

# HYSTER COMPANY

## PRODUCT ASSESSMENT OF COMPETITIVE REACH TRUCKS

### HYSTER N35-40ZR AC vs CROWN RR 5220-35

Hyster Company has compared the published specifications and performance data on the new Hyster N35-40ZR and the Crown RR 5220-35. Trucks of equivalent specifications and options have been purchased – these are the trucks that will be compared alongside each other in the Invitation to Compare II events throughout 2007. The following pages cover –

1. A side-by-side productivity comparison of the Hyster N35-40ZR AC and Crown RR 5220-35 in published performance specifications.
2. An assessment by Hyster Engineers of the comparative design, features and benefits of the Hyster N35-40ZR AC and Crown RR 5220-35 Reach Trucks.

## PRODUCTIVITY COMPARISON

### HYSTER N35-40ZR AC vs CROWN RR 5220-35

	<b>HYSTER N35-40ZR AC</b>		<b>CROWN RR 5220-35</b>	
	36 volt		36 volt	
Performance Package	Standard	High Performance	Standard	High Performance
Travel Speed, Chassis First – No Load (mph)	7.4	7.4	7.2	7.8
Travel Speed, Chassis First – Rated Load (mph)	6.5	6.5	7.2	7.2
Travel Speed, Forks First – No Load (mph)	7.4	7.4	5.7	6.5
Travel Speed, Forks First – Rated Load (mph)	6.0	6.0	5.7	5.7
Average Travel Speed (mph)	6.8	6.8	6.45	6.8
Lifting Speed – No Load (fpm)	100.0	114.0	131.0	131.0
Lifting Speed – Rated Load (fpm)	64.0	72.0	81.0	81.0
Lowering Speed – No Load (fpm)	95.0	95.0	85.0	85.0
Lowering Speed – Rated Load (fpm)	95.0	95.0	90.0	90.0
Average Lifting / Lowering Speed	88.5	94.0	96.75	96.75
Productivity Factor	604.0	641.6	624.0	653.1

**Productivity Factor - Average Travel Speed multiplied by Average Lifting/Lowering speed.**

# PRODUCT ASSESSMENT

## HYSTER N35-40ZR AC vs CROWN RR 5220-35

### Productivity Characteristics

HYSTER N35-40ZR AC	CROWN RR5220
<ul style="list-style-type: none"> <li>- Standard AC drive and hoist motors provide fast work cycles while consuming less energy.</li> <li>- AC Electric Steering</li> </ul>	<ul style="list-style-type: none"> <li>- Optional AC drive, with only DC hoist motors can perform similar work cycles, but consume more energy.</li> <li>- Dual DC hoist motors required, using additional energy.</li> <li>- Hydrostatic Steering.</li> </ul>
<ul style="list-style-type: none"> <li>- Powered lowering increases lowering speeds within free lift, improving cycle times.</li> <li>- Regenerative lowering improves energy efficiency.</li> <li>- Hydraulic oil does not heat up.</li> </ul>	<ul style="list-style-type: none"> <li>- No powered lowering.</li> <li>- No regenerative lowering.</li> <li>- Hydraulic oils run at higher temperatures, greater amp draws.</li> </ul>
<ul style="list-style-type: none"> <li>- Productivity options: Performance Options, Auto Fork Leveling, Fork Height Display, Shelf Height Indicator, Load Weight Display, and Load Transport Position.</li> </ul>	<ul style="list-style-type: none"> <li>- Productivity options: Performance Options, Auto Fork Leveling, Fork Height Display, Shelf Height Indicator, and Load Weight Display.</li> <li>- Does not offer Load Transport Position Option.</li> </ul>
<p>Ergonomics:</p> <ul style="list-style-type: none"> <li>- Optional height adjustable backrest, armrest, and adjustable steering tiller allows operator to customize compartment to their comfort zone. Multi-function control handle integrated with adjustable armrest.</li> <li>- 9.5" step height, suspended floorplate.</li> <li>- 335 square inch floorboard.</li> </ul>	<p>Ergonomics:</p> <ul style="list-style-type: none"> <li>- Non adjustable backrest and armrest. Steering tiller protrudes into operator compartment.</li> <li>- 9.4" step height, suspended floorplate.</li> <li>- 270 square inch floorboard.</li> </ul>
<ul style="list-style-type: none"> <li>- Optional steered caster provides better traction on wet floors, and more stability at high lift heights.</li> <li>- High visibility through load back rest at first shelf level.</li> <li>- Programmable performance functions through digital display.</li> <li>- Download handle mapping is available if required.</li> </ul>	<ul style="list-style-type: none"> <li>- Steered caster not available.</li> </ul>

### Uptime Characteristics

HYSTER N35-40ZR AC	CROWN RR5220
<ul style="list-style-type: none"> <li>- AC motors and controllers provide an open, uncluttered compartment with fast and easy access to major components.</li> </ul>	<ul style="list-style-type: none"> <li>- Cluttered motor and electrical compartment does not allow for fast and easy access to major components thus lengthening service times. Access 1 2 3 maps required to locate components.</li> </ul>
<ul style="list-style-type: none"> <li>- Hyster ZR AC Series requires only one contactor, and no motor brushes resulting in fewer wearable parts, less time required to service the truck.</li> </ul>	<ul style="list-style-type: none"> <li>- Crown DC/DC truck uses 2 contactors and 12 motor brushes.</li> <li>- AC/DC truck uses 2 contactors and 8 motor brushes resulting in more wearable parts, more time required servicing the truck.</li> </ul>
<ul style="list-style-type: none"> <li>- Hyster ZR AC Series require service intervals at 500 hours for standard duty applications.</li> </ul>	<ul style="list-style-type: none"> <li>- Crown reach trucks require service intervals at 250 hours.</li> </ul>
<ul style="list-style-type: none"> <li>- Dependable electronics: The Hyster ZR AC Series uses a fully integrated Danaher system, linking the AC motors, controllers, electric steering, and vehicle system manager through CANbus technology.</li> </ul>	<ul style="list-style-type: none"> <li>- Crown uses conventional DC technology in linking modular components from various suppliers.</li> </ul>
<ul style="list-style-type: none"> <li>- Wiring system uses sealed Deutsch IP66 waterproof connectors.</li> <li>- Hydraulic system uses leak resistant Parker O-Ring Face Seals (ORFS)</li> </ul>	<ul style="list-style-type: none"> <li>- Wiring system uses unsealed AMP and Molex connectors.</li> <li>- Hydraulic system uses standard 37 degree flange fittings, metal on metal, and susceptible to leaks.</li> </ul>
<ul style="list-style-type: none"> <li>- Easy ETAC access to diagnose, setup, and down load enhancements.</li> </ul>	<ul style="list-style-type: none"> <li>- Access 1-2-3</li> </ul>

### Value Characteristics

HYSTER N35-40ZR AC	CROWN RR5220
<ul style="list-style-type: none"> <li>- The high reliability factor of AC motors and controls, coupled with the lack of wearable parts, result in greater uptime.</li> <li>- 500 hr, first PM</li> </ul>	<ul style="list-style-type: none"> <li>- 250 hr, first PM</li> </ul>
<ul style="list-style-type: none"> <li>- Cost of ownership is reduced due to less energy required by the truck to complete the same amount of work, as a result of AC technology.</li> </ul>	<ul style="list-style-type: none"> <li>- Cost of ownership increased due to more energy required to complete the same amount of work, due to DC technology.</li> </ul>
<ul style="list-style-type: none"> <li>- Cost of ownership is reduced due to fewer parts being consumed, longer service intervals, and less time required for maintenance resulting in greater uptime.</li> </ul>	<ul style="list-style-type: none"> <li>- Cost of ownership is increased due to more parts being consumed, shorter service intervals, and more time required for maintenance resulting in greater downtime.</li> </ul>
<ul style="list-style-type: none"> <li>- Standard 24 month, 4,000 hour warranty on major components such as drive unit, motors, and controllers.</li> <li>- Standard 180 day warranty on spare parts, from date of installation.</li> </ul>	<ul style="list-style-type: none"> <li>- Standard 12 month, 2,000 hour warranty on major components.</li> </ul>