BHUTAN STANDARD

Walk Behind Power Reaper -Test Code (Part 2)

1 Scope

This standard specifies the test methods for Walk Behind Power Reaper.

2 Normative References

The following document is indispensable for application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BTS 36: 2017, Walk Behind Power Reaper- Basic Requirements (Part 1)

3 Definitions

For the purposes of this standard, the definitions given in BTS 36:2017 and the following apply.

3.1 Others

Any additional verifications that may be required to be undertaken for enhancing the precision of any test items.

3.2 Field capacity

The field capacity of a farm machine is expressed as the area covered by tested machine in a given time period.

3.3 Accuracy

It is the difference between the total grain losses that occurs during harvesting by machine over the reference value.

3.4 Total operating time

It is the time taken from start to the end of harvesting.

3.5 Header Loss

Header loss is expressed as the percentage of grain loss on the ground over the total grain loss from the machine harvesting in the given test.

3.6 Discharge loss

The discharge loss is expressed as the percentage of grain collected on the discharge area over the total grains loss that occurs from the machine harvesting in the given test.

4 General conditions for the test

4.1 The power reaper subjected to the test shall be run as per the manufacturer's indication and specifications.

4.2 The power reaper subjected to the test shall be adjusted as per the manufacturer's indication.

4.3 The fuel and lubricants used for the test shall be selected from those indicated by the manufacturer.

4.4 All measuring instruments used for the test shall be calibrated with relevant agencies or certification body.

5 Test items and methods

5.1 Verification of structure

The objective of this test is to confirm the specifications of a power reaper given by a manufacturer. The items shall be verified are as per the Annex A.

5.2 Safety test

The objective of this test is to ascertain the safety features of the power reaper. It shall be performed by;

a) Verifying safety devices
b) Inspection of the caution labels.
c) Availability of instruction and operation manuals.
d) Others

5.3 Operation test

The objective of the test is to assess the performance and harvesting adaptability of the machine in the field. To carry out this test, following conditions shall be maintained;

a) The manufacturer's specification, instruction and operation manuals shall be followed for fitting the accessories and any other adjustments.
b) The test shall be conducted for paddy.
c) The walk behind power reaper shall be operated by at least two experienced operators.
d) The reference test shall be conducted to determine accuracy of the walk behind power reaper machine.

5.3.1 The items to be measured or investigated are:

a) Field capacity
b) Total grain loss
c) Ease of operation

d) Noise and vibration
e) Others

6 Formulae

The field capacity, header loss, discharges loss, total grain loss shall be calculated as follows;

6.1 Field capacity

$$FC = \left(\frac{Ac}{h}\right) = \frac{Ac}{h} \text{ - - - - - - - - - - - - - - - - - - } Eq.1$$

Where:

FC: Field Capacity, acre/h
Ac: Area covered during test, acre
h: Total operating time, h

6.2 Header Loss

$$LH\ (\%) = \frac{WH}{WT}\ x\ 100 \text{ - } Eq.2$$

WH=WH1+WH2+WH3

Where:

LH: Header loss (%)
WH: Weight of total header loss (kg)
WH1: Weight of loose grain on ground (kg)
WH2: Weight of grains from cut panicles but fallen on ground (kg)
WH3: Weight of grains from uncut panicles fallen on ground after the harvesting (kg)
WT: Summation of weight of discharge loss on discharging area, weight of the grain removed from stalks on discharging area and weight of the total header loss (kg)

6.3 Discharge loss

$$LD\ (\%) = \frac{WD}{WT}\ x\ 100 \text{ - } Eq.3$$

Where:

LD: Discharging loss (%)
WD: Weight of loss grain caused by discharging
WT: Summation of weight of discharge loss on discharging area, weight of the grain removed from stalks on discharging area and weight of the total header loss.

6.4 Total grain loss

$$\boldsymbol{LT}\ (\%) = \boldsymbol{LH} + \boldsymbol{LD}$$

Where:

LT: Total grain loss, %
LH: Header loss, %
LD: Discharging loss, %

7 Inspection after disassembling

If any abnormalities are observed during any of the above tests, causes may be investigated by disassembling the specific parts.

Annex A (Normative)

(Clause 5.1)

Specification sheet for Walk Behind Power Reaper

A.1 Walk Behind Reaper

1) Model:
2) Make:
3) Overall Dimensions (mm)
   a) Length:
   b) Width:
   c) Height:

A.2 Engine

a) Model:
b) Make:
c) Type:
d) Power: .....kW /……. Rpm
e) Fuel used:

A.3 Fuel system

a) Type of fuel feed system:
b) Fuel tank capacity, (L):

A.4 Power transmission system

Numbers of speed;

a) Forwards:
b) Reverse:

A.5 Cutting device

a) No. of cutting row:
b) Cutting width (mm):
c) Minimum cutting height (mm):
d) Capacity, (acre/h):

A.6 Pick-up device

Type:

A.7 Conveying and discharging device

Type:

A.8Tyre

a) Size:
b) Ply rating:

Bibliography

1. Regional Network for Agricultural Machinery (RNAM) Test Codes and Procedures for Farm Machinery, Technical Series No. 12:1995.

2. PAES 102:2000 Agricultural Machinery - Operator's Manual - Content and Presentation

3. PAES 103:2000 Agricultural Machinery - Method of Sampling PAES

4. 212:2004 Agricultural Machinery – Power reaper – Specifications

Mechanical Engineering Technical Committee (TC-08)

Organization	*Representatives*
	Chairman
Agriculture Machinery Centre, Ministry of Agriculture and Forest	Mr. Chetem Wangchen
	Members
Agriculture Machinery Centre, Ministry of Agriculture and Forest	Mr. Kinga Norbu
Agriculture Machinery Centre, Ministry of Agriculture and Forest	Mr. SangayLhendup
Construction Development Corporation Limited	Mr. Karma Loday
Farm Machinery Corporation Limited, Ministry of Finance	Mr. Karma Thinley
Department of Agriculture, Ministry of Agriculture and Forest	Mr. Tirtha Bdr. Katwal
Road Safety and Transport Authority, Ministry of Information and Communication	Mr. Phuntsho Wangdi
Technical Training Institute, Samthang, Ministry of Labour and Human Resources	Mr. Sangay Wangchuk
Bhutan Standards Bureau	Mr. Sonam Phuntsho, Director General (Ex- Officio member)

Member Secretary

Pema Dorji
Standardization Division
Bhutan Standards Bureau