

Orderpickers

Features, Benefits Comparison

Hyster R30XMS₂
Raymond OPC30TT
Crown SP3020-30



August 2001

Operator Compartment

Operator Console

HYSTER



Hyster
Optional Adjustable Console allows 6" of vertical adjustment to accommodate most operators. Concave multi-function control handle area facilitates forks-first travel. Emergency power disconnect on top in easy reach. Cup holder, removable trash bin, multiple storage compartments.

RAYMOND



Raymond
Console is not adjustable. Limited storage space. Lack of adjustability makes it less comfortable to operate in forks-first position.

CROWN



Crown
Console is not adjustable. Limited storage space. Lack of adjustability makes it less comfortable to operate in forks-first position.

Operator Compartment Floorboard

HYSTER



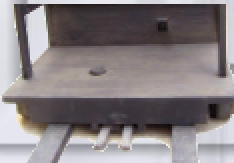
Hyster
1" thick floormat is thickest in the industry providing maximum operator comfort. Operator footswitch is flush-mounted and in a natural and optimal operator's foot position. Pallet clamp is automatically applied, foot - released.

RAYMOND



Raymond
Operator footswitch is not flush-mounted, creating a possible trip hazard and is at front of floorboard. Pallet clamp is automatically applied, foot - released.

CROWN



Crown
Operator footswitch is semi-flush mounted, but is located rearward on the floorboard requiring heel actuation for many operators. Pallet clamp is foot-applied, hand released.

Operator Controls

Return-to-Center Steering

HYSTER



Hyster

Return-to-Center steering standard. Multi-turn steering optional. Soft-touch handle is formed to fit operator's hand whether traveling chassis-first or forks-first. Facilitates ease of operation in forks-first travel. Drive tire always returns to center when released giving more precise steering control.

RAYMOND



Raymond

Multi-turn steering only. Large disc with spinner knob, but not soft-touch. Difficult to steer in forks-first travel. Drive tire centers at startup only.

CROWN



Crown

Multi-turn steering only. Small disc with spinner knob, but not soft-touch. Difficult to steer in forks-first travel. Does not center drive tire, even at startup.

Operator Controls

Multi Function Control handle

HYSTER



Hyster

Intuitive control with three position settings depending on operator preference. Palm rest feature allows operator to comfortably rest hand on handle. Thumb control of lift and lower functions. Trigger style horn button on underside of handle.

RAYMOND



Raymond

No adjustment to conform to operator preference. Does not facilitate operation in forks first travel. Thumb control for lift and lower functions. Horn button on left side of handle.

CROWN



Crown

Motorcycle-type twist grip controls traction. Can be used when operating in forks first position. Push buttons provided for two-speed lift/lower control and horn are separate from handle.

Operator Controls Retractable Side Gate

Hyster

Optional retractable side gates are gas spring assisted for ease of operation. Side gate interlock switches disable lift/lower and traction if one or both gates are raised. Fixed hoop side rails are standard on R30XMS.

HYSTER



Raymond

No side gate interlock switches. Truck can be operated when one or both gates are raised.

RAYMOND



Crown

Pinch points where handles fold up. Handles are not gas spring assisted giving no resistance when coming down. Vertical post can land on operator's foot. Side gate interlock switches disable the truck when one or both handles are raised.

CROWN



Operator Controls High Visibility Mast

HYSTER



Hyster

Excellent visibility. Wire mesh screen standard. No free lift cylinder to obstruct view. Operator can easily see to either side of mast uprights.

RAYMOND



Raymond

Good visibility. Large facades on either side can create blind spots. Small free lift cylinder.

CROWN



Crown

Overall good visibility. Free lift cylinder can create a visual obstruction.

Frame & Durability

Base Arms

HYSTER



Hyster - Dual articulating load wheels provide even floor contact. Load wheels feature enclosed toe caps to reduce potential load wheel damage and to increase sideplate bending resistance. Load wheel replacement requires no shimming. Load wheel bearings are pre-lubricated, double-sealed and require no lubrication for the life of the bearing. Note: R30XMA₂ and R30XMF₂ do not have articulating load wheels.

RAYMOND



Raymond
Open toe caps leave front load wheel exposed and susceptible to impact damage. Non-articulating load wheels. Grease fittings are on the inside of the base arms requiring the platform to be raised for service.

CROWN



Crown
Open toe caps leave front load wheel exposed and susceptible to impact damage. Non-articulating load wheels.

Electric Steering System Steer Motor

HYSTER



Hyster

New design features a brushless DC motor. Quiet, maintenance-free Hall-effect encoder positions drive wheel for return-to-center steering. No adjustments are required.

RAYMOND



Raymond

No encoder for drive wheel positioning. Drive wheel centers only on startup. Adjustments may be required.

CROWN



Crown

Drive wheel must be centered manually.

Electric Steering System

Steer Wheel Centering

HYSTER



Hyster
Automatic centering of drive
wheel at start up.

RAYMOND



Raymond
Automatic centering of drive
wheel at start up.

CROWN



Crown
Does not center at start up.

Drive Motor

HYSTER



Hyster

Vertically -mounted, stationary design. The non-rotating motor mounting eliminates power lead flexing or twisting. That means less service downtime. Motor brushes can be accessed in seconds. Motor compartment is open and uncluttered.

RAYMOND



Raymond

Drive motor rotates with drive unit. Motor compartment more cluttered.

CROWN



Crown

Stationary mounted motor. Motor compartment cluttered and crowded.

Continuous Height Sensing Height Sensors

HYSTER



Hyster Hysense™ (Standard)

Linear reduction in speed as platform raises. No stepped reduction in speed. Optical Height encoder - an optical encoder detects mast chain pulley rotation which is directly proportional to operator platform motion. There is a mast proximity switch at 24" that calibrates the position. The encoder reads each turn of the pulley to continually sense fork height.

RAYMOND



Raymond Intellispeed™ (Optional)

Similar offers linear reduction in speed as operator platform raises. Continuous height sensing achieved by monitoring high pressure hydraulic oil flow. Standard system features multiple proximity switches with stepped deceleration. Not available with freezer conditioning.

CROWN



Crown

Does not offer continuous height sensing. Utilizes proximity switches for "stepped" speed reduction at elevated heights.

Lift Pump Motors

HYSTER



Hyster utilizes a single pump and motor design. A 24v truck with a two-stage mast yields lift speeds of 40 fpm not loaded and 25 fpm loaded.

RAYMOND



Raymond also utilizes a single pump and motor design. A 24v truck with a two-stage mast yield lift speeds of 45 fpm not loaded and 33 fpm loaded.

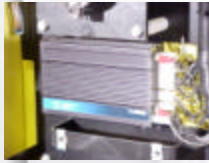
CROWN



Crown utilizes two lift pumps and motors to overcome the lack of a 36 volt option on their order picker line. Two stage mast lift speeds are 45 fpm not loaded and 28 fpm loaded.;

CANbus - Separately Excited Electronic Controls Master Controllers

HYSTER



Hyster

The CAN system is controlled by the Master Control Unit: a Curtis 1310 unit located on the operator's platform. The Master Control Unit (MCU) sends signals from the operator's input (i.e., lift/lower, forward/reverse, etc.) to the controls in the chassis below.

RAYMOND



Raymond

Raymond's master controller is proprietary; built by Raymond and only available through Raymond, leaving the potential for parts availability to become an issue.

CROWN



Crown

Was Sevcon. Now uses GE Transistor controller.

CANbus - Separately Excited Electronic Controls

HYSTER



Hyster

CAN technology permits a significant reduction in the number of electrical conductors which must be reeved over the mast between the chassis and the operator's platform. The number of conductors has been reduced from 21 to 8. This reduction provides an extremely durable and reliable design.

RAYMOND



Raymond

Design reeves additional cables over the mast between the chassis and operator platform.

CROWN



Crown design reeves multiple cables over the mast. They do not employ CANbus technology requiring more wiring to relay information.

CANbus - Separately Excited Electronic Controls Traction Controller

HYSTER



RAYMOND



CROWN



Hyster - The Metal Oxide Semiconductor Field Effect Transistor (MOSFET) traction controller is a Curtis 1243 unit. It can control and change direction of the current to the traction motor in response to directional changes from the operator. This eliminates the forward and reverse contactors. The Curtis 1243 also controls lift and lower functions. The 1243 controller reduces plugging aggressiveness at elevated heights to provide smooth traction control.

Raymond
Raymond's traction controller is proprietary; built by Raymond and only available through Raymond, leaving the potential for parts availability to become an issue.

R30XM2 KEY FEATURES AND BENEFITS LISTING

Ergonomic Operator Controls

Features and Benefits: With more ergonomic features than the competition, the driver is assured a more comfortable, productive working environment throughout the workday. The driver isn't "forced" into any one position for operation.

When fitted with the adjustable console, range of adjustability is further enhanced especially during shift change or travel in the forks direction.

The optional body fan circulates air throughout the operator compartment for enhanced air movement resulting in increased work productivity. Raymond and Crown do not offer this feature.

RTC provides precise and better control over steering the truck than multi-steer systems that require as much as 7 turns full lock to lock, which makes driving in the forks direction very cumbersome. Raymond and Crown do not offer RTC.

Adjustability to the traction control provides for a comfortable setting for precise control over electric and hydraulic functions. The driver can adjust the handle for desired position for travel in the chassis or fork direction. Raymond and Crown do not offer this feature.

The retractable side gates are designed to keep the operator within the confines of the compartment, without pinch points or the opportunity to set the gate on your foot. The gates must be in the full down position before the truck will function.

The visibility through the mast is superior to Raymond and Crown because there is no free lift cylinder, less cabling than Crown, and lack of large facades like Raymond. This is the same mast as the reach truck.

With articulated load wheels, the driver has a higher comfort level during the work shift. Raymond and Crown do not offer articulated load wheels on orderpickers.

Electric Steering and Wire Guidance

Features and Benefits: With RTC the driver always knows the direction of the drive wheel, which all but eliminates guessing where the wheel is pointed. With rail-guided applications the truck can enter the rail system without scrubbing the drive system. The Raymond does not have RTC but does center at startup. Crown does not.

When equipped with the new wire guidance package the driver simply parks the truck over the wire signal, the system learns the signal, and then stays guided on the wire.

The steer system components are located on the left side of the drive unit compartment. The electric steer motor is an all-new design featuring a brush less DC motor coupled to a 50:1 gearbox. This motor is supplied by "In Motion". The steer position potentiometer has been replaced with a hall effect encoder. The hall effect encoder is an integral part of the motor end head and senses motor shaft rotation to determine steer tire angle. The steer motor assembly requires no maintenance or adjustments. The steer motor controller is also new and utilizes CANbus communication. There are no pots or switches to adjust. Setup and adjustments are now done through the control handle and display. There is now a steer tire proximity switch that is used to determine and verify the steer tire straight-ahead position. Both RTC and multi-steer now use an optical encoder. The encoder is a sealed, maintenance free, non-contact device.

The drive motor is a separately excited stationary motor.

HySense – Continuous Height Sensing

Features and Benefits: The primary benefit to this feature is increased productivity. With greater travel speeds, at the high volume pick rack levels, the operator will be able to pick or put away more product in any given work cycle. This will result in a more productive, profitable operation. HySense employs an encoder calibrated to distinguish between lift height of the platform and determined travel speed. Because there are no string pots to deal with, and no proximity switches to worry about, much of the maintenance woes of other systems are eliminated.

The mast includes a continuous height sensor, proximity switch and an 8-conductor cable. The sensor is located under a cover at the top of the mast inner channel. The sensor uses an optical encoder to measure fork height, and unlike string pot systems like Raymond uses there are no maintenance issues. A signal goes from the encoder to the Master Control Unit to control travel speed at various heights, and reduces the number of proximity switches on the mast to one. The MCU and traction control systems will limit the maximum allowable travel speed based on fork height as determined by the height sensor and steer angle as determined by the steer motor encoder.

Raymond: Not available on freezer equipped trucks.

Accomplished through hydraulic flow sensor which records oil to the cylinder electronically. There is a proximity switch at 60". There is a propeller in the flow sensor set for a high rate of flow. If flow is low like during a very slow lift the controller resets to zero or no continuous height sensing and the cab must be lowered below the 60" to reset. The propeller can get contaminated, and then needs to be replaced or cleaned. The cost to repair is about 10 times the Hyster encoder. You can operate this system with a free lift cylinder but not with the freezer option.

Crown uses dual lift pumps to achieve performance as they have only 24 volt available. Raymond is similar to ours, but may require larger amp draw.

CANbus - SepEx Electronic Controls

Features and Benefits: CANbus reduces wiring complexity.

The master controller, Curtis 1310 controls all functions of the truck. It is small, sealed, and programmable through the traction control handle. Raymond's transistor controller is much more complex and presumably more expensive to replace. Crown is using the GE transistor controller.

CANbus is a system of controller communication. CAN stands for Controller Area Network. A bus is a channel or path for transferring data electronically. CANbus is a software language and system of communication. The number of wires in the mast cable has been reduced from 21 to 8.

Two of the 8 wires are CANbus communications lines for the MCU, traction controller, and steer controller. This results in less wiring up over the mast for improved visibility and less maintenance concerns. CANbus service requires no special tools or knowledge. Only a digital volt-ohm meter is necessary to troubleshoot connections and verify wire continuity.

In this system there is a two-wire bus. The MCU, motor controller and steer controller communicate simultaneously, using two wires with CANbus technology. These wires, labeled high and low, are the digital data link for communication between the controllers. The MCU transmits commands and receives faults and status information from the traction controller and steer controller via CANbus. The two wire CANbus connects several electronic subsystems together to form one integrated system.

The traction controller by Curtis is small and easily accessible and can be configured through the control handle. The Raymond traction controller is integrated into the master control board, is far more complex, and like the master board presumably expensive to replace.

Proportional Control – lift/lower

Features and Benefits: Smooth, precise control of the platform lift and lower provides several benefits. First and foremost it eliminates the jerky, bouncy effect of a non-proportional control. The operator is more comfortable throughout the work cycle, and feels more secure due to its smoothness. Secondly, it allows the operator to precisely place the load platform in the desired position relative to the racks. If a large, heavy load must be transitioned from the shelf to the load platform, the operator can easily match up the shelf height with the load platform height. Also, if fragile or unstable loads are being handled, it is best not to have a bouncy platform to deal with. Finally, anytime you have smooth controls over, jerky, non-precise controls, there is the feeling of quality.

The Systems:

This is the only function of the truck, which is hydraulically powered.

The primary control elements of the lift/lower system are located in the lift/lower manifold. Proper sequencing of the control valves and the pump motor contactor is vital to the smooth and predictable functioning of the system particularly during transitions.

When energized, the pump motor contactor connects the series wound pump motor directly to battery voltage. Sense lines are provided across the contactor tips to allow the control system to detect welded tips or an open circuit coil. The sense lines are also used to determine when the motor has slowed to zero speed. A new contactor requires approximately 25 msec to close and approximately 75 msec to open.

The proportional valve provides a fluid flow rate inversely linearly proportional to input current within its operational range. It requires approximately 75 mA to start closing the valve. Approximately 675 MA is required to fully close the valve. The valve is normally open. For full lift, the valve must be completely closed and for full lowering, it must be completely open.

Proportional Control – lift/lower

Since the proportional valve is not a zero leakage device, a load holding valve is required in the hydraulic circuit to prevent down drift of the platform when the lift/lower system is at rest. It also allows for unloaded pump motor start up. When de-energized, the valve acts like a check valve allowing flow from the pump to the cylinders. When energized, it allows flow in either direction.

The lift/lower manifold also contains a manual lowering valve, a pressure relief valve, and 2 check valves none of which are electrically connected to the truck's control system.

Raymond: Does have proportional lift/lower, with greater "pause" rate from lift to lower.

Crown: 2-speed lift and lower, but not proportional.

Additional Sales Points:

- High visibility mast.
- Solid steel access doors.
- Screen mesh protection barrier.
- Convenient component layout.
- Large battery rollers.
- Vanity trays.
- Comfortable rubber mat.
- Non pinch point retractable gates.
- Activation foot switch.
- Robust pallet clamp.
- Adjustable forks.