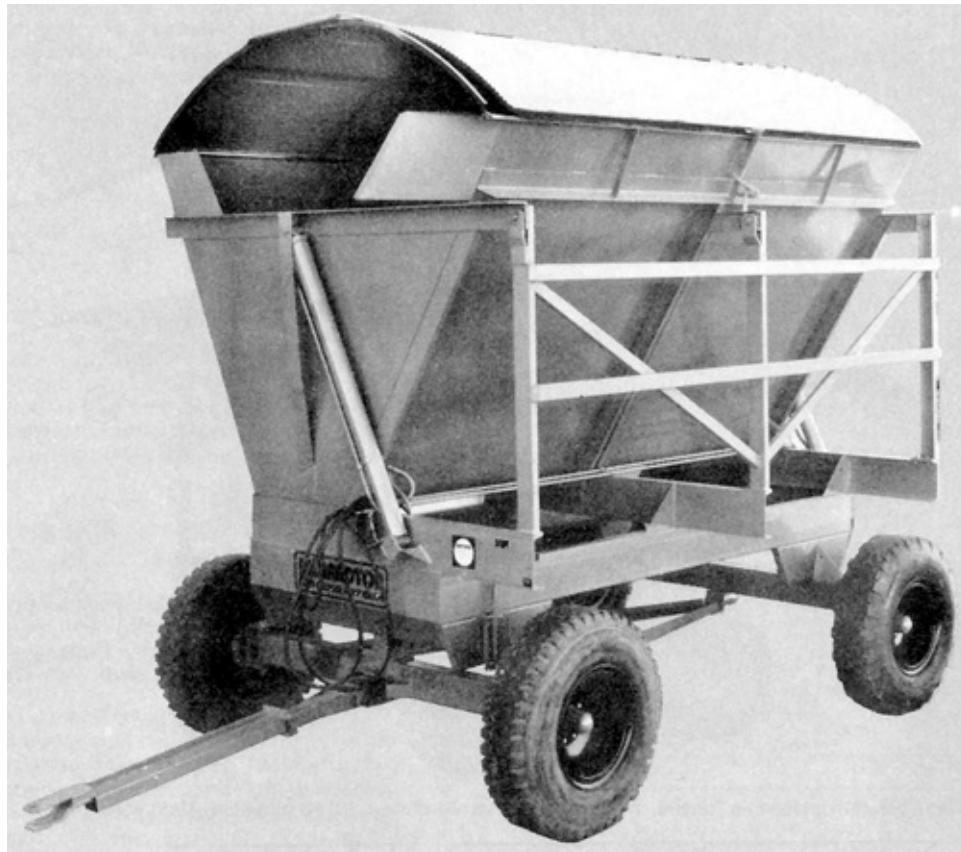


Evaluation Report 125



Richardton 1200 High Dump Wagon

A Co-operative Program Between



ALBERTA
FARM
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PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

RICHARDTON 1200 HIGH DUMP WAGON

MANUFACTURER:
Richardton Manufacturing Co.
P.O. Box 290
Richardton, North Dakota
U.S.A. 58652

RETAIL PRICE:
\$5,865.00 (November, 1979, f.o.b. Portage la Prairie, Manitoba, with optional galvanized roof and 400 mm side extensions).

DISTRIBUTORS:
Little Morden Service Limited
P.O. Box 1540
Highway No. 3 East
Morden, Manitoba
ROG 1J0

SKTN Farm and Truck Equipment Ltd.
P.O. Box 168
331 Circle Drive West
Saskatoon, Saskatchewan
S7K 3K4

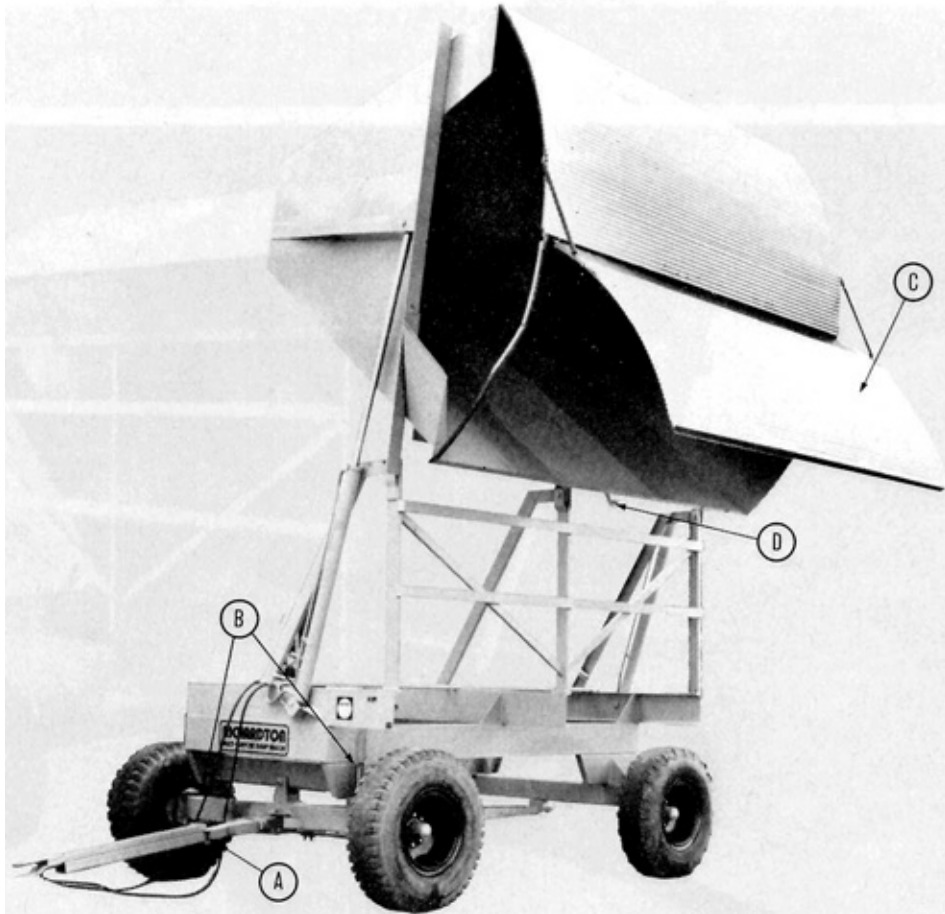


FIGURE 1. Richardton 1200: (A) Telescoping Tongue, (B) Hydraulic Bolster Stabilizers, (C) Hinged Roof, (D) Roof Retaining Latch.

SUMMARY AND CONCLUSIONS

Overall functional performance of the Richardton 1200 Dump Wagon was very good in forage crops. Ease of loading was excellent. Ease of unloading was good.

The front opening was compatible with most forage harvesters. The optional forage roof provided excellent protection from wind loss when harvesting in moderate winds. With the roof removed the wagon would be suitable for side loading from a root crop harvester.

The 3.2 m (10.5 ft) unloading height was adequate to clear most truck boxes equipped with side forage box extensions. Since the wagon dumped the forage more to the near side of the receiving truck box, box extensions were needed to prevent the forage from spilling over the edge of the box and to allow filling to capacity with a minimum of loss. Unloading time depended on the hydraulic system of the tractor used, but was usually less than one minute.

The Richardton was stable during dumping on level ground.

One screw-in drain plug provided for moisture drainage. Access to the inside of the box was inconvenient.

The unloaded Richardton towed well on smooth roads at speeds up to 50 km/h (30 mph).

Care had to be taken to avoid unloading under power lines. The 6.2 m (20 ft) maximum height during unloading exceeded minimum power line heights in the prairie provinces.

Some mechanical problems occurred with the roof latching system during the test.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Modifying the roof latching system to ensure proper latching.
2. Providing convenient access to the interior of the box.

Chief Engineer -- E.O. Nyborg

Senior Engineer -- J.C. Thauberger

Project Engineer -- R.R. Hochstein

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. Modification of the roof latch system is being seriously considered and is likely to be forthcoming.
2. Convenient access to the interior of the box would be an improvement. This recommendation is also being considered for the future.

Note: This report has been prepared using SI units of measurement. A conversion table is given in APPENDIX III.

GENERAL DESCRIPTION

The Richardton 1200 Dump Wagon is a 12.4 cubic metre capacity, side dump wagon suited for handling chopped forage, special crops, such as sugar beets, and other bulk commodities. It is designed for towing behind a forage harvester or, with the roof removed, it may be used for side loading from a sugar beet harvester or similar equipment.

Unloading is controlled with two hydraulic cylinders, connected in parallel with a flow divider, and powered from a tractor hydraulic system. The Richardton employs a single stage unloading cycle. The optional hinged corrugated metal roof springs open when the box is fully raised. The Richardton 1200 was factory assembled for dumping to the left, however, the dump direction may be reversed.

Detailed specifications are given in APPENDIX I, while FIGURE 1 shows the wagon unloading.

SCOPE OF TEST

The Richardton 1200 was towed behind a New Holland 890 forage harvester in a variety of conditions, ranging from smooth hay fields to hilled corn fields, for 230 hours while dumping about 600 loads of chopped forage. In addition, it was towed both loaded and empty over primary and secondary roads for about 500 km. The Richardton was evaluated for ease of operation, load carrying capacity, operator safety and suitability of the operator's manual.

RESULTS AND DISCUSSION

EASE OF OPERATION

Hitching: The Richardton was equipped with a clevis hitch and a telescoping tongue. The tongue length could be varied by 310 mm (FIGURE 2) to suit different forage harvesters. It was compatible with most forage harvester blower spouts.

Loading: FIGURE 2 gives dimensions of the front forage opening, when equipped with the optional forage roof. Opening height suited most forage harvester discharge spouts. The corrugated metal roof provided very good protection against forage losses in moderate winds. A 250 mm strip of expanded metal along the length of the roof provided for the escape of air from the forage harvester blower.

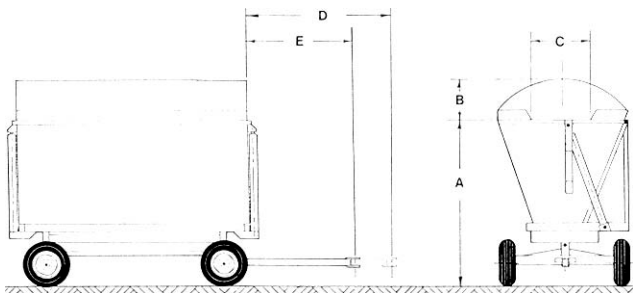


FIGURE 2. Dimensions for Harvester Compatibility: (A) Box Height, 3040 mm; (B) Roof Height, 1030 mm; (C) Front Opening, 1320 mm; (D) Extended Tongue, 2350 mm; (E) Compressed Tongue, 1840 mm.

For side loading with the roof removed, the only restriction on loading from root harvesters was the box height.

Unloading: The Richardton 1200 used two hydraulic cylinders

connected in parallel. FIGURE 3 shows the clearance dimensions during the dumping cycle. The hydraulic stabilizers lock the front rocking bolster and the roof retaining latch releases the roof at the beginning of the unloading cycle. Two springs pull the roof clear when forage in the box begins sliding out.

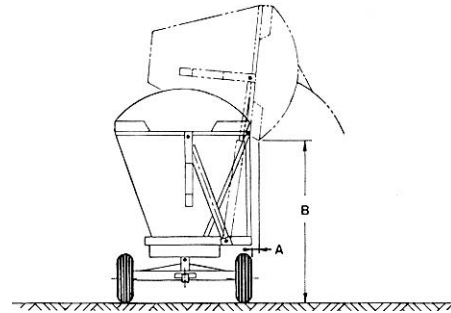


FIGURE 3. Unloading Clearance: (A) Horizontal, 300 mm; (B) Vertical, (Unloading height), 3200 mm.

Since the Richardton unloaded forage closer to the near side of a truck box, side box extensions were necessary to minimize dumping losses. The 3200 mm vertical dump clearance was adequate for loading most truck boxes equipped with forage side extensions. Unloading time depended on the tractor hydraulic system, but usually was less than one minute. The maximum dump angle was adequate.

Stability: The manufacturer recommended dumping only on relatively level ground and when parked alongside a receiving unit, such as a truck box, to prevent possible upsetting. The Richardton was stable when dumping under the test conditions.

The maximum side slope on which the Richardton 1200 could be safely unloaded depended on the flow characteristics of the material being handled. When unloading materials which bridge easily, such as high moisture chopped forage, the Richardton could tip sideways when unloading on side slopes or during winds. Unloading should not be attempted on side slopes greater than 5 degrees.

Access and Cleaning: One 44 mm diameter drainage outlet was provided in the bottom of the box. This was conveniently opened from the ground. Access to the interior of the box, for cleaning or inspection, was inconvenient. It is recommended that the manufacturer provide convenient access for an operator to enter the box.

Roof: The optional center pivoting roof performed well. It opened sufficiently during unloading and did not interfere with material flow. In addition, it provided excellent protection against wind when loading light material in moderate and severe winds.

Transporting: The Richardton towed well on smooth roads at speeds up to 50 km/h. At higher speeds, the wagon began to sway excessively. Swaying was caused by free-play in the steering linkage. Total linkage free-play, measured at the end of the hitch tongue, with tongue length set at 2600 mm, was 80 mm. The 4070 mm height just barely cleared many highway underpasses. Caution should be exercised in such situations.

LOAD CARRYING CAPACITY

Manufacturer's Load Rating: The manufacturer recommended that the maximum load carried by the running gear should not exceed 10.9 t. The box had a capacity of 12.4 cubic meters, and could be filled with most materials without exceeding the recommended load rating. For example, filling with a high density material such as wheat would not exceed the load rating.

Tires: The Richardton was equipped with four, 12 x 20, 14-ply tires. These were adequate² for the manufacturer's recommended load rating.

¹PAMI T7827-R79, Detailed Test Procedures for High Dump Wagons.

²The Tire and Rim Association Inc., 1979 Year Book.

Load Rating Test: The Richardton 1200 running gear was subjected to a standard load rating test.³ It met the test requirements.

OPERATOR SAFETY

The Richardton 1200 was safe to operate, if the manufacturer's safety instructions were followed. Dumping should not be attempted on side slopes greater than 5°. The wagon should be dumped only when alongside a receiving box, and caution should be observed when dumping in high winds. Observers should stand clear during unloading. The towing vehicle should be heavy enough and have suitable brakes to permit safe, quick stops during transport.

Maximum height of the Richardton 1200 during unloading was 5.9 m. Caution must be taken to avoid unloading near power lines. Minimum power line heights vary in the three prairie provinces. In Saskatchewan, the energized line may be as low as 5.2 m over farm land or over secondary roads. In Alberta and Manitoba, the neutral ground wire may be as low as 4.8 m over farm land. In all three provinces, lines in farmyards may be as low as 4.6 m.

OPERATOR'S MANUAL

The operator's manual was clear and well written, containing useful information on operation, servicing, adjustment and safety.

DURABILITY RESULTS

The only mechanical problems that occurred on the Richardton 1200, during 230 hours of field testing, and the standard load rating test, were failures of the mechanical roof latch (FIGURE 1), which caused the roof to flip open twice during the test. This latch did not engage, due to material buildup under the latch. As well the roof failed to return to its rest position. It is recommended that the manufacturer modify the method of latching the roof.

The intent of the field test and standard load rating test was evaluation of functional performance. An extended durability evaluation was not conducted.

APPENDIX I

SPECIFICATIONS

Make:	Richardton	
Model:	1200 Dump Wagon	
Serial No.:	498378	
Manufacturer:	Richardton Manufacturing Company	
Maximum Load Rating:	10.9 t	
Overall Dimensions:		
-- height (with optional forage roof)	4070 mm	
-- height (in full dump position)	5920 mm	
-- width	3090 mm	
-- length (less hitch)	4040 mm	
-- wheel tread	2620 mm	
-- wheel base	2950 mm	
-- ground clearance	375 mm	
Box Dimensions:		
-- width		
• bottom	760 mm	
• top	2800 mm	
-- height	1905 mm	
-- length	3630 mm	
-- capacity	12.4m ³	
Weights:		
-- left front wheel	638 kg	
-- left rear wheel	606 kg	
-- right front wheel	630 kg	
-- right rear wheel	<u>564 kg</u>	
TOTAL	2438 kg	
Tires:	Four, 12.00 x 20, 14-ply.	
Lubrication Points:		
-- lubricate every ten days	9	
-- annually	4	
Bolster Stabilizers:	Hydraulic Cylinders	
Hydraulic Cylinders:	Stabilizer (2)	Lift (2)
Type	single acting	double acting
-- Rod	30 mm	51 mm
-- Bore	64 mm	89 mm
-- Retracted Length	226 mm	1727 mm
-- Stroke	101 mm	1531 mm
Optional Equipment:		
-- 300 mm dump extension lip kit		
-- grain chute for non-clump side		
-- 2770 mm wheel tread width		
-- 150 mm riser kit		

APPENDIX II

MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports:

(a) excellent	(d) fair
(b) very good	(e) poor
(c) good	(f) unsatisfactory

APPENDIX III

CONVERSION TABLE

1 kilometre/hour (km/h)	= 0.62 mile/hour (mph)
1000 millimetres (mm) = 1 metre (m)	= 39.4 inches (in)
1 kilogram (kg)	= 2.2 pounds mass (lb)
1 tonne (t)	= 2200 pounds mass (lb)
1 cubic metre (m ³)	= 35 cubic feet (ft ³)

³American Society of Agricultural Engineers. Standard, S360 "Test Procedure for Determining the Load Carrying Ability of Farm Wagon Running Gear", December 1974.



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