



The Mobile Robot Company

Knowledge Center — Sensitive or Unstable Loads · 2026-08-04

<https://info.mobilerobot.com/applications/use-cases/sensitive-or-unstable-loads>

Sensitive or Unstable Loads

Some loads should never be picked up on autopilot: barrels, liquid containers, top-heavy stacks, fragile goods, leaning pallets. The J1600's answer is to split the job. The operator applies experience and situational awareness during pickup and close maneuvering; the robot takes over only for the repetitive travel in between.

The manual half: judgment at the forks

In [manual mode](https://info.mobilerobot.com/documentation/user-guides/manual-operation/) (<https://info.mobilerobot.com/documentation/user-guides/manual-operation/>), the J1600 handles like a conventional electric pallet jack, and the operator controls every nuance:

- **Stability assessment** before lifting — recognizing a top-heavy, leaning, or poorly stacked load.
- **Condition checks** — spotting damaged pallets, crushed corners, or leaks before they travel.
- **Controlled lifting.** [Fork speeds](https://info.mobilerobot.com/products/j1600/dimensions-and-performance/) (<https://info.mobilerobot.com/products/j1600/dimensions-and-performance/>) are deliberate: 0.10 m/s lifting unloaded, 0.08 m/s lifting at full load, 0.08 m/s lowering unloaded, 0.12 m/s lowering at full load.
- **Confined maneuvering** around obstacles, other loads, and tight approaches, with pallet detection and height decisions under manual control.
- **Height where needed** — manual pick and drop up to 1,600 mm; barrels and cages at awkward positions are placed by hand.

Demonstrations of this use case show exactly this pattern with barrels: manual judgment for the sensitive part, then autonomous transport for the distance.

The autonomous half: smooth, predictable travel

Once the load is safely on the forks, the operator selects the destination, [confirms autonomous mode](https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/) (<https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/>), and steps away. The autonomous leg favors stability by design:

- floor-level delivery only — the load is never dropped from height autonomously;

- [level-floor operation](https://info.mobilerobot.com/applications/planning/route-and-floor-suitability/) (https://info.mobilerobot.com/applications/planning/route-and-floor-suitability/) (0% automatic gradeability) — no slopes or dock plates in autonomous mode;
- consistent, repeatable driving at up to 5.4 km/h with [obstacle avoidance](https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/) (https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/);
- a [load-detection sensor](https://info.mobilerobot.com/safety-compliance/safety-functions/load-detection/) (https://info.mobilerobot.com/safety-compliance/safety-functions/load-detection/) and speed-dependent 360-degree safety field throughout — see [how J1600 safety works](https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/) (https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/).

The company's [Copenhagen test facility](https://info.mobilerobot.com/company/locations/test-and-demonstration-facility/) (https://info.mobilerobot.com/company/locations/test-and-demonstration-facility/) validates this behavior with deliberately difficult cases, including water-filled loads on uneven real-world flooring.

Supported carriers

Sensitive loads often arrive on non-standard carriers. The J1600 accepts any forkable open-base carrier within its envelope — open cages, barrels on open-base carriers, and formats beyond Euro pallets — subject to base geometry, size, stability, and operator judgment. No blanket approval exists for every carrier or for hazardous materials. See [Open Cages and Alternative Load Carriers](https://info.mobilerobot.com/applications/use-cases/open-cages-and-alternative-load-carriers/) (https://info.mobilerobot.com/applications/use-cases/open-cages-and-alternative-load-carriers/) for the exact limits.

Related reading

- The full pickup-to-delivery workflow: [Manual Pickup and Autonomous Delivery](https://info.mobilerobot.com/applications/scenarios/manual-pickup-and-autonomous-delivery/) (https://info.mobilerobot.com/applications/scenarios/manual-pickup-and-autonomous-delivery/).
- Every judgment call that stays human: [Handling Exceptions and Irregular Loads](https://info.mobilerobot.com/applications/scenarios/handling-exceptions-and-irregular-loads/) (https://info.mobilerobot.com/applications/scenarios/handling-exceptions-and-irregular-loads/).
- The concept behind the split: [Dual Mode](https://info.mobilerobot.com/products/j1600/dual-mode/) (https://info.mobilerobot.com/products/j1600/dual-mode/) and [human-in-the-loop automation](https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/) (https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/).