



NOTE: BE SURE TO CHECK THE NOTES PAGES IN THE NOTES PAGE VIEW FOR EACH SLIDE. MOST OF THE SLIDES INCLUDE INFORMATION IN THE NOTES PAGE VIEW.

This PowerPoint presentation CD was developed specifically for Hyster Dealer Principals and Sales Managers. This CD is intended to be used to enhance the selling skills and product knowledge of the Hyster dealer sales force. **This presentation is not Intended to be given to the end user.**



We introduced the Hyster E30-40HSD to compete with these other competitors in the 3-wheel stand arena.

The E30-40HSD competes with the # 1 selling Crown RC3020-30 as well as the well known Raymond Easi-Pacer, and the synergized Cat and Mitsu products.

From this point forward we will be comparing the Hyster to the Mitsu/Cat and the Crown truck.

Introduction - Capacities

Main Menu 



Electric 3-Wheel Stand Counterbalanced Lift
Truck (3,000 - 4,000 lb. Capacity)

E30-40HSD



E30-40HSD

- The Hyster E30-40HSD is a 3 wheel electric stand-up counterbalanced lift truck available in 3000, 3500 and 4000 lb.capacities.

Introduction – Capacities



RC 3000 Series

3,000-4,000 lbs.

RC 3020-30 3,000 lbs.

RC 3020-35 3,500 lbs.

RC 3020-40 4,000 lbs.



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FBC15KS-FKB25KS



3,000-5,000 lbs.

□ FBC15KS 3,000 lbs.

□ FBC18KS 3,500 lbs.

□ FBC20KS 4,000 lbs.

□ FBC25KS 5,000 lbs.

Crown 3,000-4,000 lb. Capacities

Cat/Mitsubishi 3,000-5,000 lb. capacities

Introduction - General

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E30-40HSD

The new E30-40HSD electric stand-up 3-wheel counterbalanced lift truck replaces the E30-40FR.

The E30-40HSD combines excellent ergonomics with a simple, serviceable design and superior performance.



Proven Components!

E30-40HSD

- The objective of this project was to develop a Hyster designed replacement for the E30-40FR purchased from Schaeff; the 4500 and 5000lb version of the Schaeff trucks will not be replaced.
- The new electric cushion tire 3 wheel standup counterbalance has a capacity range of 3000, 3500 and 4000lbs.
- The intent of this project is to provide a reliable product, which would be competitive in both performance and cost. We made no attempt to reproduce the Schaeff's variety of features, but only provided those deemed necessary by our customers.

Introduction – Applications

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Three wheel stand-up trucks are primarily intended for use on the dock for loading and unloading trailers, including some stocking and transport use.

These trucks are focused towards retail distribution, food manufacturing and processing, general warehousing and manufacturing, storage, plastic products, and freight transportation.



E30-40HSD



RC 3000 Series



FBC15KS-FKB25KS

Introduction – Standard Features

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						Hyster	Crown	Mitsubishi
36 Volt						Yes	Yes	Yes
Curtis SEPEX™ SEM Transistor Traction Controller						Yes	EV-100 LXT SCR	GE SX MOSFET
Multi-Function Control Handle with Simultaneous Functions						Yes	No	Yes
BDI with Lift Interrupt						Yes	Yes	Yes
Hour Meter						Yes	Yes	Yes
Dual Electric Brakes						Yes	Yes	Yes
On Demand Hydraulic Steering with Brushless DC Motor						Yes	No	No
Dual Traction Motors						Yes	Yes	Yes
Park Brake – Left Foot Step-Up						Yes	Yes	Yes
Rear Entry: Side Operator Stance						Yes	Yes	Yes
Contacter Hydraulic Control						Yes	Yes	Yes
Padded Backrest / lumbar support						Yes	Yes	Yes



Consult your E-HSD literature for information on optional features.

Introduction – Standard Features (cont.)

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						Hyster	Crown	Mitsubishi
2-Function Hydraulic Control Valve						Yes	Yes	Yes
38.5" Wide Class II Carriage						Yes	Yes	Yes
48" High Load Backrest Extension						Yes	Yes	Yes
Steel Battery Rollers						Yes	Yes	Yes
Positive Mechanical Battery Disconnect						Yes	Yes	Yes
SB 350 Gray Battery Connector						Yes	Yes	Yes
Shock Dampened Compartment Floor w/ Cushioned Mat						Yes	Yes	No
Tilt: 5 Degrees Fwd, 5 Degrees Back						Yes	2-5	3-5
88" Drive in Rack Overhead Guard						Yes	No	No
Electric Horn						Yes	Yes	Yes
Operator's Manual						Yes	Yes	Yes
UL Classification E						Yes	No	Optional E, EE

Consult your E-HSD literature for information on optional features.

Ergonomics – Operator's Compartment

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Hyster – fully padded operator compartment, side stance, palm rest/elbow pad, high back rest, side stance. large storage compartments, clipboard holder, beverage holder.

Crown – extra padded back and elbow rest, side stance. clipboard holder.

Mitsubishi – same compartment as their reach truck, Lower back rest, back and elbow pad only, side stance, clipboard holder. →



Ergonomics

All three offer Side stance

Hyster –

Hyster is the only one to offer a fully padded operator compartment and palm rest on the control handle which supports the operator's hand and forearm eliminating the need for an armrest.

Hyster offers a high padded back rest, as well as pads for the knees and elbow.

Crown –

Crown's backrest is also lower but offers the thickest padding in the back and elbow area.

Mitsubishi –

Mitsu / Cat offers the same compartment as their reach truck with a back and elbow pad only, and lower back rest than ours.



E30-40HSD

- The operator compartment floor is fully padded with a full 3/4" thick rubber mat and shock absorbent "isolated" floor that reduces operator fatigue.
- A combination of elbow, back, hip and knee urethane pads surround the operator to make the operator more comfortable.
- The cushioned step-up brake pedal has been designed for low-effort actuation. The operator can actuate the brake up and down throughout a full shift of mounting and dismounting without feeling strain. Plugging, however, is still the preferred method of stopping an electric truck.
- The truck also features a tapered side wall and an edge lip guard to help keep left foot inside the operator compartment.
- Rear door (optional) – A door for the operator compartment provides protection to an operator from objects intruding into the operator compartment. Doors should not be used on trucks operated on or near docks. Doors can increase operator exit time from the truck in the event of an off dock accident.

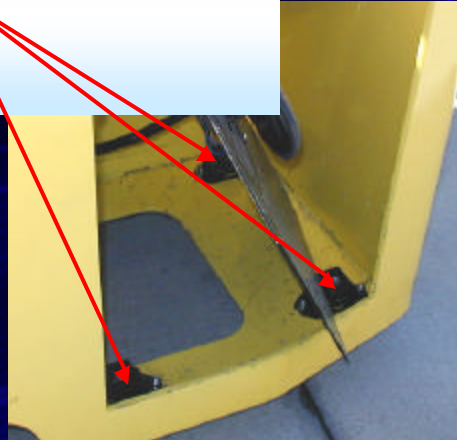
Ergonomics – Operator's Compartment

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E30-40HSD

- ☐ The floor is suspended on polymer arches to reduce vibration & shock transmitted to the operator
- ☐ Impact from driving over dock boards is reduced



E30-40HSD

- The floor is suspended on polymer arches to absorb and reduce the vibration and shock transmitted to the operator. Impact from going over dock boards is reduced by up to 25%.

Ergonomics – Operator's Compartment

[Main Menu](#)


Floor Mat

  3/4" Thick	  5/8" Thick	  5/8" Thick
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Floor Mat

Hyster–

Hyster's 3/4" thick shock absorbent floor mat rides on an "isolated" floor plate suspended by 4 polymer arches to reduce vibration & shock transmitted to the operator.

Crown –

Crown's mat is 5/8" thick and has a suspended floorboard and brake pedal design cushioning the operator against constant vibration and shock.

Mitsubishi –

Mitsu / Cat uses their ERGOMAT which is about 5/8" thick. As you can see in the picture their floor plate is not suspended.

Ergonomics – Operator's Compartment

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Step Height



7-1/2"



13"



8"

These trucks are primarily used on the docks where operators get on and off the truck several times a shift. Therefore Step Height is a focal point of ergonomics.

Hyster –

Hyster's step height is 7-1/2" with a 1/2" lip, keeping the operator's foot inside the compartment, making the deck height 7".

Crown –

Crown has a 13" step height with a 1" lip similar to Hyster's truck, making the deck height 12" to deck.

Mitsubishi –

Mitsu / Cat has an 8" step height with no lip allowing the operator to easily have foot outside of the compartment.

Ergonomics – Control Handle

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E30-40HSD

- ❑ Simultaneous operation of travel, hoist, and one auxiliary function
- Actuation direction is intuitive
- ❑ Built-in palm rest

Optional Buttons
for 4th Hydraulic Function



Standard Handle







E30-40HSD

- The multi-function control handle has been designed for low effort, single hand control of travel direction, speed control, hydraulic functions, and horn actuation.
 - Orientation, and number of buttons are specific for this truck.
- Standard: Travel, hoist, and one other hydraulic function can be operated simultaneously.**
- Option 1: one additional, single speed hydraulic function.**
- Option 2: two additional, single speed hydraulic functions.**
- Actuation direction is intuitive. Pushing the handle toward the forks causes forward travel. Moving the handle toward truck entry causes reverse travel. Pulling toward the operator causes lift, and pushing away causes lower. Similarly, the tilt and sideshift buttons are direction of actuation oriented.
 - The built in palm rest allows the hand to rest comfortably on the handle while providing support to the arm.

Ergonomics – Control Handle

[Main Menu](#)







Hyster – same multi-function control as in the reach truck.
 Intuitive direction control. Thumb actuated side shift and tilt.
 Optional trigger buttons for fourth function.

Crown - non-intuitive control handle, trigger buttons for tilt and separate aux function lever for side shift or attachments.

Mitsubishi – same multi-function control as in the reach truck.
 Intuitive direction control. Thumb actuated side shift and tilt.



Control Handle

Hyster –

Hyster uses the same multi-function control as the reach truck with intuitive direction control, thumb actuated side shift and tilt, and offers optional trigger buttons for fourth function. From a productivity standpoint, this truck is easy to learn.

Crown -

Unlike the others Crown uses a non-intuitive control handle. Their traction direction is nine o'clock and 3 o'clock, compared to our 12 o'clock and 6 o'clock. They offer trigger buttons for tilt, and a separate auxiliary function lever for side shift or attachments.

Mitsubishi –

Mitsu / Cat, like Hyster has used the same multi-function control as in their reach truck, with intuitive direction control, thumb actuated side shift and tilt.



Hyster – Overhead Guard

Hyster's standard 88" bar on edge canopy, with an interior height of 78.75" has a slanted front bar, and rear guard leg. Hyster offers an optional 83" flat plate canopy with an interior height of 75.25". This reduces the overall height by 5", and the operator compartment by only 3.5". Both are compatible with drive in rack because of narrower guard legs. (OHG support is 25.47" across the guard legs).

Crown-

Crown's standard 90.5" overhead guard has no rear guard leg, and no front angle reducing visibility like the Mitsu / Cat. Crown offers an optional retractable overhead guard which has an inside measurement of 76". With this option there is a lift cut out @ 8' if retractable OHG is down.

(Retracts to 80.5" on RC 3020-30 with standard battery compartment, 84.6" and to 84.6 on RC 3020-35 and RC 3020-40).

Mitsubishi –

Mitsu / Cat has a standard 88" OHG, bar on edge design with no front angle reducing visibility at 2nd and 3rd levels. They offer lower overhead guard heights through their engineering department. Drive-in rack is optional.

Ergonomics – Mast Visibility

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Visibility

Hyster –

Hyster has a 13-1/4" inside measurement between mast channels. With hosing the actual mast window is 12"

Crown –

Crown has a 11" inside measurement between mast channels. With hosing, the actual mast window is only 6-1/2" .

Mitsubishi –

Mitsu/ Cat has a 14-3/4" inside measurement between mast channels. With hosing the actual mast window is 13-1/4".

Serviceability – Panels

[Main Menu](#)



•Easy lift-off ABS plastic panels provide quick access to lift pump, drive motors, electronics, and power steering assembly

2 covers- no tools!



4 covers – 5 tools required



5 covers – 1 tool required

Serviceability

Hyster –

An outstanding selling feature is that Hyster has only 2 service compartment covers that require NO TOOLS for removal as well as no hardware to keep up with.

They are designed to snap off and on easily giving clear access to components and reducing service time.

Crown –

The Crown truck has 4 covers, which require 5 tools (1-ratchet, 3-sockets, 1 flat head screwdriver) to remove 13 pieces of hardware.

Once the covers are off, it is still very difficult to access components.

Mitsubishi –

The Mitsu / Cat trucks have 5 covers – which require 1 Allen wrench to remove 14 Allen head screws (hardware).

Once the covers are off, they also have clear access to components.

Serviceability – Electrical System

Main
Menu



CROWN



Electronics

Hyster–

Hyster offers the Curtis 1310 master control unit which is the same base design as our Order Picker

It also utilizes CAN Communications (Controller Area Network) which connects multiple control systems via 2 wires known as CANbus to form one integrated system.

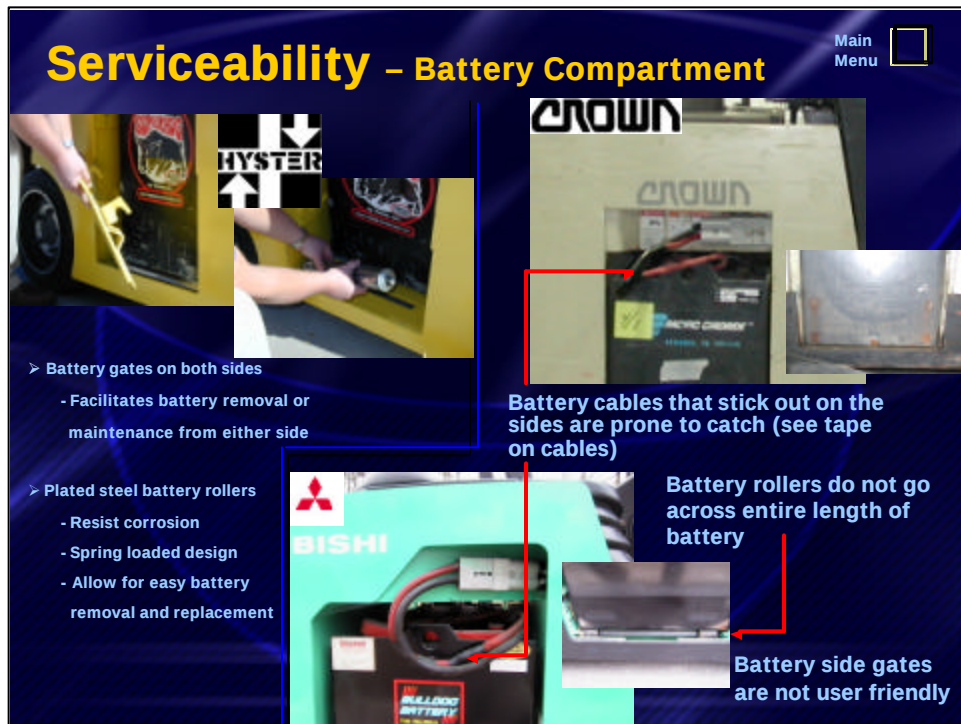
Our Curtis 1243 MOSFT(Metal Oxide Semiconductor Field Effect Transistor) traction controllers utilize SEM (separately excited motor) technology.

Crown –

Crown uses the GE EV100 LXT SCR (Silicon Control Rectifier) style controller which is the predecessor to SEM Technology.

Mitsubishi –

Mitsu / Cat uses the GE SX model of master control unit also providing them with SEM and MOSFET technology.



Hyster E30-40HSDSeries

- The battery rollers are plated to resist corrosion and wear.
- This design is spring loaded, and allows for easy removal and replacement.
- Battery gates are provided on both sides of the truck so that the battery can be removed, or maintained from either side.

Note: Always use a battery tray or other stabilizing device and stand clear of battery compartment when rolling out a battery.

Crown

Battery cable prone to catching

Mitsubishi

- Battery cable prone to catching
- Battery rollers do not go across entire length of battery
- Battery side gates not user friendly

Serviceability – Electrical System

Main Menu 

 **E30-40HSD**

- ☐ **CAN Communications (Controller Area Network)**
 - Connects multiple control systems via 2 wires known as CANbus to form one integrated system
- ☐ **Same base design as Order Picker**
- ☐ **Permits significant reduction of wires & connections**
- ☐ **CAN system controlled by a Curtis 1310 Master Control Unit**
- ☐ **Robust system, allows operation in extremely harsh environments**
- ☐ **Extensively tested to ensure reliability**

E30-40HSD

CAN communications (Controller Area Network) that allows the truck's multiple control systems to be connected using a pair of wires known as a CANbus to form one integrated system.

- The CAN system is controlled by a Master Control Unit: a Curtis 1310 unit located in the control compartment. The Master Control Unit (MCU) sends signals from the operator's input (i.e., lift/lower, forward/reverse, etc.) to the respective control.
- CAN technology allows single point diagnostics through the dash display.

The two wire twisted pair CANbus carries the following data:

- Traction throttle
- Traction direction
- Horn
- Lift
- Lower
- Status and fault information
- Parameter change downloads
- Diagnostic information

Serviceability – CANbus Advantages

Main
Menu



E30-40HSD

- ✓ Increased reliability
- ✓ Substantial reduction in connections and wiring complexity
- ✓ Extensive function monitoring capability without additional cost
- ✓ Serial bus simplicity (two wires)
- ✓ Message arbitration avoids data conflicts
- ✓ Fast data rate allows real time control
- ✓ Easy information exchange between subsystems
- ✓ Access to all controller parameter possible via single CANbus port

E30-40HSD

- This system uses the same base design as the Hyster Order Picker and is ideally suited for the E30-40HSD in that it permits a significant reduction in the number of independent electrical connections and wire harnesses used.
- CAN is a robust system that allows operation in extremely harsh environments. Transmission errors are detected by extensive error checking mechanisms. Extensive reliability testing has been performed.
- CAN technology allows single point diagnostics through the dash display.

Serviceability – Steering System

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E30-40HSD

- ☐ Totally enclosed steer unit
- ☐ No adjustments required



E30-40HSD

- The hydrostatic steer system consists of a totally enclosed rack and pinion unit. This steer unit is powered by a double acting piston.
- Totally enclosed steer unit; no way for contaminants to enter the unit.
- No adjustments required.

Serviceability – Steering System

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Menu



CROWN



- ❑ Enclosed steer unit; chain and sprocket exposed (results in excessive wear)

- ❑ Steer chain powers unit; can stretch with use, requiring additional adjustments

- ❑ Hydraulic pump and motor powers steer chain; subject to leaks

- ❑ More hydraulic connections; more potential leak points



Steering System

Crown – Full time power steering. A torque generator with low volume requirement provides consistent performance with reduced steer effort.

Crown and Mitsubishi

- Chains stretch with use, requiring additional adjustments.
- Chains require lubrication for smooth, quiet operation.
- Hydraulic pump and motor subject to leaks.
- More hydraulic connections – more potential leak points

Mitsubishi

- Hydrostatic steering – hydraulic pump and motor powers steer chain.
- Enclosed steer unit; however, the chain and sprocket are exposed. There is no bottom cover to prevent dirt and foreign matter from being thrown up on steer chain and chain sprocket. These contaminants cause premature and excessive wear on both the chain and sprocket.

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Serviceability – Control Handle

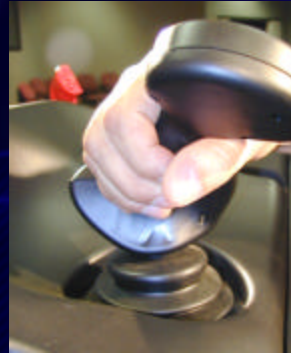
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E30-40HSD

Hall Effect Sensors

- ☐ Improved reliability
- ☐ Improved speed control & acceleration
- ☐ Replace potentiometers
- ☐ No moving parts to wear out
- Sealed to prevent moisture contamination



E30-40HSD

- Hall effect devices are used in applications to replace potentiometers. A potentiometer relies on an electrical connection of a moving wiper in contact with an element.
- Hall effect devices use sensors which measure magnetic fields. They use a magnet mounted on a mechanism which moves the magnet closer to or farther away from the sensor. Since there is no contact between the magnet and the sensor, there are no moving parts to wear out. Only the shaft and bushing are subject to wear, and will typically last many millions of cycles. The shaft is sealed to prevent moisture contamination.

Serviceability – Control Handle

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Menu



Separate auxiliary function lever for side shift or attachments - More parts to access and service.



FBC15KS - FKB25KS

Mechanical Linkage Connects Handle to Accelerator Pot and Lift/Lower Control

- ❑ Mechanical linkages subject to wear and require adjustments
- ❑ Wire harness presents pinch point between control handle base and mechanical linkage connection from handle to lift/lower controls
- ❑ Potentiometer requires adjustment and is subject to wear; difficult to troubleshoot



Crown-

Crown offers trigger buttons for tilt, and a separate auxiliary function lever for side shift or attachments. You have another handle and more componentry to access and to service.

Mitsubishi-

The multifunction control handle is designed using a mechanical linkage connecting the handle to the accelerator potentiometer and another mechanical linkage connecting the handle to the lift/lower control.

Problems include:

Mechanical linkages wear and require adjustments.

- The control handle wire harness routing presents a pinch point between the control handle base and the mechanical linkage connection from the handle to the lift/lower controls.
- The potentiometer requires adjustment and is subject to wear. Potentiometers have a tendency to be sensitive to load shock and vibration and are difficult to troubleshoot.

Performance - Hydraulics

Valves

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Hydraulics

Hyster –

Hyster places valves for easy access. If a hydraulic leak was to occur the fluid would run to the ground.

Crown –

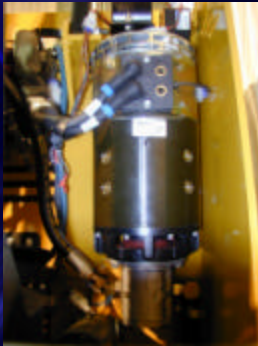
Crown's spool valve is placed in the midst of all the electronics and difficult to get to. If a hydraulic leak was to occur the fluid would run into the electronics and could cause damage.

Mitsubishi –

Mitsu/Cat places their spool valve with easy access once covers are removed. If a hydraulic leak was to occur the fluid would pool then run into the operators compartment.



Hoist Motor



Hydraulic Hoist Motors

Hyster –

The Hyster7", 36 volt series wound hoist motor is manufactured by Iskra, (the leading European manufacturer of electric motors in the automotive and material handling industries)

Series wound is best for frequent stop start cycles, typical in lift truck work.

We offer Class H insulation which provides optimum efficiency (27 minute rating)

Crown –

Crown's hoist motor offers Class H insulation and is manufactured by Crown

Mitsubishi –

Mitsu/ Cat's hoist motor is Manufactured by MCF which stands for Mitsubishi Caterpillar Forklift.



Drive Units and Brakes

Hyster –

Hyster offers 2 independent SEM Schabmuller motors which are vertically mounted for ease of brush changes, and efficient servicing.

This is the same motor and front trans-axle as the three wheel sit down truck.

Hyster uses a two position foot operated brake pedal. The first position causes the truck to power to a stop using Regen Braking, while the second stage powers the truck to a more aggressive stop, using the two spring applied, electrically released motor mounted brakes.

Hyster also offers their Auto Deceleration System through the control handle.

Crown-

Crown trucks have 2 independent, totally enclosed Crown manufactured drive motors, horizontally mounted, and difficult to service.

Their disc brakes are mounted on the drive motor shaft. They offer variable braking through the foot pedal.

Mitsubishi-

Mitsu / Cat trucks have 2 independent SEM GE motors, also vertically mounted for more efficient servicing.

Like Hyster, their brakes are also motor mounted.

Performance – Steering System

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Menu



E30-40HSD

- ❑ On demand hydrostatic steering
 - 5.5 turns lock to lock
 - Precise, reliable control
 - Compensates for fast turns to eliminate cavitation
- ❑ Hydraulic rack & pinion actuator



E30-40HSD

- The hydrostatic steering system is all hydraulic, and is designed to give precise, reliable control having 5.5 turns lock to lock.
- The system consists of a steering wheel, steering control unit, pump and motor, hydraulic rack and pinion actuator assembly and steer axle.

Steering System Operation

- Pressure and flow for the steering system operation is provided by the hydraulic pump and motor.
- The steering control unit directs and meters the oil to the steering actuator/cylinder as determined by the movement of the steering wheel. The steering cylinder force is directed through the gear rack and pinion and axle/yoke assembly to position the twin steer wheel tires. The control unit is an open-center, rotary actuated hand pump. When the steering wheel is rotated, the steering control unit meters a specific quantity of oil 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 motor stops running, the steering control unit becomes a manually operated hand pump, so the truck can be steered to a controlled stop. On demand hydrostatic steering maintains proper fluid flow and compensates for fast turns eliminating cavitation.
- Oil pressure in steering system is limited by a relief valve in power steer hand pump.
- The steer angle pot and bracket mounted on the hydraulic rack and pinion steer actuator gives steer position to the traction system.

Performance – Steering System

Main
Menu



Tiller Handle



Notice the design of all the tiller handles are similar with the smaller steer knob.

Performance – Steering Motor

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Menu



Steering Motor

Hyster –

Hyster uses the Iskra on-demand brushless DC permanent magnet motor which has no serviceable components.

Crown –

Crown's steering and auxiliary functions use the same motor. (left side).

Mitsubishi –

Mitsu / Cat uses a full hydrostatic power steering motor which has quiet operation.

Performance – Steer Axle

Main
Menu



E30-40HSD

- ❑ **Hydraulic rack and pinion**
 - Similar to J30-40XMT
- ❑ **Twin wheel assemblies**
 - Provides 180 deg total steer angle
 - Increased stability
 - More rubber to absorb shock and vibration
- ❑ **Pre-packed tapered roller bearings**
 - Long life/minimum maintenance
 - Extends steer component life
 - Increases reliability
 - Enhances operator performance



E30-40HSD

- The steer axle assembly consists of a hydraulic rack and pinion actuator assembly, a steering yoke assembly, and dual tire and wheel assemblies.
- The basic design has been provided to many 3-wheel truck manufacturers in Europe and America for approximately 10 years. The product has very good durability and service history.
- The hydraulic rack and pinion actuator assembly consists of a cast housing, hydraulic dual ended cylinder with a center gear rack piston rod, and an output shaft with integral pinion mounted on large automotive type tapered roller bearings.
- Much of the steer axle is common with that used in the J30-40XMT. A new yoke and hub were created for this truck. The rest of the internal parts, including all seals and bearings are interchangeable.
- The hydraulic fluid flows to the end of the cylinder piston causing the center rack piston rod to move axially within the cylinder housing. The axial motion of the rack translates to rotary motion of the pinion and output shaft. The output shaft bearings provide smooth rotary motion and all reactions to loads transmitted through the assembly from the ground contact.
- The steering yoke assembly consists of a high strength steel forged yoke, dual ended steel spindle shaft and forged steel wheel hubs mounted on automotive type tapered roller bearings.
- The yoke translates the actuator output shaft rotation to the dual wheel assemblies providing 180 degrees of total steer angle. The yoke is designed and tested to transmit and withstand all steering and ground contact loads.
- The dual steer tires and wheel assemblies are offered in poly tires.
- Tapered roller bearings are pre-packed for long life and minimum maintenance.
- The bearings are sealed to minimize dirt inclusion and maximize bearing grease retention.
- This design provides extended life for steering components, increased reliability and enhanced operator performance.

Performance – Steering Assembly

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Rack and Pinion



Dual Chain and Rod Driven



Chain Driven

Steering Assembly

Hyster -

Hyster uses a Rack and Pinion actuator, and a twin steer tire design allows for less scrubbing and longer life.

Crown -

Crown uses a dual chain assembly, one you cannot see located behind the wrap around bumper. It has a single steer tire design.

Mitsubishi -

The Cat/Mitsu has hydrostatic steering like ours but there are differences in design. They have a hydraulic pump and motor that drive (powers) the steer chain. The steer chain drives the hydraulic steer unit. The steer unit itself is enclosed, however; the chain and sprocket are left exposed. There is no bottom cover or anything to prevent dirt and other foreign matter from being thrown up on the steer chain and chain sprocket. These contaminants cause premature and excessive wear on both the chain and sprocket.

- Exposed steer chain and sprocket results in excessive wear. The wear causes steer wobble and reduced steer controllability.
- Chains stretch with use, therefore requiring additional adjustments.
- Chains also require lubrication for a smooth quiet operation.
- Hydraulic pump and motor is subject to leaks.
- More hydraulic connections for more potential leak points.
- More parts, more expensive

Performance - Mast

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Masts

Hyster-

Hyster offers a Vista mast which provides excellent visibility. We incorporate the flush face design with geometrically matched canted load rollers that provide full-face roller contact. This is the same mast that we use in our 3 wheel sit down trucks.

Hyster uses trunnion mounts which have replaceable bushings for longer life. Our cross members are located at the tilt cylinder mounting out of visibility range.

Mitsubishi –

Mitsu / Cat uses the same triplex mast in all of their three wheel stand trucks.

They have a stepped mast design and like Hyster they use canted load rollers. Their unique middle cross member is located higher up on mast which affects visibility.

Crown –

Crown uses a stepped mast design with canted load rollers as well.

Their mast is designed with heavy cross brace construction with sections that nest in main upright. The tilt cylinder mounting is positioned low for better visibility.

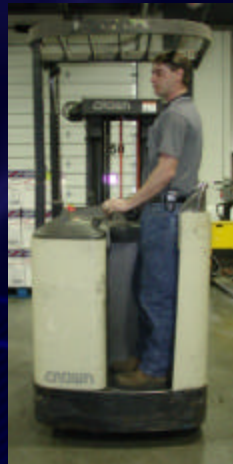
Performance – Frame

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Menu



Unitized Frame

Finite Element Modeling (FEM)



CROWN

RC 3000



Mitsu FBC-KS

Hyster –

All Hyster frames are unitized and 42" wide.

They also offer a cut out for Steer Wheel access.

Mitsubishi –

The Mitsu / Cat Frames are unitized as well, and offer two chassis widths.

The smaller 3000 and 3500 lb chassis is 41" wide. The larger 4000 and 5000 lb chassis is 42.5" wide.

They also offer a cut out for Steer Wheel access.

Crown –

The Crown frame is non-unitized with a left rear swing out Service door. They also offer two chassis sizes as well.

The smaller 3000 and 3500lb chassis is 40" wide. The larger 4000 lbs chassis is 42" wide.

Because of their wrap around bumper, they don't have a out for steer wheel access.

Performance – Dimensions

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Overall Truck Dimensions L* x W x H ** (in.)

Hyster E40HSD

69.8 x 42.0 x 88.0

Crown RC 3020-40

69.8 x 39.8 x 90.5

Mitsubishi FBC20KS

71.2 x 42.5 x 88.0

* Length to Fork Face

** Height of Overhead Guard

Hyster –

The Hyster design incorporates the forward slant with a modern appearance. We offer 2 chassis lengths.

The shorter 3000 & 3500lb chassis accommodates an 18" and a 16" battery with a 2" spacer.

The longer 3500 & 4000lb chassis accommodates a 21" battery.

Mitsubishi –

The Mitsu / Cat incorporates a wedge design which is similar to the Raymond. Mitsu / Cat offers three Chassis lengths

The shortest 3000 & 3500 lb chassis accommodates an 18" battery.

The 4000 lb chassis accommodates a 21" battery, and the 5000lb chassis accommodates a 23" battery.

Crown –

The Crown incorporates more of a box design. They offer three chassis lengths, like the Mitsu / Cat.

The shortest 3000 lb chassis accommodates a 13", 15", or 18" battery.

The 3500 lb chassis accommodates an 18" battery, and the 4000 lb chassis accommodates a 20" battery.

Performance – Battery Compartment

Main
Menu



		Battery Compartment Size	Battery Compartment Size
Truck Model		Standard	Optional
		(L x W x H) (in.)	(L x W x H) (in.)
Hyster			
E30HSD	3,000	36.6 x 18.3 x 31.1	36.6 x 16.3 x 31.1
E35HSD	3,500	36.6 x 18.3 x 31.1	(with 2” spacer)
E40HSD	4,000	36.6 x 20.8 x 31.1	36.6 x 20.8 x 31.1
Crown		(Max Battery Size)	
RC3020-30	3,000	38.56 x 13.68 x 31	
	3,000	38.56 x 15.88 x 31	
	3,000	38.56 x 18.38 x 31	
RC3020-35	3,500	38.56 x 18.38 x 31	
RC3020-40	4,000	38.56 x 20.75 x 31	
Mitsubishi			
FBC15KS	3,000	38.5 x 18.5 x 32.3	38.5 x 16.25 x 32.3
FBC18KS	3,500	38.5 x 18.5 x 32.3	(with 2” spacer)
FBC20KS	4,000	38.5 x 21.25 x 32.3	38.5 x 16.25 x 32.3
FBC25KS	5,000	38.5 x 23.75 x 32.3	

Hyster E30-40HSD

- There are 2 chassis sizes: one for the 16" & 18" batteries, and one for the 21" battery.
- To use a 16" battery, a 2" spacer must be installed inside the battery compartment.
- The shorter chassis truck offers 3000 & 3500 lb capacities. The longer chassis truck will offer 3500 & 4000 lb capacities. All frames are 42" wide.

Performance – Dash Display

Main Menu 



E30-40HSD



Standard

Standard Dash Display

- ☐ RS232 serial communication
- ☐ Back lighted alpha numeric LCD
- ☐ 1 x 8 characters
- ☐ LED indicators for warnings
- ☐ Battery charge state
- ☐ Total truck hours
- ☐ Diagnostic and fault codes

E30-40HSD

- The standard dash display is a Curtis 840. This is the same display as used on the new Order Picker, and it performs in the same way. Output consists of battery state of charge, and truck hour meter. The dash also displays maintenance fault codes.

Performance – Dash Display

Main Menu 



E30-40HSD

Premium Dash Display

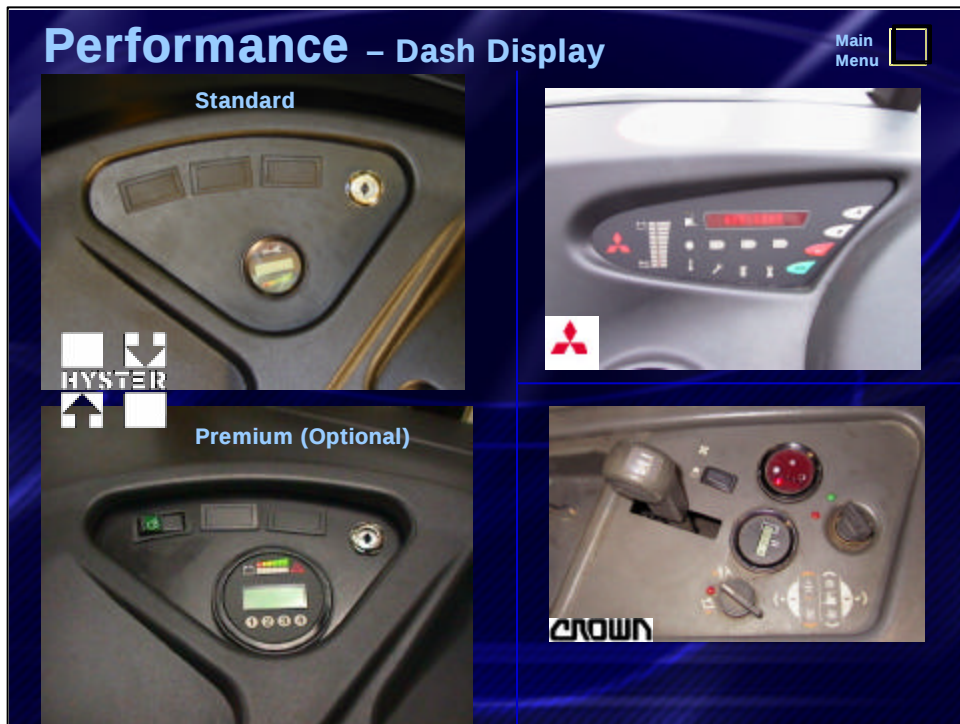
- ☐ Entry access codes for operators and service technicians
- ☐ Buttons for selecting four traction performance modes
- ☐ Lift pump hours
- ☐ Traction hours
- ☐ Total truck hours
- ☐ Extended diagnostic and fault codes
- ☐ Traction and pump motor brush wear indication
- ☐ Traction and pump motor over temp indication
- ☐ CANbus compatibility
- ☐ Back lighted alpha numeric LCD
- ☐ 2 x 12 characters
- ☐ LED indicators and a beeper for warnings
- ☐ Battery charge state



Premium

E30-40HSD

- An optional premium dash offers 4 travel modes, multiple hour meters (total truck, traction and hoist hours) and operator password options.



Dash Display

Hyster –

Hyster's standard display, and optional premium display are both programmable through the handle. For example, lift speeds, tilt speeds, travel speeds.

The premium dash gives you the option to enter passwords as well as two extra hour meters, and brush wear indicator..

Mitsubishi –

Mitsu / Cat's standard dash display is customer programmable, through the keypad

The use of passwords is standard as well as 16 continuous monitoring fault codes, 65 status codes, in English, French or Spanish.

Crown -

Crown offers a standard hour meter, and discharge indicator.

Performance – Dash Display

Main
Menu



FBC15KS-FKB25KS

- ❑ Poor location – over operator's right arm; display is not in clear view
- ❑ Hard to read in direct sunlight



FBC15KS-FBC25KS Series

- Poor location.
- Cannot be read in sunlight.

Main Vehicle Specifications				Hyster E40HSD	Crown RC 3020-40	Mitsubishi FBC20KS
Load Capacity				lb.	4000	4000
Load Center				in.	24	24
Tire Type				Poly	Rubber	Rubber/Poly
Maximum Fork Height (MFH)				in.	127	154
Mast Lowered Height				in.	82	95
Free Lift				in.	5.5	47
Load Distance *				in.	13.2	10
Wheelbase				in.	46.4	49.7
Fork Size (T x W x L)				in.	1.5 x 4 x 42	1.8 x 4 x 36
Length to Fork Face				in.	69.8	69.8
Overhead Guard Height				in.	88	90.5
Tilt Range (FWD/BWD)				deg.	5 -- 5	5 --2
Outside Turning Radius				in.	57.5	59.9
Right Angle Stacking Width				in.	70.7	69.8
Overall Width				in.	42	39.8
Carriage Width				in.	38.5	37
Speeds	Travel, Max. (FWD)	Full Load	m.p.h.	6.5	6	6.6
		No Load	m.p.h.	7	6.2	7
	Lifting	Full Load	f.p.m.	53	48	60
		No Load	f.p.m.	95	90	102
	Lowering	Full Load	f.p.m.	90	80	100
		No Load	f.p.m.	70	60	90
Total Weight w/ battery				lb.	9240	9225
Underclearance		Min. with Load	in.	3.5	3.8	3
		Center of Wheelbase	in.	4	4	4
Tire Sizes		Front		18 x 7 x 12.1	13.5 x 7 x 8	16.25 x 6x11.25
		Rear		10 x 5 x 6.5	9 x 5 x 5	10 x 3.5
*Centerline of front axle to front face of forks.						
** Add load length and clearance.						

Main Menu



Main
Menu



This information we got from the Hyster dealer website through the competitive database "LiftSource". This can be very helpful when quoting against competitors.

Take a look at right angle stacking. Hyster is within an inch of Crown and tighter than Mitsubishi / Cat.

In summary Hyster has utilized proven components such as the CANbus System, from our Order Picker, multi-function control handle from our Reach truck, and the front trans-axle and mast from the three wheel sit down trucks. As you can see we have built a superior truck and now we challenge you to make this the number one selling Class I Three Wheel Stand in North America.



E30-40HSD's SUPERIORITIES

Common proven components with J-XMT, R-XM,
N-XMR trucks

Suspended floor plate

Intuitive Multi function Handle

Maintenance Access and Component layout

On Demand Steering

18" Drive Wheels

CAN bus

SEM Technology

Hall Effect Sensors



Hyster has utilized proven components such as the CAN bus System, from our Order Picker, multi-function control handle from our Reach truck, and the front trans-axle and mast from the three wheel sit down trucks. As you can see we have built a superior truck and now we challenge you to make this the number one selling Class I Three Wheel Stand in North America.

Summary



Main
Menu



The newly designed Hyster E30-40HSD provides state-of-the-art electric motor control technology. The Curtis transistor controllers along with SEM and CAN bus technology are built to perform and last in the toughest applications.

The unit's simplified design will allow it to be highly competitive in performance and price, while maintaining the same level of serviceability and reliability as the premium line of trucks.

