

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT



संख्या / No.: Imp.194/264
माह / Month: December, 2016



**NEW SWAN ROTAVATOR, Model: NSML GT165 (Gear Drive)
(Tractor Operated)**



सत्यमेव जयते

भारत सरकार

GOVT OF INDIA

कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

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1. SCOPE OF TEST

The scope of test was to check and assess the following:

1.1 Laboratory Test:

- a) Checking of specifications
- b) Hardness of soil engaging parts (Rotavator blades)
- c) Chemical analysis of critical components (Rotavator blades)
- d) Wear analysis of critical components (Rotavator blades)

1.2 Field Test:

- a) Rate of work
- b) Quality of work
- c) Ease of operation and adjustments
- d) Labour requirement
- e) Defects, Breakdowns & Repairs

2. METHOD OF SELECTION

The implement was directly submitted for test by the applicant at this Institute. Hence, the method of selection is not known.

3. TEST PROCEDURE

The following codes were referred for testing of Rotavator.

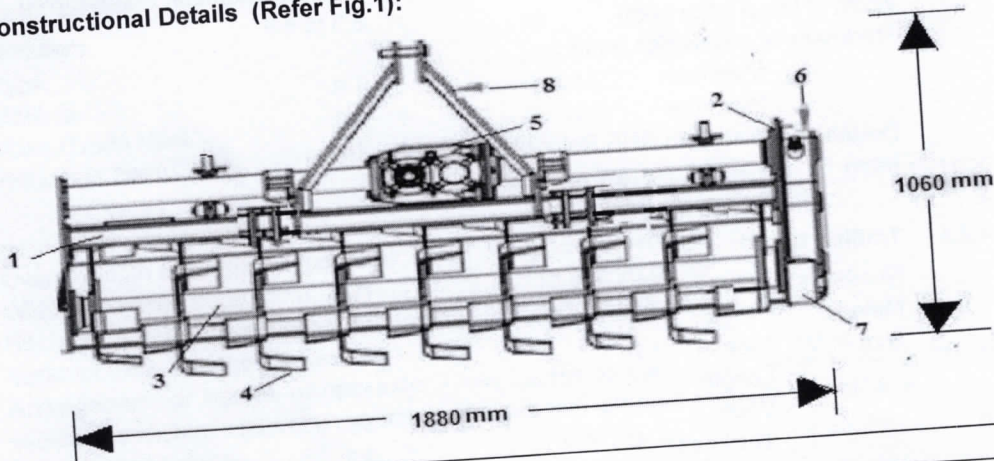
i)	IS: 6690-1981 (Reaffirmed in 2012)	:	Specifications of blades for rotavator for power tillers
ii)	IS: 4931 – 1995 (Reaffirmed in December 1999)	:	Agricultural tractors-Rear Mounted PTO shaft (Types 1, 2 & 3)
iii)	IS: 4468 – 1997 (Part-1) (Reaffirmed in 2012)	:	Agricultural wheeled Tractors- Rear Mounted three point linkage.
iv)	IS: 11531 – 1985 (Reaffirmed in 2001)	:	Test code for puddler

4. SPECIFICATIONS**4.1 General:**

Name and address of the manufacturer	:	M/s. New Swan Multitech Limited. Village Raian, Kohara-Machiwara Road PO Heeran, Ludhiana-141 112 (Punjab)
Test requested by (Applicant)	:	M/s. New Swan Multitech Limited. C-124, Naraina Industrial Area. Phase-I, Road No. 12. New Delhi-110 027
Name of machine	:	Rotavator
Make	:	NEW SWAN
Model	:	NSML GT 165
Type	:	Gear Drive (Tractor Operated)

Serial Number of machine : NSML 0022411
 Size : 1550 x 370 Φ
 Year of manufacture : 2016
 Country of origin : Not Provided
 Power Source as recommended, hp : Not Provided
 Power source used during the test : Swaraj 855 FE Tractor (Refer Annexure-III)

4.2 Constructional Details (Refer Fig.1):



KEYWORDS:

1.	Mainframe	5.	Primary reduction gear box
2.	Side plate	6.	Secondary reduction gear box
3.	Rotor shaft	7.	Skid
4.	Rotor blade	8.	Hitch pyramid

Fig.1: SCHEMATIC VIEW OF NEW SWAN NSML GT 165 ROTAVATOR

4.2.1 Main Frame:

Constructional Details: It consisted of a square MS pipe of size 1680x60.5x60.5 mm welded with two nos. of cross member (MS plate) each of size 540x170x8.4 mm in RHS and LHS respectively. One MS sheet is welded over the rotor unit on the frame (top cover) of size 1680x460 (curved) x3.2 mm. One MS hollow pipe of size 580x76.9 mm Φ was fitted to the LHS side plate extending from the LHS of the primary reduction gear box. In the RHS of primary reduction gear box one more MS hollow pipe of size 820x76.9mm Φ was welded and extended up to the RHS side plate.

Material : MS sheet, MS plate & MS pipe (square)
 Dimensions of frame, mm : 1710x460

4.2.2 Side plates:

Number(s) : Two
 Material : MS plate

Dimensions (mm):

- LHS : 650x424(max.)x8.5
 - RHS : 430x424(max.)x8.5

Method of fixing: Both LHS and RHS plate were bolted to the main frame with 4 nos. of bolts each of size having a dimensions 35.1x11.7 Φ mm. Depth adjusting skids is bolted on each side plate. Secondary reduction gear box is fitted on the LHS plate.



8. EASE OF OPERATION & ADJUSTMENTS

The operator can easily adjust and control the implement from operator's seat in the field as the adjustments are within the easy reach of operator. However the operator has to get down from the tractor in order to raise/lower the depth adjusting skids. No noticeable difficulty was observed during the operation and adjustment of Rotavator.

9. DEFECTS, BREAKDOWNS AND REPAIRS

- 9.1 Shear bolt on the propeller shaft was broken at 22.79 progressive hours and was replaced with a new shear bolt during field test.
- 9.2 The nuts and bolts which bolted the blade and the flange are found broken and get loose frequently.

10. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

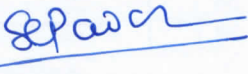
- 10.1 The dimensions of PIC of the rotavator does not conform to IS: 4931-1995. The manufacturer must look into the matter for its corrective action.
- 10.2 The diameter of upper hitch pin, lynch pin hole and mast height does not conform to IS: 4468-1997. The manufacturer should look into for corrective action and proper standardization.
- 10.3 The dimension of the PIC yoke bore does not conform to IS: 4931-1995. The manufacturer should look into for its corrective action.
- 10.4 The rate of work was recorded as 0.392 to 0.467 ha/h with operation speed of 3.13 to 3.60 kmph.
- 10.5 The depth of operation in dry land operation was recorded as 11 to 12 cm with soil moisture content of 13.5 to 15.6 % in Sandy soil and considered on lower side. The depth of puddle was recorded as 18 to 26 cm which is considered as normal for wetland operation.
- 10.6 The hourly rate of wear of blade on mass basis in Wet land & Dry land operations was recorded as 0.02 to 0.03 % and 0.10 to 0.20 % respectively.
- 10.7 The hourly rate of wear of blade on dimensional basis in Wet land & Dry land operations was recorded as 0.01 to 0.08 % and as 0.03 to 0.38% respectively.
- 10.8 The hardness of the blade does not conform to IS: 6690-1981. The manufacturer should look into for its corrective action and proper standardization.
- 10.9 Type, model, serial no. and year of manufacture was indicated on the labeling plate. However, size of implement and power requirement should also specify on the labeling plate.
- 10.10 The bolts and nuts tightening the blade and flange are found broken and get loose frequently. Therefore, it should be looked into for corrective action.

10.11 No ingress of mud and/or water was found in primary and secondary reduction boxes after 15.62 h of Wet land the sealing provided on different subassemblies were found effective.

10.12 Technical literature:

An Operator cum Service Manual & Parts Catalogue was not provided along with the machine during the course of testing. Which is the sole responsibility of manufacture and transparency among user and in public interest.

TESTING AUTHORITY



S. G. PAWAR
AGRICULTURAL ENGINEER



K.K. NAGLE
DIRECTOR

Test conducted and report compiled by -

Sh. Vithato Keyho & Sh. Rahul Prajapati

11. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant's Comments
11.1	10.1	For further production we shall take appropriate action to improve the same as per IS: 4931-1995 in future.
11.2	10.2	For further production we shall take appropriate action to improve the same as per IS: 4468-1997 in future.
11.3	10.3	We shall review the same and ensure it will conform to IS: 4931-1995 in future supplies.
11.4	10.8	Review the same ensure to comply the requirement of the blade as per IS: 6690-2002 in future.
11.5	10.10	We are already working on the same taking appropriate action to improve the same in future.
11.6	10.12	Same is in process & We shall ensure to provide the same for further supplies both technical literature.