

व्यावसायिक परीक्षण रिपोर्ट

संख्या/No. : T- 1245/1772/2019

COMMERCIAL TEST REPORT (Variant)

माह/Month : June, 2019

(यह परीक्षण रिपोर्ट 30/06/2022 तक वैध है। / THIS TEST REPORT IS VALID UPTO: 30/06/2022)



**NEW HOLLAND, 3600 – 2
ALL ROUNDER PLUS + TRACTOR**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय

कृषि, सहकारिता एवं किसान कल्याण विभाग

मशीनीकरण एवं प्रोद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE

Mechanization & Technology Division

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) - ४६६ ४४५

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO 9001: 2015 Certified Institute)

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T- 1245/1772/2019	NEW HOLLAND, 3600 – 2 ALL ROUNDER PLUS + TRACTOR - Commercial (Variant)
	THIS TEST REPORT IS VALID UPTO: 30/06/2019

Manufacturer : M/s. CNH Industrial (India) Pvt. Ltd,
Plot No.-3, Udyog Kendra,
Greater Noida – 201 306,
Distt. Gautam Budh Nagar
(Uttar Pradesh)

Month: June	Test Report No. T- 1245/1772/2019	Year : 2019
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Type of Test : **COMMERCIAL (Variant)**

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

Period of Test : February, 2019 to May, 2019

Test Report No. : **T- 1245/1772/2019**

Month/Year : **June, 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 submitted by the applicant for 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 is a Variant test report and therefore, should be read in conjunction with the Test Report of base model (2nd Batch) i.e. “New Holland, 3630 TX” tractor bearing **No. T- 1167/1694/2018** was released in **June, 2018**.
-

SELECTED CONVERSIONS		
Sl. No	Units	Conversion Factor
1	Force:	
	1 kgf	9.80665 N 2.20462 lbf
2	Power:	
	1 hp	1.01387 metric hp (Ps) 745.7 W
	1 Ps	735.5 W
	1 kW	1.35962 Ps
3	Pressure:	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

ABBREVIATIONS	
apa	As per applicant
TDC	Top Dead Centre
IS	Indian Standard
LHS/RH S	Left Hand Side/ Right Hand Side
Hg.	Mercury
Temp.	Temperature
N.R.	Not recorded
rpm	Revolutions per minute
O.D/I.D	Outer diameter/ Inner diameter
N.A.	Not available/ Not applicable
PTO	Power take-off
R.H.	Relative Humidity

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(Uttar Pradesh)

Test requested by (applicant) : The manufacturer
Selected for test by : The manufacturer
Place of running-in : At manufacturer's works

Duration of said running-in (h):

- Engine : 50
- Transmission : 50

Method of Selection : The tractor was submitted directly by the applicant for test. Hence method of selection is not known.

1. SCOPE OF TEST

The “New Holland, 3630 TX” tractor had undergone “Commercial Batch Test” at this Institute and a test report **No. T-1167/1694/2018** was released in **June, 2018**. Now the applicant has submitted an application vide letter No.PD-L116811 dated: 05.05.2017, for testing of “New Holland, 3600 – 2 All Rounder Plus +” tractor as a Variant of “New Holland, 3630 TX” tractor.

The applicant having enclosed a list of following differences in the technical specifications between the tractor base model (2nd Batch) “New Holland, 3630 TX” and variant model “New Holland, 3600 – 2 All Rounder Plus +” and requested to test the “New Holland, 3600 – 2 All Rounder Plus +” as a variant of “New Holland, 3630 TX” tractor :-

The major features of Base model and Variant model are listed below:

S. No.	Parameters	Base Model	Variant Model
1	2	3	4
1.	Make & Model of Tractor	New Holland 3630 TX	3600 – 2 All Rounder Plus +
2.	Engine:		
	Model	8035.05D.937	8035.05D.938
	Engine speed (Manufacturer's recommended production setting), (rpm) :		
	- Maximum speed at no load	2750 ± 50	2400 ± 50
	- Low idle speed	650 ± 50	700 ± 50
	- Speed at maximum torque	1400 ± 200	1300 ± 200
	Rated speed, (rpm):		
	- For PTO use	2500	2100
	- For drawbar use	2500	2100
3.	Fuel injection pump:		
	Model/Group combination No.	0460423080	F002A3ZF26, PES3A90D410LS3500
	Type	Rotary	Inline plunger
4.	Fuel injector:		
	Fuel injection timing	1.5 ± 0.2 mm plunger lift at TDC	7 ± 2 degree before TDC
	Firing order of power stroke	1 - 2 - 3	1 – 3 – 2

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1	2	3	4
5.	Governor :		
	Model/Group combination No.	Inbuilt with FIP	RSV350...1050A5C1848L
	Rated engine speed, (rpm)	2500	2100
	Governed range of engine speed, (rpm)	600 to 2800	650 to 2450
6.	Air intake system:		
	Range of suction pressure at maximum power, (kPa)	4.1 to 4.2	4.3 to 4.4
7.	Exhaust system:		
	Position of silencer outlet with respect to SIP, (mm):		
	- Vertical	1000	1075
	- Longitudinal	1350	1290
	- Lateral	245 (on LHS)	185 (on LHS)
	Range of exhaust gas pressure at maximum power, (kPa)	3.7 to 4.0	3.3 to 3.5
8.	Lubricating system:		
	Oil sump capacity, (l)	7.00	6.30
	Total lub oil capacity, (l)	8.00	6.50
	Pressure release setting, (kPa)	294.20	450.13
	Minimum permissible pressure, (kPa)	39.00	68.65
9.	Details of radiator fan	Suction type, having Four metallic blades of 390 mm outer diameter and mounted on water pump shaft.	Suction type, having Six metallic blades of 397 mm outer diameter and mounted on water pump shaft.
10.	Location of gear shifting levers:	Centre shift	Side shift
	-Main gear shifting lever	In-front of operator's seat	On RHS of operator's seat
	-Range selection lever	In-front of operator's seat	On LHS of operator's seat
11.	Range of speeds (kmph):		
	- Forward	3.08 to 30.85	2.87 to 33.72 (Variation of -7.07 to + 9.45 %)
	- Reverse	4.33 to 15.59	4.04 to 14.51 (Variation of -6.93 to -6.70 %)
12.	Reduction through rear final drive	5.636 : 1 (62/11T)	5.090 : 1 (56/11T)
13.	Power lift (Hydraulic system):		
	-Speed of pump corresponding to rated engine speed, (rpm)	2328	2268
	-Discharge of pump at rated engine speed & minimum pressure	35.8	34 ± 5
	-Max. hydraulic power, (kW)	9.1	9.5 ± 3
	-Pump delivery rate at max. hydraulic power, (l)	36.3	28 ± 5
	-Pressure corresponding to max. power, (Mpa)	15.0	18.63 ± 0.98

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1	2	3	4
14.	PTO shaft (s):		
	PTO speed corresponding to rated engine speed, (rpm)	685	631
	Engine to PTO speed ratio	3.643 : 1	3.330 : 1
	Power take-off proportional to ground speed:		
	Travelling distance for one revolution of take-off shaft, (m)	Not provided	0.314
	Number of power take-off shaft revolutions for one revolution of (rear) driving wheels	--do--	12.82
	Direction of rotation with forward gear engaged (viewed from behind tractor)	--do--	Clockwise
15.	Steering system type:	Mechanical, Recirculating ball	Hydrostatic, power steering
16.	Material of brake liners	Prendo Abex HDT 303	Non – asbestos
17.	Wheel Equipment:		
	Steered Wheel(s):		
	-Size	6.00 -16	6.50 -16
	-Maximum permissible loading capacity of each tyre for road condition (kgf)	540 (at inflation pressure of 340 kPa)	615 (at inflation pressure of 450 kPa)
	-Track width, (mm)	1380 (Std.) & 1500	1360 (Std.) & 1480
	-Drive wheel (s):		
	-Track width, (mm)	1366,1430 (Std) , 1540, 1630,1750, 1810 & 1960	1350, 1420 (Std.) , 1540, 1630, 1740, 1830 & 1940
18.	Overall Dimensions, (mm) (Length/width/height)	3480/1815/2350	3465/1825/2390
19.	Mass of tractor, (kg): (Front/Rear/Total)	795/1230/2025	815/1285/2100

Subsequent to the examination of the case in light of clause 8.4 and sr. no. (i) & (v) of table 3 of Indian Standard IS: 12207-2014, the following tests were considered to be carried out:

- Specification checking
- Nominal speed test
- PTO performance test
- Turing ability test

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 in case of variant model
1.	Engine & air cleaner oil	SAE 20W40	As recommended
2.	Gear box, differential, rear axle, final drive, brake and hydraulic system oil	SAE EP-80	Oil originally filled in the system of tractor was not changed
3.	Steering housing oil	SAE EP-180	--do--
4.	Grease	NLG1-2	MP Grease

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3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
3.1.1 Tractor:		
Make	:	New Holland
Model	:	New Holland 3630 TX 3600–2 All Rounder Plus +
Brand name	:	New Holland
Type	:	Four wheeled, Rear-wheel driven, General Purpose, Agricultural Tractor.
Year of manufacture	:	2016 G-J (i.e. July, 2018)
Chassis serial number	:	NHN3630SZHE389654 NHN36000ZJG433516
Country of Origin	:	India
3.1.2 Engine:		
Make	:	IVECO
Model	:	8035.05D.937 8035.05D.938
Type	:	Four stroke, liquid cooled, naturally aspirated, direct injection, diesel engine.
Serial number	:	205648DX 237552DX
Year of manufacture	:	2016 2017
Engine speed (Manufacturer's recommended production setting), (rpm) :		
- Maximum speed at no load	:	2750 ± 50 2400 ± 50
- Low idle speed	:	650 ± 50 700 ± 50
- Speed at maximum torque	:	1400 ± 200 1300 ± 200
Rated speed, (rpm):		
- For PTO use	:	2500 2100
- For drawbar use	:	2500 2100
3.1.3 Cylinder & Cylinder Head:		
Number	:	Three
Disposition	:	Vertical, Inline
Bore/stroke, (mm)	:	104 / 115 (apa)
Capacity as specified by the applicant, (cc)	:	2931 (apa)
Compression ratio, (apa)	:	18 (± 0.5) : 1
Type of cylinder head	:	Monoblock
Type of cylinder liners	:	Dry, replaceable
Type of combustion chamber	:	Omega shape on piston head (apa)
Arrangement of valves	:	Overhead, Inline
Valve clearance (cold/hot):		
- Inlet valve, (mm)	:	0.3 / 0.3
- Exhaust valve, (mm)	:	0.3 / 0.3
3.1.4 Fuel System:		
Type of fuel feed system	:	Gravity and force feed
3.1.4.1 Fuel tank:		
Capacity, (l)	:	60.00 57.5
Location	:	Above clutch housing
Provision for draining of sediments / water	:	Not Provided
Material of fuel tank	:	HDPE
3.1.4.2 Water separator:		
Make	:	Hilux
Model	:	48103888 Not available
Type	:	Gravity with float separation Transparent, Inverted funnel, gravity separation
Location	:	Between fuel tank and fuel feed pump

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3.1.4.3 Fuel feed pump:	<u>Base Model</u>	<u>Variant Model</u>
Make	: Iveco	Bosch, India
Type	: Diaphragm	Plunger with hand primer
Model/Group combination No.	: Not available	FP/KSG22AD10
Provision of sediment bowl	: Not Provided	Provided
Method of drive	: Through timing gear	Through FIP camshaft
Location	: RHS of engine block	On fuel injection pump
3.1.4.4 Fuel filters:		
Make	: New Holland	New Holland (apa)
Model/Group combination No.	: 479 5600 LC 77 - 3150	Not available
Number	:	Two
Type of elements :		
- Primary	:	Paper
- Secondary	:	Paper
Capacity of final stage filter, (l)	: 0.50	0.45
3.1.4.5 Fuel Injection pump:		
Make	:	Bosch, India
Model/Group combination No.	: 0460423080	F002A3ZF26, PES3A90D410LS3500
Type	: Rotary	Inline plunger
Serial number	: 71926204, VE3/12F1250L1187	85410255
Method of drive	:	Through timing gears
3.1.4.6 Fuel injectors:		
Make	:	Bosch, India
Model/Group combination No.:	:	
Holder no.	:	0432193414
Nozzle no	:	DSL133P5619
Type	:	Multi hole (Six holes)
Manufacturer's production pressure setting, (MPa)	:	26 to 27.2
Injection timing	: 1.5 ± 0.2 mm plunger lift at TDC	7 ± 2 degree before TDC
Firing order	: 1 - 2 - 3	1 – 3 – 2
3.1.4.7 Governor :		
Make	:	Bosch, India
Model/Group combination No.	: Inbuilt with FIP	RSV350...1050A5C1848L
Type	:	Mechanical, centrifugal variable speed
Rated engine speed, (rpm)	: 2500	2100
Governed range of engine speed, (rpm)	: 600 to 2800	650 to 2450
3.1.5 Air Intake system:		
3.1.5.1 Pre-cleaner:		
Make	:	New Holland (apa)
Type	:	Centrifugal with transparent dust collector
Location	:	Above main air cleaner inlet tube, outside the bonnet.
3.1.5.2 Air cleaner:		
Make	: Sietz	Not available
Type	:	Oil Bath
Location	:	In front of radiator, under the bonnet
Range of suction pressure at maximum power, (kPa)	: 4.1 to 4.2	4.3 to 4.4
Maintenance schedule	:	After every 50 hours of operation

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3.1.6	Exhaust System:	<u>Base Model</u>	<u>Variant Model</u>
	Type of silencer :	Updraft (cylindrical)	
	Position of silencer outlet with respect to SIP, (mm):		
	- Vertical :	1000	1075
	- Longitudinal :	1350	1290
	- Lateral :	245 (on LHS)	185 (on LHS)
	Range of exhaust gas pressure at maximum power, (kPa) :	3.7 to 4.0	3.3 to 3.5
	Provision of spark arresting device :	Not provided	
	Provision against entry of rain water :	A bend is provided at the top of silencer	
3.1.7	Lubricating system:		
	Type :	Forced feed-cum-splash	
	Oil sump capacity, (l) :	7.00	6.30
	Total lub oil capacity, (l) :	8.00	6.50
	Oil change period :	First change after 50 hours and subsequently after every 300 hours of operation	
	Cooling device, (if any) :	Not provided	
	Filters:		
	Type :	Spin-on throw away, paper element	
	Number :	One	
	Pump:		
	Type :	Rotary (Internal gear)	
	Method of drive :	Through cam shaft gear.	
	Pressure release setting, (kPa) :	294.20 (apa)	450.13 (apa)
	Minimum permissible pressure, (kPa) :	39.00 (apa)	68.65 (apa)
3.1.8	Cooling system:		
	Type :	Forced circulation of coolant & water	
	Name of coolant :	Zero R anticorrosive additive	
	Coolant water ratio :	1:25 (apa)	
	Details of pump :	Centrifugal, semi open impeller of 95.8 mm of outer diameter having seven vanes, and driven through crankshaft pulley by a cogged 'V'-belt common to alternator.	
	Details of fan :	Suction type, having Four metallic blades of 390 mm outer diameter and mounted on water pump shaft.	Suction type, having Six metallic blades of 397 mm outer diameter and mounted on water pump shaft.
	Means of temperature control :	Thermostat	
	Bare radiator capacity, (l) :	4.15	4.00
	Capacity of expansion flask, (l) :	0.8	1.15
	Total coolant capacity, (l) :	10.33	9.60
	Radiator cap pressure, (kPa) :	88	

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3.1.9 Starting System:

	<u>Base Model</u>	<u>Variant Model</u>
Type :	12 V, DC, Electrical	
Aid for cold starting :	None	
Any other device provided for easy starting. :	None	

3.1.10 Electrical System:

3.1.10.1 Battery:

Make & Model :	Excide Express & MHD1000
Type :	Lead Acid
Capacity and rating :	12V, 100 Ah at 20 hour discharge rating
Location :	In front of radiator, under the bonnet.

3.1.10.2 Starter:

Make :	Spark Minda
Model :	N1039-1357
Type :	Pre-engaging, solenoid operated
Capacity and rating :	Not available
Serial number :	Not available

3.1.10.3 Generator:

Make :	PMP
Model :	7030
Type :	Alternator
Serial number :	017D22225 Not available
Output rating :	Not available
Method of drive :	Through crank shaft pulley by a cogged V-belt common to water pump.

3.1.10.4 Voltage regulator : In-built with alternator

3.1.10.5 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)
1	2	4	3	5
A] Base Model:-				
Front Lights:				
- Head lights	2,12V,60/55W	1060	140 x 105	537
- Parking lights	2, 12V, 5W	1350	75 x 75	215
- Turn Indicators-cum-hazard lights	2, 12V,21W	1350	110 x 75	125
Rear lights:				
-Tail-cum-brake light	2, 12V, 21/5W	1350	75 x 75	250
- Turn Indicators-cum-hazard lights	2,12V, 21W	1350	110 x 75	155
Plough light (on RHS mudguard)	1, 12V, 55W	1475	140 x 105	400
Reflectors (Red)	2	1350	20 x 55	230
Registration plate Light	Part of rear RHS combination lamp assembly			

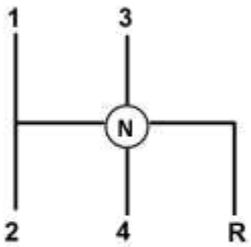
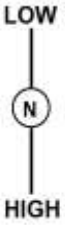
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1	2	4	3	5
B] Variant Model:-				
Front Lights:				
- Head lights	2, 12V, 60/55W	1060	140 x 105	535
- Parking lights	2, 12V, 5W	1350	75 x 75	215
- Turn Indicators-cum-hazard lights	2, 12V, 21W	1350	110 x 75	125
Rear lights:				
-Tail-cum-brake light	2, 12V, 21/5W	1350	75 x 75	250
- Turn Indicators-cum-hazard lights	2, 12V, 21W	1350	110 x 75	155
Plough light (on RHS mudguard)	1, 12V, 55W	1475	135 x 100	400
Reflectors (Red)	2	1350	20 x 55	230
Registration plate Light	Part of rear RHS combination lamp assembly			

3.1.11	Instrument panel details:	Base Model	Variant Model
i)	Engine speed-cum- cumulative digital run hour meter (0 – 32) x 100 rpm	Provided	---
ii)	Engine speed-cum- cumulative digital run hour meter (0 – 28) x 100 rpm	---	Provided
iii)	Water temperature gauge (with colour zone)	Provided	Provided
iv)	Lubricating oil pressure indicator light	Provided	---
v)	Lubricating oil pressure gauge (with colour zones)	---	Provided
vi)	Fuel level gauge (with colour zones)	Provided	Provided
vii)	Battery charging warning indicator light	Provided	Provided
viii)	Main switch key turn type	Provided	Provided
ix)	Light switch rotary type	Provided	Provided
x)	Turn indicator light switch (Two way)	Provided	Provided
xi)	Hazard light switch	Provided	Provided
xii)	Parking light 'ON' indicator light	Provided	Provided
xiii)	Head light long beam "ON" indicator light	Provided	Provided
xiv)	Turn indicator-cum-hazard indicator light tell-tale	Provided	Provided
xv)	Hand accelerator lever	Provided	Provided
xvi)	Rear view mirror	Provided	Provided
xvii)	Steering control wheel	Provided	Provided
xviii)	Horn push button	Provided	Provided
xix)	Engine shut-off knob	Provided	Provided
xx)	Mobile charging socket	---	Provided

3.1.12	Transmission System:	Base Model	Variant Model
3.1.12.1	Clutch:		
	Make :	Luk, India	
	Type :	Double, Diaphragm dry friction plates.	
	No. of friction plate(s) :	Two	
	Size, (mm):		
	- Transmission :	279.9/167.9 ⌀	
	- PTO :	279.7 / 165.4 ⌀	
	Method of operation:		
	-Transmission :	By pressing the foot pedal provided on LHS of operator's seat.	
	-PTO :	By a hand lever provided on LHS beneath the dashboard	

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3.1.12.2 Gear box:	<u>Base Model</u>	<u>Variant Model</u>
Make	:	CNH (apa)
Model	:	Not specified
Type	:	Mechanical, Combination of constant mesh and semi synchromesh gears with epicyclic unit for speed range selection.
No. of speeds:		
- Forward	:	08
- Reverse	:	02
Location of gear shifting levers	:	Centre shift Side shift
Main gear shifting lever	:	In-front of operator's seat On RHS of operator's seat
Range selection lever	:	In-front of operator's seat On LHS of operator's seat
Gear shifting pattern (Base & Variant model)	:	
		
	Main gear shifting lever	Range shifting lever
Oil capacity, (l)	:	28.0 28.3 (Common with differential, hydraulic and brake system)
Oil changing period	:	Change after every 1200 hours of operation.
3.1.12.3 Rear Differential unit:		
Type	:	Crown wheel & pinion with differential unit accommodated inside the differential housing
Reduction through crown wheel & bevel pinion	:	3.357: 1 (47/14 T)
Oil capacity, (l)	:	28.0 28.3 (Common with gearbox, brakes and hydraulic system)
Oil changing period	:	Change after every 1200 hours of operation
Differential lock:		
Type	:	Pin Type
Location	:	On RHS of differential housing
Method of operation	:	RHS foot pedal operated
3.1.12.4 Rear axle & final drive:		
Make	:	CNH (apa)
Model	:	Not specified
Type	:	Bull gear & pinion
Reduction through final drive	:	5.636 : 1 (62T/11T) 5.09 : 1 (56/11T)
Oil capacity of final drive, (l)	:	4.5 (on each side) 4.0 (on each side)
Oil changing period	:	Change after every 1200 hours of operation.
3.1.13 Power lift (Hydraulic System):		
- Make	:	CNH
- Type	:	Open centre, Live, ADDC
- No. and type of internal cylinder	:	One, single acting
- Type of linkage lock for transport	:	A knob is provided on the distributor

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3.1.13.1 Hydraulic pump:	<u>Base Model</u>	<u>Variant Model</u>
- Make & Model	: Dynamics (apa)	Rexroth
- Type	:	Gear
- Location & drive	:	On RHS of engine & driven through timing gears.
No. & Type of filter	:	One, spin on throw away type
Hydraulic oil capacity, (l)	:	28.0 28.3 (Common with gearbox, brakes and differential)
Oil change period	:	Change after every 1200 hours of operation.
Provision for external tapping	:	Provided

Details of control levers:

Sl. No.	Control	Functions
(i)	Position control lever (Yellow)	To control depth of the implement
(ii)	Draft control lever (Red)	To control the draft of the implement
(iii)	Lift-o-matic button	To raise the implement quickly without altering the position of control lever 1 & 2
(iv)	Sensitivity control knob	For adjusting the sensitivity of hydraulic system when working in draft control.
(v)	Response control knob	Varies the speed of drop of lower links.
(vi)	Diverter valve	To divert the oil path

Method of draft sensing : Through top link

3.1.13.2 Three point linkage:

S. No.	Observations	As per IS: 4468- (Part-1) -1997, (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of <u>Variant model</u>
			<u>Base model</u>	<u>Variant model</u>	
1	2	3	4	5	6
I.	Upper hitch points:				
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.71	25.84	Conforms to Cat.II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	44.24	44.00	Conforms to Cat. I & II
II.	Lower hitch points:				
a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	28.77	28.90	Conforms to Cat.II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	44.80	44.85	Conforms to Cat.II
III.	Lateral distance from lower hitch point to centre line of tractor.	359 / 435	435	433	Doesn't conform
IV.	Lateral movement of lower hitch points	100 (min) / 125 (min)	205	185	Conforms to cat I & II
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	660	655	Doesn't conform
VI.	Transport height	820 (min)/ 950 (min)	1045	1045	Conforms to cat I & II
VII.	Power range (without force)	560(min)/ 650 (min)	690	620, 680	Conforms to cat I & II

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1	2	3	4	5	6
VIII.	Leveling adjustment	100 (min)/ 100 (min)	385	345	Conforms to cat I & II
IX.	Lower hitch point clearance	100 (min)/ 100 (min)	165	175	Conforms to cat I & II
X.	Lower hitch point height	200 (max)/ 200 (max)	200	200	Conforms to cat I & II

3.1.13.3 Drawbar:

3.1.13.3.1 Linkage Drawbar [Refer Fig.1] :

Notation	As per IS: 12953-1990, (Cat.I) / (Cat.II), (mm)	As measured, (mm)		Remarks in case of <u>Variant Model</u>
		<u>Base model</u>	<u>Variant model</u>	
A	683 ± 1.5 / 825 ± 1.5	825.0	822.0	Doesn't conform
B	75 (min) / 75 (min)	76.20	77.02	Conforms to Cat I & II
C	30 (min) / 30 (min)	30.98	31.04	Conforms to Cat I & II
DØ	21.79 to 22.0 / 27.79 to 28.00	27.91	27.92	Conforms to Cat II
E	39.0 (min) / 49.0 (min)	64.51	64.69	Conforms to Cat I & II
FØ	12.0 (min) / 12.0 (min)	12.07	12.16	Conforms to Cat I & II
G	15.0 (min) / 15.0 (min)	15.02	14.20	Doesn't conform
HØ	25 ± 1 / 25 ± 1	24.48	25.02	Conforms to Cat I & II
J	80 ± 1.5 / 80 ± 1.5	80.17	80.52	Conforms to Cat I & II
No. of holes	7 / 9	09	09	Conforms to Cat-II

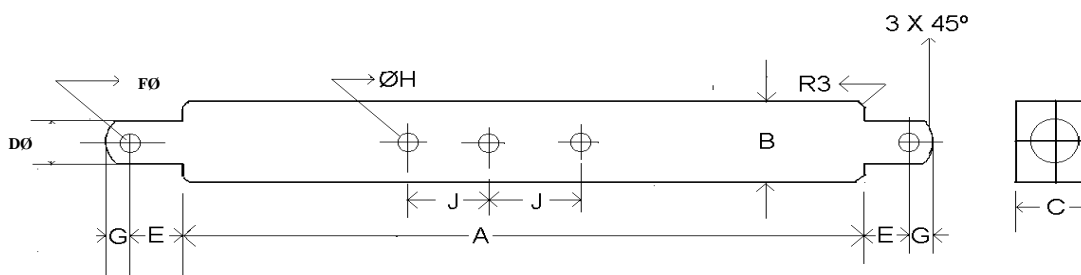


Fig. 1: DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR

	<u>Base model</u>	<u>Variant model</u>
3.1.13.3.2 Swinging drawbar :		Not provided
3.1.13.3.3 Provision to attach trailer brake valve :		Not provided
3.1.14 Power take-off shaft:		
Type :		Type-I, Independent
Method of engaging :		By a hand lever provided on LHS of operator seat
No. of shaft(s) :		One
PTO speed corresponding to rated engine speed, (rpm) :	685	631
Distance behind rear axle, (mm) :		260
Engine to PTO speed ratio :	3.643 : 1	3.330 : 1
Whether the PTO shaft is capable of transmitting the full power of engine :		Yes

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3.1.14.1 Power take-off proportional to ground speed:

Indicate 540 or 1000 rev/min	:	540 rev/min
Travelling distance for one revolution of take-off shaft, (m)	:	Not provided 0.314
Number of power take-off shaft revolutions for one revolution of (rear) driving wheels	:	--do-- 12.82
Direction of rotation with forward gear engaged (viewed from behind tractor)	:	--do-- Clockwise

3.1.14.2 Specifications of Power Take-Off Shaft:

Specification	As per IS: 4931-1995 (Type-I)	As observed		Remarks in case of Variant model
		Base model	Variant model	
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO corresponds to 1967 rpm of engine	540 rpm of PTO corresponds to 1798 rpm of engine	Conforms
No. of splines	6	6	6	-do-
Direction of rotation	Clockwise	Clockwise	Clockwise	-do-
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.	In the centre line of tractor		-do-

Dimensions, (mm) [See Fig.2(a)]:

D \varnothing	34.79 ± 0.06	34.80	34.84	Conforms
d \varnothing	28.91 ± 0.05	28.89	27.90	Does not conform
B \varnothing	29.4 ± 0.1	29.5	29.44	Conforms
A \varnothing (optional)	8.3 ± 0.1	8.21	8.40	Conforms
W	8.69 - 0.09 - 0.16	8.60	8.59	Conforms
a	7	7	7	Conforms
b (optional)	25 ± 0.5	25.4	25.02	Conforms
c	38	38	38	Conforms
X	30°	30°	30°	Conforms
B	76 (min)	86.69	83.8	Conforms
h	450 to 675	640	630	Conforms

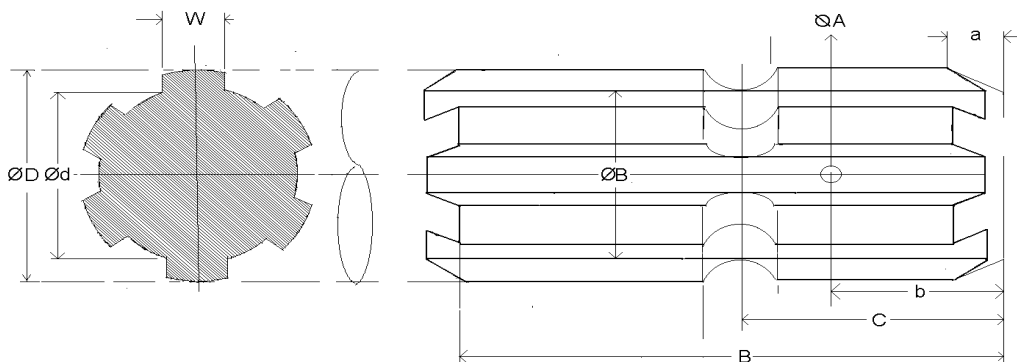


Fig.2 : DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

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		<u>Base model</u>	<u>Variant model</u>
3.1.14.3	Provision of power take-off shaft shield :		Not provided
3.1.14.4	Provision to attach trailer brake valve :		Not provided
3.1.15	Towing hitch:		
3.1.15.1	Front:		
	Type :		Clevis
	Location :		At front axle support
	Height above ground level,(mm) :		675 (fixed)
	Dia of pin hole, (mm) :	120.14	120.0
	Width of clevis, (mm) :	29.50	31.00
3.1.15.2	Rear:		
	Type :		Clevis
	Location :		At rear of differential housing
	Height above ground level, (mm):		
	- Minimum :	740	725
	- Maximum :	425	425
	- No. of positions :	06	06
	- Type of adjustment :	By changing and reversing the position of hitch on its mounting bracket	
	Distance of hitch point, (mm):		
	-From rear wheel centre :	380	390
	-From power take-off shaft end :	120	130
	Dia of pin hole, (mm) :	35.51	35.90
	Width of clevis, (mm) :	90.97	91.75
3.1.16	Steering:		
	Make :	Rane	Danfoss
	Type :	Mechanical, Recirculating ball type	Hydrostatic, power steering
	Location :		Above clutch housing
	Method of operation :		Manually, through steering control wheel
	Diameter of steering control wheel, (mm) :	455	380
	Steering oil capacity, (l) :	0.640	0.90
	Lubricant change period :	Change after every 1200 hours of operation.	
	Distributor:		
	Make :	Not Applicable	Danfoss
	Type :	--do--	Open centre
	Location :	--do--	Above clutch housing
	Pump:		
	Make :	--do--	Rexroth
	Type :	--do--	Gear
	Location :	--do--	On LHS, front of engine
	Method of drive :	--do--	Through timing gears
	Make , type & number of hydraulic ram cylinder :	--do--	Ognibene, double acting single connecting & 01
	Location of ram cylinder :	--do--	On rear of front axle, centrally located

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3.1.17 Brakes:	<u>Base model</u>	<u>Variant model</u>
3.1.17.1 Service Brake:		
Make	: JMI	Wellman (apa)
Type	: Mechanical, oil immersed multidisc	
Location	: Inside the trumpet housing at the rear axle shaft.	
No. of discs	: Three (on each wheel side)	
Area of liners. (cm ²)	: 695 (on each wheel side)	
Material of liners	: Prendo Abex HDT Non – asbestos 303 (apa) (apa)	
Method of operation	: Individual / combine pedal operation by right foot.	
3.1.17.2 Parking Brake:		
Type	: Pawl & ratchet arrangement for locking service brake discs.	
Location & Method of operation	: By locking the service brake discs through a separate hand lever provided on RHS of operator's seat.	
3.1.18 Wheel Equipment:		
3.1.18.1 Steered Wheel(s):		
Make	: MRF	
Number(s)	: Two	
Type of tyre	: Pneumatic, ribbed	
Size	: 6.00 -16 6.50 -16	
Ply rating	: 8	
Maximum permissible loading capacity of each tyre for road condition (kgf)	: 540 (at inflation pressure of 340 kPa)	615 (at inflation pressure of 450 kPa)
Recommended inflation pressure, (kPa) :		
- For field work	: 235	320
- For transport	: 235	320
Track width, (mm)	: 1380 (Std.) & 1500	1360 (Std.) & 1480
Method of changing track width	: By reversing the wheel disc.	
Make & size of wheel rim	: WIL, 4.50E x 16	
3.1.18.2 Drive wheel (s):		
Make	: MRF	
Number	: Two	
Type of tyre	: Pneumatic, traction	
Size	: 14.9 -28	
Ply rating	: 12	
Maximum permissible loading capacity of each tyre for road condition, (kgf)	: 1536 at 140 kPa	
Recommended inflation pressure, (kPa):		
- For field work	: 110	
- For transport	: 140	
Track width, (mm)	: 1366,1430 (Std.) , 1540, 1630, 1750, 1810 & 1960	1350, 1420 (Std.) , 1540, 1630, 1740, 1830 & 1940
Method of changing track width	: By changing and reversing the wheel disc on offset rim lugs.	
Make & size of wheel rim	: SSWL, W 13 x 28	

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		<u>Base model</u>	<u>Variant model</u>
3.1.18.3	Wheel base, (mm)	: 2040	2045
	Method of changing wheel base, if any, and range	: None	
3.1.19	Operator's seat:		
	Make	: New Holland (apa)	Harita Grammer
	Type	: Cushioned seat with backrest	
	Type of Suspension	: Two Helical coil springs	
	Type of Damping	: Hydraulic shock absorber	
	Range of adjustment, (mm):		
	Vertical	: Nil	
	Lateral	: Nil	
	Longitudinal	: ± 55	± 75
3.1.20	Provision for safety and comfort of operator:		
3.1.20.1	Conformity with IS: 12343-1998 (Reaffirmed in 2014)		
	All parameters meet with the requirements of IS: 12343-1998: (Re-affirmed in 2014), except the following:-		
	<u>Base model</u>		<u>Variant model</u>
	i) Width of seat does not meet the minimum requirement.		i) Length of seat from seat index point does not meet the minimum requirement.
	ii) Distance from seat index point to centre of differential lock pedal does not meet the minimum requirement.		ii) Width of seat does not meet the minimum requirement.
	iii) Vertical distance of seat index point from foot rest is more than the maximum requirement of 630 mm.		iii) Longitudinal distance from seat index point to centre of differential lock pedal does not meet the minimum requirement.
3.1.20.2	Conformity with IS: 6283 (Part-1) – 2006 (Re-affirmed in 2014) & IS: 6283 (Part-2) – 2007 (Re-affirmed in 2014):		
	All the controls are identifiable with symbols as per IS: 6283 (Part-1) – 2006 (Re-affirmed in 2014) & IS: 6283 (Part-2) – 2007 (Re-affirmed 2014).		
	Meets the requirement		Meets the requirement
3.1.20.3	Conformity with IS:8133-1983 (Re-affirmed in 2014), except the following:		
	Location and movement of various controls meet the requirement of IS: 8133-1983 (Re-affirmed in 2014), except the following:		
	Meets the requirement		i) Fuel shut-off knob does not remain in stop position.
3.1.20.4	Conformity with IS: 12239 (Part-1)-1996 (Re-affirmed in October, 2017):		
	Meets the requirements of IS:12239 (Part-1)-1996 (Re-affirmed in October, 2017), except the following:		
	i) Spark arrester is not provided in the exhaust system.		i) The spark arrester has not been provided in the exhaust system.
	ii) Width of foot step is less than the minimum requirement		ii) Vertical retainers should be provided both side of clutch & brake pedal

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3.1.20.5 Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in 2014):

Meets the requirements of IS:12239 (Part-2)-1999 (Re-affirmed in 2014), **except the following:**

<u>Base model</u>	<u>Variant model</u>
i) Power take off master shield is not provided.	i) The working clearance between the position & draft control levers is 25 mm which does not meet the requirement.
	ii) PTO master shield has not been provided.

3.1.20.6 Conformity with IS: 14683 – 1999 (Re-affirmed in 2014) :

All lighting arrangements meet the requirements of IS: 14683-1999.

3.1.20.7 Rear view mirror:

Rear view mirror has been provided.

3.1.20.8 Slow moving emblem:

Slow moving emblem has been provided.

3.1.21 Labelling of tractor:

Location of labeling:- The labelling plate riveted on outer side of LHS mudguard and provides the following information.

Name of Manufacturer	CNH Industrial India Pvt. Ltd.
Make	NEW HOLLAND
Model	3600 – 2 ALL ROUNDER PLUS +
Engine Number	237552DX
Chassis Number	NHN36000ZJG433516
Maximum P.T.O Power, kW	33.6
Specific fuel consumption, g/hp-h	182.4

3.1.22 Mass of tractor,(kg):	<u>Base Model</u>	<u>Variant model</u>
	(with standard ballast)	(with unballast)
- Front	: 795	815
- Rear	: 1230	1285
- Total	: 2025	2100

3.1.23 Overall dimensions, (mm):		
	- Length	: 3480
- Width	: 1815	1825
- Height (with exhaust pipe)	: 2350	2390
Minimum ground clearance, (mm)	: 385	380
	(Below rear hitch mounting bracket)	(below hydraulic oil suction line)

3.1.24 Number of external lubricating points:		
	- Oiling	: Nil
- Grease cups	: 13	13
- Grease nipples	: 02	02

3.1.25 Colour of tractor:		
	Chassis & engine	: Black
Bonnet	: Blue	Blue
Mudguard	White	White
Rim & disc	: White	White

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3.2 NOMINAL SPEED TEST

Movement	Gear No.	No. of engine revolutions for one revolution of driving wheel		Nominal speed at rated engine speed when fitted with 14.9-28 size tyres of 640 mm radius index, (kmph).		Variation in nominal speed (%) in Variant model
		<u>Base model</u>	<u>Variant model</u>	<u>Base model</u>	<u>Variant model</u>	
Forward	L1	196.01	176.82	3.08	2.87	-6.82
	L2	133.03	120.03	4.54	4.22	-7.05
	L3	90.86	81.92	6.65	6.18	-7.07
	L4	70.36	54.02	8.57	9.38	+9.45
	H1	54.46	49.13	11.07	10.32	-6.78
	H2	36.93	33.34	16.33	15.19	-6.98
	H3	25.22	22.77	23.89	22.23	-6.95
	H4	19.53	15.01	30.85	33.72	+9.30
Reverse	LR	139.59	125.64	4.33	4.04	-6.70
	HR	38.68	34.91	15.59	14.51	-6.93

3.3 PTO PERFORMANCE TEST

S. No.	Particulars	<u>Base Model</u>	<u>Variant Model</u>
i)	Date(s) of test	14.12.2017 & 15.12.2017	09.05.2019
ii)	Tractor run at this Institute prior to start of PTO test, (h)	1.58	2.21
iii)	Dynamometer test bench used	SAJ AG 250 Eddy Current	

The results of Power take-off performance test under natural ambient condition of **Base & Variant Model** are tabulated in **Table-1**.

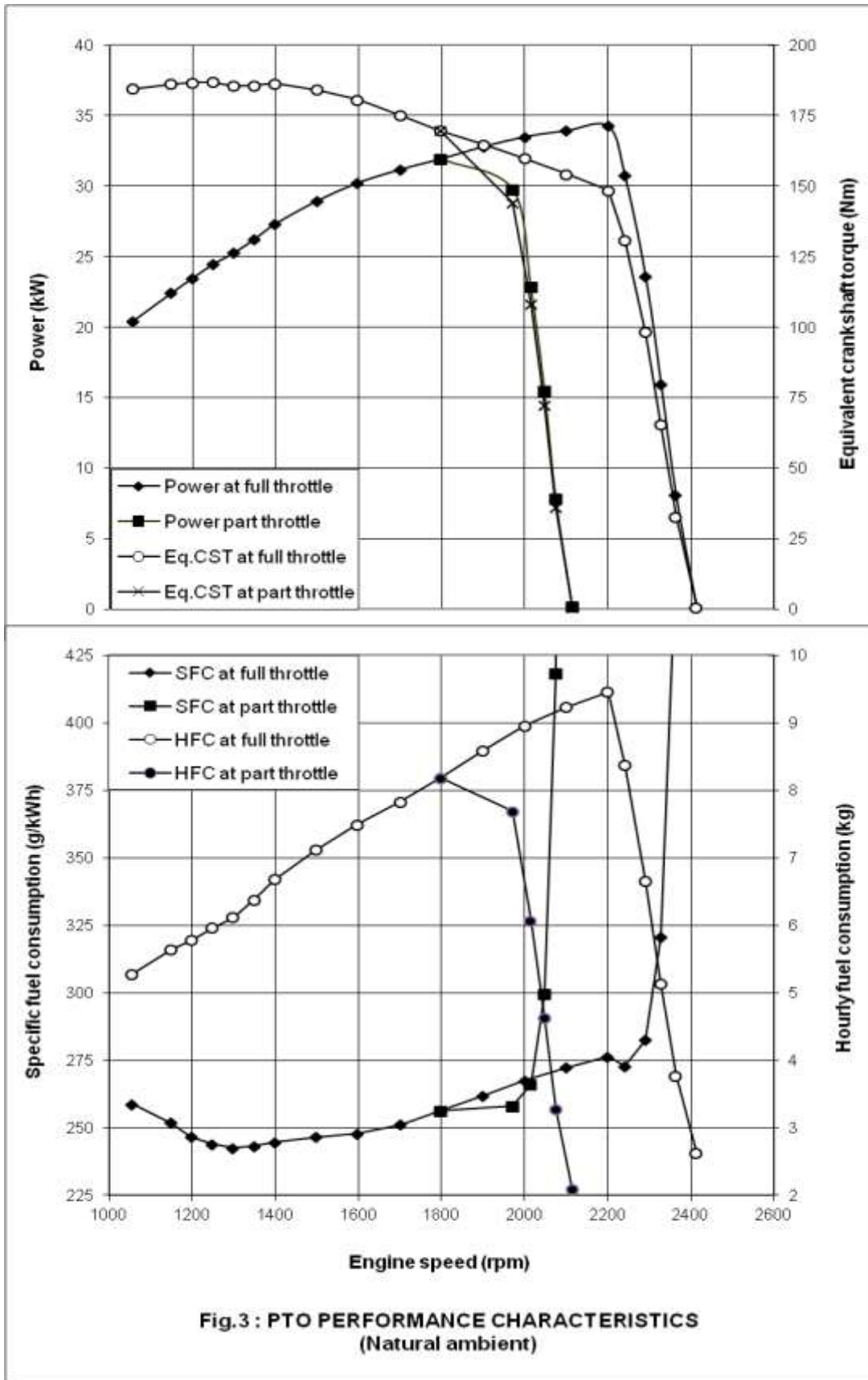
Table-1

1	Power, (kW)	Speed, (rpm)		Fuel Consumption			Specific energy, (kWh/l)
		PTO	Engine	(l/h)	(kg/h)	(kg/kWh)	
		3	4	5	6	7	8
a) Maximum power – 2 hours test (under natural ambient condition):							
Base Model	33.7	631	2299	10.81	9.04	0.266	3.11
Variant Model	34.2	661	2201	11.31	9.46	0.277	3.02
b) Power at rated engine speed (Base model: 2500 rpm & Variant model: 2100 rpm):							
Base Model	31.4	686	2499	10.84	9.06	0.289	2.90
Variant Model	33.9	631	2101	11.04	9.23	0.272	3.07
c) Power at standard power take-off speed (540 ± 10 rpm):							
Base Model	32.6	540	1967	9.82	8.21	0.252	3.32
Variant Model	31.9	540	1798	9.78	8.18	0.256	3.26
d) Varying loads at rated engine speed:							
i) Torque corresponding to maximum power available at rated engine speed:							
Base Model	31.4	686	2499	10.84	9.06	0.289	2.90
Variant Model	33.9	631	2101	11.04	9.23	0.272	3.07
ii) 85% of the torque obtained in (i) :							
Base Model	27.2	700	2550	9.82	8.21	0.302	2.77
Variant Model	30.7	673	2241	10.02	8.38	0.273	3.06
iii) 75% of the torque obtained in (ii):							
Base Model	20.7	712	2594	8.34	6.97	0.337	2.48
Variant Model	23.6	688	2291	7.96	6.66	0.282	2.96
iv) 50% of the torque obtained in (ii) :							
Base Model	14.1	725	2641	7.19	6.01	0.426	1.96
Variant Model	15.96	699	2328	6.13	5.13	0.321	2.61

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1	2	3	4	5	6	7	8
v) 25% of the torque obtained in (ii):							
Base Model	7.2	739	2692	4.78	4.00	0.556	1.50
Variant Model	8.1	710	2364	4.50	3.77	0.465	1.80
vi) Unloaded:							
Base Model	0.3	752	2740	3.57	2.98	0.993	0.08
Variant Model	0.2	725	2414	3.13	2.62	13.100	0.06
e) Varying loads at standard PTO speed							
i) Torque corresponding to maximum power available at standard PTO speed:							
Base Model	32.6	540	1967	9.82	8.21	0.252	3.32
Variant Model	31.9	540	1798	9.78	8.18	0.256	3.26
ii) 85% of the torque obtained in (i) :							
Base Model	28.7	559	2036	8.49	7.10	0.247	3.33
Variant Model	29.8	592	1971	9.20	7.69	0.258	3.24
iii) 75% of the torque obtained in (ii) :							
Base Model	22.5	583	2124	6.90	5.77	0.256	3.26
Variant Model	22.8	605	2015	7.26	6.07	0.266	3.14
iv) 50% of the torque obtained in (ii):							
Base Model	15.7	610	2222	5.48	4.58	0.292	2.86
Variant Model	15.5	615	2048	5.53	4.63	0.299	2.80
v) 25% of the torque obtained in (ii) :							
Base Model	8.0	624	2273	3.97	3.32	0.415	2.02
Variant Model	7.8	623	2075	3.92	3.28	0.421	1.99
vi) Unloaded:							
Base Model	0.3	646	2353	2.60	2.17	0.723	0.12
Variant Model	0.1	635	2115	2.50	2.09	20.900	0.04

Sl. No.	Parameters	Base Model		Variant Model
		Natural Ambient	High Ambient	Natural Ambient
i)	No load maximum speed, (rpm)	2740	2721	2414
ii)	Equivalent crankshaft torque at maximum power (Nm)	140.2	129.5	148.5
iii)	Maximum equivalent crank shaft torque (Nm)	193.0	181.6	186.9
iv)	Engine speed at maximum equivalent crankshaft torque, (rpm)	1301	1301	1249
v)	Backup torque (%)	37.7	40.2	25.9
vi)	Smoke level , maximum light absorption coefficient, (per meter)	0.27	--	0.47
vii)	Range of atmospheric condition :			
	- Temperature, (°C)	26 to 29	42 to 45	26 to 29
	- Pressure, (kPa)	99.4 to 99.8	100.5 to 100.9	98.3 to 98.7
	- Relative humidity, (%)	52 to 65	22 to 34	42 to 49
viii)	Maximum Temperature, (°C):			
	- Engine oil	120	130	118
	- Coolant	102	115	92
	- Fuel	54	67	53
	- Air intake	29	46	29
	- Exhaust gas	653	672	643
ix)	Pressure at maximum power:			
	- Intake air, (kPa)	4.1 to 4.2	4.2 to 4.3	4.3 to 4.4
	- Exhaust gas, (kPa)	3.7 to 4.0	3.7 to 4.3	3.3 to 3.5
x)	Consumptions:			
	Lub. Oil (g/kWh)	--	0.29	--
	-Coolant (% of total coolant capacity)	--	Nil	--



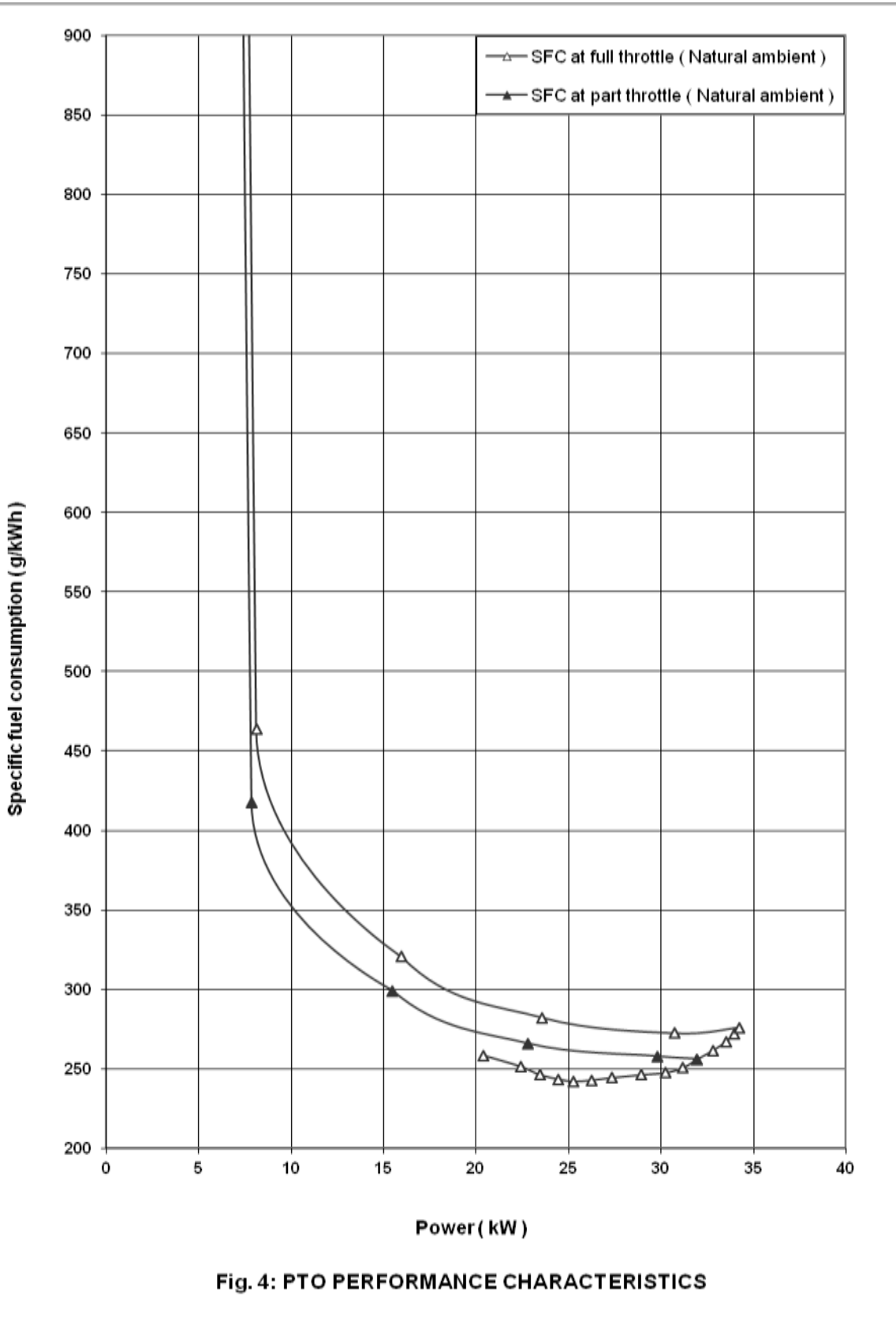


Fig. 4: PTO PERFORMANCE CHARACTERISTICS

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4. OTHER APPLICABLE TESTS

4.1 TURNING ABILITY

Characteristics	Minimum turning diameter, (m)		Minimum clearance diameter, (m)	
	LHS	RHS	LHS	RHS
Brake applied	5.89	6.12	6.21	6.42
Brakes released	6.70	6.91	7.04	7.23

5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

S. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
--None--		

6. COMPARISON BETWEEN BASE MODEL AND VARIANT MODEL (Based on Table 3 & 4 of Indian Standard 12207: 2014)

Sl. No.	Clause No.	Features	Observation on base model (T-1167/1694/2018) June, 2018)	Observation on variant model	Remakes	
1	2	3	4	5	6	
1.	i)	Single/dual/Dry / wet/ Independent clutch/Increase in size of clutch	Same configuration in base & variant models (refer para 3.1.12.1)		No change	
2.	ii)	Air cleaner	Same configuration in base & variant models (refer para 3.1.5.2), except the following:		No change	
		Range of suction pressure at maximum power, (kPa)	4.1 to 4.2	4.3 to 4.4	Changed	
3.	iii)	Exhaust system	Same configuration in base & variant models (refer para 3.1.6), except the following:		No change	
		Position of silencer outlet with respect to SIP, (mm):				
		- Vertical	1000	1075	Changed	
		- Longitudinal	1350	1290	Changed	
		- Lateral	245 (on LHS)	185 (on LHS)	Changed	
		Range of exhaust gas pressure at maximum power, (kPa)	3.7 to 4.0	3.3 to 3.5	Changed	
4.	iv)	Location and type of operating controls	Same configuration in base & variant models (refer para 3.1.12.1, 3.1.12.4, 3.1.14 & 3.1.17) except the following:		No change	
		Location of gear shifting levers	Centre shift	Side shift	Changed	
		Main gear shifting lever	In-front of operator's seat	On RHS of operator's seat	Changed	
		Range selection lever	In-front of operator's seat	On LHS of operator's seat	Changed	

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1	2	3	4	5	6	
5.	v)	Gear Box:				
		Reduction ratio of transmission:				
	Forward	Gear	Base model	Variant model	Variation in %	Remarks
		L1	196.01	176.82	-9.79	Changed
		L2	133.03	120.03	-9.77	Changed
		L3	90.86	81.92	-9.84	Changed
		L4	70.36	54.02	-23.22	Changed
		H1	54.46	49.13	-9.79	Changed
		H2	36.93	33.34	-9.72	Changed
		H3	25.22	22.77	-9.71	Changed
Reverse	H4	19.53	15.01	-23.14	Changed	
	LR	139.59	125.64	-9.99	Changed	
		HR	38.68	34.91	-9.75	Changed
		Range of speeds (kmph):				
		- Forward	3.08 to 30.85	2.87 to 33.72 (Variation of -7.07 to + 9.45 %)	Changed	
		- Reverse	4.33 to 15.59	4.04 to 14.51 (Variation of -6.93 to -6.70 %)	Changed	
6.	vi)	Additional no. of speed	None	None	No change	
7.	vii)	Fitment of accessories:				
		- Expansion tank	0.8	1.15	No change	
		- Additional hydraulic pump	None	None	No change	
		- Air compressor	None	None	No change	
		- Radiator	Provided	Provided	No change	
		- Bare radiator capacity, (l)	4.15	4.00	No change	
		-Total coolant capacity, (l)	10.33	9.60	No change	
		- Oil cooler	Not provided	Not Provided	No change	
8.	viii)	Brake system:		Same configuration in in base and variant models (refer para 3.1.17), except the following;	No change	
		Material of liners	Prendo Abex HDT 303	Non – asbestos	Changed	
9.	ix)	Type of three point linkage:	Various configuration in base & variant models (refer para 3.1.13.2)		Changed	
10.	x)	PTO shaft (s):				
		Location	Centrally located	Centrally located	No change	
		Type	Type-I, independent	Type-I, independent	No change	
		PTO speed corresponding to rated engine speed, (rpm)	685	631	Changed	
		Engine to PTO speed ratio	3.643 : 1	3.330 : 1	Changed	

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1	2	3	4	5	6
		Power take-off proportional to ground speed:			
		Travelling distance for one revolution of take-off shaft, (m)	Not provided	0.314	Changed
		Number of power take-off shaft revolutions for one revolution of (rear) driving wheels	--do--	12.82	Changed
		Direction of rotation with forward gear engaged (viewed from behind tractor)	--do--	Clockwise	Changed
		- Anticlockwise rotation speed (rpm)	Not provided	Not provided	No change
11.	xi)	Type of drive:	2WD	2WD	No change
12.	xii)	Type of hydraulic pump, location, drive, speed:	Same configuration in in base and variant models (refer para 3.1.13), except the following:-		No change
		-Speed of pump corresponding to rated engine speed, (rpm)	2328	2268	Changed
		-Discharge of pump at rated engine speed & minimum pressure	35.8	34 ± 5	Changed
		-Max. hydraulic power, (kW)	9.1	9.5 ± 3	Changed
		-Pump delivery rate at max. hydraulic power, (l)	36.3	28 ± 5	Changed
		-Pressure corresponding to max. power, (Mpa)	15.0	18.63 ± 0.98	Changed
13.	xiii)	Positioning of Hydraulic Sensing Mechanism	Through top link	Through top link	No Change
14.	xvi)	Rear final drive:			
		Reduction through final drive	5.636 : 1 (62/11T)	5.090 : 1 (56/11T)	Changed
15.	xv)	Type of fuel Injection pump: Inline/Rotary/Common rail	Rotary	Inline plunger	Changed
		Model / Group combination No. of FIP	0460423080	F002A3ZF26, PES3A90D410LS 3500	Changed
16.	xvi)	Change related to ergonomics, safety comfort, statutory / regulatory requirements:			
	a)	IS: 10273	Conformed	Conforms	No change
	b)	IS: 4931	Did not conform	Does not conform	No change
	c)	IS: 4468	Did not conform	Does not conform	No change
	d)	IS: 12953	Conformed	Does not conform	Changed

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1	2	3	4	5	6
	e)	IS:12343	Did not conform	Does not conform	No change
	f)	IS:12239 (Part-I)	Did not conform	Does not conform	No change
	g)	IS:12239 (Part-II)	Did not conform	Does not conform	No change
	h)	IS:8133	Conformed	Does not conform	Changed
	i)	IS: 6283	Conformed	Conforms	No change
	j)	IS:14683	Conformed	Conforms	No change
17.	Change related to statutory/ regulatory requirements (As per Table 4):				
	a)	Engine operating principle (spark / compression ignition, two / four stroke)	Compression Ignition, 4 stroke	Compression Ignition, 4 stroke	No change
	b)	Number & arrangement of cylinders	Three, vertical inline	Three, vertical inline	No change
	c)	Maximum declared PTO power, (kW)	33.6	33.6	No change
	d)	Engine displacement, (cc)	2931	2931	No change
	e)	Rated engine speed, (rpm)	2500	2100	Changed
18.	Other changes:				
	(a)	Engine:			
		Model	8035.05D.937	8035.05D.938	Changed
		Engine speed (Manufacturer's recommended production setting), (rpm) :			
		- Maximum speed at no load	2750 ± 50	2400 ± 50	Changed
		- Low idle speed	650 ± 50	700 ± 50	Changed
		- Speed at maximum torque	1400 ± 200	1300 ± 200	Changed
		Rated speed, (rpm):			
		- For PTO use	2500	2100	Changed
		- For drawbar use	2500	2100	Changed
		(b)	Fuel feed pump:		
	Type		Diaphragm	Plunger with hand primer	Changed
	Model/Group combination No.		Not available	FP/KSG22AD10	Changed
	Provision of sediment bowl		Not Provided	Provided	Changed
	Method of drive		Through timing gear	Through FIP camshaft	Changed
	Location	RHS of engine block	On fuel injection pump	Changed	
	(c)	Fuel injection timing	1.5 ± 0.2 mm plunger lift at TDC	7 ± 2 degree before TDC	Changed
	(d)	Firing order of power stroke	1 - 2 - 3	1 – 3 – 2	Changed

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1	2	3	4	5	6	
	(e)	Governor :				
		Model/Group combination No.	Inbuilt with FIP	RSV350...1050A5 C1848L	Changed	
		Rated engine speed, (rpm)	2500	2100	Changed	
		Governed range of engine speed, (rpm)	600 to 2800	650 to 2450	Changed	
	(f)	Lubricating system:				
		Oil sump capacity, (l)	7.00	6.30	Changed	
		Total lub oil capacity, (l)	8.00	6.50	Changed	
		Pressure release setting, (kPa)	294.20	450.13	Changed	
	(g)	Minimum permissible pressure, (kPa)	39.00	68.65	Changed	
		Details of radiator fan	Suction type, having Four metallic blades of 390 mm outer diameter and mounted on water pump shaft.	Suction type, having Six metallic blades of 397 mm outer diameter and mounted on water pump shaft.	Changed	
		(h)	Steering:			
			Type	Mechanical, Recirculating ball type	Hydrostatic, power steering	Changed
	(i)	Wheel Equipment:				
		Steered Wheel(s):				
		Size	6.00 -16	6.50 -16	Changed	
		Maximum permissible loading capacity of each tyre for road condition (kgf)	540 (at inflation pressure of 340 kPa)	615 (at inflation pressure of 450 kPa)	Changed	
		Track width, (mm)	1380 (Std.) & 1500	1360 (Std.) & 1480	Changed	
		Drive wheel (s):				
		Track width, (mm)	1366,1430 (Std) , 1540, 1630, 1750, 1810 & 1960	1350, 1420 (Std.) , 1540, 1630, 1740, 1830 & 1940	Changed	
	(j)	Overall Dimensions, (mm) (Length/width/height)	3480/1815/2350	3465/1825/2390	Changed	
	(k)	Mass of tractor, (kg): (Front/Rear/Total)	795/1230/2025	815/1285/2100	Changed	
	(l)	Sheet metal:				
		- Colour	Blue	Blue	No change	
		-Decals (Sticker)	New Holland 3630 TX	3600 – 2 All Rounder Plus +	Changed	

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7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) and non – evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 table-1 of Indian Standard **12207: 2014** 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: 12207-2014	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)	Maximum 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	33.6 (D)	33.6 (D)	33.7	34.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	33.6 (D)	33.6 (D)	31.4	33.9	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	239 (D)	248 (D)	266	277	No
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	195 (D)	200 (D)	193.0	186.9	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	25	25 (D)	37.7	25.9	Yes
f)	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.	132(D)	132 (D)	130	118	Yes
	2) Coolant	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.	119 (D)	119 (D)	115	92	Yes
h)	Smoke level, m ⁻¹	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	3.25 Max. (R)	3.25 Max. (R)	0.27	0.47	Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.2	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		--	3600 – 2 ALL ROUNDER PLUS +		Yes
	3)	Year of manufacture	Evaluative		--	G-J (i.e. July 2018)		Yes
	4)	Engine serial number	Evaluative		--	237552DX		Yes
	5)	Chassis serial number	Evaluative		--	NHN36000ZJG433516		Yes
	6)	Declaration of PTO power, kW	Evaluative		--	33.6		Yes
7.1.3	Literature (Submission to test agency):							
(a)	Operator manual	Evaluative	Provided/ Not Provided	Provided	Provided	Provided	Yes	
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	Provided	Provided	Provided	Yes	
(c)	Workshop/ Service manual	Evaluative	Provided/Not Provided	Provided	Provided	Provided	Yes	

7.1.4 CATEGORY OF BREAKDOWNS / DEFECTS :

S. 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.	None	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.	None	Yes

7.2 Salient Observations:

7.2.1 Laboratory tests:

7.2.1.1 PTO Performance:

- i) The maximum PTO power was recorded as **34.2 kW** against the declaration of **33.6 kW**, which meets the requirement of IS: 12207-2014 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **277 g/kWh** against the declaration of **248 g/kWh**, which is not within the tolerance limit of IS: 12207-2014. This should be looked into for necessary corrective action.
- iii) The maximum equivalent crankshaft torque was recorded as **186.9 N-m** against the declaration of **200.0 N-m**, which is within the tolerance limit of IS: 12207-2014.
- iv) The backup torque is **25.9 %**.

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- 7.2.1.2 Operator’s Seat:**
The dimensions Length of seat from seat index point, Width of seat & Longitudinal distance from seat index point to centre of differential lock pedal of operator’s seat does not meet the requirement of IS: 12343-1998 (Re-affirmed in 2014). This should be looked into for necessary corrective action.
- 7.2.1.3 Specifications of power take-off shaft:**
The dimension “dΦ” of PTO shaft does not meet the requirement of IS:4931-1995 (Reaffirmed 2014). This should be looked into for necessary corrective action.
- 7.2.1.4 Specifications of three point linkage:**
The parameters Lateral distance from lower hitch point to centre line of tractor and distance from end of PTO shaft to centre of lower hitch point does not meet the requirement of IS: 4468 (Part-1) -1979 (Reaffirmed 2014). This should be looked into for necessary corrective action.
- 7.2.1.5 Specifications of linkage drawbar:**
The dimension of “A” & “G” of linkage drawbar does not meet the requirement of IS: 12953-1990 (Reaffirmed October, 2017). This should be looked into for necessary corrective action.
- 7.3 Maintenance / Service Problems:**
No noticeable maintenance/ service problem was observed during the test.
- 7.4 Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
- i) Provision for spark arresting device in exhaust system.
 - ii) The working clearance between the position & draft control lever is less than the minimum requirement.
 - iii) There should be provision of PTO shaft master shield.
 - iv) Fuel shut-off knob should remain in stop position to prevent accident.
 - v) Vertical retainers should be provided both side of clutch & brake pedal
 - vi) There should be provision to attachment trailer brake valve
- 7.5 Adequacy of Literature supplied with machine:**
- 7.5.1** The following literature was supplied with the tractor for reference during the test.
- i) Operator’s manual of New Holland 3600 – 2 TX All Rounder Plus⁺ tractor model
 - ii) Service Parts catalogue Part - 1 & Part – 2 of New Holland 3630 TX T3A SUPER PLUS, New Holland 3600 – 2 TX T3A All Rounder Plus⁺, New Holland 3630 TXA1, New Holland 3600-2 All Rounder Plus⁺ tractor model
 - iii) Service Manual Part - 1 & Part – 2 of New Holland 3600 – 2 All Rounder Plus⁺ & 3600 – 2 TX All Rounder tractor model
 - iv) Warranty booklet of New Holland 3600 – 2 TX All Rounder Plus⁺ tractor model
- 7.5.2** The supplied literature was found adequate; except the following:
- a) Lubricants grade of transmission, rear axle, final drive, hydraulic, brake & steering system given in operator’s & service manual does not match with specifications submitted by applicant.
 - b) Brand name of coolant given in operator’s & service manual does not match with specifications submitted by applicant.
 - b) Scheduled servicing & routine maintenance chart is not provided in service manual.
Oil change period of engine lubrication system is recommend as very frequently but now a days good quality of lubricants are coming, which has more than 1000 hrs of change period. This should be looked into for necessary corrective action.
- 7.5.3** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

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The results of the tests carried out on variant model “New Holland 3600 – 2 ALL ROUNDER PLUS + Tractor” have been compared with those on base model “New Holland 3630 TX Tractor” and found within the limit, as specified in Indian Standard: 12207-2014.


8. CITIZEN CHARTER

Test duration under citizen charter	Duration of Test	Whether the report released within time frame given citizen charter	Remark, if any
10 Months	04 Months (February, 2019 to May, 2019)	Yes	--

TESTING AUTHORITY:-



RAJNEESH PATEL
AGRICULTURAL ENGINEER



C.V. CHIMOTE
TEST ENGINEER



Y.K. RAO
SENIOR AGRICULTURAL ENGINEER



J.J.R. NARWARE
DIRECTOR

9. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
9.1	7.2.1.1 (ii), 7.2.1.2, 7.2.1.3, 7.2.1.4, 7.2.1.5, 7.4, 7.5.2 & 7.5.3	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.

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ANNEXURE – I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running –in	--
2.	PTO performance test	6.82
3.	Turning ability	0.25
4.	Nominal speed test	1.11
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	1.36
Total		9.53