

T- 669/1175/2009	PREET 5049-I TRACTOR - Commercial (Initial)	1
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Manufacturer : **M/s. Preet Tractors Pvt. Ltd.**
Post Box No. 28,
Patiala Road, Nabha-147 201
(Punjab)

Month: May	Test Report No. T-669 / 1175 / 2009	Year: 2009
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GOVERNMENT OF INDIA
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CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE - BUDNI

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Type of Test : **COMMERCIAL (INITIAL)**

Test code/Procedure : IS: 5994-1998, IS: 9253-2001 and IS: 12207-2008

Period of Test : September, 2008 to February, 2009

Test Report No. : **T- 669 / 1175 /2009**

Month/Year : **May, 2009**

- i) The results reported in this report is observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).

SELECTED CONVERSIONS

S. No	Units	Conversion Factor
1	Force:	
	1 kgf	9.80665 N
		2.20462 lbf
2	Power:	
	1 hp	1.01387 metric hp (Ps)
		745.7 W
	1 Ps	735.5 W
	1 kW	1.35962 Ps
3	Pressure:	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

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17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

17.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	Values declared by the applicant/ Requirement	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6	7
17.1.1	PTO Performance :					
a)	- Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >35hp. -7.5/+10% for PTO power ≤ 35 hp	30.2	28.9	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.2	28.8	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	275	257	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	165	164.4	Yes
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	--	24.4	Yes
f)	Maximum operating temperature (°C)					
1)	Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	130	112	Yes
2)	Coolant (water)	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	110	106	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.60	1.25	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	---	0.08	Yes

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1	2	3	4	5	6	7
17.1.2	Drawbar performance :					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	18.68	22.86	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast	13.58	16.39	Yes
c)	Maximum drawbar power without ballast (kW).	Evaluative	Min. 80% of PTO power as referred in 17.1.1(a) of PTO performance	23.1	24.2	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	120	75	Yes
17.1.3	Power lift and hydraulic pump performance :					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
1)	At hitch points	Non Evaluative	[Tolerance of minus 10%]	11.07	12.81	Yes
2)	With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO.hp. and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	6.94	11.69	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minute, (mm)	Non Evaluative	[Tolerance of plus 5 mm]	20	78	No
17.1.4	Brake performance at 25 kmph:-					
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with ballast, (m):					
1)	Cold brake	Evaluative	10	10	7.00/8.50	Yes
2)	Hot brake	Evaluative	10	10	8.00	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600	166 to 305	Yes
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever	Evaluative	Yes	Yes	Yes	Yes

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1	2	3	4	5	6	7
17.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88	85	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98	97	Yes
17.1.6	Amplitude of mechanical vibrations at :					
1)	Left foot rest	Non Evaluative	100 microns (max)	100	190	No
	Right food rest			100	100	Yes
2)	Seat (with driver seated)			100	150	No
3)	Steering wheel			100	120	No
17.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tones):					
1)	Two wheel	Non	--	5.0	5.0	Yes
2)	Four wheel	Evaluative	--	7.0	7.0	Yes
b)	Distance travelled / litre of fuel consumption, (km/l):					
1)	Two wheel	Non Evaluative	--	5.0 to 6.0	5.17 to 5.42	Yes
2)	Four wheel		--	4.0 to 5.5	5.17 to 5.25	Yes
c)	Fuel consumption (ml/km/tonne):					
1)	Two wheel	Non Evaluative	--	30 to 40	36.9 to 38.7	Yes
2)	Four wheel		--	25 to 35	27.2 to 27.6	Yes
17.1.8	Wetland cultivation (puddling Operation):					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	The manufacturer has recommended that the tractor is not suitable for wetland cultivation (Puddling operation).	Not recommended	--
1)	Clutch assembly	-do-				
2)	Brake housings	-do-				
3)	Front axle hubs	-do-				
17.1.9	Safety features :					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	At present no requirements	---	--
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	Yes

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1	2	3	4	5	6	7
17.1.10	Labelling of tractors (Provision of labelling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP		PREET	Yes
	2) Model	Evaluative			PREET 5049-I	Yes
	3) Year of manufacture	Evaluative			2007 (07)	Yes
	4) Engine number	Evaluative			P450-00046	Yes
	5) Chassis number	Evaluative			12075-002591	Yes
	6) Declaration of PTO power, (kW)	Evaluative			30.2	Yes
17.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	95.4	94.99 to 95.01	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.70	0.075 to 0.098	Yes
(c)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	2.0	0.35 to 0.40	Yes
	- 2 nd comp. ring.		-do-	2.0	0.35 to 0.40	Yes
	- Oil ring.		-do-	2.0	0.35 to 0.45	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	0.35	Tapered Ring	Yes
	- 2 nd comp. ring.		-do-	0.35	0.063 to 0.078	Yes
	- Oil ring.		-do-	0.35	0.021 to 0.036	Yes
(e)	Clearance of main bearings (mm):					
	- Diametrical	Evaluative	-do-	0.45	0.072 to 0.108	Yes
	- Crankshaft end float	Evaluative	-do-	1.0	0.16	Yes
(g)	Clearance of big end bearings, (mm):					
(h)	- Diametrical	Evaluative	-do-	0.90	0.064 to 0.104	Yes
	- Axial	Evaluative	-do-	1.0	0.30 to 0.35	Yes
(i)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.8	0.08 to 0.19	--
(j)	Clearance between center pin and bush, (mm)	Non Evaluative	-- do--	0.8	0.11 to 0.15	Yes

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17.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No.)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	Mn 8	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns	One	Yes

17.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008:				
S. No.	Characteristic	Requirements as per IS: 12207-2008	AS observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5
1	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	0.21	Yes
2.	Seating requirements	Should meet the requirements of IS: 12343-1998	Does not conform	No
3.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992	Not provided	--
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Conforms	Yes
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not conform	No
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990 and IS:12362 Part 3-1994.	Conforms	Yes
7.	Specifications of swinging drawbar		Not provided	--
8.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

17.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in Oct. 2004)] : **Does not conform**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision)[IS: 4931-1995 (Reaffirmed in Oct. 2004)] : **Conforms**

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- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I):1997(Reaffirmed in March, 2007)/ISO730-1:1994] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : **Conforms**
- v) Agricultural tractors - Operator’s seat technical requirement [IS 12343 –1998 (First revision) (Re-affirmed in Dec, 2004)] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1) 1996 (Reaffirmed in March, 2007)/ISO 4254-1:1989] : **Conforms**
- vii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –1998(Re-affirmed in Dec, 2003)/ ISO 3767-2:1991]] : **Conforms**
- viii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) [(IS 12239 (PT-2) 1999) (Re-affirmed in Oct. 2004)] : **Does not conform**
- xi) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Re-affirmed in Oct. 2004) : **Does not conform**
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Re-affirmed in Oct. 2004) : **Conforms**

17.4 Salient Observations:

17.4.1 Laboratory tests:

17.4.1.1 PTO Performance:

- i) The backup torque is 24.4%.
- ii) The specific fuel consumption corresponding to maximum power was observed as 257g/kWh against the declared value of 275 g/kWh, which is considered on higher side for this power range of tractor.

17.4.1.2 Hydraulic performance test:

- i) Total drop in height of lift during lift load maintenance test was recorded as 78 mm against the declaration of 20 mm. this should be looked into.
- ii) The angle of mast of hydraulic lift was recorded as 7.6 degrees against the requirements of minimum 10 degrees of Indian Standard: 12224-1987 (Reaffirmed in 2004). This should be looked into for necessary corrective action.

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17.4.1.3 Mechanical vibration:

The amplitude of mechanical vibration marked as (*) in chapter-9 of this report is on higher side especially at LHS foot rest, operator's seat & steering control wheel. This calls for reduction in amplitude of vibration in view of improving service life of the component(s) and the operator's comfort.

17.4.1.4 Three point linkage:

- i) The lateral distance from lower hitch point to centre line of tractor, does not conform to the requirements of IS:4468-1997. This should be looked into.
- ii) Some of the parameters conform to Cat.-I and some of them conform to Cat.II. Keeping in view the spirit of standardization, necessary improvements may be incorporated.

17.4.1.5 Linkage drawbar:

Some of the parameters conform to Cat. I and some of them conform to Cat.II. Keeping in view the spirit of standardization, necessary improvements may be incorporated.

17.4.1.6 Operator's Seat:

- i) The length of seat does not meet the requirement of Indian Standard: 12343-1998. This should be looked into.
- ii) Vertical distance of foot rest from SIP does not meet the requirement of Indian Standard: 12343-1998. This should be looked into.
- iii) Longitudinal adjustment provided on operator's seat i.e., forward and rearward from the mid position was observed as ± 50 mm against the minimum and optimum requirement of ± 25 and ± 100 mm respectively. In view of enhancing comfort level of operator. This may be looked into for increasing.

17.4.1.7 Labelling Plate:

The year of manufacture was not provided on the labelling plate and does not meet the requirement of IS:10273-1987 (Re-affirmed in 2004). This should be looked into for corrective action.

17.4.2. Field Performance Test:

17.4.2.1 Dry land operation:

- i) The average area covered in M.B. ploughing operation with recommended size of plough was recorded in the range of 0.165 to 0.199 ha/h. Keeping in view the PTO power of the tractor, the area coverage is considered less, hence the recommended size of the plough may be reviewed.
- ii) The average area covered in rotavation operation with recommended size of rotavator was recorded in the range of 0.282 to 0.304 ha/h. Keeping in view the PTO power of the tractor, the area coverage is considered less, hence the recommended size of the rotavator may be reviewed.

17.4.2.2 Wet land cultivation (Puddling Operation):

The manufacturer has recommended that the tractor is not suitable for wet land cultivation (puddling). Therefore, the fact that the **tractor is not suitable for wet land cultivation (puddling) should be mentioned clearly and boldly in all the marketing literature relevant to the product.**

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17.5 Maintenance/service problems:

No noticeable maintenance and service problems were observed during the test.

17.6 Recommendation with regard to safety on tractor:

As per relevant Indian Standards, inter alia, the following requirements may be considered for incorporation on the tractor:

- i) Provision for spark arresting device in exhaust system.
- ii) The fuel shut-off lever does not remain in "STOP" position.
- iii) 'Minimum Cautionary notice' as per para 11.2 of the above referred standard.
- iv) The working clearance between the position and the draft control lever may be provided as per IS: 12239 (Part-2) – 1999.
- v) Provision of P.T.O. Master shield
- vi) Provision of differential lock.

17.7 Adequacy of Literature supplied with machine:

The following literature was supplied with the tractor for reference during the test.

- a) Operator's –cum- service manual (For Preet 3049/3549-I/4049-I/4549/5049-I/6049-I tractors).
- b) Spare parts catalogue (For Preet 3549-I/4049-I/4549/5049-I/6049-I tractors).

The operator's manual may be revised as per IS: 8132-1999 (Reaffirmed in Oct.2004) with inclusion of inter alia, the following;

- i) Fuel saving tips
- ii) Gross mass of trailer & safe hitch height, while using trailer.
- iii) Recommendation regarding matching implements.

The service manual has not been provided. It is therefore, recommended that service manual may be brought out as per IS: 8132-1999 (Reaffirmed in Oct.2004) for the guidance of users and service personnel in national as well as regional languages.

TESTING AUTHORITY:

J. J. R. NARWARE SENIOR TEST ENGINEER	
V. N. KALE DIRECTOR	

Test Report compiled by: **Sanjay Kumar**, Senior Technical Assistant

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18. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
18.1	Para 1.20.3 (i)	We have already taken action for this feature and will be incorporated shortly.
18.2	Para 17.4	We shall try to take necessary action on salient observation at the earliest.

APPENDIX - I

BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST

S. No.	Item	Rotavator	M. B. Plough
1.	Make	Dasmesh Mechanical works amragarh (Pb)	Anil Industries Beena
2.	Type	Mounted	Mounted
3.	No. of blades/bottoms, (mm)	30, in 6 flanges	Two
4.	Type of blades/ bottoms, (mm)	Hatchet	General purpose
5.	Size of blades/ bottoms, (mm)	120 X 110 X 6	320
6.	Spacing of blades / bottoms, (mm)	250	300
7.	Lower hitch point span, (mm)	760	820
8.	Mast height, (mm)	535	520
9.	Overall dimensions, (mm):		
	- Length	1090	1500
	- Width	1615	970
	- Height	1050	1150
10.	Gross mass, (kg)	375	235

APPENDIX - II

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Nil
2.	PTO performance test	10.5
3.	Power lift and hydraulic pump performance test	3.2
4.	Drawbar performance test	15.3
5.	Turning ability	0.5
6.	Location of centre of gravity	0.1
7.	Operator's field of vision	0.1
8.	Brake test	2.0
9.	Noise measurement	1.8
10.	Air cleaner oil pull over test	3.5
11.	Mechanical vibration test	1.0
12.	Theoretical speed test	0.9
B.	FIELD TEST:	
1.	M.B. Ploughing	17.1
2.	Rotavation	19.9
C.	HAULAGE TEST	
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	5.0
	TOTAL:	89.7

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