

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: COMB-271/2854/2022

माह/Month: May, 2022

THIS TEST REPORT VALID UP TO : 31st May, 2029



**PREET 849,
SELF PROPELLED COMBINE HARVESTER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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14. FIELD TEST

14.1 Combine harvester was operated in field for 26.58 and 27.35 hours(excluding running-in of 1.50 and 3.13 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

| Sr. No. | Parameters | | Observations | |
|---------|----------------------------------|---|--------------|--------------|
| | | | Wheat | Paddy |
| 1. | Plant height, cm | : | 92 to 129 | 90 to 120 |
| 2. | Number of tillers/m ² | : | 249 to 273 | 317 to 391 |
| 3. | Length of ear head, cm | : | 8 to 14 | 18 to 29 |
| 4. | Straw/grain ratio | : | 0.7 to 1.1 | 2.0 to 2.7 |
| 5. | Moisture, % | | | |
| | - Grain | : | 13.0 to 13.5 | 14.0 to 14.5 |
| | - Straw | : | 10.4 to 12.0 | 54 to 56 |

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 | Collectable losses (Max.) (%) | Non-collectable losses (Max.) (%) | Total processing losses (Max.) (%) | Threshing efficiency (Min.) (%) | Cleaning efficiency (Min.) (%) | Grain breakage in main tank (Max.) (%) | Forward speed (kmph) | Area covered (ha/h) | Fuel consumption | | Grain output (kg/h) | Crop throughput (t/h) |
|--------------|-------------------------------|-----------------------------------|------------------------------------|---------------------------------|--------------------------------|--|----------------------|---------------------|------------------|----------------|---------------------|-----------------------|
| | | | | | | | | | (l/h) | (l/ha) | | |
| WHEAT | | | | | | | | | | | | |
| DBW-187 | 2.3 | 1.1 | 2.6 | 98.9 | 97.4 | 1.23 | 3.00 to 3.25 | 0.621 to 0.780 | 6.03 to 7.18 | 9.72 to 10.77 | 4719 to 4822 | 8.25 to 8.31 |
| DWW-303 | 2.1 | 0.6 | 2.4 | 98.9 | 97.4 | 1.32 | 2.94 to 3.08 | 0.572 to 0.730 | 5.88 to 7.61 | 10.43 to 11.06 | 4902 to 5170 | 8.62 to 10.15 |
| PADDY | | | | | | | | | | | | |
| 1D64-DRT | 0.70 | 2.50 | 3.00 | 98.7 | 96.9 | 1.22 | 1.80 | 0.351 | 5.45 | 15.55 | 3549 | 12.13 |
| MTV-1010 | 2.40 | 1.70 | 3.50 | 98.7 | 96.7 | 1.30 | 1.82 to 1.96 | 0.373 to 0.405 | 6.71 to 8.63 | 16.92 to 22.67 | 3475 to 3810 | 11.30 to 13.55 |

14.2 Unloading of grains

The time to unload the grain tank ranged from 62 to 76 second in paddy operation & 61 to 79 seconds in wheat operation.

18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS

| 18.1 Acceptance criteria for performance characteristics as per clause 4.1 of IS 15806:2018 | | | | | | |
|--|---|--|---|-----------------------|-----------------|----------------|
| Sr. No | Characteristics | Category (Evaluative /Non evaluative) | Requirement (R)/ Declaration (D) | Tolerance | Observed | Remarks |
| I. Prime mover performance | | | | | | |
| a) | Max. power (absolute) Average max. power observed during 2 hrs. max. power test in natural ambient condition, kW | Evaluative | 62 (D) | ±5% of declared value | 62.9 | Conforms |
| b) | Max. power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW | Evaluative | 54 (D) | ±5% of declared value | 54.2 | Conforms |
| c) | Power at rated engine speed, kW (under natural ambient condition) | Evaluative | 62 (D) | ±5% of declared value | 62.0 | Conforms |
| d) | Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh. | Evaluative | 245 (D) | ±5% of declared value | 242.1 | Conforms |
| e) | Max. smoke density at 80% load between the speed at max. power & 55% of speed at max. or 1000 rpm whichever is higher | Evaluative | As pre CMV rules. Maximum smoke density Light absorption coefficient 5.2 units (R) | Nil | 2.31 | Conforms |

| | | | | | | |
|----|---|------------|--|--------------------------------------|-------------|----------------------|
| f) | Max. crank shaft torque, (N–m) observed during the test after no load engine speed is adjusted as per manufacture’s recommendation for field work | Evaluative | 355. (D) | ±8% of declared value | 355.7 | Conforms |
| g) | Back up torque, % (Natural ambient) | Evaluative | 7 % min. (R) | Nil | 21.21 | Conforms |
| h) | Max. operating temperature, ° C i) Engine oil ii) Coolant | Evaluative | 120 (D) 117 (D) | Should not exceed the declared value | 115 94.3 | Conforms Conforms |
| i) | Lubrication oil consumption, g/kWh | Evaluative | 1 % of SFC at maximum power (high ambient) (R) | Nil | 0.210 | Conforms |

II. Brake performance

| | | | | | | |
|----|--|------------|---------------------------------------|-----|-----------------------|----------|
| i) | Max. Stopping distance at a force equal to or less than 600 N on brake pedal (m)- (cold brake and hot brake) | Evaluative | As per requirement of CMVR (R) | Nil | Cold: 3.6 Hot: 4.8 | Conforms |
| i) | Effectiveness of parking brake at a force of 600 N at foot pedal or 400 N at hand lever | Evaluative | As per requirement of CMVR (R) | Nil | Yes | Conforms |

III. Mechanical vibration

| | | | | | | |
|-----|-------------------------|----------------|-------------------------|-----|-----|-------------------------|
| i) | Steering wheel | Non evaluative | 150 µm max (R) . | Nil | 229 | Does not conform |
| ii) | Seat with driver seated | Non evaluative | 120 µm max. (R) | Nil | 240 | Does not conform |

IV. Air cleaner oil pull over

| | | | | | | |
|----|--|------------|----------------------|-----|--|----------------|
| a) | Air cleaner oil pull over in % when tested in accordance with IS 8122 part (II) 2000 | Evaluative | 0.20 max. (R) | Nil | Dry type air cleaner provided hence test is not applicable | Not applicable |
|----|--|------------|----------------------|-----|--|----------------|

| V. Noise measurement | | | | | | | |
|--------------------------------|------------|--|------------|---|---|--------------------------|----------|
| | i) | Max. ambient noise emitted by combine at by-standers position, dB(A) | Evaluative | 88 dB(A) as per CMVR (R) | Nil | 83.4 | Conforms |
| | ii) | Max. noise at operator's ear level dB(A) | Evaluative | 98 dB(A) as per CMVR (R) | Nil | 93.2 | Conforms |
| VI. Header lifting Test | | | | | | | |
| | i) | Satisfactory completion of header lifting test | Evaluative | - | Nil | Satisfactorily completed | Conforms |
| VII. Discard limit | | | | | | | |
| | a) | Cylinder bore diameter, mm | Evaluative | 104.40 (D) | Should not exceed the values declared by the manufacturer | 104.04 | Conforms |
| | b) | Piston diameter, mm | Evaluative | 103.380 (D) | -do- | 103.388 | Conforms |
| | c) | Piston to cylinder liner clearance at skirt | Evaluative | 0.80 (D) | -do- | 0.80 | Conforms |
| | d) | Ring end gap, mm | Evaluative | i) Top compression ring 2.0 (D) | -do- | 0.6 | Conforms |
| | | ii) 2 nd compression ring 2.0 (D) | | 0.6 | | Conforms | |
| | | iii) Oil ring 2.0 (D) | | 0.4 | | Conforms | |
| | e) | Ring groove clearance, mm | Evaluative | 1. Top compression ring -- | -do- | Tapered | -- |
| | | 2. 2 nd compression ring 0.35 (D) | | 0.05 | | Conforms | |
| | | 3. Oil ring 0.35 (D) | | 0.03 | | Conforms | |
| | f) | Diametrical and axial clearance of big end bearing, mm | Evaluative | Diametrical 0.9 (D) | -do- | 0.9 | Conforms |
| | | Axial 1.0 (D) | | 1.0 | | Conforms | |

| | | | | | | | |
|--|-----------|---|------------|----------------------|------|--------------------------------|--------------------------|
| | g) | Diametrical and axial clearance of main bearings, mm Diametrical Axial/crank shaft end float | Evaluative | 0.9(D) 1.0(D) | -do- | 0.9 1.0 | Conforms Conforms |
| | h) | Thickness of brake lining | Evaluative | Up to rivet head (D) | -do- | 1.8 to 2.0 mm above rivet head | Conforms |
| | i) | Thickness of clutch plate | Evaluative | Up to rivet head (D) | -do- | 1.8 to 2.1 mm above rivet head | Conforms |

VIII. Field performance

| | | | | | | | |
|--|-----------|-----------------------------------|------------|---|-----|---|--------------------------|
| | a) | Suitability for crops | Evaluative | Wheat & paddy (Wheel type) Paddy (Track type) | Nil | Wheat and paddy | Conforms |
| | b) | Average processing losses (%) | Evaluative | Max. (of average) 3% 4% (R) | Nil | Wheat Max. 2.6% paddy max. 3.5 % | Conforms Conforms |
| | c) | Threshing efficiency | Evaluative | ≥98 percent for wheat & Paddy (R) | Nil | Min. 98.9 % for wheat min. 98.7 % for paddy | Conforms |
| | d) | Cleaning efficiency | Evaluative | ≥96 percent for wheat & Paddy (R) | Nil | Min. 97.4% for wheat min. 96.7 % for paddy | Conforms |
| | e) | Grain breakage in main grain tank | Evaluative | ≤ 2.5 percent (R) | Nil | Max. 1.32 % for wheat max. 1.3 % for paddy | Conforms |
| | f) | Non collectable losses | Evaluative | ≤ 2.5 percent for wheat & paddy & grain ≤ 4.0 percent for Soybean (R) | Nil | Max. 1.1% for wheat Max. 2.5 % for paddy | Conforms |

| IX. Safety requirement | | | | | | |
|-------------------------------|---|--|--|----|--|---|
| a) | Guards against all moving parts | Evaluative | Belt and chain drives, pulleys hydraulic pipes (R) | -- | Provided | Conforms |
| b) | Lighting arrangement | Evaluative | As per CMVR (R) | - | Provided | Conforms |
| c) | Grain tank cover | Evaluative | Essential (R) | - | Provided | Conforms |
| d) | Spark arrester in engine's exhaust in case naturally aspirated engine | Evaluative | Essential (R) | - | Turbo charger fitted engine provided | -- |
| e) | Stone trap before concave | Evaluative | Essential (R) | - | Provided | Conforms |
| f) | Rear view mirror | Evaluative | Essential (R) | - | Provided | Conforms |
| g) | Fire extinguisher | Evaluative | Essential (R) | - | Provided | Provided |
| h) | Slip clutch at following drives – c) cutting platform ii) undershot conveyor drive iii) Grain & tailing elevator | Evaluative Non evaluative Non evaluative | Essential (R) Optional Optional | - | Provided Not provided Provided | Conforms Does not conform Conforms |
| i) | Anti slip surfaces at operator platform & ladder & proper gripping for the control levers. | Evaluative | Essential (R) | - | Provided | Conforms |
| j) | Working clearance around the controls | Non evaluative | Essential 70mm,min (R) | - | Provided | Conforms |
| k) | Labelling of control and gauges | Evaluative | Essential (R) | - | Provided | Conforms |

| | | | | | |
|----|-----------------|------------|--|------|-----|
| 3. | Minor | Evaluative | Not more than five and frequency of each should not be more than two | None | Yes |
| 4. | Total breakdown | Evaluative | In no case total no of (major + minor) breakdowns exceed five | None | Yes |

19. COMMENTS AND RECOMMENDATIONS

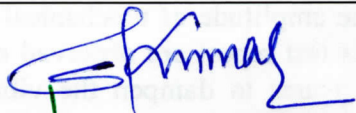

- 19.1** The amplitude of mechanical vibration of components marked as (*) in chapter 13 of this test report are observed on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub-assemblies.
- 19.2 Field performance test**
- 19.2.1** No noticeable defect observed during field test.
- 19.3 Ease of operation and safety provision**
No noticeable difficulties observed during operation of combine harvester.
- 19.4 Hardness and chemical composition**
- 19.4.1** **Chemical composition of knife blade is not within the limits specified in IS: 6025-1982. It should be looked into for corrective action at regular production level.**
- 19.4.2** **Hardness of the knife guard does not conform to their relevant IS code. It should be looked into for improvement.**
- 19.5** Slip clutch at undershot conveyer may be provided.

19.6 Literature supplied with the machine

The following literatures were supplied by the applicant as below

1. Operator's & Service manual for combine harvester
2. Operator manual –Engine
3. Spare Parts catalogue for combine harvester

TESTING AUTHORITY

| | |
|---------------------------------------|--|
| SANJAY KUMAR AGRICULTURAL ENGINEER |  |
| Dr. MUKESH JAIN DIRECTOR |  30.05.2022 |

Draft test report compiled by Vikram, Senior Technician

20. APPLICANT'S COMMENTS

We will complied with during our regular production of combine harvester.