

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: COMB.-210/2477/2020

माह/Month: June, 2020

THIS TEST REPORT VALID UP TO : 30th JUNE, 2027



**KSA GREEN GOLD
TRACTOR MOUNTED COMBINE HARVESTER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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[ISO 9001:2015 CERTIFIED]

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14. NOISE LEVEL MEASUREMENT**14.1 Noise at bystander's position**

Date of test : 04.12.19
 Type of track : Concrete
 Background noise level, dB (A) : 49.8

Location of microphone:

Height of microphone above ground level, m : 1.2
 Distance of microphone from line of travel, m : 7.5

Atmospheric conditions:

Temperature, (°C) : 27.2
 Pressure, (kPa) : 98.8
 Relative humidity, (%) : 34.8
 Wind velocity, (m/s) : 0.9 to 2.6

TEST DATA:

| S. No. | Gear Used | Travelling Speed before acceleration (kmph) | Noise level, dB (A) | |
|--------|-----------|---|----------------------------|--------------------------------------|
| | | | Silencer facing microphone | Silencer facing away from microphone |
| 1. | L-1 | 2.12 | 84 | 82 |
| 2. | L-2 | 3.10 | 83 | 82 |
| 3. | L-3 | 4.30 | 82 | 83 |
| 4. | L-4 | 6.16 | 84 | 83 |
| 5. | H-1 | 8.10 | 83 | 82 |
| 6. | H-2 | 11.21 | 84 | 84 |
| 7. | H-3 | 15.21 | 82 | 82 |
| 8. | H-4 | 20.0 | 84 | 83 |

14.2 Noise at operator's ear level

Date of test : 04.12.2019
 Type of track : In actual field condition
 Background noise level, dB(A) : 52.5
 Height of microphone from the foot board, mm : 1130

Atmospheric conditions:

Temperature, (°C) : 28.4
 Pressure, (kPa) : 99.3
 Relative humidity, (%) : 33.9
 Wind velocity, (m/s) : 0.8 to 2.2

TEST DATA:

Maximum noise level observed dB(A) : 96

15. FIELD TEST

15.1 Combine harvester was operated in field for 25.74 and 25.91 hours for wheat and paddy harvesting respectively. During the test, available varieties of crop were harvested to assess the field performance of combine with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop and atmospheric conditions during field test are given in Appendix - II & IV respectively.

The crop parameters recorded during the test for all crops are as under:-

Crop Parameters

| Sl. No. | Parameters | | Observations | |
|---------|--|---|--------------|--------------|
| | | | Wheat | Paddy |
| 1. | Average plant height, cm | : | 90 to 110 | 96 to 137 |
| 2. | Average number of tillers/m ² | : | 343 to 405 | 234 to 305 |
| 3. | Average length of ear head, cm | : | 7 to 10 | 25 to 32 |
| 4. | Average straw/grain ratio | : | 0.6 to 1.1 | 1.1 to 2.1 |
| 5. | Average moisture, % | | | |
| | - Grain | : | 8.6 to 8.8 | 13.9 to 15.8 |
| | - Straw | : | 9.5 to 9.9 | 60.5 to 65.1 |

The results of field performance test of wheat and paddy crops harvesting are summarised in Table - 5 and presented in detail in Appendix – II to V.

Table- 5 : SUMMARY OF LOSSES & EFFICIENCIES OBSERVED DURING FIELD PERFORMANCE TEST.

| Crop variety | Collect able losses (%) (Max.) | Non-collect able losses (%) (Max.) | Total proces sing losses (%) (Max.) | Thresh ing efficie ncy (%) (Min.) | Cleani ng efficie ncy (%) (Min.) | Grain breaka ge in main tank (%) | Forwa rd speed (kmp h) | Area cover ed (ha/h) | Fuel consumption | | Grain out put (kg/h) | Crop throu gh-put (t/h) |
|--------------|--------------------------------|------------------------------------|-------------------------------------|-----------------------------------|----------------------------------|----------------------------------|------------------------|----------------------|------------------|----------------|----------------------|-------------------------|
| | | | | | | | | | (l/h) | (l/ha) | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| WHEAT | | | | | | | | | | | | |
| HD 2967 | 2.4 | 0.7 | 2.5 | 99.1 | 97.2 | 0.83 to 1.53 | 1.69 to 1.79 | 0.457 to 0.489 | 3.52 to 3.92 | 7.19 to 8.57 | 2344.07 to 2633.22 | 4.19 to 4.86 |
| PADDY | | | | | | | | | | | | |
| PUSA 1121 | 1.3 | 0.4 | 1.4 | 99.2 | 97.9 | 0.53 | 1.81 | 0.402 | 5.60 | 13.93 | 3563.47 | 11.01 |
| ND 53 | 1.2 | 0.6 | 1.4 | 98.9 | 97.9 | 0.12 to 0.29 | 1.71 to 1.75 | 0.412 to 0.432 | 5.52 to 6.47 | 13.38 to 15.09 | 3680.43 to 4740.64 | 7.65 to 11.91 |
| Pusa-44 | 1.1 | 0.5 | 1.2 | 99.2 | 98.3 | 0.27 | 1.71 | 0.386 | 5.29 | 13.70 | 3691.30 | 8.10 |

SUMMARY OF FIELD PERFORMANCE OF CHOPPER CUM SPREADER

| | |
|---|------|
| Uniformity of straw speed, CV (percent) | 18.8 |
| Weight mean size of chopped straw, cm | 10.2 |

15.2

Unloading of grain

The time to unload the grain tank ranged from 80 to 91 second in wheat operation & 74 to 112 seconds in Paddy operation.

15.3

Time required for daily maintenance

The average labour required for daily maintenance was approximately two man hours.

15.4

Harvesting of any other crop

Not done, as not recommended.

16. DEFECTS, ADJUSTMENTS, BREAKDOWNS AND REPAIR

No noticeable defect observed

17. INSPECTION AND ASSESSMENT OF WEAR**17.1 Steering system**Visual condition of the components : No noticeable defect observed.
of complete steering assembly.**17.2 Chains, sprockets and belts**Visual condition of the components : No noticeable defect observed.
of complete assembly**17.3 Bearings**Visual condition of the components : No noticeable defect observed.
of complete assembly**17.4 Wear of rasp bar**

| Sr. No. | Mass of rasp bar before test (g) | Mass of rasp bar after 28.74 h test (g) | Wear (%) by weight |
|---------|----------------------------------|---|--------------------|
| 1 | 4969.7 | 4920.0 | 1.00 |
| 2 | 5250.7 | 5212.0 | 0.73 |
| 3 | 5236.0 | 5204.0 | 0.61 |
| 4 | 5366.3 | 5327.2 | 0.73 |

17.5 Wear of the peg teeth

The wear of the peg teeth of the threshing cylinder and concave was measured. The percentage wear on mass basis was computed and the results are given below:

| Sl. No. | Original mass before test (g) | Mass after 28.08 h of test (g) | Percent wear by weight (%) |
|-----------|--|--------------------------------|----------------------------|
| a) | Peg teeth of threshing cylinder | | |
| 1. | 239.0 | 237.0 | 0.84 |
| 2. | 232.5 | 232.0 | 0.65 |
| 3 | 234.7 | 232.4 | 0.98 |
| 4 | 225.1 | 223.1 | 0.89 |
| 5 | 233.9 | 232.0 | 0.81 |
| 6 | 245.4 | 243.8 | 0.65 |
| 7. | 230.5 | 229.2 | 0.56 |
| 8. | 220.6 | 219.1 | 0.68 |
| 9. | 230.8 | 229.3 | 0.65 |
| 10. | 235.7 | 234.2 | 0.64 |
| 11. | 233.4 | 231.8 | 0.69 |
| 12. | 239.2 | 237.7 | 0.63 |
| 13. | 216.7 | 215.4 | 0.60 |
| 14. | 235.7 | 234.3 | 0.59 |
| 15. | 243.0 | 241.8 | 0.49 |
| 16. | 222.7 | 221.5 | 0.54 |

| b) | Peg teeth of concave | | |
|----|----------------------|-------|------|
| 1 | 231.8 | 229.9 | 0.69 |
| 2 | 233.2 | 231.7 | 0.64 |
| 3 | 238.1 | 236.4 | 0.71 |
| 4 | 224.7 | 223.4 | 0.58 |
| 5 | 232.7 | 231.3 | 0.60 |
| 6 | 236.0 | 234.5 | 0.64 |

18. SUMMARY OF OBSERVATIONS

18.1 Tractor P.T.O. Performance Test: (Refer tractor test report No T-978/1502/2015, August, 2015 issued by C.F.M.T & T.I Budni)

18.2 Field test

18.2.1 Summary of field tests

The results of the field test are summarized below:-

| S. No | Parameters | Observed range | |
|-------|---|------------------------------|--------------------------------|
| | | Wheat harvesting | Paddy harvesting |
| 1. | Range of average speed of operation (kmph) | 1.69 to 1.79 | 1.71 to 1.80 |
| 2. | Range of average area covered (ha/h) | 0.457 to 0.489 | 0.386 to 0.432 |
| 3. | Maximum average fuel consumption: - (l/h) - (l/ha) | 3.52 to 3.92 7.19 to 8.57 | 5.29 to 6.47 13.38 to 15.09 |
| 4. | Range of average crop throughput (tonne/h) | 4.19 to 4.86 | 7.65 to 11.91 |
| 5. | Reported average grain breakage in main grain outlet (%) | 1.53 | 0.53 |
| 6. | Reported average header losses (%) | 0.72 | 0.37 |
| 7. | Reported average total non-collectable losses (%) | 0.7 | 0.6 |
| 8. | Reported average total collectable losses (%) (un threshed + broken from main outlet) | 2.4 | 1.3 |
| 9. | Reported average total processing losses (%) | 2.5 | 1.5 |
| 10. | Reported average threshing efficiency (%) | 99.1 | 98.9 |
| 11. | Reported average cleaning efficiency (%) | 97.2 | 97.9 |
| | Performance of straw chopper cum spreader | | |
| 12. | Uniformity of straw spread, CV (Percent) | -- | 18.8 |
| 13. | Weighted mean size of chopped straw cm | -- | 10.2 |

18.3 Conformity to Indian Standard

- (i) IS: 6025-1982 (Reaffirmed 2014)-Specification for : **Does not conform in toto**
knife section for harvesting machine.
- (ii) IS: 6024-1983 (Reaffirmed 2014)-Specification for : **Conforms**
guards for harvesting machines.
- (iii) IS: 10378-1982 (Reaffirmed 2016)-Specification of : **Does not conform in toto**
knife back for harvesting machine.

21. COMMENTS AND RECOMMENDATIONS

- 21.1 Mechanical vibration**
The amplitude of mechanical vibration of components marked as (*) in chapter 12 of this report are observed on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub-assemblies.
- 21.2 Field performance test**
No noticeable defect observed during field test.
- 21.3 Ease of operation and safety provision**
i) No noticeable difficulties observed during operation of combine harvester.
ii) Slip clutches at cutting platform auger, under shoot conveyer and grain & tailing elevator drive are not provided. It **MUST** be provided as per the requirement of IS 15806 : 2018
iii) The first aid box is not provided on machine. It **MUST** be provided.
- 21.4 Grain tank cover is not provided.** It **MUST** be provided as per the requirement of IS : 15806:2018
- 21.5** Cutter bar knife drive safety arrangement is not provided. It should be provided.
- 21.6** There is no provision for varying oscillation of sieve. It should be looked into.
- 21.7 Hardness and chemical composition**
Hardness & chemical composition of knife blade, knife guard and knife back is not within the limits specified in their respective IS: 6025-1982. It should be looked into for corrective action at regular production level.
- 21.8** Material of SMS blade and Bushes for flail blade is not specified. It **MUST** be specified as per the requirement of IS:15806-2018



21.11 Literature supplied with the machine

The following literature provided during the test


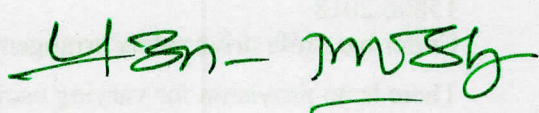
- i) Operator's manual and parts catalogue for combine harvester.

The following literature should provided

- i) Operator manual of SMS
ii) Service manual of SMS
iii) Parts catalogue of SMS

However, the Operator manual should be updated as per IS: 8132-1999.

TESTING AUTHORITY

| | |
|---|--|
| RINKU PRASAD GUPTA TECHNICAL ASSIATANT |  |
| P. K. PANDEY DIRECTOR |  |

The Test Report compiled by C.Veeranjaneyulu, Senior Technician

22. APPLICANT'S COMMENTS

| Para No | Our reference | Applicant's Comments |
|---------|---------------|--|
| 22.1 | 21.1 | During regular production level remedial measures will be taken |
| 22.2 | 21.3 (ii) | Slip clutch will be provided in regular production |
| 22.3 | 21.3 (iii) | First aid kit will be provided with each harvester |
| 22.4 | 21.4 | We will be provided in regular production |
| 22.5 | 21.5 | We will be provided in regular production |
| 22.6 | 21.6 | We will be provided in regular production |
| 22.7 | 21.7 | Hardness and chemical composition of knife blade, knife guard and knife back will be amended to conform IS standard. |
| 22.8 | 21.8 | Material of SMS bushes for flail we will be specified |

