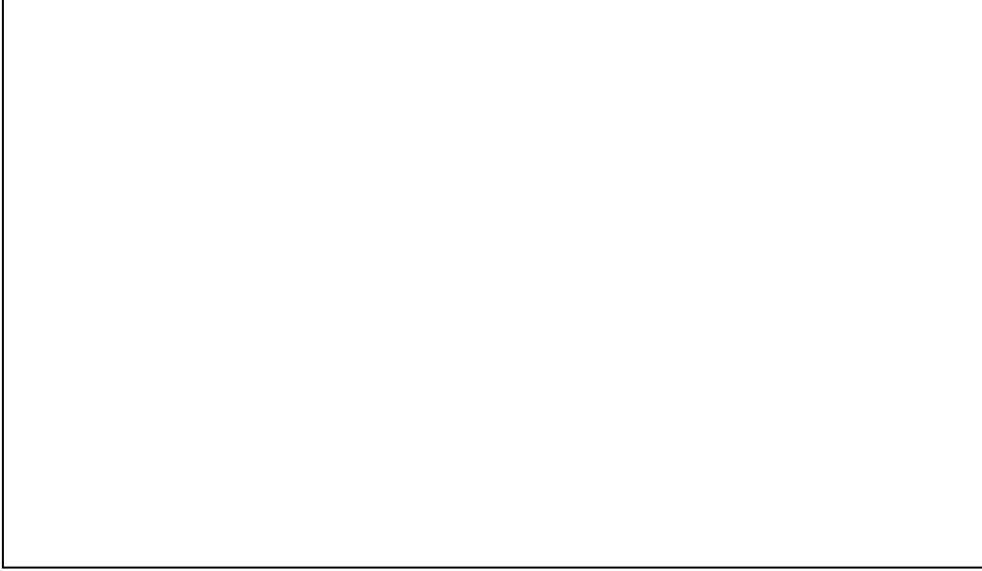


व्यावसायिक परीक्षण रिपोर्ट वैरिएंट (प्रथम बैच परीक्षण) संख्या / No. : T- 1556/2084/2021
COMMERCIAL TEST REPORT VARIANT (1st BATCH TEST) माह / Month : July, 2021

(यह परीक्षण रिपोर्ट 30/07/2026 तक वैध है | / THIS TEST REPORT IS VALID UPTO:30/07/2026)



**MAHINDRA 605 DI i 4WD S+ TRACTOR
(BRAND NAME : ARJUN NOVO)**



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय

(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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T- 1556/2084/2021	MAHINDRA, 605 DI i 4WD S+ TRACTOR (BRAND NAME : ARJUN NOVO) COMMERCIAL - VARIANT (1 st Batch Test)
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3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

3.1.1 Tractor:

Make	: Mahindra
Model	: 605 DI i 4WD S+
Brand name	: Arjun Novo
Type	: Four wheeled, Four-wheel driven (4WD), Unit construction, General purpose, Agricultural Tractor.
Month & Year of manufacture	: 10 / 20
Chassis number	: MBNWHBDKULNG00001
Country of origin	: India

3.1.2 Engine:

Make	: Mahindra
Model	: MSI4573A
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
Serial number	: NLG2WBE0001
Year of manufacture	: 2020
Country of origin	: India

3.1.2.1 Engine speed (rpm), (Manufacturer's recommended production settings):

- Maximum speed at no load	: 2400 to 2500
- Low idle speed	: 750 to 850
- Speed at maximum torque	: 1100 to 1300

Rated speed, (rpm):

- For PTO use	: 2100
- For drawbar use	: 2100

3.1.3 Cylinder & Cylinder Head:

Number	: Four
Disposition	: Vertical, Inline
Bore/stroke, (mm)	: 96 / 122
Capacity as specified by the applicant, (cc)	: 3532
Compression ratio	: 18.3 (±0.5) : 1
Type of cylinder head	: Monoblock
Type of cylinder liners	: Wet, replaceable
Type of combustion chamber	: Re-entrant bowl cavity on piston crown.
Arrangement of valves	: Overhead, Inline

Valve clearance (cold/hot):

- Inlet valve, (mm)	: 0.3 / 0.4
- Exhaust valve, (mm)	: 0.4 / 0.5

3.1.4 Fuel System:

Type of fuel feed system	: Gravity and force feed
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Previous Sample

Present Sample

6.4 Adequacy of literature:

The following combined literature tractor models were supplied with the test sample for reference during the test.

- a) Service Manual
- b) Parts Catalogue
- c) Operator's manual

- a) Service Manual
- b) Parts Catalogue
- c) Operator's manual

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of **Indian standard: 12207-2019** 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: 12207-2019	Values declared by the applicant (D) / Requirement (R)	As observed	Whether meets the requirements (Yes / No)
1	2	3	4	5	6	7
7.1.1	PTO Performance:					
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power or engine power >26 kW, $\pm 10\%$ for PTO power or Engine power ≤ 26 kW.	37.5 (D)	36.8	Yes
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	251 (D)	274	Yes
7.1.2	Drawbar performance:					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	24.30 (D) 23.10 Minimum (R)	30.39	Yes
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without / standard ballast	19.20 (D) 19.08 Minimum (R)	25.19	Yes
c)	Maximum drawbar power without ballast, or with standard ballast as the case may be, (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 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.	30.0 (D) 29.4 Minimum (R)	30.3	Yes

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1	2	3	4	5	6	7
d)	For tractor fitted with air conditioned / heated cabin: Maximum drawbar power without ballast, or with standard ballast as the case may be, kW	Evaluative	Minimum 70 percent of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 Kg.	Nil	Not fitted	Not applicable
e)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	110	103	Yes
7.1.3	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor, dB(A)	Evaluative	88 dB(A) for >1.5 tonne GVW and 85 dB(A) for <1.5 tonne GVW (as per CMVR)	88 (R)	85	Yes
b)	Maximum noise at operator's ear level, dB(A)	Evaluative	As per CMVR	96 (R)	95	Yes
7.1.4	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulics pipes (as per IS-12239 Part 2)	Meet the requirements		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Meet the requirements		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 requirements		No
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meet the requirements		Yes
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	Meet the requirements		Yes
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)	Meet the requirements		Yes
g)	Specifications of Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirements 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	31.97 (Audible warning is provided)		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.	Audible warning signal is activated, when reverse speed reaches 20 kmph		Yes

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1	2	3	4	5	6	7
7.1.5	Labelling of tractors (Provision of labelling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR along with maximum declared value of PTO power in kW and for month & year of manufacture in numerical MM YY 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		Mahindra	Yes
	2) Model	Evaluative			605 DI i 4WD S+	Yes
	3) Month & Year of manufacture	Evaluative			10 / 20	Yes
	4) Engine number	Evaluative			NLG2WBE0001	Yes
	5) Chassis number	Evaluative			MBNWHBDKU LNG00001	Yes
	6) Declaration of PTO power, kW	Evaluative			37.5	Yes
	7) Specific fuel consumption, (g/kWh)	Evaluative			251	Yes
7.1.6	Literature (Submission to test agency)					
(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
7.1.7	Fitment of Roll Over Protective Structure (ROPS): for tractors 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 Provided	Not Fitted	Not Applicable
7.1.8	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.9	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes
7.2	CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019):					
S. No.	Category of Breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirement (Yes/No.)	
1.	Critical breakdown	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes	
2.	Major breakdowns	Evaluative	There are not more than 01 major breakdowns and neither of them is of repetitive nature	None	Yes	
3.	Minor breakdowns	Evaluative	There are not more than 03 minor defects during the test and the frequency of each is not be more than two	None	Yes	
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four that is, (01 major + 03 minor) or 04 minor breakdowns	None	Yes	

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7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO Performance:

- i) During PTO test at 2 hour max. power test the average Specific Fuel Consumption was recorded 279 g/kWh against the declared value 251 g/kWh, which does not meet the evaluative requirement of IS:12207-2019. To rectify the above case, following activities were carried out:

a)	Operation of EGR and its throttle position sensor setting was check and found correct.					
b)	Fuel line was cleaned by compressed air.					
c)	Condition of fuel filter was checked and found normal.					
d)	Injectors pressure were checked and adjusted as below:-					
	Injector	As per service manual, kg/cm²		Observed, kg/cm²		Setting done, kg/cm²
	I	255 ± 8.2		248		256
	II	255 ± 8.2		240		258
	III	255 ± 8.2		242		252
	IV	255 ± 8.2		247		258
e)	Fan belt tension was checked and found correct.					
b)	Tappet clearance were checked and adjusted as below:-					
	Cylinder	As per service manual		Observed		Setting done
		Inlet (mm)	Exhaust (mm)	Inlet (mm)	Exhaust (mm)	Inlet (mm) Exhaust (mm)
	I	0.30	0.40	0.30	0.30	0.30 0.40
	II	0.30	0.40	0.25	0.30	0.30 0.40
	III	0.30	0.40	0.20	0.40	0.30 0.40
	IV	0.30	0.40	0.30	0.30	0.30 0.40

Thereafter, two hour maximum PTO power performance test was conducted and the Average Specific Fuel Consumption was recorded as 274 g/kwh against declared value of 251 g/kwh. Which, meets the evaluative requirement of IS:12207-2019.

- ii) The maximum PTO power was recorded as **36.8 kW** against the declaration of **37.5 kW**, which meets the evaluative requirement of IS: 12207-2019.
- iii) The specific fuel consumption corresponding to maximum power was recorded as **274 g/kWh** against the declaration of **251 g/kWh**, which meets the evaluative requirement of IS: 12207-2019.

7.3.1.2 Drawbar performance test:

- i) The maximum drawbar pull without ballast corresponding to 15 % wheel slip in case of previous and present sample was recorded as **25.60 kN** and **25.19 kN** against the declaration **17.76 kN** and **19.20 kN respectively**, which is within the tolerance limit as specified in IS:12207-2019.
- ii) The maximum drawbar power without ballast in case of previous and present sample was recorded as **31.4 kW** and **30.5 kW** against the declaration of **30.0 kW**, which is within the tolerance limit as specified in IS: 12207-2019.
- iii) The maximum drawbar pull with ballast corresponding to 15 % wheel slip in case of previous and present sample was recorded as **31.55 kN** and **30.39 kN** against the declaration **24.30 kN**, which is within the tolerance limit as specified in IS:12207-2019.

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7.3.1.3 Operator's seat:

The Longitudinal distance from centre of differential lock pedal to Seat Index Point, does not meet the requirement of the IS: 12343 -1998 (Reaffirmed in January, 2019). This should be looked into for necessary corrective action.

7.3.1.4 Three point linkage:

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.

7.3.1.5 Operator's work place:

Operator's work place meets the requirements of IS:12239 (Part-1) - 2018), **except the following:**

- i) Provision of vertical retainers at both sides of clutch pedal.
- ii) Provision of spark arresting device in the exhaust system.

7.3.1.6 Constructional requirement with regard to safety:

Constructional requirement with regard to safety meets the requirements of IS: 12239 (Part-2)-1999 (Reaffirmed in January, 2019), except the working clearance around the position control & draft control lever is less than the minimum requirement.

7.3.1.7 PTO master shield:

PTO master shield not provided on tractor as per the requirements of IS: 4931-1995 (Reaffirmed in January, 2019). This should be looked into for necessary corrective action.

7.3.1.8 Location of operator's controls with regard to safety:

Location of operator's controls with regard to safety meets the requirements of IS: 8133-1983 (Reaffirmed in January, 2019), except the fuel shut-off knob does not remain in stop position without the application of sustain manual effort.

7.3.1.9 Labelling plate:

- i) The maximum PTO power has been specified as 50.3 hp in parenthesis on labelling plate. Whereas, by calculation we find the same as 51.0 metric horse power (1 kW = 1.35962 Metric horse power). This should be looked into for necessary corrective action.
- ii) The specific fuel consumption has been specified as 187 g/hph in parenthesis on labelling plate. Whereas, by calculation we find the same as 184.61 g/hph (1 kW = 1.35962 Metric horse power). This should be looked into for necessary corrective action.

7.4 Maintenance / Service Problems:

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

7.5 Recommendation with regard to safety on tractor:

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

- i) Longitudinal distance from centre of differential lock pedal to Seat Index Point does not meet the requirement. It should be provided as per IS: 12343-1998, (Reaffirmed in January, 2019).
- ii) Provision of spark arrester in the exhaust system.
- iii) Master shield around the PTO shaft has not been provided. It should be provided as per IS: 4931-1995 (Reaffirmed in January, 2019).

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- iv) The working clearance between position and draft control lever of hydraulic system is less than the minimum requirement. It should be provided as per IS: 12239 (Part-2)-1999 (Reaffirmed in January, 2019).
- v) Vertical retainers at both sides of clutch pedal should be provided as per relevant standard.
- vi) The fuel shut off knob does not remain in 'STOP' position. It should automatically remain in stop position without the application of sustains manual effort.


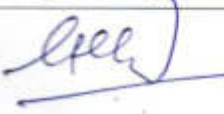
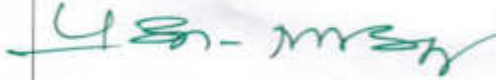
7.6 Adequacy of Literature:

7.6.1 Following literature of following tractor models were supplied with the test sample for reference during the test.

- a) Service Manual Part - I, II & III for Mahindra 605 DI PS, 605 DI i, 605 DI MS, 605 DI i 4WD S+, 605 DI MS 4WD S+ & 605 DI i Cab tractor models.
- b) Parts Catalogue for Mahindra 605 DI PS, 605DI i, 605 DI MS, 605 DI i 4WD S+, 605 DI MS 4WD S+ & 605 DI i Cab tractor models.
- c) Operator's manual Mahindra 605 DI PS, 605DI i, 605 DI MS, 605 DI i 4WD S+, 605 DI MS 4WD S+ & 605 DI i Cab tractor models.

7.6.2 The literature should be brought out in national as well as other regional languages of India for guidance of users.

TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	
Y.K.RAO SENIOR AGRICULTURAL ENGINEER	
P.K. PANDEY DIRECTOR	

Draft test report is compiled by: **Vithato Keyho**, Senior Technical Assistant

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8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	7.5 (i), (ii), (iii), (iv), (v) & (iv)	Observations will be studied and necessary action will be incorporated.
8.2	7.3.1.9 (i) & (ii)	The conversion factor i.e. 1kW = 0.7457 hp is used on Vahan Portal & the same will be printed on RTO RC book of customer. We follow the same.
8.3	7.6.2	Literatures are available in various regional languages of India.

ANNEXURE - I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	47.0
2.	PTO performance test	9.3
3.	Nominal speed test	3.8
4.	Drawbar performance test	20.3
5.	Noise measurement	2.0
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	5.5
TOTAL:		87.9