

DEPARTMENT OF REGIONAL
ECONOMIC EXPANSION
STUDY OF OPPORTUNITIES IN
MOBILE GARBAGE COMPACTORS

A REPORT FROM

Woods, Gordon & Co.
MANAGEMENT CONSULTANTS

TD
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WOODS GORDON & Co.

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DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

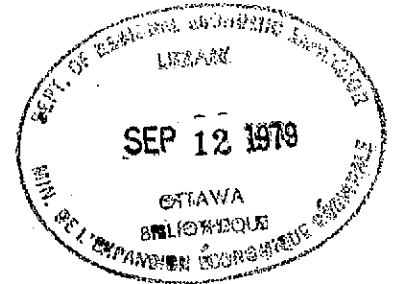
STUDY OF OPPORTUNITIES IN
GARBAGE COMPACTORS (TRUCK MOUNTED)

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JANUARY 1973



Garbage Compactors (Truck Mounted)

Summary

Sales of all types of mobile garbage compactors (packers) are approximately 400 units per year in Canada. These sales are worth \$3,675,000 excluding the value of the truck chassis. Rear loaders account for 75% of the sales, while side loaders and front loaders make up the remaining twenty-five percent.

Imports, the majority of which are rear loaders, make up 75% of the total sales and the bulk of these units normally are entered into Canada duty-free under the Canada-United States Automotive Agreement. Canadian producers supply the remaining 25% of the market, predominantly side and front loaders.

The total amount of municipal garbage generated in Canada per year (currently 1.7 million tons) is growing at a rate of between 3 and 4% per annum. This growth, however, accounts for a very small portion of the annual sales of garbage compactors as nearly all the units sold (90%) are for replacement of existing units. There are estimated to be some 2,500 to 3,000 units in use in Canada at present and the average life is between 7 and 8 years. There are some indications that the economic life of these units will be reduced to 5 to 6 years which will tend to increase annual sales in the future.

Approximately forty percent of the market is located in Ontario, thirty percent in Quebec, and ten percent in British Columbia. Alberta, Saskatchewan and Manitoba account for fourteen percent and the remaining six percent is sold in the Atlantic provinces.

Regional opportunities to manufacture garbage compactors exist in the large volume Ontario and Quebec markets as well as in British Columbia. The success of these operations, however, depends on whether the Canadian manufacturers could compete in price with the duty-free American imports. Experience of some Canadian manufacturers in this field is that it is extremely difficult to achieve reasonable profit margins and to capture a market share from the American manufacturers. Several Canadian manufacturers who have considered entering this field are reluctant at present to do so without some form of tariff protection.

While good manufacturing opportunities exist for garbage compactors in Ontario, Quebec and British Columbia, the success of a manufacturing operation would, however, depend on some form of import protection and/or access to sufficient volume to permit the producer to achieve a high degree of manufacturing efficiency.

Manufacturing efficiency may be achievable by a manufacturer who is currently producing equipment of a similar nature to garbage compactors (e.g., truck bodies, dump trucks, stationary compactors). It would also appear desirable for a manufacturer to be located away from the large urban areas of Toronto and Montreal so that premium wages would not have to be paid for the required labour skills.

An additional opportunity exists for a Canadian manufacturer to import components and sub-components and assemble units in Canada if agreements could be worked out with the American companies.

BACKGROUND

MARKET POTENTIAL

1. Canadian Home Market

There are approximately 400 mobile garbage compactor bodies sold annually in Canada amounting to a dollar value of \$3,675,000. The number and dollar value of garbage compactor units manufactured domestically and imported are:

	<u>Number of Units Sold Per Year</u>	<u>Dollar Value Of Units Sold</u>
Imported	300	\$2,632,500
Canadian Produced	<u>100</u>	<u>1,042,500</u>
Total	<u>400</u>	<u>\$3,675,000</u>

2. Sales by Type of Garbage Compactor Unit

The market breakdown by compactor type is:

<u>Type</u>	<u>Number of Units Sold Per Year</u>	<u>Percent of Total Trucks</u>	<u>Average Dollar Value Per Unit</u>	<u>Total Dollar Value by Type</u>
Rear Loader	300	75.0%	\$ 8,500	\$2,550,000
Side Loader	50	12.5	5,500	275,000
Front Loader	<u>50</u>	<u>12.5</u>	17,000	<u>850,000</u>
Total	<u>400</u>	<u>100.0</u>		<u>\$3,675,000</u>

3. Canadian Factory Shipments

There are 100 units manufactured in Canada per year. Of these 100 units, seventy are classified as side loaders and overhead front-end loaders. The remaining 30 are of the rear loader packer category. The value of all the units manufactured in Canada is \$1,042,500.

4. Imports

Number of units imported per year:

300

Dollar value of imported units:

\$2,632,500

5. Consumer Type

Local governments are responsible for garbage collection and are the major purchasers of garbage compactors in Canada. The second source of demand for garbage compactors are private companies who have contracts with cities such as Montreal and Ottawa to provide garbage collection service.

These municipalities and private contractors collect some 17 million tons of municipal garbage per year.¹ This is equivalent to 4.3 lbs per person per day. The amount of garbage generated and collected appears to be growing at a rate of between 3 and 4% per year.

6. Canadian Market by Region

The breakdown of mobile garbage packers sold annually in Canada by region is as follows:

1

A Preliminary Overview of the Solid Waste Problem in Canada, a report submitted to the Resources Research Centre, Department of Fisheries and Forestry by Thurlow & Associates, April 1971.

	<u>% of Total Units Sold Annually in Canada</u>
Eastern Canada	6%
Quebec	30
Ontario	40
Manitoba & Saskatchewan	7
Alberta	7
British Columbia	<u>10</u>
	<u>100</u>

SUPPLY

1. Imported Models

There are three major American exporters of mobile garbage packers to the Canadian market. These are shown below with approximate percentages of market share:

	<u>Approximate % Market Share</u>
Heil Co. 3000 W. Montana Street Milwaukee, Wisc.	35%
Garwood Industries Inc. 32500 Van Born Wayne, Mich.	20
Elgin Leach Corp. 222 West Adams Street Chicago, Ill.	10
Canadian Manufactured Units	25
Other Manufacturers	<u>10</u>
	<u>100</u>

American exporters sell their units through agents and distributors across Canada. A list of the major distributors and agents is shown in Appendix I.

There is a German manufacturer who has begun to achieve some degree of market penetration, particularly in the Montreal area, selling a unit referred to as the Kuka "Shark". This unit utilizes a revolutionary method (rotating drum) of compacting garbage which has been patented by the manufacturer. The address of this manufacturer is given below:

Keller & Knappich GmbH
89 Augsburg 31
Bundesrepublik, Deutschland.

2. Canadian Manufacturers

Three Canadian manufacturers produce 25% of the total mobile garbage compactor units sold in Canada. These are shown below with an indication of the types of units they produce:

	<u>UNIT TYPE</u>
Universal Handling Equipment Co. 100 Bualand Cres. Hamilton, Ontario	Front Loader, Side Loader
Century Industries Ltd. 631 Manitou Road S.E. Calgary 24, Alberta	One Man Side Loader
Amalgamated Metal Industries Ltd. 2520 Haines Road Mississauga, Ontario	Rear Loader

Two former manufacturers who are no longer manufacturing garbage compactors are:

Atlas Hoist and Body Inc.
7600 Cote de Liesse Road
Montreal, Quebec

The Wilson Motor Bodies Ltd.
1032 Howard Road
Burlington, Ontario

The main reason these two companies gave for abandoning manufacture of garbage compactors was that they could not compete "price-wise" with the duty-free American imports.

3. Other Manufacturers

Other manufacturers who have sold units in Canada and who account for a combined market share of approximately 10% are listed below:

Belgium Standard Industries (Ontario) Ltd.
35 University Avenue East
P.O. Box 186
Waterloo, Ontario
Canada

E-Z Pack Co.
605 South Market Street
Galion, Ohio
U.S.A.

Cobey Waste Control Systems
Division of Harsco Corp.
Galion, Ohio
U.S.A.

Pak-Mor Manufacturing Co.
1123 S.E. Military Drive
P.O. Box 14147
San Antonio, Texas
U.S.A.

Dempster Brothers, Inc.
Subsidiary of Carrier Corp.
Knoxville, Tennessee
U.S.A.

4. Potential Manufacturers

Manufacturers who have considered or who are considering producing units in Canada are:

Frink of Canada Ltd.
777 Laurel Street
Preston, Ontario

Diesel Equipment Limited
139 Laird Drive
Toronto 17, Ontario

Wheels, Brakes and Equipment Ltd.
245 Superior Street
Hamilton, Ontario

Willock Truck Equipment Co. Ltd.
205 West 2nd Street
Vancouver, B.C.

MARKETING CHARACTERISTICS

1. Buying Practices

Compactor units are purchased through the tender system. Municipal governments issue specifications and ask suppliers to submit tenders. Tenders may be requested for either the combined truck chassis and packer body or separately for each of these components. The advantage to the purchaser of a combined bid is that one party takes responsibility for the complete unit.

The usual practice is to request that the garbage compactor manufacturer or distributor assemble the garbage compactor body onto the truck chassis.

A sample municipal specification for compactor trucks is shown in Appendix II.

The supplier of these units is usually expected to accept trade-ins of older units and quote an allowance for trade-in value as part of the tender.

2. Determining Factors

The key determinants in choosing a supplier of compactor units are shown below:

Price

Parts Availability

Quality and Reliability

Technology

Price and parts availability are the two primary considerations of garbage compactor unit purchasers.

3. Competition

The Heil company, an importer of American garbage compactors, holds a major share of the Canadian market and have achieved their position by establishing a strong network of agents and distributors across Canada (see Appendix I). The Heil company produces a unit which consistently meets quality and price requirements. This company imports their garbage compactors into Ontario and Quebec from the United States duty-free.

The Heil company has also built a good reputation for parts availability.

Second place in the Canadian market is held by Garwood, who have a reputation for producing quality garbage compactors.

Garwood, however, are at a marketing disadvantage as they pay duty on garbage compactors imported into Canada.

Elgin Leach once held a very strong position in the Canadian market but lost this position due to poor service and parts availability in Canada. They have recently changed agents in Ontario and are attempting to regain their lost position through competitive bidding and increased service. Elgin Leach's garbage compactors are also imported duty-free.

Universal Handling Equipment in Hamilton, Ontario manufacture front loaders and side loaders. They sell these units in Canada and have established an export market, particularly for the front loader, in the United States. They do not manufacture a rear loader which accounts for the bulk of the Canadian and American markets.

Century Industries Limited in Alberta manufacture a unit referred to as the "Haul-All". This unit is a one man side loader with a 10 cubic yard capacity (standard rear packer has a capacity of 20 cubic yards) which is mounted on a standard 10,000 GVW truck chassis. They have had considerable success in selling these units in Alberta. The city of Calgary purchased 26 of these units in 1972 and Edmonton has 10 of these units at present and is ordering approximately 30 additional units this year. The success of their overall market penetration will depend on the degree of acceptance by the municipalities of the one man side loading packer over the more widely used two or three man rear packers.

Amalgamated Metal Industries in Mississauga, Ontario manufacture the Dempster rear loader under license with the American company. They compete on the basis of quality against the American competition as their prices range from \$600 to \$1,000 more expensive for comparable units.

The Kuka unit which is imported from Germany uses a spiral screw principle to shred and compact garbage. It has the advantage of fewer moving parts (less maintenance) and is capable of digesting large objects such as appliances and furniture. A unit with similar capacity to the standard 20 cubic yard rear packer is, however, more expensive (\$12,000 vs. \$8,500).

4. Relationships with End Users

There is some evidence that strong loyalty exists between some buyers and sellers. These loyalties have been established through good parts availability. Some buyers also have developed a preference for a specific machine over the years. This is especially true where municipal mechanics have become familiar with a particular unit.

5. Product Line and Pricing

Approximate list prices for various sizes and types of mobile compaction units is given below:

<u>Type</u>	<u>Size</u>	<u>List Price</u>
Rear Loader	16 cu. yd.	\$ 8,000
	20 cu. yd.	9,000
	25 cu. yd.	11,000
Side Loader	10 cu. yd.	\$ 5,000
	22 cu. yd.	12,000

Front Loader 30 cu. yd. \$17,000

The above prices are approximate only and tend to vary by supplier. The list serves to give relative list prices for the majority of packer types sold in Canada. Price is an important factor in obtaining orders and price discounting has been estimated at between ten and fifteen percent.

6. Exports

There is no export market for rear packers and limited export market for front loaders and side loaders.

INDUSTRY CHARACTERISTICS

1. General

Canadian domestic sales (Canadian production plus imports) has been estimated at 400 units per year. Historically, 20 cubic yard rear garbage compactors have comprised the bulk of sales. There is an indication that the trend is to larger rear packers (25 cubic yards) as well as increased utilization of side loaders of all sizes. (10 cubic yards to 22 cubic yards)

The great majority of sales is due to replacement of existing units. The average life of a packer unit is from 7 to 8 years and it has been estimated that there are some 2,500 to 3,000 mobile packer units in existence across Canada. This indicates that sales due to normal replacement alone would be in the order of 310 to 430 units per year. Some users claim that the economic life should be reduced to 5 years which will tend to increase the sales

of new units due to normal replacement.

The amount of garbage generated by Canadians is increasing at a rate of 3 to 4% per annum which would also tend to increase sales of new units.

These pressures for increased sales however, seem to be counter-balanced by three factors. These are:

- A tendency for some municipalities to move to private contractors for garbage collection. These companies achieve better garbage packer utilization.
- Some municipalities have or are planning to go to two shift operation.
- Larger garbage packers with better compaction ratios are being introduced into the market.

2. Rear Loaders Versus Side Loaders

Side loaders currently account for some 12.5% of the Canadian market while 75% of the units sold are rear loaders. There is some evidence of a trend toward increased use of the side loader. Considerable controversy currently exists as to which is the more economical unit to operate. It is agreed that the advantage of the side loader with its one man crew is less costly to operate overall. The realization of savings however, depends on the density of the area being serviced, the distance the collection route is from the disposal site for the case of the smaller capacity side loader units, and the acceptance of these units by the municipal labour unions.

3. Front Loaders

The front loader finds use in serving large institutions such as hospitals, hotels, restaurants, and apartment buildings. These units require the use of a large container which holds the refuse until it is collected. This market is declining as these units are being replaced by increased use of stationary compactors.

4. Import Considerations

Garbage packer bodies and garbage trucks (packer body mounted on truck chassis) when imported by a manufacturer of specified commercial vehicles come under Tariff items 9500601 and 9500501 respectively (Canada-U.S. Automotive Agreement) and are entered duty-free. Packer bodies and trucks when imported by other than a manufacturer of specified commercial vehicles come under Tariff items 4382901 and 4380301 and are assessed a duty of 15%.

Refer to the Department of National Revenue memorandum number D49-30 for a description of the requirements for a manufacturer of specified commercial vehicles and Appendix I of that Memorandum for a list of those manufacturers currently so qualified.

The distributors of the Heil and Leach units in Ontario and Quebec (see Appendix I) have qualified as manufacturers of specified commercial vehicles and therefore sell their units in these areas (which accounts for a majority of the units sold) free of duty.

The Wheels, Brakes and Equipment Ltd., distributors of the Garwood units are not presently qualified as manufacturers of specified commercial vehicles and must pay import duty on the units they sell in Canada.

PRODUCTION

1. General

The purchase of the truck and packer body are done separately or through the truck supplier for a combined unit. In either case the usual practice is for the packer body supplier to mount the packer body onto the truck chassis.

While there are various packer types, options and sizes made available to customers, demand for the standard rear packer (75% of total sales in Canada) is such that components and sub-components for these units could be batch produced.

The manufacturing steps required in producing packer units are as follows:

- Automatic Torch Cutting
- Manual Torch Cutting
- Plate Shearing
- Punching
- Drilling
- Braking (Bending)
- Welding
- Fitting
- Hydraulic Assembly
- Electrical Assembly
- Painting
- Testing

Usual practice is for the purchaser to request that all seams in the packer body are to be continuously welded inside and out and that all support members are rust-proofed.

2. Some Economic Considerations

Due to the very competitive nature of the bidding, profit margins for packer units are low.

The minimum economic production quantity is in the order of 20 to 25 units.

Because of the long lead times required for some of the materials (steel plate, hydraulics) an investment in materials may be a significant factor. With proper scheduling and judicious purchasing this investment could be minimized.

3. Material Requirements

The steel plate used in wear areas and pressure plates in the packer unit is high tensile T1 grade, abrasion and corrosion resistant, or its equivalent.

The cost of material imported is in the order of \$500 to \$1,000 per unit. This is primarily for hydraulic equipment required for the loading, compression and dumping mechanisms.

RESEARCH AND DEVELOPMENT

1. General

Development of the mobile packer units in the future will be centered around increasing the garbage capacity through larger units and higher compression ratios. This is an important factor for operators of garbage truck fleets as larger capacities mean less trips between the collection route to the disposal site and hence better crew and truck utilization.

The reaction to the one man side loader unit appears to be mixed but in general tends to favor these units particularly for rural and less dense urban areas. Development of these units should take the form of filling out the range of sizes offered, particularly in the medium size category (18 to 20 cubic yards).

Due to the high operating costs of garbage collection crews (Canadian municipalities spend over 75% of collection and disposal costs on manpower²) and the tendency of these crews toward injury there is some long range research into mechanical arm devices which would eliminate loading personnel. The mechanical arm which would be controlled by the driver in the cab would load a curb-side container with no human exertion required.

COSTS

1. Packer Cost Breakdown

The major breakdown of costs are as follows:

	<u>% of Total Costs</u>
Materials	34%
Labour and Overhead	<u>66</u>
	<u>100</u>

2. Equipment

Estimated capital cost to set up operation for a plant with a capacity of approximately 100 units per year for a new manufacturer is in the order of \$250,000. This excludes building costs.

2

Municipal Garbage: New Approaches to an Old Problem,
Carlile, D.M., Optimum, Vol. 3, No. 4, 1972.

3. Transportation

Transportation costs are included in the purchase price and depend on the distance between the supplier and purchaser. This can be a considerable cost for imported units in certain areas of Canada (e.g., British Columbia, Nova Scotia).

4. Tariffs

Import duty when applied to garbage packer bodies and garbage trucks is 15%.

PLANT LOCATION CRITERIA

1. Market Orientation

With 40% of the Canadian market located in Ontario, 30% in Quebec and 10% in British Columbia, market orientation dictates that manufacturers be located in these areas. Since a prime requirement for sales in this industry is parts availability, manufacturers of packer bodies would have to maintain an inventory of body parts in the major urban centers of these provinces. Some municipalities request one day delivery service on parts.

2. Resource and Labour Orientation

The labour content in the manufacture of garbage packers is high. Welding, shearing, cutting, fitting, electrical and hydraulic assembly are all skilled trades and the manufacturer would have to be located in an area where these skills are available.

OPPORTUNITIES

1. Regional Opportunities

Manufacturers of mobile packer bodies in Canada have gravitated towards producing the more specialized lines of side loaders and front loaders. As these units form only a small portion of the total Canadian market, the American manufacturers have been more active in the rear loader market which form the bulk of Canadian sales.

Canadian manufacturers of rear loaders cannot compete in price with American imports. One manufacturer in Montreal has terminated manufacturing of these units because he could not bid competitively and maintain a profit margin. A second manufacturer in Mississauga states that he cannot bid competitively against the American imports and relies on selling a "quality" unit. Other companies have considered beginning manufacturing operations but have held back because of import competition. The Canadian prices are in the order of \$1,000 more expensive than the equivalent American units.

The American units that are sold in Ontario and Quebec for the most part are imported by manufacturers of specified commercial vehicles and are sold duty-free.

The manufacturing opportunity exists for Canadian producers of rear loaders in Ontario, Quebec and British Columbia but the success of the operation would rely on their ability to reduce factory costs to a level to compete with the duty-free American units

and maintain a reasonable profit, or receive tariff protection.

This opportunity might be particularly attractive to those manufacturers of specified commercial vehicles who are importing units into Ontario and Quebec and who would have a thorough marketing knowledge of this industry.

There appears to exist an opportunity in British Columbia where it is estimated that some 40 units per year are sold. Users in British Columbia pay a premium in transportation costs for the rear loaders which they purchase. They also suffer from a lack of parts availability. This opportunity might appeal to a manufacturing company such as Willock Truck Equipment Co. Ltd. in Vancouver who are believed to be considering entering this market.

Century Industries Limited in Calgary, Alberta have had considerable success in selling their units in Calgary and Edmonton. Both of these cities are convinced of the economics of the small one man side loader and the market there appears to be well covered by this manufacturer.

The markets in Manitoba, Saskatchewan and the Atlantic provinces are small ones and there appears to be a very marginal opportunity for manufacturers of packer units in these regions.

2. Other Opportunities

There is an opportunity for manufacturers to import packer body parts and components and assemble and paint these units in all the areas mentioned above. The degree of success of this

opportunity would depend on whether these manufacturers could import these parts and components duty-free.

There also appears to be the opportunity for Canadian manufacturer(s) to produce the Kuka "Shark" unit under a licensing agreement. The German company has approached at least one Canadian manufacturer in this regard. The success of this venture seems to depend on the acceptance of this type of unit by municipalities and private contractors which at present seems to be rather mixed.

3. Other Factors

A factor which could affect potential Canadian manufacturers is that the manufacturers of the imported units have patented all or some portion of their compaction operation.

Because of the capital outlay required to establish a new manufacturing facility, the opportunities that exist in this industry would appeal more likely to people with existing facilities capable of truck body or large container manufacturing and who have some experience with hydraulic and electrical control assembly.

General Statistics

The following are some general statistics which may be used to give some indication of mobile packer sales.

1. Population Distribution in Canada

	<u>Population*</u>	<u>% of Total in Canada</u>
Newfoundland	522,105	2.4%
P.E.I.	111,640	.5
Nova Scotia	788,960	3.7
New Brunswick	634,555	2.9
Quebec	6,027,765	27.9
Ontario	7,703,105	35.8
Manitoba	988,245	4.6
Saskatchewan	926,240	4.3
Alberta	1,627,875	7.5
British Columbia	2,184,620	10.1
Yukon	18,390	.1
North West Territories	<u>34,805</u>	<u>.2</u>
	<u>21,568,310</u>	<u>100.0</u>

* Statistics Canada

2. Garbage Generation

The population in Canada is expected to increase by 1.4% over the next decade. The municipal garbage generated per capita is 4.3 lbs. per day. This is expected to increase at a rate of two percent per annum.

The following table shows data on refuse disposal for several municipalities in Canada based on the results of a survey conducted in 1967.

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<u>City</u>	<u>Population</u>	<u>Refuse Disposed Of Annually (Tons)</u>
Victoria	57,700	25,000
Vancouver	430,000	292,000
Burnaby	111,093	38,000
Edmonton	393,563	314,000
Calgary	354,856	294,000
Regina	137,000	56,000
Saskatoon	121,500	73,000
Toronto	665,000	334,000
Ottawa	296,248	173,000
Halifax	<u>88,044</u>	<u>154,000</u>
	<u>2,655,004</u>	<u>1,778,200</u>

3. Some U.S. Statistics

In the United States the private sector collects greater than 70 percent of that country's solid waste tonnage.⁴ An estimate of the number and types of mobile compactors used by private contractors is shown below:

<u>Type of Compactor</u>	<u>Number Of Compactors</u>	<u>Percent of Total Trucks</u>
Rear Loaders	26,230	63%
Front Loaders	7,670	18
Side Loaders	<u>7,702</u>	<u>19</u>
	<u>41,602</u>	<u>100</u>

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A Profile of the Private Sector, National Solid Wastes Management Association, Technical Bulletin, Vol. 3, No. 9, October 1972.

Partial List of Distributors and Agents
Of Imported Mobile Garbage Compactors

Heil

Reliance Truck Equipment
1901 Granville
Vancouver, B.C.

Mumford Medland Ltd.
235-66 Avenue S.E.
Calgary, Alberta

Mumford Medland Ltd.
10809-105 Avenue
Edmonton, Alberta

Mumford Medland Ltd.
740 Albert Street
Regina, Saskatchewan

Mumford Medland Ltd.
576 Wall Street
Winnipeg, Manitoba

SMI Industries
Dixie Road
Mississauga, Ontario

SMI Industries
Montreal, Quebec

Garwood

Columbia Trailer Co. Ltd.
3625 Brighton Avenue
Burnaby, B.C.

Jackson's Welding Ltd.
2005-14A Street S.E.
Calgary, Alberta

Thomas Elias Mfg. Co. Ltd.
1061 Notre Dame Street
Winnipeg, Manitoba

Partial List of Distributors and Agents
of Imported Mobile Garbage Compactors

Garwood (cont'd)

Wheels, Brakes and Equipment Ltd.
245 Superior Street
Hamilton, Ontario

Interprovincial Equipment Ltd.
9501 Ray Lawson Blvd.
Montreal, Quebec

Elgin Leach

A.R. Williams Machinery Western Ltd.
495 Railway Street
Vancouver, B.C.

Wilkinson and McClean Ltd.
9310-125th Avenue
Edmonton, Alberta

Wilkinson and McClean Ltd.
416 Manitou Road S.E.
Calgary, Alberta

Fer-Marc Equipment Ltd.
153-5th Avenue East
Regina, Saskatchewan

Fer-Marc Equipment Ltd.
968 Wall Street
Winnipeg, Manitoba

Frink of Canada
777 Laurel Street
Preston, Ontario

Laurion Equipment Ltd.
5300 Ferrier Street
Montreal, Quebec

Partial List of Distributors and Agents
of Imported Mobile Garbage Compactors

Elgin Leach (cont'd)

Atlantic (Mussens) Ltd.
1050 College Hill Road
Fredericton, N.B.

Mussens Ltd.
401 Willow Street
Truro, N.S.

Dominion Machinery and Equipment Co. Ltd.
115 New Gower Street
St. Johns, Newfoundland

APPENDIX II

SAMPLE MUNICIPAL SPECIFICATIONS FOR
MOBILE GARBAGE COMPACTORS

SPECIFICATIONS

Twenty (20) Latest Model Truck Chassis and Tilt Cabs, equipped with 20 cubic yard, Rear Loading Refuse Packer Bodies and Appurtenances, all in accordance with the following specifications:

SPECIFICATIONS

CONFIRMATION

G.V.W. RATING: Net less than 31,000 lbs.

SPECIFY: _____

C.A. DIMENSION: Not less than 120 inches.
(Alternative C.A. Dimension up to 132" depending on proper load distribution)

SPECIFY: _____

ENGINE: Gasoline, displacement not less than 400 cubic inches

SPECIFY: _____

Engine equipped with:

Full flow oil filter (2 quart capacity)

YES: _____ NO: _____

Gasoline filter

YES: _____ NO: _____

Heavy duty, dry type air cleaner

YES: _____ NO: _____

(Crankcase and gasoline filters - spin-on type preferred)

YES: _____ NO: _____

Exhaust to be vertically mounted behind cab, complete with rain cap and personnel heat guard

YES: _____ NO: _____

TRANSMISSION:

Allison Automatic, blended with engine for continuous stop-start operation. Minimum of five speeds forward, one reverse, complete with heat gauge mounted in cab, temperature gauge and safety switch which renders the transmission inoperative when power-take-off is in operation. Safety switch is to also prevent packer body cycling when transmission is in drive position.

SPECIFY: _____
(Make & Model Number)

(Number of Speeds)

Transmission system equipped with oil filter

YES: _____ NO: _____

Combination close coupled P.T.O. and pump complete with Williams Air Shift and brake lock control.

SPECIFY: _____

WILLIAMS 80 - A BRAKE-LOK
P.T.O. CHELSEA - 22 LL
PUMP DANA 22 G.P.M. - CLOSE COUPLE

FRAME: Double channelled, heavy duty reinforced, R.B.M. 500,000 lbs. minimum SPECIFY: _____

BRAKES: (SERVICE) Full air, Bendix Westinghouse "S" Cam, complete with 12 C.F.M. compressor (with B.W. air filter No. 226469) SPECIFY: _____

System to include:

Bendix Westinghouse System Guard Air Dryer, suitably mounted YES: NO:

Both wet and dry air tanks YES: NO:

Brake cylinders - Anchor Lok 8" - Rear YES: NO:

Front wheel limiting valve YES: NO:

Quick release valve mounted above or close to rear axle YES: NO:

Cast iron heavy duty drums YES: NO:

Brake cylinders to be mounted ahead of rear axle YES: NO:

EMERGENCY PARKING BRAKES: Anchor Lok, spring applied, Type 30 SPECIFY: _____

Quick release valve to be holding type mounted above or close to rear axle YES: NO:

Application valve to be push to apply type and situated on dash to right hand side of driver YES: NO:

Orscheln hand parking brake, if available SPECIFY: _____

STEERING: Full power YES: NO:

FRONT AXLE: 9,000 lbs. minimum - "I" beam only SPECIFY: _____

REAR AXLE: 22,000 lbs. minimum capacity. Single reduction, ratio approximately 7.00 to 1 SPECIFY: _____

SPRINGS: Up to or exceeding minimum ratings of axles specified at ground plus auxiliary springs on rear axle with a minimum rating of 2,000 lbs. each at ground SPECIFY: (Front) _____ (Rear) _____ (Auxiliaries) _____

FUEL TANK: Left side mounted. Step tank with minimum capacity of 44 Imperial gallons. Filler spout must be accessible after body has been mounted. Siphon proof.

SPECIFY: _____

ELECTRICAL: 12 Volt - 70 ampere hour minimum heavy duty battery. 60 ampere minimum alternator, low speed cut-in, double pulley. Circuit guard is not required.

SPECIFY: _____
(Battery)

(Alternator)

TIRES & TUBES: Seven (7) Uniroyal Limited Nylon Steel Shield
Tires to be of sufficient size and rating required to obtain the required 31,000 G.V.W. Rating Plate. Tires offered are to be of the same size and ply for both front and rear wheels.

SPECIFY: _____
(Size and Ply)

WHEELS & RIMS: Six (6) cast spoke wheels and seven (7) rims to be supplied. Carrying brackets are not required.

YES: _____ NO: _____

EQUIPMENT: Dual sun visors, dual electric windshield wipers, windshield washers, heater, dual defrosters, dual outside rear view mirrors (Dominion Auto 75-2528), permanent type anti-freeze (minimum -30°F), front and rear directional signals with four-way flashing feature, electric hour meter and colour coded tachometer, one pair of cab assist handles, auxiliary seat for two passengers - all seats to be full depth foam rubber. All other standard equipment with the exception of current license plates.

RUSTPROOFING: To be completely rustproofed by the Vital or Superior process only.

SPECIFY: _____

The successful tenderer must have the Certificate of rustproofing and guarantee for same made out fully in the name of the Corporation of the City of Toronto, Department of Purchasing and Supply, Equipment Division. This guarantee must be supplied on delivery of vehicles.

LAMPS: Lamps other than production line assembly on chassis only and lamps on body, as required, are to be in accordance with the following City of Toronto standardization:

<u>TYPE</u>	<u>DOMINION AUTO NO.</u>
Front directional signals	70-6075
Rear directional single bolt signals	70-6070
Rear directional flush type	70-6106
Stop and tail lamps	70-2001
Clearance lamps	70-2001
Reflectors	71-6502

KEYS: To be keyed in accordance with standardized key code allotted to City of Toronto, including doors.

YES: NO:

COLOUR: Cab: Lincoln Green, C.I.L. #2331-8008, with the exception of bumpers, wheels and chassis which shall be finished in Black, C.I.L. #2334-8080.

YES: NO:

G.V.W. RATING PLATE: 31,000 lbs. minimum - to be affixed to chassis

SPECIFY: _____

REFUSE PACKER BODIES: 20 cubic yard minimum capacity SPECIFY: _____

Bodies to be of the rear loading type with a loading height not greater than that of the truck frame. Each body to be equipped with auxiliary side door for loading and/or inspection.

All seams on vertical and horizontal support members to be continuously welded inside and out, both on the body proper and the packing assembly. Seams and welds are to be watertight - intermittent or spot welding will not be accepted. Binding over rear wheels is not required.

All vertical and horizontal support members in both the body proper and the packing assembly are to be rustproofed by the Vital or Superior process only.

SPECIFY: _____

Loading hopper to be of high tensile steel, hopper floor to be 1/4" high tensile T1 grade steel, abrasion and corrosion resistant, with a capacity of not less than 2 cubic yards. Control to start the automatic packing cycle to be at the rear of body on the curb side. The controls shall include control for acceleration of engine for packing speed and pressure. A buzzer to be supplied installed in the truck cab and connected with operating buttons on each side of body at rear to signal driver in cab. Safety control to be supplied to stop packing cycle instantly and reverse cycle to free jammed material.

Tailgate to be hinged with three heavy duty hinges. Dumping mechanism to be hydraulic ejection. The entire operation and cycle of the body shall be driven from the truck engine and combination power take-off. Hydraulic system to be equipped with external one quart spin-on filter in the return line and an accessible cleanable filter in the reserve tank. The tank filler pipe to have a cleanable, filtered breather cap. Grease fittings on the packing rollers must be accessible without removing inspection plates.

NOTE: Each packer body is to be equipped with a license plate bracket located at the rear of the truck body centred directly above the hopper. The bracket is to be made in such a way that the license plate will be clearly visible and illuminated by a light. The rear directional signals and stop and tail lights are to be re-located and mounted on top rear of the body. Full length hand rail on rear sides:

COLOUR: White, C.I.L. #2331-8000.

It is a mandatory condition that bidders submit certified weight distribution charts indicating the following:

Tare weight of chassis.

Tare weight of chassis with body.

Weight of chassis and body fully loaded at 600 lbs. per cubic yard.

Absolute distribution of load across front and rear axles.

THE FOREGOING SPECIFICATIONS ARE PREPARED WITH THE INTENTION OF PROVIDING A BASIS FOR SECURING COMPETITIVE BIDS. NOTWITHSTANDING CERTAIN DETAIL OF SPECIFICATIONS, EQUIPMENT OF SIMILAR DESIGN AND CONSTRUCTION WILL RECEIVE CONSIDERATION IF, IN THE OPINION OF THE USING DEPARTMENT, IT IS CONSIDERED TO BE SUITABLE FOR THE INTENDED APPLICATION AND GENERALLY CONFORMS TO PERFORMANCE REQUIREMENTS. ALL BIDS ON EQUIPMENT NOT FULLY MEETING THE SPECIFICATIONS MUST BE ACCOMPANIED BY A STATEMENT FULLY OUTLINING ANY DEPARTURES FROM THE SPECIFICATIONS, ALONG WITH DESCRIPTIVE LITERATURE FULLY DESCRIBING THE EQUIPMENT OFFERED.

If requested, tenderers shall demonstrate equipment equivalent to that tendered on, in an on-the-job efficiency comparison test.

All specifications, warranties and guarantees submitted or stated by the successful tenderer shall become part of the contract documents.

Prompt delivery is an essential part of the contract and the tenderer shall state in the Schedule of Prices the periods within which he guarantees to effect delivery.

All equipment shall be heavy duty, of the latest model, conforming to a high standard of workmanship and design.

The units shall be complete in all respects when delivered, guaranteed to perform in a satisfactory manner the work for which they are intended. The Contractor shall execute the whole of the work with every possible dispatch and in a substantial and workmanlike manner comprehending what may be reasonably implied from the specifications though not particularly shown or called for therein and the whole of the equipment shall be manufactured, assembled, delivered and completed to the entire satisfaction of the Commissioner of Purchasing and Supply.

Payments for the equipment will be made following delivery of each complete unit, subject to inspection, testing, approval and the acceptance of same by the Commissioner of Purchasing and Supply or his authorized representative, but no such approval, acceptance or payment shall relieve or exempt the Contractor from liability under any warranty or guarantee or for liability for the replacement or repair of any unit should inherent defects be subsequently discovered in the design, workmanship, materials or operation of any unit.

The Director of Equipment, Mr. E.G. Brown, 843 Eastern Avenue, telephone 367-7791, is to be contacted in connection with any additional information.

TD Woods, Gordon & Co.
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