



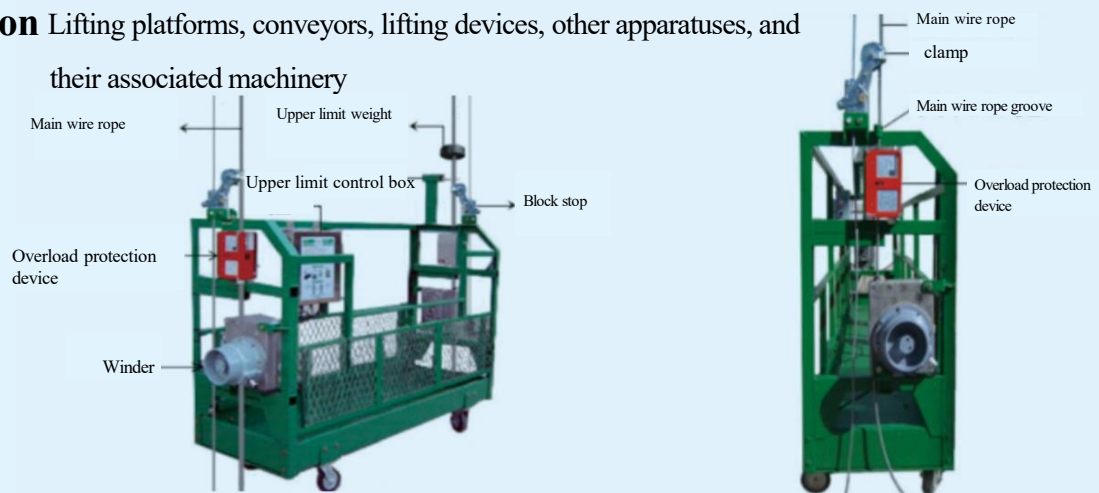
# Gondola

## Safety Operation Guide

## Gondola

**Definition** Lifting equipment that uses wire ropes or lifting cables to transport cargo vertically or allow workers to ascend and descend using a dedicated lifting device or platform

**Composition** Lifting platforms, conveyors, lifting devices, other apparatuses, and their associated machinery



## 1 Key Safety Devices

### ✓ Overload protection device

- The device prevents lifting when the load exceeds the rated capacity, is accompanied by an alarm, and is sealed to avoid unauthorized adjustment.

### ✓ Control panel

- All instruments and displays must operate normally.

### ✓ Lifeline

- The fiber rope must be free from significant damage and adequately managed to prevent unraveling.

### ✓ Anti-overrun limit (upper limit + upper limit weight)

- The device should have the functionality to cut off power and engage the brake to prevent excessive ascent.

### ✓ Mechanical assistive devices (fall prevention device/block stop):

- For temporary gondolas: This device must operate with the auxiliary and support ropes to stop the transport platform (work platform) from descending.
- For permanent gondolas: This device must be installed to automatically control the descent speed within 1.3 times the standard speed, and an additional device should be installed to automatically stop the descent if the speed exceeds 1.4 times the standard rate.

### ✓ Emergency stop

- The button should be red and protruded to cut off or rest power manually.

## 2 Major Hazards

### ✓ Fall hazards

- Risk of falling due to riding on platforms or working without a lifeline and safety harness
- Risk of platform collapse while working if the wire rope snaps

### ✓ Drop hazards

- Risk of platform fall due to exceeding the maximum load capacity (e.g., overloading with personnel or excessive work tools)
- Risk of platform collapse due to loosening of the upper securing mechanism of the gondola
- Risk of platform fall due to wire rope failure caused by excessive elevation

## 3 Safety Measures

- ✓ Install a lifeline on the gondola and ensure all occupants secure their safety harnesses.
- ✓ Inspect the gondola wire ropes before work for abnormalities.
- ✓ Check the safety devices (e.g., overload protection, anti-overrun limits, brake systems) for proper function.
- ✓ Secure the upper fastening mechanism of the gondola firmly to the structure with clips or other fasteners to prevent loosening.



Check for any abnormalities in safety devices and the braking system



Check that the safety harness hook is properly secured to the lifeline.



Check the operating status of the overload protection device.



Check the wire rope for any abnormalities.



Check for any irregularities in the control panel instruments.



Check the operating status of the hoist and fall prevention device.

## 4

## Key Inspection Items

### ✓ Gondola inspection

- Check for damage to the platform and the condition of welded joints, bolts, and nuts.
- Check whether the brakes function normally.
- Check the condition of the hoisting wire rope (10% or more strand damage per twist, 7% or more diameter reduction, kinks, etc.)
- Check the condition of the lifeline (evidence of burning, deformation, broken strands, etc.).
- Check protective measures are in place for the wire rope and lifeline during welding or other hot work (e.g., welding, gouging).
- Check the operation of safety devices such as overload protection, anti-overflow limits, emergency stops, and fall prevention devices.
- Check for any unusual noises and ensure the normal operation of the hoist and rope drum.
- Establish emergency procedures in case of power failure (e.g., disconnect the control panel power switch, contact the relevant department, and perform manual lowering).
- Check the placement of the platform load capacity sign.
- Adjust the left and right driving components to check the platform's horizontal alignment.
- Check for the risk of falling tools or materials from the platform.
- Determine whether to stop work under adverse weather conditions (e.g., wind speed of 10 m/s or more, rainfall of 50 mm or more, snowfall of 10 cm or more)

### ✓ User compliance

#### Before work

- Check the worker's protective equipment (e.g., helmet, safety shoes, safety harness, etc.).
- Only workers who have completed the 'Special Safety and Health Training' are allowed to work.
- Check if the safety inspection certificate is affixed.
- Conduct a thorough inspection before starting work.
- Install a ladder or other means for safely boarding the gondola platform from the top of the ship's signboard.

#### During work

- Do not leave the operating position while driving the gondola.
- Ensure the safety harness hook is attached to the lifeline while working (this applies when two or more people are on board). Do not use the workbench or ladder on the platform.
- Work only when the platform is in a stationary position.
- Implement "No Entry" measures under the platform when using the gondola.
- After using the gondola, return it to the designated location and turn off the power.

# 5 Risk Assessment (Example)

## ① Work preparation

Hazards	Measures	Rules on Occupational Safety and Health Standards
Risk of falling gondola components during crane hoisting for installation	<ul style="list-style-type: none"> <li>Secure gondola components and materials to prevent falling.</li> <li>Restrict access to areas at risk of falling cargo during hoisting.</li> </ul>	Article 14
Risk of falling during gondola unloading in fall-risk areas, like the deck top	<ul style="list-style-type: none"> <li>Install safety harness attachment points when unloading or installing the gondola in fall-risk areas. Workers must wear the harness and secure the hook while working.</li> </ul>	Article 42

## ② Gondola installation

Hazards	Measures	Rules on Occupational Safety and Health Standards
Risk of falling during gondola installation on the deck top mounting bracket	<ul style="list-style-type: none"> <li>Install safety harness attachment points in fall-risk areas (e.g., gondola mounting bracket); workers must wear a harness and secure the hook while working.</li> </ul>	Article 42
Risk of electric shock from exposed parts during power cable connection	<ul style="list-style-type: none"> <li>Turn off power to exposed parts during cable connection.</li> <li>Check if adjacent parts have protective covers. Workers must use insulating gloves and tools.</li> </ul>	Article 301
Risk of falling due to interference from cables, hoses, and handrails when using the gondola access ladder	<ul style="list-style-type: none"> <li>Organize cables and hoses at the ladder installation area to prevent interference with the steps.</li> </ul>	Article 22
Risk of platform fall due to gondola protective device malfunction	<ul style="list-style-type: none"> <li>Check protective devices (e.g., overload protection, anti-overrun limit, fall prevention, control devices).</li> </ul>	Article 134
Risk of platform fall due to wire rope or lifeline damage	<ul style="list-style-type: none"> <li>Check wire rope and lifeline for defects (e.g., over 10% strand breakage, 7% diameter reduction, kinks).</li> </ul>	Article 166
Risk of falling due to platform damage, poor welding, or improperly fastened bolts and nuts	<ul style="list-style-type: none"> <li>Check for platform damage, welding condition, and bolt/nut tightness.</li> </ul>	Article 35

Hazards	Measures	Rules on Occupational Safety and Health Standards
Risk of platform fall due to lifting device or rope drum malfunction	<ul style="list-style-type: none"> <li>Check the operational status of the lifting device and rope drum.</li> </ul>	Article 35
Risk of workers being struck under the platform due to sudden gondola fall	<ul style="list-style-type: none"> <li>Implement safety measures (e.g., protective ropes to restrict access to the work area beneath the platform).</li> </ul>	Article 14
Risk of falling beyond the safety railing inside the platform due to the use of ladders and work platforms	<ul style="list-style-type: none"> <li>Provide training to prevent the use of ladders and work platforms inside the platform.</li> </ul>	-
Risk of platform fall and electric shock during operation in adverse weather conditions	<ul style="list-style-type: none"> <li>Suspend work during adverse weather conditions (in accordance with the manufacturer's guidelines). Examples: wind speed of 10 m/s or more, rainfall of 50 mm or more, snowfall of 10 cm or more.</li> </ul>	-

### ③ Post-work wrap-up

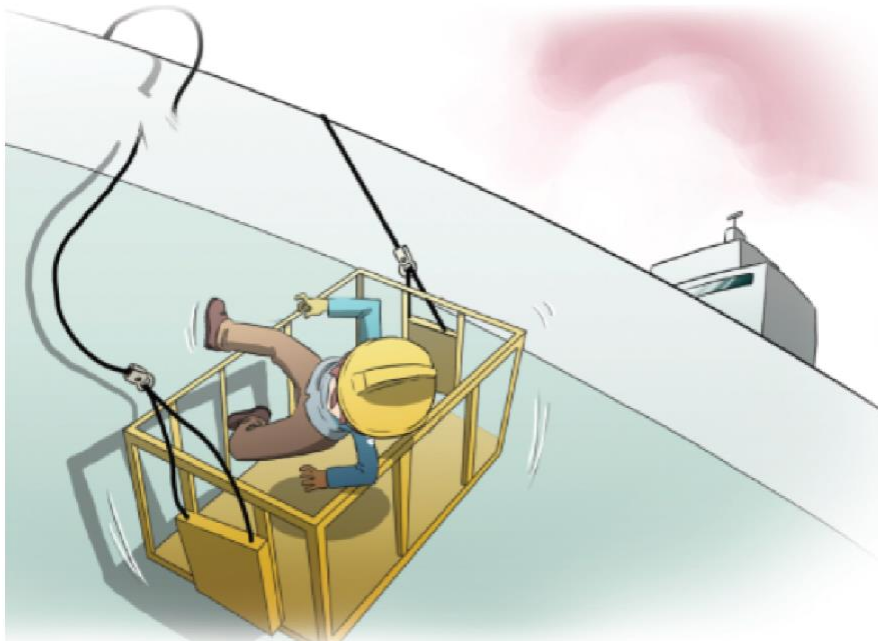
Hazards	Measures	Rules on Occupational Safety and Health Standards
Risk of workers being struck during platform descent to the ground after gondola work while in motion	<ul style="list-style-type: none"> <li>Implement safety measures (e.g., install protective barriers and restriction ropes at the bottom of the platform work area).</li> </ul>	Article 14
Risk of electric shock while turning off power at the distribution panel for power cable disconnection	<ul style="list-style-type: none"> <li>Turn off power to exposed parts during cable disconnection.</li> <li>Check if protective covers are installed on adjacent parts.</li> <li>Workers must use insulating gloves and tools.</li> </ul>	Article 301
Risk of worker falling during gondola disassembly work in fall-risk areas (e.g., the deck top)	<ul style="list-style-type: none"> <li>If there is a fall risk at the gondola disassembly location, install safety harness attachments and secure them before working.</li> </ul>	Article 42
Risk of falling gondola components during crane transport of the disassembled gondola	<ul style="list-style-type: none"> <li>Ensure that gondola components are securely fixed to prevent falling.</li> <li>Control access in areas with falling cargo risks during hoisting.</li> </ul>	Article 146



## Accident Case **Fall due to wire rope failure during grinding on a gondola**

### ✓ Summary

A worker boarded the gondola on a ship under construction at the dock, performing hull plate grinding. The gondola's wire rope failed, causing a fall from 15 meters to the ground, resulting in death.



### ✓ Causes

- Lack of lifeline installation to protect workers during falls or gondola drop
- Failure to conduct wire rope safety inspection before work begins
- Failure to provide special safety and health training for gondola workers

### ✓ Preventive Measures

- Install a lifeline to protect workers from the gondola drop and secure the safety harness hook before starting work.
- Conduct a safety inspection to check the wire rope before starting work.
- Provide special safety and health training for gondola workers, including wire rope inspection.