



NEW HOLLAND 3510 TRACTOR



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

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

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

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Plot No.-3, Udyog Kendra,
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Distt. Gautam Budh Nagar,
Uttar Pradesh, India

Month: August	Test Report No. T- 1099/1625/2017	Year : 2017
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Type of Test	:	COMMERCIAL (Supplementary)
Test code/Procedure	:	IS: 5994-1998 (Reaffirmed in 2009) And IS: 12207-2014
Period of Test	:	January, 2017 to July, 2017
Test Report No.	:	T- 1099/1625/2017
Month/Year	:	August, 2017

- 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 Supplementary test report and, should be read in conjunction with the Test Report of base model i.e. "New Holland 3510" bearing No. T-662/1168/2009, released in April, 2009.

SELECTED CONVERSIONS

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 /RHS	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
SIP	Seat Index Point



C O N T E N T S

	<u>PAGE</u>
1. Scope of test	05
2. Fuel & Lubricants	06
3. Essential Test	07
3.1 Specifications	07
3.2 Nominal Speed	18
3.3 PTO Performance Test	19
4. Other Applicable Tests	24
4.1 Hydraulic Performance Test	24
4.2 Brake Test	25
5. Adjustments, Defects, Breakdowns & Repairs	26
6. Comparison Between Base Model and Supplementary Model	26
7. Summary of Observations, Comments & Recommendations	29
8. Citizen Charter	32
9. Applicant's Comments	33
Annexure- I	34



1. SCOPE OF TEST

The "New Holland 3510" tractor had undergone "Initial Commercial Test" at this Institute vide test report No. T-662/1168/2009 was released in April, 2009. The firm has made the following changes in the technical specifications of tractor and had requested vide letter No. PD-L11713, dated: 19.09.2016, for **Supplementary** testing of "New Holland 3510" tractor.

The applicant informed that the last chassis cut off number of tractor model "New Holland 3510" generated on production line fitted with engine model TIII S324/NH is NH4312901.

The major features of Base model and Supplementary model are listed below :-

S. No.	Parameters	Previous Sample (Test Report No. T-662/1168/2009)	Present Sample
1	2	3	4
1.	Tractor		
	-Make	New Holland	New Holland
	-Model	3510	3510
2.	Engine model	T-III S 324/NH	TIII A S324/NH-F1.2
3.	Cylinder & cylinder head		
	Compression ratio	17.5:1	18.5:1±0.3
4.	Capacity of fuel tank	61.9	63.7
5.	Model/ group combination number of fuel feed pump	FP/KSG22AD45/2, 9440030030	Not Visible
6.	FIP Model / group combination number of fuel injection pump.	9 400 030 651, PES3A80D320RS2617-1	F002 AOZ 771
7.	Fuel injection timing	15±1 degree BTDC	13+0/-2 degree BTDC
8.	Governor model	RSV350...1100A2C2123-4R	RSV...1000A4C1410R
9.	Fuel Injector		
	-Model /group combination number	F 002 C70 009	Holder No: F002 C70 018 Nozzle No: DSLA 146P 5514
	-Opening pressure (Manufacturer's production pressure setting, (MPa)	23.0 + 0.8	25.0 + 0.8
10.	Bare radiator capacity, (l)	1.80	1.65
	Total coolant capacity, (l)	8.10	6.90
11.	Range of speeds, (kmph):		
	- Forward	2.74 to 31.15	2.53 to 28.25
	- Reverse	3.38 to 12.38	3.12 to 11.30
12.	Speed reduction through crown and pinion of differential	3.454:1	3.909: 1
13.	Speed of Hydraulic drive pump corresponding to rated engine speed, rpm	3125	1860
	Pump delivery rate at max. power, (l/min)	19±2	21±3,
14.	Engine to PTO speed ratio	3.235:1	3.73:1
	Standard PTO speed, (rpm) & other PTO speeds available	540 NA	540 540(E) with 2.94:1



1	2	3	4
15.	No. of oil immersed disc & Area of brake lining	02 472.7(on each wheel side)	03 692.7 (on each wheel side)
16.	Differential lock	Provided	Not Provided
17.	Rear wheel tyre size	12.4 - 28	13.6-28 (optional tyre size of 12.4 - 28)
18.	Type of steering system	Mechanical	Hydrostatic (optional mechanical steering)

Subsequent to the examination of the case in the light of clause 6.1 of Indian Standard 12207: 2014, the following tests were considered to be carried out :

- Specification checking
- Nominal speed test
- PTO power Performance test, under normal ambient condition.
- Hydraulic Performance test
- Brake test

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

Test requested by : The manufacturer
Selected for test by : Testing authority
Place of running-in : At manufacturer's place
Duration of said running-in (h):

- Engine : 50
- Transmission : --

Method of Selection : The test sample was selected randomly out of five tractors from the production line by the representative of testing authority.

2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.840 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 & Air cleaner oil	SAE 20 W 40	SAE 20W 40
2.	Transmission, differential Hydraulic & brake system	SAE EP – 80	Oil originally filled in the tractor was not changed
3.	steering oil reservoir	SAE 80 (hydrostatic, Std. fitment) SAE 140 (Optional Mechanical steering)	
4.	Grease	Not specified	Servo grease MP



3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

		<u>Previous Sample</u>	<u>Present Sample</u>
3.1.1	Tractor:		
	Make	: New Holland	New Holland
	Model	: 3510	3510
	Type	: Four wheeled, Rear-wheel driven, General Purpose, Agricultural Tractor	
	Year of manufacture	: 2007	2016
	Brand name	: New Holland	New Holland
	Chassis number	: PD0003	NHN35100ZGL372672
	Country of Origin	: India	India
3.1.2	Engine:		
	Make	: Simpsons	Simpsons
	Model	: T III S 324/NH	T III A S 324/NHF1.2
	Type	: Four stroke, naturally aspirated, water cooled, direct injection, diesel engine.	
	Serial number	: S38662	S324D97875
	Engine speed (Manufacturer's recommended production setting), (rpm):		
	- Maximum speed at no load	: 2150 to 2200	2130 to 2200
	- Low idle speed	: 700 ±100	600-800
	- Speed at maximum torque	: 1400 ± 100	1200 to 1600
	Rated speed, (rpm):		
	- For PTO use	: 2000	2000
	- For drawbar use	: 2000	2000
3.1.3	Cylinder & cylinder head:		
	Number	: Three	Three
	Disposition	: Vertical, Inline	Vertical, Inline
	Bore/stroke, (mm)	: 88.9 / 127 (apa)	88.9 / 127 (apa)
	Capacity as specified by the applicant, (cc)	: 2365	2365
	Compression ratio	: 17.5:1	18.5:1±0.3
	Type of cylinder head	: Monoblock	Monoblock
	Type of cylinder liners	: Dry, replaceable	Dry, replaceable
	Type of combustion chamber	: Direct combustion, re-entrant cavity on piston crown	Direct combustion, re-entrant cavity on piston crown
	Arrangement of valves	: Overhead, inline	
	Firing order	: 1 - 2 - 3	1 - 2 - 3
3.1.4	Fuel System:		
	Type of fuel feed system	: Gravity and force feed	Gravity and force feed
3.1.4.1	Fuel tank:		
	Capacity,(l)	: 61.9	63.7
	Location	: Above clutch housing	
	Provision for draining of sediments/water	: Not provided	Not provided
	Material of fuel tank	: Crossed polyethylene (apa) link	HDPE (apa)
3.1.4.2	Water separator:	: Not provided	
3.1.4.3	Fuel feed pump:		
	Make	: Bosch, India	Bosch, India
	Type	: Plunger	



	<u>Previous Sample</u>	<u>Present Sample</u>
Model/group combination number	FP/KSG22AD45/2, : 9 440 030 030	9 440 030 030 (apa)
Provision of sediment bowl	: provided	provided
Method of drive	: Through cam shaft of fuel injection pump	
3.1.4.4 Fuel filters:		
Make	: Mico Lic Bosch, India	New Holland
Model/group combination number	: F 002 H20 133	F002 H20 138 (apa)
Number	: Two	Two
Type of elements:		
-Primary	: Paper	Paper
-Secondary	: Paper	Paper
Capacity of final stage filter, (l)	: 0.50	0.50
3.1.4.5 Fuel Injection pump:		
Make	: Bosch, India	Bosch, India
Model/Group combination No.	: 9 400 030 651	F002 AOZ 771 (PES3A80D320RS2000)
Type	: Inline Plunger	Inline Plunger
Serial number	: 78600658	55648649
Method of drive	: Through timing gears	Through timing gears
3.1.4.6 Fuel Injectors:		
Make	: Bosch, India	Bosch, India
Type	: Multi holes (Five holes)	Multi holes (Five holes)
Model / group combination number of Injector	: F002 C70 009	Holder No: F002 C70 018 Nozzle No: DSLA 146P 5514
Manufacturer's production pressure setting, (MPa)	: 23.0+0.8	25.0 +0.8
Injection timing	: 15±1 degree BTDC	13+0/-2 degree BTDC
3.1.4.7 Governor:		
Make	: Bosch, India	Bosch, India
Model/Group combination No.	: RSV350... 1000A2C212 3-4R	RSV375... 1000A4C141 0R
Type	: Mechanical, centrifugal	variable speed
Rated engine speed, (rpm)	: 2000	2000
Governed range of engine speed, (rpm)	: 600 to 2200	600 to 2200
3.1.5 Air Intake System:		
3.1.5.1 Pre-cleaner:		
Make	: Not provided	New Holland (apa)
Type	: Centrifugal with transparent dust collector	
Location	: Above air cleaner inlet tube, outside the bonnet.	



		<u>Previous Sample</u>	<u>Present Sample</u>
3.1.5.2	Air cleaner:		
	Make	Lumax	Sietz
	Type	Oil bath	Oil bath
	Location	In front of radiator, under the bonnet	
	Range of suction pressure at maximum power, (kPa)	0.90 to 4.0	2.4 to 2.5
	Oil capacity, (l)	0.50	0.90
	Oil change period	Whenever dusty or after every 50 hours of operation	
3.1.6	Exhaust System:		
	Type of silencer	Updraft, Elliptical	Updraft (Elliptical)
	Position of silencer outlet with respect to SIP, (mm):		
	- Vertical	1040	950
	- Longitudinal	1310	1345
	- Lateral	425(LHS)	490 (on LHS)
	Range of exhaust gas pressure at maximum power (kPa)	2.0 to 5.2	9.1 to 10.8
	Provision of spark arresting device	Not provided	Not provided
	Provision against entry of rain water	A bend is provided at top of silencer	
3.1.7	Lubricating system:		
	Type	Force feed-cum-splash	Force feed-cum-splash
	Oil sump capacity, (l)	7.70	7.95
	Total lub. oil capacity, (l)	8.00	8.65
	Oil change period	First change after 50 hours and subsequently after every 300 hours of operation	
	Type of cooling device, if any	None	
3.1.7.1	Filters :		
	Make	-	New Holland
	Type	Full flow, spin-on, replaceable	Full flow, spin-on, throw away, paper element
	Number		One
3.1.7.2	Pump:		
	Type		Lobe
	Method of drive	Through timing gears	
	Pressure release setting, (kPa)	343.2 to 448.2	343.2 to 448.2 (apa)
	Minimum permissible pressure, (kPa)	176.5	39.0 (apa)
3.1.8	Cooling system:		
	Type	Forced circulation of coolant & water.	
	Details of Pump	Centrifugal, semi- open impeller of 69.7 mm diameter having six number of vanes (and driven through crankshaft pulley by a cogged 'V'-belt common to alternator)	



	Previous Sample	Present Sample
Details of fan	Suction type, having Six metallic blades of 376 mm diameter and mounted on water pump shaft.	
Means of temperature control	Thermostat	
Brand name of coolant	-	Zero-R
Coolant water ratio	-	1 : 25
Bare radiator capacity, (l)	1.80	1.65
Capacity of expansion flask (l)	0.85	0.75
Total coolant capacity, (l)	8.10	6.90
Radiator cap pressure, (kPa)	88	88

3.1.9 Starting System:

Type	12V, DC, electrical
Aid for cold starting	None
Any other device provided for easy starting	None

3.1.10 Electrical System:**3.1.11.1 Battery:**

Make	Standard Farukuwa	Standard Farukuwa
Model	SFN-88L/TR	SFN-88L/TR
Type	Lead acid	Lead acid
Capacity and rating	12V, 88 Ah at 20 h discharge rate	
Location	In-front of radiator under the bonnet.	

3.1.11.2 Starter :

Make	Mico	PANALFA
Model	F 002 G20 311	013-2855
Type	Pre-engaging, solenoid operated	
Capacity and rating	12V, 2.7 kW	12V, 2.7kW

3.1.11.3 Generator:

Make	Mico Lic Bosch, India	PMP
Model	F002 G10 360 K-1	7030
Type	Alternator	Alternator
Capacity and rating	12V, 23 A	14V, 23 Amp@6000 rpm

3.1.11.4 Details of Lights:

Description	No. & capacity of bulb	Height of the centre of beam above ground level, (mm)	Size, (mm)	Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm)
1	2	4	4	5
Supplementary Model:				
Front Lights:				
- Head lights	2, 12V, 35/35W	1145	90 x 140	715
- Parking lights	2, 12V, 5W	1290	75 x 77	715
- Turn Indicators-cum-hazard lights	2, 12V, 21W	1290	77 x 110	270



	Previous Sample	Present Sample
Gear shifting pattern for both Previous & present sample)	<p>Main gear shifting lever</p>	<p>Range Selection Lever</p>
Oil capacity, (l)	: 20.0 (Common with differential, brakes, final drive and hydraulic)	: 24.0 (Common with differential, brakes, final drive and hydraulic)
Oil change period	: After every 1200 hours of operation	: After every 1200 hours of operation
3.1.13.3 Differential Unit:		
Type	: Crown wheel & bevel pinion with differential assembly accommodated inside the gear box housing.	: Crown wheel & bevel pinion with differential assembly accommodated inside the differential housing.
Reduction through crown wheel & pinion	: 3.454:1	: 3.909: 1 (43/11T)
Differential lock	: Provided	Not Provided
Type	: Pin type	Not applicable
Method of operation	: RHS foot pedal operated	Not applicable
3.1.13.4 Rear axle & final drive:		
Type	: Planetary type reduction unit fitted inside the rear axle housing on both sides.	
Reduction through final drive	: 6.545:1	: 6.545 : 1
Oil capacity of final drive,(l)	: 20.0 (Common with gear box, brakes, and hydraulic system)	: 24.0 (Common with gear box, brakes, and hydraulic system)
3.1.14 Power lift (Hydraulic System):		
Make	: Mita	: Mita (apa)
Type	: Open centre, Live, ADDC	
No. and type of cylinder	: One, single acting	
Type of linkage lock for transport	: Hydraulic, response control valve in fully closed position acts as transport lock	
- Make	: Bosch, India	: Dynamics (apa)
- Type	: Gear	: Gear (tandem)
- Location & drive	: On RHS of engine &	: through timing gears
Hydraulic oil capacity, (l)	: 20.0 (Common with gear box, brakes, and final drive)	: 24.0 (Common with gear box, brakes, and final drive)
Oil change period	: After every 1200 hours of operation.	
Provision for external tapping	: Provided	
Details of control	: i) Position control lever (Yellow) ii) Draft control lever (Red) iii) Lift-a-matic button iv) Response control knob v) Sensitivity control knob vi) Diverter valve	: Not provided
Method of draft sensing	: Through top link	



3.1.14.1 Three point linkage:

Sl. No.	Observations	As per IS: 4468-(Part-1)-1997, (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of present sample
			Previous sample	Present sample	
I. Upper hitch points:					
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.9	25.85	Conforms to cat -II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	43.83	44.0	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	28.85	28.85	Conforms to cat -II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	34.94	34.88	Conforms to cat -I
III.	Lateral distance from lower hitch point to centre line of tractor	359 / 435	359	359	Conforms to cat -I
IV.	Lateral movement of lower hitch points	100 (min) / 125 (min)	255	200	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	560	565	Conforms to cat -I & II
VI.	Transport height	820 (min) / 950 (min)	910	950	Conforms to cat I & II
VII.	Power range (Without force)	560(min) / 650 (min)	595	610	Conforms to cat I
VIII.	Leveling adjustment	100 (min) / 100 (min)	290	300	Conforms to cat I & II
IX.	Lower hitch point clearance	100 (min) / 100 (min)	250	200	--do--
X.	Lower hitch point height	200 (max) / 200 (max)	200	200	--do--

3.1.14.2 Drawbar:

Linkage Drawbar (Refer Fig.1) :

Notation	As per IS: 12953-1990, (Cat.I) / (Cat.II), (mm)	As measured, (mm)		Remarks in case of Present sample
		Previous sample	Present sample	
A	683 ± 1.5 / 825 ± 1.5	683	684	Conforms to cat-I
B	75 (min) / 75 (min)	75.0	75.0	Conforms to Cat-I & Cat II
C	30 (min) / 30 (min)	31.3	30.0	--do--
D \varnothing	21.79 to 22.0 / 27.79 to 28.0	27.8	27.9	Conforms to cat-II
E	39.0 (min) / 49.0 (min)	66.4	53.3	Conforms to Cat-I & Cat II
F \varnothing	12.0 (min) / 12.0 (min)	12.1	12.1	--do--
G	15.0 (min) / 15.0 (min)	18.5	18.0	--do--
H \varnothing	25 ± 1 / 25 ± 1	25.3	25.0	--do--
J	80 ± 1.5 / 80 ± 1.5	80.0	80.0	--do--
No. of holes	7 / 9	7	7	Conforms to cat-I

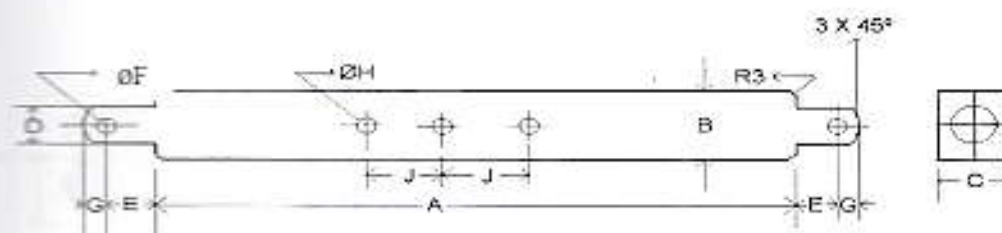


Fig. 1 (B): DIMENSIONAL NOTATIONS FOR LINKAGE DRAWBAR

	Previous Sample	Present Sample
3.1.15 Power take-off shaft:		
Type		Type-I, Not 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)	618	536
Distance behind rear axle, (mm)		335
Engine to PTO speed ratio	3.235:1	3.73 & 2.94 for (540E)
Whether the PTO shaft is capable of transmitting the full power of engine		Yes
Other speeds corresponding to rated engine speed	Not applicable	175, 262, 389, 215

3.1.15.1 Specifications of Power Take-off Shaft:

Specification	As per IS: 4931-1995 Type-I	As observed		Remarks in case of present sample
		Previous sample	Present sample	
1	2	3	4	5
Nominal speed, (rpm)	540 ± 10	540 rpm of PTO shaft corresponds to 1747 rpm of engine.	540 rpm of PTO shaft corresponds to 2014 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.	Centrally located	Centrally located	-do-
Dimensions, (mm) (See Fig. 1):				
D ϕ	34.79 ± 0.06	34.78	34.79	Conforms
d ϕ	28.91 ± 0.05	28.86	28.81	-do-
B ϕ	29.4 ± 0.1	29.36	29.4	-do-
A ϕ (optional)	8.3 ± 0.1	NA	NA	--
W	8.69 - 0.09 -0.16	8.54	8.53	Conforms
a	7	7	7	-do-
b(optional)	25 ± 0.5	NA	NA	--
c	38	38.0	38	Conforms
X	30°	30°	30°	-do-
B	76 (min)	85	79	-do-
h	450 to 675	570	590	-do-

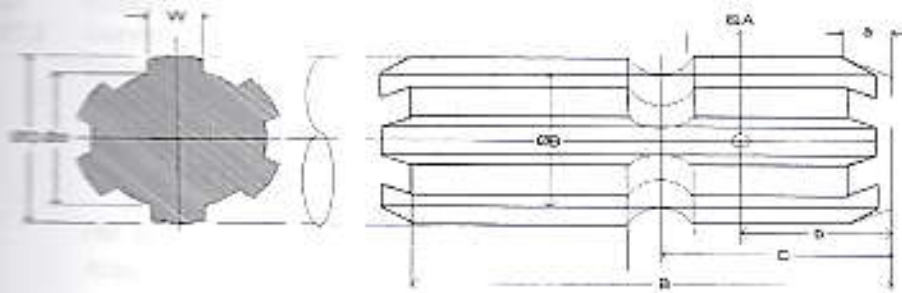


fig. 2: DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

		Previous sample	Present sample
3.1.15.2	Provision of Power take - off Shaft shield	:	Not provided
3.1.15.3	Provision to attach trailer brake valve	:	Not provided
3.1.16	Towing hitch:		
3.1.16.1	Front :		
	Type	:	Clevis
	Location	:	At front ballast mounting bracket weight bolted on front axle
	Height above ground level, (mm)	:	690 (fixed) 680 (fixed)
	Dia. of pin hole, (mm)	:	30.0 30.0
	Width of clevis, (mm)	:	115 100.0
3.1.16.2	Rear :		
	Type	:	Clevis Clevis
	Location	:	At rear, of transmission housing
	Height above ground level, (mm):		
	- Maximum	:	750 765
	- Minimum	:	370 465
	Distance of hitch point, (mm):		
	-From rear axle centre	:	475 425
	-From power take-off shaft end	:	140 90
	Dia of pin hole, (mm)	:	29 29.5
	Width of clevis, (mm)	:	84 72.0
3.1.16.3	Steering:		
	Make	:	ZF Danfoss (apa)
	Type	:	Mechanical, re-circulating ball type with single drop arm. Open Hydrostatic centre,
	Location	:	Above the clutch housing
3.1.16.4	Dai. Of steering control wheel, (mm)	:	450 375
3.1.16.5	Steering housing oil capacity, (l)	:	0.58 1.40
	Oil change period	:	First change after 600 hours and subsequently after every 1200 hours of operation After every 1200 hours of operation



		<u>Previous sample</u>	<u>Present sample</u>
3.1.17	Brakes:		
3.1.17.1	Service Brake:		
	Make	: Not specified	New Holland (apa)
	Type	: Mechanical, oil immersed disc brake	
	Location	: Inside the trumpet housing at the rear axle shaft on both sides	On both side of half axle shaft before the final drive
	No. of disc(s)	: Two	Three
	Area of liners, (cm ²)	: 472.7(on each wheel side)	692.7 (on each wheel side)
	Material of liners	: Organic	Organic
	Method of operation	: Independent or combined	pedal operation by right foot.
3.1.18	Wheel Equipment:		
3.1.18.1	Steered Wheel(s):		
	Make	: MRF	Good Year
	Number(s)	: Two	Two
	Type of tyre(s)	: Pneumatic, ribbed	Pneumatic, ribbed
	Size	: 6.00-16	6.00 -16
	Ply rating	: 8	8
	Maximum permissible loading capacity of each tyre at 230 kPa pressure (kgf)	: 450	450
	Recommended inflation pressure, (kPa) :		
	- For field work	: 230	230
	- For transport	: 230	230
	Track width, (mm)	: 1330 (std.) & 1445	1255 (Std.) & 1385
	Method of changing track width	: By extending the telescopic axle	
	Make & size of wheel rim	: Wheels India, 4.50E x 16	SSWL, 4.50E x 16
3.1.18.2	Drive wheel(s):		
	Make	: MRF	GOOD YEAR
	Number	: Two	Two
	Type of tyre	: Pneumatic, traction	Pneumatic, traction
	Size	: 12.4 - 28	13.6 -28
	Ply rating	: 12	12
	Maximum permissible loading capacity of each tyre at 140 kPa pressure, (kgf)	: 1160	1800 @ 230 kPa
	Recommended inflation pressure, (kPa):		
	- For field work	: 110	110
	- For transport	: 140	140
	Track widths, (mm)	: 1230, 1340 (Std.), 1400, 1540, 1620 & 1720	1235, 1320 (Std), 1505, 1565, 1635 & 1745
	Make & size of wheel rim	: Wheels India, W11 x 28	SSWL, W12 x 28
3.1.18.3	Wheel base, (mm)	: 1920	1910
3.1.19	Operator's seat:		
	Make	: Harita Grammer	New Holland (apa)
	Type	: Cushioned	
	Type of suspension	: Two helical coil springs	
	Type of dampening	: Hydraulic shock absorber	



	Range of adjustments:	Previous sample	Present sample
	- Vertical	:	Nil
	- Lateral	:	Nil
	- Longitudinal	: ±57	: ± 105
3.1.20	Provision for safety and comfort of operator:		
3.1.20.1	Operator's seat: Comfort with IS: 12343-1998: (Re-affirmed in March, 2009) All parameters meet with the requirement of IS: 12343-1998, except the following:		
	Previous Sample	i)	Present Sample Width of seat
3.1.20.2	Comfort with IS: 6283 (Part-1)-2006 (Re-affirmed in March, 2009) & IS: 6283 (Part-2)-2007 (Re-affirmed in March, 2009) Controls and displays are identifiable with symbols as per IS:6283 (Part-1&2)-1998, except the following:		
	i) Grease lubricant frequency		--
	ii) Oil lubricant, type and frequency		
3.1.20.3	Conformity with IS: 8133-1983 (Re-affirmed in March, 2009) Location and movement of various controls meets the requirement of IS: 8133-1983, except the following:		
	i) The fuel shut-off knob does not remain in " stop position"		--
3.1.20.4	Conformity with IS: 12239 (Part-1)-1996 (Reaffirmed in February, 2012) Meets the requirements of IS: 12239 (Part-1)-1996		
	i) The spark arresting device has not been provided in the exhaust system		
3.1.20.5	Conformity with IS: 12239 (Part-2)-1999 (Re-affirmed in March, 2009) Meets the requirements of IS: 12239 (Part-2)-1999, except the following:		
	i) The working clearance between position control lever and draft control lever has not been provided as per the requirement of above referred standard.		
	ii) Power take off master shield is not provided		
3.1.20.6	Conformity with IS: 14683-1999 (Re-affirmed in March, 2009) 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	Provision of Slow Moving Emblem: Slow moving emblem has been provided		
3.1.21	Labelling of tractor as per IS: 10273-1987 (Reaffirmed in March, 2009): Location of labeling plate: Riveted on inner side of LHS mudguard provides the following information:		
	Name of Manufacturer	CNH Industrial India Pvt. Ltd.	
	Make	New Holland	
	Model	3510	
	Engine Number	S324D97875	
	Chassis Number	NHN35100ZGL372672	
	Maximum P.T.O Power, kW (hp)	24.3 (33)	
	Specific fuel consumption,(g/hph)	198	



3.1.23 Masses:		<u>Previous Sample</u>	<u>Present Sample</u>
3.1.23.1	Mass of tractor,(kg)	: With standard ballast of 50 kg at front	
	- Front	: 730	720
	- Rear	: 1040	1105
	- Total	: 1770	1825
3.1.23	Overall dimensions, (mm):		
	- Length	: 3410	3410
	- Width	: 1690	1690
	- Height	: 2300	2250
	- Minimum ground clearance	: 366	385
3.1.24	Number of external lubricating points:		
	- Oiling	: Nil	Nil
	- Grease cups	: 02	02
	- Grease nipples	: 11	20
	Colour of tractor:		
	Chassis & Engine	: Black	Black
	Sheet metal	: Blue	Blue
	Mudguards	: White	Blue
	Rim & disc	: White	White
3.1.25	Optional Features	: --	i) With 12.4-28,12 PR Rear tyre size ii) Mechanical Steering

3.2 NOMINAL SPEED TEST

Movement	Gear No.	No. of engine revolutions for one revolution of driving wheel		Nominal speed, (kmph) at rated engine speed when fitted with tyres size of			Variation in nominal speed (%) between previous and present sample with standard fitment
				12.4-28 with 590 mm of radius index,	13.6-28 with 610 mm of radius index	12.4-28 (optional tyre size) with 590 mm of radius index,	
				<u>Previous Sample</u>	<u>Present Sample</u>	<u>Previous Sample</u>	
Forward	L1	162.1	181.30	2.74	2.53	2.45	-7.66
	L2	107.5	120.26	4.14	3.82	3.69	-7.73
	L3	72.9	81.39	6.10	5.64	5.46	-7.54
	L4	52.4	59.21	8.49	7.77	7.52	-8.48
	H1	44.1	49.93	10.09	9.20	8.90	-8.82
	H2	29.3	33.10	15.18	13.88	13.42	-8.56
	H3	19.9	22.42	22.41	20.49	19.82	-8.57
	H4	14.3	16.30	31.15	28.25	27.32	-9.31
Reverse	LR	131.7	147.67	3.38	3.12	3.02	-7.69
	HR	35.9	40.66	12.38	11.30	10.93	-8.72



3.3 PTO PERFORMANCE TEST

S. No.	Particulars	Previous Sample	Present Sample
1	Date(s) of test	06.06.2008 & 09.06.2008	08.02.2017 & 09.02.2017
2	Tractor run at this Institute prior to start of PTO test, (h)	16.9	7.3
3	Dynamometer test bench used	Eddy Current, Fuchino ESF 1000S	SAJ AG 250 Eddy Current

The results of power take-off performance test carried out for the Supplementary model are tabulated in Table-1 and graphically represented in Fig. 3, 4 and 5

Table - 1

Power, (kW)	Speed, (rpm)		Fuel consumption			Specific energy, (kWh/l)
	PTO	Engine	(l/h)	(kg/h)	Specific, (kg/kWh)	
1	2	3	4	5	6	7
a) Maximum Power -2 hours Test :						
Previous Sample						
24.6	618	1999	8.00	6.69	0.272	3.08
23.6	618	1999	7.76	6.49	0.275	3.04*
Present Sample						
23.0	536	1999	7.35	6.15	0.267	3.14
21.7	536	1999	7.07	5.91	0.273	3.07*
b) Power at rated engine speed (2000 rpm):						
Previous Sample						
24.6	618	1999	8.00	6.69	0.272	3.08
23.6	618	1999	7.76	6.49	0.275	3.04*
Present Sample						
23.0	536	1999	7.35	6.15	0.267	3.14
21.7	536	1999	7.07	5.91	0.273	3.07*
c) Power at standard power take-off speed (540 ± 10 rpm):						
Previous Sample						
23.5	540	1747	7.25	6.06	0.258	3.24
22.3	540	1747	6.96	5.82	0.261	3.20*
Present Sample						
22.3	540	2014	7.20	6.02	0.271	3.09
19.5	540	2014	6.41	5.36	0.276	3.03*
d) Varying loads at rated engine speed:						
e) Torque corresponding to maximum power available at rated engine speed:						
Previous Sample						
24.6	618	1999	8.00	6.69	0.272	3.08
Present Sample						
23.0	536	1999	7.35	6.15	0.267	3.14



1	2	3	4	5	6	7
ii) 85% of the torque obtained in (i):						
Previous Sample						
21.7	641	2074	6.97	5.83	0.269	3.11
Present Sample						
19.8	542	2022	6.45	5.39	0.272	3.07
iii) 75% of the torque obtained in (ii):						
Previous Sample						
16.4	647	2093	5.59	4.67	0.285	2.93
Present Sample						
14.9	546	2037	5.20	4.35	0.291	2.87
iv) 50% of the torque obtained in (ii):						
Previous Sample						
11.1	656	2125	4.34	3.63	0.327	2.56
Present Sample						
10.1	551	2055	4.08	3.41	0.338	2.48
v) 25% of the torque obtained in (ii) :						
Previous Sample						
5.7	670	2167	3.10	2.59	0.454	1.84
Present Sample						
5.3	576	2148	3.22	2.69	0.512	1.63
vi) Unloaded:						
Previous Sample						
0.9	675	2184	2.36	1.97	2.189	0.38
Present Sample						
0.1	586	2186	2.28	1.91	15.500	0.05
e) Varying loads at standard PTO speed: in <u>Previous Sample</u>						
i) Torque corresponding to maximum power available at standard PTO speed (540 ± 10 rpm):						
23.5	540	1747	7.25	6.06	0.258	3.24
ii) 85% of the torque obtained in (i):						
21.6	584	1889	6.63	5.54	0.256	3.26
iii) 75% of the torque defined in (ii):						
16.4	591	1912	5.36	4.48	0.273	3.06
iv) 50% of the torque defined in (ii):						
11.1	599	1938	4.02	3.36	0.304	2.76
v) 25% of the torque defined in (ii):						
5.6	610	1973	2.91	2.43	0.434	1.92
vi) Unloaded:						
0.8	621	2009	2.01	1.68	2.100	0.40
Remark:- The varying load test at standard PTO speed was not conducted on <u>Present Sample</u> as the maximum PTO power of tractor was observed at 536 PTO rpm , which is within the range of standard PTO speed of 540 ± 10 rpm.						

*Under High ambient conditions



S. No.	Parameters	<u>Previous Sample</u>		<u>Present sample</u>	
		Natural Ambient	High Ambient	Natural Ambient	High Ambient
i)	No load maximum speed, (rpm)	2184	2177	2186	2171
ii)	Equivalent crankshaft torque at maximum power, (Nm)	117.5	112.9	109.8	103.7
iii)	Maximum equivalent crank shaft torque, (Nm)	140.0	134.7	130.4	123.6
iv)	Engine speed at maximum equivalent crankshaft torque, (rpm)	1300	1265	1250	1201
v)	Back up torque, (%)	19.1	19.3	18.76	--
vi)	Range of atmospheric condition:				
	- Temperature, ($^{\circ}$ C)	27 to 28	41 to 45	27 to 28	41 to 44
	- Pressure, (kPa)	97.6 to 98.0	97.4 to 97.9	99.2 to 99.4	100.0 to 100.5
	- Relative humidity, (%)	48 to 53	21 to 28	41 to 43	21 to 27
vii)	Maximum Temperature, ($^{\circ}$C):				
	- Engine oil	100	109	111	124
	- Coolant	78	91	83	97
	- Fuel	41	57	53	68
	- Air intake	29	49	28	46
	- Exhaust gas	579	567	488	504
viii)	Pressure at max. power:				
	- Intake air, (kPa)	3.3 to 3.5	3.3	2.4 to 2.5	2.5 to 2.6
	- Exhaust gas, (kPa)	4.8 to 5.2	4.7 to 4.8	9.1 to 10.8	9.5 to 10.8
ix)	Consumptions:				
	Lub. Oil, (g/kWh)	--	2.57	--	0.73
	-Coolant (% of total coolant capacity)	--	0.60	--	Nil

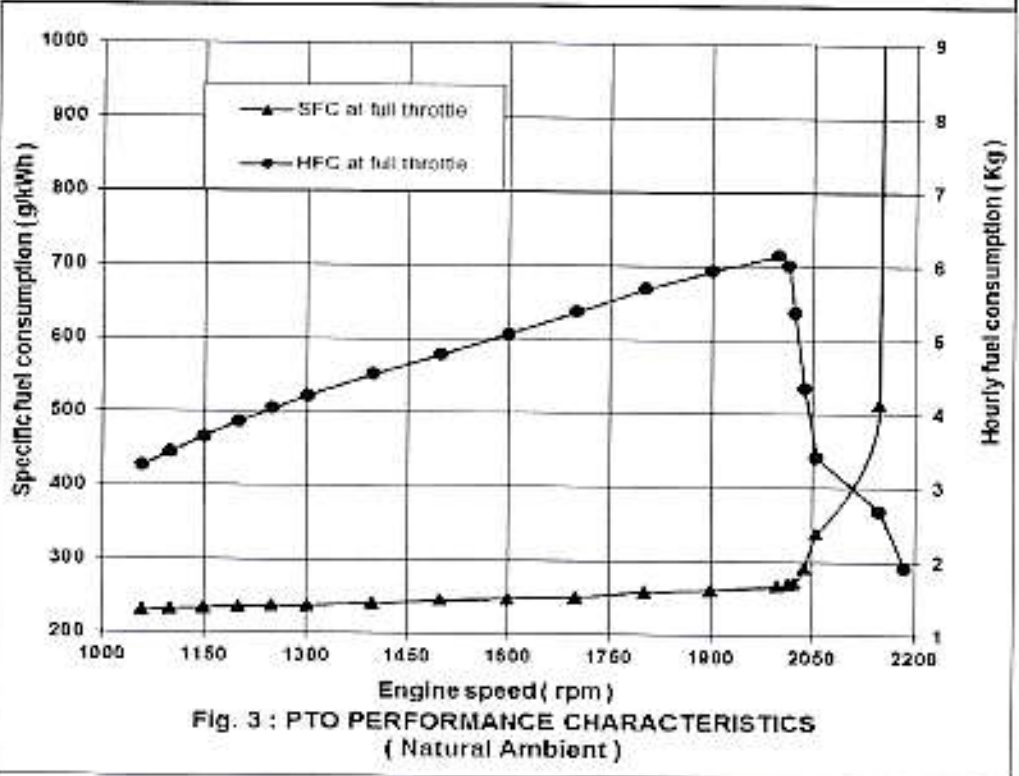
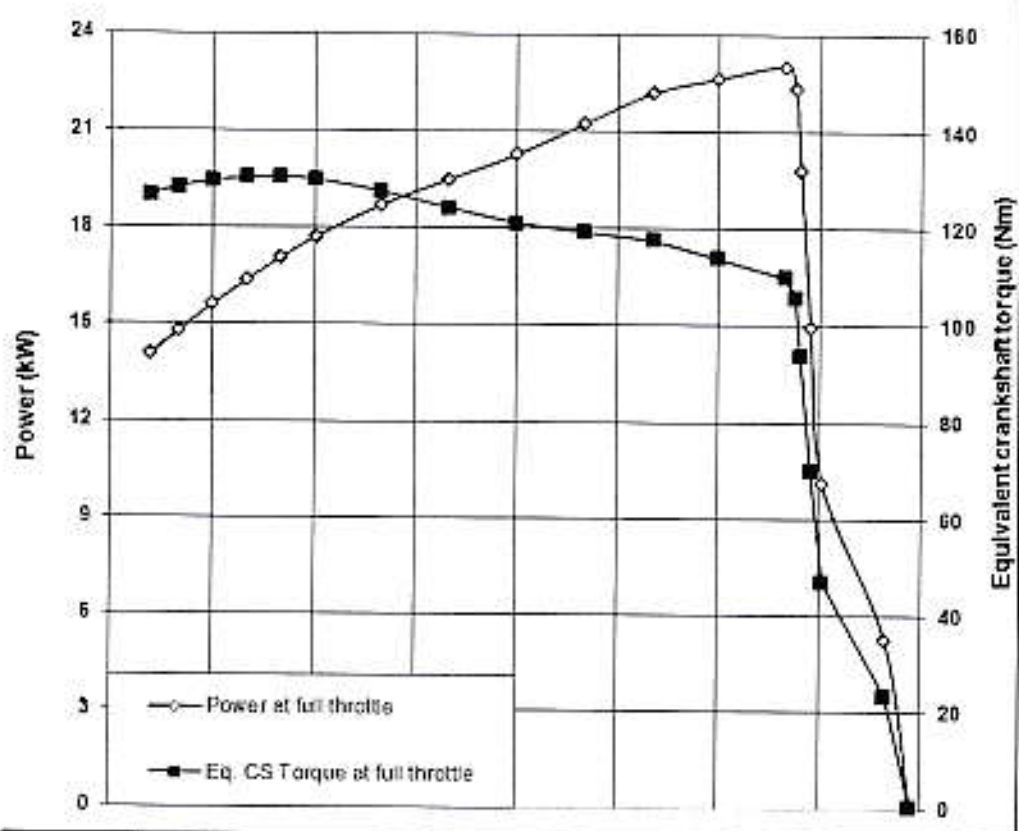


Fig. 3 : PTO PERFORMANCE CHARACTERISTICS (Natural Ambient)

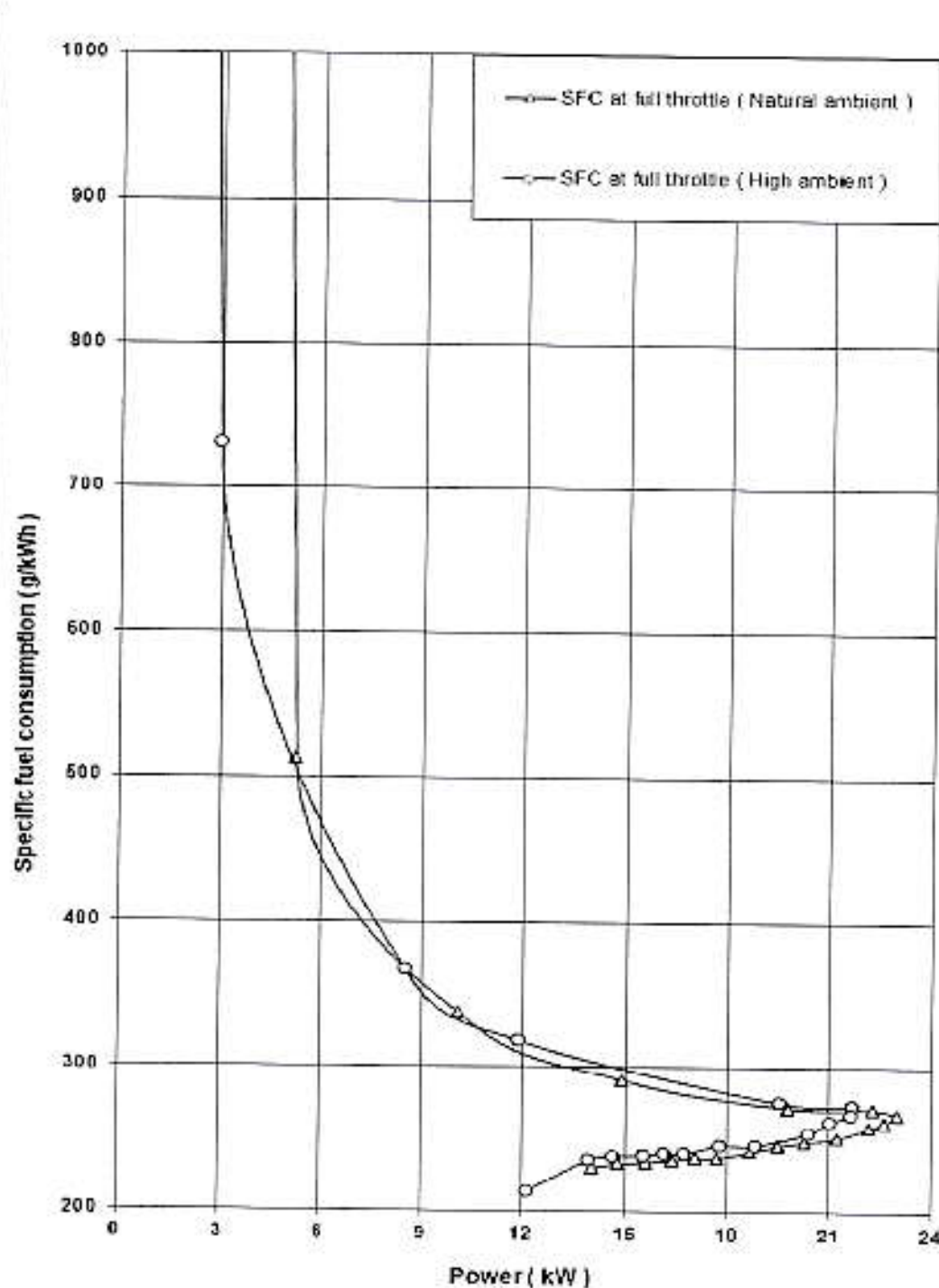


Fig. 5 : PTO PERFORMANCE CHARACTERISTICS



4. OTHER APPLICABLE TESTS

4.1 POWER LIFT & HYDRULIC PUMP PERFORMANCE TEST

Date(s) of test : 20.04.2017 & 21.04.2017

Tractor run at the Institute prior to start of : 22.0

hydraulic test, (h)

Pump speed at rated engine speed, (rpm) : 1860(apa)

4.1.1 Hydraulic power test:

Pump delivery rate at minimum pressure : 28.5
and rated engine speed, (l/min)

Maximum hydraulic power, (kW) : 6.5

Pump delivery rate at maximum hydraulic : 25.9
power, (l/min)

Pressure at maximum hydraulic power, : 15.0
(MPa)

Sustained pressure of the open relief : 17.4
valve, (MPa)

Tapping point:

a) Relief valve test : External circuit

b) Pump performance test : Pump outlet

Temperature of hydraulic fluid, (°C) : 60 to 69

4.1.2 Lifting capacity test :

Test	Height of lower hitch point above ground in down position, (mm)	Vertical movement with lifting forces, (mm)	Maximum corrected force exerted through full range, (kN)	Corresponding pressure, (MPa)	Moment about rear axle, (kN-m)	Maximum tilt angle of mast from vertical (degrees)
At hitch points	200	595	8.97	15.7	8.97	--
On the standard frame	200	590	7.59	15.7	12.22	13.0

4.1.3 Maintenance of lift load:

Force applied at the frame, (kN) : 6.83

Temperature of hydraulic fluid at the : 60
start of test, (°C)

Test data:

Elapsed time (minute)	5	10	15	20	25	30
Cumulative drop in height of lift, (mm)	00	00	05	10	15	15



4.2. BRAKE TEST

4.2.1 Service brake:

4.2.1.1 Cold brake test:

Date of test(s) : 31.01.2017
 Type of Track : Concrete
 Maximum attainable speed, (kmph):
 - With standard Ballast : 30.8
 - With Ballasted (Road work) : 30.8

		At maximum attainable speed			
Standard ballasted tractor	Braking device control, force (N)	544	430	315	201
	Mean deceleration, (m/sec ²)	3.53	3.29	3.15	2.50
	Stopping distance, (m)	10.37	11.11	11.61	14.64
Ballasted Tractor (Road work)	Braking device control force(N)	478	394	310	225
	Mean deceleration, (m/sec ² .)	3.42	3.28	2.75	2.50
	Stopping distance, (m)	10.55	11.15	13.31	14.64
		At 25 kmph travel speed			
Standard ballasted tractor	Braking device control, force(N)	498	400	302	204
	Mean deceleration, (m/sec ²)	3.48	3.19	2.91	2.50
	Stopping distance, (m)	7.17	7.56	8.28	9.65
Ballasted Tractor (Road work)	Braking device control force,(N)	510	412	314	216
	Mean deceleration, (m/sec ²)	3.35	3.16	2.90	2.50
	Stopping distance, (m)	7.37	7.64	8.32	9.65

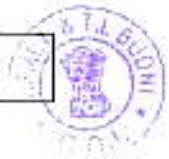
4.2.1.2 Brake fade test:

		At maximum attainable speed			
Ballasted Tractor (Road work)	Braking device control force(N)	506	434	363	291
	Mean deceleration, (m/sec ²)	3.40	3.36	2.79	2.50
	Stopping distance, (m)	10.63	10.89	13.14	14.64
		At 25 kmph travel speed			
Ballasted Tractor (Road work)	Braking device control force,(N)	540	443	346	249
	Mean deceleration, (m/sec ²)	3.27	3.07	2.88	2.50
	Stopping distance, (m)	7.57	7.85	8.37	9.65

Maximum deviation of tractor from its original course, (m) : None
 Abnormal vibration : None
 The brakes were heated by : Self-braking

4.2.2 Parking brake test:

Particulars	18 percent slope		12 percent slope with trailer mass of 1.76 ton,	
	Facing up	Facing down	Facing up	Facing down
Braking device control force, (N)	264	336	221	271
Efficacy of parking brake	-----Effective-----			



5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/defects/breakdowns and repairs	Tractor run hours
1.	--None--	--

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

Sl. No.	Clause No	Features	Observations on Previous Sample (T-662/1168/2009)	Observations on Present sample	Remakes	
1	2	3	4	5	6	
1.	i)	Single/dual/Dry / wet/ Independent clutch/Increase in size of clutch	Single, dry friction plate of 239.8 mm diameter	Single, dry friction plate of 279.7 mm diameter	No change	
2.	ii)	Air cleaner	Same configuration in base & Supplementary model.(Refer para 3.1.5)		No change	
3.	iii)	Exhaust system	Same configuration in base & Supplementary model.(Refer para 3.1.6)		No change	
4.	iv)	Location and type of operating controls	Same configuration in base & Supplementary model except the following (Refer 3.1.13.1, 3.1.13.2, 3.1.14 & 3.1.17.1)		No change	
		- Differential lock	Provided	Not provided	Changed	
5.	v)	Gear Box:				
		- Type	Constant mesh	Constant mesh	No change	
	Move ment	Reduction ratio of transmission:				
			Gear	Previous Sample	Present Sample	
		FORWARD	L1	162.1:1	181.30:1	Changed
			L2	107.5:1	120.26:1	---do---
			L3	72.9:1	81.39:1	---do---
			L4	52.4:1	59.21:1	---do---
			H1	44.1:1	49.93:1	---do---
			H2	29.3:1	33.10:1	---do---
			H3	19.9:1	22.42:1	---do---
			H4	14.3:1	16.30:1	---do---
		REV	RL	131.7:1	147.67:1	---do---
			RH	35.9:1	40.66:1	---do---
	Range of speeds (kmph):					
		- Forward	2.74 to 31.15	2.53 to 28.25 (Variation of -9.3 to -7.7%)	Changed	
		- Reverse	3.38 to 12.38	3.12 to 11.30 (Variation of -8.7 to -7.7%)	Changed	
6.	vi)	Additional no. of speed	None	None	No change	



1	2	3	4	5	6
7.	vii)	Fitment of accessories:			
		- Expansion tank	Provided	Provided	No change
		- Additional hydraulic pump	None	None	No change
		- Air compressor	None	None	No change
		- Radiator	Provided	Provided	No change
		- Bare radiator capacity, (l)	1.80	1.65	No change
		-Total coolant capacity	8.10	6.90	No change
		- Oil cooler	None	None	No change
8.	viii)	Steering System type	Mechanical	Hydrostatic	Changed
9.	ix)	Brake system	Oil immersed 2 discs & have brake line area of 472.7 cm ² each side	Oil immersed 3 discs & have brake line area of 692.7 cm ² each side	Changed
10.	x)	Type of actuation system for brake & clutch.	Mechanical	Mechanical	No change
11.	xi)	Provision of accessories	Same configuration in base & Supplementary model.(Refer para 3.1.14.2 & 3.1.16)		--do--
		- Minimum & Maximum heights of towing hook (mm):			
		- Front (fixed)	690	680	Changed
		- Rear	370 to 750	465 to 765	Changed
12.	xii)	Type of three point linkage	Same configuration in base & Supplementary model.(Refer para 3.1.14.1)		No change
13.	xiii)	PTO shaft (s)	Same configuration in base & Supplementary model.(Refer para 3.1.15),except		No change
		Engine to PTO ratio	3.235:1	3.73 & 2.94 for (540E)	Changed
14.	xiv)	Features and Location of Electrical and Instrumentation:			
		Battery (make & Model)	Standard Farukuwa, SFN-88L/TR		No Changed
		Starter (make & Model)	Mico, F002 G20 311	Panalfa,013-2855	Changed
		Generator (make & Model)	Mico Lic, Bosch F002 G10 360 K-1	PMP,7030	Changed
		Instrumentation on panel	Same configuration in base & Supplementary model.		No change
15.	xv)	Tyres size & Ply rating:			
		- Front	6.00-16, 8PR	6.00-16, 8PR	No change
		- Rear (Std. Fitment)	12.4-28, 12PR	13.6-28, 12PR	Changed
16.	xvi)	Type of drive:			
		- 2WD or 4WD	2WD	2WD	No change
17.	xvii)	Sheet metal:			
		Style of bonnet & Fender	Same configuration in base & Supplementary model.		No change
		- Colour	Blue	Blue	No change



1	2	3	4	5	6
		-Decals (Sticker)	New Holland 3510	New Holland 3510	No change
		Fitment of ROPS, Cab & Canopy	Not provided	Not provided	No change
18.	xviii)	Type of hydraulic pump, location, drive, speed	Same configuration in base & Supplementary model, except 3125 rpm @ rated engine speed	1860 rpm @ rated engine speed	No change Changed
19.	xix)	Positioning of Hydraulic Sensing Mechanism	Through top link	Through top link	No change
20.	xx)	Change related to ergonomics, safety comfort, and statutory / regulatory requirements:			
	i)	IS: 10273	Confirmed	Conforms	No change
	ii)	IS: 4931	Confirmed	Conforms	No change
	iii)	IS: 4468	Didn't Confirm	Conforms	Changed
	iv)	IS: 12953	Confirmed	Conforms	No change
	v)	IS:12343	Confirmed	Does not conform	Changed
	vi)	IS:12239 (Pt-I)	Confirmed	Does not conform	Changed
	vii)	IS:12239 (Pt-II)	Didn't Confirm	Does not conform	No change
	viii)	IS:8133	Didn't Confirm	Conforms	Changed
	ix)	IS: 6283	Didn't Confirm	Conforms	Changed
	x)	IS:14683	Confirmed	Conforms	No change
21.	xxi)	Final Reduction:	Same configuration in base & Supplementary model.		No change
22.	xxii)	Type of fuel Injection pump	Inline plunger	Inline plunger	No change
23.	Change related to statutory/ regulatory requirements (As per Table 4):				
	i)	Engine operating principle (spark/compression ignition, two/four stroke)	Compression ignition (four stroke)		No change
	ii)	Number & arrangement of cylinders	Three, vertical inline	Three, vertical inline	No change
	iii)	Declared max PTO power, (kW)	24.3	24.3	No change
	iv)	Engine displacement (cc)	2365	2365	No change
	v)	Rated engine speed, (rpm)	2000	2000	No change



7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 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 present sample meets the requiremen ts (Yes/No.)
				Previou s sample	Present sample	Previou s sample	Present sample	
1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.1	PTO Performance :							
a)	- Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -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	24.3 (D)	24.3 (D)	24.6	23.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	24.3 (D)	24.3 (D)	24.6	23.0	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	265 (D)	265 (D)	272	267	Yes
d)	Maximum operating temperature (°C):							
	1) Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	132 (D)	132 (D)	109	124	Yes
	2) Coolant (water)	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	119 (D)	119 (D)	91	97	Yes
e)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions		2.73 Max. (R)	2.57	0.73	Yes
7.1.2	Power lift and hydraulic pump performance :							
a)	Maximum lifting capacity throughout the range of lift, (kN):							
	1) At hitch points	Non Evaluative	[Tolerance of minus 10%]		10.78 (D)	9.02	8.97	Yes
	2) With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft		9.71 (D) 5.41 (R) Minimum	8.47	7.59	Yes



1	2	3	4	5 a	5 b	6 a	6 b	7
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	13	15	Yes	
7.1.3 Brake performance at 25 kmph:								
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):							
	1) Cold brake	Evaluative	10	10 (R)	6.40	7.37	Yes	
	2) Hot brake	Evaluative	10	10 (R)	7.60	7.57	Yes	
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600 (R) Maximum		320 to 390	204 to 249	Yes	
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever	Evaluative	Yes / No		Yes	Yes	Yes	
7.1.4 Safety features:								
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 Part 2)		--	Meets the requirement	Yes	
b)	Lighting arrangement	Evaluative	As per CMVR		--	Meets the requirements	Yes	
c)	Seating requirements (Tractors having more than 1150 mm track width)	Non Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)		--	Does not meet the requirement	No	
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)		--	Meets the requirements	Yes	
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS 4468 (Part 1) (as amended from time to time)		--	Meets the requirements	Yes	
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS 12953 (as amended from time to time)		--	Meets the requirements	Yes	
	Specifications of swinging drawbar	Non Evaluative	Should meet the requirements of IS 12362 (Part 3) (as amended from time to time)		--	Not provided	NA	



7.1.5 Labelling of tractors: (Present sample)							
	1)	Make	Evaluative	Should conform to the requirements of CMVR along with declared value of PTO HP	--	New Holland	Yes
	2)	Model	Evaluative		--	3510	Yes
	3)	Year of manufacture	Evaluative		--	2016	Yes
	4)	Engine number	Evaluative		--	S324D97875	Yes
	5)	Chassis number	Evaluative		--	NHN35100ZGL372672	Yes
	6)	Declaration of PTO power, kW (Ps)	Evaluative		--	24.3	Yes
17.1.13 Literature (Submission to test agency):							
(a)	Operator manual	Evaluative	Provided/ Not provided	Provided	Provided	Yes	
(b)	Parts Catalogue	Evaluative	Provided/ Not provided	Provided	Provided	Yes	
(c)	Workshop/ Service manual	Evaluative	Provided/ Not provided	Provided	Provided	Yes	

7.1.4 CATEGORY OF BREAKDOWNS/ DEFECTS :						
S. No.	Category of breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed		Whether Present Sample meets the requirement (Yes/No.)
				Previous Sample	Present Sample	
1.	Critical	Evaluative	No critical breakdown	None	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	Mj-14& Mj-16	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	Mn-14 (twice)	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	Four	None	Yes

7.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2014:				
S. No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5
1.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992.	Not provided ROPS not fitted	No Not applicable
2.	Accessories	Trailer hitch, front tow hook may be provided.	Trailer hitch is provided Front tow hook is provided	Yes Yes



7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO Performance:

- i) The max. PTO power was recorded as **23.0 kW** against the declaration of **24.3 kW**, which is within the tolerance limit of IS: 12207-2014.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **267 g/kWh** against the declaration of **265 g/kWh**, which is within the tolerance limit of IS: 12207-2014.
- iii) The backup torque is **18.76%**.

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) There should be provision of PTO master shield to prevent the entrap of loose cloths.
- iii) Differential lock should be provide to work into different field condition
- iv) The working clearance between the position control lever and draft control lever should be provided as per IS: 12239 (Part-2)-1999.

7.5 Maintenance /Service Problems:

No noticeable maintenance or service problem was observed during the test

7.6 Adequacy of Literature supplied with machine:

Following combined literature of New Holland 3510,4010,4510 & ,4710 models were supplied with the test sample for reference during the test.

- a) Operator's manual
- b) Part's catalogue
- c) Service /Repair Catalogue

8. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of test	Whether the report is released within the time frame given in the Citizen Charter	Remark
10 Months	7 Months (January, 2017 to July, 2017)	Yes	None

TESTING AUTHORITY:


RAJNEESH PATEL
 AGRICULTURAL ENGINEER


C.V. CHIMOTE
 TEST ENGINEER


Y.K.RAO
 SENIOR AGRICULTURAL
 ENGINEER


J.J.R. NARWARE
 DIRECTOR

The report compiled by Shri Nitesh Kumar Varna Agricultural Engineer

**9. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
9.1	7.4 (i), (ii), (v), (vi) & 7.5	Your valuable comments & suggestions for improvement 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	--
2.	PTO performance test	12.6
3.	Nominal speed test	1.0
4.	Hydraulic Performance	2.3
5.	Brake test	2.6
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for required Supplementary tests	2.0
	TOTAL:	17.9