"Big Truck" Line

H400-450HD/S

Series A236

HYSTER

STRONG PARTNERS. TOUGH TRUCKS.™

STANDARD FEATURES & OPTIONS

Frame

- The FLT frame is a welded construction of channels built from 1 inch thick top and bottom flanges to a ½ inch thick side plate. This provides an opportunity to apply material to the highest stress area.
- Two frame configurations are offered to meet the various applications.
  - H400-450HDS Wheelbase 138 inches
  - H400-450HD Wheelbase 148 inches
- Bolted on fuel and hydraulic tanks cleaned to ISO 19-17-14 to reduce risk of contamination on initial machine start up.
- Low profile frame channels to allow easy side access for maintenance and servicing of components located inside frame.

Operator's Compartment

- All steel structure with both pressed steel panels and formed sections to give a very strong operator compartment exceeding applicable regulations.
- To promote driver comfort and productivity, the operator compartment features spacious dimensions, adjustable suspension seat, adjustable tilt steering wheel, integrated seat and adjustable armrest with low effort controls, and power assist steering and brakes.
- Powered side tilting for improved service access is standard.
- Multi-function display panel with error code message facility for auto shift transmission and engine monitoring.
- Load sensed steering system. Steering column has both height and axial adjustment, and includes lever controls as appropriate i.e. transmission shift, turn signal lever and central warning light.
- The operator compartment is mounted on 4 rubber isolators to minimize the transmission of structure borne noise and vibration from the frame to the operator, thereby reducing noise and driver fatigue.
- Wide-angle side view mirrors are provided in the top left and right hand front corners of the cab.
- Handrails are provided to assist the operator in mounting and dismounting the unit.
- The controls are provided with a seat-mounted armrest and are independently adjustable to the seat and maintain position relative to the seat, when the seat is adjusted.
- Lights are available for full cab-equipped units as well as non-cab units.

Operator Cab:

- Curved glass to provide excellent visibility. The front windshield is tempered. Laminated glass is available as an aftermarket option.
- A high capacity heater system with 10 outlet air vents provides all round heating/cooling. A replaceable paper filter element ensures that the operator receives clean air from outside. Recirculation and fresh air positions can be manually selected. The 3-speed fan and variable heat output controls are located on the right hand side console.
- Air conditioning system provides 35,100 btu/hour cooling capacity. Two speed electric condenser fans are used to ensure constant performance at low engine operating conditions. This condenser is mounted inside the center counterweight cooling inlet.
- Defrosting of the front and rear windows is via ducting integral with the cab structure, which connect to the front and rear plastic moldings.
- Molded, easy clean floor mats, provide an effective barrier to noise, and a softer feel to the feet of the operator.
- The cab floor is flat and provides the operator with an unobstructed space for his feet. Additionally, the floor plate is an integral part of the cab and seals against noise ingress.
- For heavy rain conditions a dual (H-pattern) wiper is standard. A washer is connected to the wiper. The motor system is mounted below the cab to give unobscured visibility.
- The rear window is curved glass (tempered) and is provided with a wiper motor/washer in the centre of the screen. The rear window wraps around the side of the rear corner and provides good visibility.

H400-450HD/S

As working environments change, Hyster Company's product line must change. That is why Hyster is excited to introduce a new series of trucks, the A236. This new series will replace Hyster Company's A214-FLT.

The models offered in this series are: H400HD, H400HDS, H450HD,

- The top surface of the cab is a large laminated glass panel bonded to the frame. Additional clamps are fitted at the front of the cab to ensure a positive seal when the truck is being transported at high speed.
- An internally mounted roller type sunblind mounted in the roof and at the rear window is standard.
- Mechanical and air suspension seats are available.
- Joystick and lever pilot control options are available. All controls are simple and easy to use and can be comfortably reached.
- The electronic module for the transmission is housed in the operator compartment within the right hand module, fully protected from the environment.
- A training seat is available as an option.
- Doors are single piece steel framed with (tempered) glass for maximum visibility. The outside of the doors mount flush to the outside of the edge of the A pillar. The steel frame provides stiffness for the glass door and also attachment points for the door lock mechanism and hinges. The door handle is mounted at a low level to permit the operator to open the door from ground level.

Seats:

- A full suspension Sears seat is standard, featuring a durable cloth surface (vinyl with non-cab) and contoured for operator comfort. The seat has an adjustable backrest angle, an armrest on the right side, and spring rate adjustability for operator weight. The seat rail has 7½ inches of travel.
- A high backrest version seat is optionally available.
- An air suspension seat is optional.
- All seat options have operator restraints.
- All seats are fitted with an electrical seat switch wired to the warning buzzer system. If the operator leaves the seat with the park brake not applied a continuous sound will occur. The seats are fitted with an electrical seat switch wired to the Operator Presence System:
  - If the operator leaves the seat, this system will de-activate the transmission and both lift and tilt functions; an alarm will also sound if the parking brake is not applied.

Engine

- The engine offered will be the Cummins QSB6.7 Tier 3, turbocharged and charge air cooled.
- Cummins QSB engines feature advanced electronics, new sculpted blocks, rear gear trains, and High-Pressure Common-Rail fuel systems.

6-cylinder, 6.7 liters, 195 hp at 1800 rpm
Optionally and required for certain truck models
6-cylinder, 6.7 liters, 230 hp at 1800 rpm

Cummins engine detailed features:

- Has Cummins renowned quality and durability built-in.
- Product built on the strengths and experience of the B Series engine, renowned for simplicity, reliability, durability and low life cycle costs “In cylinder” combustion approach achieving Tier 3 requirements without after treatment or EGR.
- Significantly improved exhaust “acceleration, black and white smoke” characteristics compared to Tier 2.
- Various engine sub-systems have been integrated to provide a less complex engine with fewer parts.
- Lower engine noise and vibration levels contributing to lower truck and drivers ear noise levels.
- Rated load governed speed is 230 hp @ 1800 rpm or 195 hp @ 1800 rpm.
- Bosch HPCR with full authority electronic control fuel pump system.
- Wastegated Holset HX-35 turbocharger.
- 4 valve cylinder head.
- Rear Gear Train with die-cast aluminum gear housing.
- To assist engine starting in cold weather an engine grid heater in the air intake manifold is automatically activated below 10° F ambient.
- 500 hour oil and filter change periods.
- Standard fuel/torque de-rate through shutdown are enabled for
  - Coolant temperature
  - Air intake temperature
  - Oil pressure
- Full flow lubricating oil system

The standard shutdown and de-rate features have the following settings:

Condition	Driver Warning	De-rate (after 5 seconds)	Shutdown (after 30 seconds)
High Engine Coolant Temp	225° F	238° F	238° F
Low Engine oil Pressure	6 psi	6 psi	6 psi
High Engine Inlet Air Temp	200° F	210° F	210° F

and H450HDS. These trucks are rated at 40,000 & 45,000 pounds, respectively, at a 36-inch load center. Hyster has answered the challenge by offering two new wheelbases per model without jeopardizing capacities.

If your application requires limited operating space, then the H400-450HDS, 138” wheelbase should be your units of choice. Those who are not constrained for space will prefer the H400-450HD with a 148” wheelbase.

STANDARD FEATURES & OPTIONS

TRANSMISSION:

A. POWERSHIFT TRANSMISSION

- The truck series uses Dana SOH designed power shift transmissions:
  - TE-13 (rated for 195 hp)
  - TE-17 (rated for 230 hp)
    The main difference is in the number of clutch plates where the TE-17 has 2 more than the TE-13 depending the clutch group.
- These are 3-speed forward and reverse heavy-duty, electronically controlled transmissions, are mounted to the engine flywheel housing, and include the following features:
  - Soft shift characteristics for up-down gear shifting and reversals
  - Inching performance improved by electronic solenoid clutch modulation
  - Automatic shift standard
  - Diagnostic software “Userlink” is SOH-NMHG jointly developed user interface built on T50 Userlink experience and which is already available with the TE-10, TE-27, and TE-32 transmissions
  - Optimal clutch fill by factory calibration procedure
  - Larger pump drive, suitable for 2 speed hydraulic loads
  - Improved transmission protection (limited adjustments to parameters)
  - Exceed parameters defined and error codes displayed to driver
  - Engine de-rate at extreme transmission conditions
  - Transmission control at extreme transmission conditions
- Electric automatic shifting is standard and is controlled by a new electronic transmission controller located within the cab console. The controller receives its signals from speed sensors on the transmission case. Shifting moments are depending throttle pedal position in combination with power train load and provide optimal shifting points with smooth shifting characteristics.
- The APC 200 controller provides an adjustable option to limit maximum truck speed.
- When travelling in reverse and shifting forward, the controller will shift into first gear only when the speed is below 3.1 mph and 1400 rpm engine speed.
- The main hydraulic pump drive facility is located on the rear of the transmission housing (front side in truck).
- A torque converter with 2.191:1 (TE-13) / 2.109:1 (TE-17) stall ratio is used to match engine to transmission to give exceptional tractive and travel speed performance.

- The torque converter has two main functions:
  - To work as a fluid coupling to reduce shock loads in the power train for a smooth transfer of power from the engine to the transmission.
  - To multiply torque from the engine to match the traction power requirements when needed.
- The hydraulic system for the transmission is separate from the main hydraulic system of the truck. The transmission has its own large sump, an externally mounted spin-on filter, charge pump and control valve. Transmission oil temperature is controlled by an oil cooler to reduce wear on the clutches and promote long life. In case of overheating, a sender unit in the oil sump turns on a warning light in the instrument module. There are few potential leak points in the transmission since it is self-contained.
- The transmission control valve controls the pressure and the flow of oil to the clutch piston cavities and to the torque converter. It also provides oil flow to cool the clutch discs and lubricate the transmission. A modulating pressure valve is used to cushion directional shifts, reduce shock loads, and provide smooth clutch engagement. The modulator valve is sandwiched between the main control valve and the converter housing.

- The control valve is mounted to the side of the torque controller housing. Drillings and passages in the control valve permit oil to flow from the valve body to passages in the transmission housing. This limits hydraulic lines and fittings to reduce the possibility of leakage.
- The engine can only be started when the transmission is in neutral or with the inching pedal depressed.
- The transmission contains two directional and 3 range clutch packs that have friction discs per following table:

	TE-13 no. of discs	TE-17 no. of discs
Forward pack	9	11
Reverse pack	9	10
1st gear range pack	5	6
2nd gear range pack	5	6
3rd gear range pack	4	5

- All transmission inching occurs by disengaging either the forward or reverse directional clutch packs.
- Torque is transmitted through the transmission by engaging one directional clutch pack, and one range clutch pack.
- The transmission shafts contain oil passages that direct oil to the clutch packs for actuation and cooling. The oil is routed into the shafts through sealing rings located at the ends of the shafts.
- Helical gearing is used throughout the transmission, except for the auxiliary PTO gears for smooth, quiet operation.

B. STEERING SYSTEM

- The steering system is all-hydraulic and is designed to give precise reliable control.
- The hydrostatic steering system consists of a steering wheel and tilting column assembly, steering control unit, pump with priority control valve, steer axle, cylinder and wheel hubs and spindles.
- The steering control unit is a Danfoss OSPC500 dynamic load sensed hand pump that is controlled by the steering wheel. The unit is mounted on the underside of the cab floor and is connected by a shaft to the steering wheel.
- The tilt angle of the steering wheel is infinitely adjustable for both rake angle and height (within fixed end stops), by releasing a single lever on the steering column assembly. A compact 13.75”-diameter steering wheel with centrally mounted horn button is fitted.
- The load sensing system has been designed to provide low steering effort and good performance at all engine speeds.
- A hydraulic pump with a displacement of 54cc per rev. will supply steering flow.
- The steer axle is a welded, sandwich construction with a transverse mounted double acting cylinder, 2 non-adjustable tie rods, 2 spindles, taper roller bearings and 2 wheel hubs. The axle is pin mounted to the frame.
- The one-piece axle weldment carries the axle loads, and provides the mounting for the spindles and cylinder. The axle weldment is designed for high loads and long life.
- The steering axle spindles are supported by tapered roller bearings, and sealed to prevent contaminate entry or loss of grease. Bearing pre-load is set shimming the lower bearing cap. Increased outer bearing sizes and spindle design improvements have been introduced to cope with higher truck capacities.
- The steer cylinder is secured to the axle by 8 high tensile bolts. By this design the cylinder does not exert an external force on the frame. This design permits large wheel angles and greater maneuverability.
- No steering linkage adjustments are required. The only regular maintenance points are the lubricating fittings on the spindle and tie rod pins.
- This axle design, with its large sealed bearings, precision-machined parts, and non-adjustable tie rods, provides a durable and low maintenance system with precise steering control.

C. DRIVE AXLE

- PRC-1756W3H axles feature a heavy-duty ductile iron axle housing to ensure durability and has a load rating increased from 94,600 pounds to 110,000 pounds (+16%). These axles are securely mounted to the truck frame with 4 bolts per side for the FLT.
- Drive axle shafts are splined at both hub and differential ends and have increased strength by induction hardening. The axle assembly is a full floating design, which means that the truck weight is carried by the axle housing, not the axle shafts.
- Wet disc wheel speed brakes are standard for all models and provide for smooth braking and to:
  - Eliminate occasional brake noise complaints with the shaft speed PRC-1756.
  - Eliminate any concerns regarding inching and rock-back.
  - Effectively increases the torque rating of the wheel end gears by 10% over shaft speed design.

Brakes

Wet Brake System

- The wet brake system consists of a hydraulic supply and storage section, drive axle wheel speed multi-disc brakes. Hydraulic oil is supplied to an accumulator system from an engine-driven hydraulic pump. The oil used to actuate and cool the brakes comes from the main hydraulic reservoir. Brake cooling oil is cooled by separate oil to air cooler located in front of the hydraulic bay area. Brake cooling flow is filtered as it returns to the tank.
- The wet brake axles include a dry disc park brake. The park brake comprises a AxleTech model 1270 (Knott) pinion mounted disc brake with hydraulically released spring applied disk pads and is common to all models.
- The large 14.7 inches diameter wet disc brakes with each 6 (FLT) plates ensure braking compliance with ISO and ANSI standards.
- Increased hub bearing size to withstand higher load capacity.
- The wheel stud replacement/servicing can occur without disassembling the wheel hub.
- Modified wheel hub to house higher capacity bearings and to accommodate larger bolt circle diameter for brake driver bolted joint.
- Magnets are located in axle housing to eliminate recommended initial oil change and reduce oil pollution.
- A separate wet brake oil cooler is used with oil temperature-warning sensors on each side to provide the operator with an early indication of excessive oil temperature 230° F.

D. HYDRAULIC SYSTEM

- A 3771 psi lift hydraulic system allows the use of small hydraulic lines and components which increases operating efficiency and improves fuel economy. Tilt and auxiliaries will have 2741 psi relief in all valve variations.
- Slim diameter lift cylinders provide good visibility.
- Small hydraulic lines and components mean better maintenance accessibility.
- In-tank, full flow, return filtration for protection of the hydraulic circuit. Both steering and main hydraulic system oil are filtered as the oil returns to the tank.
- “O” Ring Face Seal hydraulic fittings are used throughout. Fittings with o-ring bosses are used to connect hoses and tubes to individual hydraulic components.
- Flexible wire-braid hoses and limited conventional steel hydraulic tubing are used to simplify the hydraulic plumbing. These hydraulic lines are carefully routed and clamped. This feature extends service life and simplifies service access.

Main Hydraulic Pump

- The main hydraulic pump is a tandem pump that contains a 74cc pumping section for the lift system, a 54cc pumping section for the steering with excess flow to tilt, auxiliary or lift system and a 23cc pumping section for the hydraulic cooling circuit.
- The Haldex-Barnes G302020 pump features high performance gear type pumping sections with improved efficiency and long life.
- It is mounted to the transmission PTO, and is driven by a gear train from the torque converter hub. This mounting location is centrally located within the truck but close to the hydraulic bay area and provides for an efficient hydraulic system. Hydraulic line lengths are minimized to reduce hydraulic system pressure losses, thereby lowering power requirements and overall system temperatures.

Main Hydraulic Control Valve

- The Husco 6000 series main control valve features include:
  - Dual lift spools directing main and unused steering/tilt/aux oil flow to the lift function and increasing lifting speeds at these conditions.
  - Metering notches in the spool control surfaces allow control of oil flow during the lift or tilt functions and provide load protection.
  - Multiple relief valves limit the lift pressure to 3771 psi, while limiting the pressure for tilt and auxiliary functions to 2741 psi. This provides high efficiency for the tilt section with hydraulic pressure compatible with the relief setting for the front end equipment.
- Simultaneous operation of lift and auxiliary functions are made possible.
- Pilot actuated hydraulic control valve sections provide the means of operator control of hydraulic functions and realize fine tuned metering of hydraulic functions.
  - Lift and tilt functions will be proportional controlled
  - Auxiliary functions will be non-proportional controlled
- The valve assemblies are open-center, sectional type design.

Combination Valve

- A newly designed HydraForce valve combines pilot pressure, accumulator charging, brake pressure, steering priority and park brake actuation functions.
- Reduces the number of individual valves, fittings and plumbing significantly. Therefore the potential for leakages is reduced also.
- Improves access and serviceability with cartridge valves and solenoids assembled into one block located on the upper side of the front of the frame.

Tilt Control Valve

- Anti-cavitation tilt control valves are plumbed at the tilt cylinder ports. It has three functions:
  - It keeps the mast from moving forward if the tilt function is actuated when the engine is not running.
  - During forward tilting, it controls the oil flow from the tilt cylinders to maintain positive pressure at the piston end of the cylinder, and improve control of the mast and the load.
  - When the tilt function is not actuated, it blocks the flow of hydraulic oil to all tilt cylinder ports, and prevents fluid transfer from one tilt cylinder to the other. This hydraulic locking resists masts torsion loading.

Hydraulic Tank

- An 84 gallon (58 gallons usable volume) hydraulic tank is mounted on the outside of the right-hand frame channel by 4 bolts. This location permits the tank to radiate heat away from the truck and operator.
- The oil level is easily checked with a glass type level indicator with floating ball. This is conveniently mounted to the side wall of the tank.
- Provisions (2" NPT flanges) are made at the bottom of the tank to allow for a customer/dealer installed hydraulic pre-heater.

Hydraulic Filter

- A replaceable hydraulic filter is located within the hydraulic tank, and maybe serviced by simply unscrewing the hydraulic filter head. The filter may be replaced without opening the hood.
- The filter contains a 10-micron paper element that protects the hydraulic system from contaminants, promotes reliable performance and helps to extend life for all the system components.
- The hydraulic filter assembly has a by-pass relief valve to provide oil flow in the event of filter clogging.
- Oil added to the hydraulic system must pass through the filter.

Hydraulic Tank Breather

- The hydraulic tank air breather includes a filter and is located outside of the operator compartment to prevent undesirable fumes. The high quality filter protects the hydraulic system from airborne contaminants.
- This breather also incorporates a stand pipe to prevent filter element dirt dropping into hydraulic tank while replacing the filter element.

Steering Control Unit

- The steering control unit is a hydraulic oil-metering valve that is controlled by the steering wheel.
- The unit is mounted inside the steering pod, and is connected by a shaft to the steering wheel. This open-center, rotary actuated hand pump determines the amount of oil that flows to the steering cylinder. When the steering wheel is stationary, oil flows freely through the control unit and not to the steering cylinder.
- If the engine stops running, the steering control becomes a manually operated hand pump, so the truck can be steered to a controlled stop with increased steering wheel effort.
- A manifold assembly is mounted to the steering control unit, which contains the relief valve set at 2400 psi. A check valve is provided to prevent steering kick back.

Tilt Cylinders

- Two double-acting tilt cylinders are mounted in a shielded location above the fenders. The tilt cylinder mounting is widely spaced for mast support and good visibility.
- The cylinders are fastened to the mast and frame anchors by hardened steel pins, and pivot through replaceable spherical bushings. Lube fittings are provided at each tilt pin to reduce wear.
- Chromed rods and single-lip urethane seals are self lubricating to offer outstanding cylinder life and low maintenance. Wiper rings are used to help prevent contaminants from entering the cylinders.

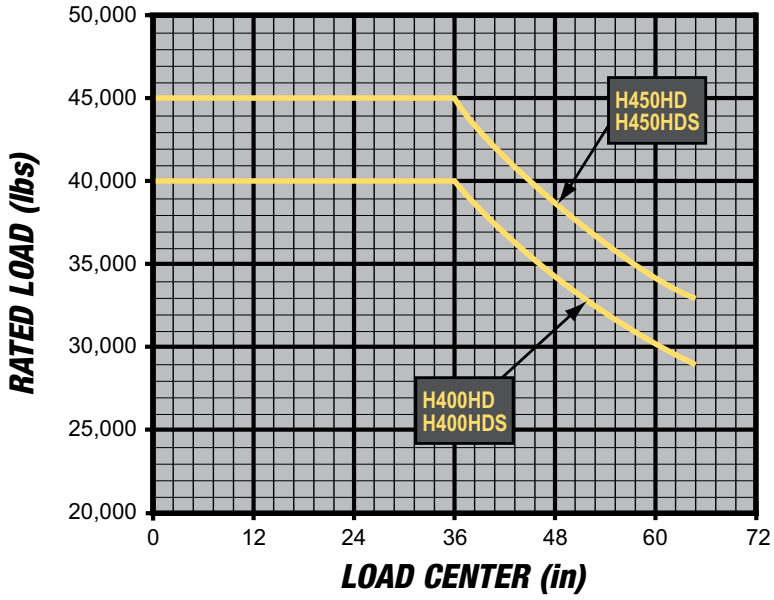
Hydraulic (brake) oil cooler

- A separate cooler unit is mounted in front of the truck near the hydraulic valve bay area. Three (3) electric driven fans are switched on at an oil temperature of 158° F.
- The 1138 btu/min cooler unit with low return line restriction is plumbed into the brake system.

E. ELECTRICAL SYSTEM – 24 VOLT

- Emphasis has been to improve truck reliability with a major upgrade in the connector technology and the routing of the harness. Significant improvements in the level and quality of information are available to the operator by a new 'state of the art' instrumentation cluster that has been introduced.
- Deutsch sealed wiring connectors are employed throughout the truck. The harnesses are pre-wired for ease of option fitment in both factory and field.
- A single color wire with number codes for each wire has been introduced.
- A multi-function display panel provides the operator with all information on the machine status.
- Switches are mounted on the right hand armrest and console. Provision is made available for 12 switches on the armrest and 7 others are available on the console.
- A 12V converter has been made standard and comes with a 12V power socket and radio mounting bracket. The operator compartment headliner is wired with two 12V connections for Radio and CB or other electrical equipment and is powered by the 12V converter option.
- The fuse and relay panels are located in the right hand side console. They are grouped together and are easy to access. Depending on the machine specification there is provision for 40 fuses and 8 relays.
- Particular attention has been paid to the location, routing and clamping of the wire harness to ensure that it is not exposed to heat and oil contamination.
- The standard (Delco 24SI) alternator has an output of 70-amp and has an internal regulator.
- The truck is wired and prepared for light options:
  - Cab and front fenders are pre-drilled to make it easy to install.
  - The tail light assembly is standard and is a cluster of brake/tail, turn and reversing lights positioned into the rear fenders/ counterweight.
  - Both Halogen and H(igh) I(ntensity) D(ischarge) lights are available as options
- The electrical system is designed to meet UL 558 requirements.
- Two batteries each 12V 900A cold cranking amps are employed. These are mounted in the battery box located at the left-hand running board. The box is integrated into the fuel tank side wall.
- Warning LED's are mounted in the steering column directly in line with the operator's line of sight to provide a warning of any malfunction indicated by the display in the right-hand console. This arrangement provides excellent forward visibility whilst alerting the operator of any need to check the comprehensive indicator display. Further information on the fault is available on this multi-functional indicator display panel located to the operator's right.
- The starter motor is a 24-volt heavy duty with integral over-running clutch mechanism and solenoid. The clutch functions to protect the starter armature from over-speeding. A starter lockout mechanism is contained in the key switch to prevent engagement of the starter when the engine is running.
- A lockout switch prevents engagement of the starter unless the transmission is in neutral, by placing the direction control in neutral on the lever-shifted trucks, or by applying the park brake on Monotrol trucks. You can start if you apply the brake/inching pedal.
- The air horn is located below the cab and can be actuated in a number of ways depending on the machine specification. These are:
  - Pressing the horn button in the center of the steering wheel;
  - Pressing the button on the joy-stick;
  - Pressing the switch on the right hand side arm rest.
- All electrical connections to the operator compartment are via high quality quick release plug and socket connectors.
- Audible and visual warnings are provided as shown in the following chart on page 9.
- Truck is equipped with a standard audible backup alarm.

RATED LOAD vs. LOAD CENTER
STANDARD CARRIAGE
U. S. CUSTOMARY



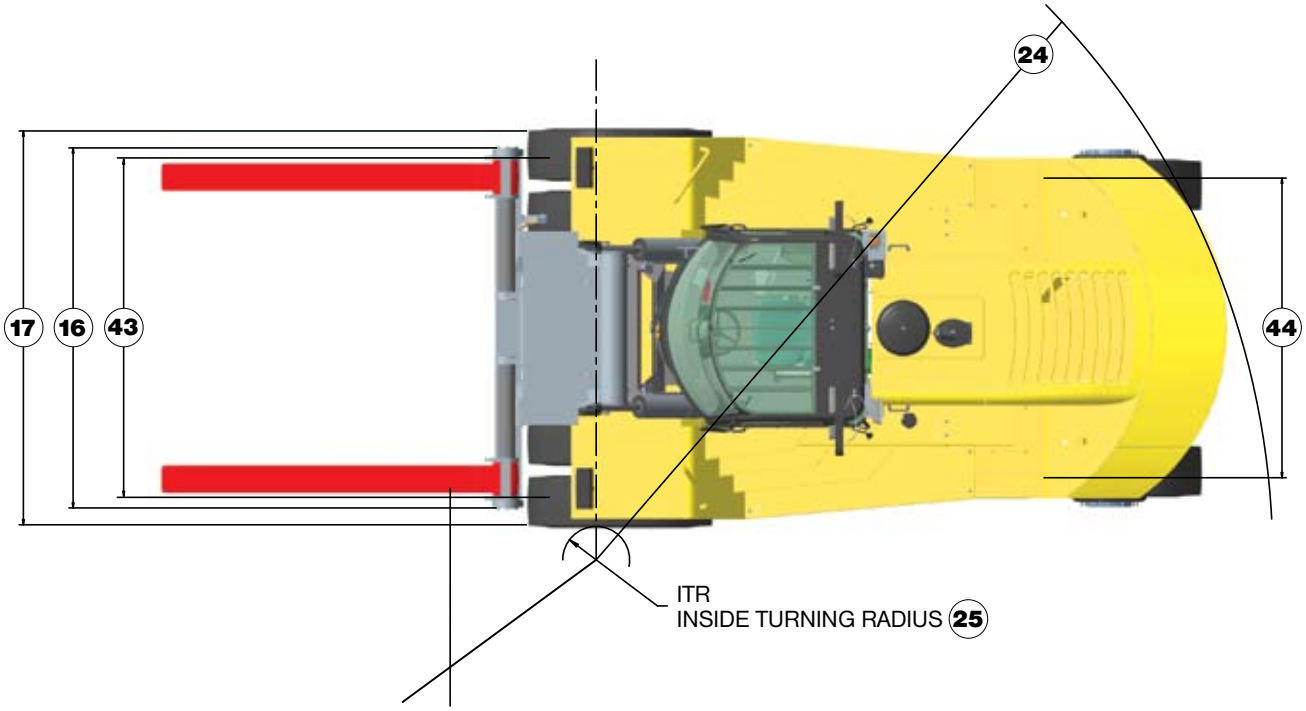
TRUCK CONFIGURATION:

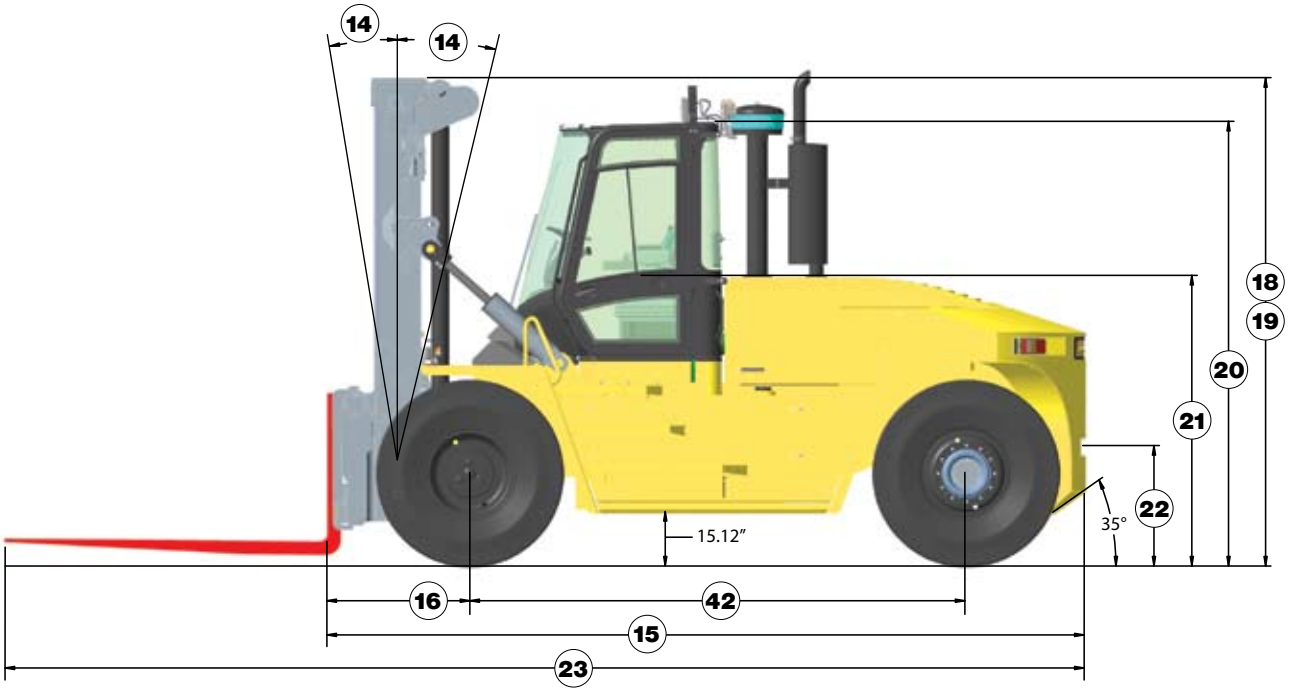
- Vista 2-Stage 212"/173" mast.
- Standard pin type sideshift fork positioner carriage.

VISTA CAB DASH DISPLAY

	Dash display warning light	Dash display dial	Master steer pod warning light	Intermittent audible warning	Engine shut down
Park brake	X			X	
Fasten seat belt	X				
Engine low oil pressure	0.4 bar / 6 psi	X	X	X	X
Engine coolant high temperature	107° C / 225° F	X	X	X	X
Engine air inlet high temperature	93° C / 200° F				X
Engine coolant low level	50%		X		
Water separator fuel system	X				
Engine air filter high restriction	X				
Battery charge (alternator)	(Vbatt < 22.5V)				
Fuel low level	10%	X	X		
Hydraulic brake system low pressure	90 bar / 1300 psi		X		
Hydraulic brake high oil temperature	110° C / 230° F		X		
Transmission low oil pressure (T.C.-out)	9 bar / 130 psi	X	X	X	
Transmission high oil temperature	125° C /257° F	X	X	X	
Transmission high oil temp (sump)	<= 50% throttle				
Transmission error - code	X	X (LCD)	X		
Engine hour meter		X (LCD)			
Engine shut down warning			X	X	X
Engine error - code	X	X (LCD)			
Operator not present with park brake off				10 sec	

SPECIFICATIONS





GENERAL	1	Manufacturer Name		HYSTER	HYSTER	HYSTER	HYSTER
	2	Model		H400HDS	H400HD	H450HDS	H450HD
	3a	Load capacity (36" load center)	lb	40,500	40,500	45,000	45,000
	3b	Load capacity (48" load center)	lb	35,200	35,200	39,600	39,600
	5	Power: battery, diesel, LPG, electric mains		Diesel	Diesel	Diesel	Diesel
	6	Operation: manual, pedestrian, stand, sit, seat		Sit	Sit	Sit	Sit
	7	TIres: L=pneumatic, V=solid, SE=pneumatic-shaped solid		L/SE	L/SE	L/SE	L/SE
	8	Number of wheels, front/rear (X = driven)		4X/2	4X/2	4X/2	4X/2
DIMENSIONS	10	Lift height (TOF)	in	212.6	212.6	212.6	212.6
	11	Free lift (TOF)	in	N/A	N/A	N/A	N/A
	13a	Fork dimensions, thickness/width/length	in	4 x 8 x 96	4 x 8 x 96	4 x 10 x 96	5 x 10 x 96
	13b	Fork carriage width	in	105	105	114	114
	14	Mast tilt, a = forward /b = back	degrees	10/12	10/12	10/12	10/12
	15	Length to face of forks	in	216	226	216	226
	16	Center Drive Tire to Face of Forks	in	39.8	39.8	42	42
	17	Overall width	in	116	116	116	116
	18	Height of mast, lowered	in	174.2	174.2	179.5	179.5
	19	Height of mast, extended	in	278.5	277.2	283.9	283.9
	20	Cab height (deduct 2 inch for non-cab option)	in	133	132	133	133
	21	Seat height	in	86	84	86	86
	22	Towing coupling height	in	34	34	34	34
	23	Overall length (with 96 inch forks)	in	312	322	312	322
	24	Outer turning radius	in	197	207	197	207
	25	Inner turning radius (To C.L. of truck)	in	77	80	77	80
	26	Aisle width for 90 deg stack with pallets 48 x 48 wide (a=0 mm)	in	344	350	344	350
	27	Stability (Comply with ANSI B56.1)		YES	YES	YES	YES
PERFORMANCE	28	Travel speed with/without load	mph	16.7 / 19.2	16.1 / 17.4	17.3 / 18.0	17.3 / 18.0
	29	Lifting speed with/without load	ft/min	64.9 / 74.8	64.9 / 74.8	64.9 / 74.8	64.9 / 74.8
	30	Lowering speed with/without load	ft/min	66.9 / 76.7	66.9 / 76.7	66.9 / 76.7	66.9 / 76.7
	31	Drawbar pull with/without load @ 1.m/h	lbs-f	24953 / 20457	21805 / 22255	24953 / 20232	24953 / 20232
	32	Drawbar pull with/without load, Max.	lbs-f	25627 / 25852	28325 / 28774	24953 / 25852	24953 / 25852
	33	Gradeability with/without load @ 1 m/h	%	24 / 35	24 / 42	22 / 34	22 / 33
	34	Gradeability with/without load, Max.	%	29 / 37	32 / 35	28 / 36	28 / 36
	35	Acceleration time with/without load (0-50 ft distance)	sec	5.9 / 6.5	5.9 / 6.5	5.6 / 6.4	5.6 / 6.4
WT.	36	Unladen weight including front end	lb	60,289	58,679	66,204	64,034
	37	Axle loading with load, front/rear (36in LC)	lb	92,983 / 7,870	90,059/8,262	100,513 / 9,700	97,303/8,464
	38	Axle loading with load, front/rear (48in LC)	lb	87,628 / 7,934	85,535/8,170	96,959 / 8,933	92,200/8,250
	39	Axle loading without load, front/rear (36in and 48in LC)	lb	28,752 / 31,536	27,415/30,406	30,961 / 35,249	28,526/32,240
WHEELS	40	Tire size, front (minimum)		14.00 X 24 - 20	14.00 X 24 - 20	14.00 X 24 - 20	14.00 X 24 - 20
	41	Tire size, rear (minimum)		14.00 X 24 - 20	14.00 X 24 - 20	14.00 X 24 - 20	14.00 X 24 - 20
	42	Wheelbase	in	138	148	138	148
	43	Tread width, front (cl outer tires)	in	100	100	100	100
	44	Track width, rear	in	83	83	83	83

CERTIFICATION: These Hyster® lift trucks meet design specifications of Part II ANSI B56.1-1969, as required by OSHA Section 1910.178(a)(2) and also comply with Part III ANSI B56.1-revision in effect at time of manufacture. Certification of compliance with the applicable ANSI standards appears on the lift truck.

NOTE: Performance specifications / ratings are for truck equipped as described under Standard Equipment in this Technical Guide. Performance specifications are affected by the condition of the vehicle and how it is equipped, as well as by the nature and condition of the operating area. Specifications are subject to change and the proposed application should be discussed with your authorized Hyster Dealer.

It's not just about the lift trucks.

Any company worth its weight knows success has just as much to do with the support before and after the sale as the sale itself. We pride ourselves on being more than just a lift truck manufacturer. Through our Dealer Network, we're also fleet managers, parts suppliers, capital procurement specialists and trainers. You'll find that when it comes to service, we do it all.

Hyster Fleet Services

As much as we'd like for your entire fleet to be Hyster, we know that's not always the case. But just because you also operate other brands doesn't mean we can't manage your lift truck maintenance and replacement plan. We can analyze your current fleet or provide summary of your fleet history and a cost-effective proposal for replacement and scheduled maintenance of all your vehicles. Once this initial review is complete, we'll continue to monitor your fleet to ensure it's performing optimally.

UNISOURCE™ Parts Program

In addition to providing fleet management for a variety of brands, we can also serve as your source of parts for all your lift trucks. With the Hyster UNISOURCE parts and service program, we offer approximately 2 million part number crosses for most brands of materials handling and other in-plant mobile equipment. UNISOURCE also has remanufactured parts that provide the same quality and guarantee but at a lower price. And we can deliver parts to you in less than 24 hours, any day of the week. How's that for convenience?

Rental Products

At Hyster Company, we're always looking for ways to help you keep your productivity up. Through the Hyster Dealer Network, you can access rental equipment for the times when leasing or buying isn't a practical option. Your local Hyster Dealer has access to over 14,000 units that are available for short- or long-term rental. Whether you need one truck to substitute for a vehicle that's being serviced or several lift trucks to accommodate seasonal changes in your business, we'll help you maintain output in a cost-effective manner.

Hyster Capital

We know that financing new additions to your fleet can sometimes be challenging. That's why your Hyster Dealer has a long list of ways for you to fund your purchase. We are skilled in arranging 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 better service and competitive rates, ensuring you receive the value you deserve.

Special Products Engineering Department (SPED)

In a perfect world, every application could be handled with a standard lift truck. However, in the real world, different materials require different handling. That's why Hyster Company's Special Products Engineering Department works with you to customize* your lift trucks. From strobe lights to specially made forks, SPED can provide you with the tools you require to get the job done right.

** May be subject to an additional charge. Contact your local authorized Hyster Dealer for more information.*

Automated Warehouse Solutions

As society's technological capabilities advance, we strive to find practical applications. One of our most recent innovations in that pursuit is our development of automated warehouse solutions. We can help you determine if your operation would benefit from this type of system, which improves inventory accuracy, warehouse productivity and safety records, as it reduces maintenance and overtime.

Operator and Service Training

Hyster Company recognizes that proper training is a key element of a profitable company. That's why your local authorized Hyster Dealer offers a training program for your lift truck operators as well as those who maintain your vehicles. Proper education in running and servicing lift trucks cuts down on the number of repairs and risk of injuries due to accidents while increasing productivity. All of our trainers are professionals with experience in materials handling.

HYSTER COMPANY UL REGISTERED FIRM ISO 9001:2000 A12495

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