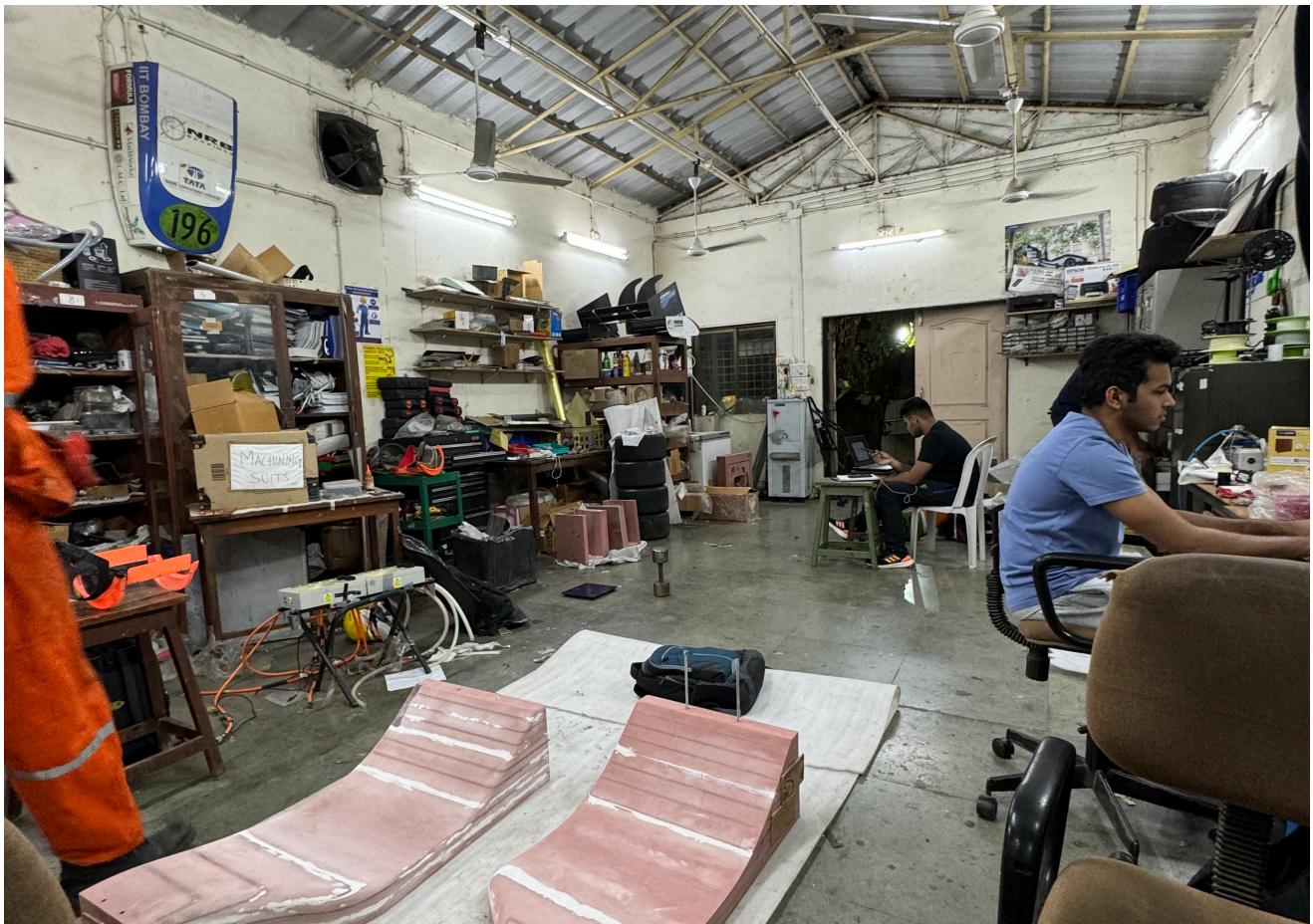


# Lab Report

## Lab 1 & 2

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# Soldering & Desoldering

## Precautions:

1. Ensure the temperature is not above the threshold temperature of any soldered parts.
2. Do not touch anything below the handle cover of the soldering iron.
3. Keep the soldering iron in the dock when not in use.



## Equipment used:

1. Soldering machine
  - i. Soldering station
  - ii. Soldering iron
  - iii. Hot air gun
  - iv. Cleaning sponge
2. Flux (Liquid/Solid)
3. Solder wire
4. Tweezer

## Soldering Process:

1. Turn on the heating dock, set the temperature as required, and let the iron heat for a minute.
2. Apply flux on the place which is to be soldered using a tweezer.
3. Touch the hot part of the iron with the solder wire.
4. Slowly apply the melted solder to the part, ensuring the component is in contact with the conduction pad using a tweezer.
5. Once done, use isopropyl alcohol spray to clean the surface.

## Desoldering Process:

1. Turn on the heating dock, set the temperature as required, and let the iron heat for a minute.
2. Pull the component with a tweezer and frequently touch both solder points.
3. Once desoldered, use the vacuum pump or the desolder braids with some flux applied to remove any excess solder left.

## Trivial points:

1. The portion just above the tip is the hottest, not the tip itself.
2. Rotate the iron while soldering to avoid bulge.
3. In case of spikes, apply more flux.
4. For a wire, use heat shrink tubes once the soldering is done for insulation.

# Crimping

Equipment used:

1. Crimper
2. Crimping terminals



Process:

1. Strip the wire, twist the strands, and place it on the terminal.
2. The insulation should end with the first hook and wire by the second.
3. Place the thicker side of the crimper with the insulation, and the third hook out of the tool is pressed thoroughly.



Trivial Points:

1. If a crimp is ruined, the wire is stripped again, limiting the total length.
2. Therefore, it must be done with very high precision.

# Connectors



1. **Molex:** Consists of small holes in which crimped wires are inserted. If any one of the joints fails, most of the whole connector and wire set is ruined.
2. **HDP:** These are more sophisticated connectors with more number of joints where crimped terminals spread across circularly.
3. **Ampseal Connector**

# PCBs

1. They are designed on EAGLE software.
2. The PCBs' upper and lower sides are insulated from each other.
3. There are different packages (sizes) of the components. Hence, the connector pad on the PCB also has different sizes.
4. Since many terminals of the PCB are earthed, there is a dedicated plate for earthing connected to one of the four screws.
5. Apart from the wholes for the whole components, a few even smaller wholes connect the upper and lower sides of the PCB.
6. Standoffs are used when components are soldered on one side, and the other side has to be soldered.