

व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक) अपूर्ण

संख्या / No. : T- 1235/1762/2019

COMMERCIAL TEST REPORT (Batch)- Incomplete

माह / Month : April, 2019



NEW HOLLAND, NEW HOLLAND 7500 TURBO SUPER12+3 UG TRACTOR



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

(Deptt. of Agricultural, Cooperation & Farmer's Welfare, Mechanization & Technology Division)

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Manufacturer : M/s. CNH Industrial (India) Pvt. Ltd.
Plot No. - 3, Udyog Kendra,
Greater Noida-201306,
Distt. Gautam Budh Nagar,
Uttar Pradesh.

Month: April	Test Report No. T- 1235/1762/2019	Year : 2019
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Type of Test : **COMMERCIAL (Batch) (Incomplete)**

Test code/Procedure : IS: 5994-1998 (Reaffirmed in 2014)
IS: 9253-2013 and
IS: 12207-2014.

Period of Test : July, 2018 to October, 2018

Test Report No. : **T- 1235/1762/2019**

Month/Year : **April, 2019**

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine randomly selected from production line by the representative of testing authority for batch test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).
- v) **This report is an INCOMPLETE BATCH TEST REPORT and should not be used for institutional finance/ subsidy purpose.**

SELECTED CONVERSIONS

SELECTED CONVERSIONS			ABBREVIATIONS	
Sl. No	Units	Conversion Factor		
1	Force:		apa	As per applicant
	1 kgf	9.80665 N	TDC	Top Dead Centre
		2.20462 lbf	IS	Indian Standard
2	Power:		LHS/RHS	Left Hand Side/ Right Hand Side
	1 Mechanical horsepower	1.01387 metric horsepower	Hg.	Mercury
		745.7 metric horsepower	Temp.	Temperature
	1 metric horsepower	735.5 W	N.R.	Not recorded
	1 kW	1.35962 metric horsepower	rpm	Revolutions per minute
3	Pressure:		O.D/I.D	Outer diameter/ Inner diameter
	1 psi	6.895 kPa	N.A.	Not available/ Not applicable
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg	PTO	Power take-off
	1 bar	100 kPa = 10 N/cm ²	R.H.	Relative Humidity
	1 mm of Hg	1.3332 m-bar		

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The firm M/s. CNH Industrial (India) Pvt. Ltd., Plot No.-3, Udyog Kendra, Greater Noida-201306, Distt. Gautam Budh Nagar, Uttar Pradesh had submitted "New Holland 7500 Turbo Super 12+3 UG" Tractor model for initial commercial testing at this institute and test report No. T-833/1342/2012 was released in June, 2012.

Subsequently; the said tractor model has randomly selected by the representative of testing authority for batch testing and therefore, the tractor was subjected to different tests as per clause 6.0 table -1 of IS: 5994-1998 (Reaffirmed in 2014).

During the course of test, maximum PTO power under natural ambient condition during maximum power 2 hours test was recorded as 47.3 kW against the minimum requirement of 47.5 kW which is 0.4% less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.

After several checking /adjustments, no considerable improvement in power was recorded. Therefore, the applicant has requested to withdraw the said test sample from the test, vide letter no. PD-L118076, dated 14.11.2018. The applicant's request was accepted by the competent authority and hence this incomplete test report is released.

Manufacturer	: M/s. CNH Industrial (India) Pvt. Ltd. Plot No. 3, Udyog Kendra, Greater Noida-201306, Distt. Gautam Budh Nagar, Uttar Pradesh.
Test requested by (applicant)	: The Manufacturer
Selected for test by	: Testing Authority
Place of running-in	: At manufacturer's works
Duration of said running-in (h):	
- Engine	: 50
- Transmission	: 50
Method of Selection	: The test sample was selected randomly out of five tractors from the production line by the representative of testing authority.

1. SPECIFICATIONS [As Specified by the Applicant]

1.1 Tractor:

Make	: New Holland
Model	: New Holland 7500 Turbo Super 12+3 UG
Variant, if any	: Yes

S. No.	Variant model(s)*	Features
i)	NH 7500DT Turbo super 12+3 UG (4WD)	Four wheel driven

Remark (*): Indicates that the variant model has not been tested yet at this institute.

Type	: Four wheeled, rear wheel driven, general purpose, agricultural tractor.
Year of manufacture	: 2017
Chassis number	: NHN 7500 ZHE 388694
Country of Origin	: India

1.2 Engine:

Make	: IVECO
Model	: 8045.25.720
Type	: Four stroke, turbo charged, water cooled, direct injection, diesel engine.
Serial number	: 205086 DT

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

- Maximum speed at no load : 2450 to 2600
- Low idle speed : 600 to 700
- Speed at maximum torque : 1200 to 1600

Rated speed, (rpm):

- For PTO use : 2300
- For drawbar use : 2300

1.3 Cylinder & Cylinder Head:

- Number : Four
- Disposition : Vertical, inline
- Bore/stroke, (mm) : 104/115
- Capacity as specified by the applicant, (cc) : 3908
- Compression ratio, (apa) : 18 : 1 ± /-0.5
- Type of cylinder head : Mono block
- Type of cylinder liners : Dry replaceable
- Type of combustion chamber : Omega shape
- Arrangement of valves : Overhead, Inline

Valve clearance (Cold/Hot):

- Inlet valve, (mm) : 0.30
- Exhaust valve, (mm) : 0.30

1.4 Fuel System:

- Type of fuel feed system : Gravity & force feed

1.4.1 Fuel tank:

- Capacity, (l) : 63.00
- Location : Above clutch housing
- Provision for draining of sediments/ water : Not provided.
- Material of fuel tank : HDPE

1.4.2 Water separator

- : Not provided.

1.4.3 Fuel feed pump:

- Make : IVECO
- Type : Diaphragm
- Model/Group combination No. : Not available
- Provision of sediment bowl : Not provided
- Method of drive : Through timing gear of cam shaft

1.4.4 Fuel filters:

- Make : Bosch
- Model/Group combination No. : 4795600 EC 773150
- Number : Two
- Type of element : Paper

1.4.5 Fuel Injection pump:

- Make : Bosch, India
- Model/Group combination No. : 0460 424 508, VE4/12F1144
- Type : Rotary
- Serial number : 718 46682
- Method of drive : Through timing gears

1.4.6 Fuel injectors:

- Make : Bosch, India
- Type : Multi hole
- Manufacturer's production pressure setting, (MPa) : 26.0 to 26.8
- Injection timing : 0.5±0.1 mm plunger lift at TDC
- Firing order : 1 - 3 - 4 - 2

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- 1.4.7 Governor:**
 Make : Bosch
 Model/Group combination No. : Inbuilt with FIP
 Type : Mechanical, centrifugal, variable speed
 Rated engine speed, (rpm) : 2300
 Governed range of engine speed : 600 to 2600 (rpm)
- 1.5 Air Intake system:**
- 1.5.1 Pre-cleaner : Not provided**
- 1.5.2 Air cleaner:**
 Make : Donaldson
 Type : Dry
 Location : In-front of radiator, under bonnet
 Range of suction pressure at maximum power, (kPa) : 2.1 to 2.3
- | | | | |
|---------------------------------|-----------|-----------|---------------|
| Detail of elements, (mm) | OD | ID | Length |
| - Primary element | 160 | 95 | 350 |
| - Secondary element | 82 | 75 | 336 |
- No. of elements : Two
 Provision of vacuum indicator : Provided on dashboard
 Provision of dust unloading valve : Provided
 Service/maintenance schedule : Clean the filter when filter clogging light glow or after every 300 hours. Replace primary and secondary element after 900 & 2700 hours of operation respectively
- 1.6 Exhaust system:**
 Type of silencer : Under hood muffler with vertical exhaust pipe
 Position of silencer outlet with respect to SIP, (mm):
 - Vertical : 1040
 - Longitudinal : 1330
 - Lateral : 400 (on LHS)
 Range of exhaust gas pressure at maximum power, (kPa) : 95.5 to 96.1
 Provision of spark arresting device : **None**
 Provision against entry of rain water : A bend is provided at the end of silencer
- 1.6.1 Turbocharger:**
 Make : HOLSET
 Model : Radial flow
 Type : HX25W
 Speed at rated engine speed : Not available
 Method of lubrication : Through engine oil
 Location : On LHS of engine head from operator's seat
- 1.7 Lubricating system:**
 Type : Forced feed-cum-splash
 Oil sump capacity, (l) : 6.00
 Total lub oil capacity, (l) : 8.40
 Oil change period : First change after 50 hours and subsequently after every 300 hours of operation.
 Cooling device, (if any) : Yes, coil type oil cooler is provided
- 1.7.1 Filters:**
 Make : IVECO
 Number : One
 Type : Full flow, Spin-on, replaceable.

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- 1.7.2 Pump:**
Type : Gear type (apa)
Method of drive : Through camshaft eccentric gear
Pressure release setting, (kPa) : 294.2
Minimum permissible pressure, (kPa) : 68.65
- 1.8 Cooling system:**
Type : Forced circulation of water (apa)
Details of pump : Centrifugal, semi-open impeller of 96.0 mm diameter, having seven number of vanes and driven through crankshaft pulley by a cogged V-belt common to alternator.
Details of fan : Suction type having six numbers of metallic blades of 395 mm diameter and mounted on water pump shaft.
Means of temperature control : Thermostat
Bare radiator capacity, (l) : 4.50
Capacity of Expansion tank, (l) : 0.90
Total coolant (water) capacity, (l) : 13.00
Radiator cap pressure, (kPa) : 88
- 1.9 Starting System:**
Type : 12V DC, Electrical
Aid for cold starting : None
Any other device provided for easy starting. : None
- 1.10 Electrical System:**
- 1.10.1 Battery:**
Make & model : Standard furukawa (SF) & SFN100/TR
Type : Lead acid
Capacity and rating : 12V, 100 Ah at 20 hours discharge rate.
Location : In front of the radiator under the bonnet
- 1.10.2 Starter:**
Make : Bosch India
Model : F002G20814
Type : Pre-engaging, solenoid operated
Capacity and rating : 12V, 3 kW
Serial Number : Not provided
- 1.10.3 Generator:**
Make : Bosch India
Model : F002G10033
Type : Alternator
Output rating : 12V, 23 Amp
Method of drive : Through crankshaft pulley by a V-belt common to water pump.
Serial number : Not provided
- 1.10.4 Voltage regulator** : In built in alternator

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1.10.5 Details of lights:

Description	No. & capacity of bulbs	Height of the centre of beam above ground level,(mm)	Size of beam, (mm)	Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm)
Front Lights:				
- Head lights	2, 12V, 35/35 W	1160	140 x 98	865
- Parking lights	2, 12V, 5W	1445	78 x 75	204
- Turn Indicators-cum –hazard warning lights	2, 12V, 21W	1445	110 x 78	204
Hazard warning lights	Part of indicator light	Part of indicator light		
Reflectors		-	-	-
Rear lights:				
Parking lights	2, 12V, 21/5W	1490	78 x 75	298
Turn indicator lights	2, 12V, 21W	1490	110 x 78	208
Hazard warning lights	Part of indicator			
Registration plate light	1, 5W	Part of indicator		
Reflectors	2	1490	60 x 22	280
Any other/plough	1, 55W	1565	140 x 110	450

1.10.6 Main switch : Key turn type having three positions viz. OFF, Circuit-ON and START

1.10.7 Light switch : Rotary type having four positions viz.
i) Off
ii) Parking lights + dashboard lights 'ON'
iii) Head lights (long beam) + (ii)
iv) Head lights (short beam) + (ii)

1.10.8 Horn:
 Make : Nikko Auto
 Type : 12V, 2B electromagnetically vibrated diaphragm type
 Location : In front of radiator, under the bonnet

1.10.9 Fuse box : Contains 08 number of fuses having following capacities:

Capacity	10A	15A
Number	04	04

1.10.10 Details of other electrical accessories:

1.10.10.1 Starting safety switch : Tractor start only when high-low gear shifting lever in neutral position.

1.10.10.2 Flasher Unit:

Make : Interface
 Capacity: 12V
 - Turn signal : 12 V, 21W x 2 + 2W x 1
 - Hazard signal : 12 V, 21W x 4 + 2W x 2
 Flashes/Min. : 85

1.10.10.3 Seven pin socket for trailer lights : Provided

1.11 Instrument panel details:

i) Engine speed hour meter with colour zone
ii) Engine cumulative run hour meter

- iii) Coolant temperature gauge with colour zone
- iv) Lub. Oil pressure gauge (with colour zone)
- v) Fuel level gauge (with colour zones)
- vi) Parking light indicator
- vii) Battery charging indicator lamp
- viii) Light switch (rotary type)
- ix) hazard light switch with indicator
- x) Head light (long beam) indicator lamp
- xi) Light switch rotary type
- xii) Turn indicator switch
- xiii) Hazard indicator switch
- xiv) Horn push button
- xv) Lubricant oil pressure gauge/indicator lamp
- xvi) Steering control wheel
- xvii) Back view mirror
- xviii) Hand accelerator
- xix) fuel shut-off knob

1.12 Transmission System:

1.12.1 Clutch

- Make : Luk India
- Type : Dry, friction plate
- No. of friction plate, (s) : Two

Size, (OD/ID) (mm):

PTO
280/165

Transmission
280/165

Method of operation:

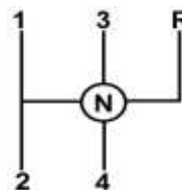
By a hand lever on LHS of operator's seat

By a pedal operated on LHS of operator's seat

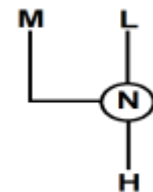
1.12.2 Gear box :

- Make : New Holland (apa)
- Type : Combination of constant, sliding and synchromesh spur gear.
- Location of gear shifting livers : Speed range selector levers provided in LHS of the operator's seat and main gear shifting lever provided in RHS of the operator's seat

Gear shifting pattern :



Main gear shifting lever



Speed range selector lever

No. of speeds:

- Forward : 12
- Reverse : 03

Oil capacity, (l) : 30.00 (common with differential housing, rear axle, final drive & hydraulic system)

Oil changing period : After every 1200 hours of operation.

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1.12.3 Nominal Speed :

Movement	Gear No.	No of engine revolutions for one revolution of driving wheel	Nominal speed at rated engine speed when fitted with 16.9-30 size tyres of 695 mm radius index, (kmph)
Forward	L1	291.57	2.07
	L2	197.84	3.05
	L3	135.26	4.46
	L4	104.62	5.75
	M1	93.05	6.47
	M2	63.16	9.54
	M3	43.11	13.97
	M4	33.36	18.04
	H1	54.57	11.04
	H2	37.07	16.23
	H3	25.31	23.82
	H4	19.58	30.75
Reverse	LR	205.69	2.93
	MR	65.62	9.19
	HR	38.51	15.65

1.12.4 Differential Unit:

- Type : Crown wheel and bevel pinion with differential unit, accommodated inside the differential housing.
- Reduction through crown wheel and bevel pinion : 3.0714 : 1 (43 / 14 T)
- Oil capacity of differential unit, (l) : 30.0 (common with gear box, final drive, hydraulic and steering system)
- Oil changing period : After every 1200 hours of operation.
- Differential lock:**
- Type : Pin type
- Location : RHS of differential housing
- Method of operation : by pressing a foot pedal provided on RHS of operator's seat

1.12.5 Rear axle & final drive:

- Make : New Holland
- Type : Bull & Pinion
- Reduction through final drive : 6.18 :1
- Oil capacity of final drive, (l) : 3.50 each side
- Oil changing period : After every 1200 hours of operation.

1.13 Power lift (Hydraulic System):

- Make : New Holland
- Type : Open centre, Live, ADDC
- No. and type of cylinder : One, single acting
- Type of linkage lock for transport : Hydraulic

1.13.1 Hydraulic pump:

- Make : Rexroth
- Type : Gear
- Location & drive : On RHS of engine & driven through timing gears.
- No. & type of filters : One, replaceable paper element.
- Hydraulic oil capacity, (l) : 30.0 (Common to gearbox, differential housing rear axle , final drive & steering system)

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Oil change period : After every 1200 hours of operation.
Provision for external tapping : Provided
Details of control levers : i) Position control lever (Yellow)
ii) Draft control lever (Red)
Method of draft sensing : Through top link

1.13.2 Three point linkage:

S. No	Observations	As per IS: 4468- (Part-1) -1997, (Cat.I / Cat.II), (mm)	As measured, (mm)	Remarks
I.	Upper hitch points:			
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.75	Conform to cat -II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	44.90	Conform to cat -II
II.	Lower hitch points:			
a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	28.90	Conform to cat -II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	44.9	Conform to cat -II
III.	Lateral distance from lower hitch point to centre line of tractor.	359 / 435	434	Does not conform
IV.	Lateral movement of lower hitch points	100 (min) / 125 (min)	248	Conforms
V.	Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position)	450 to 575 / 550 to 625	715	Does not conform
VI.	Transport height	820 (min) / 950 (min)	1085	Conforms
VII.	Power range (without force)	560(min) / 650 (min)	708	Conforms
VIII.	Leveling adjustment	100 (min) / 100 (min)	315	Conforms
IX.	Lower hitch point clearance	100 (min) / 100 (min)	40	Does not conform
X.	Lower hitch point height	200 (max) / 200 (max)	200	Conforms

1.13.3 Linkage geometry dimensions [Refer Fig.-1 (a)]:

The following are dimensions observed, corresponding **695 mm** as tyre dynamic radius index:

S. No.	Parameter	Notation	Dimension or range, (mm)	Setting used during test,(mm)
1.	Length of lower link	A	903	903
2.	Length of lift arm	B	225	225
3.	Length of lift rods	C	540 to 670	635
4.	Length of top link	D	710 to 975	810
5.	Distance of lift rod connection point from pivot point of lower link.	E	495	495
6.	Distance of lower link pivot point from rear wheel axis:			
	-Horizontally	F	05, behind	05, behind
	-Vertically	G	160, below	160, below
7.	Distance of upper link pivot point from rear wheel axis:			
	-Horizontally	H	95 behind	95 behind
	-Vertically	J	265, 290 and 315 above	290 above
8.	Distance of lift arm pivot point from rear wheel axis:			
	-Horizontally	K	70 forward	70 forward
	-Vertically	L	340, above	340, above
9.	Height of lower hitch points relative to the rear wheel axis:			
	- In high position	M	145 to 390	213 above
	- In low position	N	-588 to -140	495 below
10.	Height of lower link hitch points when locked in transport position		213 mm above	

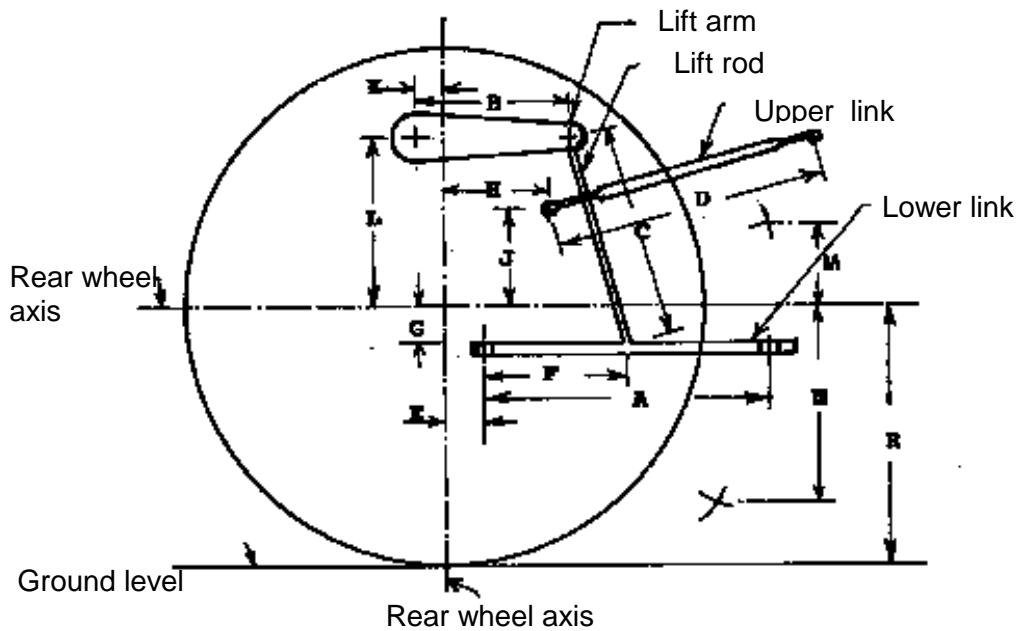


Fig.1 (a) DIMENSIONAL NOTATIONS FOR TABLE OF LINKAGE GEOMETRY

1.13.4 Drawbar:

1.13.4.1 Linkage Drawbar [Refer Fig.1(b)]:

Notation	As per IS: 12953-1990, (Cat.I)/(Cat.II), (mm)	As measured,(mm)	Remarks
A	683 ± 1.5/825 ± 1.5	823	Does not conform
B	75 (min)/75 (min)	77.15	Conforms
C	30 (min) / 30 (min)	31.30	Conforms
D \varnothing	21.79 to 22.0/27.79 to 28.0	27.90	Conform to cat -II
E	39.0 (min)/49.0 (min)	64.42	Conforms
F \varnothing	12.0 (min)/12.0 (min)	12.1	Conforms
G	15.0 (min)/15.0 (min)	14.3	Does not conform
H \varnothing	25 ± 1/25 ± 1	25	Conforms
J	80 ± 1.5/80 ± 1.5	80.3	Conforms
No. of holes	7/9	9	Conform to cat -II

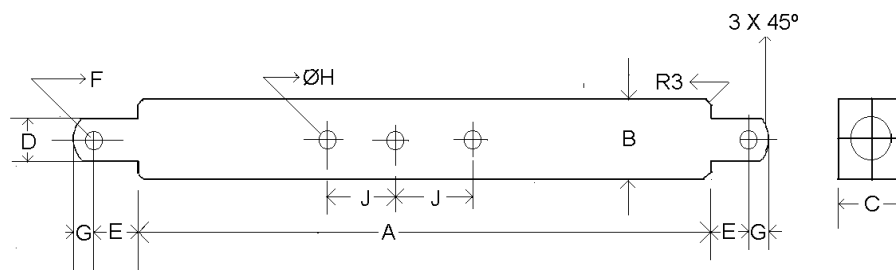


Fig.1 (b) DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR

1.13.5 Swinging drawbar : Not provided

1.14 Power take-off shaft:

Type : Type-I, independent
 Method of engaging : By a hand lever provided on LHS of operator's seat.
 No. of shaft,(s) : One
 PTO speed corresponding to rated engine speed, (rpm) : 631
 Distance behind rear axle, (mm) : 228
 Engine to PTO speed ratio : 3.643 : 1, (apa)
 Whether the PTO shaft is capable of transmitting full power of the engine. : Yes

1.14.1 Specifications of Power Take-Off Shaft (Refer Fig.2)

Specification	As per IS: 4931-1995 (Type-I)	As observed	Remarks
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO shaft corresponds to 1967 rpm of engine.	Conforms
No. of splines	6	6	Conforms
Direction of rotation	Clockwise	Clockwise	Conforms
Location	The position of the centre of the end of PTO shaft shall be within 50mm to right or left of the centre line of the tractor.	Centrally located	Conforms
Dimensions, (mm) (See Fig. 2):			
D∅	34.79 ± 0.06	34.84	Conforms
d∅	28.91 ± 0.05	27.94	Does not conform
B∅	29.4 ± 0.1	29.44	Conforms
A∅ (optional)	8.3 ± 0.1	8.33	Conforms
W	8.69 - 0.09/ - 0.16	8.60	Conforms
a	7	7	Conforms
b (optional)	25 ± 0.5	25.4	Conforms
c	38	38	Conforms
X	30°	30°	Conforms
B	76 (min)	84	Conforms
H	450 to 675	695	Does not conform

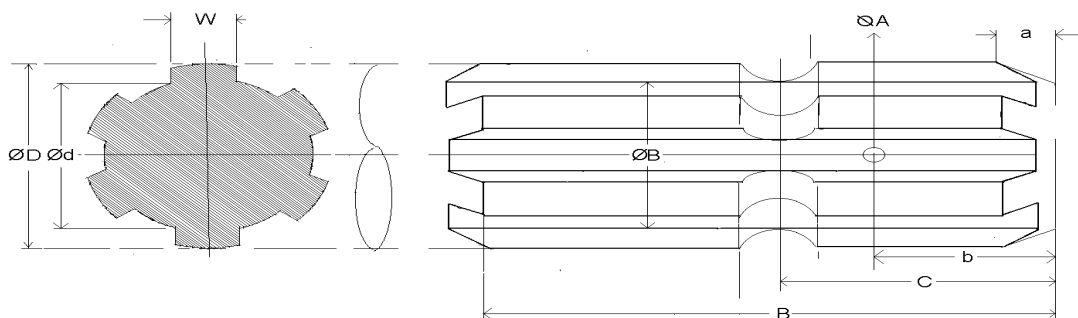


Fig. 2: DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

1.14.2 Power Take-off Master Shield : Not provided

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1.15	Towing hitch:	
1.15.1	Front:	
	Type	Clevis
	Location	At front on engine support bracket
	Height above ground level, (mm)	: 635
	-No. of positions	: One
	-Type of adjustment	: Fixed
	Width of clevis	: 110
	Dia. Of pin hole	: 30.1
1.15.2	Rear:	
	Type	: Clevis
	Location	: At the rear of transmission housing.
	Height above ground level, (mm):	
	-Minimum	: 490
	-Maximum	: 790
	- No. of positions	: Six
	- Type of adjustment	: Position by changing and reversing the towing hitch on its mounting bracket.
	Distance of hitch point, (mm):	
	-From rear axle centre	: 350
	-From power take-off shaft end	: 123
	Diameter of pin hole, (mm)	: 36.4
	Width of clevis, (mm)	: 91
1.16	Steering:	
	Make	: Ognibene
	Type	: Hydrostatic, open center
	Location of control valve assembly	: Above clutch housing
	Method of operation	: Manual, through steering control wheel.
	Dia. of steering control wheel, (mm)	: 380
	Steering oil capacity, (l)	: 1.50
	Oil change period	: Every 1200 hours of operation.
1.17	Brakes:	
1.17.1	Service Brake:	
	Make	: New Holland
	Type	: Mechanical, oil immersed brake disc brake
	Location	: Inside the trumpet housing at rear axle shaft
	No. of disc(s)	: 04 (on each wheel side)
	Area of liners, (cm ²)	: 944.3(on each wheel side)
	Material of liners	: N-266 friction material
	Method of operation	: Independent/combined operation by right foot
1.17.2	Parking Brake:	
	Type	: Pawl & ratchet arrangement for locking the service brake in engage position
	Location &	: On half axle shaft inside differential housing.
	Method of operation	: By locking service brake in position through a hand lever provided on RHS of operator's seat
1.18	Wheel Equipment:	
1.18.1	Steered Wheel(s):	
	Make	: Good year
	Number(s)	: Two

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	Type of tyre	:	Pneumatic, ribbed
	Size	:	7.50-16
	Ply rating	:	8
	Maximum permissible loading capacity of each tyre at 220 kPa pressure, (kg)	:	660
	Recommended inflation pressure, (kPa) :		
	- For field work	:	220
	- For transport	:	220
	- Track width, (mm)	:	1410 (Std.); 1450; 1510; 1550; 1610; 1650; 1710; 1750; 1810; 1850; 1910 and 1950
	Method of changing track width	:	By exchanging telescopic and reversing wheel disc.
	Make & size of wheel rims	:	WIL, 5.5 x 16
1.18.2	Drive wheel(s):		
	Make	:	Good year
	Number	:	Two
	Type of tyre	:	Pneumatic, Traction
	Size	:	16.9-30
	Ply rating	:	12
	Maximum permissible loading capacity of each tyre at 140 kPa pressure, (kN)	:	2500
	Recommended inflation pressure, (kPa):		
	- For field work	:	110
	- For transport	:	140
	Track width, (mm)	:	1440, 1510 (Std.); 1630, 1720, 1830, 1930 and 2030
	Method of changing track width	:	By reversing the wheel disc and changing the position of wheel disc on offset rim lugs.
	Make & size of wheel rims	:	Wheel India Ltd., 15 x 30
1.18.3	Wheel base, (mm)	:	2200
	Method of changing wheel base, if any, and range	:	None
1.19	Operator's seat:		
	Make	:	Harita Grammer
	Type	:	Cushioned with back rest
	Type of Suspension	:	Helical coil springs
	Type of Damping	:	Hydraulic shock absorber
	Range of adjustment, (mm):		
	Vertical	:	Nil
	Lateral	:	Nil
	Longitudinal	:	± 75
1.20	Provision for safety and comfort of operator:		
1.20.1	Operator's seat:		
	Meets the minimum requirements of IS: 12343-1998, (Re-affirmed in 2014) except the following:		
	- Length of seat		
	- Width of the seat.		
	- Distance from seat index point to center line of differential lock pedal.		
1.20.2	Conformity with IS: 6283 (Part 1)-2006 (Re-affirmed in 2014)		
	All the controls are identifiable with symbols as per IS: 6283(Part 1) -2006.		

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- 1.20.3 Conformity with IS: 6283 (Part 2)-2007 (Re-affirmed in 2014)**
All the displays are identifiable with colour codes as per IS: 6283(Part 2) -2007.
- 1.20.4 Conformity with IS : 8133-1983 (Re-affirmed in 2014):**
Location and movement of various controls meets the requirement of IS: 8133-1983.
- 1.20.5 Conformity with IS:12239 (Part-1)-1996 (Re-affirmed in 2014):**
Meets the requirements of IS: 12239 (Part-1) – 1996, **except the following:**
- The spark arrester has not been provided in exhaust system.
- 1.20.6 Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in 2014):**
Meets the requirements of IS:12239 (Part-2)-1999, **except the following:**
- The working clearance between position control lever and draft control lever.
- 1.20.7 Conformity with IS: 14683 – 1999 (Re-affirmed in 2014) :**
Lighting meets the requirements of IS: 14683 – 1999.
- 1.20.8 Rear view mirror:**
Rear view mirror is provided.
- 1.21 Labelling of tractor [as per IS:10273-1987 (Re-affirmed in March, 2009)]:**
The labelling plate riveted on inside of LHS fender, provides the following information:

Name of Manufacturer	CNH INDUSTRIAL INDIA PVT. LTD. Plot no. 3, Udyog Kendra, Greater Noida- 201306
Make	NEW HOLLAND
Model	7500 TS 12+3 UG
Year of manufacture	Not available
Chassis serial number	NHN75000ZHE388694
Engine serial number	205086DT
Maximum PTO Power, kW (hp)	50 (68)
Specific fuel consumption, (g/hph)	(198)

1.22 Ballast Mass, (kg):

Particulars		As used during drawbar test	As used during field test	As used during Haulage test
Front	C.I. weight	240	240	240
	Water	60	60	Nil
Rear	C.I. weight	440	220	220
	Water	480	480	480
	Additional weight, if any	Nil	Nil	Nil

1.22.1 Standard Ballast, if any, (kg)

Particulars	Front	Rear
C.I. weights, (kg)	50	330
Location	Dead weight mounted at the centre of front axle support	Bolted on the disc of each wheel rim

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1.23 Masses:

Particulars		Mass of the tractor without operator and all the liquid reservoirs full, (kg)		
		Front	Rear	Total
i)	With standard ballast	930	1840	2770

1.24 Overall dimensions:

Condition	Length, (mm)	Width, (mm)	Height, (mm)		Ground Clearance, (mm)
			With exhaust Pipe	Without exhaust pipe	
Without ballast	3565	1968	2260	1660	485 (At oil sump drain plug)

1.25 Number of external lubricating points:

- Oiling : Nil
- Grease cups : 02
- Grease nipples : 15

1.26 Colour of tractor:

- Chassis & engine : Black
- Sheet metal:**
- Bonnet & Mudguard : Blue
- Rims & disc : White

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 oil	SAE 20W40	SAE 20W40
2.	Transmission, rear differential, rear axle, rear final drive and hydraulic system	SAE 80	Oil originally filled in the tractor was not changed.
3.	Steering system	SAE 140	
4.	Grease	NL GI No 2 Li Base	Servo Grease MP

3. PTO PERFORMANCE TEST

- Date(s) of test : 16.10.2018
- Tractor run at the Institute prior to start of PTO test (h) : 14.08
- Type of dynamometer bench : ESF 1000 S

- 3.1** The results of power take-off performance are tabulated in **Table-1**

Table – 1

Power (kW)	Speed, (rpm)		Fuel consumption			Specific energy, (kWh/l)
	P.T.O.	Engine	(l/h)	(kg/h)	Specific, (kg/ kWh)	
Maximum power – 2 hours test:						
47.3	631	2298	17.07	14.27	0.302	2.77

Remarks:

1. During the course of test, maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as **46.2 kW** which was **2.7%** less than the minimum requirement of **47.5 kW** and did not meet the evaluative requirement of IS: 12207-2014.
2. Again, the maximum PTO power search was repeated, and maximum power was recorded as **46.4 kW** which was **2.3%** less than the minimum requirement of **47.5 kW** and did not meet the evaluative requirement of IS: 12207-2014.
To rectify the problem persist in the engine the following checking /adjustment were carried out:
 - i) Leakage was checked in air intake, exhaust pipelines, intercooler pipes and turbo system.
 - ii) Injector pressure was checked, which was observed as 260 kg/cm² in all injectors.
 - iii) Tappet clearance was checked and observed within the limit of 0.30 mm in all inlet & exhaust valve.
 - iv) Turbocharger & exhaust gas manifold and turbine gaskets (Pt. No. 4851921; 98489690 and 4834948) were replaced with new one having same specification.
3. After this maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as 46.3 kW and thereafter maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as 46.1 against the minimum requirement of 47.5 kW which is 3.0% less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.
To rectify the problem persist in the engine the following checking /adjustment were carried out:
 - i) Injector pressure was adjusted to 270 Kg/cm² against the declaration of 265.1 to 273.3 Kg/cm².
 - ii) Fuel injection timing was checked and observed as 0.5mm of plunger lift before TDC and adjusted to 0.6 mm against the declared value of 0.5±0.1mm plunger lift.
 - iii) Compression pressure was checked in all cylinders and found within the specified limit.
4. Thereafter, trial was taken for maximum PTO power search, during trial there found leakage from the high pressure pipe line of Injector No.1, 2 and 3. The high pressure pipeline (Pt. No. 581426425) was replaced with new one of same specifications.
The maximum PTO power search was again carried out at natural ambient condition and maximum power was recorded as **47.3 kW** and thereafter maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as **46.8 kW** against the minimum requirement of **47.5 kW** which is **1.5%** less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.
Upon the request of applicant, the following checking were carried out-
 - i) Fuel feed pump filter was removed, cleaned and refitted.
 - ii) To check the clutch slippage, no load and on load crankshaft pulley rpm and PTO rpm were checked and found no clutch slippage.
5. During the course of test, maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as **47.6 kW**, hence maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as **47.3 kW** against the minimum requirement of **47.5 kW** which is **0.4%** less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014. After above checking /adjustment, no considerable improvement in power was recorded. Thereafter, the applicant has requested to withdraw the said test sample from the test, vide letter no. PD-L118076, dated 14.11.2018.
The applicant's request was accepted by the competent authority and hence this incomplete test report is released.

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4. NOISE MEASUREMENT

- 4.1 Noise at bystander's position:**
Date of test : 31.07.2018
Type of track : Concrete
Background noise level, dB (A) : 56
- Atmospheric conditions:**
Temperature, (°C) : 29
Pressure, (kPa) : 96.7
Relative humidity, (%) : 76
Wind velocity, (m/s) : 2.5

TEST DATA:

S. No.	G e a r	Travelling speed before acceleration, (kmph)	Noise level, dB (A)
1.	L-1	1.72	85
2.	L-2	2.52	85
3.	L-3	3.72	84
4.	L-4	4.75	84
5.	M-1	5.41	84
6.	M-2	7.92	84
7.	M-3	11.54	83
8.	M-4	15.00	83
9.	H-1	9.15	83
10.	H-2	13.57	83
11.	H-3	19.73	82
12.	H-4	25.29	83

5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments / Defects / Breakdowns and Repairs	Tractor run hours
1.	<p>During the course of test, maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as 46.2 kW which was 2.7% less than the minimum requirement of 47.5 kW and did not meet the evaluative requirement of IS: 12207-2014.</p> <p>Again the maximum PTO power search was repeated, and maximum power was recorded as 46.4 kW which was 2.3% less than the minimum requirement of 47.5 kW and did not meet the evaluative requirement of IS: 12207-2014.</p> <p>To rectify the problem persist in the engine the following checking /adjustment were carried out:</p> <p>i) Leakage was checked in air intake, exhaust pipelines, intercooler pipes and turbo system.</p> <p>ii) Injector pressure was checked, which was observed as 260 kg/cm² in all injectors.</p> <p>iii) Tappet clearance was checked and observed 0.30 mm in all inlet & exhaust valve.</p> <p>iv) Turbocharger & exhaust gas manifold and turbine gaskets (Pt. No. 4851921; 98489690 and 4834948) were replaced with new one having same size & specification.</p>	5.50

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2.	<p>After this maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as 46.3 kW and thereafter maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as 46.1 against the minimum requirement of 47.5 kW which is 3.0% less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.</p> <p>To rectify the problem persist in the engine the following checking /adjustment were carried out:</p>	8.91
	i) Injector pressure was adjusted to 270 Kg/cm ² against the declaration of 265.1 to 273.3 Kg/cm ² .	
	ii) Fuel injection timing was checked and observed as 0.5mm of plunger lift before TDC and adjusted to 0.6 mm against the declared value of 0.5±0.1mm plunger lift).	
	iii) Compression pressure was checked in all cylinders and found within the specified limit.	
3.	<p>Thereafter trial was taken for maximum PTO power search, during trial there found leakage from the high pressure pipe line of Injector No.1, 2 and 3. The high pressure pipeline (Pt. No. 581426425) was replaced with new one of same specifications and this breakdown/defect comes under the category of Mn-10 as IS: 12207-2014.</p> <p>The maximum PTO power search was again carried out at natural ambient condition and maximum power was recorded as 47.3 kW and thereafter maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as 46.8 against the minimum requirement of 47.5 kW which is 1.5% less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.</p> <p>Upon the request of applicant, the following checking were carried out-</p>	14.08
	i) Fuel feed pump filter was removed, cleaned and refitted.	
	ii) To check the clutch slippage, no load and on load crankshaft pulley rpm and PTO rpm were checked and found no clutch slippage.	

6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of **IS: 12207-2014** 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: 12207-2014	Values declared by the applicant/ requirement	As observed	Whether meets the require- ments (Yes/No.)
1	2	3	4	5	6	6
6.1.1	PTO Performance :					
a)	- Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or-5 / +10% for Engine power >26 kW. -7.5/+10% for Engine power ≤ 26 kW	50.0	47.3	No

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1	2	3	4	5	6	6
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	50.0	47.3	No
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265	302	No
6.1.2	Noise measurement:					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	85	Yes
6.1.3	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 Part 2)	--	Provided	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	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	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	--	Does not meet the requirements	No
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	--	Does not meet the requirements	No
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS 12953 and IS 12362 (Part 3) (As amended from time to time)	--	Does not meet the requirements	No
	Swinging drawbar				Not Provided	--
6.1.4	Labelling of tractors (Provision of labelling plate):					
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	NEW HOLLAND		Yes
	2) Model	Evaluative		7500 TS 12+3 UG		Yes
	3) Year of mfg.	Evaluative		Not available		No
	4) Chassis number	Evaluative		NHN75000ZHE388694		Yes
	5) Engine number	Evaluative		205086DT		Yes
	6) Declaration of PTO power,(kW)	Evaluative		50 (68)		Yes
6.1.5	Literature					
(a)	Operator manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided		Provided	Yes
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided		Provided	Yes

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6.1.6 CATEGORY OF BREAKDOWNS / DEFECTS :					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	One (Mn-10)	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns	One (Mn-10)	Yes

6.2 Conformity with following Indian Standard:

- i) Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS: 10273-1987 (Reaffirmed in 2014)] : **Does not conform**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision) [IS: 4931-1995 (Reaffirmed in 2014)] : **Does not conform**
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I):1997 /ISO 730-1:1994] (Reaffirmed in 2017) : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 ((Reaffirmed in 2017)]. : **Does not conform**
- v) Agricultural tractors – Operator’s seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed in 2014)]. : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision): [IS 12239 (PT-1)-1996 (Re-affirmed in 2017)/ISO 4254-1:1989]. : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) IS 12239 (PT-2)-1999 (Reaffirmed in March, 2009)]. : **Does not conform**
- viii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –2006 & 2007(Re-affirmed in 2014.)/ ISO 3767-2:1991)]. : **Does not conform**
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Re-affirmed in 2014)]. : **Conforms**

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- x) Agricultural Tractor & Machinery Lighting : Conforms device for travel on public roads (IS: 14683-1999) (Reaffirmed in 2014)]

6.3 Salient Observations:

6.3.1 Laboratory tests:

6.3.1.1 PTO Performance:

- i) The maximum power was measured as **47.3 kW** against the declaration of **50.0 kW**, which does not meet the evaluative requirement of IS: 12207-2014. This should be looked into.
- ii) The specific fuel consumption corresponding to maximum power was measured as **302 g/kWh** against the declaration of **265 g/kWh**, which does not meet the requirement of IS: 12207-2014 with regard to tolerance. This should be looked into.
- iii) During the course of test, maximum PTO power search was carried out at natural ambient condition and maximum power was recorded as 47.6 kW, hence maximum power 2 hours test was carried out and the average maximum power for 2 hours was recorded as 47.3 against the minimum requirement of 47.5 kW which is 0.4% less than the minimum requirement and does not meet the evaluative requirement of IS: 12207-2014.

After several checking /adjustments, no considerable improvement in power was recorded. Therefore, the applicant has requested to withdraw the said test sample from the test, vide letter no. PD-L118076, dated 14.11.2018. The applicant's request was accepted by the competent authority and **hence this incomplete test report is released should not be used for institutional finance/ subsidy purpose.**

6.3.2 Three point linkage:

The distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) and lower hitch point tyre clearance does not meet the requirement of IS: 4468 (Part-1)-1997. This should be looked into for necessary corrective action.

6.4 Operator's Seat: Meet the requirements of IS: 12343-1998, **except following:-**

The length of seat and width of seat does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.

6.5 Technical Requirements for Power Take Off Shaft:

Dimension "d ϕ " "h" [Refer Fig.2] of PTO shaft does not meet the requirement of IS: 4931-1995(Reaffirmed in 2014). This should be looked into for necessary corrective action.

6.6 Maintenance / Service Problems:

No noticeable service or maintenance problem observed during the tests.

6.7 Recommendation with regard to safety on tractor:

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

- i) Working clearance around the hydraulic operating levers should be provided as per the requirement.
- ii) The length of seat and width of seat should be provided as per the requirement of IS: 12343-1998 (Re-affirmed in 2014) for safety and comfort of the operator.
- iii) Spark arrester should be provided in the exhaust system.
- iv) The PTO master shield should be provided.

6.8 Adequacy of Literature supplied with machine:

6.8.1 The following literature was supplied with the tractor for reference during the test:

- i) Operator's manual
- ii) Service manual
- iii) Spare part's catalogue

6.8.2 The printed literature supplied with the test sample is in English was found adequate. The literature may be brought out as per IS: 8132-1999 (Reaffirmed in 2014) for the guidance of user and service personnel in national as well as other regional languages.

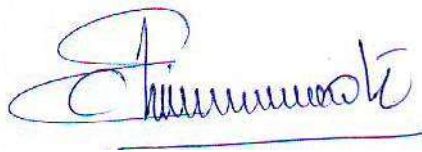
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7. CITIZEN CHARTER

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	03 Months (July to October, 2018)	Yes	--

TESTING AUTHORITY:


C. K. TIJARE
AGRICULTURAL
ENGINEER



C.V. CHIMOTE
TEST ENGINEER



Y.K. RAO
SENIOR AGRICULTURAL
ENGINEER



J.J.R. NARWARE
DIRECTOR

Test report compiled by **Shri Shivkumar Sharma**, Senior Technical Assistant

8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.3.1.1, 6.3.2, 6.4, 6.5, 6.7 & 6.8.2	Your valuable comments & suggestions for improvements are well taken. Under our policy of continuous product improvement these aspects are further being looked into & will take appropriate actions to eliminate these deviations soon wherever necessary.

ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	-

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2.	PTO performance test	3.10
3.	Noise measurement	1.03
4.	Nominal speed test	2.45
B.	Miscellaneous test and other run hours including idle run, transportation, trials, test cancellation hours and preparation for test	10.60
TOTAL:		17.18