



MAHINDRA, ARJUN 605 DI TRACTOR
(Brand Name : Ultra 1)



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रौद्योगिकी प्रभाग)

Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

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3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
3.1.1 Tractor:		
Make	: Mahindra	Mahindra
Model	: Arjun 605 DI V2	Arjun 605 DI
Brand name	: Ultra-1	Ultra-1
Type	: Four wheeled, two wheel drive unit construction general purpose Agricultural Tractor.	
Year of manufacture	: GB (October, 2011)	2013
Chassis Serial number	: NPA134	NSHA 00001
Country of Origin	: India	INDIA
3.1.2 Engine:		
Make	: Mahindra	Mahindra
Model	: NE 457 R 3A	NE 457 3A
Type	: Four stroke, turbo charged, liquid cooled, direct injection, diesel engine.	Four stroke, natural aspirated, water cooled, direct injection, diesel engine.
Serial number	: NPA134	Not provided separately, chassis number used as serial number
	Engine speed (Manufacturer's recommended production setting)(rpm):	
- Maximum speed at no load	: 2150 to 2250	2400 to 2500
- Low idle speed	: 800 to 900	750 to 850
- Speed at maximum torque	: 1300 to 1500	1000 to 1200
	Rated speed, (rpm):	
- For PTO use	: 2000	2100
- For drawbar use	: 2000	2100
3.1.3 Cylinder & Cylinder Head:		
Number	: Four	Four
Disposition	: Vertical, Inline	Vertical, inline
Bore/stroke, (mm)	: 96/115	96/122
Capacity as specified by the applicant, (cc)	: 3329	3532.3
Compression ratio, (apa)	: 17.2 ± 0.5 : 1	18.3± 0.5 : 1
Type of cylinder head	: Monoblock	Monoblock
Type of cylinder liners	: Wet, replaceable	Wet, replaceable
Type of combustion chamber	: Re-entrant bowl cavity on piston top	
Arrangement of valves	: Overhead, inline	Overhead, inline

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1	2	3	4	5	6
	l.	Governed range of engine speed	800 to 2250	750 to 2500	Changed
	n.	Engine stop knob	NA	Provided	Changed
	o.	Lubricating oil capacity of transmission system (l) (gear box, differential housing rear axle, final drive, hydraulic system, service brake)	44	38	Changed
	p.	Master shield for PTO	All the configuration in base and variant model (refer para 3.1.14.2)		No changed

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of test 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: 2008 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	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
7.1.1	PTO Performance :							
a)	- Max. power under 2 hrs. test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >35hp. -7.5/+10% for PTO power ≤ 35 hp	36.7 (D)	36.7 (D)	36.4	35.29	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	36.7 (D)	36.7 (D)	36.2	35.14	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	251 (D)	251 (D)	231	246	Yes
d)	Maximum operating temperature (°C)							
	1) Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	130 (D)	130 (D)	128	112	Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
	2) Coolant (water)	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	112 (D)	112 (D)	101	92	Yes
7.1.2	Hydraulic Performance :							
a)	Maximum lifting capacity throughout the range of lift, (kN):							
	1) At hitch points	Non Evaluative	[Tolerance of minus 10%]	16.18 (D)	16.18 (D)	16.41	16.45	Yes
	2) With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	11.28 (D)	11.28 (D)	12.01	12.01	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	[Tolerance of plus 5 mm]	100 (D)	100 (D)	31	35	Yes
7.1.3	Labelling of tractors (Provision of labelling plate):							
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	Mahindra	MAHINDRA			Yes
	2) Model	Evaluative		ARJUN 605 DI V2	ARJUN 605 DI			Yes
	3) Year of manufacture	Evaluative		2011 GB	2013 AD			Yes
	4) Engine serial number	Evaluative		NPA 134	NSHA 00001			Yes
	5) Chassis serial number	Evaluative		NPA 134	NSHA 00001			Yes
	6) Declaration of PTO power, kW	Evaluative		36.7 (49.21)	36.7 (49.21)			Yes

7.2 Salient Observations:

7.2.1 Laboratory tests:

7.2.1.1 PTO Performance:

- i) The maximum PTO power in case of base and variant models were observed as 36.4 & 35.29 kW respectively against the declaration of 36.70 kW which is within the specified limit, But the variation of – 3.05%, which is towards lower side , this may be looked into.

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- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 231 & 246 g/kWh respectively against the declaration of 251 g/kWh. Which is within the tolerance limit.

7.2.1.2 Provision for safety and comfort of operator, (Conformity with IS: 12343-1998):

The operator's seat provided on the tractor does not meet the following requirements and calls for necessary improvement in respect of following.

- i) Length of seat from SIP.
- ii) Vertical distance of SIP from foot rest.

7.2.1.3 Operator's work place: IS :12239 (Part-I& II)

The operator's work place provided on the tractor does not meet the following requirements and calls for necessary improvement in respect of following.

- i) Vertical retainers have not been provided on brake pedals.
- ii) The provision for the spark arrester on silencer is not provided.
- iii) Provision of trailer hook locking device is not given.

7.2.1.4 Labelling of tractor: -

Labelling plate of tractor meets the requirements .

7.3 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the test. However, suitable provision for draining the sediments/water may be provided at the fuel tank.

7.4 Recommendation with regard to safety on tractor:

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

- i) Fuel shut-off knob shall remain in stop position without application of manual effort.
- ii) Vertical retainers should be provided on both side of brake pedals.

7.5 Adequacy of Literature supplied with machine:

7.5.1 The following literatures were supplied by the manufacturer for reference during the test.

- a) Operator's manual for 605 DI Ultra 1 Tractors
- b) Part's catalogue Mahindra tractors
- c) Service manual for Mahindra tractors

7.5.2 The revised literature submitted by the firm was found adequate. However, these literatures may also be brought out in national as well as other regional languages.

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8. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of Test	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
10 Months	6 Months (February, 2014 to July, 2014)	Yes	None

TESTING AUTHORITY:

H. L. YADAV
SENIOR AGRICULTURAL ENGINEER

C.R. LOHI
DIRECTOR

Test report compiled by **Shri Rajneesh Patel**, Assistant Agricultural Engineer

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9. APPLICANT COMMENTS

Para No.	Our reference	Applicant's comments
7.2	7.2.1.1 (i), 7.2.1.2 (i & ii), 7.2.1.3 (i, ii & iii)	Observation will be studied and necessary action will be incorporated
7.4	7.4 (i & ii)	

TRACTOR RUN HOURS DURING TEST

Annexure-I

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running –in	--
2.	PTO Performance Test	13.37
3.	Nominal speed test	1.35
4.	Hydraulic	1.67
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for the tests.	3.13
Total (hrs)		20.52