

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT (Initial)

संख्या / No. : T-836/1345/2012
माह / Month : July, 2012

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**NEW HOLLAND, NEW HOLLAND 5500
TURBO SUPER 12+3 UG TRACTOR**



भारत सरकार
कृषि मंत्रालय
(कृषि एवं सहकारिता विभाग)



**GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & CO-OPERATION)**
केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५
**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
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**NEW HOLLAND INDIA, 5500 TURBO SUPER 12+3 UG
TRACTOR - Commercial (Initial)**

The firm M/s. New Holland Fiat (India) Pvt. Ltd., Plot No.3, Udyog Kendra, Greater Noida – 201 306, Distt Gautam Budh Nagar (Uttar Pradesh) had submitted New Holland 5500 Turbo Super 12+3 UG tractor model (Now referred as first sample) for Commercial (Initial) testing. During the PTO performance test on this tractor model, the maximum PTO power was observed as 35.0 kW against the applicant's declaration of 37.3 kW. The observed PTO power was 6.2% less than the declaration and does not meet the minimum evaluative requirements of IS: 12207-2008. Looking into this, the firm had requested for withdrawal of the said test sample from the test vide their letter No. PD-L11397 dated 13.10.2011. The applicant's request was accepted by the competent authority and the incomplete test report No. T- 805/1313/2011 was released in November, 2011.

Subsequently, the firm has submitted an application bearing No. PD-L11399 dated 15.10.2011 for commercial testing on the fresh sample. The applicant's request for Initial Commercial testing on fresh sample was accepted by the competent authority. All relevant tests on fresh tractor under Initial commercial test have been conducted and accordingly the test report is released as under:-

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

Test requested by : 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. SPECIFICATIONS**1.1 Tractor:**

Make : New Holland India
Model : 5500 TURBO SUPER 12 + 3 UG
Variants. If any:

S. No.	Variant models*	Variant features
1.	New Holland 3630 TX Turbo Super 12 + 3 UG	With TX Sheet Metal Styling & White Fenders.
2.	New Holland 5500 DT Turbo Super 12 + 3 UG	With Four Wheel Drive Version.

* The variant models have not been tested yet at this Institute.

Type : Four wheeled, Rear-wheel driven,
Standard Agricultural Tractor.
Year of manufacture : 2011 (L1)
Chassis number : 2190367
Country of origin : India



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- 14.5 Front axle:**
 Any marked wear of king pins : None
 Any marked wear of king pin bushes : None
 Clearance between king pin and bushes, (mm) : 0.19 to 0.25 | Against the discard limit of 0.40 mm.
 Condition of bearings for stub axles : Normal
 Condition of king pin bearings : Normal
 Condition of seals for stub axles and king pins : Normal
 Clearance between centre pin and bushes, (mm) : 0.16 to 0.18 | Against the discard limit of 0.50 mm.
- 14.6 Steering system:**
 Visual condition of the components of complete steering assembly : Normal
- 14.7 Starter motor & Alternator:**
 Presence of soil/oil in housing : None
 Condition of bearings and other components : Normal

15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

Sl. No.	Adjustments/Defects/Breakdowns and Repairs	Tractor run hours
1.	After completion of the 10 hour drawbar test, the RHS rear tyre was found punctured due to creeping of tyre over the rim. So, the RHS rear wheel tube was replaced with new one.	42.9
2.	During Haulage test with four wheel trailer, leakage of oil was observed in between differential and hydraulic housing.	60.5

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6	7
16.1.1	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 >35hp. -7.5/+10% for PTO power ≤ 35 hp	37.3 (D)	38.9	Yes
b)	Power at rated engine speed. (kW)	Non Evaluative	-do-	37.3 (D)	38.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+ 5%	270 (D)	271	Yes



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1	2	3	4	5	6	7
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	195.4 (D)	211.8	No
e)	Back-up torque, percent	Non Evaluative	7 percent, min.	25 (D)	22.5	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)	120	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)	103	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.76 Maximum (R)	0.15	Yes
h)	Smoke level	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 per meter Maximum (R)	1.60	Yes
16.1.2	Drawbar performance :					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	20.8 (D)	28.79	Yes
				21.10(R) Minimum		
b)	Max. drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor with standard ballast	13.70 (D)	20.01	Yes
				14.15 (R) Minimum		
c)	Maximum drawbar power with standard ballast, (kW).	Evaluative	Min. 80% of PTO power as referred in 17.1.1 (a) of PTO performance	29.8 (D)	33.4	Yes
				31.1 (R) Minimum		
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132 (D)	85	Yes
16.1.3	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%]	12.75 (D)	12.57	Yes



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1	2	3	4	5	6	7
	2) With the standard frame	Evaluative	The lift capacity should at least be 18 kg/PTO hp. and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	9.81 (D) 9.21 (R) Minimum	10.08	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes. (mm)	Non Evaluative	[Tolerance of plus 5 [mm]	50 (D) Maximum	40	Yes
16.1.4 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)	7.33	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.41	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R) Maximum	211 to 318	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
16.1.5 Noise measurement :						
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88(R)	83	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	98(R)	97	Yes
16.1.6 Amplitude of mechanical vibrations at:						
	1) Left foot rest	Non Evaluative	100 microns (max)	100(R)	100	Yes
	2) Right foot rest				90	Yes
	3) Seat (with driver seated)				60	Yes
	4) Steering wheel				100	Yes
16.1.7 Haulage requirements :						
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non Evaluative	--	6.0 (D)	6.0	Yes
	2) Four wheel		--	8.0 (D)	8.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	5 to 6(D)	3.04 to 3.08	No
	2) Four wheel		--	4 to 5(D)	3.18	No

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c)
16.1.8
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a)
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16.1.10
16.1.11
a)
b)
c)
d)

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1	2	3	4	5	6	7
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	34 to 36(D)	54.2 to 54.9	No
	2) Four wheel		--	29 to 31(D)	39.3	No
16.1.8	Wetland cultivation :					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and/or mud (R)	No ingress of mud and/or water was observed	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
16.1.9	Safety features :					
a)	Guards against moving and hot parts	Evaluative	As per CMVR	At present no requirements	Provided	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	--	Provided	Yes
16.1.10	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 India	Yes
	2) Model	Evaluative		--	5500 Turbo Super 12+3 UG	Yes
	3) Year of manufacture	Evaluative		--	L110	Yes
	4) Engine number	Evaluative		--	080845DT	Yes
	5) Chassis number	Evaluative		--	2190367	Yes
	6) Declaration of PTO power, (kW) (Ps)	Evaluative		--	37.3 (50.7)	Yes
16.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer	104.204 (D)	104.01 to 104.02	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.50 (D)	0.149 to 0.157	Yes
(c)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	1.15(D)	0.35 to 0.65	Yes
	- 2 nd comp. ring.		-do-	1.32(D)	0.35 to 0.65	Yes
	- Oil ring.		-do-	1.80(D)	0.35 to 0.65	Yes
(d)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	--	Taper rings	--
	- 2 nd comp. ring.		-do-	0.25 (D)	0.065 to 0.068	Yes
	- Oil ring.		-do-	0.25 (D)	0.066 to 0.076	Yes



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1	2	3	4	5	6	7
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	To be specified by the manufacturer	0.50 (D)	0.094 to 0.114	Yes
	- Crankshaft end float	Evaluative		0.50 (D)	0.19	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.50 (D)	0.065 to 0.087	Yes
	- Axial	Evaluative	-do-	0.75 (D)	0.35	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.40 (D)	0.19 to 0.25	Yes
(h)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	0.50 (D)	0.16 to 0.18	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	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

16.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008:				
S. No.	Characteristic	Requirements as per IS: 12207-2008	As observed	Remarks
1	2	3	4	5
1	Air cleaner oil pull over, max. oil pull over (%)	0.25% (max.)	Not applicable	--
2.	Seating requirements	Should meet the requirements of IS: 12343-1998	Meets the requirement	Yes
3.	Fitment of ROPS	With a provision for fitment of ROPS.	Not provided	No
		If ROPS fitted it should meet the requirement of IS: 11821-1992	ROPS not fitted	--
4.	Technical requirements for PTO shaft	Should meet the requirements of IS: 4931 -1995	Does not meet the requirements	No
5.	Dimensions of three point linkage	Should meet the requirements of IS: 4468 (Part-I)-1997	Does not meet the requirements	No

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1	2	3	4	5
6.	Specifications of linkage drawbar	Should meet the requirements of IS: 12953-1990.	Meets the requirements	Yes
	Specification of swing-ing drawbar	Should meet the requirements of IS: 12362 Part 3-1994.	Not provided	--
7.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Provided	Yes

16.3 Conformity with following IS:

- i) Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS: 10273-1987 (Reaffirmed in March, 2009)] : **Conforms**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)]. : **Does not conform**
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I):1997 (Reaffirmed in March, 2007)/ISO 730-1:1994] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)]. : **Conforms**
- v) Agricultural tractors – Operator's seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed in March, 2009)]. : **Conforms**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1)-1996 (Reaffirmed in March, 2009)/ISO 4254-1:1989]. : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) IS 12239 (PT-2)-1999 (Reaffirmed in March, 2009)]. : **Does not conform**
- viii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) –2006 & 2007(Reaffirmed in March, 2009)/ ISO 3767-2:1991]]. : **Conforms**
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, 2009)]. : **Conforms**
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)] : **Conforms**



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**NEW HOLLAND INDIA, 5500 TURBO SUPER 12+3 UG
TRACTOR - Commercial (Initial)****16.4 Salient Observations:****16.4.1 Laboratory tests:****16.4.1.1 PTO Performance:**

- i) The backup torque is 22.5%.
- ii) The specific fuel consumption corresponding to maximum power was recorded as 271 g/kWh against the declaration of 270 g/kWh, which is within the tolerance limit.
- iii) The maximum equivalent crankshaft torque was observed as 211.8 Nm against the declaration of 195.4 Nm and which does not meet the requirement of IS: 12207-2008 with regard to tolerance. This should be looked into for necessary corrective action.

16.4.1.2 Drawbar performance:

- i) During 10 hour drawbar test, creeping of LHS & RHS rear tyre over the rims was observed as 25 mm & 100 mm respectively, which was considered on higher side. This may be looked into for necessary corrective action.
- ii) After completion of the 10 hour drawbar test, the RHS rear tyre was found punctured due to creeping of tyre over the rim. So, the RHS rear wheel tube was replaced with new one.

16.4.1.3 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter – 9 of this test report is on higher side, especially at the steering control wheel foot rest and operator's seat. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

16.4.1.4 Three point linkage:

- i) The width of ball of upper hitch points conforms to category-I whereas the diameter of hitch pin holes conforms to category-II. Therefore, it is recommended that, both should be provided as per category-I or Category-II.
- ii) The distance from end of power take-off to the centre of lower hitch point (lower link in horizontal position) does not meet the requirement of IS: 4468 (Part-1)-1997. This should be looked into for necessary corrective action.

16.4.1.5 Specifications of Power Take Off Shaft:

The dimensions 'dø' of the Power take-off shaft does not meet the requirement of IS: 4931-1995. This should be looked into for necessary corrective action.

16.4.1.6 Location and operation of operator's control:

Working clearance between gear shift lever (when engaged in reverse gear) and the mudguard does not meet the requirement of the IS: 12239 (Part-2)-1996. This should be looked into for necessary corrective action.

16.4.2 Field performance:**16.4.2.1 Haulage Performance:**

- i) The distance travelled / litre of fuel consumption with two wheel and four wheel trailer was observed as 3.04 to 3.08 and 3.18 km/l against the declaration of 5.00 to 6.00 and 4.00 to 5.00 km/l respectively. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.
- ii) The specific fuel consumption with two wheel and four wheel trailer was recorded as 54.2 to 54.9 and 39.3 ml/km/tonne against the declaration of 34.0 to 36.0 and 29.0 to 31.0 ml/km/tonne respectively. This does not meet the requirement of IS: 12207-2008 and therefore, should be looked into for necessary corrective action.

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16.4.2

16.5

16.6

16.7

16.7.1

16.7.2

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**16.4.2.2 Wetland cultivation (Puddling operation):**

No ingress of mud or water was noticed during puddling operation of the tractor and thus meets the requirement of IS 11082-1984 (Technical requirements of agricultural tractors for wetland operation). Therefore, the tractor is recommended suitable for wetland operation (Puddling).

16.5 Maintenance / Service Problems:

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

16.6 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) Provision of PTO shaft master shield.

16.7 Adequacy of Literature:

16.7.1 The following literatures were supplied with the test tractor for reference during the test:-

- a) Operator's manual (For 7500,6500 & 5500 Turbo Super model tractors)
- b) Service Manual (For 7500,6500 & 5500 Turbo Super model tractors)
- c) Service Parts catalogue (For 7500,6500 & 5500 tractor models)
- d) Service Parts catalogue Trem 3A Supplementary (For 3630,5500,6500 & 7500 tractor models)

16.7.2 Information on variant models & their feature at a glance shall also be included in the operator's manual.

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

TESTING AUTHORITY:

C. V. CHIMOTE
TEST ENGINEER

P. K. VERMA
SENIOR AGRICULTURAL ENGINEER

V.N. KALE
DIRECTOR

Test Report compiled by **Shri Pramod Yadav**, Senior Technical Assistant.



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17. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
17.1	1.14.2 & 16.3 (ii)	These aspects are further being looked into & will take appropriate actions to eliminate these deviations soon wherever necessary.
17.2	1.13.2 & 16.3 (iii)	
17.3	1.20.4 & 16.3(vi)	
17.4	1.20.5 & 16.3(vi)	
17.5	16.7.2 & 16.7.3	

ANNEXURE - I**BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

S. No.	Item	Disc Plough	Rotavator
1.	Make	Field King	Shaktimaan
2.	Type	Mounted	Mounted
3.	No. of bottoms/blades	Three	48, in 9 flanges
4.	Type of bottoms/blades	Plain Concave	Hatchet
5.	Size of bottoms/blades,(mm)	525	130 x 70 x 5
6.	Spacing of bottoms/flanges,(mm)	520	245
7.	Lower hitch point span,(mm)	855	835
8.	Mast height (mm)	440	610
9.	Overall dimensions,(mm):		
	- Length	2030	1115
	- Width	1360	2040
	- Height	1200	1130
10	Gross mass, (kg)	380	525

ANNEXURE - II**BRIEF SPECIFICATION OF FULL CAGE WHEEL**

S. No.	Item	Specification
1.	Type	Full cage wheel
2.	Dia, (mm)	1280
3.	Width, (mm)	850
4.	No. and types of lugs	24, straight lugs made of M.S. angle section, welded to angle iron frame.
5.	Size of angle section,(mm)	50 x 50 x 6
6.	Length of lugs, (mm)	425
7.	Spacing of lugs, (mm)	160
8.	Weight of each cage wheels (kg)	145

**ANNEXURE - III****TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	—
2.	PTO performance test	13.1
3.	Power lift and hydraulic pump performance test	1.8
4.	Drawbar performance test	16.5
5.	Turning ability	0.1
6.	Location of centre of gravity	0.1
7.	Operator's field of vision	0.0
8.	Brake test	1.5
9.	Noise measurement	1.5
10.	Mechanical vibration test	1.0
11.	Theoretical speed test	1.0
B.	FIELD TEST:	
1.	Disc ploughing	11.0
2.	Rotavation	10.2
3.	Puddling (including 5.0 hours water proof test)	15.1
C	HAULAGE TEST	9.0
D.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	8.7
	TOTAL:	93.1