

15 ways the lift truck is evolving



Today's lift trucks offer more in the way of technology, power and performance than ever before. Here's a look at the latest innovations available in today's trucks.

By Bob Trebilcock, Executive Editor

Remember that old commercial: This is not your father's Oldsmobile? The same can be said for lift trucks. If you haven't replaced your fleet of lift trucks in recent years—and, thanks to the recession, many *Modern* readers parked some of their fleet during 2009—you may be surprised by the technology being built into today's offerings. The developments include everything from ergonomic improvements for operator comfort to fully automated lift trucks that operate just like an automatic guided vehicle (AGV).

But, not all of the changes are as revolutionary as converting a lift truck into an AGV. "We are an evolutionary industry, not a revolutionary industry," says Jeff

Bowles, product line manager, Mitsubishi Caterpillar Forklift America (MCFA).

If you think about it, that approach makes sense. New lift trucks have to go right to work in existing applications without disrupting operations. What's more, the basic lift truck remains the backbone of most warehouses, DCs and manufacturing plants. Those evolutionary changes are resulting in trucks that are more productive, smarter and reliable than ever before.

Modern recently spoke to 10 of the leading lift truck manufacturers in North America to learn about the 15 most important advancements found on the next generation of lift trucks. Here's what we learned.



1 Automating lift trucks. Automation is coming to lift trucks as Crown, MCFA, Toyota, Nissan and Raymond ready lift trucks that can operate as automatic guided vehicles. Raymond, for instance, has plans to introduce an automated lift truck incorporating a camera-based navigation system from Seegrid in early 2012. The justification for automation is simple: Labor is expensive. “If you look at the five-year economic life of a lift truck, labor represents 70% to 75% of the total investment,” says Frank Devlin, manager of advanced technologies at Raymond. “If you can maximize your labor force, there is a tremendous need for this.”

2 Bringing RFID to lift trucks. In addition to automated lift trucks, manufacturers are exploring semi-automated solutions. Through its relationship with Jungheinrich, MCFA is bringing RFID- and transponder-based technologies from Europe to very narrow aisle lift trucks in the North American market. One solution relies on a warehouse navigation system that knows where the truck is located based on encoders and transponders in the floor and RFID tags at the pick and pallet locations. Once order picks are loaded into the system, the truck calculates the most efficient way to pick the orders; it will also calculate the lift and drive speeds that are most productive for the process.

“The system will automatically drive and lift the truck in an automated fashion from pick location to pick location without going to a completely automated truck,” says Bowles. MCFA is also installing transponders and sensors on the truck for safer operations. On man-up trucks, for instance, the system will monitor what’s in front of the truck at the ground level. “It’ll slow the truck until the obstruction is moved

when the operator has limited visibility,” says Bowles.

3 Remote-controlled trucks. Crown is also developing semi-automated solutions that serve the gap between conventional lift trucks and AGVs: a remote-controlled vehicle for case picking. An order selector can drive the truck into a pick zone; while picking, the operator moves the truck from one pick location to the next using a remote control device. That saves the time usually spent getting on and off the truck between picks. “We are trying to bring functionality to the truck that adds value,” says Tim Quellhorst, senior vice president of Crown. “This is a good example of a solution that can drive labor productivity in the less than full automation area of operation.”

4 Lift truck, phone home. Lift trucks are getting smarter, thanks to telematics—an industry term for the convergence of telecommunications and data collection technologies such as sensors and RFID technology. Telematics allow the lift truck to collect data about the operation of the truck and the performance of the operator and then communicate that information to a system of record. The onboard computer on a Raymond lift truck, for instance, has the ability to send fault codes and the serial number of a truck by e-mail to a technician’s smart phone or computer. “That allows a technician to diagnose a truck and bring the tools, parts and components they need for the job,” says Devlin.

5 Integrating the lift truck with the WMS. Most of the information being collected by telematics systems today is being used to support maintenance and fleet management initiatives. The next step, says Jonathan Dawley, vice





president of marketing for NACCO Materials Handling Group (NMHG), is to integrate telematics with a warehouse management system (WMS). That integration would allow lift truck data to become part of the workflow of a facility. "Using data from the lift truck to improve the productivity of labor could be more important than running your lift truck 1 mph faster," Dawley says.

6 The ergonomic lift truck. Ergonomics and worker comfort have long been a priority in Europe, where distributors and manufacturers have a longer term relationship with their employees. That thinking is beginning to permeate U.S. enterprises, especially those with a global footprint. That, in turn, is driving the demand for more European style trucks here in the United States. "We see some of our U.S. and Canadian customers creating a different type of environment for their employees in the warehouse," says NMHG's Dawley. "They want a smarter, more productive operator, not a stronger operator." He believes the attention to ergonomics not only improves productivity, it helps retain skilled employees.



7 Fingertip controls. Multi-functional controls that can be controlled by an operator's fingertips are one example of improved ergonomics. With one control, an operator can work the lift of the forks, the tilt angle and the side shifter. "Fingertip controls were introduced in Europe," says Steve Ciani, director of marketing and product management for Nissan Forklift Corporation of North America. "While they're not popular yet in the United States, we're seeing increased interest because they provide a more ergonomic experience for the operator."



8 Smarter lift trucks. What might the lift truck of the future look like?

According to Lyndle McCurley, sales and marketing manager for Doosan Industrial Vehicles America, it's a truck that's smarter, more ergonomic and flexible. Last month, Doosan previewed an electric concept vehicle at the British Open. The glass on the truck's cab is clear when operating indoors and tints to keep out sunshine and heat when it's operating outside. As the forks are raised, the cabin rises slightly and tilts backward so that the operator can look up at higher elevations without straining his neck. Heads up displays include graphics of the height of the forks, the weight of the load and the tilt angle. Finally, the truck can change its center of gravity and wheel base—automatically elongating or retracting the length of the wheelbase—depending on the size of the load and the operating environment. "Instead of a 5,000-pound truck, we're developing multi-capacity trucks that can adapt to the operating requirements," McCurley says.

9 Inhibitor functions. Inhibitors are designed to predict the unsafe operation of the truck for the operator, says Ciani. These functions automatically reduce the forward and reverse travel speed of the truck at different heights and automatically control tilt angles.

10 Get on the bus. The lift truck industry, like other mechanical solutions, is moving from preventative maintenance toward predictive maintenance. "We're not there yet," says Ed Campbell, sales manager for the materials handling group at Landoll Corp. "But with the CAN BUS system, we get two-way communication with the components. That lets us know whether we're operating a higher temperature, which allows us to react to something before it fails."

11 Hydrostatic drives. "The vast majority of the equipment in use today

is powered conventionally with IC engines or battery power,” says Mark Roessler, general product manager for Linde Material Handling North America. “Because of that, our focus has been on optimizing those designs for the end user.” At Linde, that translates into hydrostatic drives that use oil flow and pressure to accelerate and decelerate the truck in either direction. “With hydrostatic drives, there

Landoll has added a low-cost camera system to provide visibility above 25 feet as well as software that can detect and display the height elevations in every row in a warehouse.

Integrated scales. Burger King created a business out of letting customers have it their way. Toyota Material Handling U.S.A. (TMHU) sees a similar interest in customization among lift truck

special tools. “The size of the battery results in a very maneuverable truck,” says Bowles. “But, as with most new technologies, cost is the issue and at present, the cost per kilowatt hour is greater than a lead acid battery.”

A hybrid lift truck. In Japan, Toyota has introduced a true hybrid diesel truck in an 8,000-pound capacity truck. The truck operates on electric power for applications like travel, but automatically switches to diesel when extra power is required for an application, just like the consumer car Prius. And, like a Prius, the batteries are recharged when the truck is under diesel power. “Because you’re not consuming electricity from the grid, the design has resulted in a 50% reduction in fuel consumption and emissions,” says Jimenez. Toyota plans to introduce a propane-based indoor cushion tire hybrid truck in North America. “Propane is the No. 1 selling fuel for us in the United States,” says Jimenez. “That’s what we’re pushing our parent company to design.” □

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—Cesar Jimenez, national product planning manager, Toyota Material Handling U.S.A.

are no friction brakes, no mechanical transmissions, no drive shafts and no U joints,” says Roessler. “That allows you to eliminate the wear and tear in the drive system.”

Getting narrower in narrow aisle.

As warehouses strive to get more storage in the same amount of space, narrow and very narrow aisle lift trucks are key. “When we first started in this business, our trucks operated in a 7-foot aisle,” says Landoll’s Campbell. “Today, we’re operating in less than 6 feet in articulating trucks.” Part of that is attributed to redesigning the articulation assembly of the trucks so they are more compact and thinner to work in a narrower aisle. Another is to design a front end that can rotate 200 degrees instead of 180 degrees.

“As you’re pulling the forks out, they start to turn. That allows you to keep the forks straight until you get them out of the pallet, which makes it easier to stack in a narrow aisle,” Campbell explains. Since narrow aisle trucks are often working in high elevations,

users. “Forty percent of our orders are customized by the customer and many of those innovations turn into options that are later integrated into options on the trucks,” says Cesar Jimenez, national product planning manager for TMHU. The recently introduced integrated forklift scale is an example of a feature that was developed for a customer and is now a standard option on Toyota trucks. The scale, which is accurate to within half a pound and is legal for trade, allows an end user to weigh and capture the weight of a load while lifting a pallet and loading it on a truck. In its current configuration, the system can store information about 350 loads that can be downloaded to an enterprise system. “We have the ability to add Bluetooth and Wi-Fi to automatically transmit the data,” Jimenez says.

Lithium ion batteries. Earlier this summer at CeMAT, Jungheinrich introduced a walkie for the European market powered by a small lithium ion battery the size of a brief case that can be replaced by the operator with no

Companies mentioned in this article

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