



SERVICE MANUAL

Challenger

H30H

H40H

H50H

H60H

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

1. When lifting components, double check all slings, chains or cables to make sure that they are properly tied, fastened and balanced before lifting. Make certain that the cable or chain is capable of retaining the weight to be lifted.
2. Do not attempt to lift heavy parts by hand when a lifting device should be used.
3. Wear safety glasses when performing any maintenance or repair work.
4. DISCONNECT THE BATTERY CONNECTOR before performing any service or repair.
5. Never leave the unit and/or heavy parts in an unstable position. Always block the unit with appropriate materials.
6. Keep the unit and working area clear of lubricants and litter.
7. Use proper tools for the job at hand.
8. Keep tools in first-class condition.
9. Always use **HYSTER APPROVED** parts that are designed for the unit being repaired. This ensures maximum service life of the unit.
10. Carefully check to see that all necessary nuts, bolts, snap rings and other locking devices are removed before using force to remove components.
11. Always attach a sign in the control area stating **DO NOT OPERATE** when the unit is being repaired.
12. Always observe the **WARNING** and **CAUTION** Statements given in this Service Manual.
13. When charging the battery: Keep vent caps installed and functioning properly; take precautions to prevent sparks and open flames near the battery; and position battery cover to allow for ventilation and dispersing of explosive fumes.

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1-1. GENERAL.

1-2. This service manual contains Maintenance and Repair instructions for the Challenger H30H-H60H Series Lift Trucks. Functional descriptions are also included in this manual to aid the repairman in understanding the construction and operation of the major systems of the lift truck. Trouble analysis tables are given to aid in isolating system malfunctions.

1-3. UNIT NAMEPLATE.

1-4. The unit nameplate is located on the seat plate at the right-hand side of the operator's compartment. The data listed on the nameplate is shown in figure 1-3.

1-5. SERIAL NUMBER DATA.

1-6. The unit serial number is located on the unit nameplate. It is also stamped on the right-hand side of the unit frame, just forward of the overhead-guard brace as shown in figure 1-1. The serial number indicates the design series, manufacturing plant, serial number of the unit and the year manufactured.

Example: D3 D 0000 R
 (1) (2) (3) (4)

1. The first letter and number of the serial number indicates the design series and model number of the unit. This letter and number constitutes



FIGURE 1-1. H30H-H60H SERIES LIFT TRUCK, RIGHT-HAND SIDE VIEW

Introduction

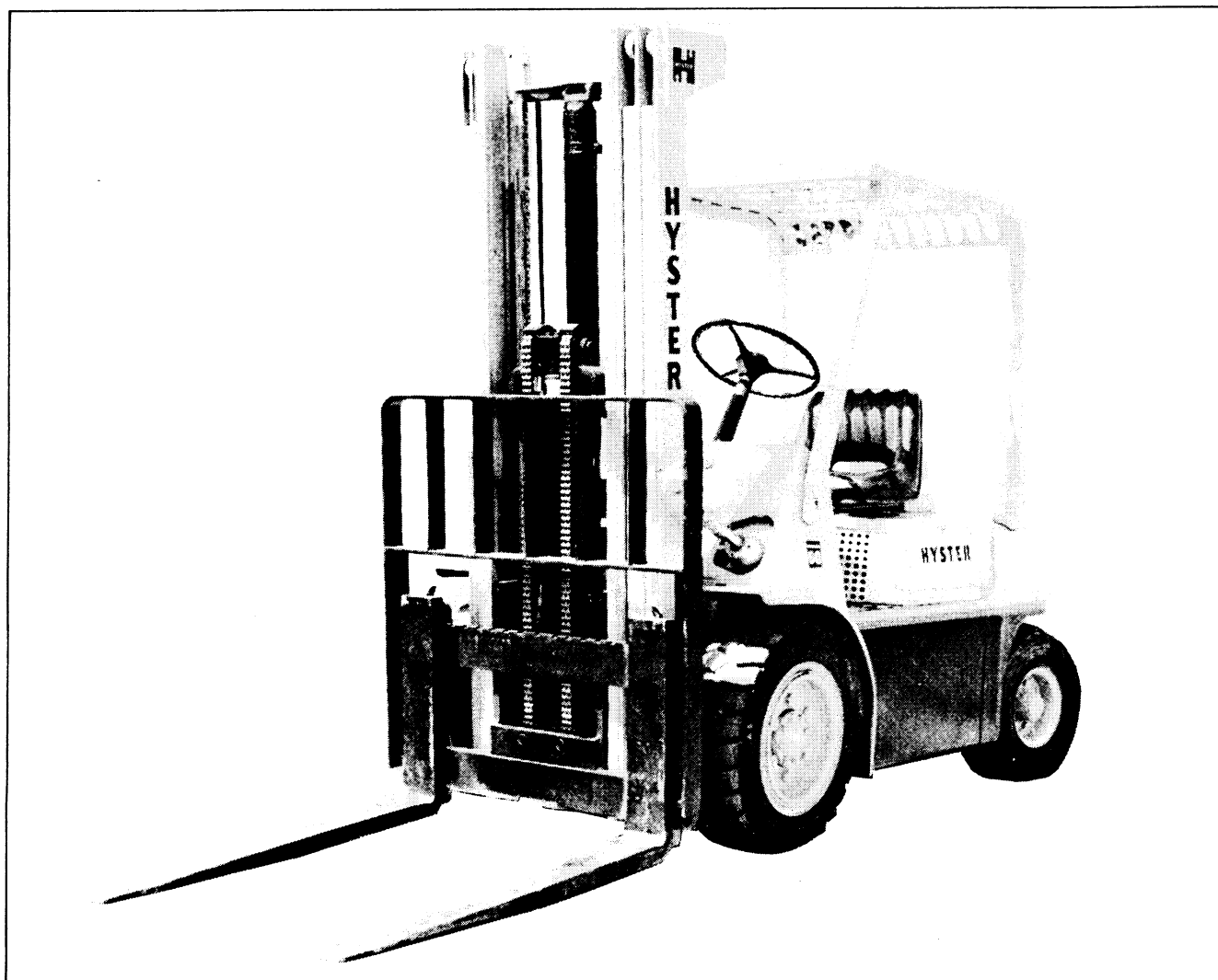


Figure 1-2. H30H-H60H SERIES LIFT TRUCK, LEFT-HAND SIDE VIEW

the serial number prefix. In the example, D3 denotes the H40H-H60H Series of Industrial trucks.

2. The second letter indicates the plant at which the unit was manufactured. The following list identifies the plants by their letter code.

A. Scotland	F. France	P. Portland
B. Tacoma	G. Belgium	R. Ipswich
C. Kewanee	H. South Africa	S. Australia
D. Danville	J. Africa	T. Canada
E. Nimegen	L. Peoria	Y. Brazil
	N. New Zealand	

3. The number series indicates the unit serial number.

4. The final letter indicates the year of manufacture, starting with the letter "A" in 1957. * The letters "I", "O" and "Q" are not used.

A. 1957	G. 1963	N. 1969	U. 1974
B. 1958	H. 1964	O. *	V. 1975
C. 1959	I. *	P. 1970	W. 1976
D. 1960	J. 1965	Q. *	X. 1977
E. 1961	K. 1966	R. 1971	Y. 1978
F. 1962	L. 1967	S. 1972	Z. 1979
	M. 1968	T. 1973	

1-7. SYSTEM DESIGN SPECIFICATIONS.

1-8. Design specifications for the individual system of the lift trucks are listed in Section 2. Engine tune-up and Maintenance specifications are also given in Section 4.

1-9. SERVICE AND MAINTENANCE INSTRUCTIONS.

1-10. Service instructions such as carburetor adjustment, breaker point adjustment and valve timing are

Introduction

given in Section 4. Maintenance procedures such as lubrication and filter replacement intervals are also given in Section 4.

1-11. TROUBLESHOOTING.

1-12. Trouble Analysis tables for each major system are given in Section 3.

1-13. SYSTEM REPAIR INSTRUCTIONS.

1-14. Sections 5 through 13 contain repair instructions for the major systems of the truck as listed in the table of contents.

1-15. SAFETY PRECAUTIONS.

1-16. When performing any maintenance or repairs, always observe the Safety Precautions given on the inside of the front cover of this Service Manual. When operating the unit, observe the safety precautions given in the applicable Owners and Operators Guide supplied with the equipment.

1-17. OPERATING THE TRUCK.

1-18. Operating instructions can be found in the applicable Owners and Operators Guide supplied with the equipment.

FOR SAFETY:		HYSTER LIFT TRUCK MODEL	
Trained Operator Only		Meets design specs Part II, ANSI B56.1-1969	
		Serial no.	
Know lift truck safety rules, operation and maintenance instructions contained in your owner's and operator's guide or available from HYSTER dealers.		Attachment	
		Approx. weight with Cwt. lb. without Cwt. lb.	
		Back tilt degrees	
		Tire pressure p.s.i. fr. rear	
		Drive tread width in.	
		Rated capacity with upright vertical and equipped as shown	
		Load height "A" in.	
		Maximum load at load center "B"	
		With counter weight Without counter weight	
		lb. in.	lb. in.
		lb. in.	lb. in.
		lb. in.	lb. in.

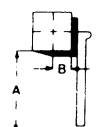


FIGURE 1-3. UNIT NAMEPLATE



2-1. GENERAL.

2-2. This section contains specification tables for each major system of the truck. Additional specification tables are included for truck dimensions, performance, tires and torques. The following is a list of the specification tables included in this section:

TABLE	TITLE	TABLE	TITLE
2-1	Truck Dimensions and Weights	2-10	Steering System Specifications
2-2	Equipment Specifications	2-11	Hoist System Specifications
2-3	Performance Specifications	2-12	Brake System Specifications
2-4	Rated Capacities	2-13	Transmission and Oil Clutch Specifications
2-5	Tire Specifications	2-14	Differential Specifications
2-6	Gasoline Fuel System Specifications	2-15	Gasoline Engine Specifications
2-7	LPG Fuel System Specifications	2-16	Diesel Engine Specifications
2-8	Diesel Fuel System Specifications	2-17	Torque Specifications
2-9	Electrical System Specifications		

TABLE 2-1. TRUCK DIMENSIONS AND WEIGHTS

TRUCK	DIMENSIONS (INCHES)									WEIGHT (POUNDS)
	A	B	C	D	E	F	G	H	I	J
H30H	82.0	45.25	93.75	7.00	61.25	17.75	14.75	43.0	63.25	7,100
H40H	82.0	45.25	94.75	7.00	61.25	17.75	15.75	43.0	63.25	8,100
H50H	82.0	45.25	98.50	7.00	61.25	17.75	19.50	43.0	63.25	8,800
H60H	81.5	47.50	102.75	6.75	68.00	18.50	16.25	42.5	63.25	10,300
TRUCK	DIMENSIONS (MILLIMETERS)									WEIGHT (KILOGRAMS)
	A	B	C	D	E	F	G	H	I	J
H30H	2085	1,150	2,380	180	1,555	450	375	1,095	1,605	3,220
H40H	2085	1,150	2,405	180	1,555	450	400	1,095	1,605	3,670
H50H	2085	1,150	2,500	180	1,555	450	495	1,095	1,605	3,990
H60H	2070	1,205	2,605	170	1,725	470	410	1,080	1,605	4,670
<p>A. Vertical Clearance (Hoist Lowered)</p> <p>B. Maximum Unloaded Width (Standard Tires)</p> <p>C. Overall Length (Standard Upright, Without Forks)</p> <p>D. Ground Clearance</p> <p>E. Wheel Base</p> <p>F. Distance From Drive Axle to Load (Standard Uprights)</p> <p>G. Distance From Steering Axle to Counterweight</p> <p>H. Distance From Ground To Operator's Seat</p> <p>I. Maximum Unloaded Width (With Optional Dual Wheels)</p> <p>J. Weight (Truck Weights Are For Trucks Equipped With Standard Uprights, 36-inch Forks, 36-inch Load Backrest and Maximum-Size Battery)</p>										
NOTE: See Figure 2-1 for Dimension Locations										

Specifications

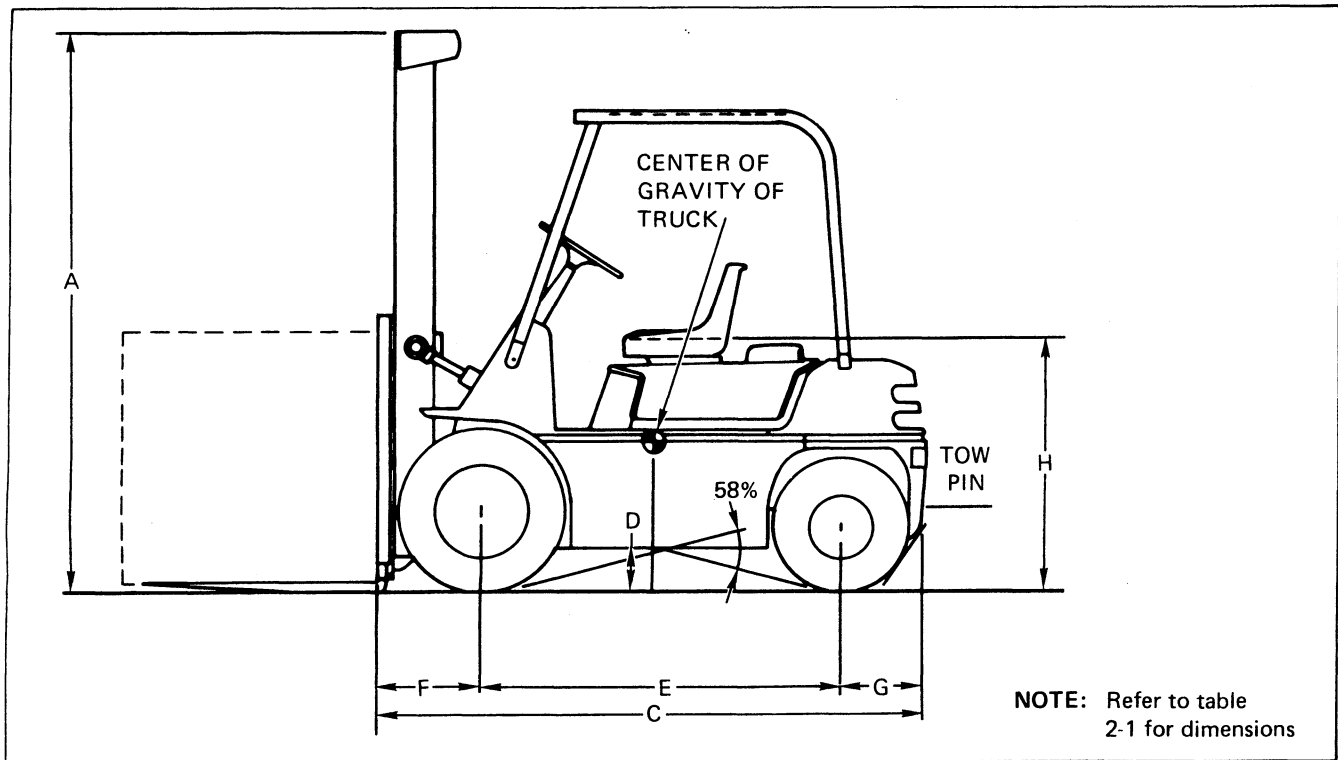


Figure 2-1. Truck Dimensions

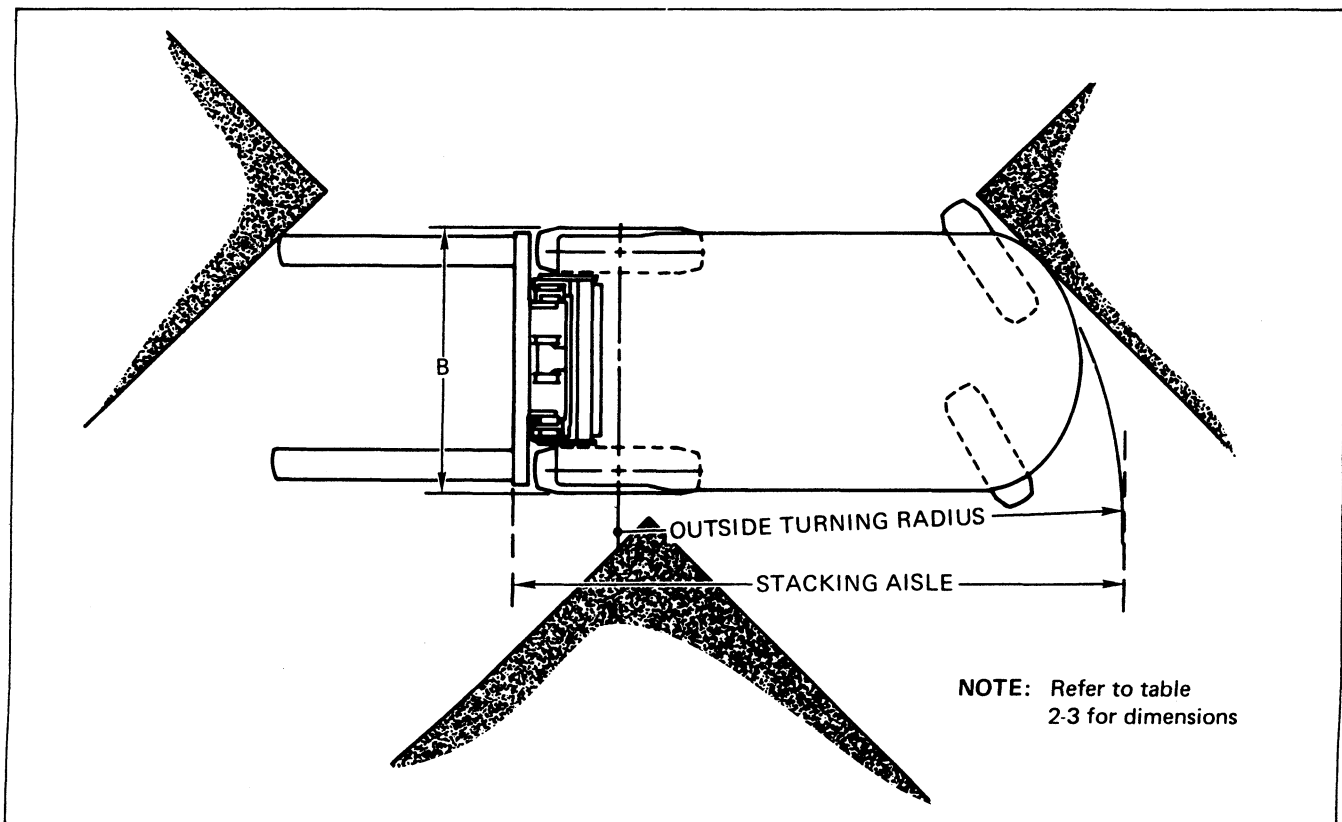


FIGURE 2-2. STACKING AND INTERSECTING AISLE

TABLE 2-2. EQUIPMENT SPECIFICATIONS

UPRIGHTS: TYPE	MAXIMUM FORK HEIGHT (TOP OF FORKS)				OVERALL HEIGHT							
					LOWERED				EXTENDED*			
	H30H, H40H H50H		H60H		H30H, H40H, H50H		H60H		H30H, H40H, H50H		H60H	
	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM
STANDARD	106.0	2690	100.5	2550	73.5	1870	73.0	1850	130.5	3310	127.0	3230
	118.0	3000	112.5	2860	79.5	2020	79.0	2010	142.5	3620	139.0	3530
	130.0	3300	124.5	3160	85.5	2170	85.0	2160	154.5	3920	151.0	3840
	150.0	3810	144.5	3670	95.5	2430	95.0	2410	174.5	4430	171.0	4340
FREE- LIFT	106.0	2690	100.5	2550	73.5	1870	73.0	1850	130.5	3310	127.0	3230
	118.0	3000	112.5	2860	79.5	2020	79.0	2010	142.5	3620	139.0	3530
	130.0	3300	124.5	3160	85.5	2170	85.0	2160	154.5	3920	151.0	3840
	150.0	3310	144.5	3670	95.5	2430	95.0	2410	174.5	4430	171.0	4340
THREE- STAGE	151.5	3850	141.5	3590	71.5	1820	71.5	1820	176.0	4470	168.0	4270
	169.5	4310	159.5	4050	77.5	1970	77.5	1970	194.0	4930	186.0	4720
	187.5	4760	177.5	4510	83.5	2120	83.5	2120	212.0	5380	204.0	5180
	199.5	5070	198.5	5040	89.5	2270	92.5	2350	224.0	5690	225.0	5720
	217.5	5520	216.5	5500	95.5	2430	98.5	2500	242.0	6150	243.0	6170
* Without load backrest extension.												
LOAD CARRIAGES (All Units) With Load Backrest Extension:												
					OVERALL WIDTH		LOAD ARM SPACING					
							IN-TO-IN MINIMUM		OUT-TO-OUT MAXIMUM			
					IN.	MM	IN.	MM	IN.	MM	IN.	MM
					42.75	1085	0	0	41.0	1040		
FORKS: 2 x 5 x 30 to 72 Inches (50 x 125 x 760 to 1830 mm) Long												

Specifications

TABLE 2-3. PERFORMANCE SPECIFICATIONS (Sheet 1 of 2)

LIFT SPEED (Rated Load)		H30H		H40H		H50H		H60H	
		ft/min	m/sec	ft/min	m/sec	ft/min	m/sec	ft/min	m/sec
Upright	Transmission								
Standard	Standard	113	0.57	113	0.57	113	0.57	98	0.50
	Powershift	103	0.52	103	0.52	103	0.52	88	0.45
Free-Lift	Standard	100	0.51	100	0.51	100	0.51	87	0.44
	Powershift	90	0.46	90	0.46	90	0.46	78	0.40
Three-Stage	Standard	108	0.55	108	0.55	108	0.55	94	0.48
	Powershift	97	0.49	97	0.49	97	0.49	84	0.43
LIFT SPEED (No Load)									
Standard	Standard	125	0.63	125	0.63	125	0.63	108	0.55
	Powershift	116	0.59	116	0.59	116	0.59	100	0.51
Free-Lift	Standard	110	0.56	110	0.56	110	0.56	98	0.50
	Powershift	102	0.52	102	0.52	102	0.52	89	0.45
Three-Stage	Standard	120	0.61	120	0.61	120	0.61	103	0.52
	Powershift	111	0.56	111	0.56	111	0.56	96	0.49
LOWERING SPEED (Rated Load)									
Standard Upright		95	0.48	95	0.48	95	0.48	110	0.56
Free-Lift Upright		90	0.46	90	0.46	90	0.46	105	0.53
Three-Stage Upright		90	0.46	90	0.46	90	0.46	105	0.53
LOWERING SPEED (No Load)									
Standard Upright		88	0.45	88	0.45	88	0.45	90	0.46
Free-Lift Upright		78	0.40	78	0.40	78	0.40	80	0.41
Three-Stage Upright		78	0.40	78	0.40	78	0.40	80	0.41
NOTE: Plus or minus 10 percent specified speeds is acceptable. Performance specifications are affected by the condition of the lift truck and how it is equipped, as well as the nature and condition of the operating area. If these specifications are critical, discuss the proposed application with a Hyster dealer.									
TRAVEL SPEEDS (All Units)		FORWARD		REVERSE					
Standard Transmission		mph	km/h	mph	km/h				
Low		7.0	11.3	7.3	11.7				
High		13.1	21.1	13.6	21.9				
Powershift		12.5	20.1	11.8	19.0				

Specifications

TABLE 2-3. PERFORMANCE SPECIFICATIONS (Sheet 2 of 2)

GRADES %	NO LOAD (Dry)	NO LOAD (Wet)	RATED LOAD (Gas)	RATED LOAD (LPG)	RATED LOAD (Diesel)
H30H (Std)	38	31	30	28	30
H30H (P. S.)	38	31	34	31	33
H40H (Std)	35	28	25	24	25
H40H (P. S.)	35	28	28	26	27
H50H (Std.)	31	25	22	21	22
H50H (P. S.)	31	25	25	22	24
H60H (Std.)	34	27	18	17	18
H60H (P. S.)	34	27	21	19	20

DRAWBAR PULL (All Units)	GAS		LPG		DIESEL	
	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms
Standard	3000	1360	2850	1290	3000	1360
Powershift	3400	1540	3100	1410	3250	1470

PERFORMANCE	H30H		H40H		H50H		H60H	
	In.	mm	In.	mm	In.	mm	In.	mm
Turning Radius (Inside Diameter)	6.81	173	6.81	173	6.81	173	6.87	174
Turning Radius (Outside Diameter)	83.50	2120	84.50	2145	87.75	2330	92.50	2345
Intersecting Aisle	72.25	1835	72.75	1850	74.50	1890	79.50	2020
Stacking Aisle (Standard and Free-Lift Upright)	101.25	2570	102.25	2595	105.50	2680	111.00	2815
Stacking Aisle (Three-Stage Upright)	102.00	2590	103.00	2615	106.50	2705	112.25	2845