejection Mechanism

While the OT-2 is powered off, open the door and pull down the tip eject sleeve of the single channel pipette to check that it moves freely.

Power Cycle OT-2 and Modules

Turn the OT-2 and modules off, wait 10 seconds, and then back on again.

Quarterly

Robot Calibration Health Check

Check your OT-2's positional accuracy by running a Calibration Health Check. This procedure identifies if any calibration needs to be updated.

Bi-Yearly

Deck Calibration

Deck calibration adjusts machine motion due to any component wear or major relocation of the machine within or between labs.

Pipette Offset

Pipette offset adjusts the calibration of the pipettes relative to the machine deck.

Tip Length Calibration

Tip length calibration adjusts the calibration of the tip length on the pipette. Or perform if installing a new pipette.

Labware Calibration

Labware calibration adjusts the calibration of the machine to specific labware being utilized. Or perform if machine positioning to any designated labware appears to be offset.

Yearly

Pipette Replacement

Replace pipette entirely with a new unit.

Air Clean Electronics Board

Applying compressed air or electronics duster to the electronics board on the OT-2.

Table 1: Adjusted Schedule

Action	The sooner of the following schedules	
	Recommended Schedule	**Adjusted Schedule**
Empty Trash Bin	Daily	If the trash bin reaches capacity.
Inspect the Deck		N/A
Pipette visual check	Weekly	If pipette aspirate or dispense actions appear to show any signs of malfunction or pipetting inaccuracy.
OT-2, Modules & Pipette Cleaning		Immediately after contamination or spillage occurs. Or if the pipette and/or module look dirty.
Check Single Channel Pipette's Ejection Mechanism	Monthly	If the pipette does not eject/pick up tips consistently.
Power Cycle OT-2 and Modules		N/A
Robot Calibration Health Check	Quarterly	If movement appears to be malfunctioning or incorrect. Or after deck calibration, pipette offset calibration, or tip length calibration.
Deck Calibration	Bi-Yearly	If OT-2's calibration health check shows inaccurate calibration results. Or if installing a new pipette. Or if pipette positioning appears to cause crashing into the deck or labware.
Pipette Offset		If OT-2's calibration health check shows inaccurate calibration results. Or if installing a new pipette. Or if pipette positioning appears to cause crashing into the deck or labware.
Tip Length Calibration		If installing a new pipette.
Labware Calibration		If machine positioning to any designated labware appears to be offset. Or if installing & using new types of labware from previous runs.
Pipette Replacement	Yearly	If pipette aspirate or dispense actions appear to show any signs of malfunction or pipetting inaccuracy.
Air Clean Electronics Board		If noticeable dust and debris have accumulated on the black electronics cover.

3. Documentation and Instructions for Maintenance Actions

OT-2 Cleaning

Cleaning Your OT-2
Cleaning the Robot's Surfaces

Pipette Cleaning

Cleaning Your Pipettes

Modules Cleaning

Cleaning Your OT-2 Modules

Labware Calibration

Get Started: Calibrate Labware

Calibration Check

Check Your OT-2's Calibration Health

Deck Calibration

Get Started: Calibrate the Deck

Pipette O-Ring Check

Replacing the O-Rings on Your 8-Channel GEN2 Pipette

Pipette Calibration

Until further notice, replace pipette after specified usage.

Empty Trash Bin

Remove the trash bin, discard used pipette tips, and return the empty trash bin within OT-2.
Operator can clean the trash bin after emptying as specified in the Cleaning the Robot's Surfaces document for cleaning the Trash Cover

For an online document that walks you through the instructions for maintenance actions please scan the below code

4. Annual* Robot Health Check / Preventative Maintenance Checklist

Instrument Serial Number:
Date of Maintenance:

Hardware

Pipettes Installed:

Gen 2:

- ▢ P1000 Single Channel SN:
- ▢ P300 Single Channel SN:
- ▢ P300 Multi Channel SN:
- ▢ P20 Single Channel SN:
- ▢ P20 Multi Channel SN:

Gen 1:

- ▢ P300 Single Channel SN:
- ▢ P300 Multi Channel SN:
- ▢ P50 Single Channel SN:
- ▢ P50 Multi Channel SN:
- ▢ P10 Single Channel SN:
- ▢ P10 Multi-Channel SN:

Modules Installed:

Temperature Module	Gen. 1 or Gen. 2	SN:
Magnetic Module	Gen. 1 or Gen. 2	SN:
Thermocycler Module	Gen. 1	SN:
HEPA Module	Gen. 1	SN:

Software

Server Version:
Firmware Version:

Cleaning:
▢ All installed modules are removed and cleaned.

Connectivity:
▢ Instrument connects via USB or WiFi.
▢ All installed pipettes are connected and recognized.
▢ All installed modules are connected and recognized.

Pipette Replacement:
▢ Replace pipettes entirely with a new pipettes.

Positional Calibrations:
▢ Deck Calibration
▢ Tip Length Calibration
▢ Pipette Offset Calibration
▢ Calibration Health Check
▢ Labware Calibration

Name (Print):
Name (Signature):
Date:

*Based on daily hour usage found in Maintenance Schedule

5. Maintenance that should not be done on the OT-2

Clean or grease the linear rail

The OT-2 linear rails come with specific oil on them. Removing this oil decreases the longevity of the rails/bearings.

Grease lead screws

Greasing the lead screw might introduce particulates or contaminants. This can decrease the longevity of the lead screw.

6. For any issues, concerns or questions

Please reach out to the Opentrons support team by email support@opentrons.com

7. Terms of Usage

Opentrons will not provide you with an onsite preventative maintenance or onsite setup assistance. It is your responsibility to maintain and update the information listed on this form, and to provide such updates to Opentrons when requesting support. You acknowledge that Opentrons will not store this information, and will not be held liable for inaccuracies contained in the contents of this form or for failing to provide support due to such inaccuracies.