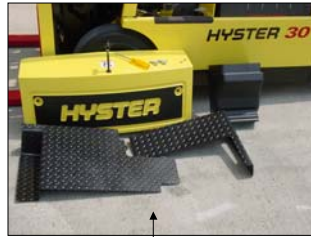


Competitive Presentation



HYSTER J30-40XMT₂ VS MITSUBISHI FB16KT

Hyster Covers and Panels



Major component access is obtained with the removal of only 4 covers and 4 Philips screws on the J30-40XMT₂. The two piece drop in floor plate requires no tools to remove or install. The plastic lower control valve cover is secured with two Philips screws. The rear electrical compartment cover is also secured with two Philips screws.



View from operator's seat of motor compartment with drop in floor plates removed.



View of motor compartment with floor plates removed; notice that all motor access is achieved at this point. In addition, all motor power cables are accessible and easily identified.

The Hyster J30-40XMT₂ is one of the best service accessible trucks you will find in the industry. The innovative design and component layout is a strong selling feature of this truck.

All motors can be accessed by removing the two piece drop in floor plate. Brush access to all motors is achieved without removing any other truck components.

Power cable and control cable wiring are easily accessed and identified.

The four covers seen above are secured by only four Philips screws. A single screw- driver allows the service technician to remove these covers and gain access to all motors and major electrical components.

With Hyster's high quality motors and pumps, the noise levels in this truck are remarkable. This is how only a two piece drop in floor plate can be used to cover the motor compartment. Notice that on the Mitsubishi, there is cover under cover used to reduce heat and noise levels.

Mitsubishi Covers and Access Panels



Service access panels and covers. There are 12 total access panels and covers, 21 bolts and screws. Requires 3 different type wrenches and a Phillips screw driver.



Rear electrical compartment cover, not shown in photo to the left.



View of motor compartment with drop in floor plate removed.

The Mitsubishi FB16KT has 12 covers and a floor mat. The lower floor plate is a drop in, however; from that point on, either machine screws or bolts have to be removed in order to access or inspect any critical components.

As can be seen in the bottom photo, only the lower floor plate is a drop in. Removing the drop in floor plate does not provide access to major truck components for routine service checks and inspection.

In fact, there are several covers under the floor plates and side panels, used as noise buffers and for heat reduction within the operator compartment.

Rattles are quite frequent due to a lot of metal to metal surface contact. Also, metal covers are heavy and are corrosive.

For the service person, these covers are cumbersome to work with. When we think about fatigue, we are generally thinking of the operator using the truck. Let's consider the service repairman and fatigue. Removing and installing these covers for routine service checks can lead to technician fatigue and even longer repair time.

Hyster Accelerator and Service Brake Pedal



The Hyster brake pedal is at an approximate 43° angle. The brake pedal foot pad is 3.25 inches off the floor plate. Notice the right foot can pivot about the floor plate and activate the service brake pedal.

The Hyster Monotrol Pedal (Standard) allows hands free directional changes and is also ergonomically positioned and angled for low effort activation and ease of use.



The Hyster accelerator pedal is at an approximate 18° angle and is 2.5 inches off the floor plate.



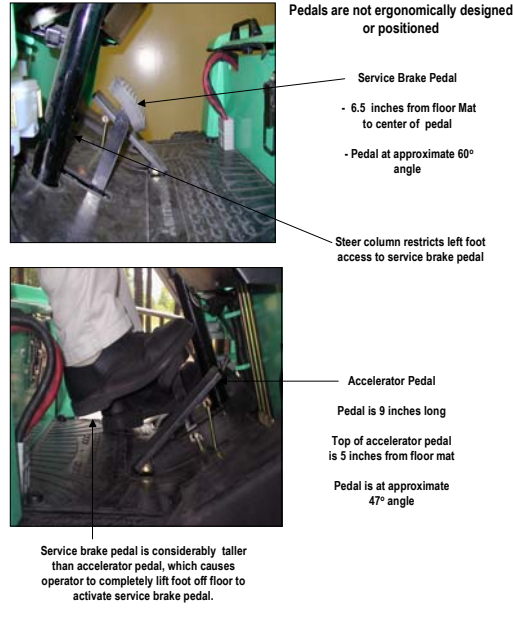
Notice the position of the accelerator pedal and how it is angled toward the operator. This lets the operator pivot the right foot and not have to use large leg muscle groups to activate foot control functions (optional accelerator pedal shown).

The J30-40XMT₂ floorboard and foot control layout is ergonomically unmatched as compared to the Mitsubishi FB16KT.

- Left foot or right foot braking, operator's choice, with the Hyster.
- Low pedal height requires low effort braking and acceleration
- The use of large leg muscle groups is not required to alternate between brake and accelerator pedal.
- Foot control pedals are positioned within the operators comfort zone.

The standard "Monotrol" accelerator pedal further enhances operator comfort and productivity by allowing hands free directional changes.

Mitsubishi Accelerator and Service Brake Pedal



The Mitsubishi literature states that the FB16KT is designed with the operator in mind. A closer look indicates that they did not spend much time in floorboard area for the operator.

The service brake foot pad is at an approximate 60° angle. The brake pedal is 6.5 inches from the floor plate and requires the use of the large leg muscle group to activate; which leads to operator fatigue.

The foot brake is not only at an uncomfortable angle, the pedal is positioned only 1.25 inches from the accelerator pedal; this could be a problem for operators with large feet, especially with work boots on.

The foot pedal control layout is set up for right leg actuation for both braking and acceleration. The steer column protrudes over 5 inches into the operator compartment limiting foot positioning, and further restricting right foot braking. The shape, position and angle of the service brake pedal indicates little ergonomic consideration.

The 9 inch accelerator pedal is at an approximate 47° angle. The accelerator pedal is not difficult to actuate; however, the combination of the accelerator pedal length and angle reduces pedal control. Because the foot has to be up on the top side of the pedal, feathering or creep speed is difficult to maintain.

Hyster Hydraulic Control Functions



Seat side hydraulics provide the means for the operator to be in his natural relaxed “seated” position, and activate hydraulic control functions. With seat side hydraulics, there is no reaching out and over to engage hydraulic functions, which results in reduced operator arm and shoulder fatigue. Reaching out and leaning over to access cowl mounted hydraulic levers requires more energy and effort from the operator. Over an 8 hour shift, this constant motion may fatigue the operator resulting in lower productivity levels.

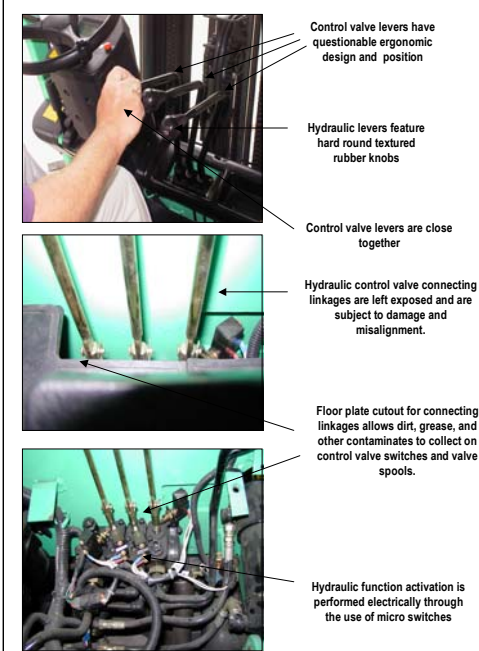
The ergonomically positioned and shaped hydraulic control levers provide proper spacing between handles reducing the chance of activating two hydraulic control functions at one time. The hand levers are designed to fit comfortably in various hand sizes, and the soft touch sure grip rubber coating on the hand levers reduces hand fatigue.

The upper control valve linkage pivots forward to allow battery cover latch access. The pivoting upper linkage also provides easy, quick access to hydraulic control valve linkages in the event any adjustments are required. Two Philips screws secure the lower control valve cover. Once the lower cover is removed, complete access to the hydraulic circuit board, lower connecting linkages and all control valve hose connections is achieved.

Hydraulic functions are electronically sensed by opto sensor switches on the hydraulic control board. The opto switches themselves have no mechanical components to wear which result in no adjustment requirements; unlike micro switches which are prone to wear and adjustment requirements.

The hydraulic hand levers are placed within the operators comfort zone.

Mitsubishi Hydraulic Control Functions



Mitsubishi control levers are a cowl mounted design. There are several issues to exploit with this type of design:

- The hand levers are very close together and secondary functions are easily activated.
- There is little ergonomic shape or design on the hydraulic levers. The hand levers are positioned above
- The hand lever control knobs are pushed on the end of the lever shaft and are made of a hard textured rubber. The operator has to reach out and over to activate the hydraulic functions.

The operator input for hydraulic functions is electrically relayed via micro switches. Micro switches are prone to wear and require adjustments.

The control valve is located under the upper floor plate. Both the upper and lower floor plate must be removed in order to see the control valve. Seeing the control valve and servicing it are two different things. The location and position of the hydraulic control valve would make servicing the valve extremely difficult and may contribute to extended down time.

The cutout in the floor plate for hydraulic control valve connecting linkages allows dirt, grease and other contaminants to fall on the control valve spools and micro switches; this can lead to premature wear and adjustments; furthermore, this could eventually lead to component failure.

Hyster Drive Motors and Motor Brush Access



The vertical mounted dual drive motors provide easy access to motors for brush inspection or replacement and power cable access and identification.



Drive motor and drive motor brush access is achieved by removing the two piece drop in floor plate.



Cutouts in the frame front cross member and cowl assembly weldment enhance drive motor brush inspection



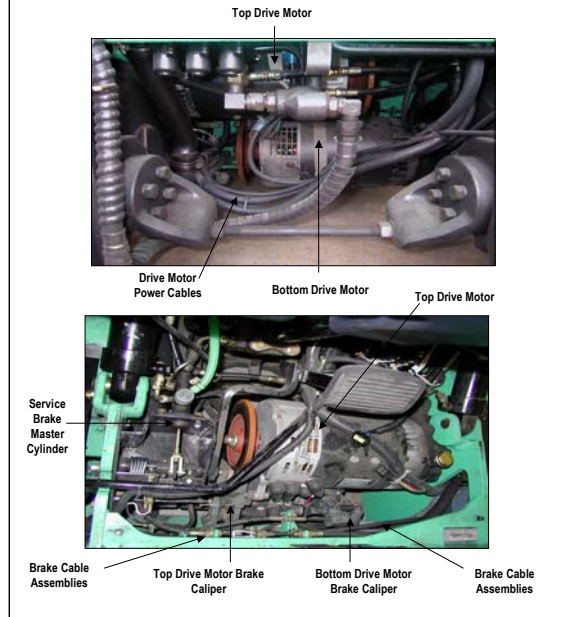
Dual drive units are individually mounted in the frame with complete and separate traction motor and braking system. This design is compact, easily serviced, and allows for independent traction control for each wheel.

The drive motors are spline fitted to the transmissions, allowing for removal and or replacement of the drive motors without affecting gear train set-up. The drive axle assembly is a “full floating” design. This means that the weight of the truck is carried by the axle housing, not the axle shafts; providing reliable component life.

The Hyster dual drive motors are vertically stacked in the motor compartment. To access the drive motors, simply remove the two piece drop in floor plate. There are several advantages with the vertically mounted drive motor design:

- Motor brush access is accessible for inspection on both motors, brush access cutouts are provided in the frame front cross member and cowl assembly plate weldment further simplifying this job.
- The truck is not required to be over a pit or blocked up to service the drive motors; therefore, the technician does not have to be under the truck. Again, less truck downtime, reducing maintenance costs and increasing truck availability for higher production levels.
- Power cables are easily accessed and easy to identify.

Mitsubishi Drive Motor and Motor Brush Access



The drive motors are horizontally stacked. The motor compartment is very cluttered. Drive motor power cable access and identification is difficult.

Drive motor brush inspection or replacement is very difficult and can lead to excessive truck downtime. In order to inspect or replace the drive motor brushes without removing the motors from the vehicle the following steps must be taken.

- Park the vehicle over a pit
- Raise battery compartment cover and latch cover to rear overhead guard leg
- Remove the battery
- Disconnect the accelerator rod and remove the floor plate
- Remove the front battery cover (four bolts secure front plate)

If there is no pit to park the truck over, then the motors will have to be removed from the vehicle. In order to remove the drive motors for brush inspection or replacement, the above steps must be followed in addition to these listed below

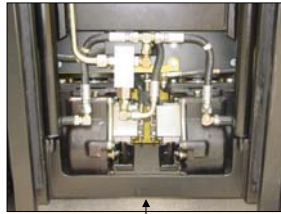
- Remove battery adjustment Plate (Four bolts secure adjustment plate)
- Disconnect brush sensor and heat sensor wires from motors
- Disconnect power cables from drive motors
- Remove brake calipers
- Remove front axle
- Using a crane or motor type jack lift drive motor and transfer case from vehicle (one at a time)
- separate the transfer case from the drive motor (four bolts secure)

Brush access or inspection is possible at this point. This can be a very expensive and time consuming operation.

Hyster Service Brake Assembly



The Hyster service brake assembly, which includes the master cylinder, can be easily accessed by removing the two piece drop in floor plate.



The dual automotive type brake calipers are easily accessed by raising the mast. The technician is not required to be under the truck. The brake discs are protected by dual disc brake shields which are mounted individually to each drive unit housing.

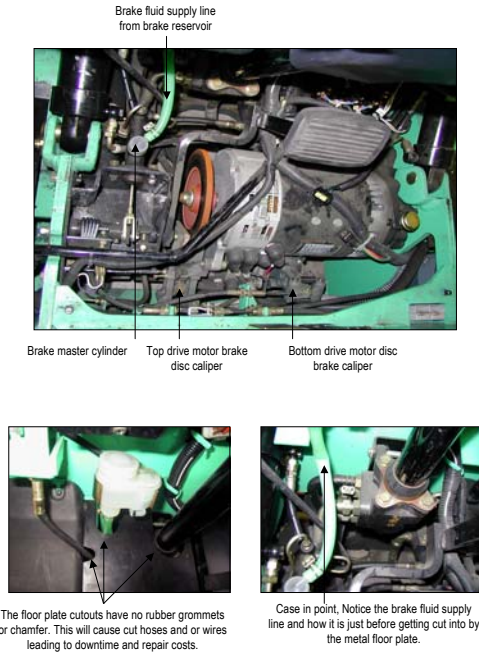
Mounted on each drive unit, the dual disc brake system is hydraulically activated independently per wheel to provide low effort braking. Braking is assisted by utilizing regenerative motor brake current. This design reduces heat and brake wear.

Raise the mast (block the mast for safety), and brake rotor and friction pads are accessible through the mast for inspection and replacement .

A large brake pedal is positioned for use by either foot. The sealed master cylinder reservoir contains a sensor, which lights a warning lamp on the dash panel if the fluid level becomes low. Self adjusting brake pads are made from non-asbestos materials.

The master cylinder is part of the service brake assembly and is accessible when the two piece drop in floor plate is removed.

Mitsubishi Service Brake Assembly



The Mitsubishi FB16KT features dual disc brakes. The brakes are mounted to the drive motor output shaft.

To gain access to the Mitsubishi service brake assembly, the following steps must be taken:

- Floor mat removed
- Lower (drop in) floor plate removed
- Unbolt the upper floor plate and remove
- Pivot the upper floor plate up and disconnect the accelerator switch

Service brake assembly access is now achieved.

The lack of grommets and or a chamfer on the floor plate cutouts can cause hose and or wire damage. As can be seen from the photos above the brake fluid supply line is already showing signs of being cut into. This can cause excessive downtime and increasing maintenance costs.

The brake disc caliper pads are manually adjusted. With the horizontally stacked drive motors this is not an easy task. The Hyster disc brake pads are self-aligning and self-adjusting.

Hyster Instrument Panel Display

Standard Dash Features

- Six LED warning lights
- 16 Character numerical display
- Hour meter
- Warning lights
- Service maintenance monitor
- Under fault conditions, the display will show the fault code number



View of dash from operator's seat
(standard dash shown)

Premium Dash Features

- Alpha-Numeric display
 - 2 lines with 20 characters per line
- Six LED warning lights
- Under Fault Conditions
 - Shows fault code numbers, followed by the text explanation
- Keyless password entry
- Start up check list



Standard Display: Six warning LED lights:

Seat belt (lit for 10 seconds after key is turned on)

Parking brake (lit when parking brake is applied and key turned on)

Low brake fluid indicator (lit when brake fluid in reservoir is low)

Service (lit when service is required. Accompanies fault code display on LCD) Hour meter (lit when hour meter time is displayed on LCD)

Battery (lit when BDI reaches warning level)

Note: All lights are displayed for 2 seconds after key is turned on

The fault code will display only while the truck system is experiencing a problem or is disabled by the detected problem.

The standard display has only one adjustment option. The operator can disable fault codes so that they do not appear on the display.

The premium display can be changed to:

Disable fault codes

Disable full text

Disable seat belt warning

Disable the ability to adjust the BDI and lift lockout setting

Enable checklist questions for startup maintenance

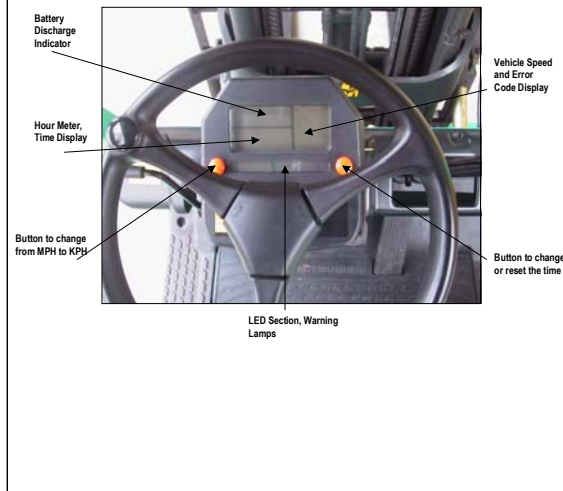
Premium Display Customer-selected Enhancements:

Keyless password entry and operator history -- A keyless password entry and record of operator history are two new features. This feature is disabled at the factory and can be activated by the customer with a laptop computer. When the key switch is turned on, the display will require the driver to key in a password before the truck will operate. The display will record the driver code number and truck hours when the driver started operating the truck. The history will be recoverable by PC. Password access can be a safety feature for novice operators. The operator password can be tied to authorization to work at specific maximum mode levels. A new operator might be given only slow mode access.

Startup Checklist -- Customer can program the display to ask up to 10 customer selected questions (up to 40 characters each)

The premium dash also allows the customer to optimize performance and energy consumption by selecting one of four performance modes to best meet his particular job application requirements. Performance mode selection can be selected at anytime, regardless of if the truck is in motion.

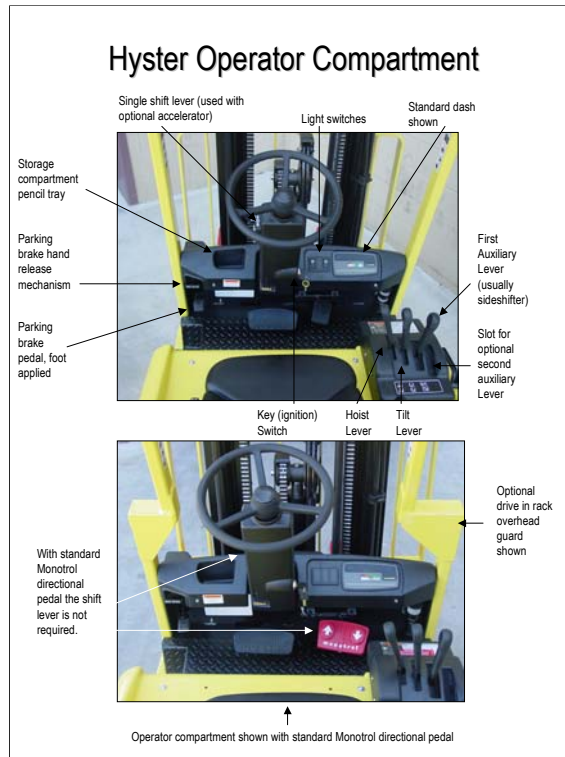
Mitsubishi Instrument Panel Display



The Mitsubishi instrument panel display provides four view windows. The windows are identified as indicated above. The dash display functions are as follows:

- When the key switch is turned on, the bottom left window, which usually tells the time, will flash drive motor hours, pump motor hours, and vehicle service hours indicated sequentially; then defaults back to the clock mode.
- The top left hand window indicates the battery state of charge. When the battery becomes discharged, the state of charge bar will flash and the truck goes into a power reduction mode. The right side view window indicates the travel speed during normal operation and will flash fault codes in the case of truck malfunction.
- The bottom view window is a service indicator and component warning LED. There are icons to represent following components: service required, motor brush replacement needed, Overheating alert (drive motor, pump motor or controller), Low battery charge indicator, brake fluid level indicator, parking brake indicator and a fault detection indicator.
- The orange button on the left side allows operator to switch between miles per hour and Kilometers per hour.
- The orange button on the right side allows the clock to be reset or the time changed.

The dash can be programmed to five different performance modes. The dash also provides truck operational history by viewing the last 32 fault codes. Diagnostic capability is also provided through the dash.



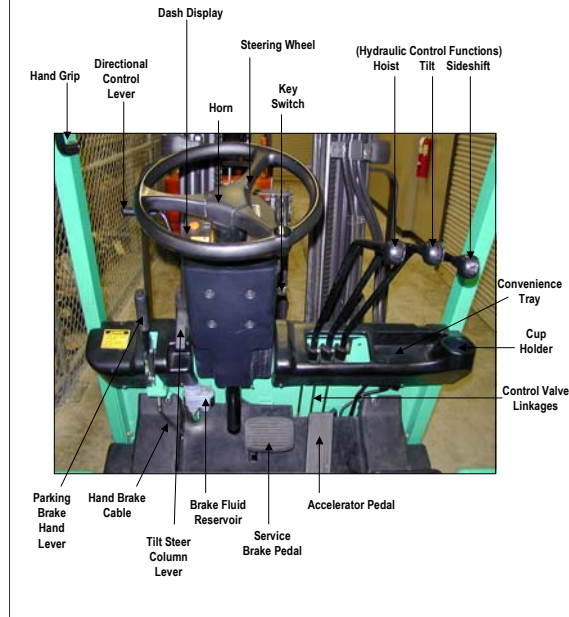
The Hyster floorboard area measures 17.5 inches wide and 34.5 inches deep, between the left hand and right hand step. The Mitsubishi floorboard area measures just about the same as the Hyster however, the Mitsubishi has uneven floor surfaces that limit foot positioning, and a steer column and parking brake cable that impose on operator comfort.

Notice the Hyster floorboard area is open, and has no steer column or uneven floor surfaces to restrict operator foot positioning. The ergonomically designed floorboard area layout provides the operator with the choice of right foot or left foot braking.

The foot controls are ergonomically positioned and angled to provide low effort actuation and do not require the operator to use large leg muscle groups to activate.

The 14 inch steering wheel is made with a soft touch sure grip textured rubber coating with finger notches provided on the bottom side of the steering wheel for added gripping and less chance of steering wheel slipping through the hands of operators; especially in freezer or wet applications. The Mitsubishi steering wheel is made of a hard plastic, and has no finger notches for sure gripping. This can be a problem in freezer or wet applications due to the steering wheel slipping out of the operator's hands.

Mitsubishi Operator Compartment



The Mitsubishi FB16KT series has a good size operator compartment floorboard area which is approximate 31 inches wide (between steps) and 20 inches deep. They can achieve this by having the bulk of their Hydraulic system (including hydraulic tank) and electrical system located in the rear of the truck. There are several shortcomings of the operator compartment that stand out:

- The dash display is mounted to the back of the steer column cover, proving difficult for the operator to see and interface with from the operator seat.
- The directional lever is located on the left hand side of the steer column and is made of a hard plastic.
- Mitsubishi's "infinite adjusting" steer column is referred to as infinite because there is no set position to lock the steer column while in its pivoting adjustment mode. The draw back to this design is that when the locking mechanism is released, the steer column floats, and can be easily slammed into its full forward or full rearward position. In addition, if the steer column locking mechanism is not tightened securely enough, running over uneven floor surfaces and dock plates causes vibrations and jarring affects which could cause the steer column to slip loose and fall back onto the operator. With the steer hand pump integral to the steer column, this can also contribute to premature hydraulic leaks also.
- Notice the uneven floor surface on each side to accommodate the tilt cylinders limiting foot space and positioning. The parking brake cable protrudes just under 6 inches into the operator compartment floorboard area further restricting foot positioning.

The FB16KT uses a 13 inch steering wheel. The steering wheel is made of a hard plastic and has no finger notches for good gripping. This can be a problem in freezer or wet applications.

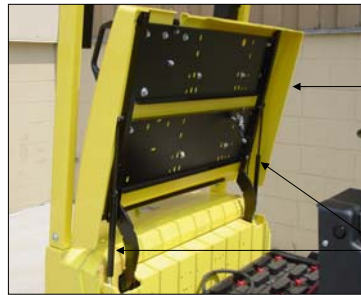
Hyster Battery Compartment Cover



Convenient access handle is located on the right hand side of the battery compartment cover for quick, easy, and safe raising and lowering.



There is no pinch point between the battery compartment cover and the rear overhead guard leg.



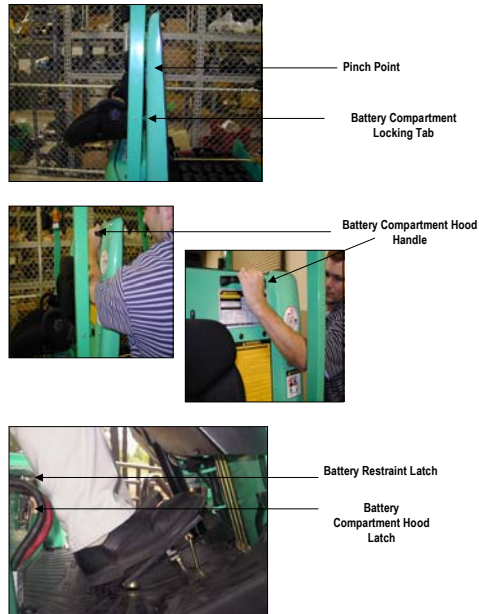
The battery compartment cover and seat are support by a rugged one piece metal seat frame weldment. The seat frame weldment is designed in such a way that allows it to also be the battery restraint mechanism. Another innovative design by Hyster Company.

Dual gas assist cylinders are provided for ease of raising and lowering, and to provide adequate support when battery compartment cover is raised.

The Hyster battery compartment cover is molded from a heavy duty ABS thermal-formed engineered plastic. The battery compartment hood and the operator's seat are mounted to and supported by a rugged one piece metal weldment. This weldment is also utilized as the battery restraint system in compliance with ANSI and EEC standards. There are several distinct advantages with the Hyster battery compartment cover as compared to the Mitsubishi's:

- The heavy duty ABS plastic cover is molded with the Hyster yellow color, thus no paint peeling or fading.
- The ABS plastic cover is non- corrosive and will not rust, a distinct advantage in freezer and wet applications.
- Dual assist gas cylinders are provided on the battery cover for ease of use and for providing adequate support for the hood when raised.
- A convenient handle is located on the battery cover to further enhance ease of use when raising and lowering.
- There is no pinch point between the battery cover and the rear leg of the overhead guard.

Mitsubishi Battery Compartment Cover



The Mitsubishi battery compartment cover is a large metal cover that is hinged from the counterweight.

The battery compartment cover has several drawbacks:

- There is a grab assist handle on the battery compartment cover, however using it will cause a arm pinch point between the battery compartment cover and the rear right hand overhead guard leg.
- Metal is highly corrosive and will typically become an issue in intermittent freezer and wet applications.
- Rattles are frequent due to metal to metal contact.

Hyster Power Steering Motor Access



View from left hand side of truck of motor compartment with drop in floor plates removed.



The power steer motor access cutout in the battery compartment front plate further simplifies steer motor brush inspection and brush replacement.

Power steering motor access is achieved by removing the left hand side of the two piece drop in floor plate.

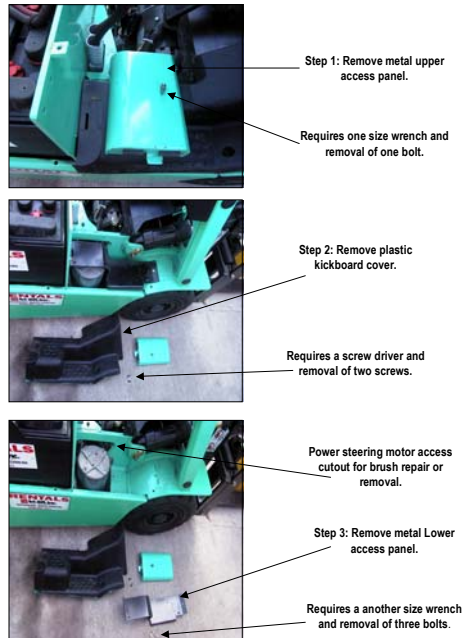
Power steering motor access is achieved by simply removing the two piece drop in floor plates.

Because of the high quality steer pump and motor assembly used in the J30-40XMT₂, secondary panels and covers are not required to muffle noise or deflect heat from entering the operator's compartment.

Another simple, but innovative, design of the Hyster two piece drop in floor plates is that both left and right hand floor plates have cutouts in them. These cutouts perform two duties. First it is used as a grab access point when installing or removing the floor plates. Secondly, the cut out allows air circulation and ventilation within the motor compartment.

A steer motor brush access cutout is provided in the battery compartment front plate, further simplifying motor servicing.

Mitsubishi Power Steering Motor Access



The power steering motor and steering module are located under the floor on the right hand side of the truck

In order to get to the power steer motor or steering control module the following steps must be taken:

- First, both upper and lower floor plates must be removed. (Upper floor plate is secured by two bolts)
- Next, the outer side cover panel must be removed. (2 bolts secure)
- Next, the power steer motor cover must be removed.
- Brush motor access is now available, however to inspect or service the steer pump, one must remove the inner / lower side cover panel(2 bolts secure) to gain access to the supply hoses and hydraulic fittings.

Hyster Hoist Motor Access and Brush Replacement



Removing the two piece drop in floor plate is the only step required to gain Hoist motor access.



View from left hand side of truck of motor compartment with two piece drop in floor plates removed. The hydraulic pump and motor is shock mounted to the hydraulic tank with four elastomeric mounts.



To inspect or replace hoist motor brushes, simply loosen the motor anchoring straps and pivot the motor up.

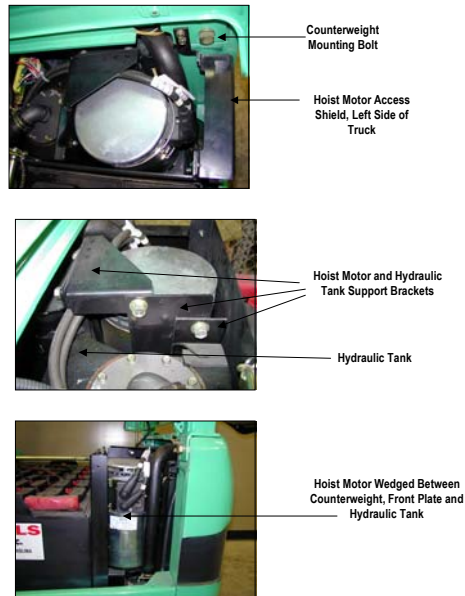
Hoist motor brush access cutout

Hoist motor access for brush inspection or replacement on the Hyster J30-40XMT₂ is quick and easy. To access the hoist motor remove the two piece drop in floor plate. To access or inspect motor brushes loosen the two motor anchoring straps and pivot the motor up. Hoist motor brush access cutout located on the front plate of the battery compartment further simplifies brush inspection or replacement.

The premium hoist motor option provides a temperature sensor and brush wear indicator that is used with the premium dash to indicate when motor temperature may be getting close to thermal limits and / or when motor brushes need servicing.

The hoist motor is shock mounted using four elastomeric mounts for reduced vibration.

Mitsubishi Hoist Motor Access and Brush Replacement



The Mitsubishi FB16KT locates the hoist motor in the rear of the truck behind the battery compartment rear plate.

Not shown is a single piece side access panel(already removed) that is mounted to protect the hoist motor. Once the side access panel is removed hoist motor can be seen and that is just about it. To inspect / replace the hoist motor brushes the following steps must be taken:

- Open battery compartment cover
- Remove side access panel
- Disconnect all power wires from motor
- Disconnect the hydraulic hose from the suction side of the pump
- Disconnect the hydraulic hose on\ the pressure side of the pump
- Remove the mounting bolts of the motor bracket
- Remove the hydraulic pump and motor from the vehicle
- Place motor on the work bench and remove cover band

As can be seen, changing the hoist motor brushes can be a very expensive and time consuming on the Mitsubishi FB16KT.

Hyster Mast Design



The Hyster Vista mast does not require additional cross members and fabricated support brackets up and down the stationary mast channel for structural integrity.

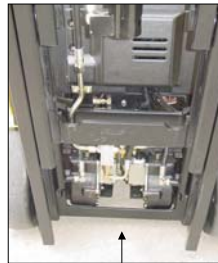
Premium cast components are used on the Vista mast construction. Castings are used for optimizing weight and strength.



Nested mast channels are directly aligned eliminating channel damage caused by forward movement during lowering and reduces right angle stacking dimensions.



Canted load rollers allow full face bearing contact with the mast channel.



View of the Hyster drive units and disc brake calipers with the mast raised. Notice there are no dangling cables and wires.

The nested mast channels on the Hyster VISTA are compact and reduce the truck's right-angle stacking dimensions and lost load center.

The channels are directly aligned and eliminate channel damage caused by forward movement during lowering. Hydraulic cushioning is provided to allow a smooth, quiet transition between the main lift cylinder and the free lift cylinder when staging during lowering function.

Full face bearings canted at a three degree angle allow for full face contact with the mast channels. Loading is evenly distributed on the roller bearing over a greater area which contributes to increased bearing life, channel life, and virtually eliminates the need for adjustments.

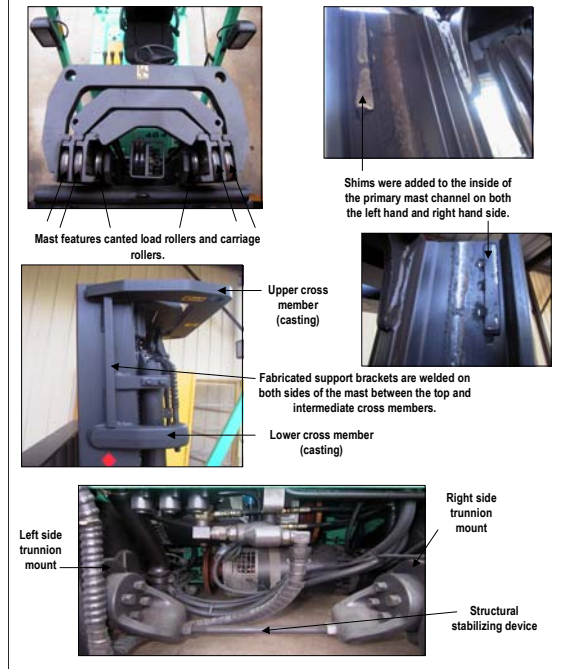
Hyster utilizes premium cast components for mast cross- members, brackets and support gussets. Castings are used for optimizing weight, strength and precision mast construction. The wrap-around brackets, tie bars and chain anchor mountings are not cut, bent or welded fabrications.

Notice on the Hyster product when the mast is raised how the hoses are neatly tucked and routed. The hoses and connections are not at floor level and are high enough up on the mast structure to be protected from floor debris, pallets and other obstacles that could cause potential hose damage.

The Hyster Vista chain and hose routings are designed to optimize visibility. The Vista chains and hoses are positioned behind the mast channels and do not restrict forward visibility.

The Vista mast's upper channel support has built in lifting eyes for quick and safe mast servicing and / or replacement.

Mitsubishi Mast Design



The Mitsubishi mast is trunnion mounted. A structural stabilizing bar is mounted between the two front drive axles which suggests some structural deficiencies. This structural device is used to reduce movement (side to side tension-compression) of the forward frame mounting plates.

Hyster frames feature an integral cross member to keep the transmission and mast loads from creating high frame stress. In short, we gusset support the cross member to provide adequate structural support.

The Mitsubishi mast is constructed of both metal castings and fabricated support bars. These fabricated bars are welded to the mast outer channels and tied into the upper / outer cross member to provide required structural support of the mast. Excessive welding on the mast channels can cause heat weakening of the metal which causes more structural deficiency.

Take notice of the hoses, tubes, and power cables that are left exposed when the mast is raised. This type of design has the potential for causing time consuming and costly repairs due to cut or damaged hoses and misaligned hydraulic pressure fittings causing hydraulic leaks.

The Mitsubishi mast utilizes the canted load roller design similar to the Hyster Vista mast, however, notice the metal shims that have been added to the inner mast channel. This is further evidence of mast structural deficiencies.

The Mitsubishi mast outer channel support has built in lifting eyes for quick and safe mast servicing and or replacement.

Hyster Hydrostatic Steer System



The hydraulic rack and pinion steer actuator is fully enclosed and is accessed by removing the rear access panel.

Hydrostatic steering in conjunction with the twin steer wheel axle contribute to reduced tire wear resulting in longer tire life, tight turning radius, a more stabilized feel (especially when turning) and provides a very smooth ride.



The rear access cover is secured by two Philips screws. The rear compartment cover is sealed by a weather-stripping type rubber that keeps water and contaminants out of the rear compartment as well as reducing noise levels.

Twin steer tires, which are standard on the J30-40XMT₂, provide a smooth stable feel. Twin steer tires provide several advantages over single wheel drive axles.

- The twin steer tires distribute stress and wear over a wider area, which reduces reduces spindle and bearing loads and provides a smoother ride than single wheel axles.
- Twin steer tires are not subject to the load stress, road born shock loads or sidewall (Opposing) pressures that a single tire endures. This feature ensures longer component life and reduces tire change-outs.
- Twin steer tires also provide larger, more balanced tread imprint providing increased traction and a more stabilized feel; especially when turning.

The twin steer tire axle in conjunction with hydrostatic steering provides an excellent turning radius, smoother ride and improves maneuverability over single steer tire trucks. These feature advantages will increase operator comfort and provide the means for higher productivity levels.

Servicing the steer axle on the J30-40XMT₂ is much less complex and time consuming compared to the Mitsubishi truck. Hyster steer axle removal requires the following steps:

- Remove rear OHG bolts and loosen front OHG bolts. Pivot OHG forward and secure.
- Remove counterweight.
- Block up and secure truck.
- Remove the steer actuator hydraulic hoses.
- Remove mounting bolts and remove steer axle.

Mitsubishi Dual Steer Wheel Axle



Hydrostatic steer system with twin steer wheel design

Twin steer tires, which are standard on the Mitsubishi FB16KT, provide a smooth stable feel. The FB16KT shares the same advantage as the Hyster truck over single steer tire trucks. However, a look at the truck specifications indicates that the Hyster truck has a tighter turning radius and greater right angle stacking capabilities.

Servicing the steer axle on the Mitsubishi FB16KT is much more complex and time consuming compared to the Hyster J30-40XMT₂. The steer (rear) axle is mounted to the counterweight. It is necessary to remove all surrounding components in order to access and remove the steer axle. The following steps must be taken:

1. Remove operator seat.
2. Remove gas assist cylinder, battery compartment cover and rear cover.
3. Remove Battery and battery compartment rear plate.
4. Remove the transistor controller, which includes disconnecting all power cables and control harnesses wiring)
5. Remove all hydraulic hoses and support / mounting brackets.
6. Remove Hydraulic pump and motor assembly.
7. Remove all hydraulic tank assembly hoses and connections.
8. Remove hydraulic tank.
9. Remove all steer hoses from steer actuator assembly.
10. Lift and block up rear of truck in order to remove steer axle assembly.

Hyster Ingress and Egress



↑
The Hyster J30-40XMT₂ features a 3 point entry system = hand grip on front left hand overhead guard leg, convenient 19.7 inch height step, and a reachable hip restraint on the operator's seat. Diamond plated metal floor plates with a non-slip adhesive mating on the left hand side of the frame provide safe footing when entering or exiting the operator's compartment.



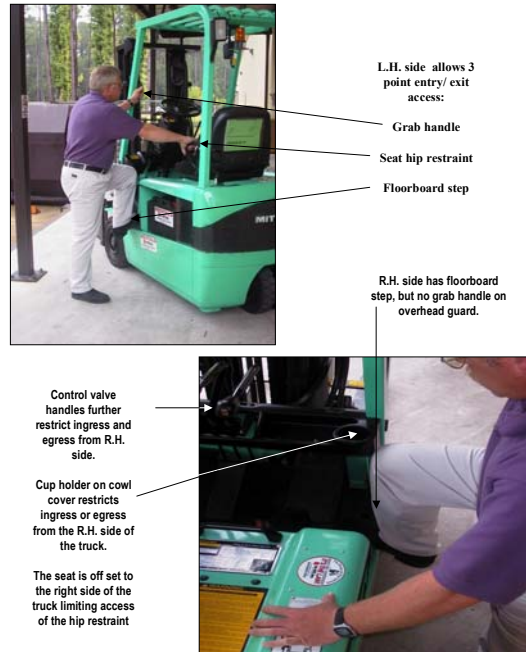
The Hyster J30-40XMT₂ provides a 3 point entry system. A 19.7 inch step height provides good foot placement for truck entry.

The grab handle is located (two optional positions 70 inches or 64) inches from the floor on the left front overhead guard leg. The grab handle is made of metal and is coated with the same soft touch sure grip rubber as the hydraulic control valve hand levers. This feature reduces hand fatigue, especially in frequent on truck / off truck applications. The rubber coating also provides a much better grip in wet and freezer applications.

The seat is equipped with hip restraints, which provide an additional grab point for operator compartment entry and exit.

The two piece drop in floor plate is made of diamond plate metal to provide sure footing when entering and exiting the operator compartment. On the left hand side of the frame there is an additional adhesive strip positioned on the frame further enhancing footing while entering and exiting the lift truck.

Mitsubishi Ingress and Egress



The Mitsubishi FB16KT provides a 3 point entry system. An 18.5 inch step height provides good foot placement for truck entry.

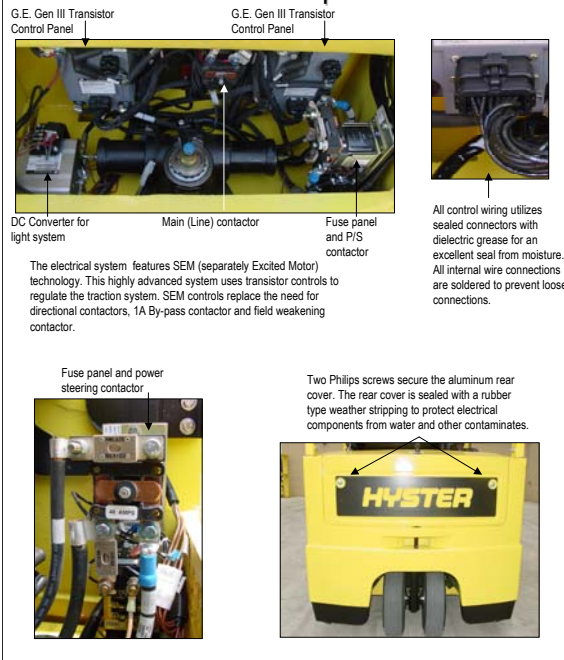
The grab handle is located 60 inches from the floor on the left front overhead guard leg. The grab handle is made of a hard plastic. The grab handle is not coated with soft touch sure grip rubber as on the Hyster truck. The hard plastic grab handle provides very little grip in freezer or wet applications.

The seat is equipped with hip restraints which provide an additional grab point for operator compartment entry and exit.

There is a step provided on the right hand side of the FB16KT, 18.5 inches off the floor just like the left hand side of the truck, but there is no grab handle on the right front overhead guard leg. Further, hydraulic control levers project into the operator compartment limiting entry from the right hand side of the truck. In addition, the cup holder protrudes out into the operator compartment making entry even more difficult from the right side of the truck.

The off-set seat puts the hip restraint out of reach for most operators further restricting entry from the right side of the truck.

Hyster Electrical System and Electrical Compartment



The J30-40XMT₂ features SEM (separately Excited Motors) technology. Separately excited motors feature independent armature and field controls. The traction system is controlled by dual G.E. GEN III transistor traction controllers, one controller for each drive motor.

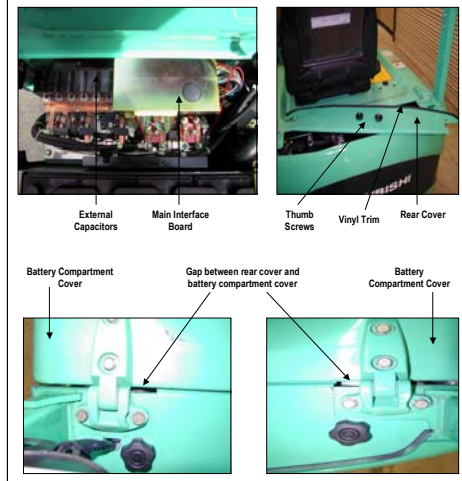
The traction system operates at 12kHz, above the normal audible range. There is no controller hum as found in earlier SCR traction controlled systems.

The G.E. GEN III controllers feature soldered internal wiring connections. This eliminates loose connections typically found as a result of heavy dock use (vibrations and jarring effects from uneven floor surfaces, dock plates and constant running in and out of trailers).

Regenerative braking (standard feature) is fully electronic, without the need for a contactor. Regenerative braking occurs when travel direction is reversed during plugging. This action draws heat away from the motor during plugging and prolongs the life of the traction motor brushes by 3-5 times. The energy generated during plugging goes into the battery as a positive charge and not as heat to the motor.

The electrical compartment is encased by an aluminum rear cover. The rear cover has an adhesive weather strip type rubber that provides a water tight seal that prevents moisture and other contaminants from entering the electrical compartment.

Mitsubishi Electrical System and Electrical Compartment



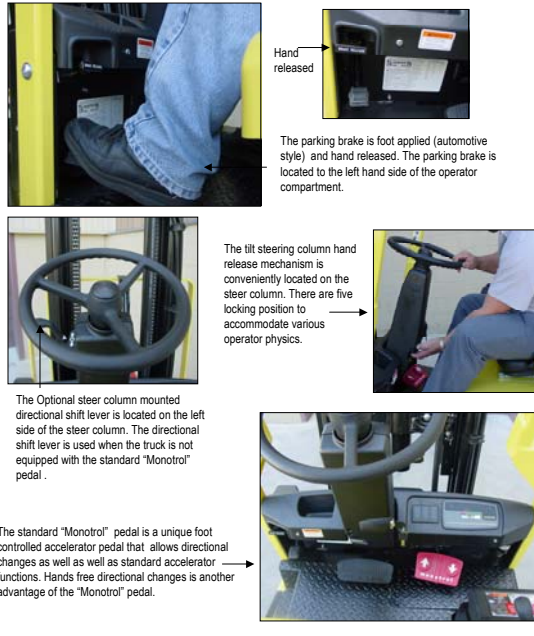
The Mitsubishi FB16KT uses their own designed TR4000SX transistor controller. With their own designed controller, proprietary pricing and servicing will be reflected during service and maintenance requirements. Typically, proprietary electrical systems and their components tend to be more expensive than off the shelf items.

Hyster utilizes the G.E. GEN III transistor controllers. G.E. has been manufacturing electrical systems for lift trucks many years. The GEN III transistor controllers uses state-of-the-art technology, and has proven itself worthy of high duty work cycles found in many of today's warehousing lift truck applications.

The FB16KT utilizes SEM (Separately Excited Motor) technology as the Hyster J30-40XMT₂ does. The features and benefits associated with SEM will be found likewise on this truck as the Hyster.

The rear electrical compartment cover is supposed to be sealed with a lip-to-lip overlap with the battery compartment cover. This design does not form a water tight seal. This can be a problem in intermittent freezer or wet applications.

Hyster Tilt, Directional Lever & Parking Brake



The parking brake is an automotive style that is foot applied and hand released.

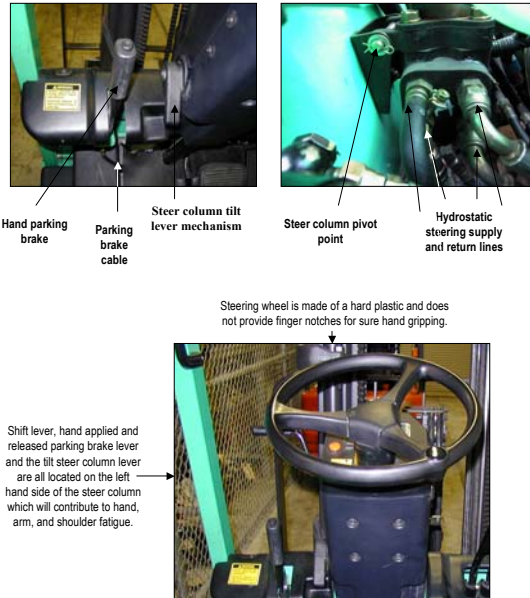
The tilt steering column provides the operator with five different locking positions to make the operator as comfortable as possible. The steer column tilting design uses a cog style gear to ensure the steer column stays where you put it.

The Monotrol directional / accelerator pedal is standard on the J30-40XMT₂, and provides the operator with hands free directional changes.

The single shift lever (L.H. mounted on steer column) is coated with the same soft touch sure grip rubber coating as the hydraulic levers, which reduces hand fatigue.

The steering wheel is made of a soft touch textured rubber that reduces hand fatigue. The steering wheel also has finger notches on the bottom side for sure hand gripping.

Mitsubishi Tilt Lever & Parking Brake

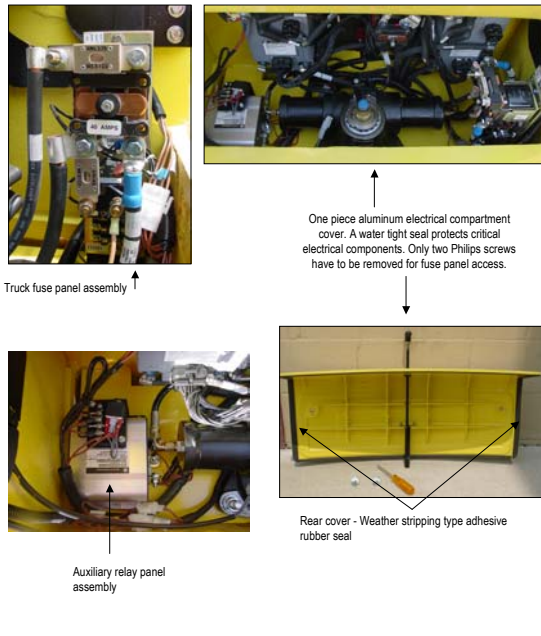


The Mitsubishi parking brake is hand applied and hand released. With the shift lever located on the left hand side and the parking brake lever also located on the left hand side, applications where the operator is on and off the truck frequently could contribute to arm and shoulder fatigue by the end of an 8 hour shift.

The alarm sounds if key switch is on and operator is out of the seat.

The Mitsubishi steering wheel is made of a hard plastic and provides no finger notches on the bottom side of the steering wheel. This can cause problems for operators who work in freezer or wet applications of the steering wheel slipping out of their hands.

Hyster Fuse Panel and Contactor Panel Access



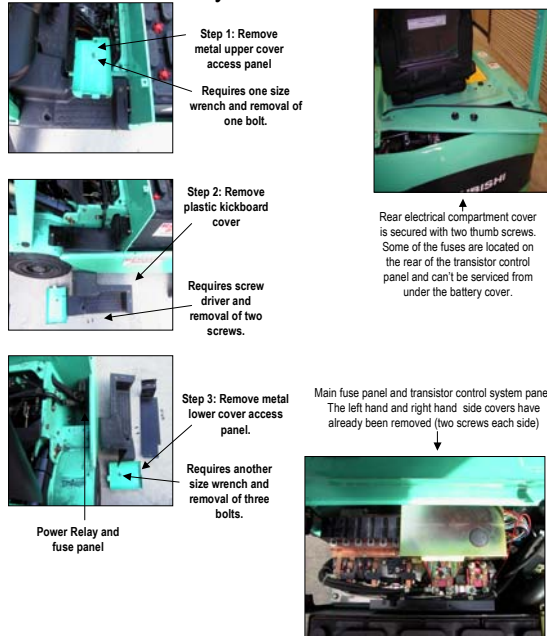
The J30-40XMT₂ fuse panel and auxiliary relay panel assembly are located in the electrical compartment.

To gain access to the fuse panel assembly, the single piece aluminum rear cover must be removed. Only two Philips screws secure the rear cover and total electrical compartment and component access is achieved at this point. The technician does not have to go to different areas of the truck nor does he have to remove four and five covers.

Good serviceability is critical. Simple issues such as fuse replacement, that should be a five minute job, can turn into a lot more when various tools are needed and covers and access panels are required to be removed for component access.

As compared to the Mitsubishi FB16KT the Hyster J30-40XMT₂ has less truck downtime, reduced maintenance costs and higher productivity levels are achievable.

Mitsubishi Fuse Panel and Power Relay Panel Access



For auxiliary fuse panel (lights) and power relay panel access, several covers must be removed. Steps 1-3 above do not include the removal of the floor mat and the drop in floor plate; they have already been removed.

The main truck fuse panel is located on the transistor control panel assembly. To gain access to the panel assembly the battery hood is raised. The right hand side cover panel can be removed for total access to the front side of the controller panel assembly (two screws secure). Some of the fuses are located on the rear of the panel assembly and require the removal of the rear cover (two thumb screws secure).

The FB16KT requires a lot of access panel and cover removal as compared to the Hyster J30-40XMT₂ where a technician needs one Philips screw driver to remove one access cover for fuse access.

The Mitsubishi covers are metal covers. The rear cover shown above is secured with two thumb screws. There is only a lip to lip seal between the rear cover and the battery cover. This could be an issue in intermittent freezer or wet applications where water / condensation can find its way into the electrical compartment.

Hyster Sideshift Carriage & Mast Chain and Hose Routing



New integral sideshifter reduces lost load center (LLC) dimensions for improved truck capacity ratings and a tighter turning radius as compared to hang on sideshifters

Precise chain and hose routings on the Hyster Vista mast provides good fork tip (product) view throughout the entire lift lower range.



Main mast supply pressure hose is protected with a metal plate to prevent hose or fitting damage.

New integral sideshifter design further enhances operator's forward visibility for increased comfort and productivity levels



Hyster's integral side shift carriage design replaces the global hang-on sideshift. The hang-on sideshift is still available, but is no longer the standard carriage used in production. Some advantages of the new integral sideshifter as compared to the hang-on sideshifters are indicated below:

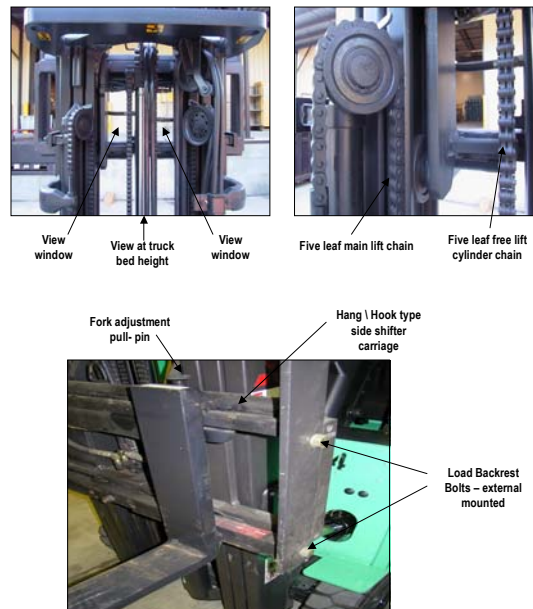
- Reduced weight and lost load thickness (LLT) for improved truck ratings
- Improved visibility to enhance operator comfort and productivity
- Improved maneuverability as a result of improved LLT dimension
- Simple construction and installation
- Carriage outer frame mounting hooks are located above the bottom bar to eliminate catching on dock boards
- Outer frame bar design prevents build up of foreign material to eliminate binding.

The Mitsubishi FB16KT uses hang-on sideshifters. The above advantages can be used to contrast short-comings of the hang-on sideshifter and the benefits of Hyster Company's innovative designs.

The same load backrest and forks are interchangeable between the hang-on carriage design and the new integral carriage design. Notice the load backrest bolts are actually protected by the load backrest. This design prevents the bolts from being sheared off.

The Hyster Vista mast routes the mast chains and outboard cylinders behind the mast channels to provide cylinder protection and enhance operator visibility.

Mitsubishi Sideshift Carriage & Mast Chain and Hose Routing



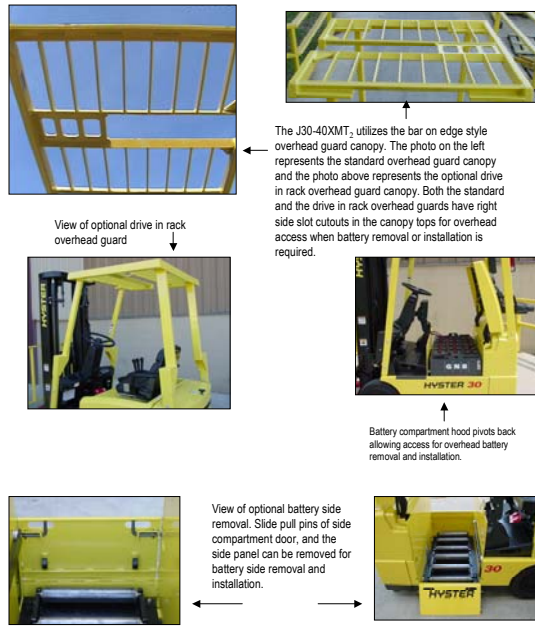
The Mitsubishi FB16KT uses hang-on sideshifters. There are several disadvantages to hang on sideshifter designs. However, the Mitsubishi carriage does provide good visibility. They too have an open face carriage. The hang on type sideshift design has the following disadvantages:

- There is more lost load face resulting in reduced capacity (load face is considered the distance between the center of the drive wheel and the face of the fork).
- The hook / hang-on type sideshifter puts the load out farther on the forks, resulting in less load control.
- Right angle stacking dimensions are reduced with hook / hang on type sideshifters.
- Hook / hang-on sideshifters decrease the trucks inside turning radius for reduced maneuverability.
- Hook / hang-on type sideshifters have more parts and are more expensive to repair and service.

The Mitsubishi mast routes the mast chains behind the mast channels for protection and improved visibility.

The load backrest bolts are externally mounted and are prone to shearing off.

Hyster Overhead Guard and Battery Removal Access



The Hyster low profile overhead guard has an overall height of 78" (1,978 mm) allowing the J30-40XMT₂ to be used in applications with low ceiling and doorway clearances.

The rolled steel cross members and fore and aft reinforcing bars provide strength and excellent visibility.

A right side battery removal slot was designed for the use of an overhead chain hoist for easy battery removal.

The overhead guard is easily removed by loosening six easy to access bolts and then lifting straight off.

Optional drive in rack overhead guards and optional battery roller tray are standard price book options.

Mitsubishi Overhead Guard & Battery Removal



Counterweight mounted overhead guard; rear legs

Right side battery removal cutout

Cowl mounted overhead guard; front legs

The battery cover has a single assist gas cylinder, which is counterweight mounted

View from operator's seat with mast raised at MFH



Battery Restraint

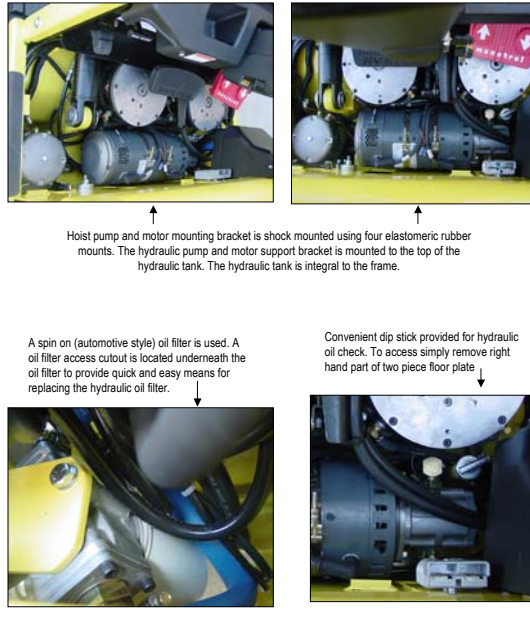


The Mitsubishi overhead guard is secured to the truck similar to the Hyster design. The front overhead guard legs are secured to the cowl weldment using four mounting bolts. The rear overhead guard legs are mounted by two bolts secured to the counterweight.

Right hand overhead guard canopy cutout is provided for battery removal or installation. Before removing the battery, the battery compartment cover latch must be released and the battery restraint locking bar mechanism must be removed.

The bar on edge design of the overhead guard canopy provides good overhead visibility.

Hydraulic System and Hydraulic Filter Access



The Hyster hydraulic system is a much simpler system than the Mitsubishi. The J30-40XMT₂ hydraulic tank is an integral part of the frame. The hydraulic tank is located under the hoist pump and motor.

Hydraulic oil level is checked via a dip-stick (automotive style) by removing the right hand side of the two piece drop in floor plate.

A replaceable spin-on (automotive style) hydraulic oil filter is located in the return line on the right side of the truck under the right hand floor plate. It has a by-pass relief valve that ensures oil flow in the event the filter becomes clogged. The filter contains a 10 micron filter element that protects the hydraulic system from contaminants, promotes long reliable performance, and helps to provide long life for all the hydraulic system components.

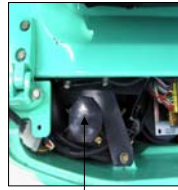
An oil filter access cutout is located under the oil filter in the frame bottom plate, making hydraulic oil filter changes quick and easy.

The oil filter can be changed without draining the oil from the hydraulic tank.

Mitsubishi Hydraulic System and Hydraulic Filter Access



Main hydraulic supply line routed from front to back



Hydraulic oil fill cap and dipstick



Hydraulic oil filter access, canister type

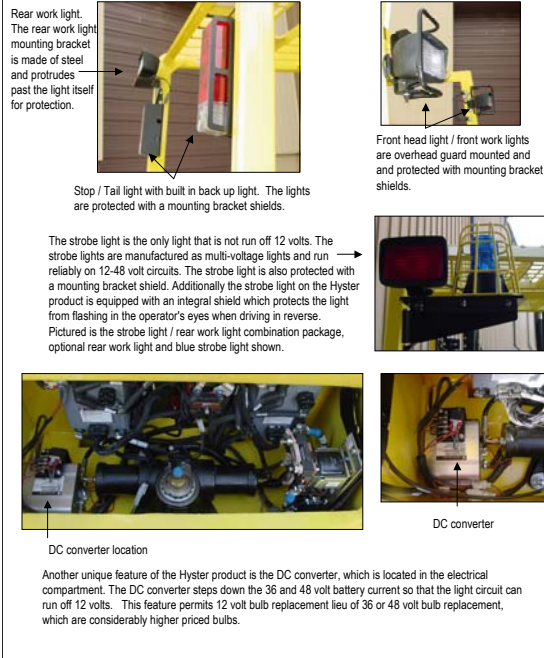
Hoist motor

The Mitsubishi FB16KT hydraulic system utilizes a canister type oil filter which is internal to the hydraulic tank. The hydraulic tank is mounted on the counterweight. To change the oil filter and suction strainer the hydraulic tank must be removed. In order to remove the hydraulic tank the following steps must be taken:

- Raise battery compartment lid and disconnect seat switch
- Remove both battery cover assist cylinders
- Remove the hinged bolts from the counterweight and lift off battery cover
- Remove all power cables from the transistor control panel assembly
- Remove all control wires and wire harnesses from the controller assembly
- Remove the hydraulic hoist pump and motor (refer to page 19 for steps required to remove hoist pump and motor)
- Disconnect remaining hoses from hydraulic tank assembly
- The tank drain plug does no good because the tank has to be removed before the plug can be removed. This means the tank has to be removed with the oil in it, further complicating this endeavor.

Compare the steps required to perform this job on the Mitsubishi FB16KT to the steps involved in replacing the oil filter and strainer on the Hyster J30-40XMT₂.

Hyster Work lights and Strobe Light



All lift truck manufacturers have optional light packages that they offer for their products. However, not everyone has a DC converter that steps down 36 and 48 volt battery current to 12 volts for the light circuit. This unique feature allows 12 volt bulbs to be used in the lights in lieu of 36 and 48 volt bulbs. There are two distinct advantages with this design:

- 12 volt light bulbs are cheaper than 36 and 48 volt bulbs
- 12 volt replacement bulbs (automotive bulbs run on 12 volts) are readily available, where as the 36 and 48 volt replacement bulbs are not.

The strobe light is the only light circuit that is run on something other than 12 volts. This is because strobe lights are manufactured as multi-voltage lights. Most strobe lights' voltage range is between 12 and 48 volts. A unique feature of the Hyster strobe light is an internal shield that blocks the flashing light from interfering with the operator's vision, especially when driving in reverse.

All light wire harnesses are protected with rubber grommets where the light harnesses pass through the truck frame and through overhead guard legs. All lights are protected by mounting shield brackets.

Mitsubishi work lights and Strobe Lights



The auxiliary light systems are operated at truck voltage. This leads to more expensive bulbs and replacements.

The strobe light is a multi-voltage light, which is common with most strobe light manufacturers. However, the strobe light is not equipped with the internal light shield. The internal light shield will protect the operator from the flashing of the light while driving, especially while driving in reverse.

The front headlights are guarded for protection, however, the strobe light offers no light guard protection.

All light wire harnesses are protected with rubber grommets where the light harnesses pass through the truck frame and overhead guard legs.



Competitive Presentation Summary

The Hyster J30-40XMT₂ series provides state-of-the-art electric motor controls that are built to perform and last in the toughest applications. The GE GEN III transistor controllers along with SEM technology are designed for heavy-duty work cycles and exceptional performance. The J30-40XMT₂ proven power and efficiency are key to its outstanding performance in either 36 or 48 volt systems. Innovative designs make this model highly competitive in performance and price.

The Mitsubishi FB16KT features SEM technology with transistorized motor controls like the Hyster J30-40XMT₂, however, the Mitsubishi's transistor controls and electrical system are their own design. Typically, proprietary parts result in more expensive parts and service. The FB16KT features hydrostatic steering with a dual steer wheel design. The Mitsubishi hydrostatic steer system is a rack and pinion design much like the Hyster J30-40XMT₂, however, from an access and serviceability stand point, the Hyster design is much less complex. Operator controls found on the Mitsubishi FB16KT do not seem to reflect the same level of ergonomic consideration as the Hyster J30-40XMT₂. Hyster lift trucks are designed from the ground up with the operator in mind, and it shows!

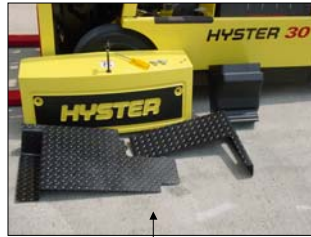
It should be noted that the Mitsubishi Class I sit down 3 wheel truck and the Caterpillar Class I sit down 3 wheel truck are both manufactured by MCF (Mitsubishi Caterpillar Forklift). These trucks are built down the same assembly line and likewise share components. Basically, other than color schemes, these two forklifts are the same.

Competitive Presentation



HYSTER J30-40XMT₂ VS TOYOTA 5FBE

Hyster covers and Panels



Major component access is obtained with the removal of only 4 covers and 4 Philips screws on the J30-40XMT₂. The two piece drop in floor plate requires no tools to remove or install. The plastic lower control valve cover is secured with two Philips screws. The rear electrical compartment cover is also secured with two Philips screws.



View from operator's seat of motor compartment with drop in floor plates removed.



View of motor compartment with floor plates removed; notice that all motor access is achieved at this point. In addition, all motor power cables are accessible and easily identified.

The Hyster J30-40XMT₂ is one of the best service accessible trucks you will find in the industry. The innovative design and component layout is a strong selling feature of this truck.

All motors can be accessed by removing the two piece drop in floor plate. Brush access to all motors is achieved without removing any other major truck components.

Power cable and control cable wiring are easily accessed and identified.

The four covers seen above are secured by only four Philips screws. A single screw-driver allows the service technician to remove these covers and gain access to all motors and major electrical components.

With Hyster's high quality motors and pumps the noise levels in this truck are remarkable. This is how only a two piece drop in floor plate can be used to cover the motor compartment. Notice that on the Toyota, there is cover under cover used to reduce heat and noise levels.

Toyota Covers and Panels



12 Metal covers encase the Toyota truck. There are 18 total screws involved in securing these panels and two different size wrenches required. The two steer pod covers are not shown or included. The service brake master cylinder is under the steer pod covers. This adds additional covers and screws.



View from operator's seat of motor compartment with drop in floor plate removed (lower floor plate)

Steer pod cover



View from operator's seat of motor compartment with upper and lower floor plate removed.

The Toyota 5FBE has 12 metal covers. The lower floor plate is a drop in, however; from that point on, either machine screws or bolts have to be removed in order to access or inspect any critical components.

As can be seen only the lower floor plate is a drop in floor plate. Removing the drop in floor plate does not provide access for routine truck component checks.

In fact there are several covers under the floor plates and side panels, used as noise buffers and for heat reduction within the operator compartment.

Rattles are quite frequent due to a lot of metal to metal surface contact. Also, metal covers are heavy and are corrosive.

For the service repairman, these metal covers are heavy and cumbersome to work with. When we think about fatigue we are generally thinking of the operator using the truck. Let's consider the service repairman and fatigue. Removing and installing these metal covers for routine service checks can lead to technician fatigue and even longer repair time causes excessive downtime and increased maintenance costs.

Hyster Accelerator and Service Brake Pedal



The Hyster brake pedal is at an approximate 43° angle in relationship to the floor plate. The brake pedal foot pad is 3.25 inches off the floor plate. Notice the right foot can pivot about the floor plate and activate the service brake pedal.

The Hyster Monotrol Pedal (Standard) allows hands free directional changes and is also ergonomically positioned for low effort activation and ease of use.



The Hyster accelerator pedal is at an approximate 18° angle and is 2.5 inches off the floor plate.



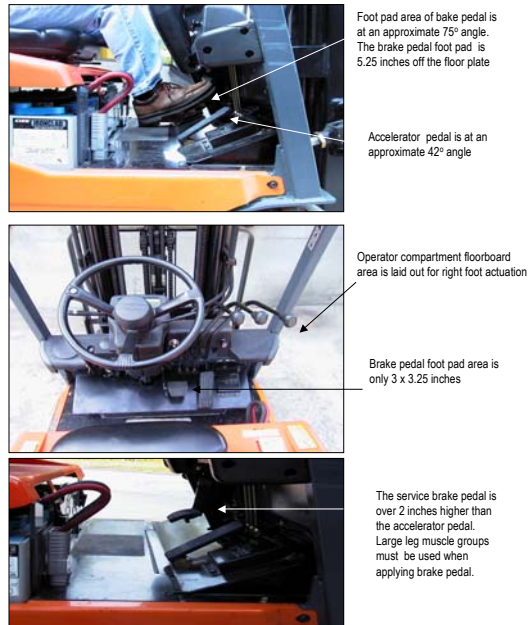
Notice the position of the accelerator pedal and how it is angled (standard monotrol & optional accelerator) toward the operator. This lets the operator pivot the right foot and not have to use large leg muscle groups to activate foot control functions.(optional accelerator pedal shown)

The J30-40XMT₂ floorboard and foot control layout is ergonomically unmatched compared to the Toyota.

- Left foot or right foot braking, operator's choice, with the Hyster.
- Low pedal height requires low effort braking and acceleration
- The use of large leg muscle groups is not required to alternate between brake and accelerator pedal.
- Foot control pedals are positioned within the operators comfort zone.

The standard "Monotrol" accelerator pedal further enhances operator comfort and productivity by allowing hands free directional changes.

Toyota Accelerator and Service Brake Pedal



Toyota literature states that the 5FBE is designed with the operator in mind. A closer look indicates that they did not spend much time in the floorboard area for the operator.

The service brake foot pad is at an approximate 75° angle. The brake pedal is 5.25 inches from the floor plate and requires the use of the large leg muscle group to activate, which may lead to operator fatigue.

The foot brake is not only at an uncomfortable angle, the pedal is positioned only 2.5 inches from the accelerator pedal. The brake pedal itself is only 3 inches wide and practically limits the operator to use only the right leg for both acceleration and braking.

The shape, position and angle of the service brake pedal indicates little ergonomic consideration.

The 8 inch accelerator pedal is at an approximate 42° angle. The accelerator pedal is not difficult to operate, however, the combination of the accelerator pedal length and the angle reduces pedal control. The foot must be up on the top portion of the accelerator pedal to activate, making feathering or creep speeds difficult to maintain.

Hyster Hydraulic Control Functions



Seat side hydraulics provide the means for the operator to be in his natural relaxed “seated” position, and activate hydraulic control functions. With seat side hydraulics there is no reaching out and over to engage hydraulic functions, resulting in reduced operator arm and shoulder fatigue. Reaching out and leaning over to access cowl mounted hydraulic levers requires more energy and effort from the operator. Over an 8 hour shift this constant motion will fatigue the operator resulting in lower productivity levels.

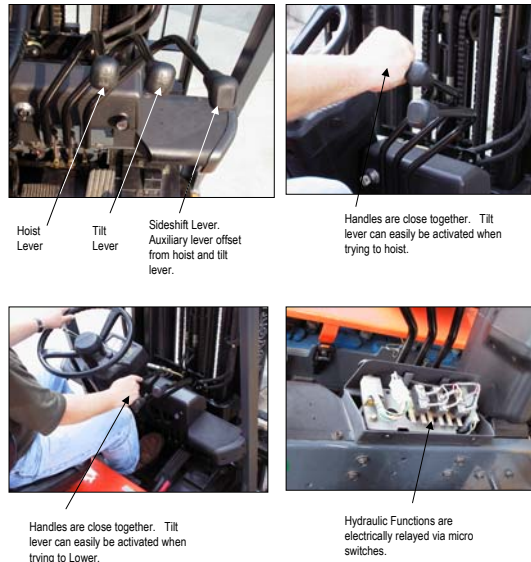
The ergonomically positioned and shaped hydraulic control levers provide proper spacing between handles reducing the chance of activating two hydraulic control functions at one time. The hand levers are designed to fit comfortably in various hand sizes, and the soft touch sure grip rubber coating on the hand levers reduces hand fatigue.

The upper control valve linkage pivots forward to allow battery cover latch access. The pivoting upper linkage also provides easy, quick access to hydraulic control valve linkages in the event any adjustments are required. Two Philips screws secure the lower control valve cover. Once the lower cover is removed, complete access to the hydraulic circuit board, lower connecting linkages and all control valve hose connections is achieved.

Hydraulic functions are electronically sensed by opto sensor switches on the hydraulic control board. The opto switches themselves have no mechanical components to wear. Unlike the micro switches used on the Toyota 5FBE which are prone to wear and adjustment requirements.

The hydraulic hand levers are placed within the operators comfort zone.

Toyota Hydraulic Control Functions



The Toyota control levers are the cowl mounted design. There are several issue to exploit with this type of design:

The hand levers are very close together and secondary functions are easily activated.

There is little ergonomic shape or design on the hydraulic levers. The hand levers are positioned above the cowl.

The hand lever control knobs are made of a hard textured rubber that is pushed on to the end of the control valve lever shaft. The operator has to lean out and over to activate the hydraulic functions.

The operator input for hydraulic functions is electrically relayed via micro switches. Micro switches are prone to wear and adjustments.

The control valve is located under the upper floor plate. Both the upper and lower floor plate must be removed in order to see the control valve. Seeing the control valve and servicing it are two different things. The location and position of the hydraulic control valve would make servicing the valve difficult and may contribute to extended down-time.

Hyster Drive Motors and Drive Motor Access



The vertical mounted dual drive motors provide easy access to motors for brush inspection or replacement and power cable access and identification.



Drive motor and drive motor brush access is achieved by removing the two piece drop in floor plate.



Cutouts in the frame front cross member and cowl assembly weldment allow quick drive motor brush inspection or replacement



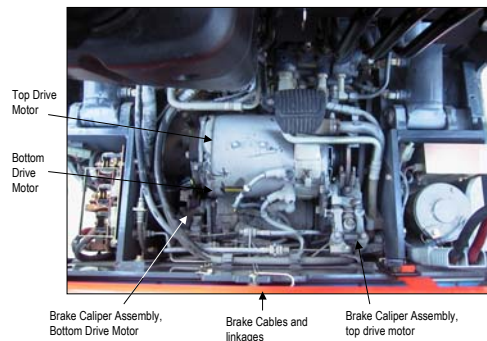
Dual drive units are individually mounted in the frame with complete and separate traction motor and braking system. This design is compact, easily serviced, and allows for independent traction control for each wheel.

The drive motors are spline fitted to the transmissions, allowing for removal and or replacement of the drive motors without affecting gear train set-up. The drive axle assembly is a “full floating” design. This means that the weight of the truck is carried by the axle housing, not the axle shafts; providing reliable component life.

The Hyster dual drive motors are vertically stacked in the motor compartment. To access the drive motors simply remove the two piece drop in floor plates. There are several advantages with the vertically mounted drive motor design:

- Motor brush access is accessible on both motors. Brush access cutouts are provided in the frame front cross member and cowl assembly plate weldment further simplifying this job and reducing truck downtime.
- The truck is not required to be over a pit or blocked up to service the drive motors; therefore, the technician does not have to be under the truck. Again, less truck downtime more truck uptime; reducing maintenance costs and increasing truck availability for higher production levels.
- Power cables are easily accessed and easy to identify.

Toyota Drive Motors and Drive Motor Brush Access



The bottom drive motor is barely seen from in front of the truck with mast raised. Drive motor Brush replacement can lead to excessive downtime and increased maintenance costs as compared to the J30-40XMT₂.



The drive motors are horizontally stacked. This design is supposed to allow a more open and accessible motor compartment. The motor compartment is very cluttered.

Drive motor brush access is very difficult. The bottom drive motor must be partially serviced from underneath the truck. This means either the truck must be moved over a pit or put on a hydraulic lift in order to access the bottom drive motor.

If no pit or hydraulic lift is available, then the motors will have to be removed from the truck to be completely serviced

The Hyster J30-40XMT₂ provides the technician with the means to service the drive motors without removing other truck components. The drive motors are accessible by removing the drop in two-piece floor plate. Additionally, the J30-40XMT₂ does not require the vehicle to be over a pit or on a hydraulic lift.

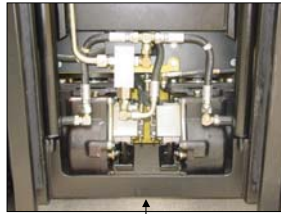
Drive motor power cables are much more difficult to access and identify.

Drive motor brush access on the Toyota 5FBE will be more difficult as compared to the Hyster J30-40XMT₂. This may result in excessive downtime, increased maintenance costs, and reduced productivity levels.

Hyster Service Brake Assembly



The Hyster service brake assembly, which includes the master cylinder, can be easily accessed by removing the two piece drop in floor plate.



The dual automotive type brake calipers are easily accessed by raising the mast. The technician is not required to be under the truck. The brake discs are protected by dual disc brake shields which are mounted individually to each drive unit housing.

Mounted on each drive unit, the dual disc brake system is hydraulically activated independently per wheel to provide low effort braking. Braking is assisted by utilizing regenerative motor brake current. This design reduces heat and brake wear.

Raise the mast (block the mast for safety), and brake rotor and friction pads are accessible through the mast for inspection or replacement .

A large brake pedal is positioned for use by either foot. The sealed master cylinder reservoir contains a sensor, which lights a warning lamp on the dash panel if the fluid level becomes low. Self adjusting brake pads are made from non-asbestos materials.

The master cylinder is part of the service brake assembly and is accessible when the two piece drop in floor plate is removed.

Toyota Service Brake Assembly



Brake caliper pad adjustment nut Bottom drive motor brake caliper Top drive motor brake caliper Brake caliper pad adjustment nut



Service brake master cylinder is located under the steer column covers.

The Toyota 5FBE features twin hydraulic non-asbestos disc brakes. However, notice the large number of mechanical linkages and cables used in this brake system. Both the drop in floor plate and the bolt in floor plate must be removed in order to access the brake calipers.

The Toyota brake system has a lot of moving parts and a lot of wearable parts compared to the Hyster brake system. More mechanical linkages and cables may result in more adjustment requirements.

The master cylinder is located under the steer column cover. In order to access or service the master cylinder the steer column covers have to be removed. Unlike the Hyster product, where by simply removing the drop in two piece floor plate access to the master cylinder is provided.

The Hyster J30-40XMT₂, has self aligning and self adjusting brake calipers. The Toyota 5FBE requires manual adjustments for proper pad clearance. Brake calipers out of adjustment can cause overheating of the pads. This over heating can contribute to a warped disc and excessive disc pad wear.

As with many other serviceable aspects of the Toyota 5FBE there is more downtime and less up time, which contributes to decreased productivity levels and increased maintenance costs.

Hyster Instrument Panel Display

Standard Dash Features

- Six LED warning lights
- 16 Character numerical display
- Hour meter
- Warning lights
- Service maintenance monitor
- Under fault conditions, the display will show the fault code number



View of dash from operator's seat
(standard dash shown)

Premium Dash Features

- Alpha-Numeric display
- 2 lines with 20 characters per line
- Six LED warning lights
- Under Fault Conditions
- Shows fault code numbers, followed by the text explanation
- Keyless password entry
- Start up check list



Standard Display: Six warning LED lights:

Seat belt (lit for 10 seconds after key is turned on)

Parking brake (lit when parking brake is applied and key turned on)

Low brake fluid indicator (lit when brake fluid in reservoir is low)

Service (lit when service is required. Accompanies fault code display on LCD) Hour meter (lit when hour meter time is displayed on LCD)

Battery (lit when BDI reaches warning level)

Note: All lights are displayed for 2 seconds after key is turned on

The fault code will display only while the truck system is experiencing a problem or is disabled by the detected problem.

The standard display has only one adjustment option. The operator can disable fault codes so that they do not appear on the display.

In contrast, the premium display can be changed to:

Disable fault codes

Disable full text

Disable seat belt warning

Disable the ability to adjust the BDI and lift lockout setting

Enable checklist questions for startup maintenance

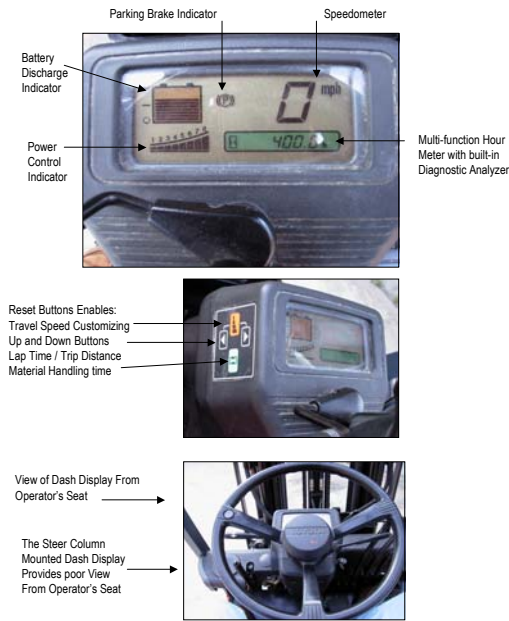
Premium Display Customer-selected Enhancements:

Keyless password entry and operator history -- A keyless password entry and record of operator history are two new features. This feature is disabled at the factory and can be activated by the customer with a laptop computer. When the key switch is turned on, the display will require the driver to key in a password before the truck will operate. The display will record the driver code number and truck hours when the driver started operating the truck. The history will be recoverable by PC. Password access can be a safety feature for novice operators. The operator password can be tied to authorization to work at specific maximum mode levels. A new operator might be given only slow mode access.

Startup Checklist -- Customer can program the display to ask up to 10 customer selected questions (up to 40 characters each)

The premium dash also allows the customer to optimize performance and energy consumption by selecting one of four performance modes to best meet his particular job application requirements. Performance mode selection can be selected at anytime, regardless of if the truck is in motion.

Toyota Instrument Panel Display



The Toyota dash display provides a wide variety of options with large bold readout characters. Toyota designed and built the SIT (static induction transistor) controller that interfaces with the Digital Multi-Display Monitor to provide real time diagnostics and allow the operator to customize eight travel and acceleration speeds.

The dash display is steer column mounted which restricts the operators view of the dash. The operator must look up and over the steering wheel to see the dash display.

Adjusting and customizing the travel and acceleration speeds must be done with the truck in a static condition.

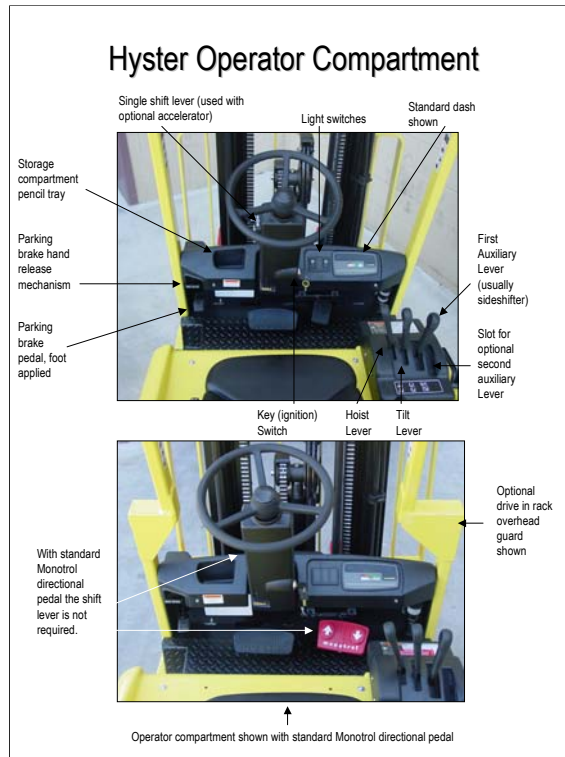
Trying to change the mode setting on the dash from the operator's seat while the truck is in motion would prove difficult because the mode selector buttons can not be seen from the operators seat.

The following functions can be analyzed through the Multi-Display Monitor:

1.Total key-on time 2.Lap time 3.Travel time 4.Material handling time 5.Travel distance 6.Trip distance

The Toyota designed SIT (static induction transistor) eliminates the need for peripheral hand held devices for troubleshooting. Trouble shooting and circuit analyzing can be done through the Multi-Display Monitor. Specific alpha and numeric codes are displayed representing certain faults within a specific circuit or system.

These Toyota designed electrical components carry proprietary cost and associated expense typically found in proprietary type environments.



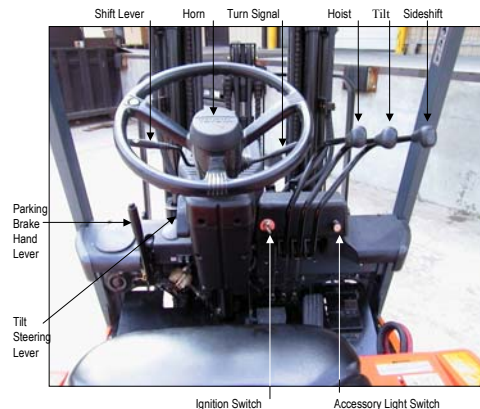
The Hyster floorboard area measures 17.5 inches wide and 34.5 inches deep, between the left hand and right hand step. The Toyota 5FBE floorboard area measures larger than J30-40XMT₂ because there is no step on the 5FBE to assist the operator entering or exiting the operator compartment.

Notice the Hyster floorboard area is open, and has no steer column or uneven floor surfaces to restrict operator foot positioning. The ergonomically designed floorboard area layout provides the operator with the choice of right foot or left foot braking.

The foot controls are ergonomically positioned and angled to provide low effort actuation and do not require the operator to use large leg muscle groups to activate.

The 14 inch steering wheel is made with a soft touch sure grip textured rubber coating with finger notches provided on the bottom side of the steering wheel for added gripping and less chance of the steering wheel slipping through the hands of operators, especially in freezer or wet applications. The Toyota steering wheel is made of a hard plastic and can be hard to grip in freezer or wet applications. This can cause the steering wheel to slip through an operators hands.

Toyota Operator Compartment



The Toyota 5FBE series has a good size operator compartment floorboard area which is approximate 41 inches wide and 17 inches deep. They achieve this by having the bulk of their Hydraulic system (including hydraulic tank) and electrical system located in the rear of the truck. However, there are several short-comings of the operator compartment that stand out:

- There is no step provided on either the left or the right hand side of the truck for operator entry and exit.
- The wing back style seat is not equipped with hip restraints.
- The floor plates have no tread or foot mat. There is only a small 8 inch x 12 inch non-slip pad glued to the center of the lower floor plate. The location of the slip resistant pad questions it's effectiveness for the operator entering or exiting the operator compartment.
- The main contactor and fuse panel assembly is located under the floor plate on the left hand side of the truck. The operator's compartment is very noisy with directional contactors pulling in and out during travel. Toyota has **not** adapted transistorized traction controls and the use of SEM (separately excited motor) technology. This is evident by the noise generated through the contactor panel assembly in the operator's compartment. This is also evident by the lack of smooth transitional directional changes and acceleration.
- The dash display is mounted to the back of the steer column cover, which has proven to be difficult for the operator to see and interface with from the operator seat.
- The top cowl cover has no pencil tray or pocket provided for operator convenience. There is a cutout on the left hand side of the dash for a cup holder, but this is capped off on this truck.
- The directional lever is located on the left hand side of the steer column and is made of a hard plastic.
- Toyota's "infinite adjusting" steer column is no more than the steer column mounting bracket pivoting on a screw at the base of the steer shaft. They refer to it as infinite because there is no set positions to lock the steer column while in its pivoting adjustment. The draw back to this design is that when the locking mechanism is released, the steer column floats and can be easily slammed into its full forward or full rearward position. With the steer hand pump internal to the steer column, this can contribute to premature hydraulic leaks. If not properly tightened, vibrations or jarring effects from rough or uneven floor surfaces could cause the steer column to become loose and fall downward to the operator.

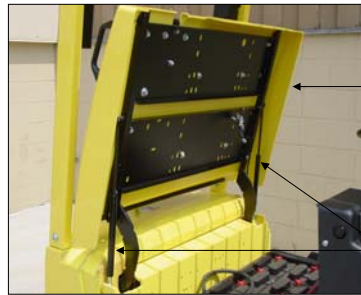
Hyster Battery Compartment Cover



Convenient access handle is located on the right hand side of the battery compartment cover for quick, easy, and safe raising and lowering.



There is no pinch point between the battery compartment cover and the rear overhead guard leg.



The battery compartment cover and seat are support by a rugged one piece metal seat frame weldment. The seat frame weldment is designed in such a way that allows it to also be the battery restraint mechanism. Another innovative design by Hyster Company.

Dual gas assist cylinders are provided for ease of raising and lowering, and to provide adequate support when battery compartment cover is raised.

The Hyster battery compartment cover is molded from a heavy duty ABS thermal-formed engineered plastic. The battery compartment hood and the operator's seat are mounted to and supported by a rugged one piece metal weldment. This weldment is also utilized as the battery restraint system in compliance with ANSI and EEC standards. There are several distinct advantages with the Hyster battery compartment cover as compared to the Toyota battery compartment cover:

- The heavy duty ABS plastic cover is molded with the Hyster yellow color, thus no paint peeling or fading.
- The ABS plastic cover is non- corrosive and will not rust, a distinct advantage in freezer and wet applications.
- Dual assist gas cylinders are provided on the battery cover for ease of use and for providing adequate support for the hood when raised.
- A convenient handle is located on the battery cover to further enhance ease of use when raising and lowering.
- There is no pinch point between the battery cover and the rear leg of the overhead guard.

Toyota Battery Compartment Cover



The Toyota battery compartment cover is a large metal cover that is hinged from the counterweight.

The battery compartment cover has several short-comings:

- There is no grab assist handle on the battery compartment cover
- There is only one gas assist cylinder (Top Photo)
- There is a finger pinch point when lowering the hood as can be seen in the middle photo.
- An arm pinch point is created when raising the hood as can be seen in the bottom photo.
- Metal is highly corrosive and will typically become an issue in intermittent freezer and wet applications. Rattles are also quite frequent due to a lot of metal to metal cover contact.

Hyster Power Steering Motor Access



View from left hand side of truck of motor compartment with drop in floor plates removed.



The power steer motor access cutout in the battery compartment front plate further simplifies steer motor brush inspection or replacement.

Power steering motor access is achieved by removing the two piece drop in floor plate.

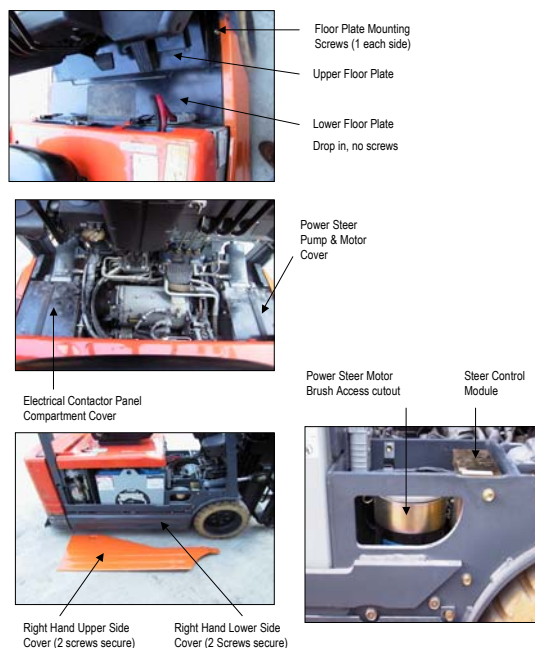
Power steering motor access is achieved by simply removing the two piece drop in floor plates.

Because of the high quality steer pump and motor assembly used in the J30-40XMT₂, secondary panels and covers are not required to muffle noise or deflect heat from entering the operator's compartment.

Another simple, but innovative design of the Hyster two-piece drop in floor plate is both the left and right hand floor plates have cut outs in them. These cut outs perform two duties. First it is used as a grab access point when installing or removing the floor plates. Secondly, the cut out allows air circulation and ventilation within the motor compartment.

A steer motor brush access cut out is provided in the battery compartment front plate further simplifying motor servicing.

Toyota Power Steering Access



The power steering motor and steering module are located under the floor plate on the right hand side of the truck.

In order to get to the power steer motor or steering control module the following steps must be taken:

- First both upper and lower floor plates must be removed.(Upper floor plate is secured by two bolts)
- Next the outer side cover panel must be removed (2 bolts secure)
- Next the power steer motor cover must be removed.
- Brush motor access is now available, however, to inspect or service the steer pump, one must remove the inner or lower side cover panel(2 bolts secure) to gain access to the supply hoses and hydraulic fittings

Hyster Hoist Motor Access And Brush Replacement



Removing the two piece drop in floor plate is the only step required to gain Hoist motor access.



View from left hand side of truck of motor compartment with two piece drop in floor plates removed. The hydraulic pump and motor is shock mounted to the hydraulic tank with four elastomeric mounts.



To inspect or replace hoist motor brushes, simply loosen the motor anchoring straps and pivot the motor up.

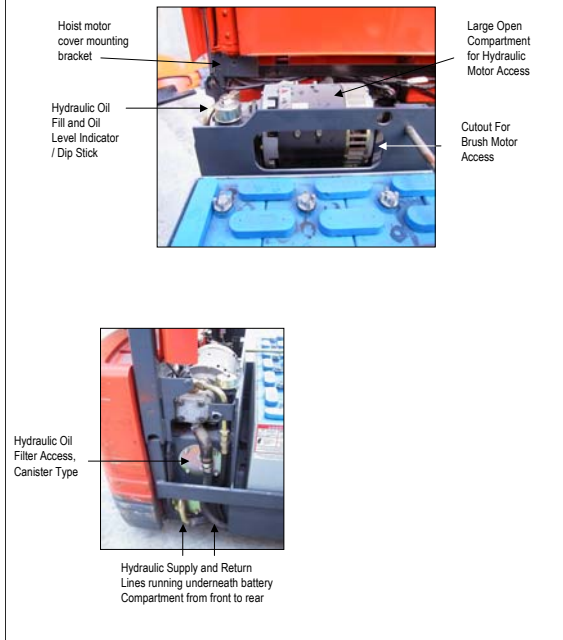
Hoist motor brush access cutout

Hoist motor access for brush inspection or replacement on the Hyster J30-40XMT₂ is quick and easy. To access the hoist motor remove the two piece drop in floor plate. To access or inspect motor brushes, loosen the two motor anchoring straps and pivot the motor up. Hoist motor brush access cutout located on the front plate of the battery compartment further simplifies brush inspection or replacement.

The premium hoist motor option provides a temperature sensor and brush wear indicator that is used with the premium dash to indicate when motor temperature may be getting close to thermal limits and / or when motor brushes need servicing.

The hoist motor is shock mounted using four elastomeric mounts for reduced vibration.

Toyota Hoist Motor Access And Brush Replacement



The Toyota 5FBE locates the hoist motor in the rear of the truck behind the battery compartment rear plate.

The hoist motor is shock mounted to the top of the metal hydraulic tank.

Not shown is a single piece rear cover (already removed) that is mounted over the hoist motor. Once the top cover is removed, hoist motor brushes can be accessed. A hoist pump motor access cutout is provided in the rear plate of the battery compartment. There is enough room in the rear compartment to provide adequate access to the hoist motor. Brush inspection or replacement is acceptable.

Hyster Mast Design



The Hyster Vista mast does not require additional cross members and fabricated support brackets up and down the stationary mast channel for structural integrity.

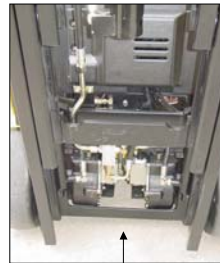
Premium cast components are used on the Vista mast construction. Castings are used for optimizing weight and strength.



Nested mast channels are directly aligned eliminating channel damage caused by forward movement during lowering and reduces right angle stacking dimensions.



Canted load rollers allow full face bearing contact with the mast channel.



View of the Hyster drive units and disc brake calipers with the mast raised. Notice there are no dangling cables and wires.

The nested mast channels on the Hyster VISTA are compact and reduce the truck's right-angle stacking dimensions and lost load center.

The channels are directly aligned and eliminate channel damage caused by forward movement during lowering. Hydraulic cushioning is provided to allow a smooth, quiet transition between the main lift cylinder and the free lift cylinder when staging during lowering function.

Full face bearings canted at a three degree angle allow for full face contact with the mast channels. Loading is evenly distributed on the roller bearing over a greater area which contributes to increased bearing life, channel life, and virtually eliminates the need for adjustments.

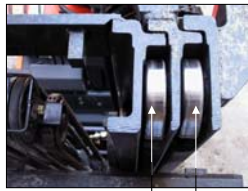
Hyster utilizes premium cast components for mast cross-members, brackets and support gussets. Castings are used for optimizing weight, strength and precision mast construction. The wrap around brackets, tie bars and chain anchor mountings are not cut, bent or welded fabrications.

Notice on the Hyster product when the mast is raised how the hoses are neatly tucked and routed. The hoses and connections are not at floor level and are high enough up on the mast structure to be protected from floor debris, pallets and other obstacles that could cause potential hose damage.

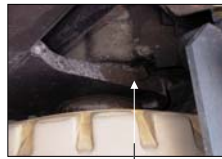
The Hyster Vista chain and hose routings are designed to optimize visibility. The Vista chains and hoses are positioned behind the mast channels and do not restrict forward visibility.

The Vista mast's upper channel support has built in lifting eyes for quick and safe mast servicing and or replacement.

Toyota Mast Design



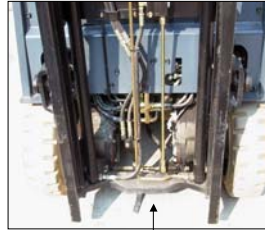
Straight load roller design



Mast is trunnion mounted via the drive axles.



A structural device is used between the drive axles to reduce side to side tension – compression of the forward frame mounting plates.



Hydraulic hoses, tubes and connectors are exposed and prone to damage.



Fabricated mast braces are required on both left hand and right hand side of mast to provide adequate structural support

The Toyota mast is trunnion mounted integrally to the drive axle housings. This mounting design is much like the Hyster concept at first glance. However, a closer look reveals a structural stabilizing bar mounted in between the two drive axles which suggests some structural deficiencies. This structural device is used to reduce movement (side to side tension-compression) of the forward frame mounting plates.

Hyster frames feature an integral cross member to keep the transmission and mast loads from creating high frame stress. In short, we gusset support the cross member to provide adequate structural support.

The Toyota mast is constructed of both metal castings and fabricated support bars. These fabricated bars are welded to the mast's outer channels and tied into the upper / outer cross member to provide required structural support of the mast.

As with other Toyota mast designs, this mast uses straight load rollers that are shimmed to slide against the extrusions that are formed into the mast channels for side thrust support. This sliding effect has tendency to mill the extrusion – especially with off center loads.

Take notice of the hoses and tubes that are left exposed when the mast is raised. This type of design has the potential for causing time consuming and costly repairs due to cut or damaged hoses and bent misaligned tubes causing hydraulic leaks.

Hyster Hydrostatic Steer System



The hydraulic rack and pinion steer actuator is fully enclosed and is accessed by removing the rear access panel.

Hydrostatic steering in conjunction with the twin steer wheel axle contribute to reduced tire wear resulting in longer tire life, tight turning radius, a more stabilized feel (especially when turning) and provides a very smooth ride.



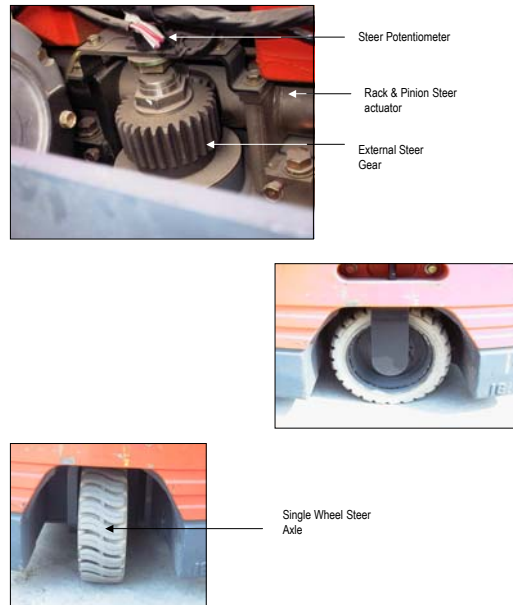
The rear access cover is secured by two Philips screws. The rear compartment cover is sealed by a weather-stripping type rubber that keeps water and contaminants out of the rear compartment as well as reducing noise levels.

Twin steer tires, which are standard on the J30-40XMT₂ provide a smooth, stabilized feel. Twin steer tires provide several advantage over single wheel drive axels.

- The twin steer tires distribute stress and wear over a wider area which reduces spindle and bearing loads and provides a smoother ride than single wheel axels.
- Twin steer tires are not subject to the load stress, road born shock loads or sidewall (Opposing) pressures that a single tire endures. This feature ensures longer component life and reduces tire change-outs.
- Twin steer tires also provide larger, more balanced tread imprint providing increased traction and a more stabilized feel; especially when turning.

The twin steer tire axle in conjunction with hydrostatic steering provides an excellent turning radius, smoother ride and improves maneuverability over single steer tire trucks. These feature advantages will increase operator comfort and provide the means for higher productivity levels.

Toyota Hydrostatic Steer System



The 5FBE is equipped with a rack and pinion type Hydrostatic steering system in conjunction with a single wheel steer axle. A potentiometer is mounted in relationship with the steer gear to relay truck steer angles to the central processing unit.

The rack and pinion steer assembly is mounted within the confines of the counterweight, however, notice the external gear reduction. This open style housing can result in:

- Premature gear wear, resulting in a less responsive steer system
- Exposed gear teeth can cause tooth damage resulting in gear mesh problems and noises
- Loose hardware or other contaminates can fall or drop in steer housing leading to costly repairs

The single wheel steer axle design has several short-comings as well:

- Increased tire wear due to wheel loadings being applied to a single wheel versus having the loads distributed over two tires.
- Premature wear on wheel bearing due to loads being distributed on a single wheel bearing versus having the load distributed across two bearings.
- A rougher ride than the dual wheel design because of less rubber contact with the floor to absorb shock loads.
- Dual steer tire design widens the rear portion of the stability triangle providing a stabilized feel, especially when turning, and offers significant advantages in truck ride and maneuverability.

Hyster Ingress and Egress



↑
The Hyster J30-40XMT₂ features a 3 point entry system, hand grip on front left hand overhead guard leg, convenient 19.7 inch height step, and a reachable hip restraint on the operator's seat. Diamond plated metal floor plates with a non-slip adhesive mating on the left hand side of the frame provide safe footing when entering or exiting the operator's compartment.



The Hyster J30-40XMT₂ provides a 3 point entry system. A 19.7 inch step height provides good foot placement for truck entry.

The grab handle can be located either 70 inches from the floor or 64 inches from the floor on the left front overhead guard leg. The grab handle is made of metal and is coated with the same soft touch sure grip rubber as the hydraulic control valve hand levers. This feature reduces hand fatigue, especially in frequent on truck off truck applications. The rubber coating also provides a much better grip in wet and freezer applications.

The seat is equipped with hip restraints which provide an additional grab point for operator compartment entry and exit.

The two piece drop in floor plates are made of diamond plate metal to provide sure footing when entering and exiting the operator's compartment. On the left hand side of the truck, an additional adhesive strip is positioned on the frame just below the step enhancing footing while entering and exiting the lift truck.

Toyota Ingress and Egress



Step Height of 22"



Wing back type seat has no hip restraints, therefore, provides no grab point for entering or exiting the operator's compartment.



Hard plastic hand grip (RH Side Only) located 58" from floor.



Large open floorboard area

8" X 12" Skid Pad
Metal floor plates with no tread or substantial skid pad for entering and exiting the operator's compartment.

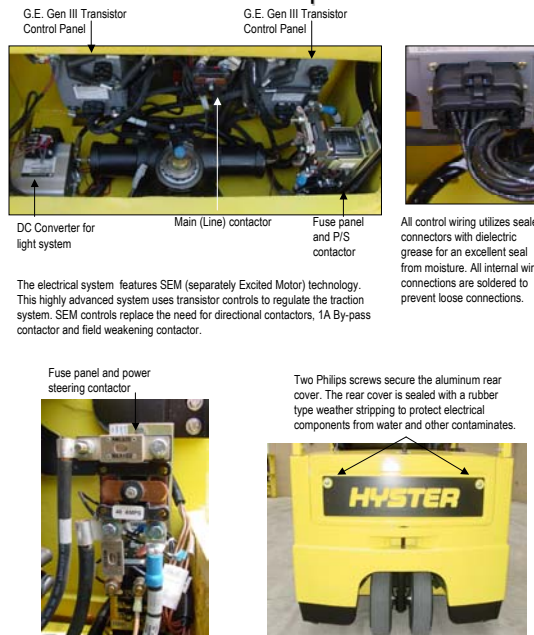
The Toyota 5FBE does not provide a 3 point entry system. The wing back seat is not equipped with hip restraints. With the 22 inch step height (over 2 inches higher than Hyster) and no actual step, it is more difficult entering the Toyota operator compartment than the J30-40XMT₂.

The grab handle is located 58 inches from the floor on the left front overhead guard leg. The grab handle is made of a hard plastic. The grab handle is not coated with a soft touch sure grip rubber as on the Hyster truck. The hard plastic grab handle provides very little grip in freezer or wet applications.

Left side and right side entry is possible on the Toyota 5FBE however there is no step or grab handle on the right hand side of the truck for operator entering. Further, hydraulic control levers project into the operator compartment limiting entry from the right hand side of the truck.

There is no slip resistant tread or matting provided on the frame or the floor plates other than a 8 inch x 12 inch piece of adhesive matting in the center of the drop in floor plate. With the non-slip matting located there, it's effectiveness is questionable in aiding operators entering or exiting the truck from the left side or right side. Additionally, this may be a problem in freezer, intermittent freezer and wet applications.

Hyster Electrical System and Electrical Compartment



The J30-40XMT₂ features SEM (separately Excited Motor) technology. separately excited motors feature independent armature and field controls. The traction system is controlled by dual G.E. GEN III transistor traction controllers, with one controller for each drive motor.

The traction system operates at 12kHz, above the normal audible range. There is no controller hum as found in earlier SCR traction controller systems.

The G.E. GEN III controllers feature soldered internal wiring connections. This eliminates loose connections typically found as a result of heavy dock use (vibrations and jarring effects from uneven floor surfaces, dock plates and constant running in and out of trailers).

Regenerative braking (standard feature) is fully electronic, without the need for a contactor. Regenerative braking occurs when travel direction is reversed during plugging. This action draws heat away from the motor during plugging and prolongs the life of the traction motor brushes by 3-5 times. The energy generated during plugging goes into the battery as a positive charge and not as heat to the motor.

The electrical compartment is encased by an aluminum rear cover. The rear cover has an adhesive weather strip type rubber providing a water tight seal that prevents moisture and other contaminants from entering the electrical compartment.

Toyota Electrical System and Electrical Compartment

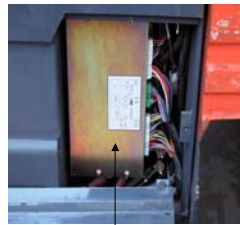


Contactor panel assembly includes: line, hoist, steer and directional contactors

Central Processing Unit (CPU) MOSFET technology



Main truck fuses are located on the contactor panel assembly



Toyota designed electrical system = proprietary parts

The Toyota 5FBE is **not** equipped with SEM (separately excited motor) technology. An older generation of technology is used including directional contactors. This older generation traction system has several shortcomings as compared to SEM technology:

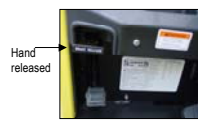
- Contactors are much more noisy
- Contactors are less energy efficient
- Contactors have more wearable parts.
- Contactors require frequent adjustments

The transistor controlled traction system on the Hyster J30-40XMT₂ ensures the highest efficiency of battery energy and provides smooth step-less acceleration and proportional regenerative braking.

In fact, traction systems utilizing transistor traction controls will prolong drive motor brush life 3 to 5 times. With the horizontally stacked drive motors and the downtime associated with replacing the drive motor brushes on the Toyota 5FBE, the Hyster J30-40XMT₂ has a huge advantage over the competition.

The electrical components are very difficult to access. Trouble shooting and tracing wires will prove to be very time consuming and cumbersome due to the fact the electrical components are crammed in a small compartment between the rear battery compartment plate and the counterweight. The Toyota truck will have excessive down time and increased maintenance costs, as compared to the Hyster product.

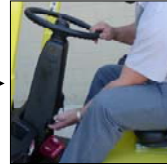
Hyster Tilt, Directional Lever & Parking Brake



The parking brake is foot applied (automotive style) and hand released. The parking brake is located to the left hand side of the operator compartment.



The tilt steering column hand release mechanism is conveniently located on the steer column. There are five locking position to accommodate various operator physics.



The Optional steer column mounted directional shift lever is located on the left side of the steer column. The directional shift lever is used when the truck is not equipped with the standard "Monotrol" pedal.

The standard "Monotrol" pedal is a unique foot controlled accelerator pedal that allows directional changes as well as standard accelerator functions. Hands free directional changes is another advantage of the "Monotrol" pedal.



The parking brake is an automotive style that is foot applied and hand released.

The tilt steering column provides the operator with five different locking positions to make the operator as comfortable as possible. The steer column tilting design uses a cog style gear to ensure the steer column stays where you put it.

The Monotrol directional / accelerator pedal is standard on the J30-40XMT₂, and provides the operator with hands free directional changes.

The single shift lever (L.H. mounted on steer column) is coated with the same soft touch sure grip rubber coating as the hydraulic levers, which reduces hand fatigue.

The steering wheel is made of a soft touch textured rubber that reduces hand fatigue. The steering wheel also has finger notches on the bottom side for sure hand gripping.

Toyota Tilt, Directional Lever & Parking Brake



Hand applied and released parking brake

Steer column tilt steering mechanism



Steer column mounted directional shift lever (Left hand side only)

The Toyota parking brake is hand applied and hand released. With the shift lever, the parking brake lever, and tilt steering column lever all located on the left hand side of the truck, applications where the operator is frequently on and off the truck could contribute to arm and shoulder fatigue by the end of an 8 hour shift.

Alarm sounds if key switch is on and operator is out of the seat.

The Toyota literature states they have infinite tilt steering. Basically this is no more than a compression nut type locking system that wedges the steer column against the mounting bracket when the hand mechanism is turned. This design may cause the steer column to slam in the downward position (toward the operator) when the hand lever is released if the operator is not careful and holding on to the steering wheel. This can also be a problem if the hand mechanism is not tightened securely enough. Rough, uneven floor surfaces (like dock plates) could disengage the compression nut.

The Toyota steering wheel is made of a hard plastic. This may cause problems for operators who work in freezer or wet applications because the steering wheel can easily slip out of an operator's hands in this type of environment.

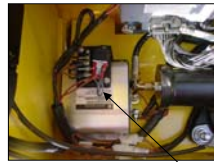
Hyster Fuse Panel and Contactor Panel Access



Truck fuse panel assembly



One piece aluminum electrical compartment cover. A water tight seal protects critical electrical components. Only two Philips screws have to be removed for fuse panel access.



Auxiliary relay panel assembly



Rear cover - Weather stripping type adhesive rubber seal

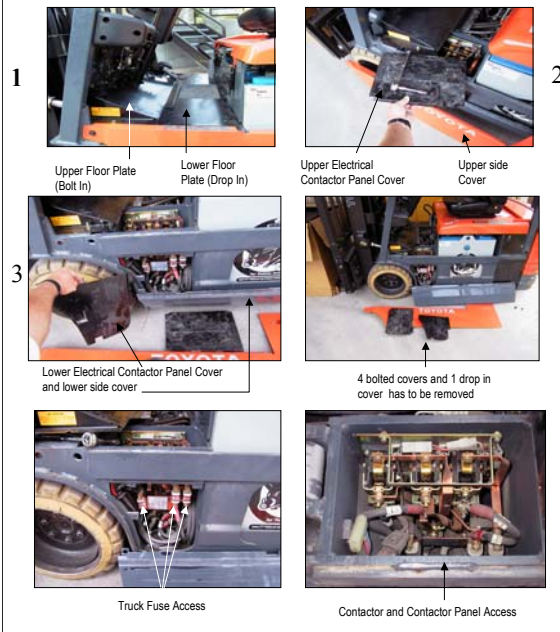
The J30-40XMT₂ fuse panel and auxiliary relay panel assembly are located in the electrical compartment.

To gain access to the fuse panel assembly, the single piece aluminum rear cover must be removed. Only two Philips screws secure the rear cover and total electrical compartment and component access is achieved at this point. The technician does not have to go to different areas of the truck nor does he have to remove four and five covers.

Good serviceability is critical. Simple issues such as fuse replacement (that should be a five minute job) can turn into a lot more when various tools are needed and covers and access panels are required to be removed for component access.

As compared to the Toyota 5FBE the Hyster J30-40XMT₂ has less truck downtime, and reduced maintenance costs. Higher productivity levels are achievable.

Toyota Fuse Panel and Contactor Panel Access



The steps required to access the fuse panel and contactor panel assembly can be seen in the above slide.

Accessing the Toyota fuse and contactor panel assembly is much more involved than in the Hyster J30-40XMT₂ product. To access fuse panel assembly on the J30-40XMT₂ the technician only has to remove the electrical compartment cover (2 Philips screws secure); one quick and easy step.

Again, serviceability on the Toyota 5FBE, as compared to the Hyster J30-40XMT₂ will encompass longer truck downtime and higher maintenance costs. When the truck is down, productivity levels are reduced.

Hyster Sideshift Carriage & Mast Chain and Hose Routing



New integral sideshifter reduces lost load center (LLC) dimensions for improved truck capacity ratings and a tighter turning radius as compared to hang on sideshifters

Precise chain and hose routings on the Hyster Vista mast provides good fork tip (product) view throughout the entire lift lower range.



Main mast supply pressure hose is protected with a metal plate to prevent hose or fitting damage.

New integral sideshifter design further enhances operator's forward visibility for increased comfort and productivity levels



Hyster's integral sideshift carriage design replaces the global hang on sideshift. The hang on sideshift is still available, but is no longer the standard carriage used in production. Some advantages of the integral sideshifter as compared to the hang on sideshifters are indicated below:

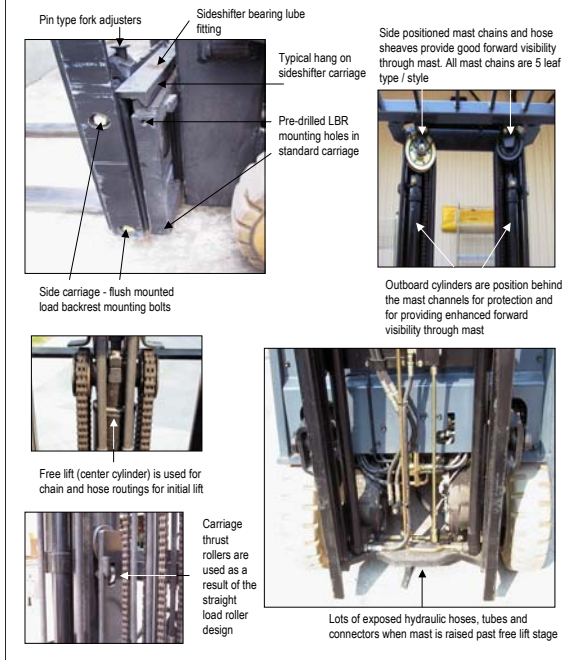
- Reduced weight and lost load thickness (LLT) for improved truck ratings. (LLT is defined in the glossary of terms)
- Improved visibility to enhance operator comfort and productivity
- Improved maneuverability as a result of improved LLT dimension
- Simple construction and installation
- Carriage outer frame mounting hooks are located above the bottom bar to eliminate catching on dock boards
- Outer frame bar design prevents build up of foreign material to eliminate binding.

The Toyota 5FBE uses hang on sideshifters. The above advantages can be used to show short comings of the hang on sideshifter and the benefits of Hyster Company's innovative designs.

The same load backrest and forks are interchangeable between the hang-on carriage design and the new integral carriage design. Notice the load backrest bolts are actually protected by the load backrest. This design prevents the bolts from becoming sheared off.

The Hyster Vista mast routes the mast chains and outboard cylinders behind the mast channels to provide cylinder protection and enhance operator visibility.

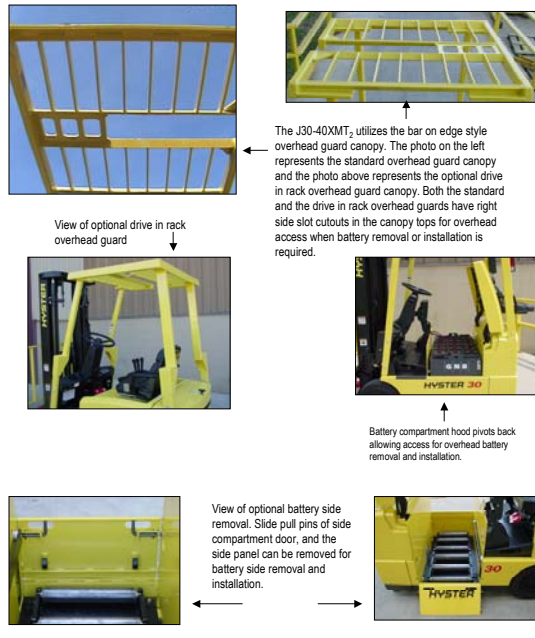
Toyota Sideshift Carriage & Mast Chain and Hose Routing



The Toyota 5FBE uses a typical hang on type sideshifter. The hang on type side shifters have several drawbacks as compared to integral sideshifter designs:

- There is more lost load face resulting in reduced capacity (load face is considered the distance between the center of the drive wheel and the face of the fork).
- The hook / hang on type sideshifter puts the load out farther on the forks, resulting in less load control.
- Right angle stacking dimensions are reduced with hook / hang on type sideshifters.
- Hook / hang on sideshifters decrease the trucks inside turning radius for reduced maneuverability.
- Hook / hang on type sideshifter has more parts and is more expensive to repair and service.
- The Toyota mast design uses straight load rollers on both carriage and upright channels. This design usually results in the addition of side thrust rollers for proper side loading protection. The straight load roller design results in more wearable / replaceable parts and lengthy downtime.
- The LBR (load backrest) is mounted external to the carriage. The LBR mounting bolts are countersunk in the LBR to ensure no shearing of the bolts, which is usually the problem with externally mounted load backrests.
- The 5FBE mast uses a 5 leaf load chain on both free lift and outboard cylinders. The mast chains are for the most part routed very neatly along side the center cylinder and free lift cylinder.
- The hydraulic hoses appear to be routed neatly within the mast until the mast is raised above free lift. Notice all the exposed hydraulic tubes and hoses once the mast is raised above free lift. This design can contribute to cut or damaged hydraulic hoses resulting in hydraulic leaks and excessive down time.

Hyster Overhead Guard and Battery Removal Access



The Hyster low profile overhead guard has an overall height of 78" (1,978 mm) allowing the J30-40XMT₂ to be used in applications with low ceiling and doorway clearances.

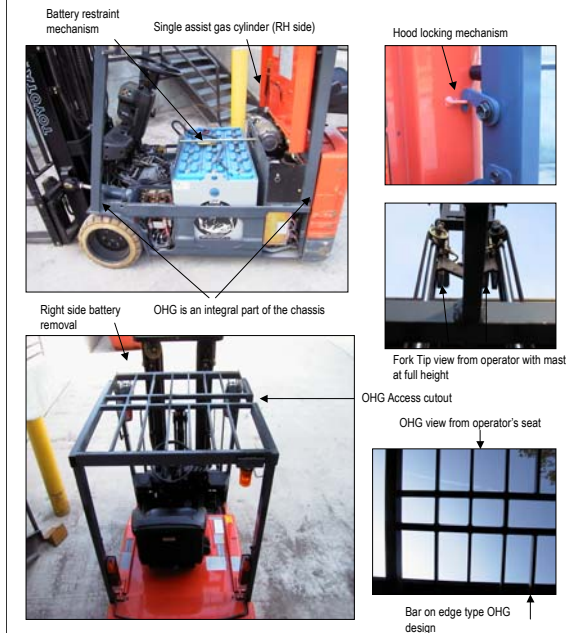
The rolled steel cross members and fore and aft reinforcing bars provide strength and excellent visibility.

A right side battery removal slot was designed for the use of an overhead chain hoist for easy battery removal.

The overhead guard is easily removed by loosening six easy to access bolts and then lifting straight off.

Optional drive in rack overhead guards and battery roller trays are available standard price book options.

Toyota Overhead Guard and Battery Removal Access



Battery removal and installation is possible from the right hand side of the truck. The overhead guard is cut out for overhead hoist system or overhead battery removal / installation system. The battery restraint mechanism must be removed before the battery compartment can be lifted out.

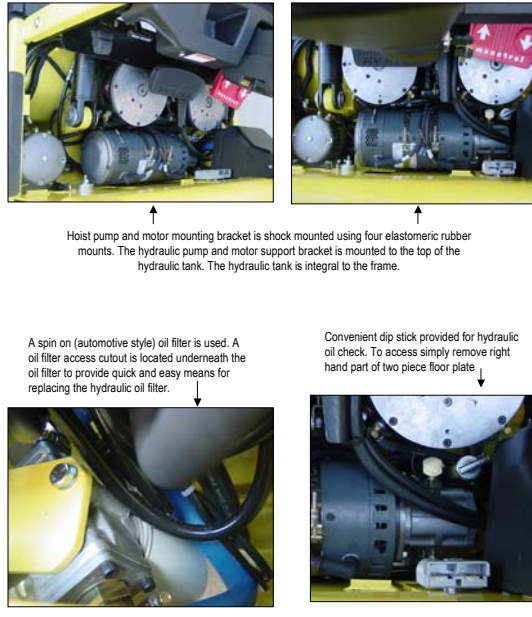
The overhead guard is an integral part of the truck chassis. This type of design can be costly for several reasons:

- Truck specification / ordering is even more critical than usual
- A change to an existing warehouse rack system with this type of design could create a major problem due to the expense of modifying or replacing the overhead guard to match a new rack layout.
- If the overhead guard becomes damaged, replacing it will be very costly and cause extended downtime.

The bar on edge overhead guard design allows good overhead view from operator's seat in all directions.

A single gas assist cylinder is utilized for the opening of the battery compartment cover. As mentioned, the battery compartment cover is made of metal and is heavy. For this reason, an external locking latch mechanism is located on the back right rear overhead guard leg for locking the battery compartment cover in the open position.

Hydraulic System and Hydraulic Filter Access



The Hyster hydraulic system is a much simpler system than the Toyota. The J30-40XMT₂ hydraulic tank is an integral part of the frame. The hydraulic tank is located under the hoist pump and motor.

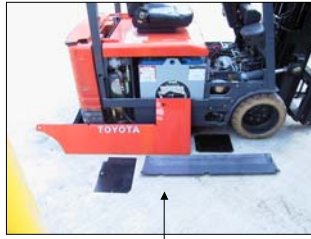
Hydraulic oil level is checked via a dip stick (automotive style) by removing the right hand side of the two piece drop in floor plate.

A replaceable spin on (automotive style) hydraulic oil filter is located in the return line on the right side of the truck under the right hand floor plate. It has a by-pass relief valve that ensures oil flow in the event the filter becomes clogged. The filter contains a 10 micron filter element that protects the hydraulic system from contaminants, promotes long reliable performance, and helps to provide long life for all the hydraulic system components.

An oil filter access cutout is located under the oil filter in the frame bottom plate, making hydraulic oil filter changes quick and easy.

The oil filter can be changed without draining the oil from the hydraulic tank.

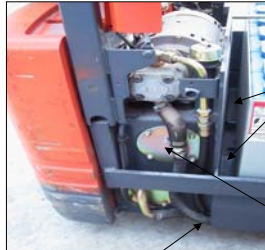
Hydraulic System and Hydraulic Filter Access



Four metal covers must be removed to gain access to the hydraulic system. Two of the covers are secured with bolts – different size bolts as well.



Hydraulic pump & motor is shock mounted



Due to truck design, all main hydraulic hoses have to be routed from front of the truck to the rear of truck.

Metal troughs are internal to the frame structure and are located below the battery on both the left and right hand side of the truck. The right hand trough carries all hydraulic hoses from front to rear of truck. The left side trough carries all the main electrical harnesses.

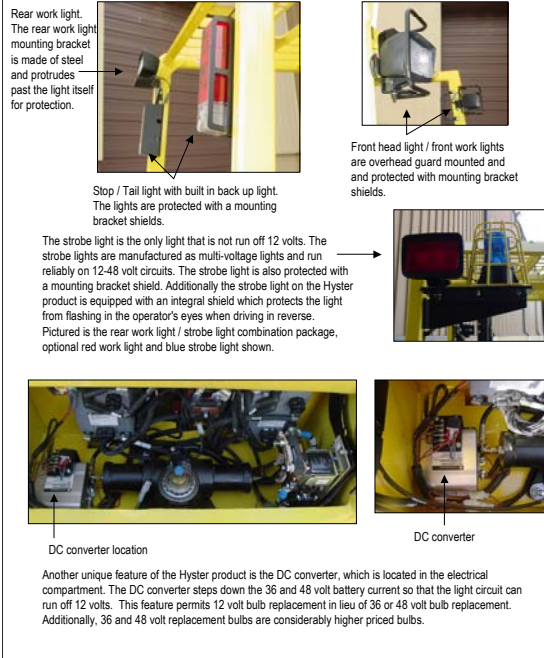
Canister type hydraulic oil filter and strainer are located here. The hydraulic oil must be drained from the tank in order to change the oil filter

The Toyota 5FBE hydraulic system utilizes a canister type oil filter and strainer, which is internal to the hydraulic tank. It is recommended that the oil be changed every 2000 hrs (minimal) depending on truck application. The following steps must be taken in order to change the oil filter and strainer:

- Upper and lower side covers must be removed (4 bolts).
- Rear access panel must be removed (3 screws).
- The hydraulic oil must be drained from the hydraulic tank.
- Remove the pressure and suction hoses from the tank connecting flange covers.
- Remove the upper and lower hydraulic tank connector flanges (total of 10 screws, all the same size).
- Replace both strainer and oil filter.
- Remove / scrape the old gaskets from the connector flanges and the hydraulic tank where the flanges mount. Install new gaskets.
- Replace oil strainer and filter.
- Reinstall the tank connector flanges.
- Make all proper hydraulic hose connections.
- Fill hydraulic tank with oil and verify no leaks.
- Reinstall access panel and side covers.

With the hydraulic motor and hydraulic tank located in the rear of the truck, all hydraulic supply and return hoses are routed from the rear of the truck to the front of the truck. The hydraulic hoses are routed underneath the battery in metal troughs for protection. However, replacing a hydraulic hose will prove to be quite an ordeal as compared to the Hyster J30-40XMT₂. There are only two hydraulic hoses routed from front to rear on the J30-40XMT₂, they are the hydraulic hoses for the hydrostatic steer actuator.

Hyster Work lights and Strobe Light



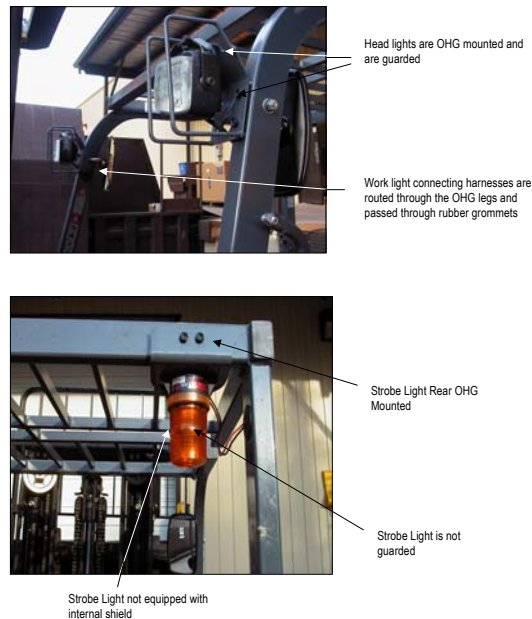
All lift truck manufacturers have optional light packages that they offer for their products. However, not everyone has a DC converter that steps down 36 and 48 volt battery current to 12 volts for the light circuit. This unique feature allows 12 volt bulbs to be used in the lights in lieu of 36 and 48 volt bulbs. There are two distinct advantages with this design:

- 12 volt light bulbs are cheaper than 36 and 48 volt bulbs
- 12 volt replacement bulbs are readily available (automotive bulbs run on 12 volts), where the 36 and 48 volt replacement bulbs are not.

The strobe light is the only light circuit that is run on something other than 12 volts. This is because strobe lights are manufactured as multi-voltage lights. Most strobe lights voltage range is between 12 and 48 volts. The unique feature of the Hyster strobe light is an internal shield that blocks the flashing light from interfering with the operator's vision, especially when driving in reverse.

All light wire harnesses are protected with rubber grommets where the light harnesses pass through the truck frame or through overhead guard legs. All lights are protected by mounting shield brackets.

Toyota Work Lights and Strobe Light



The auxiliary light systems are operated at truck voltage. This leads to more expensive bulbs and replacements.

The strobe light is a multi-voltage light, which is common with most strobe light manufacturers. However, the strobe light is not equipped with the internal light shield. The internal light shield will protect the operator from the flashing of the light while driving, especially while driving in reverse.

The front headlights are guarded for protection, however, the strobe light offers no light guard protection.

All light wire harnesses are protected with rubber grommets where the light harnesses pass through the truck frame or overhead guard legs.



Competitive Presentation Summary

The Toyota 5FBE features an older generation of motor and electrical system controls that are far less efficient than the transistorized controls found on the J30-40XMT₂.

The Toyota 5FBE does not feature the many ergonomic benefits found on the J30-40XMT₂.

Serviceability on the Toyota 5FBE is more complex and time consuming as compared to the J30-40XMT₂.

There is also Proprietary cost associated with the Toyota 5FBE, which can contribute to more expensive repairs.

The Hyster J30-40XMT₂ series provides state-of-the-art electric motor controls that are built to perform and last in the toughest applications. The GE GEN III transistor controllers along with SEM technology are designed for heavy-duty work cycles and exceptional performance. The J30-40XMT₂ proven power and efficiency are key to its outstanding performance in either 36 or 48 volt systems. The ergonomic approach to foot and hand controls further enhance the relationship between man and machine. The innovative designs of today's J30-40XMT₂ make this model highly competitive in performance and price.

"HYSTER. IN FOR THE LONG RUN"



Hyster J30-40XMT₂ Series VS. Crown SC 4000 Series



The Hyster J30-40XMT₂ Series has been developed to provide a compact, reliable lift truck with low operating cost and performance levels to match the most demanding customer applications. To help enhance the selling skills and product knowledge of your Hyster dealer sales force, the following presentation compares features and benefits of the Hyster J30-40XMT₂ Series and the Crown SC 4000 Series.

J30-40XMT₂ INTRODUCTION

The J30-40XMT₂ Series:

Developed to cover the needs of the 3-wheel sit down electric truck users in North America.

- Specific requirements
 - ✓ Compact
 - ✓ Reliable
 - ✓ Low operating cost
 - ✓ Performance levels that match the most demanding applications.



The J30-40XMT₂ series has been developed to cover the needs of the 3-wheel sit down electric truck users in North America. The specific requirements for this market call for a compact, reliable lift truck with low operating cost and performance levels that match the most demanding customer applications.

J30-40XMT₂ INTRODUCTION

Hyster Company's market research and input from the field provided important input to fine-tune the J30-40XMT₂ design features.

□ Results of the Research:

- The J30-40XMT₂ models combine simplicity with up-to-date technology and a host of new features.



Hyster Company's research, surveys and feedback from the field provided important input to fine-tune the J30-40XMT₂ design features.

The J30-40XMT₂ series design combines simplicity with up-to-date technology and a host of new features.

J30-40XMT₂ FEATURES

- ✓ Power
- ✓ Versatility
- ✓ Enhanced overall performance and shift life
- ✓ Increased productivity and efficiency
- ✓ Maneuverability
- ✓ Ergonomic operator comfort



The J30-40XMT₂ models were designed for demanding applications that require clean, quiet-running, heavy duty capabilities. These lift trucks are extremely maneuverable, energy efficient and offer excellent ergonomics, reliability, ease of maintenance and plenty of power.

The simplicity of the design is clearly visible. This no nonsense truck has all the features that are required in today's demanding applications.

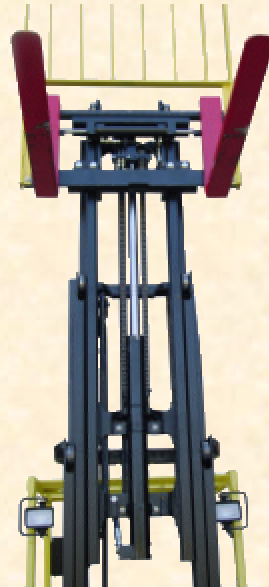
The Hyster J30-40XMT₂ series features power, versatility, improved overall performance and shift life, increased productivity and efficiency, maneuverability and ergonomic operator comfort.

J30-40XMT₂ FEATURES

■ Additional design features

include:

- GE GEN III Traction Control
- SEM Technology
- Twin steer tires
- Hydrostatic activated rack and pinion steering
- Upgraded dash display
- Redesigned counterweight
- Optional transistor hydraulic controls
- On-demand steering
- Integral Sideshifter



The 3-wheel electric rider models feature the General Electric (GE) GEN III transistor controller and Separately Excited Motor (SEM) technology. Additional features include twin steer tires, rack and pinion steering, an updated dash display, a redesigned counterweight, optional transistor hydraulic controls, and an optional “on demand” steering system.

While in operation, the driver will experience excellent maneuverability and visibility. This unit will allow ease of operation and efficiency for all operators improving driver productivity.

SC 4000 SERIES

The Crown SC 4000 Series features:

- ❑ **Compact operator compartment**
 - **Acceptable view of the forks.**
- ❑ **Narrow steering column**
- ❑ **Low cowl**
 - **Partially enhances line of vision.**
- ❑ **With load elevated, operator visibility through the mast and overhead guard area is acceptable.**



The Crown SC 4000 series sit-down counterbalanced rider features a compact operator compartment. A narrow steering column, and a low cowl make the operator line of vision acceptable. When the load is elevated, operator visibility through the mast and overhead guard area appears to be improved over their previous design.

SC 4000 SERIES FEATURES

- **The Crown SC 4000 series features: drivability, enhanced visibility, more operator room, and better productivity than previous models.**
- **Crown's appearance has improved with a new modern design and overhead guard.**
- **No 48 Volt option**



Compared to their previous 3,000 and 3,500 lb. capacity models, the SC 4000 series provides enhanced visibility, more operator room, and increased productivity. According to Crown, the appearance has also improved with a new over-head guard design and aesthetics.

Aesthetically the style of the new SC 4000 Series is a dramatic change over the older model. During this presentation we will discuss the features and provide you with actual performance test data to assist you in presenting the customer the real value of the Hyster product versus Crown.

PUBLISHED SPECIFICATION COMPARISON

Manufacturer/Model	Capacity	Wheel Base	Turning Radius	Right Angle
Hyster J40XMT ₂	4,000 lbs	54.5"	61.8"	75.1"
Crown SC 4040-40	4,000 lbs	54.7"	62.7"	77.2"

Manufacturer/Model	Capacity	Max Travel Speed (mph)	Max Lift Speed, Std (ft/min)	Battery Compartment (Max Size - in.) (w x l x h)	OHG Height (in.)
		NL / RL	NL / RL		
		36V	*48V		
Hyster J40XMT ₂	4,000 lbs	7.7 / 6.9 8.6 / 8.1	90 / 50	39.0 x 25.2 x 26.12	78
Crown SC 4040-40	4,000 lbs	8.2 / 7.1 N/A	90 / 58	38.81 x 24.88 x 22.80	78.5



Hyster has a speed advantage (where speed is important) with the 48V “No cost” option, providing increased cycle time with the larger battery compartment.

*Not available for “EE” rated units

There is a noticeable 2 inch difference in right angle stack Hyster versus Crown.

Does the 2 inches in right angle stack make a difference?

Both trucks will be able to work in the aisle, but the 2 inches provides the operator with additional room to maneuver and increases productivity on the Hyster.

Remember, increased right angle adds to operator productivity as well as reduced product and equipment damage.

The Crown SC 4040-40 is 3/10ths of a mile per hour faster than the Hyster spec to spec. Actual speeds can vary by up to 5/10ths mph on any given model. If speed is critical consider a 48 volt model where Hyster has a significant advantage.

J30-40XMT₂ OPERATOR COMPARTMENT

- Contoured, rubber coated handgrip on left overhead guard leg
- A non skid full step located on the left side for easy entrance and exit



(3 Point Entry)

The low 20" inch step height in combination with the easy to grab hip restraint, and a well positioned handgrip, provide excellent on/off access.

SC 4000 SERIES OPERATOR COMPARTMENT

- Contoured overhead guard legs and cowl

- No hand grip

- Full steps located on both sides

- Compartment has an uncluttered floorboard area.



Crown has slightly more foot room than the Hyster with less obstruction.

Crown floor dimension measures 31"w x 17.5"l (not including wide steps on both sides).

Hyster's is 34-1/2"w x 15"l (not including step on left side only).

The Crown does not have a hand grip mounted to the overhead guard. In perfect conditions, this is acceptable, but with greasy hands, cold environments, or heavy gloves the absence of a hand grip makes it more difficult for operator entry/exit of the truck.

The Crown has a low step height of 15".

HYSTER J30-40XMT₂

- Standard, non- suspension, vinyl seat provides the operator with low height and easy entry and exit
- All Hyster seats have a seat activated park brake warning buzzer switch.
- Seat mounted, retractable belts are standard
- Optional premium seat is available
- Hip restraints provide better tip over protection



(optional premium seat)

- Seats on Hyster trucks are ergonomically designed for operator comfort, reducing fatigue and increasing productivity.
- A non suspension and semi suspension seat are available in cloth or vinyl and include seat belt and hip restraints. The optional premium seat is fully adjustable for position and firmness based on the operators weight.
- 6 seat adjustments can be made to create the most ideal driving position.
- A switch mounted within the seat activates the park brake warning buzzer when the operator is not seated and the park brake is not set. When activated it disables hydraulic steering and traction to prevent inadvertent movement.
- Hyster and Crown both offer seat mounted retractable belts. This type of mounting is optimal for operators by preventing the belt from rubbing into the operator's stomach and restricting the operator. The belt moves with the operator.

CROWN SC 4000 SERIES

- **Non suspension seat with “shoulder” restraint is standard**
- **Optional full suspension seat is available**
- **Seat mounted, retractable belts are standard**



- Both non suspension and optional full suspension seats are available.
- Seat is adjustable forward and back.
- A switch mounted within the seat activates the park brake warning buzzer when the operator is not seated and the park brake is not set. When activated, it disables hydraulic steering and traction to prevent inadvertent movement.



The Hyster recommended procedure in the event a tip over occurs is to stay with the unit. **DO NOT JUMP OFF !** Hyster suggests the operator lean forward toward the cowl, holding onto the steering wheel tightly, brace both feet on floor board and lean away from impact. Leaning forward on the Crown would diminish the effect of shoulder high body restraints.

The Hyster operator hip restraint system was designed to help keep the operators body within the confines of the operator compartment.

Hyster Company's research shows that the lower part of the operator is most likely to slip out of the confines of the truck in the unlikely event of a tip over.

J30-40XMT₂

- Storage compartment
- Area to place paperwork on the hood



Provided as standard equipment, a convenient storage box is located on the left side of the cowl for pencils, pens, and other miscellaneous items. The hood area located to the right of the operator seat provides an area to place paperwork. Optional clip available.

SC 4000 SERIES

- No storage compartment on dash
- No area to place paperwork on the hood



Crown offers an optional storage tray with armrest for the operator to place paperwork or store items needed to perform daily activities such as pens, and safety glasses. (No picture available). This is a \$175.00 price book option.

HYSTER J30-40XMT₂

- Compact steering wheel
- Lock-to-lock steering requires 5.3 turns of the wheel
- 5 position tilt column to suit different operators



The steer column is adjustable to five tilt positions to accommodate the operator. A compact 14" (356 mm) steering wheel is offset by 2" (50 mm) for left hand operation providing quick, precise steering.

The larger Hyster 14" (vs. Crown 12") steering wheel provides lessened steering effort and increased controllability.

The Hyster lock to lock steering requires 5.3 revolutions of the wheel. The extra steer turn compared to Crown decreases the chance of too sensitive steering at higher travel speeds. Too few turns could lead to increased turning effort and very sensitive steering.

CROWN SC 4000 SERIES

- Adjustable tilt steering
- 4.25 turns lock to lock
- Compact steering wheel



- The Crown tilt steer column is gas spring assisted
- The tilt column locking lever is designed into the cowl
- The 12 inch steering wheel is smaller than the Hyster and requires 4.25 turns lock to lock. A smaller wheel gets lost in the hands of a typical operator.

J30-40XMT₂

■ Monotrol pedal (standard)



Hyster: The standard Monotrol pedal is a highly productive directional accelerator pedal. The pedal allows the operator to change direction and acceleration without the use of hands. This innovative design, reduces operator movement, resulting in increased productivity.

(optional column mounted directional control lever available)

Crown offers a foot direction control pedal as an option.

J30-40XMT₂ PARK BRAKE

- Easy, step down foot actuated parking brake
- Hand released
- Park brake warning buzzer



Similar to other Hyster electric products, hand and foot controls are ergonomically shaped and positioned for increased operator comfort and potential higher productivity levels.

The independent parking brake is mechanically linked to a pedal. It is operated by depressing the pedal with the left foot and released by pulling the handle located on the left side of the cowl.

- Visual and audible warnings inform the operator to release or engage the brake when entering or exiting the unit.

An electrical activated seat parking brake is available as a standard price book option.

CROWN SC 4000 SERIES PARK BRAKE

■ Hand actuated and released

➤ Pinch point

■ Park brake warning buzzer



Pinch Point

- Located on the right side of the cowl, the independent parking brake is mechanically linked to the service brake pedal. It is actuated by pulling the handle towards the operator and released by depressing the plunger with the right hand.
- The design and angle of the Crown hand actuated park brake provides a potential hand pinch point.
- Audible warnings inform the operator to release or engage the brake when entering or exiting the unit.

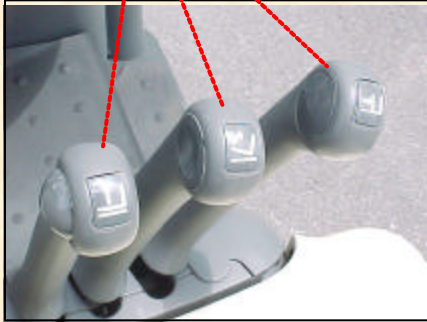
Located below the floor plate under the drive motors, adjustments to the mechanical linkage can prove to be a task.

A seat activated park brake option is available.

HYDRAULIC LEVERS

CROWN SC 4000 SERIES

- Urethane covered control handles
- Tactile feedback



HYSTER J30-40XMT₂

- Contoured
- Soft touch
- Low effort
- 3 spool - 2 handle (std)
- 3 spool - 3 Handle (opt)
- 4 spool - 4 handle detent 2nd aux (opt)



The Hyster hydraulic levers are positioned to the right side of the seat - within easy reach of the operator, and conform to the natural movement of the arm. The levers are ergonomically contoured and molded with a polyurethane compound maximizing grip that provide reliable load control while minimizing required force. The shorter handles provide less operator fatigue. With the premium seat the operator can rest the elbow while activating the hydraulics.

Both Hyster and Crown offer a 3 spool - 2 handle valve as standard. The 3 spool - 3 handle and 4 spool - 4 handle detent (2 aux) valve are optional on both.

The Crown hydraulic levers are positioned to the right side of the seat - but are located perpendicular to the front battery compartment plate. This placement forces the operator to reach a little further than on the Hyster. Additionally, the Crown truck does not feature hip restraints. Crown uses a shoulder type operator restraint. With this design, the operator has no hip restraint to rest the elbow on while activating the hydraulics, promoting fatigue.

The Crown hydraulic levers are contoured and molded with a urethane compound maximizing grip. The tactile feedback allows the operator to know which handle is chosen without looking at it.

CROWN SC 4000 SERIES

■ Lever Pod

- **Activates automatically when hood is raised for battery and component access**



The Crown hydraulic lever pod activates automatically when the hood is raised to move the levers out of the way when battery or electrical component servicing is required.

The Hyster is a simple one step operation, performed on the same side of the truck to service the battery and for daily operator checks.

OVERHEAD GUARD

Hyster J30-40XMT₂

- Low profile - 78" Height
- Rolled steel "Bar on edge" overhead guard
- Excellent Visibility
- Right side battery removal



CROWN SC 4000 SERIES

- One piece OHG/Cowl design
- Acceptable visibility
- Right side battery removal



The Hyster low profile overhead guard has an overall height of 78" (1,981 mm) allowing the J30-40XMT₂ to be used in applications with low ceiling and doorway clearances. The rolled steel cross members and fore and aft reinforcing bars provide strength and excellent visibility. A right side battery removal slot was designed for the use of an overhead chain hoist for easy battery removal.

The overhead guard is easily removed by loosening six easy to access bolts and then lifting straight off.

An optional 29" OAW drive in rack OHG (47.75" to 75" above floor, 78" OAH) is available. This option is not compatible with premium seat or OHG mounted lights.

The Crown one piece overhead guard design aesthetically looks good, however, removal appears to be very complicated. The crown OHG has an overall height of 78.5" (1,994 mm). The OHG is part of the cowl, in fact it is welded, not bolted to it. In order to remove, the entire cowl, all components secured to the cowl, the hood, 2 hood gas springs, seat switch wiring, and the horn bracket require removal, this then leads you to the 2 bolts securing the rear OHG legs & cross member which are located slightly down into the counterweight . These bolts need to be accessed in the cramped control compartment to remove. After all this the OHG/Cowl assembly can be removed. This can be a very time consuming and costly procedure.

An optional drive in rack OHG 29' OAW from 47.5" to 74.5" measured from floor is available.

J30-40XMT₂ BATTERY COMPARTMENT

- UL approved ABS plastic hood
 - Excellent strength to weight characteristics
 - Non-Corrosive
 - Gas spring assisted
- ✓ Hood tilts rearward for access



Also serves as a battery restraint

The battery compartment cover is made from a durable, UL approved, ABS plastic. The ABS designed hood is non-corrosive, and less susceptible to noise amplification. The dual gas- spring assisted cylinders allows easy changing of the battery and reduced operator effort when opening the hood.

Hyster has easier battery removal - on Crown you must remove the battery side panels before you can remove the battery.

The battery compartment cover also serves as a battery restraint.

The standard 36 volt or an optional 48 volt system is available. Both systems are available in different compartment sizes to meet a variety of application requirements. The 48 volt system may be selected as a no charge option. This interchangeable option provides dealerships with added stocking flexibility.

Optional battery side removal with roller or slide removal is available in the standard price book. (Max battery height 22.8")

SC 4000 SERIES BATTERY COMPARTMENT

- **Gas spring assisted**
- **Metal formed hood**
 - **Allows more noise**
 - **Susceptible to corrosion**



The dual gas -spring assisted cylinders reduce operator effort when opening the heavier metal formed hood.

The Crown metal hood amplifies more noise from the control compartment and is susceptible to corrosion from battery acid and other application environmental conditions. In the event of damage, the hood is susceptible to deflection which could cause alignment problems resulting in replacement.

The battery compartment cover also serves as a battery restraint.

Optional battery rollers are available (Compartment height 23.13")

SC 4000 SERIES BATTERY COMPARTMENT

- **Driveable with battery side plates removed**
- **Battery side panels;**
 - **Heavy**
 - **Awkward to replace**

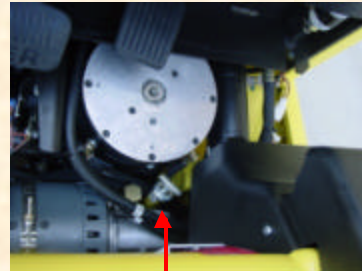


In the event that the battery side plates are removed and not replaced, the Crown truck can still be driven, providing an opportunity for the battery to slide out from the compartment. The standard equipped Crown truck does not provide a battery restraint mechanism that disables traction.

This is not an issue for the Hyster J30-40XMT₂ because the battery fits within the confines of the frame. Additionally, the battery side removal option is designed so that if the battery compartment side panel is removed the traction circuit is disabled.

J30-40XMT₂ FLOOR PLATE

- Removable two-piece floor plate
 - Provides access for the oil level check and components
- Hand holes on each side provide ventilation



Oil Level check



Optional
accelerator
shown

The Hyster floor plate has an anti skid material on foot contact areas. The two piece design allows quick access to the motor compartment for servicing and operator daily checks. They are easily removed by hand without the use of tools.

Hydraulic oil level check is made easy by removing right floor plate.

Tilt cylinders are located below the floor plate providing increased and uncluttered foot space.

CROWN SC 4000 SERIES FLOOR PLATE

- Removable two piece
- Acceptable access
- Accelerator pedal designed into right hand floor plate

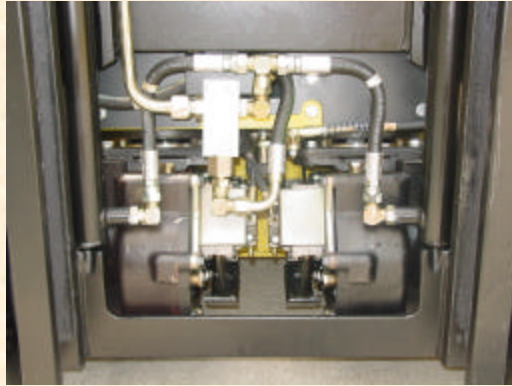


The Crown two piece floor plates are removed by sliding out and off. The tilt cylinders are located beneath the floor plate. Access to components for daily inspection is acceptable.

The accelerator pedal is designed into the right hand floor plate.

J30-40XMT₂ BRAKES

- Hydraulically activated “Regenerative braking”
 - Dual disc
 - 3.75 power amplification per wheel
 - Low effort
 - Self adjusting



Mounted on each drive unit, the dual disc brake system is hydraulically activated with 3.75 power amplification per wheel to provide low effort braking. Braking is assisted by utilizing regenerative motor brake current. This design reduces heat and brake wear. Block the mast and brake rotor and friction pads are accessible through the mast for inspection and replacement. A large brake pedal is positioned for use by either foot. The sealed master cylinder reservoir contains a sensor, which lights a warning lamp on the dash panel if the fluid level becomes low. Self adjusting brake pads are made from non-asbestos materials.

SC 4000 SERIES BRAKES

- **Mechanically activated**
 - **Dual disc**
 - **5:1 brake multiplication factor**
 - **Proportional to pressure applied**



The disc brake assemblies in the Crown are mounted to the drive unit intermediate shaft which creates a brake multiplication factor of about 5:1. Braking is assisted with regenerative motor brake current as well. Brake stopping distance is proportional to the amount of pressure applied to the foot brake. The more pressure applied to the foot brake, the shorter the stopping distance. The result of this design requires more operator effort which increases fatigue.

Mechanical linkage is hard to reach if an adjustment is necessary and has the opportunity to become sloppy when parts wear.

J30-40XMT₂ COUNTERWEIGHT

- Designed to provide an easy access compartment for all major electrical and steer system components.



All major electrical and steer system components are accessible behind the cast counterweight cover. The cover is easily removed by loosening two bolts; this releases the counter weight cover from the truck frame giving full access to electric and steer components as well as basic truck fuses. The cover has a watertight internal seal to protect the components.

The lateral stabilizing stops molded into the counterweight provide added stability.

SC 4000 SERIES CONTROL COMPARTMENT

- Poor serviceability
- Limited access to components
- No counterweight access



Serviceability to electrical components is poor. The counterweight does not provide access through the back like the Hyster truck to service components. When servicing or removal of electrical components is required, removal and disassembly of major components is required for adequate service access. The result is increased downtime and higher labor costs.

J30-40XMT₂ POWER STEERING SYSTEM

- The steer axle assembly consists of a hydraulic rack and pinion actuator - designed for excellent durability and serviceability



A totally enclosed rack and pinion hydrostatic power steering system is standard. The hydraulic design provides precise, reliable control while eliminating mechanical linkages and road shocks at the steering wheel.

The steer axle is one piece - forged steel and is mounted to a rack and pinion hydraulic actuator. The actuator is mounted to the rear frame reinforced support plate.

The rack and pinion actuator supports wheel thrust and torque loading through large automotive type tapered roller bearings, as well as providing rotating motion for the dual tire and wheel assemblies. This design provides extended life for steering components, increased reliability and enhanced operator performance.

J30-40XMT₂ DUAL STEER WHEELS



- ✓ Provides stability
- ✓ Reduces tire wear and increases tire life
- ✓ Provides operator with a comfortable ride

The standard twin steer tires are made of special compounds to strengthen the drive tires and provide acceptable load handling capacity and low energy consumption. Twin steer tires widen the rear portion of the stability triangle providing a stable feel when turning and offer significant advantages in truck ride and maneuverability. Tire life is extended due to the dual wheels having more rubber to absorb shock on rough floors and dock plates. Tires can be quickly dismounted / removed with the removal of 5 mounting nuts.

Two interchangeable tire types: Solid Cushion and Pneumatic Shaped Solid.

Hyster steer tire dimensions:

15x4x11.2 for Solid Cushion tires (Standard)

15x4.5x8 for Pneumatic Shaped Solid tires (Option)

Hyster drive tire dimensions:

18x7x12.1 for Solid Cushion tires (Standard)

18x7x8 for Pneumatic Shaped Solid (Option)

200/50x10 for Pneumatic Shaped Solid (Option)

SC 4000 SERIES STEERING SYSTEM



- Dual steer wheels
- Rack and Pinion Actuator

The Crown hydrostatic power steering uses a rack and pinion assembly that is also totally enclosed, however the purpose of having a totally enclosed assembly is defeated due to the optional quick disconnect pressure fittings mounted to the body. This provides opportunity for oil leaks in a system that by design was manufactured to reduce oil leakage.

Crown has a “steering speed limit” feature. This feature regulates the drive motor’s output by the turning degree of the truck. In other words, the truck can be set up to limit speeds at designated steer angles. This feature selection is made by the operator.

The Crown uses 15”x 5”x11.25” dual steer tires to provide traction and stability. Crown’s 1” wider steer tires are required for heavier counterweight loadings.

Crown steer tire dimensions:

15”x 5”x 11.25” standard

Non-marking smooth or lug rubber tires are available as an option.

Crown drive tire dimensions:

18”x 8”x 12.125” standard

Non-marking smooth or lug rubber tires are available as an option.

J30-40XMT₂ DASH DISPLAY

STANDARD DASH

- Six Warning LED lights
- 16 character numerical display
- Hour meter
- Warning lights
- Service maintenance monitor
- Under fault conditions, the display will show the fault code number
 - ➔ When operator leaves the truck, the display will read "TURN KEY OFF"
 - ➔ The display is adjustable



Standard Display: Six warning LED lights:

Seat belt (lit for 10 seconds after key is turned on)

Parking brake (lit when parking brake is applied and key turned on)

Low brake fluid indicator (lit when brake fluid in reservoir is low)

Service (lit when service is required. Accompanies fault code display on LCD) Hour meter (lit when hour meter time is displayed on LCD)

Battery (lit when BDI reaches warning level)

Note: All lights are displayed for 2 seconds after key is turned on

The fault code will display only while the truck system is experiencing a problem or is disabled by the detected problem.

The standard display has only one adjustment option. The operator can disable fault codes so that they do not appear on the display.

In contrast, the premium display can be changed to:

Disable fault codes

Disable full text

Disable seat belt warning

Disable the ability to adjust the BDI and lift lockout setting

Enable checklist questions for startup maintenance

J30-40XMT₂ DASH DISPLAY

PREMIUM DASH

- An alpha-numeric display
 - 2 lines with 20 characters per line
 - Six warning LED lights
- Under fault conditions
 - Shows fault code numbers, followed by the text explanation
- Keyless password entry
- Startup checklist



Six warning LED lights: Seat belt, park brake, low brake fluid indicator, service, hour meter and battery.

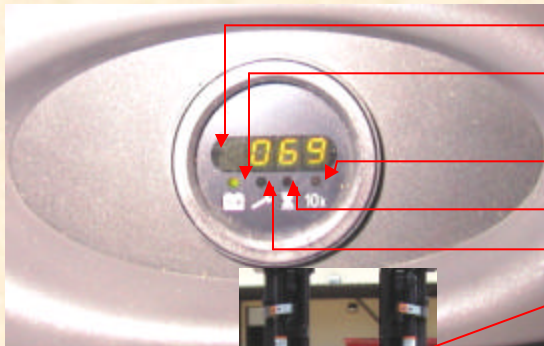
Premium Display Customer-selected Enhancements:

Keyless password entry and operator history -- A keyless password entry and record of operator history are two new features. This feature is disabled at the factory and can be activated by the customer with a laptop computer. When the key switch is turned on, the display will require the driver to key in a password before the truck will operate. The display will record the driver code number and truck hours when the driver started operating the truck. The history is recoverable by PC. Password access can be a safety feature for novice operators. The operator password can be tied to authorization to work at specific maximum mode levels. A new operator might be given only slow mode access.

Startup Checklist -- Customer can program the display to ask up to 10 customer selected questions (up to 40 characters each)

SC 4000 SERIES BDI & DISPLAY

Standard Display (No optional display is offered)



- Meter Display
- Battery Charge Light
- 10k Light
- Hour Meter Light
- Event Code Light
- Event Code Label
 - lists the events that the operator can correct without asking for service

The dash display provides several monitoring functions into one meter. The display provides a battery state of charge, a combined event and fault code light, an hour meter that indicates the total accumulated operation time and a light that indicates that the truck has reached 10,000 hours of use.

Crown has no offering for keyless password entry or operation history.

Battery charge light: When illuminated, it shows the percent of charge remaining in the battery. When flashing, it warns the operator of low battery charge. **If equipped with the lift interrupt option**, it will disable the pump circuit with 10% battery charge after the flashing begins.

10K light: Indicates when lit that the unit has exceeded 10,000 hours of operation. (If applicable).

Hour meter light: with key switch off, the display provides total truck hours.

Event code: when lit it indicates that the system has detected an event that the operator can correct or provide a fault code which requires servicing.

J30-40XMT₂ ADDED PRODUCTIVITY with SEM FEATURES

● GE GEN III transistor controllers provide:

- Increased reliability
- Reduced noise / Quiet
- Only 1 contactor
- Improved overall performance
- Step-less acceleration without 1A bypass.



GE GEN III
Traction Controllers

State of the art GEN III transistor controllers ensure the highest efficiency of battery energy and provides smooth stepless acceleration and proportional regenerative braking.

The GE GEN III transistorized controller has eliminated all of the high cycle contactors, eliminating the servicing of these consumable parts.

All of the electrical connections in the controller are soldered, eliminating possible loose connections due to improperly tightened hardware.

The control is in a self-contained “gray box” component. If the gray box cannot be corrected through diagnosis, simply replace it. No more changing rectifiers, capacitors, control cards, contactors and wires. (Others must replace these items on their SCR systems)

The pulse rate of the SEM transistor system is about 12,000 times per second (12KHz). This faster pulse rate is beyond the frequency range that human ears can hear, so, the system is virtually silent.

With older SCR systems, there is a constant hum as contactor switches activate and deactivate, creating clicking sounds. With SEM, this noise factor is eliminated since there is only one contactor (the line contactor) operating.

J30-40XMT₂ EASY CONTROLLER MAINTENANCE

- Control adjustments are made with a “hand-held” programmer
- Connected to the controller without disturbing any normal truck wiring



Real time diagnostics better define problems and display numerical fault codes on the dash display. Performance control settings are adjustable by a hand held device that is plugged into the traction controller without disturbing truck wiring.

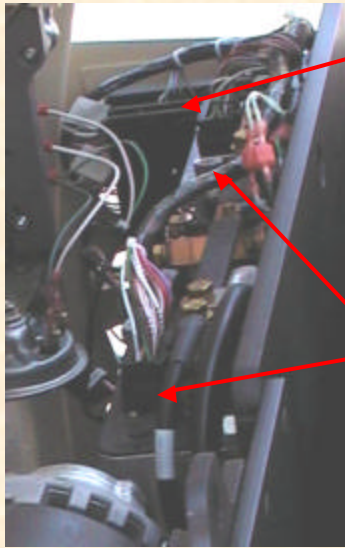
J30-40XMT₂ COMPUTER DIAGNOSTICS

- A laptop computer with a standard serial port can also be used to program or change a control in seconds



Computer diagnostic capability is also available to program or change control parameters quickly.

SC 4000 SERIES TRANSISTOR CONTROL



■ Distribution Panel

- Test points
- Control fuses
- Central wiring

■ Handset diagnosis

- Same as SCR

■ GE GEN II SX Controllers

- Lower current rating
- Performance profiling (3 modes)

CROWN uses an older generation of GE GEN II SX transistor controllers with a lower current rating (less amp capacity) than Hyster. In general, a smaller controller is susceptible to overheating and may not provide sufficient torque for gradeability and driving over obstacles. Transistorized dual motor controllers regulate both drive motors. Three modes of performance can be selected (performance profiling) to accommodate operator experience or application requirements. A separate distribution panel located in the rear control compartment provides test points for troubleshooting and houses control fuses and central wiring.

The controllers are adjusted by connecting the handset to the distribution panel located in the electrical control compartment. No computer diagnostic capability is offered.

The same handset for diagnosing an EV100 SCR motor control systems is used with a different cable to program and access fault history for their transistor control system.

J30-40XMT₂ OPTIONAL TRANSISTOR HYDRAULIC CONTROL

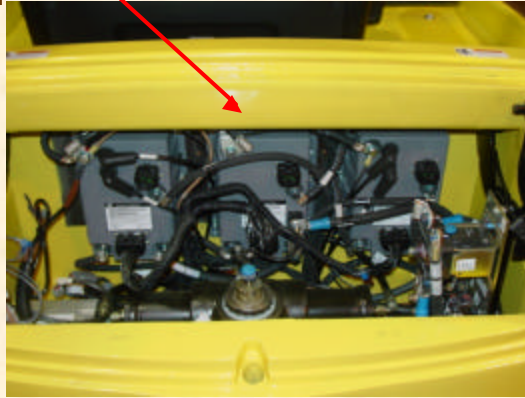
- GE GEN III transistor pump controller

- Features:

- Controlled lift acceleration
 - Increased system life

- Provides:

- Smooth, quiet, energy efficient operation



The optional transistor hydraulic control system controls the motor with a GE GEN III transistor pump controller that provides smooth, quiet, energy efficient operation. The controlled acceleration feature of the transistor reduces pump and motor loading during start up for increased system life. The transistor hydraulic system is recommended for any truck with high attachment usage.*

*Sideshifters are excluded in this statement.

HYSTER VISTA[®] MAST

- VISTA[®] mast provides excellent visibility
- Small lift cylinder diameter
- Provide superior cushioning
- Integral Sideshifter



The Hyster VISTA mast is a statement of efficiency. Cross-members have been formed from cast steel that eliminates heat weakening of the mast caused by extensive welding. This mast provides good visibility through engineered channel nesting and hydraulic cylinder, tube and hose placement.

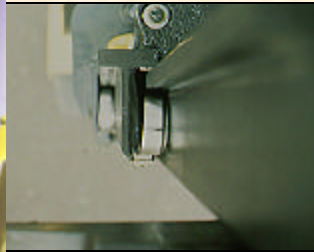
Hyster Company's innovative cylinder design provides smooth stage transition when lifting or lowering. The cylinders are located behind the uprights to maintain the visibility window which allows the operator a wide field of vision.

The integral sideshift carriage provides quick and easy maintenance requirements and provides a picture window view for excellent visibility throughout the lift / lower range.

J30-40XMT₂ ANGLED LOAD ROLLERS



- Flush face channel design
- Full faced load rollers
- Ride against web and flange
- Resist side-to-side movement
- Eliminate side rollers
- Simplify maintenance



The Hyster VISTA mast channel faces are directly aligned, eliminating channel damage caused by forward movement of the face during lowering. This more compact design also reduces the trucks right angle stacking dimension.

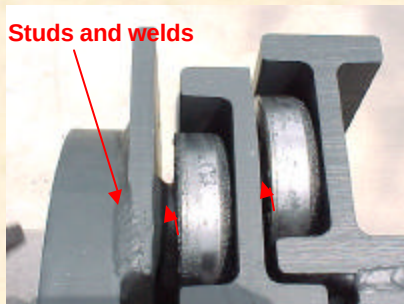
The canted roller bearings are angled against the channel web and flange. Combining this with an inverted “J” inner channel allows full face roller contact resisting side to side movement and also eliminates the need for side thrust rollers.

This design spreads the roller loading over a greater area, virtually eliminating the need for adjustment and maintenance resulting in increased roller and channel life which further enhances operator performance and productivity.

The mast trunnion mounts secure to the drive units using 2 bolts and a single half fiber bushing to make removal easy.

SC 4000 MAST

- Interlocked “I” beam design
- Canted roller
- Fabricated cross member
- Trunnion mounted



The Crown manufactured mast assembly uses a canted roller, flush face interlocked I-beam, designed in an attempt to improve visibility, truck length and lost load. Unlike the Hyster VISTA mast, this mast is not a “true” flush face design; the primary channel sticks out past the the secondary.

Crown states that mast roller bearing studs are welded on both sides of the rails for added strength. Unlike the Hyster canted roller design where the rollers are angled against the channel web and flange, the Crown mast design has unfavorable wear characteristics due to the constant bearing contact only in the cross section of the channel.

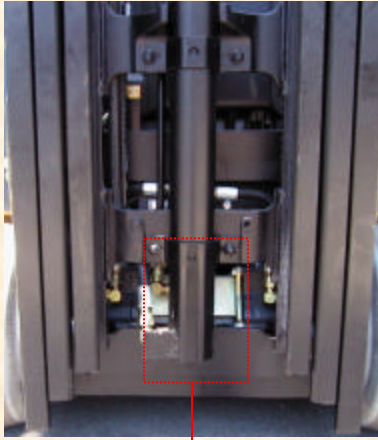
Fabricated cross members wrap around the rails to add strength and resist off center load forces.

Hoist cylinders and hosing are mounted to the sides to open up operator visibility.

The free lift cylinder utilizes a single lift chain providing the opportunity for cylinder rod damage if a slack chain condition occurs.

The mast is secured to the drive units by trunnions.

FREELIFT CYLINDER MOUNTING



Hyster cylinder has a protection plate



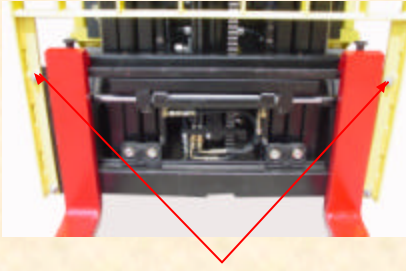
Crown cylinder has less protection

The Hyster free-lift cylinder has a protection plate that wraps around the lower cylinder port area. This plate provides protection against protrusion which could cause damage to the cylinder, hose or fitting. Dual lift chains eliminate the opportunity for cylinder rod damage if a slack chain condition occurs.

The Crown lower free lift cylinder is exposed providing greater damage potential.

CARRIAGE & LOAD BACK REST

HYSTER



Shear point

CROWN



Carriage bolts are protected by "L" bracket and are less prone to shear off

Hyster provides a 48" load back rest extension as standard. The Hyster LBR is attached to the front of the carriage with four mounting bolts. These bolts are protected by "L" shaped angle iron which provide strength and durability. This design helps prevent the bolts from shearing off.

Crown also offers a 48" load back rest as standard. The Crown LBR is attached to the carriage from the side with four mounting bolts. This design provides less durability in the event impact occurs. Even though their LBR was designed with protective contours on each mounting leg, the mounting bolts are still susceptible to shear.

HYSTER ADDED PRODUCTIVITY with SEM FEATURES



- Dual SEM Hyster Traction Motors

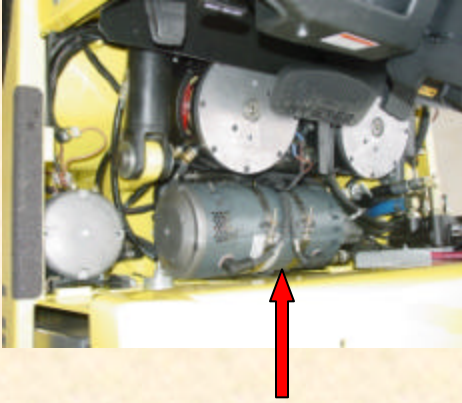
(reduction in heat in the operator compartment)

The J30-40XMT₂ utilizes Separately Excited Motor control technology designed for heavy duty work cycles. It uses motors with high starting torque and smooth, rapid acceleration. The dual 8.1 diameter SEM traction motors, feature an additional .63" longer stack length than the previous truck series, and are individually mounted for easy servicing. Long stack drive motors reduce heat in the operator compartment through improved heat dissipation. The larger mass of these motors better absorb peak loads and permit heat to be dispersed throughout a large surface area.

A class rating on insulation materials has been established based on a motor's ability to withstand a specific temperature over a specific period of operation. Hyster lift trucks use class "H" insulation for long life -- the highest class rating. The class "H" motor must withstand an armature temperature of 356 degrees. The motor's frame temp is normally lower than the armature temp which is measured internally. The premium class H insulation and internal cooling fans provide heat resistance and longer life.

Crown's dual 7.5" diameter traction motors (class rating not known) are designed and built in their New Knoxville, Ohio facility. These motors are also shunt wound and vertically mounted providing easy access to brushes.

HYSTER HOIST MOTOR ACCESS



Hoist Motor

- The hoist motor can be easily tilted up for motor brush inspection and replacement
- Premium hoist motors feature motor temperature and brush wear sensors

The hoist motor, located beneath the floor plates, can be easily tilted up for motor brush inspection and replacement. (The motor is held in place by two screw clamps.) The premium hoist motor brush wear indicator and motor temperature features can be used with the premium display option.

Hyster hydraulic tank capacity = 4.7 gals @ hot oil and 4.5 gals @ cold oil.
Hyster hydraulic filter = 10 micron.

Crown hydraulic tank capacity = 4.4 gals @ hot oil and 4.0 gals @ cold oil.
Crown hydraulic filter = 10 micron.

CROWN HOIST MOTOR ACCESS

- The hoist and steer motors are located in a tight space behind the battery compartment
- The motors must be lifted out of the truck to change all 4 brushes. (Easy access to two brushes, but not all four).



Servicing the hydraulic and steer motors for brush inspection becomes complicated due to the restricted space between the counterweight and battery box. When the motor brushes require replacement, the entire motor assembly must be removed. This makes what should be a 15 minute job into an hour or more. Removal of pump and motor assemblies require disconnection of hydraulic hosing where oil spillage is inevitable. Customer environments such as the pharmaceutical industry and food distribution do not tolerate oil leaks in the application.

SUMMARY

The J30-40XMT₂ provides state-of-the-art electric motor control improvements that are built to perform and last in the toughest applications. The GE GEN III transistor controllers along with SEM technology are designed for heavy duty work cycles and exceptional performance. The J30-40XMT₂ proven power and efficiency are key to its outstanding performance in either 36 or 48 volt systems.

These innovative designs make this model highly competitive in performance and price.





HYSTER. IN FOR THE LONG RUN.