

व्यावसायिक परीक्षण रिपोर्ट (प्रथम बैच)

संख्या/No. : T-1774/2305/2023

COMMERCIAL TEST REPORT (1st Batch)

माह/Month : September, 2023

Application Reference No. 28/2022-23/119

(यह परीक्षण रिपोर्ट 30/09/2030 तक वैध है / THIS TEST REPORT IS VALID UPTO 30/09/2030)



Make of Agricultural Tractor : GROMAX
Model : TRAKSTAR 531
Manufactured by : M/s. Gromax Agri Equipment Limited
Near Vishwamitri Railway Overbridge,
Vishwamitri Vadodara ,
Gujrat - 390011



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS' WELFARE

(DEPARTMENT OF AGRICULTURE & FARMERS' WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

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T-1774/2305/2023	GROMAX, TRAKSTAR 531 TRACTOR– Commercial (1 st Batch)
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IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a OM No. 13-17/2021-M&T (I&P) dated 28.07.2022, that since 15th August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report:-

1. PTO performance
2. Hydraulic performance
3. Drawbar performance
4. Brake performance

Month: September	Test Report No.: T-1774/2305/2023	Year: 2023
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[C]	Manufacturer	:	M/s. Gromax Agri Equipment Limited Near Vishwamitri Railway Over bridge, Vishwamitri Vadodara , Gujarat – 390011
[C]	Submitted for test by (Applicant)	:	The Manufacturer
[C]	Selected for test by	:	The test sample was selected randomly out of Five tractors from the production line by the representative of testing authority through online mode.

Details of tractors made available for random selection :

		S.No.	Chassis Number
		i)	M9KATAAAAAPVD01732
		ii)	M9KATAAAAAPVD01735
		iii)	M9KATAAAAAPVD01734
		iv)	M9KATAAAAAPVD01733
		v)	M9KATAAAAAPVE01756
[D]	Place of running-in	:	At manufacturer's works
[D]	Duration of running-in, (h):		
	-Engine	:	15
	-Transmission	:	30
[C]	Location of test	:	Government of India, Central Farm Machinery Training and Testing Institute, P.O. - Tractor Nagar, BUDNI – 466445 (M.P.), INDIA

1. SPECIFICATIONS OF TRACTOR

1.1	Identification:		
1.1.1	Denomination		
[C]	Make of tractor	:	Gromax
[C]	Model (trade name)	:	Trakstar 531
[C]	Type	:	Rear Wheel Drive, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	08/23`
[D]	Country of origin	:	India
1.1.2	Numbers:		
[D]	1 st Serial No. or prototype	:	M9KATAAAAHVB00005
[C]	Serial No.	:	M9KATAAAAAPVE01756
1.2	Engine:		
[D]	Manufacturer's address	:	M/s. Mahindra & Mahindra i) Akurli Road, Kandivli(East) Mumbai – 400101 ii) MIDC,Hingna Road,Nagpur- 440028 iii) Khatima Panipat Highway,Rudrapur, Udhamsinghnagar- 263153 iv) Jaipur Ajmer Road ,Jaipur-303007 v)Near Bidar 'T' Junction, Mahindra Nagar, Zaheerabad - 502220
[C]	Make	:	Mahindra & Mahindra
[C]	Model	:	GTS2231NA3A
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
[C]	Serial No.	:	NPD6RBJ0044

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6.2.4 Brake performance test at 25 kmph speed (max.)	Parameter	Previous sample		Present sample	
		Cold	Hot	Cold	Hot
	Maximum Stopping distance, (m)	7.38	7.40	7.82	7.93
	Weather parking brake is effective at a force of : 600N at foot pedal (s) or 400 N at hand lever	Effective		Effective	

6.3 Adequacy of literature:

Following literatures has been supplied with the tractor for reference during the test.

i) Operator's manual for Gromax Trakstar 531 tractor model	i) Operator's manual for Gromax Trakstar 531 tractor model
ii) Part's catalogue of for Gromax Trakstar 531 tractor model	ii) Part's catalogue of for Gromax Trakstar 531 tractor model
iii) Workshop / Service manual of for Gromax Trakstar 531 tractor model	iii) Workshop / Service manual of for Gromax Trakstar 531 tractor model

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of **IS: 12207-2022** 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: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&T (I&P) dated 28th of July, 2022).						
7.1.1	PTO Performance:					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or engine power > 26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW.	20.5 (D)	20.7	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	20.5 (D)	20.65	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	Should not be more than 10% of declared value	258 (D)	269	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	115.5 (D)	126.8	No
e)	Back-up torque, percent	Evaluative	Should be minimum 12 percent	29 (D) 12 (R)	41.5	Yes

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1	2	3	4	5	6	7	
f)	Maximum operating temperature, (°C):						
	1)	Engine oil	Evaluative	The declared value should not exceed the <i>Max</i> value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration	130 (D)	90	Yes
	2)	Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	112 (D)	89	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under natural ambient conditions.	2.69 Maximum (R)	0.310	Yes	
h)	Smoke level, m ⁻¹	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR).	3.25 per meter Maximum (R)	0.45	Yes	
7.1.2	Drawbar performance:						
	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	14.1 (D)	--	Not appli- cable	
a)	Maximum drawbar pull without ballast or with standard ballast corresponding to 15% wheel slip or 7% track slip, (kN)	Evaluative	In case of tractors having total static mass ≥ 1 5 00 kg, Min 70% of static mass of tractor without ballast or with standard ballast, as the case may be. In case of light weight tractors having ≤ 1 500 kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	11.5(D) 12.36 (R) Minimum	12.77	Yes	
b)	Maximum drawbar power without ballast or with standard ballast as the case may be, kW	Evaluative	Min 80% of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1 500 kg. Min 75% of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having ≤ 1500 kg total static mass of tractor. Min 75% of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	16.4(D) 16.6 (R) Minimum	18.9	Yes	
c)	For tractors fitted with air conditioned /heated cabin: Maximum drawbar power without ballast, or with standard ballast as the case may be, kW	Evaluative	Min 70%of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1 500 Kg.	Not fitted	Not fitted	Not applic able	
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	110 (D)	81	Yes	

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1	2	3	4	5	6	7
7.1.3	Power lift and hydraulic pump performance:					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
1)	At hitch points	Evaluative	Should not be less than 90% of declared value.	14.0 (D) 12.6 (R)	16.88	Yes
2)	With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft.	4.9 (D) 8.47(R) Minimum	13.81	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 Minutes, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	00	Yes
7.1.4	Brake performance at 25 kmph:					
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal without ballast, (m):					
1)	Cold brake	Evaluative	10	10 (R)	7.82	Yes
2)	Hot brake	Evaluative	10	10 (R)	7.93	Yes
b)	Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever	Evaluative	Yes / No	Yes	Yes	Yes
7.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.					
7.1.6	Safety features:					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement		Yes
c)	Seating requirements (Tractors having more than 1150 mm rear track width)	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)	Does not meet the requirement		No
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement		Yes
e)	Dimensions of three-point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	Does not meet the requirement		No
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement		Yes
g)	Specifications of Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part-3) (As amended from time to time)	Not provided		Not applicable
h)	Audible warning signal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	Not provided		Not applicable

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1	2	3	4	5	6	7	
7.1.7	Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW, Specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form <table border="1" style="margin-left: 20px;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01-12 in box No. 1 for MM will represent the month and next two digit in the box No. 2 for YY will represent the year of manufacturing	MM	YY	Gromax	Yes
MM	YY						
2)	Model	Evaluative		Trakstar 531	Yes		
3)	Month & Year of manufacture	Evaluative		08/23	Yes		
4)	Engine number	Evaluative		NPD6RBJ0044	Yes		
5)	Chassis number	Evaluative		M9KATAAAAPVE 01756	Yes		
6)	Maximum PTO power, (kW)	Evaluative		20.5	Yes		
7)	Specific fuel consumption, g/kWh	Evaluative	258	Yes			
7.1.8	Literature (Submission to test agency):						
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 and should submit along with the test sample.	Provided	Yes		
(b)	Parts Catalogue	Evaluative		Provided	Yes		
(c)	Workshop/ Service manual	Evaluative		Provided	Yes		
7.1.9	Fitment of Roll Over Protective Structures (ROPS):						
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard	Not fitted	Not applicable		
7.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Yes		
7.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Not fitted	Not applicable		

7.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2022):					
S. No.	Category of break-downs	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	As observed	Whether meets the Requirements (Yes/No)
1.	Critical	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major	Evaluative	There are not more than 1 major break down.	None	Yes
3.	Minor	Evaluative	There are not more than 3 minor defects during the test and neither of them should of repetitive nature.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of break downs should exceed four that is, (1major + 3 minor) or 4 minor breakdowns.	None	Yes

7.3 Conformity with following IS:

- i) Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)] : Conforms
- ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)] : Conforms

- iii) Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 : **Does not conform**
Categories 1, 2, 3 & 4 (fourth revision) [IS:4468 (Part-2) – 1993 (Reaffirmed in Jan., 2019)]
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] : **Conforms**
- v) Agricultural tractors- Operator's seat technical requirement [IS12343 - 2021] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors:Part 1 : **Does not conform**
General requirements (first revision):[IS 12239 (Part 1) - 2018]
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] : **Does not conform**
- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021] : **Does not conform**
- ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007 (Reaffirmed Year 2019)] : **Does not conform**
- x) Agricultural Tractors and Machinery-Lighting device for travel on public roads (IS:14683-1999) (Reaffirmed Year 2019)] : **Conforms**

7.4 Salient Observations:

7.4.1 Laboratory tests:

7.4.1.1 PTO performance test:

Maximum equivalent crankshaft torque was observed as 126.8 Nm against the declaration of 115.5 Nm, which does not meet the requirement of IS: 12207-2022. Even though this parameter is categorized as 'Non-Evaluative', as per IS: 12207-2022, yet for the sake of improvement it would be advisable to look into the matter to make it conforming to the requirement.

7.4.1.2 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Spark arresting device has not been provided in the exhaust system.
 - ii) Master shield has not been provided.
 - iii) Width of foot step was measured 160 mm against the minimum requirement of 200 mm
- Therefore, all of the above should be looked into for necessary corrective action.

7.4.1.3 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Inclination of back rest was measured 18° against the requirement of 10 ± 5°.
- ii) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- iii) Vertical distance from SIP to centre of steering control wheel has been measured as 240 mm against the requirement of 265 to 385 mm.
- iv) Longitudinal distance from SIP to centre of steering control wheel has been measured as 675 mm against the requirement of 425 to 525 mm.
- v) Vertical distance from SIP to centre of accelerator pedal has been measured as 540 mm against the requirement of 450 to 520 mm.

7.4.1.4 Three point linkage:

The dimensions viz. diameter of hitch pin hole & width of ball of upper hitch points, diameter of hitch pin hole & width of ball of lower hitch points and lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS:4468 (Part-I) – 1997. This should be looked into for corrective action.

7.4.1.5 PTO master shield:

PTO master shield has not been provided on tractor. This should be looked into for necessary corrective action.

7.5 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the test.

7.6 Recommendation with regard to safety on tractor:

- i) Identification of engine speed control, engine stop control, transmission control, parking brake lever & PTO engaging lever by colour has not been provided as per the requirement as laid down in Table - 5 of IS: 8133-2021.
- ii) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table - 1 of IS: 8133-2021.
- iii) Colour code on illuminated display has not been provided as per the requirement as laid down in IS: 6283 (Part 2): 2007.
- iv) Provision of safety against accidental start of engine.
- v) Differential lock has not been provided.
- vi) The working clearance between position control lever & draft control lever has been measured as 45 mm against the minimum requirement of 70 mm.

Above parameters should be looked into for necessary corrective action.

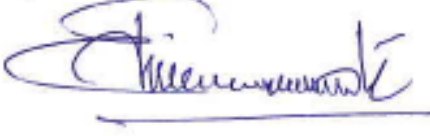

7.7 Adequacy of Literature supplied with machine:

The following literatures were supplied with the test tractor for reference during the test: -

- a) Operator's manual for Gromax Trakstar 531 tractor model
- b) Part's catalogue of Gromax Trakstar 531 tractor model
- c) Service manual of Gromax Trakstar 531 tractor model

TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA

TESTING AUTHORITY

C. V. CHIMOTE TEST ENGINEER	
A.K. UPADHYAY DIRECTOR (I/C)	

Draft Test Report is compiled by **Dharmendra Kumar**, Senior Technical Assistant.

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8. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
8.1	7.3 (iii, v, vi, vii, viii, ix)	Observation will be studied and necessary corrective actions will be incorporated.
8.2	7.4.1.1	Advisable improvement will be studied and if feasible it will be incorporated in production.
8.3	7.4.1.2	Looked into the matter and necessary corrective action will be introduced.
8.4	7.4.1.3	Looked into the matter and necessary corrective action will be introduced.
8.5	7.4.1.4	Resolve the issue with coordinate with supplier.
8.6	7.4.1.5	Advisable improvement will be studied and if feasible it will be incorporated in production.
8.7	7.4.1.6	Advisable improvement will be studied and if feasible it will be incorporated in production.

ANNEXURE-I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	14.4
3.	Power lift and hydraulic pump performance test	0.9
4.	Drawbar performance test	3.2
5.	Brake performance test	1.8
6.	Nominal speed test	2.0
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	4.7
TOTAL:		27.0