

Equipment Market Analysis in North America

INDUSTRIAL LIFT TRUCKS



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Industrial Lift Trucks January 2015

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Industrial Lift Trucks

EXECUTIVE SUMMARY

This report examines the industrial lift truck market in North American and serves as an update to our previous report of December 2010. These machines have been a part of the industrial marketplace for decades and are found in many end markets from factories to warehouse and distribution sites to big box stores. They are found in almost every end market where goods have to be moved and where weight and distance are a factor.

Table 1 provides a statistical summary of each major section of this report for year-end 2013. The U.S. and Canadian markets for forklifts had an estimated wholesale value of \$5.0 billion in 2013. This dollar amount is based on total estimated unit sales in the marketplace and a weighted average of wholesale prices for lift trucks of all sizes during the year. While we completed the work on this report at the end of 2014, we do not have final data for the year.

Table 1: Statistical Summary –2013

Statistical Category	2013
Estimated Market Value (\$-millions)	
Electric (Classes 1, 2)	\$1,627
Electric Class 3	\$1,062
Internal Combustion (Classes 4, 5)	\$2,340
North American Sales (units)	
Electric (Classes 1, 2) ITA	58,100
Electric Class 3 ITA	58,050
Internal Combustion (Classes 4, 5) ITA	73,100
Other (Non-ITA)	5,000
Total Sales	194,250
North American Production (units)	
Electric (Classes 1, 2) ITA	58,500
Electric Class 3 ITA	61,000
Internal Combustion (Classes 4, 5) ITA	67,500
Other Non-ITA	4,500
Total Production	191,500
Imports / Exports	
NA Imports Units / % of Sales	13,500 / 7%
NA Exports Units / % of Production	5,000 / 3%
Field Population NA (units)	
Electric (Classes 1 and 2)	689,000
Electric Class 3	698,000
Internal Combustion (Classes 4 and 5)	960,000
Total Population	2,347,000
Forecast (% change)	
	'13 – '14 '14 – '15
Production (All Classes)	10.2% 8.8%
Sales (All Classes)	9.2% 8.0%

Source: Yengst Associates

The North American market for these machines was deeply affected by the recession that started in 2008 and ended in 2009. Since that time, the market has had five years of recovery. Sales for most suppliers have improved overall and in all lift truck market segments. From 2009 through 2013, sales increased roughly 87 percent for Classes 1 and 2 machines combined and 131 percent for IC Classes 4 and 5 trucks. Class 3 sales improved 84 percent.



Production levels for most lift trucks follow the sales side closely because a high portion of sales come from domestic production. We see this trend continuing for the next five years, and production levels will increase to over 240,000 units in line with sales of machines before 2018.

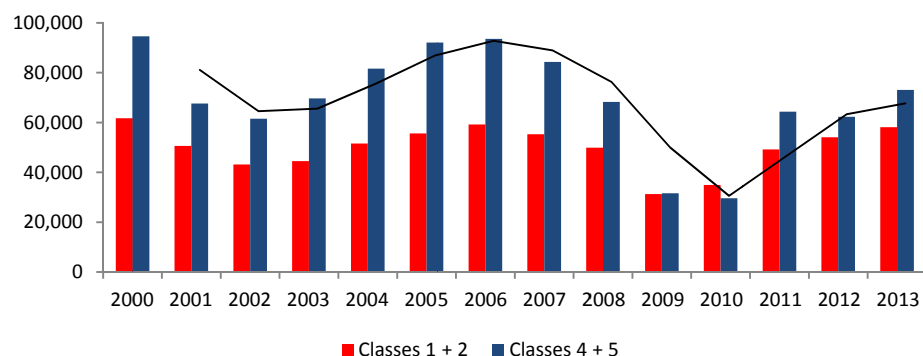
As for our outlook for industrial fork lift trucks, the market in 2014 has been a good one and sales were up an estimated 10 percent over 2013 levels, which is higher than we had expected earlier in 2014. Moving forward to 2015 and the four years thereafter, we look for the industry to peak in sales around 2016, then modestly decline in a cyclical manner in line with a slowing economic cycle that will likely occur within the next three to five years. The economy in the United States and that of Canada will be long overdue for a cyclical shift to the downside by 2016. However, it is difficult to project when a change might actually occur. On a positive side, we believe that it will take several more years for a negative slide to take place because of the very sluggish positive changes made in the economy since the recession five years ago, and the fact that inflation remains very low and business overall continues to be moderately improved and not out of control and approaching a “bubble” situation.

Class	Description
1	Electric-powered rider trucks including counter-balanced, sit-down and stand-up types.
2	Electric-powered narrow aisle rider trucks including order-pickers, side-loaders, and turret and reach trucks.
3	Electric-powered low and high lift walk-behind pallet trucks.
4	Internal combustion-powered counter-balanced rider lift trucks with cushion tires.
5	Internal combustion-powered counter-balanced rider lift trucks with pneumatic tires.

NORTH AMERICAN SALES

A cyclical pattern of sales has occurred for industrial lift trucks over the past 10 years, as shown in the chart below. Classes 1 and 2 (electric ride-on trucks) have been combined below, as have the IC lift truck sales of Classes 4 and 5. Class 3 truck sales are not included in the chart. Industrial lift truck sales are based on factory shipments for all suppliers as identified by the Industrial Truck

Sales of Electric and IC Ride On Lift Trucks in North America



Association, which accounts for roughly 97 percent of all sales by lift truck OEMs for these machines. As seen in the chart, electric ride on truck sales have generally been lower than the IC truck sales, but in 2010 that changed briefly and electric trucks outsold the IC machines by a small margin. Moving forward since 2010, IC ride on truck sales have once again outsold the electric counterparts, but the margin of difference has been small.

In Table 2, we show the estimated forklift truck sales in North America by class for all suppliers (based on shipments) from 2008 through 2013, along with estimated sales from companies not disclosing their activities to the ITA. This information is estimated by Yengst Associates based on discussions with lift truck suppliers, information that is publicly available from the Industrial Truck Association, and other sources.

As seen in the chart, sales declined significantly from 2007 through 2009 (the low point in demand) then rebounded following the financial crisis from 2009 through 2013 to the levels shown both in the table below and in the chart. Based on our analysis of the market, the industry experienced the biggest sales decline in over 40 years during the downturn from 2007 through 2009.

Table 2: Industrial Lift Trucks
Estimated Sales in North America by Class Type: 2008 - 2013

(Units)	2008	2009	2010	2011	2012	2013
Class 1 (Electric Sit Down)	29,100	20,450	22,200	30,250	32,950	34,500
Class 2 (Electric Narrow Isle)	20,800	10,800	12,750	18,950	21,100	23,600
Class 3 (Electric Walk Behind)	48,100	31,500	40,300	46,450	52,100	58,050
Class 4 (IC-Cushion Tire)	31,750	14,850	14,600	29,050	27,950	33,500
Class 5 (IC-Pneumatic Tire)	36,550	16,750	15,000	35,300	34,350	39,600
Subtotal ITA Est. Sales	166,300	94,350	104,850	160,000	168,450	189,250
Other Lift Truck Sales*	4,000	2,000	2,500	3,800	4,300	5,000
Total Sales	170,300	96,350	107,350	163,800	172,750	194,250

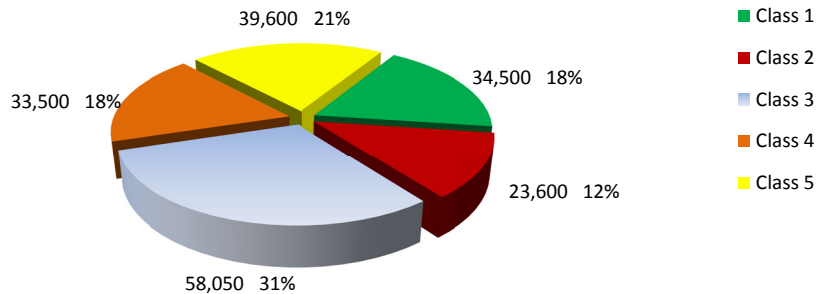
Source: Yengst Associates; Industrial Truck Association *Estimates for a number of other lift truck suppliers not reporting annual results to ITA.

The economy is the largest single factor behind the cyclical demand for these machines. For this reason, sales of lift trucks are highly dependent on the ebb and flow of the economy, as lift trucks are used in numerous applications within our daily lives and are dependent on market drivers such as changes in economic activity, employment, manufacturing, services, and capital investment to name a few.

As shown in the above table, Class 3 trucks (electric walk behind machines) have the highest level of sales by type of machine annually for each of the years shown. In 2013, Class 3 trucks accounted for 31 percent of all truck sales. Classes 1 and 2 (electric rider trucks) represented 18 percent and 12 percent respectively of all sales, while Classes 4 and 5, the IC (internal combustion) rider trucks, held 18 percent and 21 percent respectively for all sales.

The “Others” category in the table is a composite of sales of lift trucks (all types) by smaller suppliers marketing trucks in North America from overseas locations or suppliers manufacturing trucks domestically, but not included in ITA sales figures. We believe the “Others” segment of sales represents about 2 - 3 percent of total truck sales for any given year.

Industrial Lift Truck Sales by Type in 2013



Sales Breakdown By Lift Capacity

Sales are shown for the various types of lift trucks in Table 2 and the chart above. In similar manner, sales by size of lift truck for the various types of machines is shown in the table below based on our estimates from 2013 sales. There are variations of these sales breakdowns from year-to-year. IC trucks with lift capacities of 4,500 to 6,500 lbs represented 63 percent of all IC trucks sold compared to roughly 61 percent in 2009. These estimates vary by manufacturer since some companies focus on the small and mid-sized machines of bigger models versus other suppliers that offer a spectrum of models covering all weight lifting capacities.

**Table 3: Industrial Lift Trucks
Estimated Sales Breakdown by Lift Capacity in North America - 2013**

Electric (Classes 1 + 2)			Internal Combustion (Classes 4 + 5)		
Pounds	Units	%	Pounds	Units	%
< 4,000	17,400	30	< 4,000	9,500	13
4,000 –	36,600	63	4,000 - 6,500	46,000	63
> 6,500	4,100	7	6,500- 13,000	11,000	15
Total	58,100	100	13,000 - 16,000	2,900	4
Class 3			16,000 - 30,000	2,200	3
<6,000	58,050	100	> 30,000	1,500	2
Total	58,050	100	Total	73,100	100

Source: Yengst Associates; ITA Note: Table does not include “other” lift truck sales

It is interesting to note that IC and electric machines have at least one common identity in that the 4,000 to 6,500 lbs lift capacity segment is the most popular lift class for both types of machines and have similar sales breakdowns exceeding 60 percent for all machines sold. Electric lift trucks (rated less than 4,000 lbs lift capacity) accounted for approximately 30 percent of the electric trucks sold, while similar IC machines rated less than 4,000 lbs were approximately 13 percent of

total IC machines sold. As expected, sales of electric machines rated over 6,500 lbs lift capacity represents a small portion of the total electric trucks sold, whereas approximately 24 percent of all IC machine sales are rated over 6,500 lbs. Class 3 machines (walk-behind electric trucks) are typically rated at or below 6,000 lbs lift capacity.

Sales Breakdown By Region

Our research indicates that the majority of industrial lift trucks is sold in and around metropolitan areas and is highly dependent on population distribution. In 2013, the US population was roughly 310 million, while that of Canada was in the range of 34 million. Our analysis of the sales by region shows that approximately 90 percent of sales during 2013 came within the U.S., the balance of 10 percent came from Canada. Canadian sales as a portion of total sales vary annually and have ranged from 8 percent to 12 percent in recent years.

Table 4: Industrial Lift Truck Sales by Region 2013

(Units and Percent)	2013	
Region	Sales	%
South	71,900	38
Midwest	45,400	24
West	30,300	16
Northeast	22,750	12
Total USA	170,350	90
Canada	18,900	10
Total No. America	189,250	100

Source: Yengst Associates, ITA

The south is the leading regional market, accounting for about 38 percent of all industrial lift truck sales, followed by the Midwest at 24 percent, the West at 16 percent and the Northeast at 12 percent. (A guide to the regional breakdown by states is provided below.)

As shown, the Canadian market represented about 10 percent of sales in 2013, which over the past few years is reasonably close to the normal.

U. S. Regional Breakdown of States

Midwest	Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, N. Dakota, S. Dakota
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, Pennsylvania
South	Delaware, Dist. Of Columbia, Florida, Georgia, Maryland, N. Carolina, S. Carolina, Virginia, W. Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, Texas
West	Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, Washington

Source: Yengst Associates

Market Trends

Market trends for industrial lift trucks continue to revolve around two issues we have covered previously, namely engine emissions for the IC trucks and AC-power for electric trucks. We should note that more is heard about the use of **fuel cells** as a replacement for batteries, something that has been discussed and studied for over 25 years. However, fuel cells to our understanding continue to represent a very small portion of electric truck sales in the marketplace today. OEMs are quietly studying the use of fuel cells and even diesel fuel cell technology as we move forward.

- **Emissions** – Tier 4 has arrived in the IC industrial truck market. Small and large IC-powered lift trucks (75 hp and above) will be covered for Tier 4 EPA compliance as of January 1, 2015. Trucks rated below 75 hp in many cases already meet EPA standards. Of course, many trucks in the IC segment are powered by liquid propane gas, which is very clean burning compared to diesel and other fuels. The manufacturers have worked hard to reach the new emission goals, and, of course, a tremendous investment has been made by all.

Along with attaining the EPA goals, all manufacturers offering IC trucks have been working on making their machines more efficient and improving fuel conservation as well. Hybrid models with IC engines and electrical generators and battery packs have been available for several years, although hybrids are not in high demand since LPG machine options exist in the marketplace. There is no question, however, that reduced fuel consumption and the means to reduce high operating costs is foremost in OEM minds.

- For electric powered trucks, **AC-Power** is now a standard for most OEMs. While we did not make an extensive survey of all machines being sold in the marketplace by OEM, we recognize the fact that nearly all electric trucks rated above 3,000 lbs lift capacity are offered with 24, 36, 48, and 80 volt AC designs depending on the lift capacity. Even hand operated machines carry AC designs for most OEMs.

MARKET SHARES

There are approximately 30 suppliers of industrial lift trucks offering machines in the North American market. Roughly 20 of these companies (brand names) are members of the Industrial Truck Association and comprise roughly 97 percent of all lift truck sales; there are a number of other suppliers that are not members of ITA. (The companies that are not members of ITA generally account for about 3 percent of total lift truck sales annually from our estimates and are not included in the Market Share data shown below.)

In this section we provide our estimates of the sales of machines by type of lift truck by manufacturer for each of the various types of machines, i.e. electric and internal combustion engine machines. **We consider only ITA sales (based on industry shipments) in our market share analysis.** We have combined Classes 1 and 2 for the electric trucks and Classes 4 and 5 for internal combustion trucks. Class 3 trucks (electric motor hand lift trucks) are reported separately for the first time in this report.

Electric Trucks: (Classes 1 / 2)

For the Class 1 and 2 electric trucks (counterbalanced Class 1 and narrow isle machines Class 2), **Crown Equipment** has for years been the leading supplier, accounting for approximately 25 percent of industry sales, as shown in the table below. Crown produces and sells electric lift trucks, and is equally strong in Class 1 and 2 trucks. Crown has improved its position in electric lift truck sales marginally during the most recent five-year period relative to the other suppliers.

Yale and Hyster, the two brands combined, accounted for 22 percent of industry sales in 2013, as compared to shares of 25 - 30 percent 10 years ago.

Raymond, which is a subsidiary of Toyota, produces and sells electric lift trucks almost exclusively. We estimate that Raymond held about 18 percent of the Classes 1 and 2 markets for most of the past five years. Raymond is stronger in narrow isle trucks (Class 2 machines) than it is with counterbalance (Class 1) lift trucks. **Toyota**, by itself, holds about 14 percent of the electric truck market, heavily leaning towards ride-on trucks). **Caterpillar**, which offers only Class 1 ride-on electric trucks, has generally held about 4 - 5 percent of the overall industry market position for Classes 1 and 2 trucks. Caterpillar, however, accounted for about 7 percent of the Class 1 category in 2013 and held over 10 percent share of these truck sales during the mid-2000s.

Nissan/TCM held 3 percent of the electric lift truck market (weighted to ride-on trucks) in 2013 along with **Linde, Komatsu, and Mitsubishi** each held roughly 1.5 percent of the market; **Clark Material Handling** has held just over 2 percent of the electric market in recent years, whereas 20 years ago was a market leader. **Jungheinrich** of Germany at 2.6 percent of the market has grown to its position over the past five years, being strongest in narrow-isle (Class 2) machines; **Doosan** with 1.7 percent market penetration is weighted towards ride-on Class 1 trucks; **Hyundai** had little or no market penetration for several years, but has gained some position during the past two years.

**Table 4: Industrial Lift Trucks – Electric Classes 1 and 2
North American Sales by Supplier 2009 - 2013**

OEMs	2009	%	2010	%	2011	%	2012	%	2013	%
Crown	8,100	26	8,900	25.5	12,500	25.4	13,800	25.5	14,600	25.1
Raymond	5,900	18.9	6,800	19.5	9,200	18.7	10,200	18.9	10,900	18.8
Toyota	4,700	15	5,200	14.9	7,100	14.4	7,600	14.1	8,200	14.1
Yale	4,400	14.1	4,800	13.7	6,600	13.4	7,200	13.3	7,500	12.9
Hyster	2,900	9	3,250	9.3	4,600	9.3	4,900	9.1	5,200	9.0
Caterpillar (MCFA)	1,500	4.8	1,800	5.2	2,300	4.7	2,500	4.6	2,700	4.6
Nissan/TCM	1,150	3.7	1,300	3.7	1,600	3.3	1,750	3.2	2,000	3.4
Jungheinrich (MCFA)	25	<1	50	<1	1,200	2.4	1,350	2.5	1,500	2.6
Clark	750	2.4	900	2.6	1,200	2.4	1,200	2.2	1,200	2.1
Doosan	550	1.8	600	1.7	800	1.6	900	1.7	1000	1.7
Mitsubishi (MCFA)	475	1.5	550	1.6	775	1.6	850	1.6	900	1.5
Komatsu	250	<1	300	<1	600	1.2	800	1.5	900	1.5
Linde	400	1.3	450	1.3	650	1.3	700	1.3	800	1.4
Hyundai	50	<1	50	<1	75	<1	300	<1	700	1.2
Total	31,250	100	34,950	100	49,200	100	54,050	100	58,100	100

Source: Yengst Associates Sales based on ITA factory shipments.

Electric Walk Behind (Class 3)

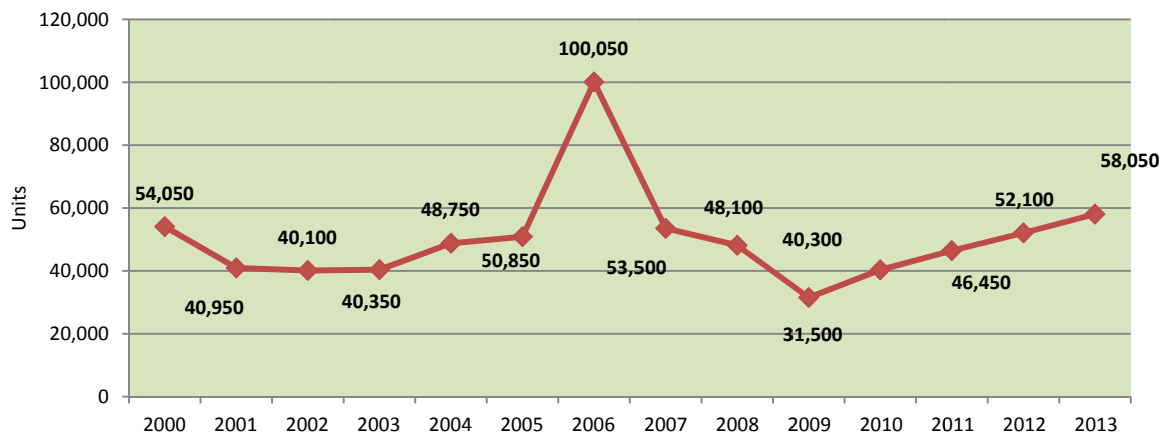
As shown in the chart below, electric walk behind truck sales (ITA shipments) have generally ranged in the 40,000 – 50,000 annual unit range except in two years – 2006 and 2009. 2006 was an extraordinary situation where walk behind truck sales were in high demand during a very strong economic period of time in the U.S. market. 2009 was the low point in sales during the financial slowdown that began in 2008. While we have not covered market penetration for these lift



trucks in past reports, we have a better understanding of the market involvement of the various suppliers in Class 3 trucks than before and feel it important to make it a part of this report. For 2013, sales were estimated at 58,050 units, compared to the low point of 31,500 units in 2009.

Crown, Hyster/Yale, and Raymond/Toyota are the market leaders. Other suppliers include Jungheinrich (MCF), Clark, Mitsubishi, Linde and UniCarriers (Nissan and Barrett combined). As with the Class 1 and 2 electric lift truck categories, Crown has a commanding position in the Class 3 segment, accounting for roughly 32 - 33 percent of the market in recent years. Hyster and Yale together hold an estimated 23 - 25 percent of industry sales, while Toyota/Raymond combined total about 23 - 25 percent with Raymond the dominant of the two brands. Jungheinrich held close to 6 percent market penetration in 2013, while the Nissan/Barrett combination accounted for an estimated 5 percent share. All other ITA member companies together represented an estimated 8 - 9 percent market penetration.

Class 3 Lift Truck Sales in North America



Internal Combustion Trucks (Classes 4 / 5)

On the IC side of lift trucks, sales based on ITA shipments are provided below, with a breakout of sales by the suppliers as we have estimated from our analysis of the marketplace. As shown, for Classes 4 and 5, **Toyota** is the market leader with approximately 34 percent of industry sales during the past five years. The next closest competitors include **Hyster-Yale** combined at 20 percent and **MCFA (Mitsubishi and Caterpillar)** at 17 percent based on 2013 results.

Nissan/TCM (UniCarriers) is a strong competitor combination in Classes 4 and 5 together having about 8 percent market penetration, followed by a number of other suppliers rated at 5 percent and lower, as shown above. A number of "Others" are shown grouped together as each has a very low market share of less than 1 percent from our analysis of the market.

**Table 5: Industrial Lift Trucks - Internal Combustion Classes 4 and 5
North American Sales by Supplier: 2009 - 2013**

OEMs	2009	%	2010	%	2011	%	2012	%	2013	%
Toyota	10,800	34.2	10,300	34.8	21,800	33.9	21,000	33.7	25,000	34.2
Caterpillar (MCFA)	3,700	11.7	3,500	11.8	8,300	12.9	7,900	12.4	8,900	12.2
Hyster	3,200	10.1	3,050	10.3	6,700	10.4	6,400	10.3	7,600	10.3
Yale	3,200	10.1	2,950	10.0	6,400	9.9	5,900	9.5	7,100	9.4
Nissan/TCM	2,600	8.2	2,400	8.1	5,400	8.4	4,900	7.9	5,800	7.9
Mitsubishi (MCFA)	1,500	4.7	1,300	4.4	3,200	5.0	3,000	4.7	3,600	4.9
Clark	1,700	5.4	1,500	5.1	3,700	5.7	3,300	5.1	3,500	4.8
Doosan	1,600	5.1	1,600	5.4	2,700	4.2	2,900	5.1	3,100	5.1
Komatsu	1,000	3.2	1,000	3.4	2,400	3.7	2,300	3.8	2,600	3.6
Linde	800	2.5	700	2.4	2,000	3.1	1,800	2.9	2,300	3.0
Hyundai	200	0.6	200	0.7	250	0.4	1,500	2.1	1,700	2.3
*Others	1,300	3.0	1,100	2.7	1,500	2.3	1,400	2.7	1,900	3.0
Total	31,600	100.0	29,600	100.0	64,350	100.0	62,300	100.0	73,100	100.0

Source: Yengst Associates *Others: Crown, Hamech, Lift Rite, UTILEV, and LiuGong. Sales based on ITA factory shipments.

As we discussed earlier, there are a number of other lift truck suppliers that do not report sales or shipment data to the Industrial Truck Association. Estimated sales for these suppliers from 2009 through 2013 ranged from 2,000 units in 2009 to 5,000 units in 2013. We did not break out sales for these other lift truck suppliers (not members of ITA).

However, **Taylor Machine, Manitex (Schaeff and Lowry), Princeton, Chrisman, Moffet Mounty, Combilift, and Heli** are important in our opinion. Several of these companies (Princeton, Chrisman, Moffet and Combilift) offer specialty lines of lift trucks, some designed for mounting on commercial flatbed trucks used for moving materials at jobsites, and others that are found lifting odd shaped or long objects that cannot normally be moved by a conventional lift truck. Heli Americas offers a more standard line of machines, all which are imported from China. Taylor Machine is well known for its heavy duty industrial lift trucks used for lifting large containers and other heavy-weight objects. "Others" also include suppliers including **Rico, Tailift (Taiwan), World-Lift (Taiwan), Landoll, Hoist, EP Equipment, Elwell-Parker, Big Lift, and Sichelschmidt**. Each company's product line is outlined later in this report.

NORTH AMERICAN PRODUCTION

Production of electric-powered industrial lift trucks follows closely the demand for these machines. There are no industry trade statistics covering production levels of machines by manufacturer. We have estimated production based on our analysis of the demand side of the market, taking into consideration imports and exports of lift trucks by the OEMs and other information gained during the course of this report's preparation. Please note that we have separated ITA supplier production estimates from all other supplier manufacturing estimates.



Table 6: Industry Production of Industrial Lift Trucks in North America

(Units)	2009	2010	2011	2012	2013	% Change '12 – '13
Classes 1 & 2 (Elec)	28,100	35,000	50,600	53,700	58,500	8.9
Class 3 (Elec Walkie)	31,000	40,000	48,000	55,000	61,000	10.9
Classes 4 + 5 (IC)	28,100	28,700	60,000	58,200	67,500	16.0
Est. ITA Suppliers	87,200	103,700	158,600	166,900	187,000	12.0
Other Suppliers*	1,600	2,000	3,000	3,600	4,500	25.0
Total Production	88,800	105,700	161,600	170,500	191,500	12.3

Source: Yengst Associates, Inc. estimates *Non-ITA suppliers

Our machine production estimates by type of lift truck are shown above. The data is self-explanatory for the period from 2009 through 2013. The low point in production in 2009 occurred at the time sales were the lowest because of the financial downturn and economic recession. We made an adjustment to our previous report relative to 2009 production levels based on more recent information about sales that year. Non-ITA supplier estimated production levels ranged from about 1,600 units in 2009 to 4,500 units in 2013. These figures could not be confirmed, but include our estimates of domestic sales by these companies and a certain level of exports outside of North America.

Electric: (Classes 1 / 2)

Production levels for the primary lift truck suppliers of Classes 1 and 2 (electric ride-on trucks) is provided in the table below for the period of 2009 through 2013. **Toyota/Raymond** together account for 35 percent of all electric ride-on trucks manufactured in North America, while second in the production department is **Crown** at 26 percent, followed closely by **Hyster-Yale Materials Handling** at 24 percent. Each brand is shown separately to match up with our estimates of sales in North America, shown earlier plus estimated exports.

**Table 7: Industrial Lift Trucks – Electric Classes 1 and 2
North American Production by Supplier 2009 - 2013**

OEMs	2009	%	2010	%	2011	%	2012	%	2013	%
Crown	7,000	24.9	8,700	24.9	13,000	25.5	14,000		15,300	26.0
Raymond	5,200	18.5	6,900	20.0	10,800	21.2	11,000	20.3	12,000	20.4
Toyota	4,800	17.1	5,400	15.7	7,500	14.7	8,100	15.0	8,600	14.6
Yale	4,400	15.7	5,000	14.9	7,300	14.3	7,700	14.2	8,400	14.3
Hyster	3,000	10.7	3,600	10.3	5,100	10.0	5,200	9.6	5,800	9.8
MCFA	1,900	6.8	3,000	7.7	4,000	7.9	4,500	8.3	5,000	8.5
Nissan / TCM	1,100	3.9	1,500	4.3	1,800	3.5	2,000	3.7	2,100	3.6
Komatsu	300	1.1	300	0.9	600	1.2	800	1.5	900	1.5
Linde	400	1.4	500	1.4	800	1.6	800	1.5	800	1.4
Total	28,100	100.0	35,000	100.0	50,900	100.0	54,100	100.0	58,900	100.0

Source: Yengst Associates

MCFA (Mitsubishi Caterpillar Forklift) held the fourth position in 2013 and has been consistently fourth for the past five years. **Nissan/TCM (UniCarriers)** is fifth with 3 – 4 percent industry production shares, with Linde and Komatsu accounting for the balance of the industry output. There has not been much change in the market production positions of the top players in electric ride-on forklift trucks since 2009.

Electric Walk Behind (Class 3)

This is our first production estimate for this category of lift trucks. As shown earlier, total production for these machines was estimated at 31,000 units in 2009, down from roughly 54,000 units in 2007 and 48,000 units in 2008. Production by 2013 improved to about 61,000 units, up 97 percent in five years. **Crown Equipment** holds the first position in production holding more than 30 percent of the industry output. **Toyota/Raymond** is estimated to have roughly 27 percent and **Hyster-Yale** about 25 percent of the output. All other suppliers (Clark, Nissan/TCM, Mitsubishi, and Linde account for the balance of the industry's production. Jungheinrich (MCFA), a strong supplier, imports its machines from Germany.

Internal Combustion: (Classes 4 / 5)

Toyota, Mitsubishi-Caterpillar (MCFA), Hyster-Yale, and Nissan/TCM are the top manufacturers of sit-down IC lift trucks in North America (pneumatic tired and cushion tired machines). These companies accounted for nearly 81 percent of the unit volume in output in 2013; Toyota is by far the biggest single company producing these machines in North America representing about 38 percent of industry total production in 2013. Hyster-Yale accounted for 23 percent of the total and MCFA (Caterpillar and Mitsubishi Forklift) held 19 percent. Nissan/TCM held close to 9 percent of the total, and all other suppliers the balance of about 10 percent. **Clark, Doosan, and Hyundai**, source all or most of their machines from South Korea.

Table 8: Industrial Lift Trucks - Internal Combustion Classes 4 and 5
North American Production by Supplier 2009 – 2013

OEMs	2009	%	2010	%	2011	%	2012	%	2013	%
Toyota	10,800	38.4	11,000	38.3	22,800	38.0	22,000	37.8	25,800	38.2
MCFA	5,200	18.5	5,200	18.1	11,900	19.8	11,700	20.1	12,900	19.1
Hyster	3,200	11.4	3,300	11.5	7,000	11.7	6,800	11.7	8,100	12.0
Yale	3,200	11.4	3,300	11.5	6,600	11.0	6,400	11.0	7,600	11.3
Nissan/TCM	2,600	9.3	2,600	9.1	5,600	9.3	5,200	8.9	6,000	8.9
Komatsu	1,000	3.6	1,100	3.8	2,500	4.2	2,600	4.5	2,800	4.1
Linde	800	2.8	800	2.8	2,000	3.3	2,000	3.4	2,400	3.6
*Others	1,300	4.6	1,400	4.9	1,600	2.5	1,500	2.6	1,900	2.8
Total	28,100	100.0	28,700	100.0	60,000	100.0	58,200	100.0	67,500	100.0

Source: Yengst Associates *Others include: UTILEV, Lift Rite, and Crown.

EXPORTS / IMPORTS

Lift truck imports in 2009 were increased over our previous estimate of 5,700 units to about 7,000 units. Machine imports prior to 2009 were estimated at 12,000 units in 2008 and even higher in the years prior to 2008. Moving into 2010, imports of all lift trucks gained slightly, but inventories of machines from previous years still caused manufacturers to restrain ordering excessive levels of machines to reduce inventories. Imports for all types of trucks in 2010 were estimated at about 7,500 units, moving up to about 9,500 units by 2011, 12,000 units in 2012, and 13,500 units in 2013. There are no absolute ways to know the



exact number of imports each year based on government records and the record keeping methods employed. Most imports arrive by shipping from overseas ports, but some machines come through Canada into the U.S. via truck, likewise from Mexico.

Imports of most trucks come primarily from South Korea, some from China, and Europe. Clark, Doosan, and Hyundai are the three major importers of IC and electric trucks from Korea. We also see lift trucks for Clark coming from its plant in Mexico; however, we are unable to confirm the level of activity from Mexico. LiuGong's machines are all imported from China. Heli machines are also imported from China. In Europe, Jungheinrich, Moffett, Cargotec, Combilift, Hyster-Yale, and MCFA all import a certain level of machines annually.

On the **export** side, Mexico is the biggest market for IC lift trucks outside of North America, accounting for 40 – 50 percent of all U.S. and Canadian exports throughout the world. Other strong markets are found in other Latin countries; Australia and South Africa are also important.

Exports of lift trucks are difficult to track. We estimate lift truck exports were estimated in the range of 3,000 to 4,000 units annually for the years 2009 – 2011. In 2012 and 2013, exports increased to an estimated 4,000 to 5,000 units annually, but we are not certain that export statistics are accurate and cannot get individual companies to divulge actual export levels.

COMPONENT SUPPLY

There are a large number of suppliers making and selling fork lift trucks in North America. We have elected to show several of the top suppliers and their respective sourcing of components where we could gain the information.

- **Engines** – Among those OEMs with the largest unit volumes of IC lift trucks sold each year, our research uncovered a total of 12 different engine suppliers. The primary engine vendors for the IC trucks were Perkins, Mitsubishi, General Motors, Isuzu, Nissan, Cummins, and Kubota. However, we need to add that there are a large number of IC engine suppliers being used by the OEMs. We have listed most of the engine manufacturers in the specification sheets found at the end of this report. The largest percentage of IC lift truck engines are of the LPG type, followed by diesel, gasoline, CNG and dual-fuel.
- **Transmissions** – Powershift transmissions are found on a very high percentage of IC lift trucks. While several OEMs take credit for manufacturing their own gear boxes, we are of the opinion that a number of transmissions are supplied under private label from other vendors. Hyster was found using ZF transmissions on its bigger heavy-duty machines.

**Table 9: Industrial Lift Trucks
Component Suppliers to the Major Manufacturers**

Major Manufacturers	IC Engines	Electronic Controls	Transmissions	Axles
Caterpillar (MCFA)	Perkins Mitsubishi General Motors	Caterpillar	Caterpillar Mitsubishi	Mitsubishi Dana
Clark MH	Perkins Mitsubishi General Motors	Na	Carraro Dana	Dana
Crown	John Deere	Crown General Electric	Crown	Crown
Doosan	Mitsubishi General Motors Perkins / Doosan	Na	Doosan	Doosan
Hyster - Yale	Mazda / Isuzu General Motors Perkins / Cummins	General Electric	Hyster-Yale Dana	Hyster-Yale ZF
Komatsu	Isuzu Nissan / Komatsu	General Electric	Komatsu	Komatsu
Linde	Volkswagen Deutz / Perkins	Linde General Electric	Linde	Dana / Linde Kessler
Mitsubishi (MCFA)	Perkins Mitsubishi	General Electric	Caterpillar Mitsubishi	Mitsubishi Dana
Nissan-TCM	Nissan Isuzu Mitsubishi	Hitachi	Nissan / TCM Mitsubishi	Nissan / TCM
Raymond (Toyota)	Na	General Electric	Na	Na
Toyota	Toyota / Hino	Toyota	Toyota	Toyota

Source: Company Information

- **Axles** – As was the case with transmissions, many OEM's claim to source axles in-house. AxleTech and Kessler are also used for large capacity IC lift truck axles by several OEMs, while Dana was mentioned a number of times during our survey.
- **Electronic Controls** – General Electric is a major supplier of electronic controls used by OEMs. We know there are other suppliers, but had difficulty in gaining specific names for the OEMs. Those OEMs that claim to provide in-house supply of electronic controls are MCFA, Crown, Linde, and Toyota.

FIELD POPULATION

We work with estimated sales of lift trucks to determine the approximate population levels for the different types of trucks being sold in the marketplace. **There is no census of machines in the field at any given time and lift trucks like most off-highway machinery are not registered annually in any state or federal jurisdiction.**

For years we assumed that most lift trucks had a 15 year life, but found from talking with various industry people that we were probably short on our timing, which we later increased to 17 years on average. Using that life expectancy for all lift trucks and including scrappage factors, we concluded the population estimates through 2013 as shown below. We estimated that about 2.4 million lift trucks (all types) are working in North America. The breakdown shown in the table is self-explanatory.



**Table 10: Industrial Lift Trucks
Estimated Field Population through 2013**

Class Type	Units	%
Electric	1,387,000	59
Class 1 – Counterbalanced	400,000	17
Class 2 – Narrow Aisle	289,000	12
Class 3 – Pallet Trucks	698,000	30
Internal Combustion	960,000	41
Class 4 – Cushion Tire	425,000	18
Class 5 – Pneumatic Tire	535,000	23
Total Population	2,347,000	100
Country		
United States	2,090,000	89
Canada	257,000	11
Total Population	2,347,000	100

Source: Yengst Associates

Class 1 and 2 trucks and IC Classes 4 and 5 accounted for about 41 percent of the total.

This is the first year we have analyzed the Class 3 pallet trucks and used the same basic analysis on these machines as with the electric and IC ride-on trucks. Pallet trucks account for the largest single type of lift truck in the overall population, accounting for roughly 30 percent of all machines in the field. We found about 29 percent of the total population coming from

As for the population break in sales for the United States versus Canada, we estimate that the U.S. accounts for roughly 89 percent of the total and Canada the balance of 11 percent. This ratio has not changed over the years even though we realize that sales in Canada vary each year within a small range of approximately 9 – 12 percent of total.

FORECAST

Our outlook for the lift truck market at this time is more optimistic than it has been for several years. Yew, we have had big percentage improvements during the past five years, as shown earlier, but all of the improvements have come from a very low base in 2009, which was brought on by the financial fallout and economic recession during 2008 and 2009. We have nearly recovered to the level of output and demand seen prior to that found during the last economic cycle, and our outlook is positive for most of the next five years.

We anticipate that 2014 results will be at least 9 – 10 percent better than the 2013 levels shown in the following table. While this report was being prepared near the end of 2014, we felt it more important to concentrate on the forecast period starting in 2014, rather than speculate on final 2014 results before they were made available. (In fact, we may have the final 2014 numbers within 4 – 6 weeks of the publishing date for this report.)

We see no major fundamental changes for the foreseeable future and believe 2015 will be a reasonably good year for the industrial truck manufacturers with growth in sales of about 8 – 10 percent above 2014 results. Of course, we will watch the political and economic picture in North America and maintain contact with industry suppliers to assess whether our projections are holding true or need changing.

**Table 11: Industrial Lift Trucks
Projected ITA and Non - ITA Production & Sales in North America through 2018**

Rejected ITA and Non-ITA Production & Sales in North America through 2018							
	Forecast						% Growth '13 – '18
(Units)	2013	2014	2015	2016	2017	2018	
Production							
Elec Classes 1+2	58,500	64,000	69,000	74,000	74,000	70,000	19.7
Elec Class 3	61,000	66,000	72,000	75,000	75,000	72,000	18.0
IC (Classes 4 + 5)	67,500	76,000	83,000	90,000	90,000	85,000	25.9
ITA	187,000	206,000	224,000	239,000	239,000	227,000	21.4
Others	4,500	5,000	5,500	6,000	6,000	5,500	22.2
Total	191,500	211,000	229,500	245,000	245,000	232,500	21.4
Sales							
Elec Classes 1+2	58,100	63,300	68,000	72,000	72,000	69,000	18.8
Elec Class 3	58,050	63,500	69,000	73,000	73,000	70,000	20.6
IC (Classes 4 + 5)	73,100	79,700	86,900	92,000	92,000	86,000	17.6
ITA	189,250	206,500	222,900	237,000	237,000	225,000	18.9
Others	5,000	5,600	6,100	6,500	6,500	6,000	30.0
Total	194,250	212,100	229,000	243,500	243,500	231,000	18.9

Source: Yengst Associates projections

At this time, our projections through 2018 are generally positive and showing improved demand and higher levels of output (production) for the industry, with growth coming through 2016, then leveling out in 2017 and dropping modestly in 2018. Our thinking behind these sales and production levels is that the economies in North America (primarily the U.S. economy) will continue to show average growth of about 3 percent annually for the next two years through 2016, with cyclical changes occurring thereafter which will impact growth and create a slowing trend in demand, later dropping modestly in the fifth year. This is a conservative and reasonable projection in our opinion, which we believe is more likely to occur, although outside issues are always possible that can alter the way our national economy moves and which will have an impact on demand for these machines.

We are assuming that inflation will continue to hold at less than two (2) percent annual growth during the next few years and no serious need to raise interest rates to check that possible issue. We are modestly concerned about the Federal Reserve changing interest rates during 2015 and beyond to bring the monetary system into balance from the low interest rates imposed during recent years. The uncertainties of interest rate changes on the upside and the lack of direction from the administration and Congress relative to needed tax reforms still requires us to re-evaluate our projections frequently. We must also monitor growth in overseas markets that impact exports from the manufacturing side, as many of the markets outside of North America are facing very slow economic growth conditions at present, several we expect will continue through 2015.

SUPPLIER SUMMARY

This section provides a brief profile of all industrial lift truck suppliers to the North American market, selling Classes 1 / 2 / 3 (electric trucks) and Classes 4 / 5 (IC



machines). Yengst Associates initially takes a more in-depth look at the market's 'major' suppliers, followed by a brief description of all other competitors.

**Table 12: Industrial Lift Trucks
Major Supplier Summary**

Supplier	Manufacturing Location(s)	Class 1 / 2 / 3 / 4 / 5	Electric Capacity Range (lbs.)	IC Capacity Range (lbs.)
MCFA	Houston, TX Japan	1 / 2 / 3 / 4 / 5	3,000 - 12,000	3,000 – 35,000
Clark MH	South Korea / Mexico/ Lexington, KY	1 / 2 / 3 / 4 / 5	3,000 - 16,500	2,500 – 18,000
Crown	Ohio (4 locations) Greencastle, IN Kinston, NC / China / Germany / Mexico	1 / 2 / 3 4 / 5	3,000 – 6,000	4,000 – 6,500
Doosan	South Korea / China	1 / 4 / 5	2,500 – 10,000	3,000 - 33,000
Hyster - Yale	Berea, KY Greenville, NC Italy / UK	1 / 2 / 3 / 4 / 5	2,000 – 12,000	2,500 – 105,000
Komatsu	Newberry, SC / Japan	1 / 2 / 4 / 5	3,000 – 6,500	3,000 – 35,000
Linde	Summerville, SC UK / Germany	1 / 2 / 3 / 4 / 5	3,000 – 10,000	3,000 – 40,000
UniCarriers (Nissan/TCM)	Marengo, IL, W. Columbia, SC Japan	1 / 2 / 3 / 4 / 5	3,000 – 8,000	3,000 – 22,000
Toyota	Columbus, IN Japan	1 / 2 / 3 / 4 / 5	3,000 – 12,000	3,000 – 51,000
Raymond	Greene, NY Muscatine, IA	1 / 2 / 3	2,000 - 8,000	NA

Source: Yengst Associates / Company Information

Mitsubishi Caterpillar (MCFA)

Mitsubishi Caterpillar North America, Inc. (MCFA) is a privately held joint venture between Mitsubishi Heavy Industries, Ltd. and Caterpillar Industrial Inc. MCFA is engaged in the manufacture and distribution of material handling equipment and parts under the Mitsubishi Forklift and Cat® Lift Truck brand names. The company is headquartered in Houston, Texas. MCFA is a dominant supplier of lift trucks, upgrading its product line annually and constantly looking for new avenues to compete.

Caterpillar-branded machines are distributed by approximately 400 dealer locations throughout North America and Latin America. Mitsubishi trucks are distributed by approximately 200 dealer outlets. Most Cat and Mitsubishi lift trucks available in North America are manufactured and distributed from the plant in Houston, Texas.

In August 2009, MCFA reached an agreement with Jungheinrich of Germany in which Jungheinrich lift trucks would be distributed in North America through the MCFA dealer network and which MCFA would manufacture a number of Jungheinrich branded trucks in Houston for distribution in North America (U.S., Canada and Mexico). The agreement went into effect January 2010 and production of Jungheinrich trucks began about the second quarter of 2010.

The Mitsubishi product line mirrors the Caterpillar lift truck product line in many respects, although the Mitsubishi line includes narrow aisle Class 2 trucks. Jungheinrich offers Class 1, 2, and 3 trucks, which complement the Caterpillar and Mitsubishi lines nicely.

MCFA with Jungheinrich accounts for about 9 – 10 percent of the Class 1 +2 truck market compared to 5 – 6 percent in 2010 prior to the agreement with Jungheinrich. For Class 3 trucks, Jungheinrich has increased the MCFA market position from less than 2 percent of the market to about 8 percent market penetration today. On the IC side, Caterpillar and Mitsubishi together hold about 17 percent of the market, Caterpillar being the more dominant supplier of the two companies for both Class 4 and 5 trucks.

Crown Equipment

Crown Equipment Corporation is privately owned company and is headquartered in Bremen, Ohio. Crown is the leading brand of electric lift trucks in North America and considered one of the leading suppliers of electric trucks on a global scale. The company manufactures a wide selection of electric lift trucks in eleven different manufacturing locations within the United States. The company is known for its vertical integration manufacturing a high portion of its component needs in-house. Overseas, the company has manufacturing sites in Suzhou, China, Roding Germany, and Queretaro, Mexico.

Crown owns close to 50 dealer locations and supports more than 100 independent dealer locations in the United States; owns 19 distributors and supports more than 40 independent distributors in Europe and owns 33 dealer locations and supports a number of independent dealer locations in the Asia Pacific region.

Crown entered the IC lift truck product area in 2008 when it announced that it had reached a branding agreement with Komatsu Forklift USA to distribute IC lift trucks in North America through Crown dealers under the Hamech name; the agreement with Komatsu ended at the end of 2011, and Crown turned to Clark Material Handling to provide the Hamech line of products, which continues today. Meanwhile, Crown introduced its own in-house developed C-5 model IC lift truck line with both pneumatic and cushion tired models available and powered by John Deere diesel engines. The Hamech line, which consists of 2 cushion tired models and five pneumatic tired machines, has been slow to develop for Crown to our understanding, but Crown has developed modest sales for its IC machines (both Crown-made and Hamech trucks) accounting for about 1 – 2 percent of the overall industry market since 2012.

On the electric truck side, Crown's sales in 2013 totaled roughly 14,700 Class 1 and 2 electric ride-on lift trucks in North America, up from an estimated 7,900 units in 2009, the low year for sales during the past five years. The company has held roughly 25 percent of the overall Class 1 and 2 lift truck markets for the past five years, based on our analysis. Crown is also strong in Class 3 electric "walkie" trucks, where we estimate that it accounts for about 33 percent of that market based on recent industry sales.

Doosan

Doosan Infracore is headquartered in Suwanee, GA and maintains its Lift Truck Division near Cleveland, Ohio, with offices and technical service centers throughout North America. DIA lift truck dealers operate through more than 200 sales and service locations in the U.S. and Canada. The lift truck product line consists of electric and IC machines ride-on trucks (Classes 1, 2, 4, and 5) and Class 3 walk-behind models, which were added to the company's product line since our last report.

All of Doosan's electric models are sit-down, with a number of three-wheeled and four-wheeled machines available ranging from 2,500 to 10,000 lb range. The narrow aisle line consists of two models rated from 3,500 to 4,000 pounds. The company's IC product line is extensive and includes both cushion and pneumatic tires and capacities ranging from 3,000 to 36,000 pounds.

Doosan is not strong in its Class 1 and 2 lift trucks, accounting for 1 – 2 percent of the market, while Class 3 truck penetration is nil at best. The company is much stronger in the Classes 4 and 5 machines, representing about 5 percent of industry sales. All of Doosan's machines are imported, most from South Korea, a much smaller number from China.

Hyster - Yale

Hyster - Yale Materials Handling is a publicly owned lift truck supplier, one of the largest in the world. The company, formed in September 2012 following a spin-off from NACCO Industries, has manufacturing sites around the world with locations in the US, the United Kingdom, Brazil, the Netherlands, Japan, Italy, Mexico, and Australia. The company has a vast global network of dealers working in roughly 100 countries. In North America, there are approximately 220 dealer locations selling the Yale, Hyster, and UTILEV lift truck brands. The Hyster – Yale corporate office is located in Cleveland, OH; however, the headquarters for NMHG (NACCO Materials Handling Group) is in Greenville, NC. In 2011, the company introduced a new brand of trucks, known as UTILEV, which is also manufactured and sold through NMHG.

Hyster – Yale offer trucks in all lift truck types from Class 1 to Class 5, covering lift capacities ranging from 2,000 pounds to 100,000 pounds. The company dates back decades and has always been one of the leading suppliers of these machines for over 50 years. In Classes 1 and 2, Hyster and Yale account for about 23 percent of all electric trucks sold in North America. For Class 3 machines, the combination holds about 25 percent market share; in Classes 4

and 5 the company is also very competitive with roughly 25 percent market penetration based on 2013 industry sales. The addition of the UTILEV brand, which consists of two IC models rated from 5,000 to 6,000 lbs lift capacity and one three-wheel electric model rated 3,000 to 4,000 lbs, has not yet made a material difference in the company's lift truck position from our standpoint, but the concept of offering inexpensive and simply-designed machines is new for Hyster – Yale and will be tested over time.

We should note that that Hyster-Yale's operating company NMHG acquired a small fuel cell manufacturer, Nuvera Fuel Cells, Inc., Billerica, MA which is expected to commercialize the use of fuel cells in electric lift trucks offered by Hyster-Yale in coming years. No time line has been established on when the company is expected to offer electric lift trucks with fuel cells, but the stage has been set for that possibility.

Komatsu Forklift

Komatsu Forklift U.S.A. is a division of Komatsu Ltd. Komatsu Forklift U.S.A. has manufacturing and product support operations in Newberry, SC, moved there about five years ago from Georgia. The company's headquarters are in Rolling Meadows, IL. The company offers line up of sit-down electric models (Class 1), three Class 2 models, and Class 4 and Class 5 machines. The company does not offer Class 3 "walkie" lift trucks. Komatsu produces the largest portion of its product line in South Carolina, but imports a portion of its needs from Japan as well.

The company for many years marketed two brands of lift trucks – namely its Komatsu brand and the Tusk brand. It discontinued the Tusk brand of machines in July 2010. Komatsu had manufactured the Tusk brand of lift trucks at its plant in Georgia, but the whole process became uneconomic, forcing the decision to drop the Tusk brand.

Komatsu is a supplier in the electric lift truck market, accounting for an estimated 3 – 4 percent of industry sales in recent years. The IC market is a bigger volume market for Komatsu, but market penetration is about 4 percent relative to the industry. Both cushion and pneumatic tire IC lift trucks are offered and the company has nearly equal sales in both types of machines. As mentioned above, the company imports some models from Japan, with the largest portion of its sales come from trucks produced in its South Carolina facility.

Linde Material Handling

Linde Material Handling North America, part of Linde AG of Germany, is located in Summerville, South Carolina. Linde AG is considered one of the largest manufacturers of lift trucks in the world. The company sells its lift truck product line through a nationwide dealer network that totals about 200. The large majority of the machines sold in North America are produced in the company's factory in Summerville, although some machines are imported annually.

We estimate that Linde sold about 2,300 units of its Class 4 and 5 IC trucks in North America in 2013, accounting for about 3 percent market penetration for

those two classes of trucks. On the electric side, we estimate the company accounts for 1 – 2 percent of the overall market, most of that weighted to Class 1 trucks. The company held a 3 percent market share in the electric truck market in North America for several years, but that has eroded in our opinion. The company sources a large portion of its parts and components from Europe, which are mostly shipped to the company in South Carolina from the parent company in Germany. Linde has a small share in the Class 3 trucks from our analysis, in the range of 1 – 2 percent.

UniCarriers Americas Nissan Forklift and TCM America merged to form UniCarriers Americas Corporation in April 2013. UniCarriers Americas is a division of UniCarriers Holdings in Tokyo, Japan, the parent company. The company has five brands – Nissan, Barrett, Atlet, TCM, and UniCarriers. The Nissan brand is sold through approximately 140 dealer locations, while the TCM line is covered by about 175 locations. Barrett walkie trucks are primarily sold through Nissan dealers.

The company offers all types of industrial trucks both IC and electric versions. The IC line of cushion machines (Nissan and TCM) has lift capacities ranging from 3,000 to 8,000 pounds, while the pneumatic-tired machines range from 3,000 to 11,000 pounds. Electric rider trucks range from 3,000 to 8,000 pounds lift capacity and the walkie trucks have capacities of 4,400 to 8,000 pounds.

UniCarriers (TCM, Nissan, and Barrett) produces and sells Class 3 trucks under the Barrett brand name, as well as the Nissan and TCM names. The company's (all three brands) machines account for an estimated 5+ percent of the Class 3 trucks sold in North America based on 2013 industry sales. For electric ride-on trucks (Classes 1 and 2), UniCarriers held a 3 – 4 percent market position in our opinion for 2013; IC truck market share for UniCarriers is roughly 8 - 9 percent in recent years.

Raymond Raymond Corporation, owned by Toyota Material Handling, is a well-known electric lift truck manufacturer, marketing its products on a global scale. Raymond has two manufacturing facilities in the domestic market, but also imports some machines from Italy. The company closed a plant in Canada in March 2010 to consolidate production of its narrow aisle machines in its primary manufacturing facility in Greene, NY. A second plant is located in Muscatine, IA where Class 3 lift trucks are produced. In North America, Raymond Handling Concepts Corporation provides sales and services for a high portion of the company's customers.

Raymond's focus on electric trucks Classes 1, 2 and 3 has covered several decades. Based on our analysis of the marketplace for 2013, Raymond by itself represented about 33 percent of Class 2 truck sales in North America and held approximately 10 percent of the Class 1 sit-down trucks sold. In Class 3 trucks, the company is a strong competitor with about roughly 15 - 16 percent of the market in recent years.

Toyota

Toyota is the largest supplier of lift trucks in North America, particularly when considering its combined ownership of Raymond. The company's product line covers all five of the categories of trucks discussed in this report (Classes 1 through 5). The company manufactures most of its Toyota brand trucks at its manufacturing plant in Columbus, Indiana, although Toyota does import some machines annually. Headquarters for Toyota Material Handling is located at the factory in Indiana. There are 73 authorized Toyota industrial equipment dealers in North America, with approximately 225 dealership locations throughout the U.S. and Canada.

For the electric truck product line, Toyota has both cushion and pneumatic tired machines with lift capacities ranging from 3,000 to 12,000 pounds. For the IC trucks, both cushion and pneumatic tired, Toyota offers its cushion tire machines ranging up to 15,500 pounds lift capacity; while the pneumatic tired product line is capable of lifting up to 55,000 pounds.

Toyota accounted for 37 - 38 percent of the cushion tire IC trucks and roughly 30 percent of the pneumatic tired IC trucks sold in 2013. The company market shares have not varied much in recent years. In Class 1 sit-down electric trucks, Toyota is estimated to have close to 20 percent of the market, although the company's position in Class 2 machines is weak having less than 5 percent share in that particular market segment. In Class 3 trucks, the company accounts (excluding Raymond's position) about 10 percent of the market.

When combining Toyota's results with those of Raymond it is clear that Toyota overall has the lead or second position in all but one industrial lift truck segment. Class 3 machines remain the one segment of the market today that Toyota does not hold the lead position when including Raymond's sales, however, comes in second and only by a small margin.

Table 13: Industrial Lift Trucks | Summary of Other Suppliers

Supplier	Manufacturing Location(s)	Class 1 / 2 / 3 / 4 / 5	Comments
Big Lift	Dells, WI	3	Based in Lombard, IL. Has more than 200 dealers in North America. Has been in business since 1950. Lift capacities of its qualifying Class 3 models range from 2,000 to 4,500 lbs. New owners bought the company in 2009 and it is now called Big Lift LLC. Products including pallet trucks, stackers, and order pickers sold under the Big Joe brand name. Products are sold through roughly 200 independent dealer locations in North America with a Master Distributor in Canada. A new distribution strategic partnership with EP Equipment USA (Chinese supplier) has been set.
Rico Equipment	Medina, OH	1 / 2 / 3 4 / 5	Company offers specialty electric and IC sit-down lift trucks rated 20,000 to 40,000 lbs. Customer base includes users in the industrial, commercial and military markets. Sales are made through about 60 primary dealers, with its strongest customers in the automotive and steel industries.
Elwell-Parker	Coraopolis, PA	1 / 4 / 5	H & K Equipment purchased Elwell-Parker from Hoist Liftruck in early 2010. Trucks have lift capacities ranging from 15,000 to 100,000 lbs. H&K is a material handling and industrial cleaning equipment distributor located in Coraopolis, PA. The company also sells forklifts made by Nissan, Taylor, and Komatsu.
Heli Americas	China	1 / 3 / 4 / 5	Heli Americas is based in Memphis, TN and was started in 2007. The company offers several models of its electric sit-down lift trucks (Class 1 and one model in the Class 3 category of walkie lift trucks). On the IC side, Heli provides both cushion and pneumatic tired machines, with lift capacities ranging from 2,000 to 22,000 lbs. All machines are imported from China.
Hoist Liftruck	Bedford Park, IL	1 / 4 / 5	Headquartered in Bedford Park, IL. All products are specialty high-capacity lift machines ranging from 15,000 to 115,000 lbs. The company has overseas sales and is selling to the U.S. Govt. Domestic sales made through independent dealers. A high portion of components are sourced in-house. Sales volumes are estimated in the 400 unit range for 2013.
Hyundai	South Korea	1 / 4 / 5	Hyundai has been selling lift trucks in North America for a number of years. The trucks are marketed by Hyundai Construction Equipment Americas, Inc. located in Suwanee, GA. The company offers both electric and IC sit-down machines. The company typically has sold about 1,000 to 1,300 units annually except in 2009 when sales dropped to about 500 units. The largest portion of sales is made in the IC product line.
Jungheinrich (MCFA)	Germany Houston, TX	1 / 2 / 3	Jungheinrich Lift Truck Corp., USA started in 2000. In late 2009, the company realigned its North American business through agreements with Mitsubishi Caterpillar Forklift America (MCFA) effective 1 January 2010 in which MCFA became the exclusive distributor of Jungheinrich products in North America, also producing equipment developed by Jungheinrich for the North American market. Production of some models in Houston began in March 2010. The company had estimated Class 1 and 2 lift truck sales in 2013 of 1,500 units, about 3 percent of industry sales. In Class 3 sales, the company holds about 6 percent of the industry sales, which has greatly assisted MCFA in this market segment.
Landoll Corp.	Marysville, KS	2 / 5	Landoll offers Bendi, Drexel and Landoll branded narrow aisle electric and IC forklifts. The company sells products through a dealer network of about 100 locations. The company exports 15 - 20% of its annual production – primarily to Europe. Sales of all brands are estimated at roughly 300 units annually.
Aisle-Master, Ltd	Ireland	2 / 4	Capacities up to 4,400 lbs. Specialty narrow-aisle machines imported from Ireland. Sold through independent dealers in North America. Sales range from 25 – 50 units annually. Electric and LPG power available.

Table 13: Industrial Lift Trucks | Summary of Other Suppliers

Supplier	Manufacturing Location(s)	Class 1 / 2 / 3 / 4 / 5	Comments
E-P Equipment	Inman, SC	1 / 3 / 4 / 5	E-P started selling lift trucks in the US in 2002. The company, headquartered in China, manufactures and imports all machines from China. Most sales are Class 3 electric pallet trucks and stackers. We estimate sales of about 150 - 200 units annually in recent years.
Manitex Liftking (Lowry)	Woodbridge, ON Canada	4	Lowry is part of Manitex Liftking. The Lowry brand lineup has 7 models of IC cushion tire heavy duty lift trucks ranging in lift capacity from 18,000 to 45,000 lbs used in heavy industrial applications. Sales are made through independent dealers in North America. Estimated annual sales are roughly 300 units.
Royal Tractor	Olathe, KS	1 / 4 / 5	IC and electric lift trucks used in special applications. The company is in bankruptcy to our understanding. Lift truck sales are quite low in our opinion.
Schaeff (Manitex)	Bridgeview, IL	1 / 2	Schaeff, a division of Manitex International, offers stand-up and sit down electric trucks only. Sales are made through an extensive dealer network in North America, with overseas sales also made in some Latin American countries, Australia, and Algeria. Domestic sales are believed to be in the 300 unit range based on 2013 sales estimates.
Sichelschmidt	Germany	1 / 3	Sichelschmidt focuses primarily on "Explosion Proof" market applications. Trucks are distributed through Repara Lift Express in Quebec, Canada. Company is not marketing in the U.S. Sichelschmidt machines cover lift capacities of 2,500-6,600 lbs. Annual volume in North America is < 25 units.
Tailift	Taiwan	1 / 3 / 4 / 5	Introduced to the North American market in late-1996. Tailift with electric and IC trucks is represented in North America by Worldwide Wholesale Forklifts, a master distributor located in Ft. Lauderdale, FL with over 100 dealer locations. Tailift trucks have lift capacities ranging from 3,000 to 22,000 lbs. Tailift manufactures forklifts in Taiwan since 1987. Flexi (articulated) forklifts are also part of the Tailift line of machines. Sales of all trucks are estimated at 300 – 400 units annually. Tailift and Toyota Industries Corp. (TICO) signed an agreement in April 2014 in which Toyota will invest in Tailift and assist in product expansion and marketing of the Tailift product line of machines. No formal takeover of the lift truck business will occur before 2020, and Tailift will continue operating as it is until 2020.
Taylor Machine Works	Louisville, MS	4 / 5	IC cushion tire lift trucks with lift capacities of 18,000- to 30,000-lbs. Pneumatic tire IC trucks are offered from 16,000- to 120,000-lbs. Privately held company. Sells through independent dealers. Exports a high portion of production. Domestic sales estimated at 300 – 400 units annually during the past three years.
World-Lift	Taiwan	1 / 4 / 5	Like Tailift, this company is represented by Worldwide Wholesale Forklifts of Fort Lauderdale, FL. with 120 dealers in the U.S. and Canada. The product line includes IC cushion and pneumatic tire lift trucks, as well as a limited lineup of electric sit-down machines. Domestic sales are estimated to be 100 to 150 units annually at best.
Combilift	Greensboro, NC	1 / 2 / 4 / 5	Global headquarters for Combilift in Ireland. Specialty lift trucks are imported from there. Long-load handling market is the specialty of the company's product line. Machines include IC and electric trucks. Lift capacities range from 5,000 to 55,000 lbs. LP gas, diesel and electric available. Sales through independent dealers in North America. Domestic sales estimated at 400 – 700 units annually in recent years.

Source: Yengst Associates / Company Information



Table 14: Industrial Lift Trucks – Manufacturer Addresses

Big Lift, LLC 1060 N. Garfield Street Lombard, IL 60148 (630) 916-2600 www.bigjoeforklifts.com	Clark Material Handling Company 700 Enterprise Dr. Lexington, KY 40510 (859) 422-6400 www.clarkmhc.com	Hyster Company 1400 Sullivan Drive Greenville, NC 27834 800-497-8371 www.hysterusa.com
Crown Equipment Corp. 44 S. Washington St. New Bremen, OH 45869 (419) 629-2311 www.crown.com	Doosan Infracore 4350 Renaissance Pkwy Warrensville Heights, OH 44128 (216) 595-1212 www.doosanlift.com	Raymond Corp. PO Box 130 Greene, New York 13778 (607) 656-2311 www.raymondcorp.com
Heli Americas 2005 Fletcher Creek Dr. Memphis, TN 38133 901-255-0735 www.heliamericas.com	Hoist Liftruck Mfg., Inc. 6499 W. 65 th St. Bedford Park, IL 60638 Phone 708.458.2200 www.hoistlift.com	TCM America, Inc. by Unicarriers 107 McQueen Street West Columbia, SC 29172 803-791-5205 www.tcmforklifts.com
Hyundai Construction Equipment Americas 6100 Atlantic Blvd. Norcross, GA 30071 678-823-7777 www.hceamericas.com	MCFA Jungheinrich 2121 West Sam Houston Pkwy North Houston, TX 77043 (713) 365-1000 www.jungheinrich.com	Yale Materials Handling Corp. 1400 Sullivan Drive Greenville, NC 27834 (252) 931-5100 www.yale.com
Komatsu Forklift (USA) Inc. One Continent Towers Rolling Meadows, IL 60008 847-437-5800 www.komatsuamerica.com	Linde Material Handling North America 2450 West 5 th North St. Summerville, SC 29483 (843) 875-8000 www.lmh-na.com	Toyota Material Handling USA, Inc. 5559 Inwood Dr. Columbus, OH 47201 812-341-3810 www.toyotaforklift.com
Manitex Lifting ULC 7135 Islington, Ave. Woodbridge, ON L4L1V9 Canada (905) 851-3988 www.manitexlifting.com	Nissan by Unicarriers Americas 240 N. Prospect St. Marengo, IL 60152 (815) 568-0061 www.nissanforklift.com	Worldwide Wholesale Forklifts 2810 SW 2 nd . Avenue Ft. Lauderdale, FL 33155 (954) 768-9875 www.worldwideforklifts.com
Schaeff Lift Truck, Inc. (Manitex) 7402 W. 100 Place Bridgeview, Illinois 60455 (708) 430-5300 www.schaeffinc.net	Taylor Machine Works, Inc. 650 North Church Avenue Louisville, MS 39339 (662) 773-3421 www.taylorbigred.com	Chrisman Manufacturing, Inc. 7399 Beatline Road Long Beach, MS 39560 228-864-6293 www.navigatorforklift.com
Landoll Corporation 1900 North Street Marysville, KS 66508 (785) 562-5381 www.landoll.com	Kalmar USA 103 Guadalupe Drive Cibola, TX 78108 210-599-6541 www.kalmarind.com	Princeton Delivery Systems, Inc. 415 E. Dundee St. Ottawa, KS 66067 800-331-5851 www.piggy-back.com
Professional Materials Handling Co. Steinbock Boss Lift Trucks 6932 Hanging Moss Rd. Orlando, FL 407-677-0040 www.pmh-co.com	Tailift USA 11778 San Marino Street Rancho Cucamonga, CA 91730 (909) 930-9801 www.tailift.com/usa2	UTILEV 1400 Sullivan Drive Greenville, NC 27834 252-931-5100 www.northamerica.utilev.com

Table 14: Industrial Lift Trucks – Manufacturer Addresses (continued)

HAMECH 40 South Washington, Street New Bremen, OH 45869 419-629-2311 www.crown.com	Mitsubishi Caterpillar Forklift America 2121 Sam Houston Pkwy North Houston, TX 77043 713-365-1000 www.mitforklift.com	LIFT RITE, Inc. 5975 Falbourne Street, Unit # 3 Mississauga, ON L5R 3L8 Canada 905-546-2603 www.liftright.com
EP Equipment USA 1770 Campton Rd. Inman, SC 29349 864-472-2776 www.epequipmentusa.com	Combilift USA 303 Concord Street Greensboro, NC 27406 877-266-2456 www.combilift.com	

Source: Company Information

**Table 15: Industrial Lift Truck Specifications
Electric Counterbalanced and Narrow Isle (Classes 1 and 2)**

Manufacturer	Number of Models		Capacity Range (lbs)
	Class 1	Class 2	
Big Joe	1	1	1,000 – 3,500
Bendi (Landoll)	--	5	3,000 – 5,500
Caterpillar (MCFA)	20	14	3,000 – 12,000
Clark MH	20	5	2,500 -6,500
Crown	19	5	3,000 – 6,000
Doosan	19	2	2,500 – 10,000
Drexel (Landoll)	2	8	3,000 – 12,000
Elwell-Parker	4	--	- 22,000
Heli Americas	2	--	4,000 – 5,000
Hyster-Yale	29	20	2,000 – 12,000
Hyundai	10	-	3,000 – 6,500
Jungheinrich (MCFA)	5	9	1,900 – 11,000
Kalmar	8	8	3,000 – 6,000
Komatsu	11	3	3,000 – 6,500
Landoll		2	2,500 – 3,000
Linde	6	16	3,000 – 10,000
Mitsubishi (MCFA)	14	13	3,000 – 6,000
Nissan	15	5	3,000 – 8,000
Raymond (Toyota)	2	11	3,000 – 8,000
Schaeff (Manitex)	4	15	2,500 – 12,000
Tailift	14	0	3,000 – 6,000
TCM	7	-	3,000 – 8,000
Toyota	20	10	3,000 – 12,000
World Lift	6	--	3,000 – 6,000

Source: Company Information

**Table 16: Industrial Lift Truck Specifications
Electric Walkie Trucks (Class 3)**

Manufacturer	Number of Models	Capacity Range (lbs)
Big Joe	9	1,000 – 4,500
Barrett (UniCarriers)	12	3,000 – 8,000
Clark MH	15	2,200 – 4,000
Crown	13	2,000 – 4,000
Doosan	6	3,000 – 10,000
Heli Americas	1	4,500
Hyster	19	4,000 – 8,000
Jungheinrich (MCFA)	8	2,200 – 8,000
Linde	6	3,000 – 8,000
Mitsubishi (MCFA)	13	2,200 – 5,500
Nissan (UniCarriers)	7	3,000 – 8,000
Raymond (Toyota)	9	2,000 – 8,000
Tailift	6	1,600 – 3,500
TCM (UniCarriers)	14	3,000 – 8,000
Toyota	28	2,000 – 8,000
Yale	10	2,500 – 8,000

Source: Company Information

Table 17: Industrial Lift Truck Specifications – IC Cushion Tires (Class 4)

Manufacturer	No. of Models	Capacity Range (lbs)	Engine Supplier Options	Transmission Type
Bendi (Landoll)	1	4,000	GM	Hydrostatic
Caterpillar (MCFA)	18	3,000 – 15,500	Mitsubishi / GM	Powershift
Clark MH	12	3,000 – 16,500	Mitsubishi / GM	Powershift
Crown	4	4,000 – 6,500	John Deere	Powershift
Doosan	7	4,000 – 12,000	Mitsubishi / GM	Powershift
Heli Americas	3	4,000 – 6,000	GM	Powershift
Hyster	15	2,500 – 15,500	Mazda / GM / Perkins	Powershift
Hyundai	2	3,000 – 3,500	Mitsubishi	Powershift
Crown (Hamech)	2	3,000 – 6,500	Hyundai/GM	Powershift
Kalmar	7	3,000 – 10,000	Nissan / Perkins	Powershift / Hydrostatic
Komatsu	11	3,000 – 14,000	Nissan	Powershift
Landoll	1	4,000	Perkins / Deutz / Continental	Hydrostatic
Linde	8	3,000 – 6,500	Volkswagen	Hydrostatic
Liftking (Manitex)	8	18,000-40,000	GM/Cummins	Powershift
Mitsubishi (MCFA)	14	4,000 – 15,500	Mitsubishi / GM	Powershift
Nissan (UniCarriers)	15	3,000 – 8,000	Nissan	Automatic
Tailift	5	3,500 -8,000	Isuzu, Yanmar, Nissan, GM	Automatic
Taylor	8	18,000-50,000	Cummins	Powershift
TCM (UniCarriers)	7	3,000 – 8,000	Nissan / Isuzu / Mitsubishi	Powershift
Toyota	16	3,000 – 15,500	Toyota	Powershift
World Lift	6	3,000 – 8,000	GM / Perkins / Yanmar	Powershift
Yale	6	3,000 – 15,500	Mazda / GM	Powershift

Source: Company Information

Table 18: Industrial Lift Truck Specifications – IC Pneumatic Tires (Class 5)

Manufacturer	No. of Models	Lift Capacity Range (lbs)	Engine Supplier Options	Transmission Type
Caterpillar (MCFA)	30	3,000 – 33,000	Mitsubishi / GM / Perkins	Powershift
Chrisman Mfg.	4	4,000 – 6,500	Kubota	Hydrostatic
Clark Mat. Hand.	17	3,000 – 18,000	Mitsubishi / Perkins / GM Yanmar / Iveco	Powershift
Crown	4	4,000 – 6,500	John Deere	Powershift
Doosan	15	3,000 – 33,000	Kubota / Yanmar Doosan / GM	Powershift / Autoshift
Drexel (Landoll)	1	6,000	GM	Hydrostatic
Crown (Hamech)	15	3,000 – 18,000	Yanmar/Iveco/GM/Deutz/Hyundai	Powershift
Heli Americas	21	2,000 – 40,000	GM/ Mitsubishi/Cummins/Kubota	Powershift/Various
Hyster	42	2,500 – 105,000	Mazda / GM / Perkins/Cummins	Powershift
Hyundai	9	3,000-15,500	Kubota / Yanmar / Hyundai / Mitsubishi	Powershift
Kalmar	11	3,000 – 18,000	Nissan	Powershift / Hydrostatic
Komatsu	37	3,000 – 35,000	Nissan / Komatsu	Powershift
Linde	24	3,000 – 40,000	Perkins / Deutz / Volkswagen	Hydrostatic
Mitsubishi (MCFA)	18	3,000 – 35,000	Mitsubishi / GM	Powershift
Nissan (UniCarriers)	14	3,000 – 17,500	Nissan	Automatic/Powershift
Princeton	10	4,500 – 8,000	Perkins, Kubota	Hydrostatic
Tailift	6	3,000 – 22,000	Isuzu / Yanmar / Perkins Nissan / GM	Automatic/Powershift
Taylor	20	16,000 – 120,000	Perkins / Cummins	Powershift
TCM (UniCarriers)	17	3,000 – 22,000	Nissan / Isuzu / Mitsubishi	Powershift
Toyota	36	3,000 – 51,000	Toyota / Hino	Powershift
World Lift	12	3,000 – 22,500	GM / / Perkins / Yanmar	Powershift
Yale	7	3,000 – 36,000	Cummins / Mazda / Yanmar / GM	Powershift

Source: Company Information

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