This PowerPoint presentation CD was produced specifically for Hyster Dealer Principals and Sales Managers. This CD is intended to be used to help enhance the selling skills and product knowledge of the Hyster dealer sales force. <u>This presentation is not intended to be given to the end user</u>.

The Hyster W40Z and W45Z Motorized Hand Trucks are designed for maneuverability and value. All motorized hand truck components are engineered for outstanding performance, extended life and low maintenance. The easy-to-use handle designed with advanced ergonomics, contributes to exceptional operator comfort and results in greater productivity.

In June of 2000 Crown introduced the WP2000 series motorized hand truck which competes with the W40Z and W45Z. This series replaced their GPW40 series. The WP2000 series includes the WP2030, WP2035, WP2040, and WP2045. Specifications and technical information are available on the internet at <u>www.crown.com/NorthAmerica/pdfs/wp2000.pdf.</u> With the introduction of their new truck, Crown has the ability to turn inside a trailer; something they were unable to do before. This truck is competitive in appearance, performance, and price.

<u>NOTE</u>: BE SURE TO CHECK **NOTES PAGE** FOR EACH SLIDE . MANY OF THE SLIDES HAVE ADDITIONAL INFORMATION IN THE **NOTES PAGE** VIEW.

W40Z
vs.
Crown WP2030-45

Bottom mounted handle vs. top mounted handle

Position and orientation of Hyster tiller handle

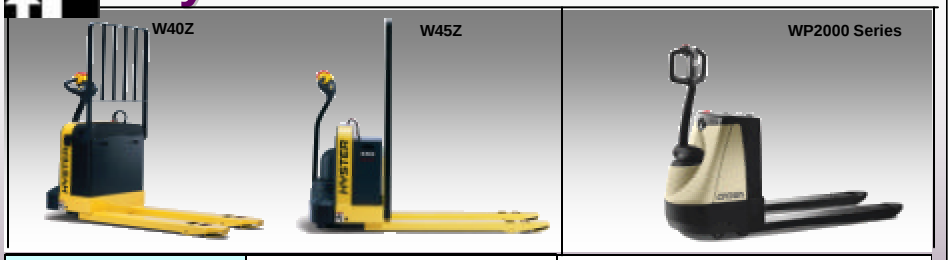
Several factors were involved in positioning and orientating the Hyster tiller handle:

- Operator height
- Walking clearance
- Fork tip visibility
- Direction of travel (predominate use is forks trailing)
- Minimize Length – tiller handle must remain within the profile of the bumper

  when in the upright position.
- Steering effort

To optimize these factors, Hyster walkie pallet trucks are equipped with a bottom-mounted tiller handle.

Hyster and Crown Models



Model	W40Z (4,000 lbs)				WP2030-45 (4,500 lbs)			WP2035-45 (4,500 lbs)
Nominal Fork length	**36"**	**42"**	**48"**		**36"**	**42"**	**48"**	**Profiled Fork**
Head Length (in.)	21.4	21.4	21.4		23.2	23.2	23.2	23.2
Wheelbase - Raised/Lowered (in.)	39.7/43.1	45.6/49.0	51.5/54.9		44.2/39.7	50.3/45.8	56.2/51.7	55.2/52.1
Turn Radius (in.)	50.9	56.8	62.7		51.6	57.7	63.6	62.6
Weight less battery (lbs.)			**540**				**712**	
Battery pack weight (lbs.)	310	310	310		340	340	340	340
Battery compartment size	7.9" W x 23.9" L x 28.4" H				7.9" W x 25.83 " L x 26" H			

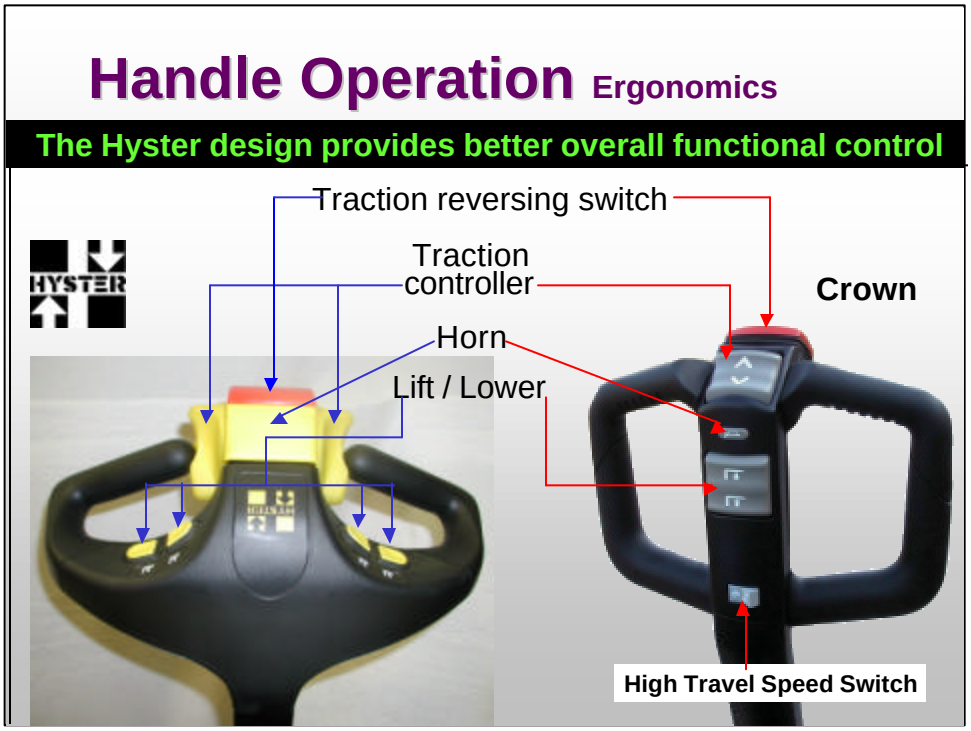
Model	W45Z (4,500 lbs.)				WP2040-45 (4,500 lbs)			WP2045-45 (4,500 lbs)
Nominal Fork length	**36"**	**42"**	**48"**	**60"**	**36"**	**42"**	**48"**	**Profiled Fork**
Head Length	22.4	22.4	22.4	22.4	24.4	24.4	24.4	24.4
Wheelbase - Raised/Lowered	40.7/44.1	46.6/50.0	52.5/55.9	64.3/67.7	45.4/40.8	51.5/46.9	57.4/52.8	56.4/53.3
Turn Radius	51.9	57.8	63.7	75.6	52.8	58.9	64.8	63.8
Weight less battery			**560**				**712**	
Battery pack weight	360	360	360	360	340	340	340	340
Battery compartment size	7.5" W x 26.4" L x 27.3" H				9.1" W X 25.83" L x 26" H			

The Crown WP 2000 has two fork styles.

The main difference between the 2030 and the 2035 is the 2035 comes with a 45.5” fork. As noted above, the 45.5” fork reduces the turn radius to 62.6” for the 2035.

The Crown “profiled fork” features tapered fork tips with shorter lengths and wheelbase to improve the turning radius is limited to 5.2” of lift, while the standard fork features 6” of lift.

The same applies to the difference between the 2040 and the 2045. The 2045 only comes with the 45.5” fork.



Handle operation is one of the keys to operator comfort and productivity with motorized hand trucks. The Crown truck traction control button is a large rocker switch designed for thumb actuation. The Hyster butterfly switches can be operated with thumb, forefinger, or both with either hand providing more operator flexibility.

The horn button on the Hyster truck is large and easily actuated with thumb or forefinger. The horn button on the Crown truck is small and not in close proximity to the natural resting position of the thumb or forefinger.

Lift and lower on the Crown truck are actuated by a large rocker switch which is out of range of the thumb and a real stretch for the forefinger. The hand must be removed from the handle to operate it comfortably. The Hyster lift / lower controls are separate, full width buttons which can be easily accessed with either thumb or forefinger.

The Crown truck features a high travel speed switch (Turtle / Turtle/Rabbit) mode and *has four pre-programmed performance levels.*

Handle Operation

DURABILITY: Tiller Handle & Controls

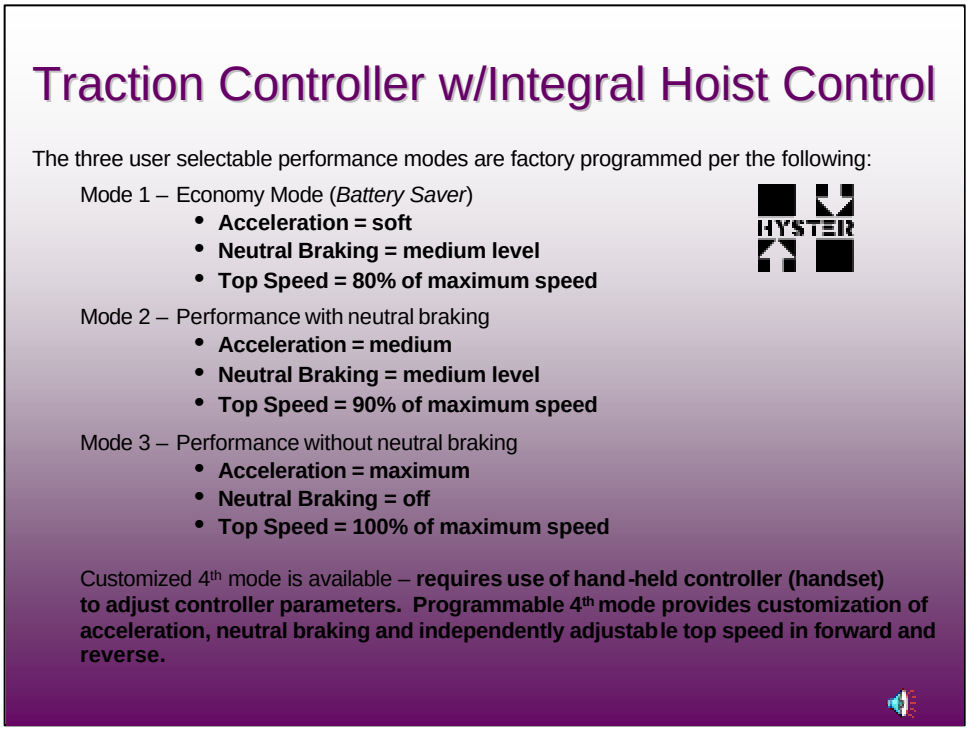
The most significant attribute of the tiller handle other than ergonomics for a Walkie pallet truck is durability.

The Hyster tiller handle is the same as the handle on the W45Z, W60Z and W80Z.

Materials: The handles are injection molded of a fiberglass impregnated composite material that gains strength from the hot injection molded process. There is no concern with durability in cold storage environments or from direct exposure to sunlight/UV.

The Crown control handle is urethane covered for insulation from cold and vibration. Handle construction material is not known.

Crown



User Selectable Performance Modes:

(Mode 3 is the default setting from the factory).
The user has a choice of three performance modes that are selectable through the tiller handle. The mode selection is made at start-up, or key "on". Performance parameters that vary are acceleration, deceleration (neutral braking), and top travel speed.

Note:
If the truck is programmed using the hand set for the customized 4th performance mode, the 3 user selectable modes will be disabled.

Traction Controller w/Integral Hoist Control

The three user selectable performance modes

(Mode 3 is the default setting from the factory).

1. The tiller handle must be in the full upright position, brake “ON”
2. Press and hold the horn button while turning the key switch to the “ON” position
3. The horn will sound, then release the horn button
4. Toggle through the modes by pressing the lift or lower buttons
5. The horn provides an audible indication as to the mode selected. One “beep” represents Mode 1, two beeps represents Mode 2 and three beeps represents Mode 3.

Handle Operation

Crown

Four pre-programmed performance levels from the factory:

Level 1: Rabbit - maximum speed

Level 2: Rabbit/Turtle - a speed somewhere between maximum speed and minimum speed pre-set at the factory and determined by the customer.

Levels 3 & 4:

Brake Override position – 2 speed settings: Rabbit or Rabbit/Turtle

Two speeds in normal range
Two speeds in brake override
All fully adjustable…

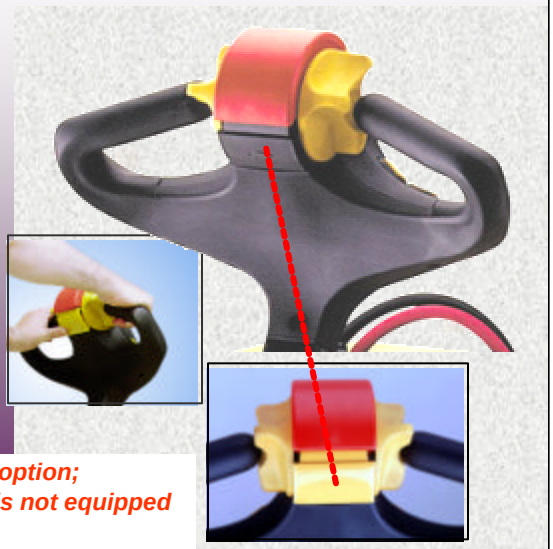
(All pre-programmed performance levels are operator adjustable by switching the high travel speed switch (Rabbit / Rabbit/Turtle switch) and the traction controller button).

All Crown settings can be customized by the use of a handset.

Handle Operation

Creep Speed Control (Optional)

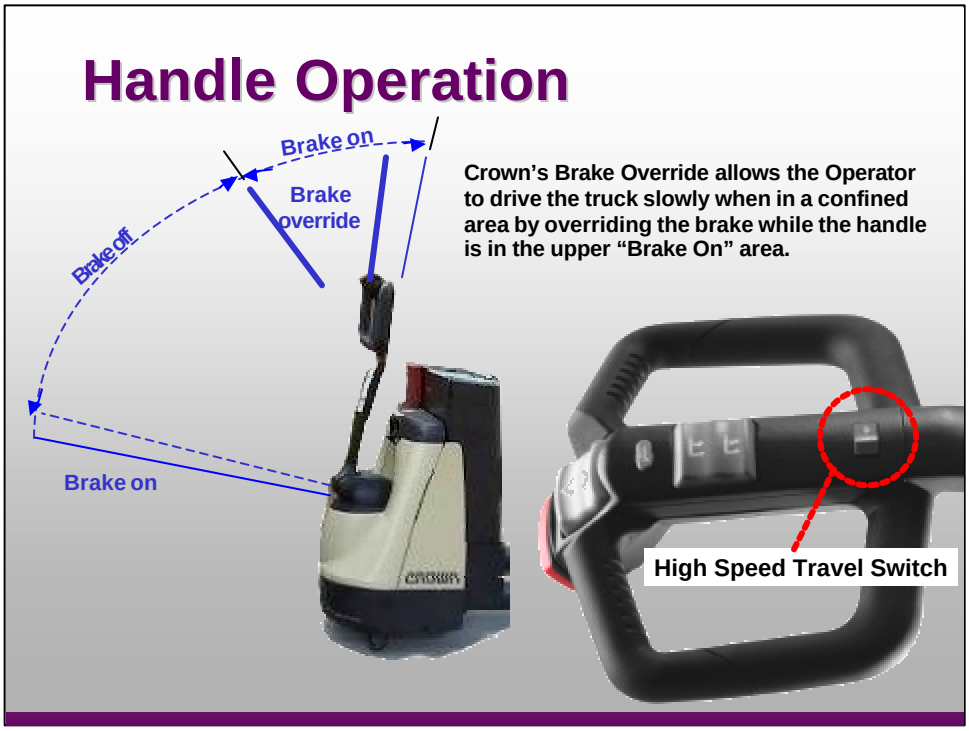
- "Creep Speed" allows the operator to override the brake and maneuver the truck in tight areas without lowering the control handle.
- *Yellow button centrally located on the backside of the control handle can be easily operated with either thumb.



***Button is yellow if truck has this option; A black blank is in place if truck is not equipped with this option.**

The optional creep speed control, also known as "Turtle" speed, has been introduced allowing an operator to maneuver the truck in tight areas without lowering the handle. The actuator is centrally located on the backside of the tiller handle where it can easily be operated with either thumb. The actuating force is 2.2 ft. pounds of pressure. The truck speed is variable up to approximately 1 MPH in both directions. The Creep Speed Control is active until the direction/throttle control is returned to the neutral position or the creep speed actuator is released. If the tiller bar is lowered to the driving position, or brake "OFF", while the creep speed actuator is depressed, the creep speed control will remain active. The truck will resume the normal driving mode once the creep speed actuator is released. The creep speed control cannot be re-activated until the handle is returned to the full upright position, or brake "ON".

The angle of the tiller handle tube provides a better operating position with the new handle improving the ergonomics of the truck.



Both the Hyster and Crown tiller handles have the ability to maneuver within the confines of a trailer.

The brake override feature allows the operator to drive the truck at creep speed with the control handle in a near vertical position.

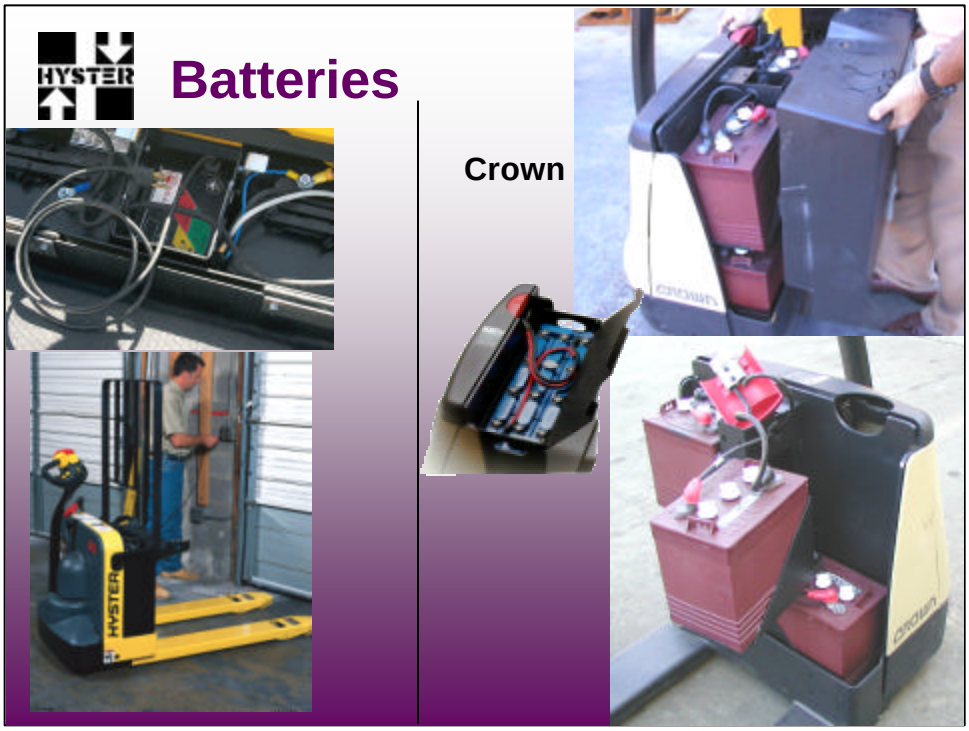
The standard battery pack consists of four (4) deep-cycle batteries, a low-frequency battery charger, tray weldment and battery cover with hinged convenience tray. The four batteries are connected in series to provide a 24-volt system.

The batteries are 6 volt, deep-cycle flooded cell type delivering 158 AH (6 hour rate). As with any flooded cell battery, these batteries will require periodic inspection of water level and electrolytes.

The battery charger delivers 20 amps. The charger requires 110 VAC at 50 to 60 Hz. A detachable industrial AC power cord and truck/charger inhibit circuit are included. The battery connector remains connected to the truck, unless the operator disconnects the battery in the event of an emergency. The charger will automatically inhibit the truck traction system drive circuit to prevent the truck from being driven while the batteries are being charged. Once the AC power cord is disconnected from the outlet, the truck may resume driving.

The charger is mounted in the battery compartment. This mounting location requires the user to open the battery compartment cover which enables natural air flow for charger cooling and to ventilate the battery gases which are produced during the charging cycle.

The tray weldment includes locking swing-out trays for the top two batteries to enable easy inspection and maintenance of the two lower batteries.



Crown's WP2030 is available with three battery options:

Two battery compartments are available.

The 7.9" battery compartment (WP 2030 / WP 2035) is designed for the battery package options (shown on next slide).

The 9.1" battery compartment (WP 2040 / WP 2045) will accept an industrial storage battery up to 330 amp hour capacity.

An onboard 120 volt / 30 amp charger is priced as an option, but is required on the 2030 and 2035. It is not required on the 2040 and 2045.

Note: a dry cell battery is one which is shipped without electrolyte. It is filled, charged, and tested, and then drained for shipping purposes. This process normally adds to the cost of the battery.

Batteries

Hyster W40Z

No. of Cells	Cell Size	Plates per Cell	Capacity (6 hr rate) Amp-Hours	KWH	"X" Dim.	"Y" Dim.	"Z" Dim.	Max. Weight
Standard Battery Pack With 20A charger			158 (185 AH @ 20hr rate)	4.0	28.4"	7.9"	23.9"	310 lbs.
GNB PalletPro® Battery Pack with 25A Charger			195	4.4	27.3"	7.5"	26.4"	375 lbs.
Crown WP 2030 / WP 2035								
Maintenance free battery pack			195		26"	7.9"	25.83"	340 lbs.
Wet cell swing out battery pack			160		26"	7.9"	25.83"	
Dry cell swing-out battery pack			160		26"	7.9"	25.83"	
Crown WP 2040 / WP 2045								
Industrial Batteries			up to 330		26"	9.1"	25.83"	

A red SBX type battery connector is used with all battery packs. Following industry standard, the red connector identifies a 24-volt system. The SBX connector provides two auxiliary contacts that are used to connect the charger inhibit circuit with the traction controller.

The optional battery offering is the GNB PalletPro® Maintenance-Free pack with on-board charger. According to the manufacturer this offering is limited to 60% D.O.D. (depth of Discharge) and not recommended for use in cold storage and freezer applications. The Maintenance-Free battery technology is less tolerant to over discharge than traditional flooded-cell batteries and may result in irreparable damage. To minimize the potential of over discharge, the battery type is a selectable feature of the traction system.

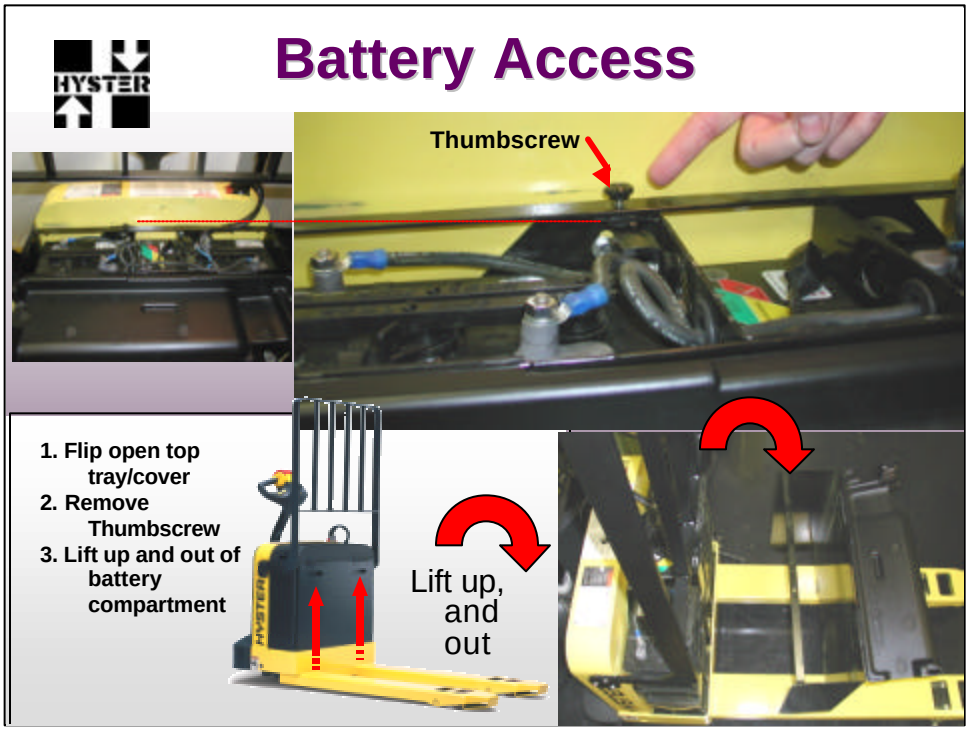
Note: The cord for the battery pack charger will come from the factory stored below the charger to prevent loss.

Note: a dry cell battery is one which is shipped without electrolyte. It is filled, charged, and tested, and then drained for shipping purposes. This process normally adds to the cost of the battery.

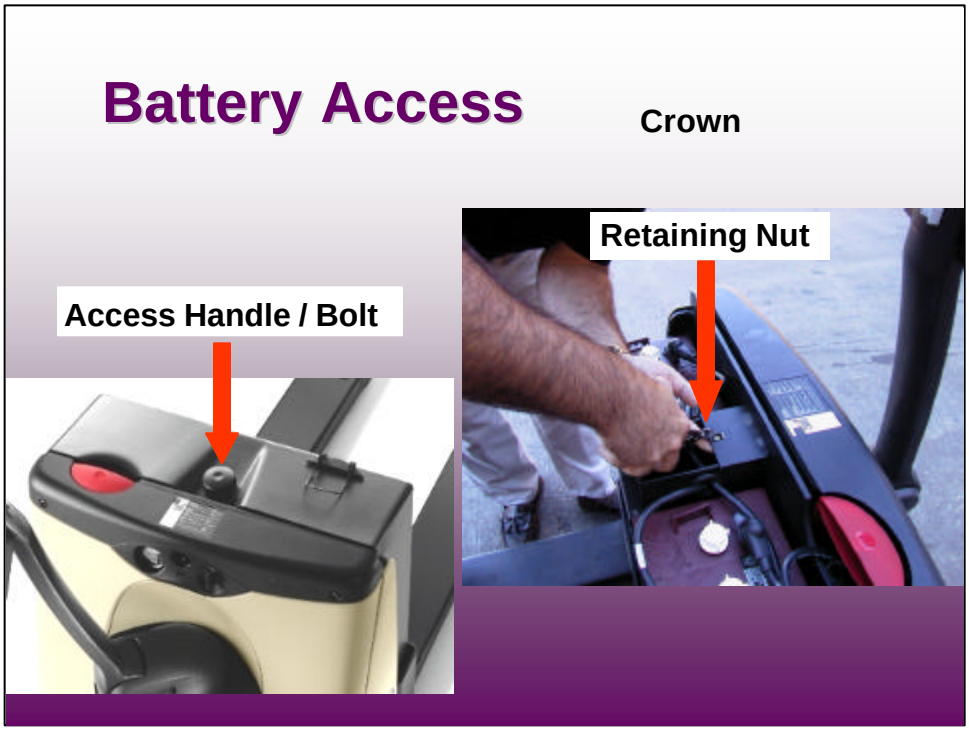
Battery Cover With Hinged Convenience Tray (Standard on W40Z)

Crown paper retainer

Crown only has a paper retainer clip on the battery cover (WP 2030 and WP 2035)



The Hyster battery cover is secured with one small thumbscrew bolt which screws through a clip with a nut underneath. The nut is part of the clip so it will not fall out. Once the thumbscrew is removed, the entire battery cover can be lifted up and out of the battery compartment for easy access to the batteries. The Hyster battery cover will stand on its own once removed.



The Crown battery cover is a one piece steel unit secured with one bolt that has a large urethane covered twist handle. This makes the cover easy to remove, but because of the notched-out configuration of the bottom of the cover, it will not stand on its own. It must be laid down, requiring the operator to bend over or throw it down which can result in damage to the cover. Additionally, the retaining nut is not secure and falls out when the cover is removed. When we removed the cover, we had to find the nut and re-insert it before re-installing the cover.

Battery Access

Crown

Swing out Batteries

Battery Release

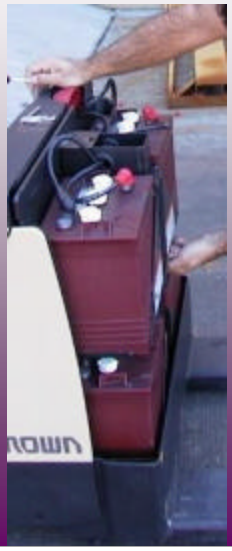
side view

Crown

face view

This slide illustrates the position of the battery tray release for each truck.

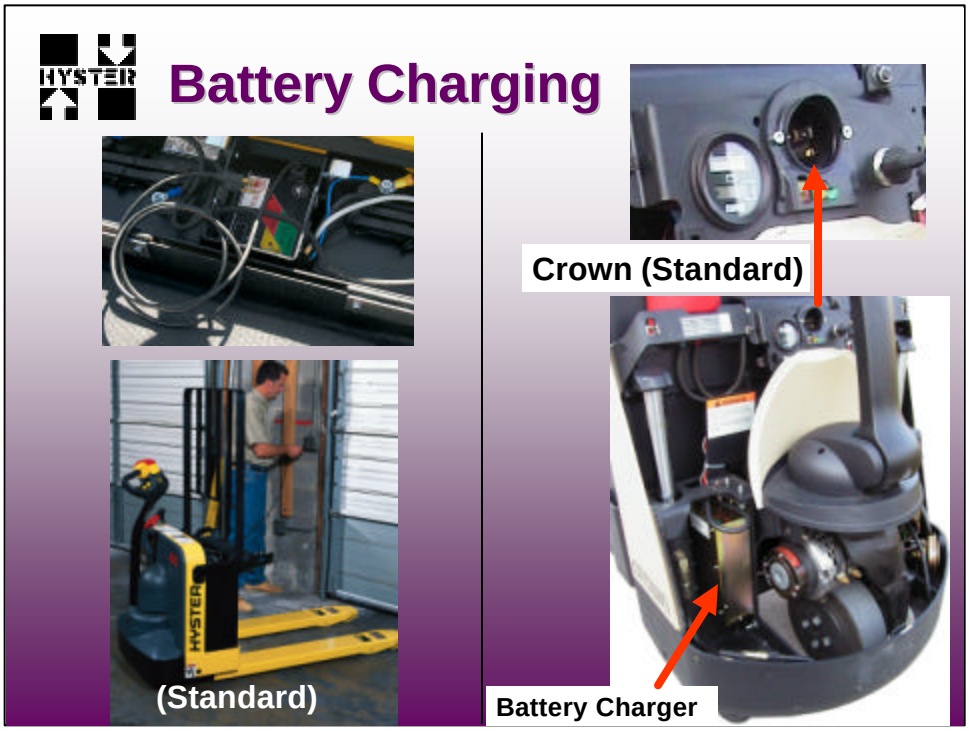
Battery Access



Crown

To access the swing out battery tray on the Crown requires considerable effort. The operator must bend over or stoop down to release the catch. In addition, the catch required substantial force to release. An operator who experiences a great degree of difficulty in accessing the lower batteries is less likely to check and fill the water levels.

The Hyster W40Z has an easy-to-use release that most operators can access without bending over. The ease of operation is such that the operator can swing out the tray in seconds with one hand.



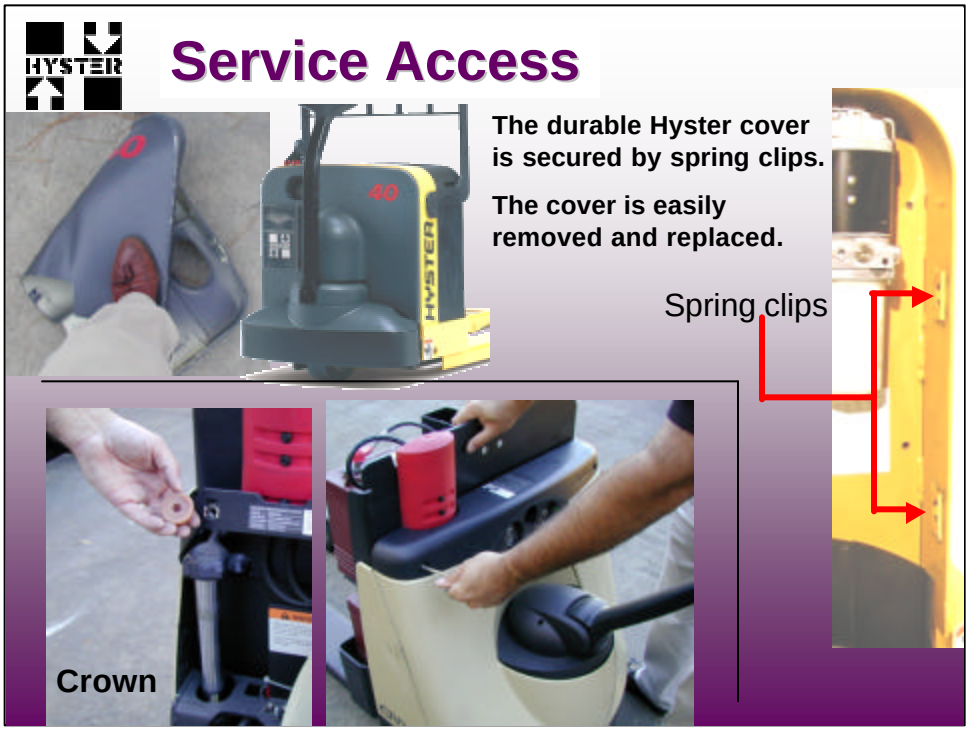
The Standard Hyster battery charger is mounted within the battery pack, providing improved cooling. A detachable AC power cord with on board storage compartment is included. With this system, the top battery cover must be flipped to charge the batteries.

The 20 amp charger operates from a 110 volt outlet and includes a detachable AC power cord with an on board storage compartment. To charge batteries, simply attach the power cord to the charger and plug it into the outlet. The battery connector remains connected to the truck while the batteries are being charged. The charger automatically prevents the truck from being driven. Once the power cord is disconnected from the outlet, the truck is again operational. A GNB PalletPro™ maintenance free battery pack with built in charger is optional.

The Standard Crown truck utilizes a socket instead of an integral power cord. An extension cord must be connected to the charger. The battery cover does not have to be removed for charging.

Note the proximity of the onboard battery charger to the drive tire. This makes it susceptible to moisture and debris thrown up from the floor via the drive tire.

On the Crown, an optional ($375.00) built in 30 amp charger is available and operates off of a 120 volt outlet.



The Crown service compartment cover is a two-piece assembly. The top is constructed of a lightweight plastic that may not hold up well in demanding applications, while the lower portion is formed sheet metal. The cover is secured by two metric allen head screws. Rubber grommets / spacers are used on the inside of the cover to help reduce vibration and give a snug fit. These grommets fall out when removing the cover and are hard to keep in place when re-installing the cover. If they are lost or not replaced, the cover does not fit snugly and rattles excessively.

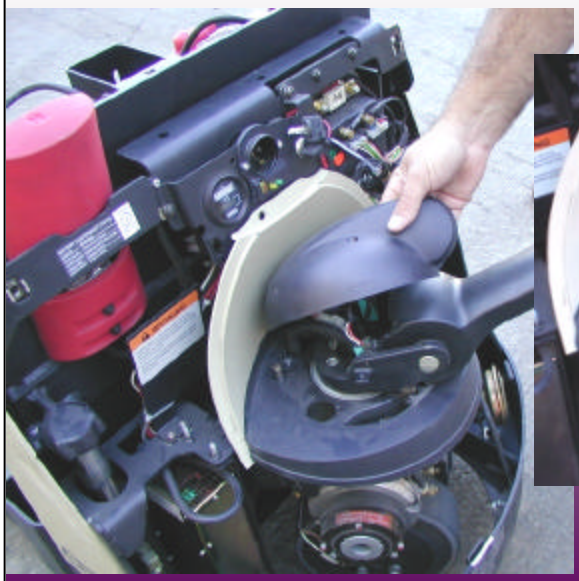
The Hyster cover is constructed of ABS composite material and is secured by spring clips.

Service Access

Crown

The stamped steel power unit cover must be removed / re-installed over the steer tiller handle. This is awkward, and time consuming.

Service Access



Crown

To fully access the service compartment three separate covers have to be removed. After the first, larger cover is removed, two smaller plastic covers must be removed.

The smaller of the two covers the tiller handle torsion springs and electrical connections that run to the control handle.

This is more time consuming than simply pulling off the entire cover as on the Hyster truck.

The third and final Crown service compartment cover completes the enclosure of the back cover. It is made from a lightweight plastic materials that may not hold up well when too much torque is applied in re-installing it. As you can see in this image the cover has already cracked under normal use.

Service Access

Crown

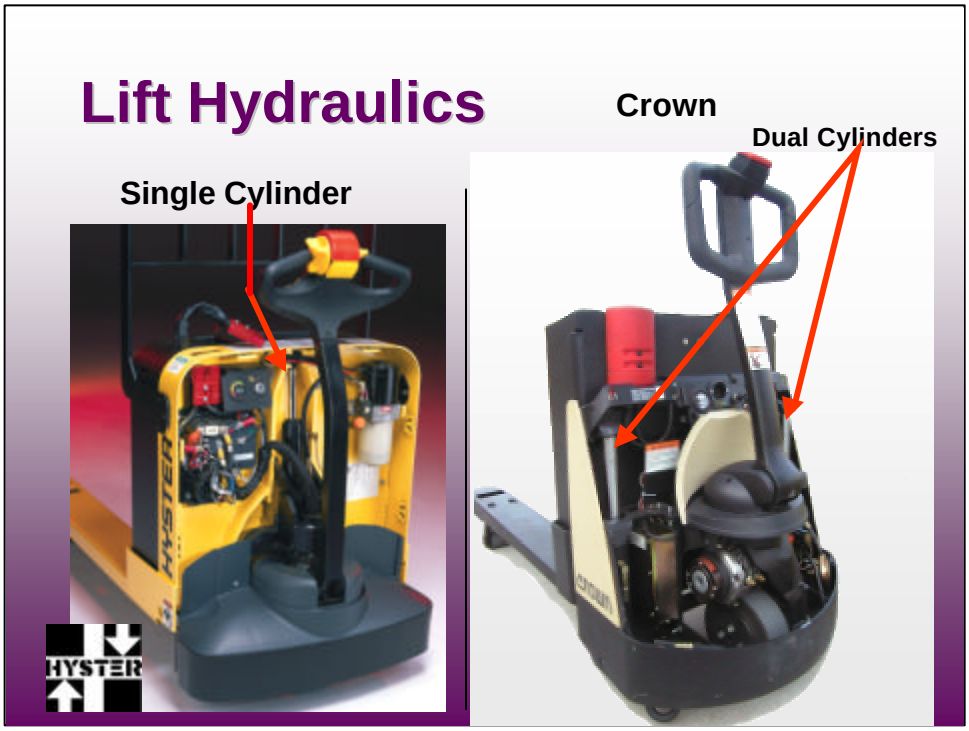
This cover cannot be fully removed without removing the handle, as the opening is too small to slide over the control handle. As a result, it must be secured to the handle during service to keep it out of the way.

Serviceability

Crown

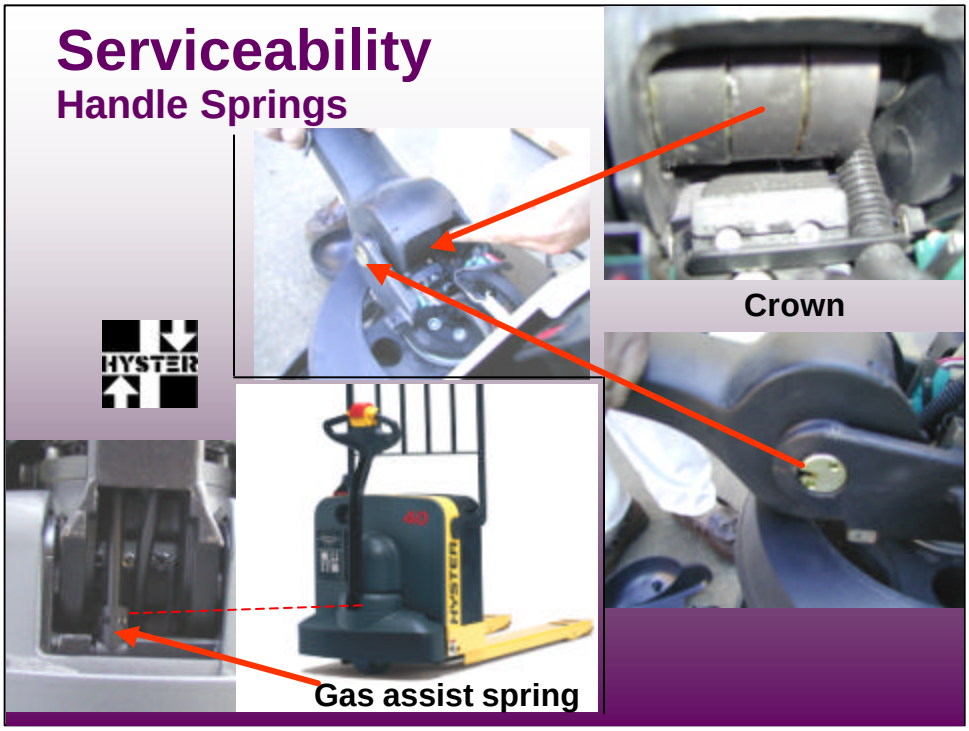
Once inside the Crown truck, a cluttered mass of electrical and hydraulic connections is revealed. The Crown service compartment is crowded and confusing. Compare the service compartments of the Hyster and Crown trucks. The Hyster truck offers a simpler, less cluttered environment.

Lift Hydraulics



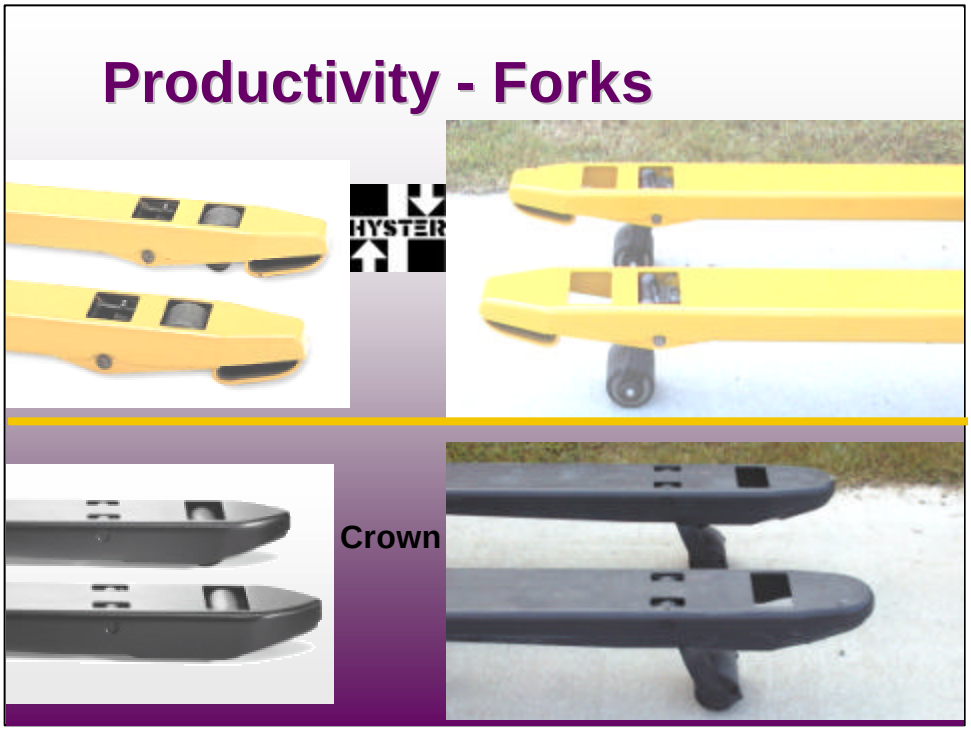
The Crown truck is equipped with dual displacement cylinders and 9 hydraulic connections.

The Hyster truck is equipped with a single piston cylinder with 8 hydraulic connections.



Crown utilizes torsion springs as the handle return mechanism that exert less force when the handle is in the upright position. The torsion springs reduce the effort required to lower and hold the handle in the operating position to less than 1 pound. A special tool is required to adjust the tension of the torsion springs. When transporting the WP 2000 in the back of a trailer, the brake can bounce on and off.

The Hyster handle utilizes a gas assist spring providing effortless positioning and controlled return of the handle to a vertical position.

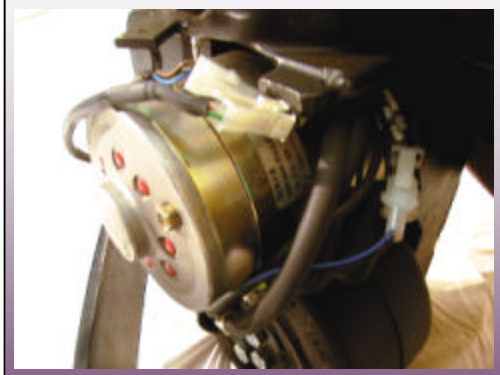


Crown's fork design did not test well with empty or lightly loaded pallets. The truck displayed poor pallet entry. Pallets with thicker bottom deck boards were also very difficult to exit when empty or lightly loaded. The W40Z displayed excellent pallet entry and exit.

The Crown truck features 6" of lift as opposed to Hyster's 5" of lift.

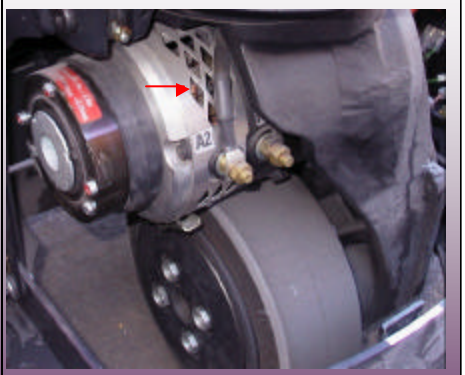
The profiled forks on the 2035 and 2045 reduce turn radius. The 2035 and 2045 have only 5.2" of lift.

Reliability



HYSTER

Enclosed traction motor



Crown

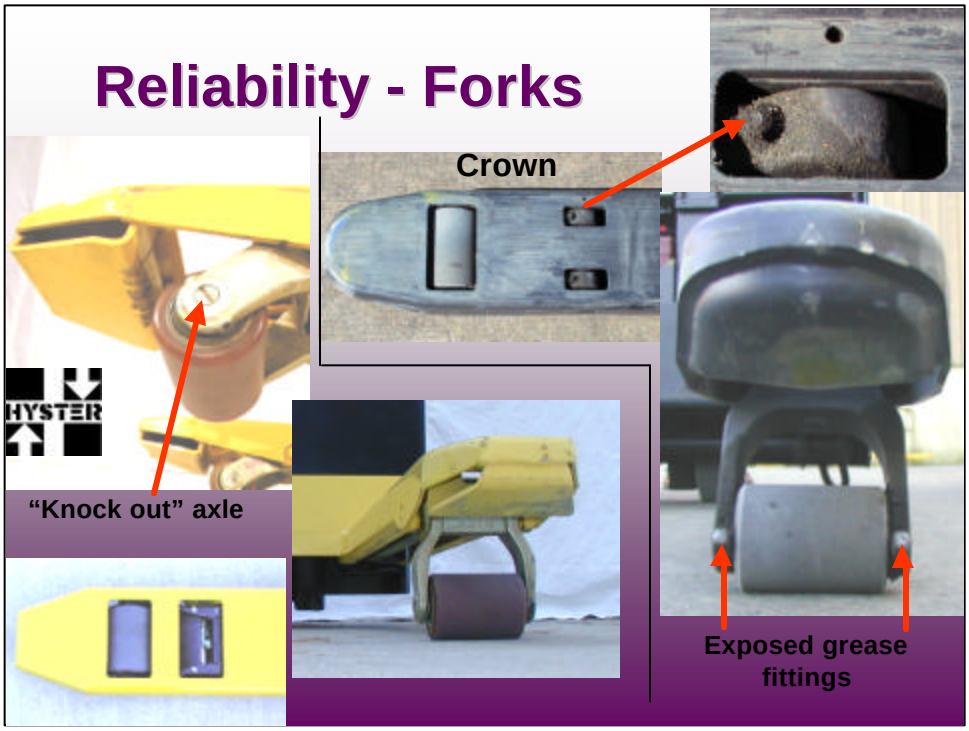
Traction motor not completely enclosed

The Hyster and Crown truck features Separately Excited Motor (SEM) technology.

On the Crown, the traction motor is located directly above the drive tire with a ventilated band covering the brush and commutator area. Protection is reduced from contamination and debris that can be thrown up from the floor via the drive tire directly into the motor.

The Hyster designed traction motor features an enclosed unit to prevent intrusion of debris or contamination.

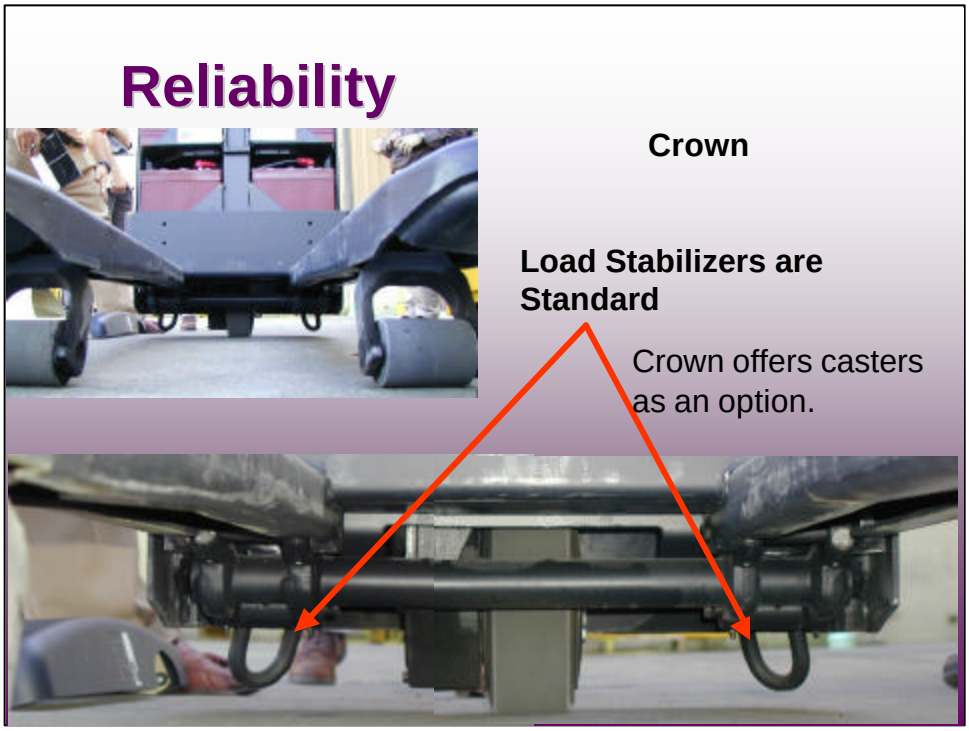
It is important to note that these trucks are frequently used in grocery receiving areas to unload refrigerated and freezer trucks where there is excessive moisture. Receiving docks are also highly susceptible to moisture from rain, snow, etc.



Lift linkage grease fittings are located on top on both trucks giving easy access for service.

Load wheel grease fittings for the Crown truck are exposed when in the elevated position, leaving them susceptible to impact damage.

Hyster’s load wheels have no exposed grease fittings and the “knock out” axle on each load wheel provides quick and easy maintenance.



The bolt-on load stabilizers proved to be cumbersome when operating on ramps or dock plates. During testing, the stabilizers got hung up causing the truck to stop when operating on a slight incline with uneven pavement, and again when on uneven dock plates.

Casters / Stability Tabs

- Stability tabs and casters are optional equipment.
- Stability tabs or casters are required (not standard) for fork widths of 560mm (22”).
- 92 durometer polyurethane spring-loaded casters measure 82mm (3.25”) in diameter x 40mm (1.5”) in width.
- Stability tabs and casters bolt onto standard frame without modifications.

Use of stability tabs or casters are subject to application requirements. General guidelines for consideration are:

No casters or stability tabs – level ground with low load height, and a tightly stacked, banded or wrapped load.

Stability tabs – medium slope/grades with medium high load height and medium stacked, banded or wrapped load.

Casters – higher slope/grades with taller load height or loosely stacked or unstable loads.

Stability tabs and casters are easily installed and are interchangeable.

Note: Stability tabs can cause surface damage to floors. Stability tabs and casters may have a tendency to hang up on dock plates depending on the application and type of dock plates used. Casters do require additional maintenance.

Specification Comparison

Manufacturer	Hyster	Crown
Model	W40Z	WP2030-45
Load Capacity @ 24" Load Center	4000	4500
Travel Speed E/L (24v)	3.7/3.2	3.7/3.4
Type of Controller	Transistor	Transistor
Number of Travel Speeds	4	4
Lift in.	5	6
Overall Lift Height in.	8.3	9.25
Fork Width/Spread in.	6.75/26.4	6.7/26.4
Maximum Frame Width in.	29.2	27.9
Length to Fork Face	21.4	23.2
Based on 48" x 40" Load:		
Overall Length in.	68.6	70.9
Turning Radius Raised/lowered	59.3/62.7	NA/63.6
Wheelbase in. Raised/lowered	51.5/54.9	51.7/56 .2
Percent Grade Clearance	30	38.7
Standard Tires:	rubber	rubber
Drive Tire in.	9 x 4 Rubber	10 x 4 Rubber
Load Wheels in.	3.25 x 4.5 Poly	3.5 x 4.5 Poly
Battery Compartment in. (Standard)	28.4 x 7.9	28.25 x 7.9
(Optional)	27.3 x 7.5	28.25 x 9.1
Amp Hours (24v)	158	160
Battery Type	Wet	Wet
Maint. Free (Opt.)	*	*
Weight less Battery	540	712

It's a Matter of Trust!