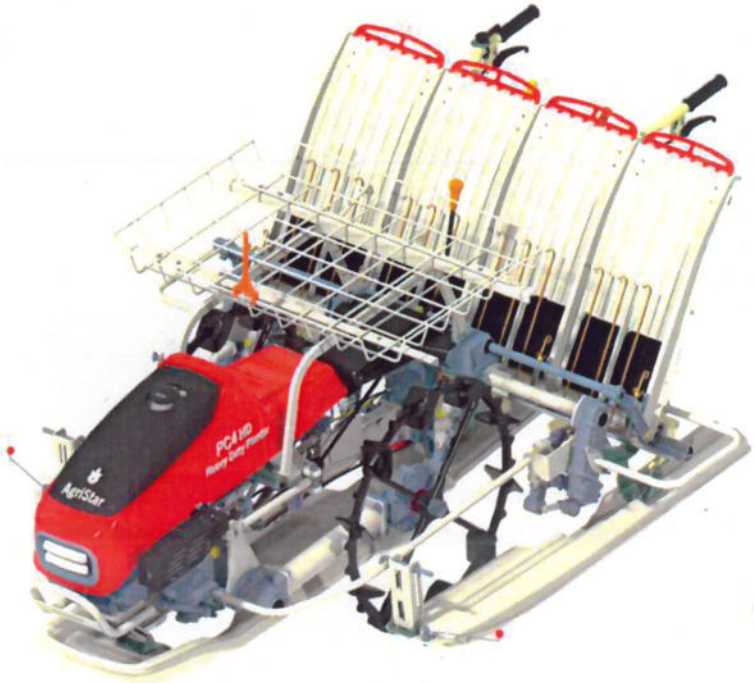
संख्या/No.: Machine 138/512
माह / Month: December 2024

गोपनीय परीक्षण रिपोर्ट
CONFIDENTIAL TEST REPORT

व्यावसायिक परीक्षण रिपोर्ट में परिवर्तित
CONVERTED TO COMMERCIAL TEST REPORT

THIS TEST REPORT IS VALID UPTO 31.12.2031



TAFE LTD., AGRISTAR PC4 HD, PADDY TRANSPLANTER

सत्यमेव जयते

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
उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
बिश्वनाथ चारिआलि, जिला - बिश्वनाथ (असम)
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4.0 SPECIFICATIONS

4.1 General:

Name and address of the manufacturer : M/s Tractors and Farm Equipment Limited,
77, Nungambakkam High Road,
Nungambakkam, Chennai - 600 034

Name and address of the applicant : Tractors and Farm Equipment Limited,
77, Nungambakkam High Road,
Nungambakkam, Chennai - 600 034

Country of origin : INDIA
Name of machine : Paddy Transplanter
Type : Self-Propelled, 4 Rows, Walk Behind
Make : TAFE LTD
Model : AGRISTAR PC4 HD
Size of Transplanter, mm : 4 x 300
Machine Serial no. : A4QB0002
Month and Year of manufacture : 02/2024

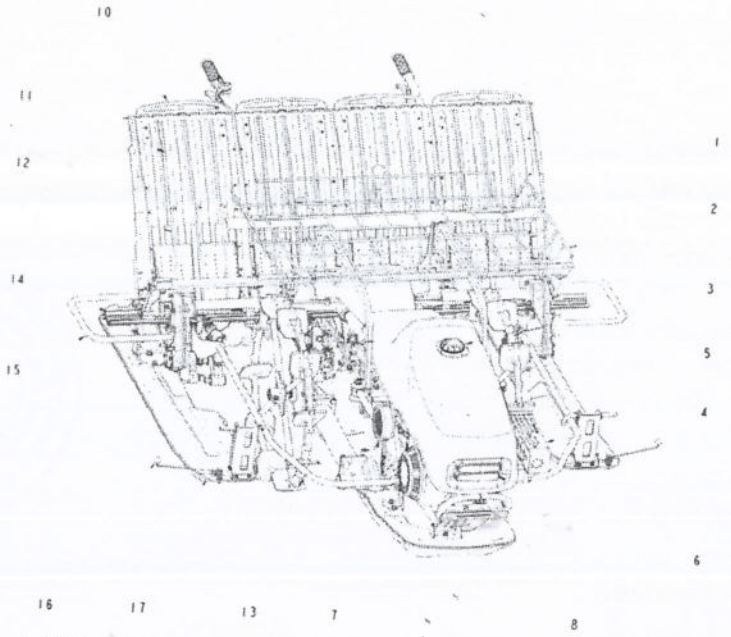

Fig. 1 SELF PROPELLED PADDY TRANSPLANTER, MAKE: TAFE LTD., MODEL: AGRISTAR PC4 HD

Keywords:

1	Centre guide	7	Air cleaner	13	Wheel
2	Seedling storage tray	8	Bumper	14	Sliding frame
3	Fuel cap	10	Seedling platform extension	15	Sliding board guard
4	Muffler	11	Seedling platform	16	Side guide
5	Bonnet	12	Seedling Guide	17	Side float
6	Head light				

Summary of field performance results

Table -2

Sl. No.	Parameters	Range
1	Forward speed, kmph	2.43 to 2.47
2	Engine speed, rpm	
	No load	3153 to 3159
	On load	3000 to 3003
3	Depth of transplanting, cm	5.5 to 6.8
4	Travel reduction (%)	0.26 to 0.99
5	Spacing between rows, cm	30
6	Number of plants per hill (nos.)	7 to 8
7	Spacing between hills, cm	18
8	Total number of hills per m^2	24
9	Percentages of transplanting faults per m^2, %	
	- Missed hills	0 to 0.83
	- Floating seedlings	0 to 0.83
	- Buried seedlings	Nil
	- Damaged seedlings	0 to 0.83
	- Total transplanting faults, %	0 to 0.83
10	Average area covered, ha/h	0.211 to 0.218
11	Time required to cover 1 ha, h/ha	4.59 to 4.74
12	Field efficiency, %	72.3 to 74.1
13	Fuel Consumption	
	-l/h	0.99 to 1.04
	-l/ha	4.58 to 4.74
14	Number of seedling trays consumed per ha	239 to 251

11.1 Rate of work

The average area covered and time required to cover one hectare area recorded as 0.211 to 0.218 ha/h and 4.59 to 4.74 h respectively at the forward speed of 2.43 to 2.47 kmph.

11.2 Quality of work

The quality of work was assessed by taking into consideration of the following parameters :-

The depth of transplanting was recorded as 5.5 to 6.8 cm.
The spacing between row to row was recorded as 30 cm.
The number of plants per hill was recorded as 7 to 8
The spacing between hills was recorded as 18 cm.
The total number of hills per m^2 was recorded as 24.
The percentage of missing hills was recorded as 0 to 0.83.
The percentage of floating seedlings was recorded as 0 to 0.83.
The percentage of buried seedlings was recorded as nil.
The percentage of damaged seedlings was recorded as 0 to 0.83.
The total percentage of transplanting faults was recorded as 0 to 0.83.

11.3 Fuel Consumption

The hourly fuel consumption was recorded as 0.99 to 1.04 lit and fuel required for planting of one hectare area was recorded as 4.58 to 4.77 l/ha.

11.4 Labour requirement

One skilled operator is required for continuous operation of machine. One person is required for feeding nursery mats to machine and two persons for handling the nursery trays.

11.5 Ingress of water and/ or mud

After completion of field tests, the transplanter was partially dismantled to check the effectiveness of sealing provided against ingress of water and / or mud in various assemblies / components.

Sl. No.	Locations	Whether ingress of mud and / or water was observed
1	Engine oil	No
2	Transmission oil	No
3	Planting transmission oil	No
4	Planting arm	No
5	Hydraulic oil	No

12. EASE OF OPERATION AND ADJUSTMENT

No noticeable difficulties were observed in operation and adjustment during the field test.

13. BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during the test.

14. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

14.1 Engine:

The engine and other assemblies were dismantled after 36.3 hours of operation.

14.1.1 Cylinder:

Cylinder	Cylinder bore dia (mm)						Max. Permissible wear limit (mm)
	Top position		Middle positon		Bottom position		
1	Thrust side	Non Thrust side	Thrust side	Non Thrust side	Thrust side	Non Thrust side	
	68.04	68.02	68.03	68.01	68.03	68.01	68.60

14.1.2 Piston:

Piston no.	Piston dia (mm)				Clearance between Piston and cylinder liner at the skirt of the Piston (mm)	Max. Permissible wear limit of Piston diameter (mm)
	At top		At skirt			
	Thrust side	Non thrust side	Thrust side	Non thrust side		
1	67.58	67.59	67.94	NA	0.09	67.15

14.1.3 Ring side clearance:

Piston Rings	Ring side clearance (mm)	Max. Permissible clearance limit (mm)
1st Compression ring	0.04	0.40
2nd Compression ring	0.05	
Oil ring	NA	

14.1.4 Ring end gap:

Ring No.	Ring End gap (mm)			Max. Permissible End gap limit (mm)
	At top	At middle	At bottom	
1st Compression ring	0.26	0.25	0.25	0.60
2nd Compression ring	0.25	0.25	0.25	0.80
Oil ring	NA	NA	NA	NA

14.1.5 Big end bearing:

Bearing no.	Dia of bearing (mm)	Dia of crank pin (mm)	Clearance (mm)		Max. Permissible clearance limit (mm)	
			Diametrical	Axial	Diametrical	Axial
1	30.04	29.98	0.06	NA	0.40	0.75

Condition of bearing: Normal

14.1.6 Main bearing:

Two nos. of ball bearing 6205 were used.

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. Permissible clearance limit (mm)	
			Diametrical clearance	Crankshaft end float
1	Ball bearing	0.14	NA	NA
2	Ball bearing			

14.1.7 **Valve guide clearance:**

Valve guide diameter (mm)		Valve stem diameter(mm)		Valve guide clearance (mm)		Max. Permissible wear limit (mm)	
Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
5.47	5.48	5.45	5.45	0.02	0.03	0.07	0.08

14.2 Any marked sign of overheating of valves : None

Pitting of seat/faces of valves : Normal

Any visual damage of teeth of timing gears : None

Condition of ingnition coil & magneto : Normal

14.3 **Transmission Gears:**

Any visual damage, pitting and chipping of any transmission gear teeth. : No

14.4 **Planting mechanism:**

The following sub-assemblies were dismantled after completion of all the test to check their condition and damage, if any and reported as under:-

Sl. No.	Sub-assembly	Observations
1.	Planting gearbox	Normal
2.	Planting arms	Normal
3.	Planting fingers	Normal
4.	Seedling platform	Normal
5.	Cross feed mechanism	Normal
6.	Float	Normal
7.	Hydraulic systems	Normal

15. PARAMETERS APPLICABLE FOR QUALIFYING MINIMUM PERFORMANCE CRITERIA

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 18718-2024	Values declared by the applicant (D) / Requirement (R)	As obser-ved	Whether meets the require-ments (Yes/No)
(In the ensuing table, '**D**' stands for applicant's declaration, whereas '**R**' stands for requirement as per BIS test code)						
1	2	3	4	5	6	7
15.1	**Engine performance:**					
a)	Power at rated engine speed, (kW)	Non Evaluative	To be declared by the manufacturer	3.30 (D)	3.30	Yes

1	2	3	4	5	6	7
b)	Maximum operating temperature(^{O}C)					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company. Manufacturer/applicant shall supply the recommendation of oil company along with the application form.	125 (D)	112	Yes
	2) Cylinder liner	Evaluative	Observed value should not exceed the declared value	Not declared	Not recorded	--
c)	Parking brake	Evaluative	No rotation of drive wheels at a slope of 18 % facing up and facing down.	Yes (R)	NA	--
d)	Air cleaner oil pull over	Evaluative	0.25 % max.	Yes (R)	NA	--
15.2	**Noise measurement:**					
a)	Maximum ambient noise emitted by the paddy transplanter, dB(A)	Evaluative	85	85 (R) maximum	78	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	96	96 (R) maximum	85	Yes
15.3	**Amplitude of mechanical vibrations at:**					
	a) Steering handle grips	Non Evaluative	100 microns (max)	100 (R) maximum	380	**No**
	b) Gear lever (s): 1) Transmission 2) Planting				220	**No**
	c) Clutch/brake lever (s)/pedal(s)				170	**No**
	d) Accelerator lever/knob				530	**No**
	e) Operator's seat				NA	--
	f) Foot rest				NA	--

1	2	3	4	5	6	7
15.4	**Field requirements:**					
a)	Variation in seedling trays consumption per ha., %	Non Evaluative	5 % max.		2.85	Yes
b)	Variation in number of hills per meter of row length, %	Evaluative	5 % max.		Nil	Yes
c)	Transplanting faults per m^2, %					
	1. Missed hills,	Evaluative	5 % max.		0.83	Yes
	2. Floating seedlings	Evaluative	3 % max.		0.83	Yes
	3. Buried seedlings	Evaluative	2% max.		Nil	Yes
	4. Damaged seedlings	Evaluative	2 % max.		0.83	Yes
	5. Total faults	Evaluative	10 % max.		0.83	Yes
d)	Variation in number of seedlings per hill	Non Evaluative	15 % max.		10.26	Yes
e)	Variation in planting depth	Non Evaluative	15 % max.		11.58	Yes
15.5	**Effectiveness of sealings:**					
	a Engine oil	Evaluative	The entry of mud/water should not take place in components/sub-assemblies		Yes/No	Yes
	b Hydraulic oil	Evaluative				Yes
	c Transmission oil	Evaluative				Yes
	d Clutch assembly	Evaluative				Yes
	e Planting gear box oil	Evaluative				Yes
	f Planting arms	Evaluative				Yes
15.6	**Safety requirements:**					
a	Provision of guard on moving parts	Evaluative	Yes		Yes	Yes
b	Location and direction of exhaust emission to be away from the operator	Evaluative	Yes		Yes	Yes
c	Cover on hot parts	Evaluative	Yes		Yes	Yes
d	Provision of headlights	Non Evaluative	Yes		Yes	Yes
15.7	**Literature (Submission to test agency)**					
a	Operator manual	Evaluative	Provided	Provided	Provided	Yes
b	Parts Catalogue	Evaluative	Provided	Provided	Provided	Yes
c	Workshop/ Service manual	Evaluative	Provided	Provided	Provided	Yes

15.8	Labelling of machine (Provision of labelling plate):					
	a)	Name of manufacturer	Evaluative	Metallic plate shall be welded / riveted permanently on the machine at place where it can be easily identified.	Provided	Yes
	b)	County of origin	Evaluative		Provided	Yes
	c)	Make	Evaluative		Not Provided	**No**
	d)	Model	Evaluative		Provided	Yes
	e)	Year of manufacture	Evaluative		Provided	Yes
	f)	Engine number	Evaluative		Not Provided	**No**
	g)	Chassis number	Evaluative		Provided	Yes
	h)	Size of machine	Evaluative		Provided	Yes
	i)	Max. engine power, kW	Evaluative		Not Provided	**No**
	j)	Specific fuel consumption, g/kWh	Evaluative		Not Provided	**No**

16. CRITICAL TECHNICAL SPECIFICATIONS

Sl. No.	Parameters	Specifications	Observation	Remarks
1	2	3	4	5
1.	Type of machine	Manually operated walk behind/ self-propelled walk behind/ self-propelled ride-on type.	self-propelled walk behind	Conforms
2.	Working width (mm)	880 (Min)	1200	Conforms
3.	Type of planting mechanism	Finger type for mat type nursery/ cup type for seedling cups.	Finger type for mat type nursery	Conforms
4.	Number of row	4,6,8	4	Conforms
5.	Row spacing (mm)	220 to 300 (Adjustable)	300 (not adjustable)	**Does not conform**
6.	Average hill spacing (mm)	120 to 250 (Adjustable)	140-180 (adjustable)	Conforms
7.	Type and number of floats	Wooden plank/metallic sheet/PVC Sheet/hollow plastic.	hollow plastic, 3	Conforms
8.	Angle of mat sliding board, (degrees)	45 to 70 (Adjustable)	60 (adjustable)	Conforms
9.	Material of planting fork/fingers/tweezers	Stainless steel type 4 and above.	Stainless steel	Conforms
10.	Provision for adjusting the row spacing	Must be provided.	Not provided	**Does not conform**
11.	Provision for adjusting depth of planting	Must be provided.	Provided	Conforms
12.	Provision for adjusting hill spacing	Must be provided.	Provided	Conforms

1	2	3	4	5
13.	Provision for adjusting no of plants per hill	Must be provided.	Provided	Conforms
14.	Provision for area recorder	Must be provided.	Not provided	**Does not conform**
15.	Marking/labelling	The labelling plate should be riveted on the body of machine having name & address of manufacturer, country of origin, make, model, year of manufacture, serial number, size, required size of prime mover kW/HP.	Provided except make & required size of prime mover kW/HP.	**Does not conform**
16.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

17. COMMENTS AND RECOMMENDATIONS

17.1 Labelling plate of machine should be provided as per IS 18718: 2024. This should be looked into for corrective action.

17.2 Provision for adjusting row to row spacing should be provided. This should be looked into for corrective action.

17.3 Fuel tank was found rusted from inside during final specification checking. This should be looked into for quality improvement.

17.4 The amplitude of mechanical vibration marked as (*) on the relevant chapter are on drastically higher side. It is not just directly concerned with operator's health, safety and comfort, but also adversely affects the useful life of the machine components. In view of above, this deserved to be given top priority for corrective action.

17.5 The engine was not marked with Manufacturer's name or trade-mark, Rated power, Rated speed and type of fuel used which does not fulfil the requirement of IS 7347-1974 (Amended 2021). This may be looked into.

17.6 **Technical literature :**

Operator manual, Service Manual and Parts Catalogue was provided along with the machine during the course of testing. It is further recommended to bring out these manuals in Hindi language also.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)
DIRECTOR

Draft test report compiled by - **Shri. Rahul**
Sr. Technical Assistant

18. APPLICANT'S COMMENTS

Para No	Our Reference	Applicant's Comments
18.1	17.1	Labelling plate will be modified to meet the requirement of IS 18718: 2024.
18.2	17.2	It is challenging to provide a mechanism for adjusting row to row spacing in the current machine layout as it will require significant design changes. However, this provision will be considered in the next machine upgrade.
18.3	17.3	A 10 litre capacity fuel tank made of plastic will be introduced shortly as part of the machine's continuous improvement process.
18.4	17.4	The amplitude of vibration will be analysed and corrective action will be taken to reduce the same.
18.5	17.5	A separate engine marking plate riveted below the operator handle will be considered and appropriate corrective actions will be taken.
18.6	17.6	Will be considered and take appropriate corrective action.