

H450-500HD-EC SERIES



**STRONG PARTNERS.
TOUGH TRUCKS.™**

MASTED EMPTY CONTAINER HANDLER

H450-500HD-EC SERIES



RELIABILITY IN EMPTY CONTAINER HANDLING

The Hyster® H450-500HD-EC trucks provide high capacity empty container handling in the mid-range of the Hyster® line of container handling trucks. 50 years of Hyster's heritage in container handling and spreader design is brought to bear in this series providing superb performance in empty container handling applications. The machines offer fast handling using reliable proven components while offering an excellent return on your investment in container and reefer handling equipment. The series comes standard with a Tier 4 Final powertrain featuring a Cummins 6.7L QSB engine and a 5 speed ZF 5WG 211 transmission. These trucks deliver as much as 22% lower fuel consumption* over Tier 3 products produced over 5 years ago.

Two models are available: the H450HD-EC with 18,700 lbs. of lifting capacity and the H500HD-EC with 20,000 lbs. of capacity on a standard 177" wheelbase.

** Results will vary based on application, physical environment, fuel quality, etc.*





■ **DEPENDABILITY**

- Integrated powertrain
- Travel speed limiters
- Hydraulic systems
- High capacity cooling system

■ **LOW COST OF OWNERSHIP**

- Lower fuel consumption
- Empty seat engine shutdown
- Powertrain protection system
- On-demand hydraulics
- On-demand cooling system

■ **SERVICEABILITY**

- Easy access to key components
- Optimized electrical layout and hydraulic routing
- Longer service intervals
- Guaranteed Availability Program (GAP)

■ **ERGONOMICS**

- Cab comfort & visibility
- Intuitive operator joystick
- Uncluttered message center
- Automatic throttle-up

■ **PRODUCTIVITY**

- Multiple performance modes
- Twistlock module with indicator lights
- High capacity spreader
- Hyster Tracker compatible

DEPENDABILITY

ENGINEERED FOR HEAVY DUTY APPLICATIONS

■ INTEGRATED POWERTRAIN

TIER 4 FINAL

- The Tier 4 Final Cummins QSB 6.7L engine delivers 220 horsepower (164 kW) rated featuring cooled exhaust gas recirculation (EGR), selective catalytic reduction (SCR), water-cooled variable geometry turbocharger and an integrated diesel exhaust fluid (DEF) delivery system.
- The engine protects itself from excessive temperatures and pressures including:
 - high coolant temperatures.
 - high air intake temperatures.
 - high transmission oil temperatures.
- A torque derate strategy is implemented for engine and drivetrain protection.
- Rugged and capable ZF 5-speed 5WG 211 powershift transmission with proven field experience and reliability.
- ECO-mode selectable performance levels
 - ECO-eLO
 - Hi-P
- Automatic throttle-up
- On-demand cooling system
- A 24V electrical system with a 120 amp alternator, which includes a master battery disconnect switch.
- CANbus controls enables easy monitoring of the engine, transmission, instruments, and load-moment protection systems to facilitate troubleshooting.
- A 92.5 gallon fuel tank is standard on all H450-500HD-EC trucks. Tier 4 Final trucks also get a 10 gallon DEF tank standard.

TIER 3

- Tier 3 Cummins QSB 6.7L engine delivers 220 rated horsepower.
- ZF 5-Speed 5WG 211 powershift transmission
- On-demand hydraulic system
- Automatic throttle-up
- Wastegate turbo
- 24V electrical system with a 120 amp alternator, including a master battery disconnect switch
- CANbus diagnostic connection available to monitor engine, transmission, instruments, and load-moment protection systems to facilitate troubleshooting.

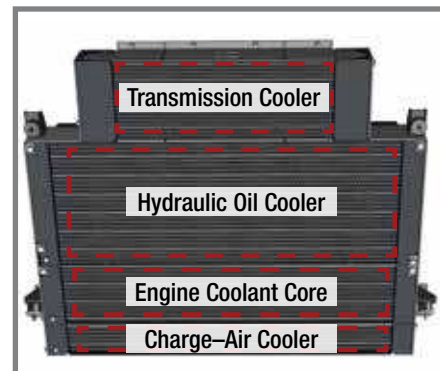


■ HYDRAULIC SYSTEM

- Leak-free ORFS (O-ring face seal) type fittings are used throughout the truck.
- Efficient filtration with new breathers. Full-flow return line filter with 5 micron cartridge on the main system, plus in-line pressure filter with 5 micron cartridge on power-assist and support systems.
- Hydraulic oil tank features a 54 gallon usable volume, with level, temperature gauge and magnetic drain plugs, providing additional cooling and reserve capacity.
- Centralized pressure check points.
- Fewer fittings, shorter hoses and conveniently located hydraulic components.

■ HIGH CAPACITY COOLING SYSTEM

- Designed for high temperature ambient conditions up to 113° F (45° C).
- Components last longer with cooler fluid temperatures.
- Puller fan draws cool and clean air, enabling the cooling system to operate more effectively.
- Hydraulically activated cooling system operates the cooling fan only when required, reducing fuel consumption and noise levels as the truck operates.
- Enhances component life by reducing wear and thermal degradation.



Quad-core configuration enables efficient cooling.



Puller fan draws cool and clean air.

TRAVEL SPEED LIMITERS (LADEN)

Travel speed limitation is a standard feature on these trucks with standard factory settings at 16 mph. When a container load is detected, the speed will be limited to the standard factory preset speed of 10 mph.



LOW COST OF OWNERSHIP

TECHNOLOGY THAT TRANSFORMS

When it comes to keeping costs down, Hyster beats the competition by offering significant savings in fuel consumption and less maintenance costs for your truck over its useful life. Because we understand that your total cost of ownership extends beyond just the initial acquisition costs, Hyster has collaborated with leading suppliers to provide well-integrated powertrains that reduce the overall cost of operations.

■ DURABLE COMPONENTS

The powertrain and drivetrain components have been designed to enable longer service intervals, up to 500 hours, thereby reducing the overall cost of operations for the truck. Advancements in hydraulic fluids and lubricating oils used also result in less frequent replacement and longer mean time between replacement.

■ LOWER FUEL CONSUMPTION

Fuel consumption is a key driver of the total ownership costs for container handling operations. Hyster provides a truck with superior fuel consumption characteristics compared to similarly sized trucks produced in the past. The engine design produces greater power and torque using a high-pressure common rail fuel injection system with variable geometry turbochargers. Advanced controls enable the Cummins QSB 6.7L engine to provide peak performance and operating efficiency while delivering great fuel economy and durability.

All Tier 4 Final H450-500HD-EC trucks require the use of DEF and feature engines with variable geometry turbocharging (VGT). An SCR package for NOx reduction and a diesel oxidation catalyst (DOC) for particulate matter (PM) removal are also packaged onto each truck. DEF tanks have been sized to require fill-ups along with every other fill of the fuel tank.

Technological enhancements in the Tier 3 QSB 6.7L optional engine provide peak performance and outstanding torque in a durable package while delivering improved fuel economy over baseline Tier 3 engines produced 5 years ago.



EPA Tier 4 Final Cummins QSB 6.7L diesel engine, lowers emissions and fuel consumption by up to 22% from Tier 3 baseline.*



Optional EPA Tier 3 Cummins QSB 6.7L diesel engine (limited availability in US and Canada).

Note: A Tier 4 Final engine must run on Ultra Low Sulfur Diesel (ULSD) fuel, with a maximum of 15 ppm sulfur content. Diesel fuel with a higher sulfur content than 15 ppm will compromise the emissions performance of the engine and may result in damage to components.

** Results may vary. Tier 4 Final features may help increase efficiency by delivering lower fuel consumption over Tier 3 products produced 5 years ago.*

■ EMPTY SEAT ENGINE SHUTDOWN

To further reduce operating and ownership costs, the Hyster® H450-500HD-EC can be equipped with an optional Empty Seat Engine shutdown feature. This feature ensures that the engine is turned off should the operator leave the seat. An adjustable time delay, adjustable within 3–15 minutes, enables flexibility in programming this function to best suit the customer's specific site applications. Primary electric power remains on during this time.

This feature prevents extensive idling and wear on engine and drivetrain components while reducing fuel consumed. The result is extended service intervals for the trucks and a reduced total cost of ownership.

■ ON-DEMAND HYDRAULICS

The on-demand, load sensing hydraulic system is developed in collaboration with Sauer Danfoss to deliver flow only when required. A variable displacement pump, capable of more oil displacement even at low pump speeds, means the engine runs at lower speeds, extending the life of components while operating more quietly. The system consumes up to 10% less fuel than a typical fixed displacement hydraulic system while producing less heat. Oil and filters can last longer, as well as hoses, seals and other critical components.

■ POWERTRAIN PROTECTION SYSTEM

An engine protection system, acting on low oil pressure and high coolant temperature, is standard equipment. A transmission protection system, triggered by excessive oil temperature, is also standard equipment. In order to minimize damage to the truck, these systems will initially decrease the engine power when a problem is detected and derate the engine to creep mode if immediate action is not taken.

■ ON-DEMAND COOLING (TIER 4 ONLY)

On-demand cooling is provided by a hydraulically controlled cooling fan, which reduces both noise and power consumption during cooling. The cooling system is designed for high ambient temperature conditions and provides on-demand cooling. The fan operates at variable speeds (depending on cooling needs) to ensure that the maximum engine power is available during driving and handling operations, thereby maximizing productivity. A heavy duty cooling system is standard for all Tier 4 trucks, which provides all the necessary cooling of the engine and hydraulic system for working in ambient temperatures of up to 120° F.



SERVICEABILITY

SUPERIOR SERVICEABILITY AND EASE OF MAINTENANCE

Hyster® trucks have been designed with the service technician in mind. Easy access to the engine, hydraulics and other major components is enabled with a large gull which swings out of the way for easy clear access.

Broad, slip resistant running boards foster quick daily checks. A utility toolbox and storage compartment is optional on the left hand side of the truck. The hydraulic oil tank features a sight gage for the oil level monitoring as well as magnetic drain plugs and two 3-inch shut-off valves for ease of maintenance.

Clean hydraulic hose and electrical harness routing enable seamless service of the truck and facilitate shorter service times.

EASE OF SERVICE

Wide open access to major powertrain and hydraulic components enhance ease of serviceability for on-going maintenance.



LONGER SERVICE INTERVALS

Major engine and drivetrain components are engineered to operate on 500-hour service intervals. Extended service intervals ensure that the truck remains in operation with longer mean times between oil changes or servicing.

- Complete diagnostics available through the PC service tool include engine, transmission, hydraulic system, and troubleshooting.
- Designed to aid technicians in first-time repair, eliminating unnecessary parts changes, and significantly reducing downtime.

AUTOMATIC GREASING SYSTEM (OPTIONAL)

An automatic greasing system is optional on H450-500HD-EC trucks. Greasing is enabled for the base truck and outer mast. Additional automatic greasing is also available for the Spreader. Centralized greasing is also designed for mast upper chain sheaves to enable longer service intervals on all empty container handler models. Steer axles, tilt cylinders and mast chain sheaves are greased via a centralized grease application location.



Optional automatic greasing system.

FAST DAILY CHECKS



Diesel Exhaust Fluid (DEF) tank.



Hydraulic site glass located externally on the truck for clear/instant visibility of oil levels.



Battery box with Quick Disconnect Switch.

SUPPORTING CUSTOMERS WITH WORLD-CLASS PARTS & SERVICE

Four Parts Distribution Centers strategically located around the world provide a full range of original equipment and aftermarket parts that help maintain our customers' uptime. G.A.P., our Guaranteed Availability Program, guarantees that if a covered part is not available the next business day it will be provided to you FREE of charge.*

We also take that commitment into the field with the Hyster CERTECH® Certification training program. This technical training program provides both systems level as well as product-specific education to ensure lift trucks are repaired right the first time.



**Contact your local dealer for program details.*

COMFORTABLE CAB. INTUITIVE CONTROLS.

Hyster Company is known for tough lift trucks, but we're also recognized for ergonomically advanced lift trucks. The H450-500HD-EC series builds on this reputation by simplifying empty container handling with intuitive controls while providing the quietest, most comfortable work environment possible. A spacious, comfortable operator environment and an operator interface with ergonomically-designed controls elevates productivity while minimizing operator fatigue.

■ ComforCabII FEATURES

- A 3-way adjustable seat combined with a 6-way adjustable armrest control module to ensure minimum fatigue and precise controllability during operation.
- A cabin air filtration system is standard for the closed cab configuration. A high capacity air conditioning system is also available as an option for the closed cab. Top and rear sunshades further enhance comfort.
- Steps and intuitively placed grab handles on both sides of the cab provide easy 3-point access.
- An adjustable steering column, power-assisted steering and lever controls, push-button parking brake and conveniently positioned instruments.
- Low noise levels create a quiet and relaxed working environment, reducing fatigue and enhancing operator alertness.
- Responsive hydraulic brakes, throttle and inching pedals in a convenient layout further contribute to driver confidence and comfort.
- Wide-view rear view mirrors inside cab, outside rear view mirrors on front fenders.
- A comprehensive set of work lights.
- The optional air-conditioning system is integrated into the heating and ventilation system with manual temperature control.
- Automatic throttle-up function when lifting.
 - When operating the lifting function, either when not in gear or when the inching pedal is pushed, the engine automatically revs up to 1800 rpm.
 - When the transmission is engaged the automatic throttle-up function is deactivated.
- Proportional controls with Powered Pile Slope (PPS Optional on ECH).
- Large and uncluttered cab allows ample room for auxiliary options.
- Optional map reading light.



A quiet and spacious cab means a comfortable, more productive operator.



The ComforCabII offers large windows fitted with tempered safety glass, with excellent all-around visibility.



■ CAB COMFORT & VISIBILITY

Superb visibility allows easy positioning of containers at any height for more precise and efficient load handling. The unique mast design positions cross-members away from critical container lift heights, allowing ultimate forward vision while keeping twistlocks in view at all times.

The cab's structural design and curved tempered glass windshield creates the best all-around visibility available, optimal for container stacking. Rearward visibility is outstanding with the cab location engineered to enable sweeping views over both the left and right shoulders.

■ AUTOMATIC THROTTLE-UP

Automatic throttle-up is available on Hyster® H450-500HD-EC trucks which provides automatic response to lift inputs from the operator when the lift lever is activated. A joystick-controlled rev-up keeps the engine in the most efficient band delivering good fuel economy. Given the improved operator ergonomics, this feature helps enhance productivity. Automatic throttle-up feature applies only when the truck is in neutral.



Rear sloping counterweight design.



Uncluttered message center provides key information with minimal operator interference.

■ DISPLAY & CONTROLS

The display and controls are located on the right hand side of the operator compartment for unobstructed forward visibility. The message center features key truck controls, functionality and troubleshooting.

Located at the operator's right hand, the intuitive joystick is designed for simplicity to ensure easy, precise operation of the mast and spreader.

- Ergonomically designed electro-hydraulic controls
- Integrated into armrest
- Minimizes muscle and joint strain
- May reduce operator fatigue over long shifts



Operator Joystick (standard on all models) allows easy operation of the mast and spreader.

PRODUCTIVITY

WHEN PRODUCTIVITY COUNTS, HYSTER MORE THAN MEASURES UP

Through the combination of mast & spreader, engine, transmission and hydraulic technologies, the H450-500HD-EC lift truck provides superior performance in all aspects of empty container handling, lowering the cost of a container move. A significant improvement in cycle speeds enables the movement of more containers per hour, combined with 5 or 6 high stacking capability for the most effective use of yard capacity. 6 or 7 high stacking capability is also available for customers.

■ POWER & PERFORMANCE

LIFTING, LOWERING AND TRAVEL SPEEDS

Hyster® H450-500HD-EC container handling trucks deliver high productivity with 4-mode average speeds of 109 ft/min (0.55 m/s),* quite competitive in the industry at rated laden container handling capacities.

Travel Speeds:

16 mph (25km/h) with or without load

Lifting Speeds:

114 ft/min (0.58 m/s) - Unladen

126 ft/min (0.64 m/s) - Laden

Lowering Speeds:

98 ft/min (0.50 m/s) - Unladen

98 ft/min (0.50 m/s) - Laden

HIBERNATE IDLE MODE (TIER 4 FINAL ONLY)

Hibernate idle mode lowers the engine idle revolutions, from 900 to 700 RPM, after 30 seconds of idling if no driver input is received, thereby saving fuel.

ECO-MODE

ECO-mode controls maximum engine RPM and throttle response to provide the required balance of performance and fuel savings:

- Hi-P provides maximum performance and good fuel economy.
- e-Lo provides minimum fuel consumption without losing productivity.

* Average speed calculated using: laden lift speed (ft/min) at full rated capacity; unladen lift speed; laden lowering speed at full rated capacity; unladen lowering speed.

■ SPREADER PERFORMANCE

- Hyster® model 586TB spreader with removable spacer blocks is standard on all models for handling domestic and ISO 8' and 8' 6" wide containers.
- Hyster® model 589 spreader with hydraulically adjustable heads also available as an option for ISO and Wide Twistlock Position (WTP) 8' and 8' 6" containers.
- For handling 2 empty containers at a time, customers can also get the Hyster 584 spreader with side clamps available via SPED.**
- Mechanical Pile Slope (MPS) function on the EC spreader with floating function end-posts and manually adjustable heads.
- Sideshift movement is ample with +/- 23.6 inches (600 mm) for a total of 47.2 inches (1200 mm) of side shifting capability for handling flexibility while enabling both container and reefer correction possibility.
- Automatic greasing for the spreader is available on all H450-500HD-EC lift trucks.
- Long lasting LED lights on the spreader are also available for enhanced visibility of twistlocks.
- LED twistlock indicator lights (1x red, 2x orange, 1x green, 1x blue) signal spreader engagement in the cab.
 - Orange Left Hand - Container landed
 - Green - Locked
 - Red - Unlocked
 - Orange Right Hand - Container landed
 - Blue - Mast Lift interrupt active
- LED twistlock indicator lights on the spreader are standard.

** Contact Hyster Company for details.

■ HIGH CAPACITY SPREADERS

Productivity is a primary focus on Hyster® empty container handlers. Consequently, the trucks are equipped with Hyster® 500 series spreaders with the following features and functionality:

- Three spreaders to choose from for handling empty containers up to 20,000 lbs.
- Mechanical Pile Sloping with floating end-posts is standard on all trucks.
- Powered pile slope is available as an option.
- Hydraulic telescoping designed to handle ISO, domestic and WTP containers.
- Two vertical hardened pendular twistlocks ensure the container is securely fastened prior to lifting.
- A twistlock indication system provides electrical and mechanical twistlock interlock. Indicator lights (one red, two orange and one green) located in the cab provide a visual indicator of twistlock status to safe handling on unladen containers and reefers.
- The mast over-lowering interrupt function prevents further lowering of the mast when the spreader is landed on a container. When active, a blue warning light illuminates to eliminate slacking in the lift chains while reducing shocks to the spreader. The system also helps to prevent lifting a container with partially engaged twistlocks.
- Spreader articulation is enabled by a 9.0 inch floating (upward/downward) movement of the spreader vertical end beams. This enhances proper handling of containers onto / from a sloping surface.



TWIST module with indicator lights

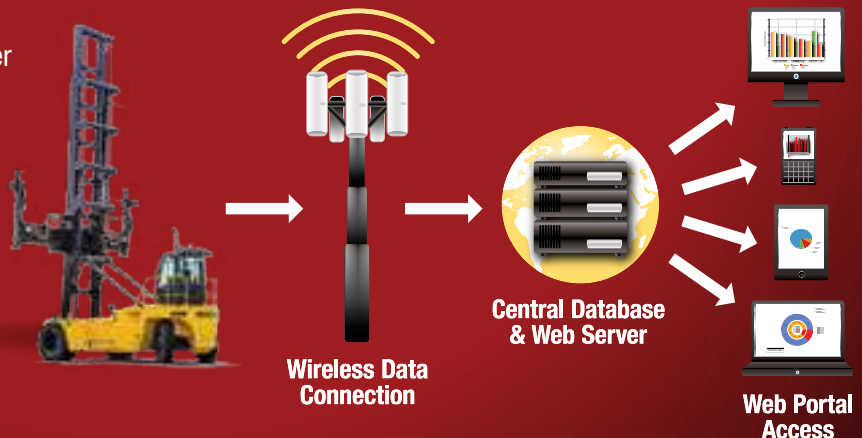


HYSTER TRACKER - WIRELESS ASSET MANAGEMENT

Take your fleet operation to the next level with wireless asset management from Hyster. Hyster Tracker provides a scalable solution for fleets. From monitoring truck utilization to limiting operator access, Hyster Tracker allows you to track your fleet at your fingertips.



TRACKER



INNOVATIVE TRUCKS ENGINEERED TO MEET THE MOST DEMANDING APPLICATIONS

For more than 80 years, Hyster has been conquering the world's most demanding applications. In the 1920's Hyster started as a manufacturer of lifting machines used in the rigorous logging industry of the United States' Pacific Northwest. A few years later the first forklift trucks were invented and the Hyster brand quickly gained its reputation for rugged quality. Hyster® lift trucks are designed to lower your cost of operations. Every truck we make — gasoline, LPG, diesel and electric — is purpose-built to excel in its application. Every truck is also backed by an unmatched network of specialists.



Dealer Network — Our Dealer Network can offer the expertise of fleet managers, parts suppliers, capital procurement specialists and trainers. Hyster's carefully chosen dealers fully understand customer applications, assist in selecting the right lift truck and provide fast, reliable support.



Hyster Fleet Services — Even if you operate other brands, we can manage your maintenance and replacement plan. We can offer complete fleet analysis, fleet history summary and a cost-effective proposal for replacement and scheduled maintenance.



Parts — With genuine Hyster replacement parts and UNISOURCE™ parts for all makes of lift trucks, we are your one-stop source for lift truck parts. In fact, we offer more than 2 million part number crosses for most brands of materials handling and other in-plant mobile equipment.



Rental Products — When leasing or buying isn't a practical option, we have access to more than 14,000 units for short- and long-term rental. We'll help you maintain output in a cost-effective manner.



Hyster Capital — We can arrange solutions for special financing requirements, taking the difficulties out of buying the equipment you need. Whether you purchase or lease a new or used lift truck, Hyster Capital offers superior service and competitive rates.



Special Products Engineering Department (SPED) — Different materials require different handling. That's why we can work with you to customize your lift trucks. From strobe lights to specially made forks, SPED has the tools to help you get the job done right.



Operator Training — Proper education in operating lift trucks minimizes the risk of injuries due to accidents while increasing productivity. Hyster offers OSHA-compliant materials that support the training of qualified operators.




Service — Your local Hyster® dealer offers a flexible, customized and comprehensive maintenance plan based on each lift truck's operation environment. Hyster service programs offer scheduled inspections and maintenance, along with quick, responsive service dispatched to your location.





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