

4.6 Handrail Maintenance, Adjustment, Removal and Replacement

The following instructions will guide the worker through maintenance, adjustment, removal and replacement of the handrails.

4.6.1 Maintenance and Adjustment

The following maintenance and adjustment procedures for the handrail are as follows:

- Cleaning and inspecting
- Adjusting

4.6.1.1 Handrail Cleaning and Maintenance

The following instructions will guide the worker through the cleaning and maintenance of the handrails.

1. Tools and Materials:

- Cloth should be clean fabric of soft texture (woolen knit, flannel, gauze, etc.).
- Water, Neutral Detergent-Commercial, detergent should be diluted ten times or more with water.
- Ethyl Alcohol used to remove grease or chewing gum.
- Disinfectant soap should be diluted 200 times or more with water.
- Polishing Liquid, “Rubber Shine” is recommended by the handrail manufacturer.

2. How to clean grease or other dirt:

- Slight dirt: Wipe away the dirt with a slightly wrung cloth soaked in the neutral detergent. Or apply the rubber cleaner liquid recommended by handrail manufacturer to cloth and wipe away the dirt. Then completely wipe the detergent or liquid off the handrail with a damp cloth that was soaked in clean water. Finally, wipe the surface with a dry cloth until it is completely dry.
- Grease or Heavy Dirt: Wipe with a cloth soaked in ethyl alcohol. After cleaning, wait until the alcohol has completely evaporated and no odor can be detected. (Use this procedure only when necessary. Repeated alcohol use will dry out the rubber.)
- Chewing Gum, Glue etc.: Scrap off as much of the foreign material as possible, paying attention not to damage the handrail surface. Then, locally wipe it with a cloth soaked in ethyl alcohol.

3. Periodic Handrail cleaning:

- Cleaning with water once a week is recommended. Wipe the rubber surface with a damp cloth. Repeat this several times, and change the water when it becomes murky. Finally wipe the rubber surface with a dry cloth to completely remove moisture.
- Cleaning during operation of escalator. During escalator operation, wipe the handrail surface only with a clean dry cloth such as gauze.

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4. Handrail Disinfecting:

- After completion of cleaning, wipe the handrail surface with a cloth soaked in disinfectant and quickly dry the surface. Then, apply the following finishing procedures.

5. Handrail Finishing:

- Application of polished liquid: After the handrail surface is completely dry, apply the recommended polishing liquid “Rubber Shine” to the surface with a cloth. Wipe only one light coat of “Rubber Shine” over the entire rubber surface.
- Finishing (Polishing): After the polishing liquid is completely dry, polish surface with a dry cloth until the rubber surface becomes glossy.

6. Handrail Don'ts

- NEVER operate the escalator while cleaning the handrail with water, detergent, rubber cleaner, cleaning liquids, disinfectant, and polishing liquid.
THESE SUBSTANCES MUST NEVER BE LEFT ON THE HANDRAIL SURFACE.
- NEVER use heat or hot air to dry the handrail surface.
- Since unknown materials might cause swelling or deterioration of the rubber surface, NEVER use any material other than those specified.

4.6.1.2 Inspection and Cleaning of Guides and Underside of Handrails

The following instructions will guide the worker through the cleaning of the guides and under portion of the handrail.

1. Before cleaning, drive the handrails to check for any unusual noise over the entire length of the upper side handrails.
 - Give particular close inspection to the sections where unusual noises are detected.
2. Clean and dust the newel, upper curve, lower curve, and incline sections.
 - The initial cleaning should be done after two or three months of operation start.
 - After that, clean semi-annually.
3. Detach handrails from the guides. (See paragraph 4.7.1.)
4. Remove dust or foreign matter at the guides with a vacuum cleaner, brush, etc. Remove all debris from roller guides.
5. Manually rotate the roller guides on the return side to check for smooth rotation.
 - If they generate unusual noises or are defective or damaged, replace the rollers with new ones by removing c-clips.
6. Check for abnormal wear, damage, or loose screws on the guides.
7. Semi-annually, brush the handrail's canvas surface two or three times with a wire brush over the entire length of the handrails and remove the abrasive dust with a vacuum cleaner.