TERMINAL TRACTORS

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NACFE
NORTH AMERICAN COUNCIL FOR FREIGHT EFFICIENCY

Market Segment & Fleet Profile Fact Sheet

Operational Characteristics

Duty Cycle	Single to multiple shifts
Operation	High idle and high run rate
Daily Range – On Road	Less than 150 miles
Daily Range – Off Road	Less than 100 miles
Routes	Fixed
Fueling	Between shifts
Fuel Consumption	2.5 gallons/hour
Replacement Cycle	10 -12 years
Average Age	6 years
Axle Configuration	4x2 (most common) & 6x2

Definition

Terminal tractors are Class 8 vehicles used to move semi-trailers and shipping containers (loaded or empty) short distances quickly and efficiently. They are commonly operated in warehouses, ports, cargo yards, truck terminals and cross dock facilities, and can be configured for both on-road and off-road applications. They are known by a variety of names, including yard truck, yard hostler, yard jockey, spotter truck and shunt truck.

Notable features include a single cab offset for improved driver visibility, a short wheelbase for tighter turning radius and a sliding rear door for drivers to efficiently couple and uncouple from trailers.

Increased maneuverability, especially in small spaces, make terminal tractors three to 10 times faster at moving trailers and/or containers than day cabs.

Diesel vs. Electric Comparison

Using Kalmar specs as a representative sample for terminal tractors

Kalmar T2	Vehicle	Kalmar T2e
Diesel	**Fuel Type**	Electric
81,000	**GCWR**	81,000
14,500	**Approx. Weight**	20,000
126”	**Height**	126”
97”	**Width**	97”
116”	**Wheelbase**	126”
191”	**Overall Length**	201”
200 - 240	**Horsepower**	215
540	**Torque** (lbs-ft)	500
25 mph	**Max Speed**	45 mph
$100,000 – $117,000	**Purchase Price** (USD)	$272,000 - $349,000

Market Summary

The terminal tractor market, globally, is estimated to grow from about $700M USD in 2021 to more than $850M USD in 2026. Currently in the US and Canada, there are approximately 25,242 terminal tractors in operation. Traditional OEMs include Kalmar, Terberg, Capacity Trucks, TICO Tractors, and Autocar. However, Kalmar, BYD, Lonestar SV, and Orange EV are also producing electric versions.

Run on Less – Electric included three brand new or remanufactured fully electric terminal tractors, all of which are available in the market today. Remanufacturing reuses the durable parts of an existing tractor, like the cab and frame, and restores them to like-new condition before they enter the electric truck production line.

The terminal tractors featured were the Kalmar Ottawa T2e, which is the electric version of the company’s diesel T2 product platform; the Orange EV T Series, which offers both new and remanufactured options; and the Lonestar SV S22, which is fully a remanufactured tractor. Collectively, the duty cycles for these terminal tractors were highly representative of the overall market segment.

Both the Kalmar T2e and the Lonestar SV S22 terminal tractors operated alongside traditional diesel yard trucks at their respective locations.

Because they are captured assets limited to warehouse yards or complexes, and the current battery technology fits the operational requirements of terminal tractors, **NACFE considers this segment to be 100% electrifiable.**

Run On Less – Electric Findings & Metrics

Diesel terminal tractors with aftertreatment (on-road highway emissions standards became mandatory with model year 2020) have significantly more downtime than previous models.

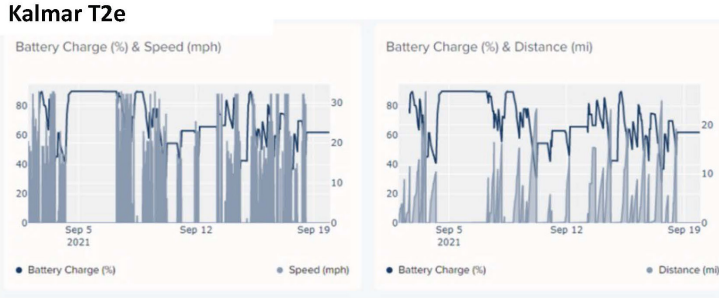
Based on the duty cycle and frequency of intermittent charging, fleets may be able to reduce the battery pack size, which will lower the overall cost of the vehicle without sacrificing performance. One fleet indicated they had yet to see the battery state of charge lower than 70%.

Terminal tractors can be calibrated to one pedal driving to maximize energy capture from regenerative braking, which equates to increased range and longer lasting brakes.

Kalmar is finding the power consumed to charge their terminal tractor is less than originally expected, resulting in less impact to the supporting infrastructure.

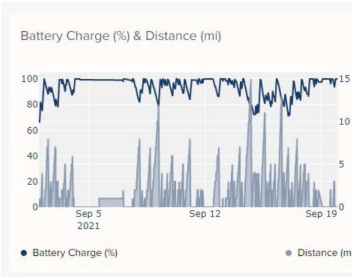
In many cases, utility engagement was low with the initial terminal tractor deployments because of the lower power requirements.

Kalmar T2e

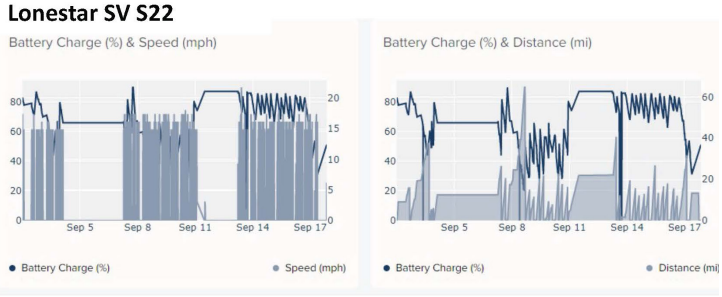


Orange EV T Series

Not Available



Lonestar SV S22



To view the Kalmar metrics in more detail, click here.

To view the Orange EV metrics in more detail, click here.

To view the Lonestar metrics in more detail, click here.

If 100% of the terminal tractors in the US and Canada were electrified, it would require approximately 726 gWh of electricity for charging and result in the avoidance of 929,687 MT CO_2e* annually.

** Carbon dioxide equivalent, used in GHG reporting to bundle greenhouse gases into a single number.*

NFI
Kalmar T2e

Ruan
Orange EV T Series

Ryder Logistics
LoneStar SV S22

	Kalmar T2e	Orange EV T Series	Lonestar SV S22
ROL-E Site	Chino, CA	Otsego, MN	Georgetown, KY
Fleet	NFI	Ruan	Ryder Logistics
Facility Details	8 warehouse complex	300,000 sq ft warehouse	1,300 acre campus
Weather – Temp Range	58 – 101 degrees F	46 – 89 degrees F	54 – 86 degrees F
Duty Cycle Requirement	22 hours / day	10 hours / day	22 hours / day
Battery Capacity	132 - 220 kWh	160 kWh	224 kWh
Battery Range	Up to 20 hours	22 hours	Over 22 hours
Battery Chemistry	Li-ion	LFP	NMC
Charging Power	70 kW	22 kW	162 kW
Battery Charger	Proprietary	Proprietary (not UL certified)	CCS1
Total Runtime	297 hours	-	367 hours
Total Miles	386	270	598
Estimated Moves	718	60 / day (per fleet)	462
% of Speed <20 mph	77%	-	100 %
Charging Opportunity	Intermittent	Intermittent	Intermittent
Charger Location(s)	Near breakroom	Near office / breakroom	Near breakroom / shop
Charging Port on Tractor	Behind cab on left side	Nose	Nose
Parking to Charge	Back-in	Nose-in	Nose-in