

Evaluation Report

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Jiffy Hydump 700 Dump Wagon

A Co-operative Program Between



JIFFY HYDUMP 700 DUMP WAGON

MANUFACTURER AND DISTRIBUTOR:

Kuelker's Manufacturing Ltd.
P.O. Box 160
Didsbury, Alberta
T0M 0W0

RETAIL PRICE:

\$7,000.00 (May, 1980, f.o.b. Didsbury, Alberta, with optional galvanized roof and 400 mm side extensions).

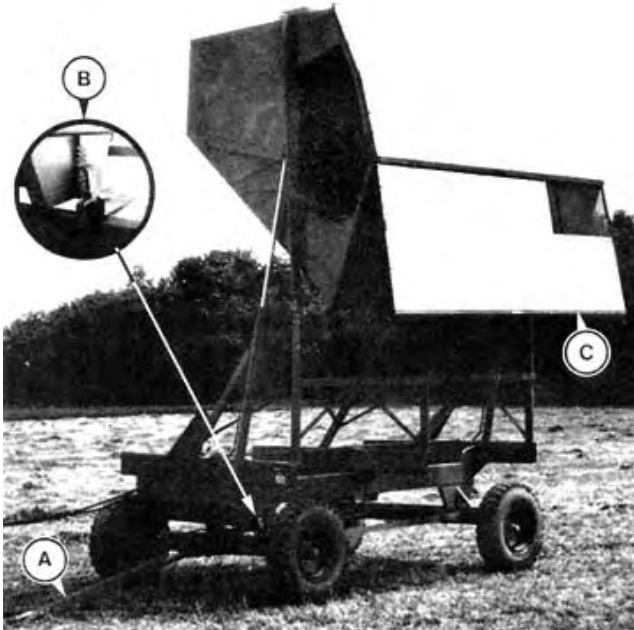


FIGURE 1. Jiffy Hydump 700: (A) Variable Length Tongue, (B) Mechanical Bolster Stabilizers, (C) Hinged Roof.

SUMMARY AND CONCLUSIONS

Overall functional performance of the Jiffy Hydump 700 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 was 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 extensions. Since the wagon dumped forage closer to the receiving side of a truck box, side extensions were needed on the truck box to allow filling to capacity with minimum loss. Unloading time depended on the hydraulic system of the tractor, but was usually less than one minute.

The Jiffy Hydump was stable while dumping on level ground. A rear access door provided water drainage. Access to the inside of the box was inconvenient.

The unloaded wagon towed well on smooth roads at speeds up to 40 km/h (25 mph).

Care had to be taken to avoid unloading under power lines. The 6.1 m (20 ft) unloading height exceeded minimum power line heights in the prairie provinces.

The operator's manual was unsatisfactory.

One minor mechanical problem occurred with the mechanical bolster stabilizer latch.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Producing a new operator's manual, complete with clear safety, operating, and assembly instructions.

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 the recommendations: Steps to correct the deficiencies in the operator's manual have been taken. We now have a ladder in front of the machine to make it easily accessible. Also, a tube has been added along the top end of the tank for greater stability.

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

GENERAL DESCRIPTION

The Jiffy Hydump 700 Wagon is a 17.3 m³, side dump wagon suited for handling chopped forage, root crops, 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 beet harvester or similar equipment.

Unloading is controlled with two hydraulic cylinders, connected in parallel, and powered from a tractor hydraulic system. The Jiffy employs a single stage unloading cycle. The hinged corrugated metal roof springs open when the box is fully raised. The Jiffy is designed only for dumping to the left. Dump direction is not reversible.

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

SCOPE OF TEST

The Jiffy Hydump 700 was operated behind an International Harvester 830 forage harvester in a variety of conditions, ranging from smooth hay fields to hilled corn fields, for about 260 hours while dumping about 700 loads of chopped forage. In addition, it was towed both loaded and empty over primary and secondary roads for about 400 km. The Jiffy 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 Jiffy was equipped with a clevis hitch and a telescoping tongue. The tongue length (FIGURE 2) could be varied 300 mm to suit different machines. It was compatible with most forage harvesters.

Loading: FIGURE 2 gives dimensions of the wagon front opening, when equipped with the optional roof. The height of the opening suited most forage harvester discharge spouts and the corrugated metal roof provided very good protection against forage loss in moderate winds. A section of expanded metal at the rear of the roof provided for the escape of air from the forage harvester blower.

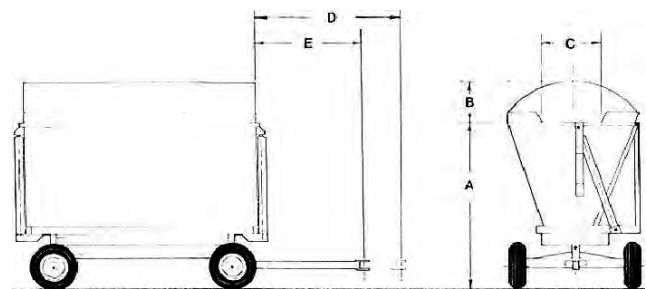


FIGURE 2. Dimensions for Forage Harvester Compatibility: (A) Box Height, 3250 mm; (B) Roof Height, 890 mm; (C) Front Opening Width, 1450 mm; (D) Extended Tongue, 2470 mm; (E) Compressed Tongue, 2170 mm.

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

Unloading: The Jiffy had two hydraulic cylinders, connected

in parallel, for dumping. FIGURE 3 shows the clearance dimensions during the dumping cycle. Mechanical stabilizers automatically lock the front rocking bolster at the beginning of the loading cycle. Two springs help to open the roof when it is contacted by the unloading forage.

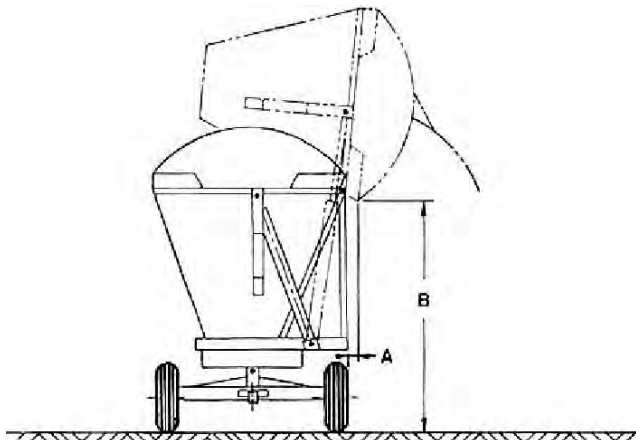


FIGURE 3. Unloading Clearance: (A) Horizontal, 350 mm; (b) Vertical, 3200 mm.

Since the Jiffy dumped forage closer to the receiving side of a truck box, side extensions were needed on the truck box to allow filling the truck to capacity with minimum loss. The 3200 mm vertical dump clearance was adequate for loading most truck boxes equipped with side extensions. Unloading time depended on the tractor hydraulic system, but usually was less than one minute. The 47° dump angle was adequate for dumping forage. The hydraulic cylinders were not equipped with a flow divider, however synchronization of the cylinders was not a problem, provided the wagon was evenly filled. The operator's manual advised that the wagon not be dumped when forage was unevenly distributed at the ends of the box or with under inflated tires.

Bridging during unloading occurred only once with clover at 60% moisture content. The roof usually held forage in the wagon box until it was fully raised, and then did not swing fully clear to allow the forage to fall towards the centre of the truck box. When the wagon was filled to capacity, some forage dropped through the front opening during unloading.

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

The maximum side slope on which the Jiffy could be safely unloaded depended on the flow characteristics of the material being handled. When unloading materials which bridge easily, the Jiffy could tip sideways when unloading on side slopes or during winds. Unloading should not be attempted on side slopes greater than 5 degrees.¹

Access and Cleaning: A 120 mm diameter cleanout door was provided at the bottom rear of the box. The door could be easily opened from the outside. 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 centre pivoting roof provided excellent protection against wind, however, the roof did not open sufficiently during unloading to allow the forage to flow smoothly from the dump box. Springs at the front and rear of the roof were not adequate to pull the lid away, however they did prevent the lid from opening during severe cross winds.

Transporting: The Jiffy Hydump towed well on smooth roads at speeds up to 40 km/h. At higher speeds, the wagon began to sway excessively due to free-play in the steering linkage. Total linkage free-play, measured at the hitch pin, was about 150 mm. The 4140 mm height just barely cleared many highway underpasses.

LOAD CARRYING CAPACITY

Manufacturer's Load Rating: The manufacturer recommended

that the maximum load not exceed 8.2 t. Since the box had a capacity of 17.3 m³, the box could be only partially filled with some materials, and grains, before the recommended load rating was exceeded. For example, over 11 m³ of wheat would overload the wagon. The wagon could also be overloaded with some high moisture content forages.

Tires: The Jiffy was equipped with four, 11 x 20, 14-ply tires. These were adequate² for the manufacturer's recommended load rating.

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

OPERATOR SAFETY

The Jiffy Hydump was safe to operate, if the manufacturer's safety instructions were followed. Dumping should not be attempted on side slopes greater than 5° or with under inflated tires. 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 adequate brakes to permit safe stops during transport.

Maximum height during unloading was 6.1 m. Caution must be exercised to avoid unloading near power lines. Minimum power line heights vary in the three prairie provinces. Lines over farmland and secondary roads may be as low as 5.2 m in Saskatchewan, and as low as 4.8 m in Manitoba and Alberta. In farmyards, lines may be as low as 4.6 m in all three provinces.

OPERATOR'S MANUAL

The operator's manual was unsatisfactory. Operating instructions were unclear and often did not relate to the wagon. For example, the instructions referred to a hydraulic bolster stabilizer system that did not exist on the Jiffy Hydump 700. Instructions on lubrication were vague. Assembly instructions and illustrations were confusing and difficult to follow.

It is recommended that the manufacturer consider producing a new operator's manual complete with clear safety, operating and assembly instructions.

DURABILITY RESULTS

Only one minor mechanical problem occurred during the 260 hours of field testing and the standard load rating test. The mechanical bolster stabilizer locked and failed to disengage once after unloading. Locking was caused by binding between the bolster latch and the bolster. One wheel had to be jacked up to disengage the latch. The problem did not reoccur.

The intent of the test was evaluation of functional performance. An extended durability evaluation was not conducted.

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

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

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

APPENDIX I

Make: Jiffy
Model: 700
Serial No.: C129279H35

Maximum Load Rating: 8.2 t

Overall Dimensions:

-- height (with optional forage roof) 4140 mm
 -- height (in full dump position) 6100 mm
 -- width 3100 mm
 -- length (less hitch) 4500 mm
 -- wheel tread 2730 mm
 -- wheel base 3450 mm
 -- ground clearance 380 mm

Box Dimensions:

-- width
 - bottom 1015 mm
 - top 2930 mm
 -- height
 - right side 1980 mm
 - left side 2180 mm
 -- length 4110 mm
 -- capacity 17.3 m³

Weight:

-- left front wheel 728 kg
 -- left rear wheel 736 kg
 -- right front wheel 720 kg
 -- right rear wheel 578 kg
 TOTAL 2762 kg

Tires: four, 11.00 x 20, 14-ply.

Lubrication Points:

-- grease fittings 16, periodically
 -- wheel bearings 4, periodically

Bolster Stabilizers:

mechanical

Hydraulic Cylinders (two):

-- rod size 51.0 mm
 -- bore 89.0 mm
 -- retracted length 1740 mm
 -- stroke 1550 mm

**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) = 0.6 mile/hour (mph)
 1 metre (m) = 3.3 feet (ft)
 1 kilogram (kg) = 2.2 pounds mass (lb)
 1 tonne (t) = 2200 pounds mass (lb)
 1 cubic metre (m³) = 35 cubic feet (ft³)
 1 millimetre (mm) = 0.04 inches (in)



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