

Application Reference No. 28/2023-24/97

(यह परीक्षण रिपोर्ट 30/06/2031 तक वैध है / THIS TEST REPORT IS VALID UPTO 30/06/2031)



Make of Agricultural Tractor : Gromax
Model : TRAKSTAR 536
Manufactured by : M/s. Gromax Agri Equipment Limited
Near Vishwamitri Railway Over Bridge,
Vishwamitri, Vadodara (Gujrat) – 390 011



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
TRACTOR NAGAR, BUDNI (M.P.) 466 445
(An ISO 9001:2015 Certified Institute)

T-1862/2393/2024	GROMAX, TRAKSTAR 536 TRACTOR – COMMERCIAL VARIANT (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: June	Test Report No.: T-1862/2393/2024	Year: 2024
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T-1862/2393/2024	GROMAX, TRAKSTAR 536 TRACTOR – COMMERCIAL VARIANT (1st BATCH)
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- [C] Tractor manufacturer's name and address : M/s. Gromax Agri Equipment Limited
Near Vishwamitri Railway Over Bridge,
Vishwamitri, Vadodara (Gujarat) – 390 011
- [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) | M9KATABAARVL03164 |
| | ii) | M9KATABAARVK03079 |
| | iii) | M9KATABAARVL03161 |
| | iv) | M9KATABAARVL03163 |
| | v) | M9KATABAARVL03162 |
| [D] Place of running-in | : | At manufacturer's works |
| [D] Duration of running-in, (h): | | |
| -Engine | : | 50 |
| -Transmission | : | 40 |
| [C] Location of test | : | Government of India,
Central Farm Machinery Training and Testing
Institute, P.O. - Tractor Nagar,
Budni – 466 445 (M.P.), INDIA |

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1 Denomination

- [C] Make of tractor : Gromax
- [C] Model (trade name) : TRAKSTAR 536
- [C] Type : Rear Wheel Drive, Standard Agricultural Tractor.
- [C] Month & year of manufacture : 02 / 24
- [D] Country of origin : India

1.1.2 Numbers:

- [D] 1st Serial No. or prototype : M9KATABAALVF01517
- [C] Serial No. : M9KATABAARVL03161

1.2 Engine:

- [D] Manufacturer's address : Mahindra & Mahindra Limited
- i) Akurli Road, Kandivali (E), Mumbai – 400101
- ii) MIDC, Hingna Road, Nagpur – 440028
- iii) Jaipur Ajmer Road, Jaipur – 303 007
- iv) Khatima Panipat Highway, Rudrapur, Udhamasinghnagar, 263 153
- v) Near Bidar "T" junction, Mahindra Nagar, Zaheerabad – 502 220
- [C] Make : Mahindra & Mahindra Ltd.
- [C] Model : GTS2235NA3A
- [C] Type : Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
- [C] Serial No. : NRK2DEJ0025

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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:

Sl. 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.	23.0 (D)	21.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	23.0 (D)	21.6	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	$\pm 8\%$	126 (D)	132.4	Yes
e)	Back-up torque, percent	Evaluative	Should be min. 12%	12 (D) 12 (R)	41.2	Yes
f)	Maximum operating temperature, ($^{\circ}$ C):					
	1) Engine oil	Evaluative	The declared value should not exceed the Max value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	130 (D)	94	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)	95	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at Max power under natural ambient condition. The value would be based on the test conducted under natural ambient condition	2.69 Maximum (R)	0.38	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). Max Smoke level shall be reported out of 6 readings tested as per IS 12062 and observed value should be well within the required limits.	3.25 per meter Maximum (R)	0.32	Yes

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1	2	3	4	5	6	7
7.1.2	Drawbar performance:					
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	*	*	*
*Applicant vide letter no. Nil dated 05.03.2024 has requested not to conduct the ballasted drawbar performance test & ten-hour drawbar test which was allowed as per the additional guidelines for testing of tractors as per new regime of testing of tractors vide an OM No. 13-32/2023-M&T(I&P) (FTS-125476) dated 16.05.2023. Accordingly, drawbar performance test under standard ballast condition was conducted only.						
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	In case of tractors having total static mass \geq 1500 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 \leq 1500 kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	12.60 (D) 12.56 (R) Minimum	13.91	Yes
c)	Maximum drawbar power with standard ballast, (kW).	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75% of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having \leq 1500 kg total static mass of tractor. Minimum 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.	18.4 (D) 17.3 (R) Minimum	18.4	Yes
d)	Maximum transmission oil temperature, ($^{\circ}$ C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	110 (D)	78	Yes
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) Minimum	16.47	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.	5.4 (D) 5.08 (R) Minimum	13.64	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	75	No

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1	2	3	4	5	6	7
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 with road ballast, (m):					
	1) Cold brake	Evaluative	10	10 (R)	7.31	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.16	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	Conforms		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: 17231 - 2019 (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)	Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not fitted		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 fitted		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 536	Yes		
3)	Month & Year of manufacture	Evaluative		02/24	Yes		
4)	Engine number	Evaluative		NRK2DEJ0025	Yes		
5)	Chassis number	Evaluative		M9KATABAARV L03161	Yes		
6)	Maximum PTO power, (kW)	Evaluative		23.0	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:11821 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	Provided	Yes	

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 Requirement (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 breakdown.	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 breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns.	None	Yes	

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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 - Categories 1N, 1, 2N, 2, 3N, 3, 4N and 4 [IS: 17231 - 2019] | : | Does not conform |
| 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 General requirements (first revision):[IS 12239 (Part 1) - 2018] | : | Does not conform |
| 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 Hydraulic Performance Test:

During the hydraulic lift load maintenance test the drop in vertical height of the lower links was observed as **75 mm** against the maximum permissible limit of 50 mm. This should be looked into for necessary corrective action.

7.4.1.2 Three-point linkage:

The following parameters does not meet the requirements of IS: 17231 - 2019 :

- i) Diameter of lower hitch point hole and width of ball for lower hitch point have been measured as 28.80 and 44.90 mm against the requirement of 22.40 to 22.65 mm and 34.5 to 35.0 mm respectively.
- ii) Lateral distance from lower hitch point to centre line of tractor has been measured as 364 mm against the requirement of 359 mm.
- iii) The distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) has been measured as 480 mm against the requirement of 500 to 575 mm.

All of the above should be looked into for necessary corrective action.

7.4.1.3 Operator’s seat:

The following parameters do not meet the requirement of IS: 12343-2021:

- i) Provision for adjustment of driver’s mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- ii) Longitudinal distance from SIP centre of steering control wheel has been measured as 650 mm against the requirement of 425 to 525 mm.
- iii) Vertical distance of SIP centre of steering control wheel has been measured as 225 mm against the requirement of 265 to 365 mm.
- iv) Vertical distance of SIP from foot rest has been measured as 555 mm against the requirement of 450 to 520 mm.

The observations at S. No. (ii) were also made in the previous test report No. T-1507/2034/2021 (January, 2021) and no improvement have been made as regards to its conformity so far. All of the above should be looked into for necessary corrective action.

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7.4.1.4 Operator’s work place:

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

- i) Spark arresting device has not been provided in the exhaust system.
- ii) Vertical retainers have not been provided on inner side of clutch and brake pedals.

The observation at S. No. (i) was also made in the previous test report No. T-1507/2034/2021 (January, 2021) and no improvement have been made as regards to its conformity so far. All of the above should be looked into for necessary corrective action.

7.4.1.5 PTO master shield:

PTO master shield has not been provided on tractor as per IS: 12239-1999 (Part-2). This should be looked into for necessary corrective action.

7.4.1.6 Specification of Tractor

Discrepancies in the specification between the Specification sheet and Operator’s manual are as under:

S. No.	Description	As per Specification Sheet	As per Operator’s manual
1	2	3	4
a.	Nozzle injection pressure, (MPa)	25.0 + 0.8	25.0± 0.8(P.No. 7)
b.	Total capacity of cooling system, (l)	6.6	7.0 (P. No. 8)
c.	Recommended brand of coolant	Lubzs corporation	Trakstar Genuine Coolant or coolant conforming to JIS K-2234 (P. No. 57)
d.	Coolant -water ratio	0.05 : 1	10% coolant (P. No. 8)
e.	Recommended grade of transmission oil, (l)	MTRAC 30	“Trakstar genuine transmission oil” (P. No. 57)
f.	Engine oil change period	First change after 250 hours of operation and subsequently after every 300 hours of operation.	First change after 100 hours of operation and subsequently after every 350 hours of operation. (P. No. – Not available)
g.	Engine oil filter change period	First change after 300 hours of operation and subsequently after every 350 hours of operation.	First change after 50 hours of operation and subsequently after every 350 hours of operation.
h.	Transmission oil change period	First change after 1000 hours of operation and subsequently after every 1000 hours of operation.	First change after 1150 hours of operation and subsequently after every 1050 hours of operation. (Oil change to be done max upto 1500 hours).
i.	Transmission oil filter change period	First change after 1000 hours of operation and subsequently after every 1050 hours of operation.	First change after 100 hours of operation and subsequently after every 350 hours of operation. (Oil change to be done max upto 1500 hours).

The observations at S. No. (e), (f), (g), (h) & (i) were also made in the previous test report No. T-1507/2034/2021 (January, 2021) and no corrective action has been taken so far. All of the above should be looked into for necessary corrective action.

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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) Colour codes on illuminated display has not been followed as per the requirement as laid down in IS: 6283 (Part 2): 2007.
- ii) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- iii) Safety switch has not been provided to prevent the engine starter from accidental engaging as per the requirement laid down in Table-1 of IS: 8133-2021.
- iv) 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.
- vii) The working clearance between draft control lever & RHS mudguard has been measured as 35 mm respectively against the minimum requirement of 70 mm as per the requirement of IS: 12239 (Part II) - 1999.
- vi) The distance of engine stop control from the engine start control has been measured as 300 mm which does not meet the requirement of maximum 150 mm as laid down in Table 1 of IS: 8133-2021.

The observations at S. No. (iv) & (vi) were also made in the previous test report No. T-1507/2034/2021 (January, 2021) and no improvement have been made as regards to its conformity so far. All of the above should be looked into for necessary corrective action.

7.7 Adequacy of Literature supplied with machine:

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




- a) Operator manual of Trakstar 531, Trakstar 536, Trakstar 540, Trakstar 545 & Trakstar 550 tractor models.
- b) Parts catalogue of Trakstar of Trakstar 531, Trakstar 536, Trakstar 540, Trakstar 545, Trakstar 545DC, Trakstar 550 & Trakstar 550DC tractor models.
- c) Service Manual of of Trakstar 531, Trakstar 536, Trakstar 540, Trakstar 545 & Trakstar 550 tractor models.

7.7.2 The operator manual may be brought out for the guidance of users and service personnel as per IS: 8132-1999 incorporating, inter alia, the following:

- i) Fuel saving tips.
- ii) Recommended ballast masses for different operations.

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

B.N. DIXIT AGRICULTURAL ENGINEER	
R.P. PANDEY SENIOR INSTRUMENTATION ENGINEER (TESTING HEAD)	
A.K. UPADHYAY DIRECTOR(I/C)	

Draft test report compiled by **Dharmendra Kumar**, Senior Technical Assistant.

8. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
8.1	7.3 (iii, v, vi, vii, viii & ix), 7.4.1.1, 7.4.1.2, 7.4.1.3, 7.4.1.4, 7.4.1.5, 7.4.1.6, 7.6, & 7.7.2	Observation will be studied & necessary action will be incorporated.

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	12.4
3.	Power lift and hydraulic pump performance test	0.84
4.	Drawbar performance test	2.87
5.	Brake performance test	2.08
6.	Nominal speed test	0.77
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	3.42
TOTAL:		22.38