

व्यावसायिक परीक्षण रिपोर्ट (वैरिएंट)

COMMERCIAL TEST REPORT (Variant)

संख्या / No. : T-1507/2034/2021

माह / Month : January, 2021

(यह परीक्षण रिपोर्ट 31/01/2024 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 31/01/2024)



**GROMAX, TRAKSTAR 536 TRACTOR**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
कृषि, सहकारिता एवं किसान कल्याण विभाग  
मशीनीकरण एवं प्रौद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Department of Agriculture, Cooperation & Farmers Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान  
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

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## 2. FUEL AND LUBRICANTS

**2.1 Fuel** : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

### 2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine & air cleaner oil	SAE 15W40	SAE 15W40
2.	Gear box , rear differential unit, rear axle, hydraulic system and rear final drive	MTRAC 30	Oil originally filled in the tractor was not changed
3.	Steering gear box	EP 90	
4.	Grease	MP-3 Lithium base	MP-3 Lithium base

## 3. ESSENTIAL TESTS

### 3.1. SPECIFICATIONS

3.1.1 Tractor:	Base Model	Variant Model
Make	Gromax	
Model	Trakstar 531	Trakstar 536
Brand name	Traksatar	
Type	Four wheeled, Rear wheel drive, Unit construction, General purpose, Agricultural tractor.	
Month & Year of manufacture	05/17	09/20
Chassis number	M9KATAAAAHVB00005	M9KATABAALVF01517
Country of Origin	India	India

3.1.2 Engine:	Mahindra & Mahindra	
Make	Mahindra & Mahindra	
Model	GTS2231NA3A	GTS2235NA3A
Serial number	NHM6RBE0008	NHM2DEE0018
Type	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine	

#### Engine speed (Manufacturer's recommended production setting),(rpm) :

- Maximum speed at no load	2325 to 2525
- Low idle speed	750 to 850
- Speed at maximum torque	1200 to 1500

#### Rated speed, (rpm):

- For PTO use	2200
- For drawbar use	2200

### 3.1.3 Cylinder & Cylinder Head:

Number	Three
Disposition	Vertical, inline
Bore/stroke, (mm)	88.9/120
Capacity as specified by the applicant, (cc)	2235 (apa)
Compression ratio, (apa)	21.3 (± 1) : 1 (apa)
Type of cylinder head	Monoblock
Type of cylinder liners	Wet, replaceable
Type of combustion chamber	Re-entrant bowl
Arrangement of valves	Over head, Inline
<b>Valve clearance (cold/hot)</b>	
- Inlet valve, (mm)	0.3 to 0.4/0.4 to 0.5

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## 6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of tests conducted, the performance results have been summarized as evaluative (mandatory) and non – evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 (table-1) of **Indian Standard 12207: 2019** for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model are as under:

Sl. No.	Characteristic	Category (Evaluative /Non-Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ requirement		As observed		Whether variant model meets the requirements (Yes/No.)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 (a)	5 (b)	6 (a)	6 (b)	7
<b>6.1.1</b>	<b>PTO Performance:</b>							
a)	- Max. 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 $\leq 26$ kW.	20.5 (D)	23.0 (D)	19.6	23.2	Yes
b)	Power at rated engine speed (kw)	Non-Evaluative	-do-	20.5 (D)	23.0 (D)	19.6	23.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	258 (D)	258 (D)	253	226	Yes
<b>6.1.2</b>	<b>Safety features :</b>							
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)	--		<b>Does not meets the requirement</b>		<b>No</b>
d)	Technical requirements for PTO shaft	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)	--		<b>Does not meets the requirement</b>		<b>No</b>

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1	2	3	4	5	6	7		
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	--	Meets the requirement	Yes		
g)	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	--	Not Provided	Not applicable		
h)	1) Maximum travelling speed at rated engine speed in reverse gears, Kmph	Evaluative	Should not exceed 20 Kmph	--	11.84 kmph (Meets the requirement)	Yes		
	2) Audible warning signal on tractor	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor shall be activated. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer/dealer shall ensure the training on this aspect to operator before the delivery of tractor.	Not applicable	Not applicable	Not applicable		
<b>6.1.3</b>	<b>Labelling of tractors (Provision of labelling plate):</b>							
	1) Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form.  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>MM</td> <td>YY</td> </tr> </table> Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of manufacturing.	MM	YY		Gromax	Yes
MM	YY							
	2) Model	Evaluative				TRAKSTAR 536	Yes	
	3) Year of manufacture	Evaluative				09/20	Yes	
	4) Engine number	Evaluative				NHM2DEE0018	Yes	
	5) Chassis number	Evaluative				M9KATABAALVF 01517	Yes	
	6) Declaration of PTO power, (kW)	Evaluative				23.0	Yes	
	7) Specific Fuel Consumption g/kWh	Evaluative			258	Yes		
<b>6.1.4</b>	<b>Literature (Submission to test agency):</b>							
(a)	Operator manual	Evaluative	Provided/ Not Provided	Provided	Provided	Yes		
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	Provided	Provided	Yes		
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	Provided	Provided	Yes		
<b>6.1.5</b>	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 Applicable	Not applicable		

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1	2	3	4	5	6	7
6.1.6	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	--	Provided	Yes
6.1.7	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	--	Provided	Yes

6.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019):					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requirements (Yes/No.)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than one and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than three and frequency of each should not be more than two.	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four, that is, (1 major + 3 minor) or 4 minor breakdowns.	None	Yes

### 6.3 Salient Observations:

#### 6.3.1 Laboratory tests:

##### 6.3.1.1 PTO performance:

- i) The maximum PTO power was observed as **23.2 kW** against the declaration of **23.0 kW**, which meets the requirement of IS:12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was observed as **226 g/kWh** against the declaration of **258 g/kWh**, which meets the requirement of IS:12207-2019 with regard to tolerance limit.

##### 6.3.1.2 Operator's seat:

The dimension of longitudinal distance from seat index point to the centre of steering control does not meet the requirement of IS: 12343-1998 (Re-affirmed in 2014). This is recommended to looked into for necessary corrective action.

##### 6.3.1.3 Three point linkage:

The distance from end of power take-off to centre of lower hitch point (lower link in horizontal position) does not meet the requirement of IS: 4468 (part-1):1997 (Reaffirmed in Oct., 2017). This may be looked into for necessary corrective action.

### 6.4 Maintenance / Service Problems:

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

### 6.5 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Spark arrester should be provided in the exhaust system as per IS: 12239(Part-2)-1999 (Re-affirmed in 2014).
- ii) PTO master shield should be provided around the PTO shaft as per IS: 12239 (Part-2)-1999 (Re-affirmed in 2014).
- iii) Working clearance between the Position & Draft control lever of hydraulic system should be as per requirement of relevant test code as per IS: 12239 (Part-2)-1999 (Re-affirmed in 2014).

iv) Fuel shut-off knob should remain in "Stop" position as per IS:8133-1983 (Re-affirmed in 2014)

v) The location of the front towing hitch is offset towards RHS. For the safety and easy hitching of any object it should be in the center.

**6.6 Adequacy of Literature supplied with machine:**

**6.6.1** The following literature has been supplied with the tractor

a) Parts catalogue of Gromax TRAKSTAR 531, 536, 540, 545 and 550 models.  
b) Service manual of Gromax TRAKSTAR 531, 536, 540, 545 and 550 models.  
c) Operator manual of Gromax TRAKSTAR 531, 536, 540, 545 and 550 models.

**6.6.2**

i) The nominal speeds of all gears of the model as tabulated in the product specifications in the operator's manual doesn't match with the technical specifications provided for the test sample. This calls for the necessary corrections in literature.

ii) The literature should be bought out in national as well as other regional languages of India for guidance of users.

**6.6.3**

i) In the technical specifications, the mass reactions of the tractor were provided for the "Unballasted tractor" while on physical examination it was equipped with the front standard ballast weight. This calls for the necessary improvement in providing the correct technical specifications matching with test sample.

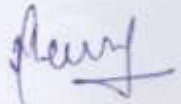
ii) On the standard weight provided with the test sample, its mass was not punched on it. This calls for punching the mass on the ballast weight provided for the test.

**6.7** The results of tests carried out on variant model "Gromax TRAKSTAR 536" tractor have been compared with the base model "Gromax TRAKSTAR 531" and found within the limit as specified in Indian Standard : 12207-2019.

**7. CITIZEN CHARTER**

Duration of Test	Time frame for Testing & Evaluation as per Citizen Charter	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
3 Month (October, 2020 to December, 2020)	10 Months	Yes	None

**TESTING AUTHORITY:**

  
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 AGRICULTURAL ENGINEER

  
**C.V. CHIMOTE**  
 TEST ENGINEER

  
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### 8. APPLICANTS COMMENTS

Para No.	Our reference	Applicant's comments
8.1	6.3.1.2,6.3.1.3, 6.5,6.6.2 & 6.6.3	Observation will be studied and necessary action will be incorporated.

### ANNEXURE-I

#### TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	<u>HOURS</u>
1.	Running –in	--
2.	Nominal speed test	1.0
3.	PTO performance test	3.7
<b>B.</b>	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.57
	<b>Total</b>	<b>5.27</b>