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ReachStacker Container Handlers

RS 45-27 CH, RS 45-31 CH, RS 46-36 CH
RS 46-41L CH, RS 46-41S CH, RS 46-41LS CH

ReachStacker Intermodal Handlers

RS 45-24 IH, RS 45-28 IH, RS 46-33 IH
RS 46-38L IH, RS 46-38S IH, RS 46-38LS IH

Built on Experience

ReachStacker Development Story

Hyster began building ReachStackers in 1995 and since that time, hundreds have been delivered to customers worldwide.

The latest generation of trucks in the RS45-46 range consists of 12 models, starting with ‘first row’ Container Stackers through to ‘second-rail’ Intermodal Handlers.

These ReachStackers, in addition to adopting the best features of the previous generation, are available with either Stage IIIA or Stage IIIB compliant engines, in order to meet the different legislative requirements, regarding exhaust emissions.

- **Fastest Lifting Speeds**
- **All-round Visibility & Sliding Vista Cab**
- **Compact Design**
- **Proven Concept**
- **Lowest Cost of Operation and Ownership**

First, Second and Third Row ReachStackers

The Hyster RS range of ReachStackers has been designed to achieve maximum space utilisation on container terminals, thanks to outstanding manoeuvrability, superior handling speed and unrestricted stacking capabilities, delivering class leading productivity and at the same time, keeping operating costs to a minimum.

Compact

- Compact machine with a standard wheelbase of 6.2 m, and a turning radius of just 8.42 m to 8.5 m (depending on the model). The RS46-41LS CH and RS46-38LS IH models have a wheelbase of 6.7 m and a turning radius of 9.17 m.

Fast Lifting Speeds

- The practical average 4-mode speed is a fantastic 0.41 m/sec., with the 224 kW (300 Hp) Stage IIIA engine.

Strong and Durable

- Capacities of up to 41 tonnes in the 2nd row - for the CH model - ensuring that there are no container weight limitations when handling containers in the 2nd row.

Stacking Ability

- Ability to stack containers five-high (9'6" in the 1st row and 8'6" in the second row, with 6-high 8'6" in the first row now available as an option).

All-round Visibility

- Excellent visibility all-round, thanks to a Powered Sliding Cab, wide-spaced rear boom supports, and the sloping contours of the rear counterweight.

Proven Concept

- Proven concept using the refined structures (frame, boom and spreaders) of the original Hyster ReachStacker, together with proven driveline, hydraulic and control components.

A Framework of Experience

Frame

- The frame and boom structures offer excellent durability.
- The frame is immensely strong, as heavy-duty welding of the main sections and the wide-spaced rear supports provide rigidity. Furthermore, the design delivers excellent visibility to the rear.
- The new boom design, with increased plate thickness on the inner boom, offers increased durability, easier maintenance, as well as less wear and improved component life. This results in lower service costs and improved uptime, which help to reduce overall operating costs.

- The pivot points for the boom are positioned right at the back of the frame and therefore minimise the 'overhang', resulting in a very compact machine and ensuring that the excellent rearward visibility is maintained, even when the boom is raised.
- The two-stage boom is rectangular in shape, is welded both inside and outside, and telescopes on self-lubricating self-aligning non-metallic bearings.

Power & Performance

Fastest

- The hydraulic system is highly efficient, and features 'Power on demand' and 'Two-speed lift' functions.
- The result is lifting speeds that are class leading: The practical 4-mode average lifting speed is a fantastic 0.41 m/sec. with the 224 kW (300Hp) Stage IIIA engine.
- Average of four lifting modes:
  - › Unladen lift speed = 0.48 m/sec.
  - › Laden lift speed = 0.25 m/sec (with 78% load = 35 ton).
  - › Unladen lowering speed = 0.45 m/sec.
  - › Laden lowering speed = 0.46 m/sec.

Clean Power Choice

- The Hyster ReachStackers are available with two engine options. Stage IIIB compliant trucks (for EU countries, and other territories where Ultra-Low Sulphur Diesel is available), feature the new Cummins QSL9 9-litre engine. Stage IIIA compliant trucks (for other markets) have the Cummins QSM11 10.8 litre engine.
- The 'Cooling on Demand' and 'Load Sensing Hydraulics' systems only use power when needed and therefore help to reduce overall fuel consumption.
- Cooling on Demand is provided by a hydraulically-driven fan, which reduces both noise and power consumption during cooling - The fan can operate at variable speeds (depending on cooling needs) to ensure that during driving and handling operations the maximum engine power is available, so reducing overall operating costs.
- Two Variable Displacement Pumps (VDP) are used to provide the steering and main hydraulic functions. When the engine is operating at a low r/min, one pump is active with the second cutting in only when the system senses that increased engine power is being applied. A third VDP provides pressure and flow to the hydraulic fan, which always provides minimum pressure and flow for filtration and axle cooling, so preventing unnecessary power (and fuel) usage.

Power Packages

- Stage IIIB:

  For use mainly within EU (European Union) countries, trucks with Stage IIIB diesel engines have significantly reduced exhaust gas emissions. Also by downsizing the engine and applying Hyster Intelligent Design criteria, these trucks are not only cleaner running but also more economical, achieving up to 20% fuel saving.

  - The new Stage IIIB compliant Cummins QSL9 9-litre engine has a maximum performance of 276 kW (370 Hp) at 1900 rpm and maximum torque of 1491 Nm at 1500 rpm. The transmission available as standard with the engine is the TE-27 series, with the TE-32 available as an option.

NOTE: A Stage IIIB engine must run on Ultra Low Sulphur Diesel (ULSD) fuel, with a maximum of 15 ppm sulphur content. Diesel fuel with a higher sulphur content than 15 ppm will compromise the emissions performance of the Stage IIIB engine and may result in damage to components.

- Stage IIIA:

  This existing diesel engine conforms to Stage IIIA emission standards and will continue to be supplied into markets where the NRMM (Non Road Mobile Machinery) Stage IIIB legislation does not apply.

  The standard Stage IIIA compliant Cummins QSM11 10.8 litre engine has a maximum performance of 224 kW (300 Hp) @ 1800 rpm and maximum torque of 1424 Nm @ 1000-1400 rpm. The transmission available as standard with this engine is also the TE-27 series, with the TE-32 available as an option.

  As an option, for use in the heaviest duty applications, a version of the Stage IIIA Cummins QSM11 engine is available, with maximum performance of 272 kW (365 Hp) @ 1800 rpm. Maximum torque is a mighty 1674 Nm @ 1000-1400 rpm. The standard transmission is the TE-27 series, with the TE-32 available as an option.

  This power package results in noticeably quicker acceleration and agility, plus a 12% higher laden lift speed, and up to 2 km/h faster laden drive speed.

Drive Axle

- The wide heavy duty drive axle with reinforced spindles offers excellent sideways stability and long-term durability thanks to the strong end-reduction shafts and gears.
- Oil-immersed brakes on the drive axle feature oil cooling for durability and are virtually maintenance free.

Fuel Tank

- 890 litres (830 litres useable) - more than ample for a three-shift operation resulting in lower service costs and improved uptime.

Autoshift

- All trucks feature S.O.H. transmissions, which are fitted with the industry leading 'APC216' automatic gear change system. This auto-shift system features:
  - › Load-sensitive shifting action.
  - › Finely tuned shift points, which deliver low fuel consumption.
  - › A 'soft-shift' characteristic (through electronic 'throttle-back' function during gear change). In addition to providing improved driver comfort, the system also eliminates shifting-shocks on the driveline.
  - › An 'on the move' forward-reverse shifting lock-out function protects the transmission and drive-line against overloading, during abrupt direction changes.
  - › Back-up (reverse driving) alarm.

Cooling

- The cooling air outlet is located between the boom towers, for an improved cooling air flow path. This avoids dust being drawn from underneath the truck and hot air being circulated inside the truck. The hydraulically driven cooling fan only operates on-demand, consuming less energy, improving fuel economy and reducing noise.
- A tropical cooling system is standard: This provides additional cooling of the engine and hydraulic system, for working in ambient temperatures of up to maximum 50°C.

Protection Systems

- An engine protection system, acting on low oil pressure and high coolant temperature, is standard equipment.
- A transmission protection system, acting on high oil temperature, is also standard equipment.

  In order to minimise damage to the truck, these systems will initially decrease the engine power when a problem is detected and will derate the engine to creep mode if immediate action is not taken.

Hyster Steer Axle

- The steer axle features a double-acting, single steering cylinder with non-adjustable tie rods. It is renowned for its long lifespan and low maintenance requirements.
- Steer wheel nut protection (recessed studs) is also standard.

Ease of Operation & Excellent All-round Visibility

The RS series features the Hyster “Vista” cab, which has been designed to be the industry-leading ergonomic operator environment, and focuses on optimising driver comfort and visibility for maximum productivity.

- Large windows, fitted with tinted safety glass, offer excellent all-round visibility. This is further enhanced in poor weather conditions by a fresh air inlet, sliding windows, an effective heater and defroster and wipers (with intermittent wipe function) and washers on front, top and rear screens.
- The optional air-conditioning system is integrated into the heating and ventilation system, with manual temperature control. Sunshade screens are fitted on the top and rear windows.
- A joystick provides an intuitive control of boom lift and telescope, and spreader functions: Sideshift, Rotation, Telescope 20’-40’ and Twistlock unlocking (locking is automatic).
- 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 in gear, the ‘auto-throttle-up’ function is deactivated.

This gives additional fuel savings as the optimum engine rpm is ‘auto-matched’ to the hydraulics performance requested by the operator.

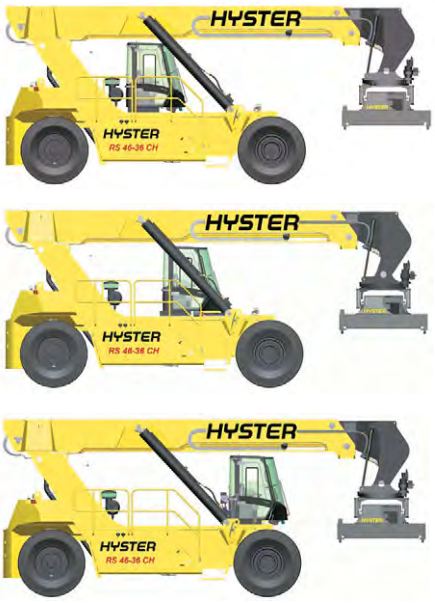
- Optional two speed lifting. High speed up to 10 tonnes load.
- Optional ‘Straight lift’ function. When activated, the boom derricking and telescoping functions are synchronized to give a functional ‘straight’ (vertical) lift movement of the container / load.
- Proportional controls for the spreader rotation functions and Powered Pile Slope (PPS – optional on CH).
- Full-flow return line filter with 5 micron cartridge on the main system.
- Optional drive speed on load limits vehicle speed between 7 km/h and maximum speed, depending on load weight and height. It can be set to user preferences.
- Improved controllability of functions:
  - Optional pre-defined user modes (smooth, medium, or direct).
  - Optional soft start/stop of hydraulic functions.

The cab features:

- A full-suspension fully adjustable driver’s seat with a high backrest, seat belt, operator presence system and “park brake off” warning buzzer.
- Optional map reading light and extra air circulation fan.
- An adjustable steering column, power-assisted steering and lever controls, push-button parking brake and conveniently positioned instruments.
- Responsive, fully hydraulic brakes and an automotive style pedal layout further contribute to driver confidence and comfort.
- Wide-view rear view mirrors inside cab, outside rear view mirrors on front fenders.
- The truck is equipped with a comprehensive set of road and work lights and two orange flashing beacons. For further details see under Lights.

Powered Sliding Cab

Illustration shows CH model with optional Full-sliding cab



A powered Partial-sliding cab standard on CH models:

- When the cab is located at the rear of the machine, it offers the most comfortable viewing angle when stacking containers 4-5 high, and this is often preferred by drivers, due to its position behind the lift cylinders.
- The cab can be moved to various positions for optimum visibility in variable operating conditions and/or to accommodate drivers preferences.
- The Powered Sliding Cab is operated by a switch inside the cab - to save time this can done while driving and/or lifting.
- The partial forward (0.9 m max.) cab position offers an unobstructed view of 40' (and 45') containers, from low (lorry bed) height up to higher lifting heights. Cab entry / exit is only possible in the rearward position.

A Powered Full-sliding cab is standard on IH models (optional on CH models):

- The cab can slide from the rear of the machine over 2.6 m to a fully forward position. This is essential for IH models when handling swap-bodies or trailers, so that the driver can see the grapple feet at ground level.
- Some drivers also prefer the fully forward position for low height container handling.
- Access is easy, thanks to convenient staircases plus platforms with handrails, and wide opening doors.
- For the version with powered full-sliding cab, extra steps and handrails are provided, on the left-hand front fender, to facilitate for cab entry / exit in the forward position. A second set of rear view mirrors, positioned on the front fenders is included as standard.
- The cab features a low noise level of 70 dB(A), according to the DIN 45635 standard.

Rearward visibility is excellent, thanks to:

- The widely spaced rear boom supports, and rear sloping design of the counterweight.
- The length of the counterweight extending out at the rear of the machine has been kept to a minimum.

  This has been achieved by using a solid piece of metal for the rear section of the box-type frame, so keeping much of the required ballast inside the machine.
- The unique 'boomerang' shaped frame, with the pivot point of the boom at the furthest point to the rear.

Hydraulic & Electrical Systems

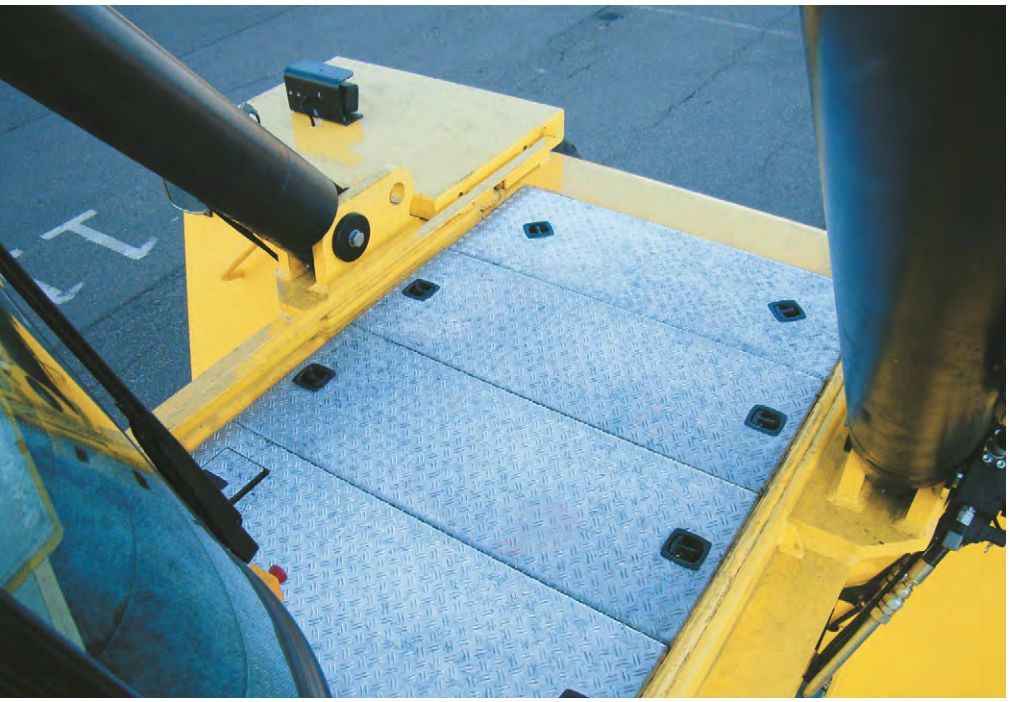
Hydraulics

- E-hydraulics, proportional controls and optional soft start / stop improve controllability and durability.
- Pumps: Two variable-displacement piston pumps, with a total performance of maximum 585 l/min.
- Hyster two-speed system with regenerative function results in high lift speeds.
- Leak-free ORFS (O-ring) type fittings are used throughout the whole machine.
- When hydraulic temperature is too low for operating conditions, the engine will derate. To prevent overheating of the hydraulic oil, an option is available which will reduce truck speed, giving time for the oil to cool down to the correct operating temperature.
- Filtration: Extremely 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 on power-assist and support systems.
- Large oil cooler for the hydraulic system, suitable for working in ambient temperatures of up to 50°C. 6000 hrs oil service interval means lower service cost.
- Hydraulic oil tank: 600 litre useable volume, with level and temperature gauge and magnetic drain plugs, providing additional cooling and reserve capacity.
- Hydraulic control program for easy status and diagnostics and custom settings. Hydraulic temperature protection means lower service costs and improved uptime.
- Emergency lowering device, to lower the spreader when the engine is not running.
- Centralised pressure check points.
- Damping system on the longitudinal (forwards / backwards) oscillating movement of the spreader, providing an effective ‘controlled sway’ of the spreader, under varying load weight and operating conditions.

Electrics

- 24 Volt system, 70 A alternator (Stage IIIA) or 120 A Prestolite alternator (Stage IIIB), 184 Ah battery with master switch.
- ‘CANbus’ diagnostic connection in the cab for engine, transmission, instruments, and load-moment protection system.

Ease of Servicing



Servicing

- The hydraulic oil tank features a sight glass for the oil level, as well as magnetic drain plugs. A sensor, with a warning light in the cab, to identify overheating of the oil temperature is available as an option.
- The cab is powered (Partial or Full-sliding) in combination with quickly removable (lightweight aluminium) floor plate sections, which provides truly excellent access for service work.
- New side panel design, plus the open structure, galvanized steps and running boards offer easier access to major systems and components.
- Easier access to electrics, oil and air filters.
- Driver access from the right-hand side is now optional.

Spreader Specifications

Container Handling Spreader

The Hyster 'CH' type Telescopic Container spreader, for handling 20'-40' ISO containers, features:

- A uniquely wide spaced boom head, to provide strong support for the spreader.
- A rotator with two hydraulic oil-immersed brakes and one hydraulic motor.
- Ample rotation angle of +195 / -105 degrees.
- A very smooth and precise rotation function, thanks to the E-hydraulic proportional controls, with an optional soft start / stop function for improved controllability and durability. In addition the rotation function is cushioned by a hydraulic accumulator.
- The Powered Damping Cylinders (PDC) function, (optional on CH and standard on IH models) 'tilts' the spreader forwards and backwards, over +/- 5 degrees, with limited power.
  - › Operated by a control knob on the joystick.
  - › Facilitates, for example, the easier positioning of the spreader onto containers, which are located on sideways (not front to back) sloping trailers. (For IH models, it is also used to facilitate easier engagement onto the bottom-lift points of trailers / swap-bodies).
- Free (non-powered) sideways articulation of +/- 2.5 degrees, to facilitate easy handling of containers on / off sloping trailers.
- 1600 mm total sideshift movement, 800 mm to each side.
- Pendular floating ISO twistlocks.
- Twistlocks turn automatically to locked position, unlocking is done manually.
- Twistlock indicator lights are standard equipment, and are positioned on the spreader, under the boom, and also inside the cab on the roof.
- Twistlock lock-out device, to help prevent;
  - › Picking up of a container on less than 4 corners
  - › Unlocking when carrying a container.
- Lift interrupt system on partially turned twistlocks, so lifting is possible only when twistlocks are either in the fully locked or in the unlocked position*.

  * With optional extra 30' automatic stop: Also suitable for general cargo lifted at 9 m length position.

- 4 Lifting eyes on the 4 corners of the end-beams of the telescopic container spreader, for lifting general cargo (of minimum 6 m length).

  NOTE: Full capacity use (40 tonne) is only allowed in 20' (6 m) or in the 40' (12 m) end-positions of the spreader, not in any in-between positions.

Intermodal Spreader

Equipped as the 'CH' spreader, with, in addition:

- PPS: 'Powered Pile Slope' (hydraulically powered sideways articulation of +/- 6.0 degrees), operated by 4 cylinders, to facilitate the precise positioning of the bottom-lift grapple feet onto (sloping) swap-bodies / trailers.
- Free (non-powered) sideways articulation is +/- 1.5 degrees, to facilitate easy handling of containers on / off sloping trailers.
- 4 integrally mounted 'bottom-lift' legs (at a fixed lateral distance of 4875 mm centre to centre), to handle swap-bodies / trailers (European types with bottom-lift points according to ISO 1496/1).
- When handling containers, all 4 legs can be hydraulically rotated (swivelled) upwards. The 'block-stacking' feature (standard equipment) allows the bottom-lift legs to fold-up within the contours of a (2.44 m wide) ISO container.
- With a swap-body or trailer in the four grapple arms, the truck will only drive 10km/h, in compliance with the ISO 3691 ruling. (This ruling does not apply when carrying a container by the twistlocks).

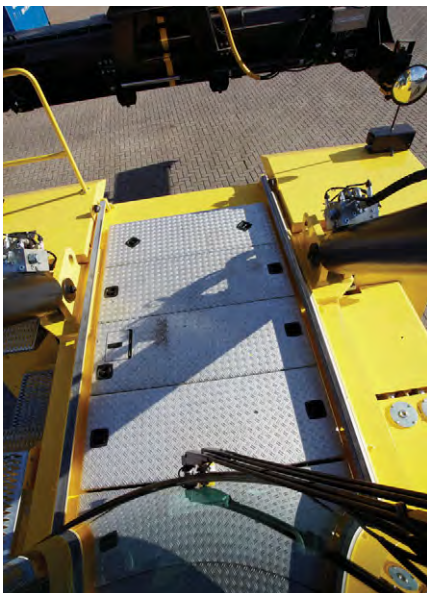
Other Features

Brakes

- Service Brake: Multiple oil immersed discs on the drive axle, with cooling system.
- Parking Brake: Dry disc brake on the drive axle input shaft, spring applied and hydraulically released.

Electronic Load Moment Control System

- With automatic shut-off beyond the rated load-moment.
- Automatic shut-off function on boom lowering and telescope-out).
- Warning lights in the dash board: Green, Orange (at 90% load-moment), Red (at 100% rated load moment)
- Digital display unit, showing actual load, max. rated load, and load distance plus load height.



Lights

- 10 front work lights (4 on the boom and 4 on the front fenders and 2 rear, all halogen type) 2 front marker lights, 4 direction indicators, 2 tail/stop lights, one orange flashing beacon, elevated above the boom, 2 work lights on the container spreader, directed towards the engagement points (4 work lights with intermodal spreader).

Optional Equipment

- Special tyres: Bias or diagonal type, with tread or as ‘slicks’.
- Automatic greasing system: On the truck, the boom and the CH or IH spreader. ‘Twin-line’ greasing system for precise and even distribution of grease to the many grease points. Two displays in the cab indicate the selected interval grease mode (light/medium/heavy duty).
- Special RAL colour(s) paint.
- Spare wheel (complete tyre and rim).
- Full-Sliding cab on a CH model.
- Right-hand cab access system.
- Storage box on running board for container stacking cones.
- Hydraulic (oil) temperature protection. This option reduces truck speed, if the hydraulic oil becomes too hot (> 85°C) in order to protect the hydraulic system components from damage. (A system to protect the truck when the hydraulic temperature is too low for operating conditions (<10°C) is fitted as standard.)
- H.I.D. (‘High Intensity Discharge’ Xenon lights) work lights, (4 x on the boom and 1 x on the rear of the truck), instead of standard Halogen lights.

  NOTE: Only suitable for (non-public) on-terminal use, as these very bright lights may cause inconvenience for other operators / personnel.

On the Container or Intermodal Spreader:

- 30’ Automatic stop, is required when handling (a) 30’ container(s). Consists of: Spreader reinforcements and electrically operated mechanical stop locks at 30’ spreader position.
- Extra lifting eyes (4 x) on the underside of the container spreader. Placed at 2500 mm (width) distance, for lifting compact general cargo (e.g. coils, blocks, machinery). Capacity 40 tonnes maximum, 10 tonnes per lifting eye. Includes reinforcements of the spreader structure.

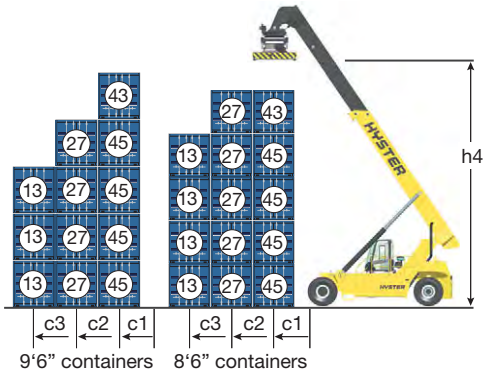
  NOTE: The 4 lifting eyes at the four corners of the spreader (near the twistlocks), are standard equipment.
- PPS (Powered Pile Slope) function on the CH spreader (standard on IH). Please consult your dealer for application advice on the PPS function.

In-Cab and Operator Convenience Items Include:

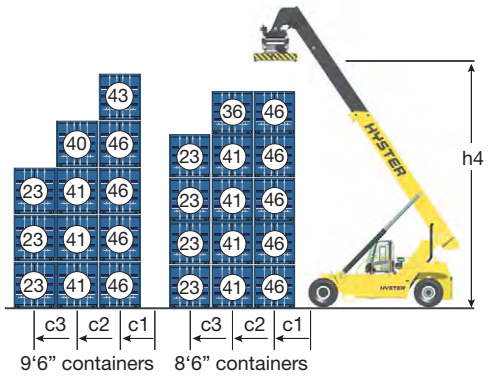
- Large multi-function colour display (screen size 86 x 115 mm) on the Load Moment Control system, with extra functions: Engine rpm, travel speed, engine temperature.
- Deluxe air suspended seat, instead of mechanically suspended seat. Also available with seat heating.
- Trainer seat (small extra seat cushion)
- Support stand with mounting plate, to fit computer terminal or communications equipment, in right-front area of the cab. (Restricts access via the right-hand cab door).
- Converter: 24 Volt DC to 12 Volt DC, to use 12 V accessories.

Rated Capacities and Stacking Heights – Container Handlers

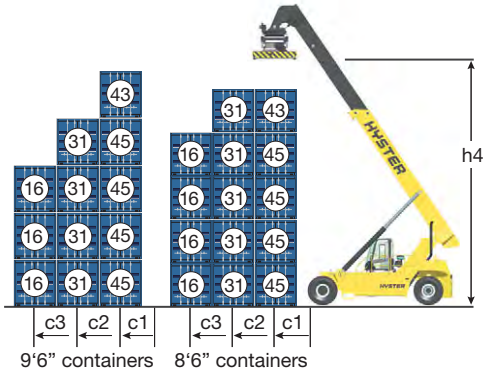
RS 45–27 CH Container Spreader



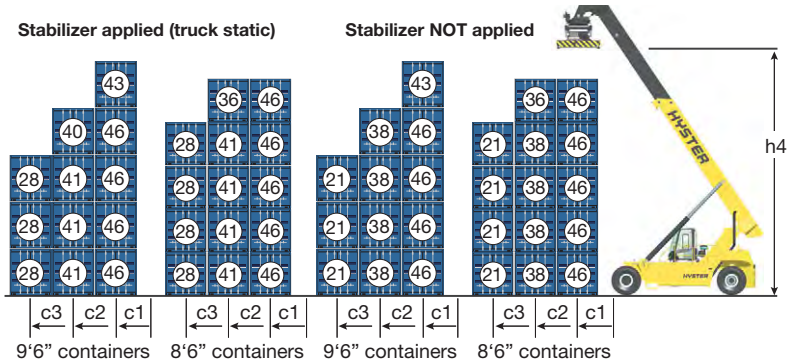
RS 46–41L CH Container Spreader



RS 45–31 CH Container Spreader

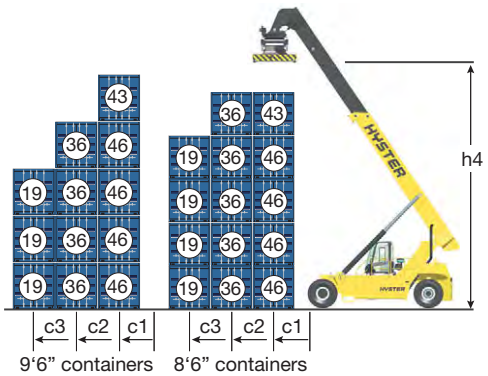


RS 46–41S CH Container Spreader

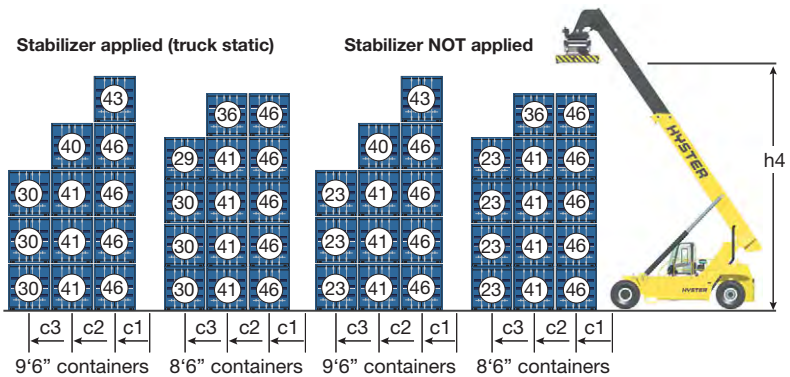


Note: All load centres c1, c2, c3 are taken from the front face of the (front) tyres, **deduct 100mm** for load centres taken from the **front face of the Stabilizer**.

RS 46–36 CH Container Spreader



RS 46–41LS CH Container Spreader

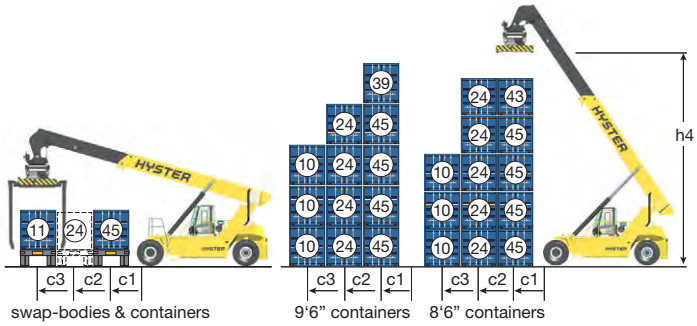


Note: All load centres c1, c2, c3 are taken from the front face of the (front) tyres, **deduct 100mm** for load centres taken from the **front face of the Stabilizer**.

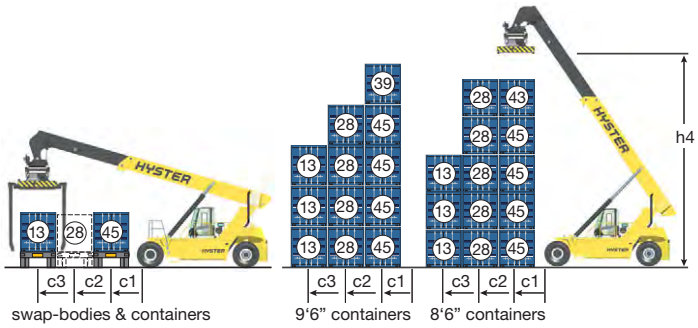
NOTE: Care must be exercised when handling elevated loads.
When the load is elevated, truck stability is reduced.

Rated Capacities and Stacking Heights – Intermodal Handlers

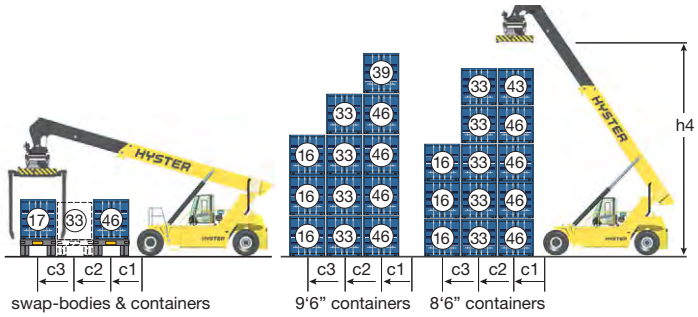
RS 45–24 IH Intermodal Spreader



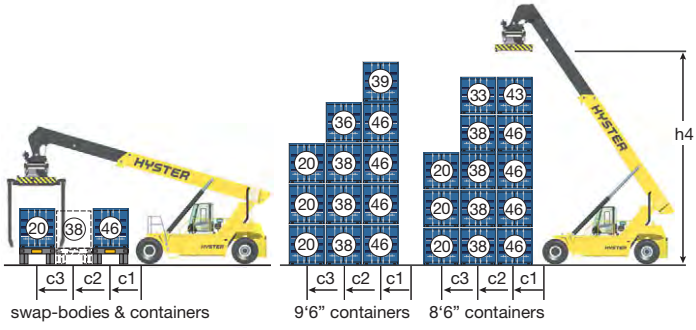
RS 45–28 IH Intermodal Spreader



RS 46–33 IH Intermodal Spreader

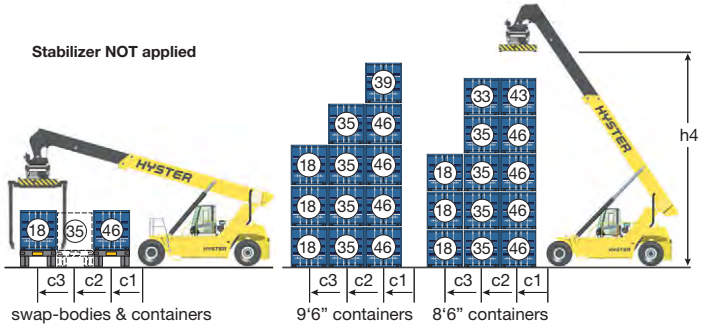


RS 46–38L IH Intermodal Spreader

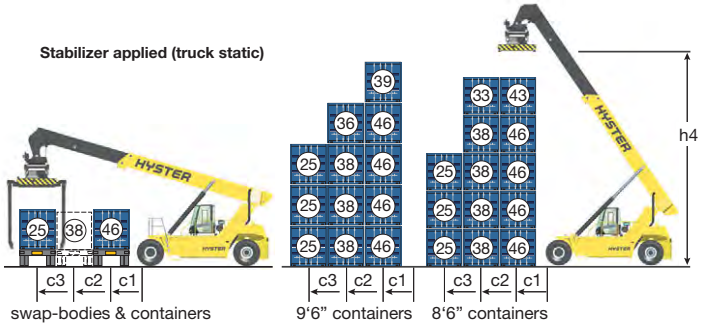


RS 46–38S IH Intermodal Spreader

Stabilizer NOT applied



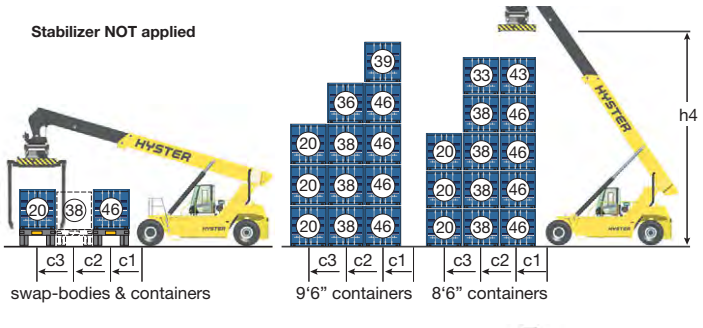
Stabilizer applied (truck static)



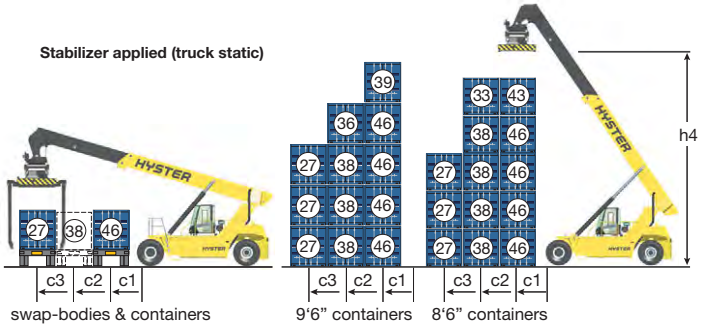
Note: All load centres c1, c2, c3 are taken from the front face of the (front) tyres, **deduct 100mm** for load centres taken from the **front face of the Stabilizer**.

RS 46–38LS IH Intermodal Spreader

Stabilizer NOT applied



Stabilizer applied (truck static)



Note: All load centres c1, c2, c3 are taken from the front face of the (front) tyres, **deduct 100mm** for load centres taken from the **front face of the Stabilizer**.

NOTE: Care must be exercised when handling elevated loads.
When the load is elevated, truck stability is reduced.

RS 45-27 CH - RS 46-41LS CH Container Handlers

CHARACTERISTICS	1.1	Manufacturer		HYSTER			HYSTER			HYSTER		
	1.2	Model designation		RS 45-27 CH			RS 45-31 CH			RS 46-36 CH		
	1.3	Power: battery, diesel, LPG, electric mains		Diesel			Diesel			Diesel		
	1.5	Load capacity first / second / third container row	Q (kg)	45 000	27 000	13 000	45 000	31 000	16 000	46 000	36 000	19 000
		Load capacity first / second / third row, with Stabilizer applied (truck static)	Q (kg)	N/A			N/A			N/A		
	1.6	Load centre first/second/third container row, from face of front tyres ◆	c1/c2/c3 (mm)	1 865	3 815	6 315	1 865	3 815	6 315	1 865	3 815	6 315
	1.8	Load distance to face of front tyres / front of Stabilizer	x (mm)	840 / NA			840 / NA			930 / NA		
	1.9	Wheelbase	y (mm)	6 200			6 200			6 200		
WEIGHTS	2.1	Unladen weight	kg	68 500			72 200			79 300		
	2.2	Axle loading at load centre c1, with rated load, front / rear	kg	99 900	13 600		99 600	17 600		103 200	22 100	
	2.2	Axle loading at load centre c2, with rated load, front / rear	kg	87 800	7 700		94 500	8 700		105 300	10 000	
	2.3	Axle loading at load centre c1, unloaded, front / rear	kg	35 300	33 200		35 000	37 200		36 500	42 800	
	2.3	Axle loading at load centre c2, unloaded, front / rear	kg	40 500	28 000		40 300	31 900		41 700	37 600	
WHEELS & TYRES	3.1	Tyres: L=pneumatic, V=solid, SE=pneumatic-shaped solid		L			L			L		
	3.2	Tyre size, front		18.00 x 25			18.00 x 25			18.00 x 33		
	3.3	Tyre size, rear		18.00 x 25			18.00 x 25			18.00 x 33		
	3.5	Number of wheels front/rear (X = driven)		4X / 2			4X / 2			4X / 2		
	3.6	Track width, front	mm	3 033			3 033			3 033		
	3.7	Track width, rear	mm	3 020			3 020			3 020		
DIMENSIONS	4.1	Boom angle minimum / maximum	degrees	0° / 59°			0° / 59°			0° / 59°		
	4.2	Boom height, minimum	h1 (mm)	4 700			4 700			4 760		
	4.3	Minimum distance spreader from ground ●	h2 (mm)	1 342			1 342			1 440		
	4.4	Maximum lift height under spreader, in first container row / second container row ●	h4 (mm)	15 260	13 850		15 260	13 850		15 370	13 960	
	4.5	Boom height, maximum	h6 (mm)	18 110			18 110			18 200		
	4.8	Seat height	h7 (mm)	2 555			2 555			2 645		
	4.19	Overall length	l1 (mm)	11 873			11 873			12 073		
	4.20	Length without boom	l2 (mm)	8 360			8 360			8 650		
	4.21	Overall width over front tyres	b2 (mm)	4 220			4 220			4 220		
	4.30	Sideshift movement, from centre to left / right	b8 (mm)	800 / 800			800 / 800			800 / 800		
	4.31	Ground clearance lowest point, without load	m1 (mm)	312			312			400		
	4.32	Ground clearance, center of wheelbase	m2 (mm)	495			495			585		
	4.34	90° Stacking Aisle 20' / 40', spreader central above front axle, without operating clearance †	Ast (mm)	9 817	12 569		9 817	12 569		9 977	12 569	
		90° Stacking Aisle 20' / 40', without operating clearance ❖	Ast (mm)	12 439	14 203		12 439	14 203		12 608	14 203	
		90° Stacking Aisle 20' / 40', with 200mm operating clearance ❖	Ast (mm)	12 639	14 403		12 639	14 403		12 808	14 403	
		90° Stacking Aisle 20' / 40', with 10% operating clearance according FEM TN01 ❖	Ast (mm)	13 683	15 623		13 683	15 623		13 869	15 623	
	4.35	Turning radius	Wa (mm)	8 495			8 495			8 562		
PERFORMANCE	5.1	Travel speed with load / without load - with 224 kW Stage IIIA engine	km/h	20	23		20	23		20	25	
		Travel speed with load / without load - with optional 272 kW Stage IIIA engine	km/h	21	23		21	23		23	26	
		Travel speed with load / without load - with 276 kW Stage IIIB engine	km/h	20	22		20	22		21	23	
	5.2	Lifting speed with load (35 ton) / without load, first row average - with 224 kW Stage IIIA engine	m/s	0,25	0,48		0,25	0,48		0,25	0,48	
		Lifting speed with load (35 ton) / without load, first row average - with optional 272 kW Stage IIIA engine	m/s	0,28	0,48		0,28	0,50		0,28	0,50	
		Lifting speed with load (35 ton) / without load, first row average - with 276 kW Stage IIIB engine	m/s	0,28	0,48		0,28	0,50		0,28	0,50	
	5.3	Lowering speed with / without load	m/s	0,46	0,45		0,46	0,45		0,46	0,45	
	5.6	Maximum drawbar pull with load (with all engines)	kN	378			378			378		
	5.7	Gradeability with load (with all engines) @1.6 km/h ¶	%	22	26		22	26		22	26	
	5.8	Maximum gradeability with load (with all engines) ¶	%	34			33			32		
	5.10	Service brake		Oil immersed brakes			Oil immersed brakes			Oil immersed brakes		
POWER UNIT	7.1	Engine make and type		Cummins QSM11/QSL9			Cummins QSM11/QSL9			Cummins QSM11/QSL9		
	7.2	Engine power, in accordance with ISO1585, Stage IIIA: maximum @ 1800 rpm / nominal @ max. 2100 rpm	kW(hp)	Stage IIIA: 224 (300) / 216 (290) optional Stage IIIA: 272 (365) / 261 (350)								
		Stage IIIB: maximum @ 1900 rpm / nominal @ max. 2100 rpm	kW(hp)	Stage IIIB: 276 (370) / 261 (350)								
	7.3	Governed maximum engine speed	rpm	2 100			2 100			2 100		
	7.4	Number of cylinders/displacement	cm3	Stage IIIA: QSM11: 6 / 10 800 Stage IIIB: QSL9: 6 / 8 900								
	7.5	Fuel consumption, average	l/h	Stage IIIA QSM11: 20 Stage IIIB QSL9: 17								
OTHER	8.1	Drive control		4-speed autoshift SOH TE27 optional SOH TE32								
	8.2	Pressure for attachments	bar	260			260			260		
	8.3	Oil flow for attachments	l/min	110			110			110		
	8.4	Noise level LpAZ, inside cab, according to DIN 45635 O	dB (A)	70								
		Noise level LWAZ outside truck	dB (A)	Stage IIIA: QSM11: 112 Stage IIIB: QSL9: 109								
	8.5	Towing coupling type		-			-			-		

Specification data is based on VDI 2198

HYSTER			HYSTER			HYSTER			
RS 46-41L CH			RS 46-41S CH			RS 46-41LS CH			CHARACTERISTICS
Diesel			Diesel			Diesel			
46 000	41 000	23 000	46 000	38 000	21 000	46 000	41 000	23 000	
N/A			46 000	41 000	28 000	46 000	41 000	30 000	
1 865	3 815	6 315	1 865	3 815	6 315	1 865	3 815	6 315	
930 / NA			930 / 1 030			930 / 1 030			
6 700			6 200			6 700			

82 600		83 600		84 600		WEIGHTS
103 400	25 200	105 400	24 200	105 600	25 000	
113 100	10 500	111 900	10 200	115 300	10 300	
38 200	44 400	38 700	44 900	40 400	44 200	
43 000	39 600	43 900	39 700	45 300	39 300	

L		L		L		WHEELS & TYRES
18.00 x 33		18.00 x 33		18.00 x 33		
18.00 x 33		18.00 x 33		18.00 x 33		
4X / 2		4X / 2		4X / 2		
3 033		3 033		3 033		
3 020		3 020		3 020		

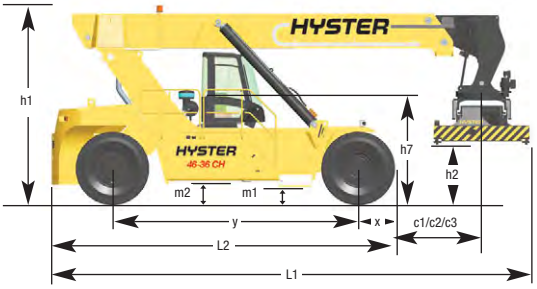
0° / 59°		0° / 59°		0° / 59°		DIMENSIONS
4 760		4760		4 760		
1 440		1 440		1 440		
15 370	13 960	15 370	13 960	15 370	13 960	
18 200		18 200		18 200		
2 645		2 645		2 645		
12 573		12 073		12 573		
9 150		8 750		9 250		
4 220		4 220		4 220		
800 / 800		800 / 800		800 / 800		
400		250		250		
585		585		585		
10 477	12 569	9 977	12 569	10 477	12 569	
12 608	14 203	12 608	14 203	12 608	14 203	
12 808	14 403	12 808	14 403	12 808	14 403	
13 869	15 623	13 869	15 623	13 869	15 623	
9 062		8 562		9 062		

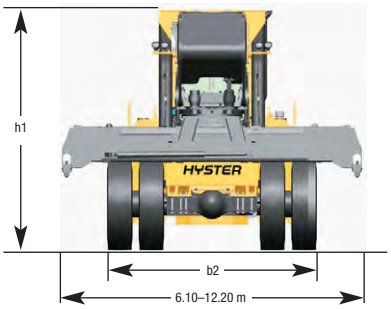
19	22	19	22	19	22	PERFORMANCE
20	24	20	24	20	24	
21	23	21	23	21	23	
0,25	0,48	0,25	0,48	0,25	0,48	
0,28	0,50	0,28	0,50	0,28	0,50	
0,28	0,50	0,28	0,50	0,28	0,50	
0,46	0,45	0,46	0,45	0,46	0,45	
374		376		374		
19	22	19	22	19	22	
29		29		29		
Oil immersed brakes		Oil immersed brakes		Oil immersed brakes		

Cummins QSM11/QSL9		Cummins QSM11/QSL9	Cummins QSM11/QSL9	POWER UNIT
Stage IIIA: 224 (300) / 216 (290) optional Stage IIIA: 272 (365) / 261 (350)			
Stage IIIB: 276 (370) / 261 (350)			
2100		2100	2100
Stage IIIA: QSM11: 6 / 10 800 Stage IIIB: QSL9: 6 / 8 900			
Stage IIIA QSM11: 20 Stage IIIB QSL9: 17			

4-speed autoshift SOH TE27 optional SOH TE32			OTHER
260		260	260
110		110	110
70			
Stage IIIA: QSM11: 112 Stage IIIB: QSL9: 109			
-		-	-

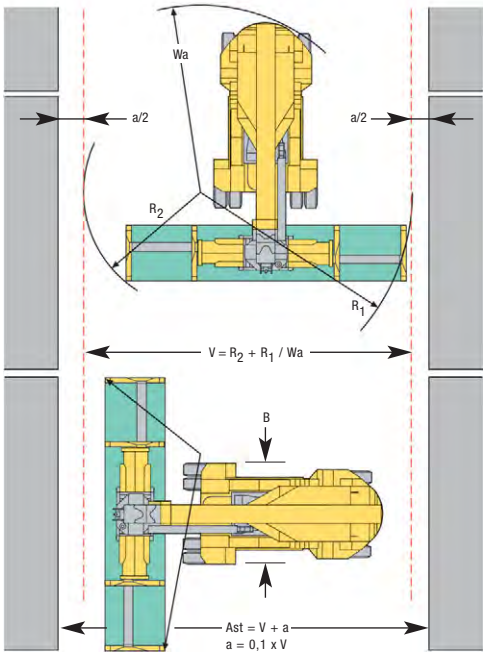
Illustration shows CH model





90 Degree Stacking Aisle

(According to FEM TN01)



Ast = Practical 90 degrees Stacking aisle
= V (theoretical stacking aisle) + a (total operating clearance)

Where V = R2 + the larger of R1 or Wa

a = 200 mm (100 mm each side acc. VDI) See line 4.34

a = 10% of V (acc. FEM TN01 recommendation).

Notes:

Please refer to notes on the following page.

RS 45-24 IH - RS 46-38LS IH Intermodal Handlers

CHARACTERISTICS	1.1	Manufacturer		HYSTER			HYSTER			HYSTER		
	1.2	Model designation		RS 45-24 IH			RS 45-28 IH			RS 46-33 IH		
	1.3	Power: battery, diesel, LPG, electric mains		Diesel			Diesel			Diesel		
	1.5	Load capacity first / second / third container row	Q (kg)	45 000	24 000	11 000	45 000	28 000	12 000	46 000	33 000	17 000
		Load capacity first / second / third row, with Stabilizer applied (truck static)	Q (kg)	N/A			N/A			N/A		
	1.6	Load centre first/second/third container row, from face of front tyres ◆	c1/c2/c3 (mm)	1 865	3 815	6 315	1 865	3 815	6 315	1 865	3 815	6 315
	1.8	Load distance to face of front tyres / front of Stabilizer	x (mm)	840 / NA			840 / NA			930 / NA		
	1.9	Wheelbase	y (mm)	6 200			6 200			6 200		
WEIGHTS	2.1	Unladen weight	kg	72 400			76 100			83 200		
	2.2	Axle loading at load centre c1, with rated load, front / rear	kg	105 400	12 000		105 200	15 900		108 800	20 400	
	2.2	Axle loading at load centre c2, with rated load, front / rear	kg	89 300	7 100		96 000	8 100		106 800	9 400	
	2.3	Axle loading at load centre c1, unloaded, front / rear	kg	40 800	31 600		40 500	35 600		42 100	41 100	
	2.3	Axle loading at load centre c2, unloaded, front / rear	kg	47 300	25 100		47 000	29 100		48 600	34 600	
WHEELS & TYRES	3.1	Tyres: L=pneumatic, V=solid, SE=pneumatic-shaped solid		L			L			L		
	3.2	Tyre size, front		18.00 x 25			18.00 x 25			18.00 x 33		
	3.3	Tyre size, rear		18.00 x 25			18.00 x 25			18.00 x 33		
	3.5	Number of wheels front/rear (x = driven)		4X / 2			4X / 2			4X / 2		
	3.6	Track width, front	mm	3 033			3 033			3 033		
	3.7	Track width, rear	mm	3 020			3 020			3 020		
DIMENSIONS	4.1	Boom angle minimum / maximum	degrees	0° / 59°			0° / 59°			0° / 59°		
	4.2	Boom height, minimum	h1 (mm)	4 700			4 700			4 760		
	4.3	Minimum distance spreader from ground ●	h2 (mm)	882			882			981		
	4.4	Maximum lift height under spreader, in first container row / second container row ●	h4 (mm)	14 780	13 375		14 780	13 375		14 880	13 375	
	4.5	Boom height, maximum	h6 (mm)	18 110			18 110			18 200		
	4.8	Seat height	h7 (mm)	2 555			2 555			2 645		
	4.19	Overall length	l1 (mm)	11 873			11 873			12 073		
	4.20	Length without boom	l2 (mm)	8 360			8 360			8 650		
	4.21	Overall width over front tyres	b2 (mm)	4 220			4 220			4 220		
	4.30	Sideshift movement, from centre to left / right	b8 (mm)	800 / 800			800 / 800			800 / 800		
	4.31	Ground clearance lowest point, without load	m1 (mm)	312			312			400		
	4.32	Ground clearance, center of wheelbase	m2 (mm)	495			495			585		
	4.34	90° Stacking Aisle 20' / 40', spreader central above front axle, without operating clearance †	Ast (mm)	9 817	12 569		9 817	12 569		9 977	12 569	
		90° Stacking Aisle 20' / 40', without operating clearance ❖	Ast (mm)	12 439	14 203		12 439	14 203		12 608	14 203	
		90° Stacking Aisle 20' / 40', with 200mm operating clearance ❖	Ast (mm)	12 639	14 403		12 639	14 403		12 808	14 403	
		90° Stacking Aisle 20' / 40', with 10% operating clearance according FEM TN01 ❖	Ast (mm)	13 683	15 623		13 683	15 623		13 869	15 623	
	4.35	Turning radius	Wa (mm)	8 495			8 495			8 562		
PERFORMANCE	5.1	Travel speed with load / without load - with 224 kW Stage IIIA engine	km/h	20	23		20	23		20	25	
		Travel speed with load / without load - with optional 272 kW Stage IIIA engine	km/h	21	23		21	23		23	26	
		Travel speed with load / without load - with 276 kW Stage IIIB engine	km/h	20	22		20	22		21	23	
	5.2	Lifting speed with load (35 ton) / without load, first row average - with 224 kW Stage IIIA engine	m/s	0,24	0,47		0,24	0,47		0,24	0,47	
		Lifting speed with load (35 ton) / without load, first row average - with optional 272 kW Stage IIIA engine	m/s	0,27	0,47		0,27	0,47		0,27	0,47	
		Lifting speed with load (35 ton) / without load, first row average - with 276 kW Stage IIIB engine	m/s	0,27	0,47		0,27	0,47		0,27	0,47	
	5.3	Lowering speed with / without load	m/s	0,46	0,45		0,46	0,45		0,46	0,45	
	5.6	Maximum drawbar pull with load (with all engines)	kN	378			378			378		
	5.7	Gradeability with load (with all engines) @1.6 km/h ¶	%	22	26		22	26		22	26	
	5.8	Maximum gradeability with load (with all engines) ¶	%	33			32			31		
	5.10	Service brake		Oil immersed brakes			Oil immersed brakes			Oil immersed brakes		
POWER UNIT	7.1	Engine make and type		Cummins QSM11/QSL9			Cummins QSM11/QSL9			Cummins QSM11/QSL9		
	7.2	Engine power, in accordance with ISO1585, Stage IIIA: maximum @ 1800 rpm / nominal @ max. 2100 rpm	kW(hp)	Stage IIIA: 224 (300) / 216 (290) optional Stage IIIA: 272 (365) / 261 (350)								
		Stage IIIB: maximum @ 1900 rpm / nominal @ max. 2100 rpm	kW(hp)	Stage IIIB: 276 (370) / 261 (350)								
	7.3	Governed maximum engine speed	rpm	2 100			2 100			2 100		
	7.4	Number of cylinders/displacement	cm3	Stage IIIA: QSM11: 6 / 10 800 Stage IIIB: QSL9: 6 / 8 900								
	7.5	Fuel consumption, average	l/h	Stage IIIA QSM11: 20 Stage IIIB QSL9: 17								
OTHER	8.1	Drive control		4-speed autoshift SOH TE27 optional SOH TE32								
	8.2	Pressure for attachments	bar	260			260			260		
	8.3	Oil flow for attachments	l/min	110			110			110		
	8.4	Noise level LpAZ, inside cab, according to DIN 45635 O	dB (A)	70								
		Noise level LWAZ outside truck	dB (A)	Stage IIIA: QSM11: 112 Stage IIIB: QSL9: 109								
	8.5	Towing coupling type		-			-			-		

Specification data is based on VDI 2198

HYSTER			HYSTER			HYSTER			
RS 46-38L IH			RS 46-38S IH			RS 46-38LS IH			
Diesel			Diesel			Diesel			
46 000	38 000	20 000	46 000	35 000	18 000	46 000	38 000	20 000	CHARACTERISTICS
N/A			46 000	38 000	25 000	46 000	38 000	27 000	
1 865	3 815	6 315	1 865	3 815	6 315	1 865	3 815	6 315	
930 / NA			930 / 1 030			930 / 1 030			
6 700			6 200			6 700			

86 500		87 500		88 500		WEIGHTS
108 800	23 700	111 000	22 500	111 000	23 500	
114 500	10 000	112 500	10 000	116 700	9 800	
43 600	42 900	44 200	43 300	45 800	42 700	
49 600	36 900	50 700	36 800	51 900	36 600	

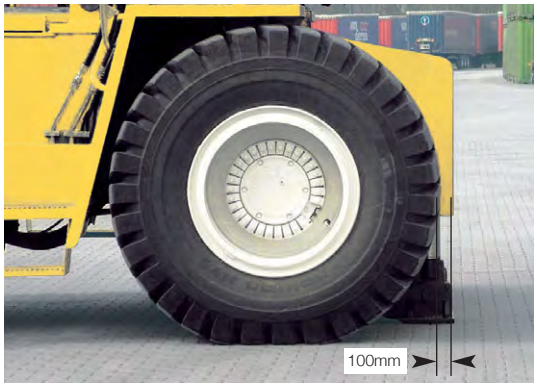
L		L		L		WHEELS & TYRES
18.00 x 33		18.00 x 33		18.00 x 33		
18.00 x 33		18.00 x 33		18.00 x 33		
4X / 2		4X / 2		4X / 2		
3 033		3 033		3 033		
3 020		3 020		3 020		

0° / 59°		0° / 59°		0° / 59°		DIMENSIONS
4 760		4 760		4 760		
981		981		981		
14 880	13 375	14 880	13 375	14 880	13 375	
18 200		18 200		18 200		
2 645		2 645		2 645		
12 573		12 073		12 573		
9 150		8 750		9 250		
4 220		4 220		4 220		
800 / 800		800 / 800		800 / 800		
400		250		250		
585		585		585		
10 477	12 569	9 977	12 569	10 477	12 569	
12 608	14 203	12 608	14 203	12 608	14 203	
12 808	14 403	12 808	14 403	12 808	14 403	
13 869	15 623	13 869	15 623	13 869	15 623	
9 173		8 562		9 173		

19	22	19	22	19	22	PERFORMANCE
20	23	20	23	20	23	
21	23	21	23	21	23	
0,24	0,47	0,24	0,47	0,24	0,47	
0,27	0,47	0,27	0,47	0,27	0,47	
0,27	0,47	0,27	0,47	0,27	0,47	
0,46	0,45	0,46	0,45	0,46	0,45	
376		376		376		
18	21	19	22	18	21	
28		29		28		
Oil immersed brakes		Oil immersed brakes		Oil immersed brakes		

Cummins QSM11/QSL9	Cummins QSM11/QSL9	Cummins QSM11/QSL9	POWER UNIT
Stage IIIA: 224 (300) / 216 (290) optional Stage IIIA: 272 (365) / 261 (350)			
Stage IIIB: 276 (370) / 261 (350)			
2100	2100	2100	
Stage IIIA: QSM11: 6 / 10800 Stage IIIB: QSL9: 6 / 8900			
Stage IIIA QSM11: 20 Stage IIIB QSL9: 17			

4-speed autoshift SOH TE27 optional SOH TE32			OTHER
260	260	260	
110	110	110	
70			
Stage IIIA: QSM11: 112 Stage IIIB: QSL9: 109			
-	-	-	



Notes:

Specifications are affected by the condition of the vehicle and how it is equipped, as well as the nature and condition of the operating area. If these specifications are critical, the proposed application should be discussed with your dealer.

- ◆ Deduct 100 mm for load centre from front side of Stabilizer
- ● For CH models only: With optional P(owered) P(ile) S(lope) function: Deduct 310mm from dimension h4.
- † Spreader at 8.0m high
- ❖ This data applies to when the container is carried 500 mm in front of the wheels (load centre 1720 mm)
- ¶ Gradeability figures (lines 5.7 & 5.8) are provided for comparison of tractive performance, but are not intended to endorse the operation of the vehicle on the stated inclines. Follow instructions in the operating manual regarding operation on inclines.
- o Add 2 dB(A) for option with additional cab fan

All capacities are according to prEN1459

All specifications and capacities are valid for trucks equipped with a Hyster container handling spreader for handling ISO containers.

CE **Safety:** This truck conforms to the current EU requirements.

Operators must be trained and adhere to the instructions contained in the Operating Manual.

Strong Partners, Tough Trucks, for Demanding Operations, Everywhere.

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TITO LIFTTRUCKS

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