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Government of India  
Ministry of Agriculture & Farmers Welfare  
(Department of Agriculture & Farmers welfare)  
(Mechanization & Technology Division)

Krishi Bhawan, New Delhi  
Dated: 8<sup>th</sup> January 2024

**OFFICE MEMORANDUM**

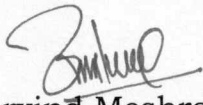
**Subject: Consolidated Guidelines for Testing of Power Tillers for Performance Evaluation**

Testing of Power Tillers for performance evaluation is presently being done only at Southern Region Farm Machinery Training & Testing Institute (SRFMTTI), Garladinne, District –Anantapur (Andhra Pradesh). With the technological advancements in design and manufacturing of Power Tillers in the country, the process of testing of Power Tillers has also undergone several changes with time.

With a view to simplify the process of testing of Power Tillers and to further enhance the ease of doing business in the country, promote trust-based governance at all levels, the Department of Agriculture & Farmers Welfare (DA&FW) after due consultation with all the stakeholders, has consolidated the guidelines for testing of Power Tillers and the same are enclosed herewith for information and necessary compliance.

This is issued with the approval of competent authority of this Department.

Encl: as above

  
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**Distribution:**

1. The Director, Southern Region Farm Machinery Training & Testing Institute (SRFMTTI), Tractor Nagar, Garladinne, District- Anantapur (Andhra Pradesh)
2. The President, Power Tiller Association of India (PTAI), No.1, Dyavasandra Industrial Area, Whitefield, Mahadevapura Post , Bangalore-560048
3. The Chairman, Technical Committee of Tractor Manufacturers Association (TMA)
4. The Member Secretary, FAD11, Food and Agriculture Department, Bureau of Indian Standards, Manak Bhawan, 9 Bahadur Shah Zafar Marg, New Delhi – 110001
5. Agriculture Department, All State Governments

6. Director, Farm Machinery Training & Testing Institutes, Budni (MP), Hisar (Haryana), Biswanath Chariali (Assam)

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**Guidelines for Testing of Power Tiller  
for Performance Evaluation**

Government of India  
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**January, 2024**

## 1. Introduction

- 1.1 Power Tiller means an agricultural machinery used for soil preparation having a single axle in which the direction of travel and the control for field operation is performed by operator walking behind it. This equipment may or may not have a riding attachment and when coupled to a trailer can be used for transportation of goods. The maximum speed of the Power Tiller when coupled to a trailer, shall not exceed 22 km/h. The maximum haulage capacity of the Power Tiller coupled to a trailer shall not exceed 1.5 tonnes.
- 1.2 A background note on evolution of testing of power tillers in India is at **Annexure- I**
- 1.3 The Government is providing subsidy under Sub-Mission on Agricultural Mechanization (SMAM) for purchase of Power Tillers by the farmers and Small and Marginal Farmers/ Women Farmers/Scheduled Caste/Scheduled Tribe Farmers and Farmers of North Eastern States are eligible to receive subsidy @ 50% of the cost and up to a maximum of Rs. 1.20 lakhs per power tiller of 11 BHP and above. Whereas, other farmers are eligible to receive subsidy @ 40% of the cost of power tiller and up to a maximum of Rs. 1.00 lakh per power tiller of 11 BHP and above.
- 1.4 One of the condition for supply of PT under subsidy is that the power tiller should have undergone testing at the authorized testing institutions.
- 1.5 Presently the testing of power tillers is done only at Southern Region Farm Machinery Training & Testing Institute (SRFMTTI), Garladinne, District-Anantapur (Andhra Pradesh)

## 2 Present Scenario

- 2.1 The testing of Power Tillers is done at SRFMTTI with 15 different tests and the required testing time is 4-5 months for one Power Tiller model. These tests are as under:

S. No.	Name of the Test	Tests conducted
1	Running-in	Power tiller is run-in before the test for the duration as may be specified by applicant/manufacturer. It may be carried out by applicant/manufacturer at their premises. In case of imported model, the testing authority may itself run-in the power tiller in accordance with the procedure prescribed or agreed to with the manufacturer/applicant.
2.	Engine Performance Test	(a) Natural Ambient Test at $27 \pm 7$ °C - Maximum power test and varying speed test at Full Load (b) High Ambient Test at $43 \pm 2$ °C - Maximum power test and varying speed test at Full Load
3	Rotary Shaft Performance Test	Normal Ambient Temperature Test - Varying Speed Test and Five Hour Test at Rated Power of Rotary Shaft
4	Drawbar Performance Test	Test for Maximum Power and Pull in all forward gears and Ten Hour Test in the gear designated by the manufacturer/applicant for field work
5	Turning Ability Test	Power tiller is turned to the left and right side by the use of steering clutch till a 360 degree turn is completed. Diameter of the minimum turning circle and turning space is measured.
6	Parking Brake test and Brake Performance Test with trailer for CMVR certification	The power tiller is placed out of gear on a slope of 18 percent with the brakes applied and facing up and then down the slope and the rotation of the braked wheel is reported. The force, necessary to apply at the control of the parking braking device to hold a vehicle combination comprising the power tiller and an unbraked trailer of the same mass of the power tiller or 1 tonne whichever is less, stationary when facing up and down on 12 percent gradient is measured.

		on 12 percent gradient, shall be measured.
7	Air Cleaner Oil Pull Over test	The engine is operated at full governed speed for 15 minutes followed by sudden accelerations and decelerations made after every 30 seconds for a period of 15 minutes. Loss of mass of oil, both in grams and in percentage of Mass is reported.
8	Mechanical Vibration test	The amplitude of mechanical vibration of components/assemblies of the power tiller is measured.
9.	Noise level Test	Noise at By-Stander Position and Operators Ear level is measured and compared with the limits specified.
10.	Nominal Speed Test	Speed in each gear is measured.
11.	Haulage Test	Conducted with gross trailer loads recommended by the manufacturer on a level track having about 80 percent of tarmacadam surface and 20 percent of earthen surface and having gradients not exceeding 8 percent at certain short Lengths. The test consisting of equal test run in both the directions is conducted for a test run of minimum 50 km and minimum three trials are conducted
12.	Field Test	Conducted for 35 hours (25 hours in dryland and 10 hours in wetland (puddling) condition)
13.	Torture Test	Done on Torture Test Track at a speed of 2 kmph for distance of 2 km length.
14.	Material & Chemical Composition	Chemical composition of critical components of Power Tiller is tested
15.	Components & Assembly Inspection	Power tiller is dismantled for wear and tear assessment.

2.2 The Power Tiller Association of India (PTAI) in October 2022 raised concerns and recommended reforms in the current testing regime of power tillers. In brief they are:

Recently there has been a major change in the Initial commercial Testing (ICT) regime of tractors where in the number of mandatory tests have been reduced to 4 because of which the test completion time has been reduced to 75 working days. A similar initiative is required for Power Tillers where in 15 tests are mandatory as of now.

- (a) This will optimize the resources of the testing centres which will also reduce the testing fees.
- (b) Validity of test report for tractors has been increased from 3 to 5 years in case of ICT and 5 to 7 years in case of batch test. Similar initiative can be considered for power tiller also.
- (c) Currently the ICT / batch test facility for power tillers is available only at FMTTI, Anantapur. Other FMTTIs should also be allowed to undertake these tests which would further improve the turnaround time of ICT.
- (d) Apart from ICT, two other tests mainly COP & CMVR are currently not being done in Anantapur which is not only extremely inconvenient but also drastically increases the completion of testing time. So, therefore provision should be made to complete ICT, COP & CMVR at the same institute

2.3 The above suggestions were examined through a Committee consisting of representatives from ICAR, FMTTIs, State Govts Power Tiller Association of India (PTAI) and major power tiller companies. It was to make recommendations to streamline the process of testing of Power Tillers. The Committee in its meeting had stated that

At present, there are around 15 Power tiller manufacturers in India with production capacity of around 50 thousand per annum.

- 2.4 India holds the 2<sup>nd</sup> rank in manufacturing of Power Tiller in the world.
- 2.5 Power tillers are subjected to CMVR tests before its launch in the market. The CMVR testing includes Brake Test, measurement of Overall Dimensions, Steering effort and Turning Ability Test, Condition of tyres, checking of electrical lighting fitted in the power tiller, and other safety related tests etc. as per CMVR Rules. In view of this, the stringent testing process being done at SRFMTTI needs revision.
- 2.6 On the basis of the above and on the recommendations of the committee constituted by the Department to streamline the process of testing of Power Tiller at SRFMTTI, and referring to the recent consolidated guidelines issued by the Department for testing of Tractors, the guidelines as enumerated in the next chapter have been framed for testing of Power Tillers. The testing of Power Tiller will be done in accordance with these Guidelines w.e.f. the date of its issue.

### **3 GUIDELINES FOR TESTING OF POWER TILLERS**

#### **3.1 Eligibility of Power Tiller for Subsidy:**

- (a) The Power Tiller manufacturers shall be allowed to participate in the subsidy scheme on the basis of CMVR/Conformity of Production (COP) certificates and a self-declaration to be given by the company that the Power Tiller proposed for inclusion under subsidy conforms to the benchmark specifications given by DA&FW and test on the same shall be done within three months.
- (b) The manufacturer/Applicant shall give a minimum of three year warranty on the power tiller to be supplied under government subsidy schemes. The responsibility for any issues with the quality of the power tiller supplied under subsidy shall be solely of the manufacturer/Applicant. However, in the cases of deliberate malafied intentions or misrepresentations of the facts by the manufacturer/applicant, the DA&FW after



due diligence may take action against the manufacturers/Applicants which may include blacklisting, banning from participation under subsidy programmes/schemes of the Government etc.

### 3.2 Tests to be conducted on power tiller:

(a) **The test reports on the Power Tiller shall compulsorily include the performance data on following tests:**

- (i) Rotary Shaft Performance Test
- (ii) Brake test
- (iii) Drawbar Performance Test
- (iv) Noise level test
- (v) Turning ability test
- (vi) Nominal Speed test
- (vii) Haulage Test
- (viii) Torture Test
- (ix) Material Test & Chemical composition
- (x) Field Test

(b) **The procedure for conducting the compulsory tests and test report generation is indicated below:**

- (i) **Rotary Shaft Performance Test:** It shall only be conducted under varying speed in natural ambient conditions.
- (ii) **Brake Test:** This test shall be done as per the requirements under CMVR. The test already done under CMVR at any authorized institutions shall not be repeated and the same data shall be incorporated in the test reports.
- (iii) **Drawbar Performance Test** – It shall only be conducted to test maximum power and pull in different gears through the use of suitable load car.
- (iv) **Noise level test:** This test shall be done as per the requirements under CMVR. The test already done under CMVR at the authorized institutions and the same data shall be incorporated in the test reports.

- (v) **Tuning Ability Test:** This test shall be done as per the requirements under CMVR. The test already done under CMVR at the authorized institutions shall not be repeated and the same test data shall be incorporated in the test reports.
  - (vi) **Nominal Speed Test:** This test shall be done in all the gears at engine speed recommended by the applicant/manufacturer
  - (vii) **Haulage Test:** The Haulage Test with the trailer and payload as recommended by the manufacturers shall be conducted for only one test run and a distance of 50 KM shall be covered in both the direction of travel where two observations shall be taken.
  - (viii) **Field Test:** shall be conducted for a total duration of 25 hours of which 15 hours shall be conducted in dryland operation and 10 hours shall be conducted in wetland condition (puddling). The test shall be done at SRFMTTI or at any other location as may be suggested by the manufacturer/applicant where fields are available for earliest completion of test.
  - (ix) **Torture test:** shall be done on Torture Test Track at a speed of 2 kmph for distance of 2 km length.
  - (x) **Material & Chemical Composition:** The applicant shall provide test report from NABL accredited test lab of Material Test & Chemical composition of critical components of Power Tiller as laid down in IS: 13539-2018. The test data as may be provided by the applicant shall be included in the test reports.
- (c) **Optional Tests:** The tests viz. Running-in, Engine Performance Test, Drawbar Performance (Ten hours test), Rotary Shaft Performance Test (Five hours test at rated power), air cleaner oil pull over test, Mechanical Vibration test, components / assembly inspection shall be kept “**Optional**” and it may not be necessary to include the performance data on these tests in the test

report of power tiller. These tests shall be conducted only on the request of the manufacturer/applicants .

- (d) The tests indicated at serial number (i) (iii) (vi) & (viii) under 3.2 (a) shall be conducted only at SRFMTTI. The manufacturer shall have the option to conduct the tests indicated at serial number (ii) (iv) & (v) under para 3.2 (a) at any of the institutes authorized for conducting tests under CMVR. These tests shall not be repeated by SRFMTTI and the same test data shall be incorporated in the test reports released by SRFMTTI.
- (e) Apart from SRFMTTI, the manufacturer shall also have the option to conduct the tests indicated at serial number (vi) and (vii) under para 3.2 (a), at any other Government Institutes having adequate resources to conduct these tests as per required BIS code. The test data as may be provided by such Government Institute shall be included in the test report of SRFMTTI with the remarks that the tests have not been carried out by the SRFMTTI and performance results are certified by the Government Institute (Name of the institute to be mentioned)
- (f) The test reports on Power Tillers shall only be released by SRFMTTI.
- (g) The Test Codes that may be referred for conducting compulsory and optional tests are indicated in **Annexure-II**

### **3.3 Process of Testing of Power Tiller at SRFMTTI, Anantapur (AP):**

In case the manufacturer/applicant prefers to get tests done at SRFMTTI, then the following procedure shall be followed:

- (i) All manufacturers/applicants shall submit application through online portal (<https://agrimachinery.nic.in/FMTTI/Management/Index>)
- (ii) Applicable test fee will be submitted by the applicant/manufacturer along with the application

form. Applications received without test fee shall be cancelled by SRFMTTI

- (iii) Scrutiny of applications by SRFMTTI, for admission of power tiller for test may not be exercised henceforth. The applicant/manufacturer shall submit a declaration along with the application form with an undertaking/self-certification that the technical specifications/details provided in the application are confirming to the product submitted for test. Any discrepancy in the technical specifications/details provided by the applicant/manufacturer will be the responsibility of the applicant/manufacturer.
- (iv) Place of running-in shall be declared by the applicant/manufacturer in the application itself. The manufacturer has the option of conducting the running-in of the test sample under Initial Commercial test (ICT)/Batch/Variant test at their manufacturing site. However, if the applicant/manufacturer prefers to conduct the same at SRFMTTI it will be charged separately as per the applicable fees for testing.
- (v) The applicant/manufacturer shall submit the test sample (Power Tiller) directly at SRFMTTI, without requiring any random selection by testing authority for the power tiller to be tested under Initial Commercial Testing/Confidential Testing. The applicant/ manufacturer shall submit the Power Tiller at SRFMTTI, only after explicit approval by the institute for admission of power tiller in the testing roll.
- (vi) In case of Batch Testing, the power tiller shall be picked up randomly by the SRFMTTI from minimum 5 power tiller to be made available by the manufacturer/applicant from production line/warehouse.
- (vii) The Test Reports of the Power Tillers tested under Batch Test shall remain valid for 9 years from the date of its release.

- (viii) Verification of technical specification against the declaration by the applicant/ manufacturer for various broad specifications including measurements of rotary blades, nominal speed test etc. shall be carried out by the institute in its campus only.
- (ix) The tests indicated in para 3.2 (a) shall be completed and the final test report shall be released within 45 working days from the date of admission of test sample for testing.
- (x) The optional tests as indicated in para 3.2 (c) above may be conducted only on the request of applicant/ manufacturer and the performance data may be included in the test report. These tests should be completed in a maximum period of 30 days.
- (xi) SRFMTTI shall also introduce system of Administrative/Technical Extension on tested Power Tillers on the pattern of Tractors testing and the same shall be incorporated in the relevant BIS Code.
- (xii) The above stated procedure for testing of Power Tiller shall also be applicable for confidential testing, variant testing, optional feature tests and repeat test as per IS:9980-1988, IS:9935-2002 and IS: 13539-2018.
- (xiii) **Test fee:** The test fee may be charged as per existing orders till such time the complete revision of testing charges are taken up by the Department of Agriculture & Farmers Welfare based on the recommendation of the committee already constituted for this purpose.

#### 4 **Self-Certification of Power Tillers**

The above stated guidelines for testing of Power Tillers provides simplified procedures for completing the tests in shortest possible time so that the manufacturers of Power Tillers do not lose out their participation under SMAM. Presently there are no National regulations concerning design, manufacturing and supply of power tiller by defining 'essential requirements' to ensure its performance, safe use and barriers free sale in the

country. The M&T Division of DA&FW in consultation with SRFMTTI and Power Tiller Industry shall work towards devising a suitable framework for partial self-certification of Power Tiller based on consolidated tractor testing guidelines issued by the DA&FW.

**BACKGROUND ON POWER TILLER TESTING IN INDIA**

- (i) Power tiller was first introduced in India in the year 1963. Manufacturing of several make of Power Tillers like Iseki, Sato, Krishi, Kubota, Yanmar and Mitsubishi were started in India after 1963. The first Power Tiller was tested at Central Farm Machinery Training & Testing Institute (CFMTTI), Budni (MP) in the year 1964, primarily with a view to ascertain the suitability to the agro-climatic conditions of the country.
- (ii) Southern Region Farm Machinery Training & Testing Institute (SRFMTTI), Garladinne, District- Anantapur has been established in the year 1982. With a view to decentralize the testing activities, the facilities for testing of Power Tillers has been created at SRFMTTI and Power Tiller testing has been started at SRFMTTI in the year 2007-08. Presently, the Power Tillers from all across the country and imported are tested for performance evaluation as per Bureau of Indian Standard (BIS) Codes only at SRFMTTI.
- (iii) Amendment of Central Motor Vehicle Rules (CMVR), 1989 in the year 2005, included Power Tiller as a vehicle under the ambit of CMVR. However, the testing and certification of Power Tillers for compliance under CMVR is done at Central Farm Machinery Training & Testing Institute (CFMTTI), Budni (MP) as SRFMTTI is not an institution authorized by Ministry of Road Transport and Highways for conducting such test.
- (iv) Till the year 1990, the whole Power Tiller market was serviced by two indigenous manufacturing companies. However, thereafter import of Power Tillers was started by some of the Indian companies mainly from China and captured the market share of about 32%.
- (v) Examination of the subject “Variance in Cost and Quality of Agricultural Tools and Implements being provided to the farmers under Rashtriya Krishi Vikas Yojana (RKVY) and problems being faced by the farmers due to imported Power

Tillers-a review” was taken up by the Standing Committee on Agriculture in September 2015 in which the issues of cheap and substandard quality import of Power Tillers from China were raised. Subsequently, based on recommendation of the Standing Committee on Agriculture, the DA&FW constituted an Expert Committee and based on recommendations of the report of Expert Committee changes in the process of testing of Power Tillers were incorporated and made it more stringent.

- (vi) Based on the recommendation of DA&FW, the Directorate General of Foreign Trade vide its Notification No. 19/2015-2020 dated 15th July 2020 notified the Import Policy for Power Tillers and its components and by which the import of Power Tillers and its components was amended from ‘Free’ to ‘Restricted’ category. With this, the import of Power Tillers specifically, from China has been drastically reduced. The Importers transformed into the manufacturers and presently, almost all the Power Tiller market is serviced by the indigenous manufacturers.

### **Evolution of testing process of Power Tiller at SRFMTTI**

- (i) The test reports of Power Tiller from SRFMTTI were insisted for subsidy.
- (ii) Amendment of Central Motor Vehicle Rules (CMVR), 1989 in the year 2005 included Power Tiller as a vehicle under the ambit of CMVR.
- (iii) To evaluate a Power Tiller to qualify for subsidy, the Minimum Performance Standards (MPS) were brought out by the Department of Agriculture & Farmers Welfare in the year 2001 and later in the year 2008, the same were included in the included in the BIS Code.
- (iv) Since then, the test report conforming to the MPS and compliance of CMVR was made as a requirement to qualify Power Tiller for subsidy.



- (v) Subsequent to the recommendations of the Sanding Committee on Agriculture and Expert Committee report, the Minimum Performance Standards for Power Tillers have been revised and Torture Test has been added as new in the array of tests from 2018
- (vi) The requirements of test report conforming to the MPS and compliance of CMVR has been continued for subsidy under Sub-Mission on Agricultural Mechanization (SMAM) being implemented from 2014-15.

## Annexure-II

### Power tiller Tests and applicable Indian Standard Codes

Sr. No.	Tests	Indian Standard (IS) Applicable
A	<b>Compulsory Tests:</b>	
(i)	Rotary Shaft Performance Test (Varying speed test only)	IS:9935-2002 (reaffirmed in 2022) & S. No. 2 [(a) to (c)] of Table 1 of IS: 13539-2018
(ii)	Brake Performance Test	IS:9935-2002 & Sr. No. 4 (a) of Table 1 of IS: 13539-2018. Service brake test shall be conduct as laid down in CMVR Rule No- 96D
(iii)	Drawbar performance test i.e. test for maximum power and pull	IS:9935-2002 (reaffirmed in 2022) & S. No. 3 (a) of Table 1 of IS: 13539-2018
(iv)	Noise level Test	IS:9935-2002 (reaffirmed in 2022) & S. No. 6 [(a) & (b)] of Table 1 of IS: 13539-2018
(v)	Turning Ability Test	IS:9935-2002 (reaffirmed in 2022)
(vi)	Nominal Speed Test	IS:9935-2002 (reaffirmed in 2022)
(vii)	Haulage Test (Observation of two readings in test run of 50 km)	IS:9935-2002 (reaffirmed in 2022) & S. No. 8 [(a) to (c)]of Table 1 of IS: 13539-2018
(viii)	Torture Test	IS: 13539-2018
(ix)	Material Test & Chemical composition	IS 6690:1981 & IS: 13539-2018
(ix)	Field Test (total 25 hours- include 15 hours of Dry land & 10 hours of Wet land (puddling) operation respectively)	IS:9980-1988 & S. No. 9 of Table 1 of IS: 13539-2018

B	<b>Optional Tests:</b>	
(i)	Running-in	IS:9935-2002 (reaffirmed in 2022)
(ii)	Engine Performance Test	IS:9935-2002 (reaffirmed in 2022) & S. No. 1 [(a) to (k)] of Table 1 of IS: 13539-2018
(iii)	Rotary Shaft Performance Test (Five hours Test at rated Power)	IS:9935-2002 (reaffirmed in 2022) & S. No. 2 [(a) to (c)] of Table 1 of IS: 13539-2018
(iv)	Drawbar Performance (Ten hours test)	IS:9935-2002 (reaffirmed in 2022) & S. No. 3 (a) of Table 1 of IS: 13539-2018
(v)	Air Cleaner Oil Pull Over test	IS:9935-2002 (reaffirmed in 2022) & Sr. No. 5 of Table 1 of IS: 13539-2018
(vi)	Mechanical Vibration test	IS:9935-2002 (reaffirmed in 2022) & Sr. No. 7 of Table 1 of IS: 13539-2018
(vii)	Components & Assembly Inspection	IS:9935-2002 (reaffirmed in 2022) & Sr. No. 5 of Table 1 of IS: 13539-2018

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