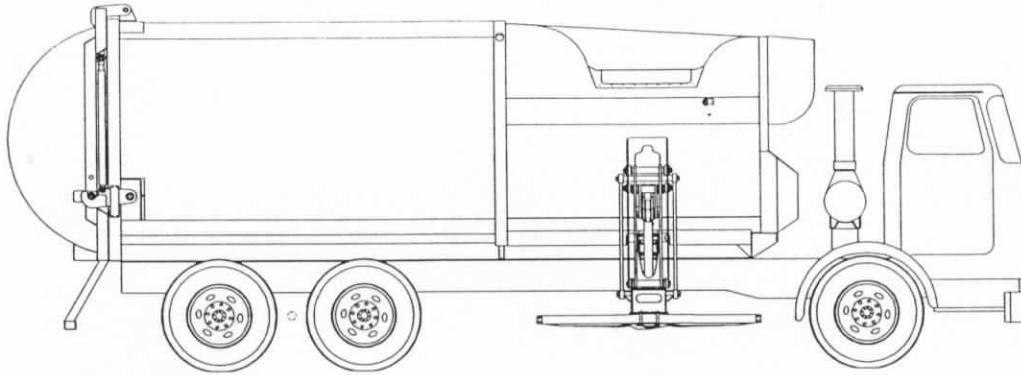




PROTOTYPE AUTOMATED ARM

- FEATURES -
WITTKE AUTO SIDE LOADER
June 6, 2000



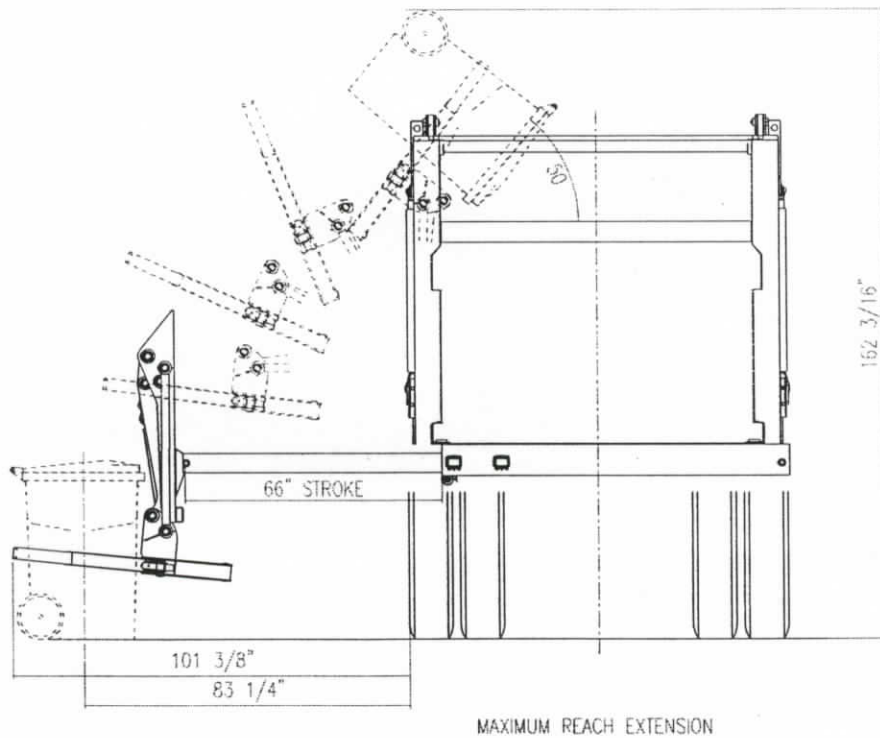
- Denison T6DCM vane pump. Vane pumps are characterized by high volumetric efficiency at low rpm, long service life and easy, inexpensive rebuild costs.
 - “Dual” Hydraulic System - lift arm circuit is fed by separate pump. Allows for independent operation of packer blade and lift. Containers can be dumped while packer blade is cycling.
 - Avantech Digital Controller – to control container lift arm. Allows for automatic control of lift speed, acceleration and deceleration without operator intervention. All programming parameters can be field adjusted to suit individual operator’s preference.
 - Low Operating RPM – Lift hydraulic system is designed to operate at engine idle. Reduction of noise and increase in fuel efficiency result.
 - Lift Speed Interlock – Lift speed is controlled through engine ECU. Engine rpm is limited to 1000 when lift is operated. Eliminates shock to arm and body as well as eliminating heat buildup and horsepower losses.
 - Simple Lift Operation – entire lift cycle is controlled with single handle joystick. Leveling of grabber is automatic and mechanical, accomplished through geometry of lift arm components.
 - Large Hopper Size –allows for fewer pack cycles. “Pack on the run” ensures that there is no waiting for pack cycle to finish.
 - Proven Body Design - uses same body design as Wittke front loader – proven over 13 years of continuous service to be strong yet light weight.
 - Full Eject Pack System – Unloading is accomplished through ejection by packer blade. Ideal for disposal at transfer stations and unstable landfill locations where ‘tip to dump’ systems would not be practical.
- Optional ‘Auto-dump Feature – can be incorporated through programming of digital controller to allow single pushbutton dump and return of container to its original pickup point.

- SPECIFICATIONS -

I. Lift Arm

A. General

- | | |
|---|------------|
| • Lift capacity | 500 lbs |
| • Container sizes (gallons) | 35, 65, 90 |
| • Reach (side of chassis to tip of grabber) | 101.4" |

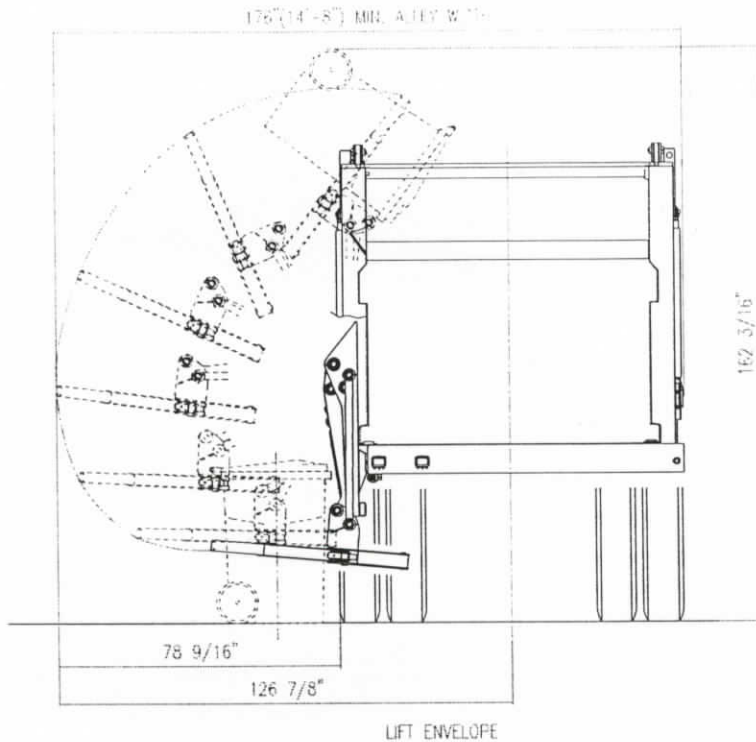


- | | |
|---|--------|
| • Reach(absolute) | 66.0" |
| • Swing out (side of chassis to tip of grabber) | 78.6" |
| • Min. pass-through width(to dump) | 76.0" |
| • Extreme height when dumping container | 163.0" |
| • Engine rpm (while dumping, max.) | 1000 |
| • Weight (as installed, complete) | 950 lb |

B. Cycle Times (seconds @ 800 rpm)

- | | |
|----------------|-----|
| • Full reach | 2.7 |
| • Full retract | 3.3 |
| • Lift 'up' | 3.6 |

• Lift 'down'	3.2
• Container 'grip'	0.5
• Container 'release'	<u>0.9</u>
Total	14.2



II. Body

A. Dimensions

• Overall length	278.9"
• Overall width	101.5"
• Overall height	134.3"
• Weight (as installed, complete with lift)	14,374 lb

B. Volume (cubic yard)

• Hopper	5.0
• Main body	22.7
• Tailgate	<u>4.3</u>

Total 32.0

C. Construction

• Hopper floor	1/4" ASTM A514
• Hopper lower walls	3/16" ASTM A715 gr. 80
• Body floor	3/16" ASTM A715 gr. 80
• Body walls	10 gauge ASTM A715 gr. 80

- Roof 10 gauge ASTM A715 gr. 80
- Tailgate 10 gauge ASTM A715 gr. 80

D. Cycle Times (seconds @1200 rpm)

- Pack 13.0
- Return 2.8
- Hopper cover close (speed controlled) 4.5
- Hopper cover open (speed controlled) 6.3
- Tailgate close (speed controlled) 10.6
- Tailgate open (speed controlled) 9.0

III. Hydraulic System

A. Specifications

- Pump – Denison Vane, dual, T6DCM. Body functions fed with 5.47 cu. in. displ.(28.4 US gpm @ 1200 rpm). Arm functions fed with 4.28 cu. in. displ. (22.2 US gpm @ 1200 rpm).
- Control valve, body – Commercial Intertech VA35, air over hydraulic.
- Control valve, arm – Nordhydraulic RSQ240, electro-hydraulic proportional.
- Reservoir size – 60 US gpm
- Reservoir filtration – 100 mesh suction screen, 5 psi pressurized breather
- Return filter – Hydac RFM-500, $\beta_{10} \geq 100$.
- Pressure filter, lift circuit – Fairey Arlon FMT100A, $\beta_{25} \geq 200$.

B. Hydraulic Cylinders

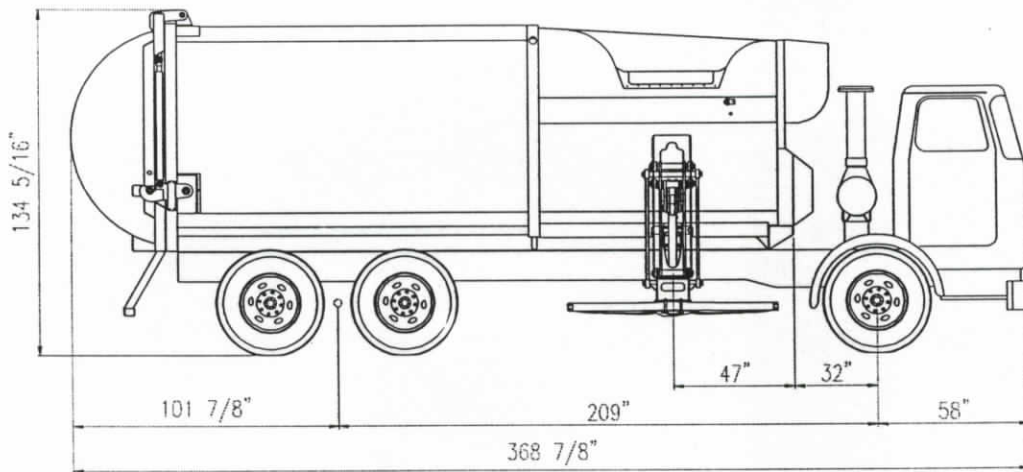
	Bore	Stroke	Shaft Dia.
Pack	5.5 x 4.5 x 3.5	168.375	3.000
Hopper Cover	2.000	12.000	1.250
Tailgate	2.500	36.000	1.750
Arm lift	2.500	17.125	1.500
Arm slide	1.500	66.000	1.000
Container Grip	2.000	4.625	1.250

IV. Control System

- A. Body – electrical switches activating pneumatic solenoid valves.
- B. Lift – Avantech digital controller, in conjunction with electronic analog dual axis joystick, for lift and slide. Gripper is controlled through rocker switch in joystick handle.

V. Payload

Payload data is based on the US Federal Bridge Law with chassis wheel base as shown below and optimal tire sizes.



	CHASSIS	BODY	TARE	PAYLOAD	GROSS	LEGAL
FRONT AXLE	9,570 lb	6,226 lb	15,797 lb	615 lb	16,412 lb	20,000 lb
REAR AXLE	7,010 lb	8,148 lb	15,157 lb	18,843 lb	34,000 lb	34,000 lb
TOTAL	16,580 lb	14,374 lb	30,954 lb	19,458 lb	50,412 lb	50,685 lb
CENTROID	88.40"	118.50"	102.30"	202.40"	141.00"	