

OECD Approval No. : 2/3 155

Date of approval : 04th of July 2019

**Report on test in accordance with
OECD STANDARD CODE 2
for the Official Testing of Agricultural and Forestry Tractors**



Agricultural Tractor Make : **Escorts Limited**
Model : **FARMTRAC 26**
Type : **4WD (B96RM < 20 km/h Speed)**

Manufactured by : **M/s. Escorts Limited,**
Plot No. 2 & 3, Sector – 13
FARIDABAD (HARYANA) – 121 007,
INDIA

Submitted for test by : **The manufacturer**

Report No. : **T-1259/1786/61/OECD/2019**

Date : **July, 2019**

GOVERNMENT OF INDIA
Ministry of Agriculture and Farmers Welfare,
(Department of Agriculture, Cooperation and Farmers Welfare)
Mechanization and Technology Division
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
P.O. Tractor Nagar, BUDNI (M.P.) – 466 445 INDIA

E-mail: fmti-mp@nic.in Web site: <http://www.fmttibudni.gov.in>

This is a report on a tractor test in accordance with **OECD STANDARD CODE 2** for the Official Testing of Agricultural and Forestry Tractors.

It does not contain an evaluation of the tractor on practical work.

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In this report unit of all performance characteristics are given corresponding to the International system of units.

The relationship to the Technical System of Units is given by the following conversions:								
Force	1	kN	=	1000	N	=	102	kgf
Power	1	kW	=	1000	W	=	1.36	Ps
Pressure	1	MPa	=	10	bar	=	10.2	kgf/cm ²
	100	kPa	=	1000	mbar	=	750.1	mm of Hg

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Statement

The information opposite each item in the specification portion of this report has been validated by the Testing Station. An item marked [C] indicates to the test report user that the information declared by the manufacturer has been checked whereas an item marked [D] indicates that the manufacturer's declaration has been endorsed.

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[C]	Tractor manufacturer's name and address	:	M/s. Escorts Limited, Plot No. 2 & 3, Sector – 13 FARIDABAD (HARYANA) – 121 007, INDIA
[D]	Location of tractor assembly	:	M/s. Escorts Limited, Plot No. 2 & 3, Sector – 13 FARIDABAD (HARYANA) – 121 007, INDIA
[D]	Submitted for test by	:	The manufacturer
[C]	Selected for test by	:	Testing Authority in the agreement with the manufacturer.
[D]	Place of running-in	:	M/s. Escorts Limited, Plot No. 2 & 3, Sector – 13, FARIDABAD (HARYANA) – 121 007, INDIA
[D]	Duration of running-in	:	50 hours
[C]	Location of test	:	Government of India, Central Farm Machinery Training and Testing Institute, P.O.- Tractor Nagar, BUDNI – 466 445 (M.P.), INDIA
[C]	Code version	:	OECD Standard Code 2 (February, 2019)

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1 Denomination

[C]	Make of tractor	:	Escorts Limited
[C]	Model (trade name)	:	FARMTRAC 26
[C]	Type	:	4WD, Agricultural tractor

1.1.2 Numbers:

[D]	1 st Serial No. or prototype	:	M6SB96RMMBF417112
[C]	Serial No.	:	M6SB96RMJBF437544

1.1.3 Other specification (if applicable):

[D]	Model(s) for other countries	:	Not announced
[C]	Transmission type or gears x ranges	:	Mechanical, constant mesh, 9 Forward, 3 Reverse
[C]	Speed version	:	< 20 km/h
[D]	Manufacturer identification or Technical type no.	:	B96RM

1.2 Engine:

[C]	Make	:	Mitsubishi Heavy Industries, VST Diesel Engines Pvt. Ltd.
[C]	Model	:	MVS3L2-Z362ET
[C]	Type	:	Four stroke, water cooled, indirect injection, diesel engine.
[C]	Serial No.	:	A17257 G8

1.2.1	Cylinders:		
[C]	Number/disposition	:	Three, vertical, in-line
[D]	Bore/Stroke	:	78 / 92 mm
[D]	Capacity	:	1318 cm ³
[D]	Compression ratio	:	22 (±5%) : 1
[D]	Arrangement of valves	:	Overhead
[D]	Cylinder liners	:	Wet, replaceable
1.2.2	Supercharging	:	Not applicable
1.2.3	Fuel system:		
[C]	Fuel feed system	:	Electronically operated
	Filter(s):		
[C]	Make	:	Not available
[C]	Model	:	Not available
[C]	Type	:	Spin-on paper element
[C]	Number(s)	:	One
[D]	Capacity of fuel tank	:	23.8 dm ³
	Injection pump:		
[C]	Make	:	Denso Japan
[C]	Model	:	8440
[C]	Type	:	Plunger, in-line
[C]	Serial Number	:	03B29 0455
	Manufacturer's production setting of injection pump:		
[C]	Flow rate (rated engine speed & full load)	:	5.72 dm ³ /h
[D]	Timing	:	17° ± 1 degree before TDC
	Injectors:		
[D]	Make	:	Nippon Denso, Japan
[D]	Model	:	DN15 PD-6
[D]	Type	:	Pintle
[D]	Injection pressure	:	14.22 MPa
1.2.4	Governor:		
[C]	Make	:	NHI, JAPAN
[C]	Model	:	Inbuilt with fuel Injection pump
[C]	Type	:	Mechanical, variable speed
[C]	Governed range of engine speed	:	970 to 2930 rev/min
[C]	Rated engine speed	:	2700 rev/min.
1.2.5	Air cleaner:		
	Pre-cleaner	:	Not available

Main cleaner:

[C]	Make	:	Donaldson
[C]	Model	:	Not available
[C]	Type	:	Dry
[C]	Location of air intake	:	On RHS of engine, under the bonnet
[C]	Maintenance indicator	:	Warning light on dash board

1.2.6 Lubrication System:

[D]	Type of feed pump	:	Gear
[C]	Type of filter(s)	:	Spin on
[C]	Number of filter(s)	:	One

1.2.7 Cooling System:

[C]	Type of coolant	:	Water (with coolant)
[D]	Type of pump	:	Semi open, centrifugal pump

Specification of fan:

[C]	Number of fan blades	:	7
[C]	Fan diameter	:	380 mm
[C]	Total Coolant capacity	:	4.9 dm ³
[C]	Type of temperature control	:	Thermostat
[D]	Over pressure system	:	88 kPa

1.2.8 Starting system:

[C]	Make	:	SPARK MINDA
[C]	Model	:	2878 H
[C]	Type	:	Electrical, solenoid operated
[D]	Starter motor power rating	:	1.8 kW
[C]	Cold starting aid	:	None
[C]	Safety device	:	i) Starter will not operate unless the High-Low range shifter lever is in neutral position. ii) Tractor will not start unless the operator is on seat.

1.2.9 Electrical System:

[C]	Voltage	:	12V
	Generator:		
[C]	Make	:	SPARK MINDA
[C]	Model	:	EP 1815.5AC 25
[C]	Type	:	Alternator
[D]	Power	:	12V, 42Amps @ 6000 rev/min
	Battery:		
[C]	Number	:	One
[D]	Rating	:	12V, 65 Amp at 20 hours discharge rate

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1.2.10 Exhaust System:
 [C] Make : Farmtrac
 [C] Model : D10551000
 [C] Type : Horizontal, cylindrical (Downdraft)
 [C] Location : On LHS of engine

1.2.11 Reagent Injection System : Not applicable

1.2.12 Diesel Particulate Filter : Not applicable

1.3 Transmission:

1.3.1 Clutch (Travel alone):

[D] Make : Luk India
 [D] Model : Not announced
 [D] Type : Dry, single clutch
 [D] Number of plate(s) : one
 [D] Diameter of plate(s) OD/ID : 224/150 mm
 [C] Method of operation: : LHS foot operated, by pressing the clutch pedal fully

1.3.2 Gear Box:

[D] Make : Escort Limited
 [D] Model : S8BW3PN
 [D] Type : Constant mesh

	Description:	Forward	Reverse
[C]	Number of gears	3	1
[C]	Number of ranges	3 ('L' 'M' & 'H')	3 ('L' 'M' & 'H')
[C]	Total of arrangements	9	3

'L' = LOW; 'M' = MEDIUM; 'H' = HIGH

[D] Available options : None

1.3.3 Rear axle and final drives:

[D] Make : Escorts
 [D] Model : Not announced
 [D] Type : Crown wheel and bevel pinion with differential unit.

Differential lock:

[D] Type : Dog clutch
 [C] Method of engagement : By depressing a pedal, on RHS
 [C] Method of disengagement : By releasing the above pedal

1.3.4 Front axle:

Front axle and final drives:

[D] Make : Escorts
 [D] Model : Not announced
 [D] Type : Bevel-pinion
 - Differential lock : Not available

1.3.5 Total ratios and traveling speeds:

	Movement	GEAR	RANGE	Number of engine revolutions for one revolution of the driving wheels	Nominal traveling speed (*) at rated engine speed of 2700 rev/min, (km/h)
[C]	Forward	1	L	354.67	1.21
[C]		2	L	251.09	1.70
[C]		3	L	140.65	3.04
[C]		1	M	111.83	3.82
[C]		2	M	79.18	5.40
[C]		3	M	44.28	9.65
[C]		1	H	56.44	7.57
[C]		2	H	39.94	10.71
[C]		3	H	22.38	19.08
[C]	Reverse	1	L	306.64	1.39
[C]		2	M	96.61	4.43
[C]		3	H	48.87	8.75

'L' = LOW; "M" = MEDIUM; 'H' = HIGH

* Calculated with a tyre dynamic radius index of 420 mm (ISO: 4251-1:2005)

[C] **Number of revolutions of front wheels for one revolution of rear wheels** : 1.463

1.4 Power take-off:**1.4.1. Main Power Take-Off:**

[C] Type : Not Independent
 [C] Method of engagement : By a separate PTO hand operated lever
 [C] Number of shafts : One
 [C] Method of changing power take-off shaft ends and speeds : Not available

1.4.1.1 Power take-off proportional to engine speed:**Power take-off at 540 (rev/min):**

[C] - Location : At rear of tractor
 [C] - Diameter of power take-off shaft end : 34.79 mm
 [C] - Number of splines : 6, conformity with ISO:500- 3 :2004
 [C] - Height above ground : 480 mm
 [C] - Distance from the median plane of the tractor : 0 mm
 [C] - Distance behind rear-wheel axis : 265 mm
 [C] - PTO speed at rated engine speed : 582 rev/min

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- [C] - Engine speed at standard power take-off speed : 2503 rev/min
- [C] - Ratio of rotation speeds (Engine speed/ PTO speed) : 4.636 : 1
- [D] - Power restriction : **None**
- [D] Maximum torque transmissible : 320 Nm
- [C] Direction of rotation (viewed from rear of tractor) : Clockwise

1.4.1.2 Other Power take-off proportional to rated engine speed:

- [C] - Location : At rear of tractor
- [C] - Diameter of power take-off shaft end : 34.79 mm
- [C] - Number of splines : 6, conformity with ISO:500– 3 :2004
- [C] - Height above ground : 480 mm
- [C] - Distance from the median plane of the tractor : 0 mm
- [C] - Distance behind rear-wheel axis : 265 mm
- [C] - PTO speed at rated engine speed : 716 rev/min
- [C] - Ratio of rotation speeds (Engine speed/ PTO speed) : 3.769 : 1
- [C] Direction of rotation (viewed from rear of tractor) : Clockwise

1.4.1.3 Power take-off proportional to ground speed : None

1.4.2 Optional power take-off : None

1.5 Hydraulic power-lift:

- [C] Make : Mita
- [C] Model : Not announced
- [C] Type of hydraulic system : Open centre, live
- [C] Type and number of cylinders : Single acting, one
- [C] Type of linkage lock for transport : Shut-off valve in close position act as a transport lock
- [D] Relief valve pressure setting (tolerance) : 18.63 ± 0.98 MPa
- [D] Opening pressure of cylinder safety valve : 22.5 Mpa
- [D] Lift pump type : Gear type
- [D] Transmission between pump and engine : Gear drive
- [C] Number and Type of filter(s) : One and spin on
- [C] Site of oil reservoir : Differential housing

[C] **Type, number and location of tapping points:**

- Type : Quick coupling
- Number : Two
- Location : Behind the operator's seat
- Maximum volume of oil available to external cylinders : 16.0 dm^3

1.6 Three point linkage:

- [C] Category : 1N (Not in conformity with category 1 of ISO 730 : 2009/Amd.1:2014)
- [C] Category adapter : None

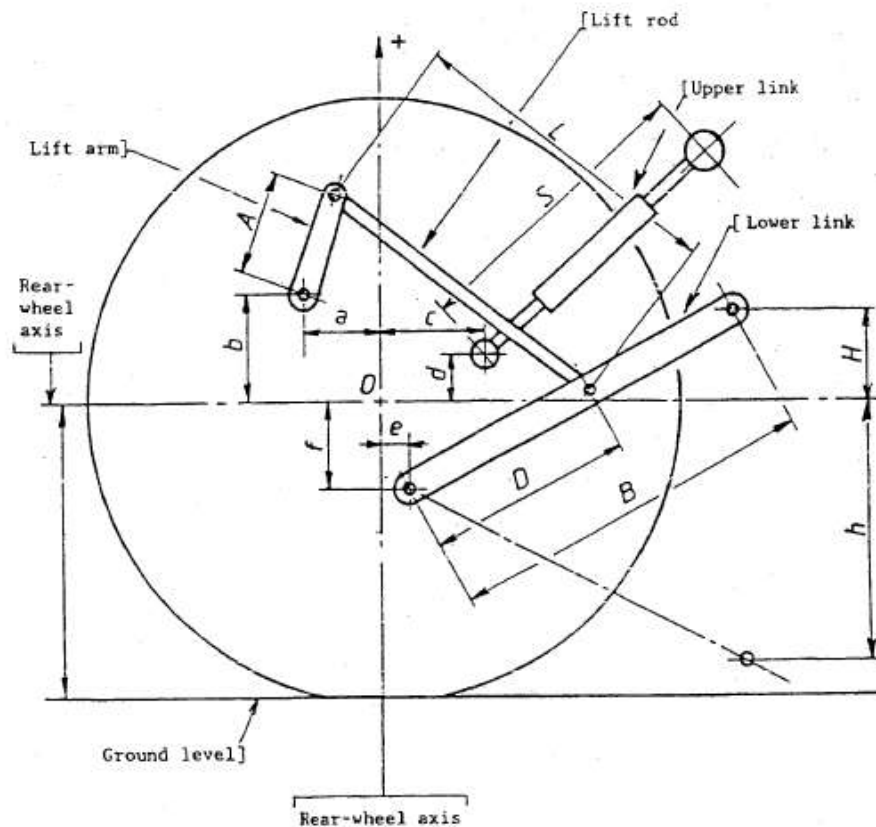


Fig. 1 .1

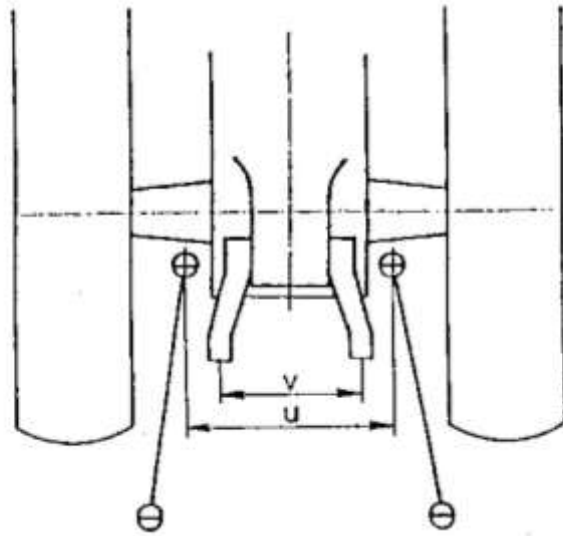


Fig. 1.2

Table: Linkage Geometry dimensions (Ref. fig. 1.1 & 1.2):

(1)	(2)	(3)	Dimension or range, (mm)	Settings used during test, (mm)
(1)	(2)	(3)	(4)	(5)
[C]	Length of lift arms:	(A)	200	200
[C]	Length of lower links:	(B)	570	570
	Distance of lift arm pivot point from rear-wheel axis:			
[C]	- Horizontally	(a)	95, behind	95, behind
[C]	- Vertically	(b)	300, above	300, above
[C]	Horizontal distance between the 2 lower link points:	(u)	340	340
[C]	Horizontal distance between the 2 lift arm end points:	(v)	270	270
[C]	Length of upper link:	(S)	370 to 540	450
	Distance of upper link pivot point from rear wheel axis:			
[C]	- Horizontally	(c)	230, behind	230, behind
[C]	- Vertically	(d)	270, above	270, above
	Distance of lower link pivot point from rear wheel axis:			
[C]	- Horizontally	(e)	110, Behind	110, Behind
[C]	- Vertically	(f)	85, below	85, below
[C]	Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	250, 305, 345	250

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(1)	(2)	(3)	(4)	(5)
[C]	Length of lift rods:	(L)	390 to 480	395
	Height of lower hitch points relative to the rear-wheel axis:			
[C]	- in low position	(h)	– 385 to – 130	220
[C]	- in high position	(H)	20 to 205	200
[C]	Height above ground of lower hitch points when locked in transport position (*)	--	Any height within lift range	

(*) Assuming r = 420 mm, tyre dynamic radius index of ISO: 4251-1:2005 (pneumatic tyred tractors only).

1.7 Swinging drawbar:

[C]	Type	:	Clevis
[C]	Height above ground	:	360 mm (Fixed)
[C]	Type of adjustment	:	None
[C]	Distance of hitch point from rear-wheel axis, horizontally	:	520 mm & 620 mm
	Distance of hitch point from power take-off shaft end		
[C]	- Vertically	:	255 mm
[C]	- Horizontally	:	255 mm & 355 mm
	Lateral adjustment (centre of clevis)		
[C]	- Right hand	:	110 mm
[C]	- Left hand	:	95 mm
[C]	Distance of pivot point from rear-wheel axis, horizontally	:	230mm
[C]	Diameter of drawbar pin hole	:	20.95 mm
[D]	Maximum vertical permissible load	:	2.70 kN

1.8 Trailer hitch: : Not provided

1.9 Holed drawbar:

[C]	Number of holes	:	5
[C]	Distance between holes	:	80.2 mm
[C]	Hole diameter	:	25.15 mm
[C]	Thickness / Width of drawbar	:	40.2 mm / 75.4 mm
[C]	Height above ground:		
	- Minimum	:	35 mm
	- Maximum	:	625 mm
[C]	Horizontal distance to power take-off shaft end (rear)	:	410 mm

1.10 Steering:

[D]	Make	:	Ognibene power
[D]	Model	:	Not announced
[D]	Type	:	Hydrostatic power steering
[D]	Method of operation	:	Manual, through steering control wheel
[D]	Pump(s)	:	Through timing gears
[D]	Ram(s)	:	Reciprocating
[D]	Working pressure	:	9.41 ± 0.49 Mpa

1.11 Brakes:**1.11.1 Service brake:**

[D]	Make	:	M/s. BIL
[D]	Model	:	Not announced
[D]	Type	:	Oil immersed, multi discs
[C]	Method of operation	:	Mechanical, Independent or coupled pedal operation
[C]	Trailer braking take-off (hydraulic or air brake)	:	None

1.11.2 Parking brake:

[C]	Type	:	Pawl and ratchet arrangement
[C]	Method of operation	:	Manual, by a hand lever

1.12 Wheels:

	Number		
[C]	Front	:	Two (driving & steering)
[C]	Rear	:	Two (driving)
[C]	Wheel base	:	1540 mm

Track width adjustment:

		Minimum [mm]	Maximum [mm]	Adjustment method
[D]	Front	865	1015	Reversing wheels
[D]	Rear	710	1000	Reversing wheels and offset lug rims

1.13 Protective structure:

[C]	Make	:	Escorts Limited
[C]	Model	:	Two post foldable
[C]	Type	:	Rear roll bar
[C]	Manufacturers name and address	:	M/s. Escorts Limited, Plot No. 2 & 3, Sector – 13 FARIDABAD (HARYANA) – 121 007, INDIA
[C]	Protective device	:	Roll
[C]	Tiltable / not tiltable	:	Tiltable

OECD approval:

[C]	Approval number	:	Not tested
[C]	Date of approval	:	Not applicable
[C]	Number of minor modification certificates, if any	:	Not applicable

1.14 Seat:**1.14.1 Driver's seat:**

[C]	Make	:	Star seating system
[D]	Model	:	None
[C]	Type	:	Cushioned
[C]	Seat and steering wheel reversible	:	No
[C]	Type of suspension	:	Two helical coil springs
[C]	Type of dampening	:	Hydraulic shock absorber

Range of adjustment:

[C]	Longitudinally	:	90 mm
[C]	Vertically	:	60 mm
[C]	Safety belt	:	Provided

1.14.2 Optional driver's seat(s) : Not provided

1.14.3 Passenger seat : Not provided

1.15 Lighting:

		Height of centre above ground	Size	Distance from outside edge of lights to median plane of tractor
		[mm]	[mm]	[mm]
[C]	Head lights	930	70 Ø	305
[C]	Side lights	940	50 x 80	125
[C]	Rear lights	955	50 x 80	148
[C]	Reflectors	910	55 x 55	275

2. TEST CONDITIONS

2.1	Overall dimensions (unballasted tractor):			
Length [mm]	Width		Height at top of	
	Minimum [mm]	Maximum [mm]	Protective Structure [mm]	Exhaust pipe [mm]
2730	915	1150	2230	610

2.2 Ground clearance (unballasted tractor) : 302 mm
Clearance – limiting part : At brake actuating linkage

2.3 Tractor Mass:

		Unballasted	
		Without driver	With driver
		[kg]	[kg]
Front	430	445	
Rear	600	660	
Total	1030	1105	

2.4 Tyres and track width specifications:

Tyres	Front	Rear
- Dimensions	6.00 – 12	8.30 – 20
- Ply rating	6	6
- Type	Pneumatic, traction	Pneumatic, traction
- Maximum load (tyre manufacturer's)	4.00 kN	6.95 kN
- Maximum load (tractor manufacturer's)	4.00 kN	6.95 kN
- Inflation pressure (tyre manufacturer's)	215 kPa	85 kPa
- Dynamic radius index	260	420
- Chosen track width	865 mm	830 mm

2.5 Fuel:

Type : High speed diesel conforming to IS:1460-2005
 Density at 15 °C : 0.836 g/cm³

2.6 Oils and lubricants:**2.6.1 Capacity and change interval:**

	Capacity, (dm ³)	Oil change, (h)	Filter change, (h)
1	2	3	4
Engine oil sump	3.1	First change after 50 hours of operation and subsequently after every 500 hours of operation.	First change after 50 hours of operation and subsequently after every 500 hours of operation.
Gear box, differential, rear axle, rear final drive, hydraulic, brake and steering system	16.0	After every 1200 hours of operation	Not applicable
Front axle & Front final drive	3.0	After every 1200 hours of operation.	Not applicable

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2.6.2 Specifications:

	Recommended	Used during test
Engine:		
Type	Servo ultra 40E	As recommended
Viscosity	146.28 cSt at 40°C 14.15 cSt at 100°C	
Classification	API CI-4 Plus/SL	
Transmission:		
Type	Universal transmission oil	As recommended
Viscosity	96.7(typ) at 40°C 10.5 to 12.5 at 100°C	
Classification	SAE 20W40	
Hydraulic fluid , Rear axle and final drive (rear) oil:		
Type	Universal transmission oil	As recommended
Viscosity	96.7(typ) at 40°C 10.5 to 12.5 at 100°C	
Classification	SAE 20W40	
Steering oil :		
Type	Universal transmission oil	As recommended
Viscosity	96.7(typ) at 40°C 10.5 to 12.5 at 100°C	
Classification	SAE 20W40	
Front axle oil:		
Type	GEAR OIL XP80W	As recommended
Viscosity	98.15(typ) at 40°C 10.73 at 100°C	
Classification	API GL-5	
Final drive oil (front):		
Type	GEAR OIL XP80W	As recommended
Viscosity	98.15(typ) at 40°C 10.73 at 100°C	
Classification	API GL-5	

2.6.3 Grease:

Number of lubricating points:

Grease nipples : 07 Nos.
Grease cups : Not available

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3. COMPULSORY TESTS RESULTS

3.1 Main power take-off test:

Date and location of tests : 16.04.2019, CFMTTI, BUDNI (M.P.), India

Type of dynamometer bench : SAJ AG- 250, Eddy current

Power, (kW)	Speed			Fuel consumption			Specific Energy, (kWh/l)
	Engine	PTO	Fan	Hourly		Specific	
	(rev/min)			(kg/h)	(l/h)	(g/kWh)	
1	2	3	4	5	6	7	8
3.1.1 Maximum Power – One-Hour Test:							
14.5	2503	540	3354	4.56	5.45	314	2.66
3.1.2 Power at Rated Engine Speed (2700 rev/min) :							
14.2	2698	582	3615	4.79	5.72	337	2.48
3.1.3 Standard Power Take-Off Speed [540 ± 10 (rev/min)] :							
14.5	2503	540	3354	4.56	5.45	314	2.66
3.1.4 Part Loads:							
3.1.4.1 The torque corresponding to maximum power at rated engine speed :							
14.2	2698	582	3615	4.79	5.72	337	2.48
3.1.4.2 85 % of torque obtained in 3.1.4.1 :							
12.4	2782	600	3728	4.45	5.32	359	2.33
3.1.4.3 75 % of torque defined in 3.1.4.2 :							
9.5	2814	607	3771	3.79	4.53	400	2.10
3.1.4.4 50 % of torque defined in 3.1.4.2 :							
6.4	2842	613	3808	3.15	3.77	492	1.70
3.1.4.5 25 % of torque defined in 3.1.4.2 :							
3.3	2879	621	3858	2.58	3.08	782	1.08
3.1.4.6 Unloaded :							
0.2	2921	630	3914	2.07	2.48	10350	0.08

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1	2	3	4	5	6	7	8
3.1.5 Part Loads at Standard Power Take-Off Speed [540± 10 (rev/min)] :							
3.1.5.1 The torque corresponding to maximum power :							
14.5	2503	540	3354	4.56	5.45	314	2.66
3.1.5.2 85 % of torque obtained in 3.1.5.1 :							
12.7	2564	553	3436	4.15	4.96	327	2.56
3.1.5.3 75 % of torque defined in 3.1.5.2 :							
9.7	2605	562	3491	3.52	4.21	363	2.30
3.1.5.4 50 % of torque defined in 3.1.5.2 :							
6.6	2638	569	3535	2.91	3.48	441	1.90
3.1.5.5 25 % of torque defined in 3.1.5.2 :							
3.3	2680	578	3591	2.33	2.79	706	1.18
3.1.5.6 Unloaded :							
0.2	2726	588	3653	1.82	2.18	9100	0.09
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS							
3.1.6.1 Maximum power at rated engine speed:							
14.2	2698	582	3615	4.79	5.72	337	2.48
3.1.6.2 80% of power obtained in 3.1.6.1 at max. speed setting :							
11.4	2796	603	3747	4.16	4.98	365	2.29
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed :							
11.4	2429	524	3255	3.69	4.41	324	2.59
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed :							
5.7	2429	524	3255	2.51	3.00	440	1.9
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed :							
8.5	1618	349	2168	2.41	2.88	284	2.95
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed :							
5.7	1618	349	2168	1.82	2.18	319	2.61

No load maximum engine speed : 2921 rev/min

Torque (equivalent crankshaft) :

at maximum power:

-At rated engine speed : 50.40 Nm

-At one hour test : 55.40 Nm

Maximum torque (equivalent crankshaft) (Engine speed: 1502 rev/min) : 63.20 Nm

Mean atmospheric conditions:

-Temperature : 23 °C

-Pressure : 98.8 kPa

-Relative humidity : 55 %

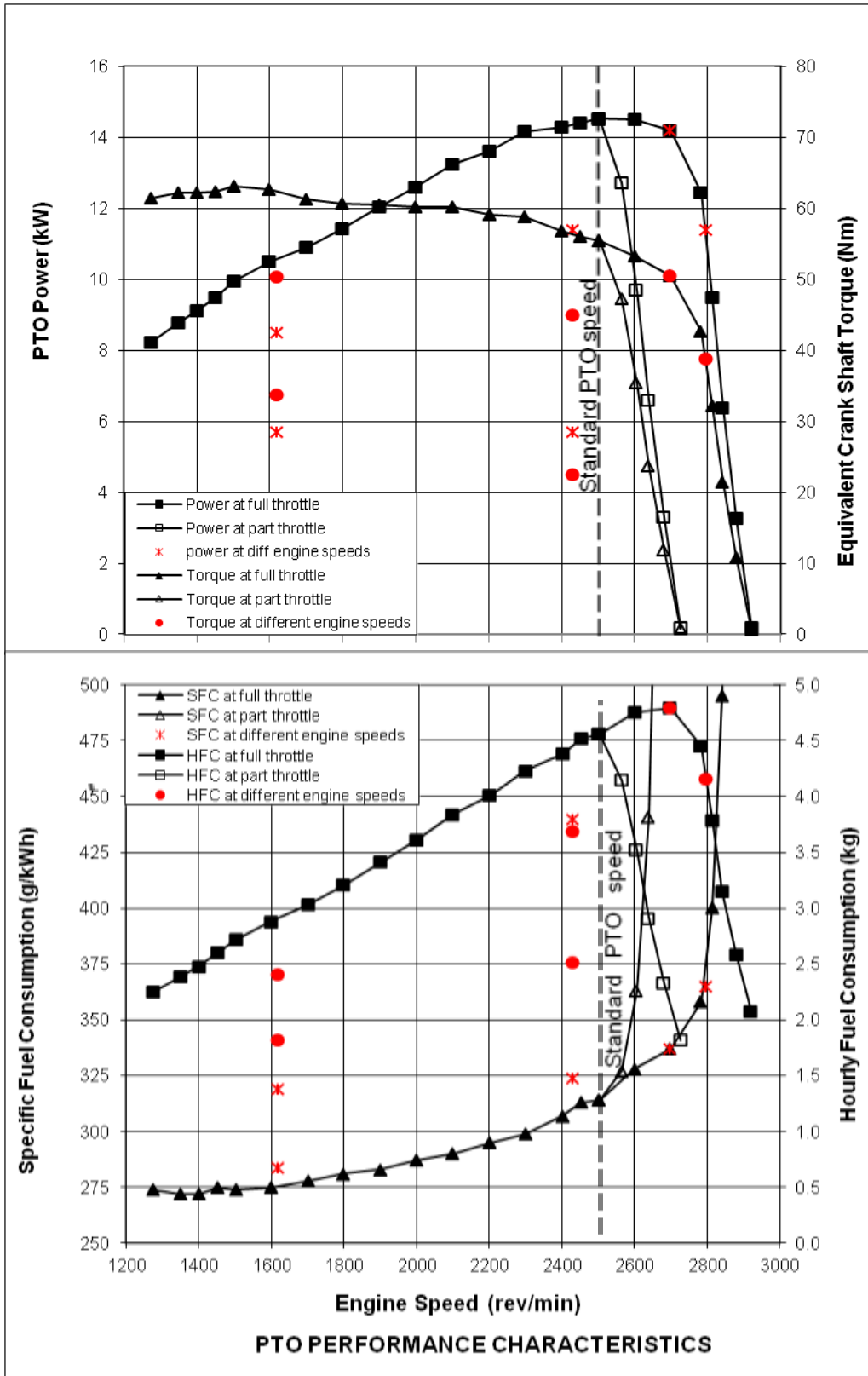
Maximum temperatures:

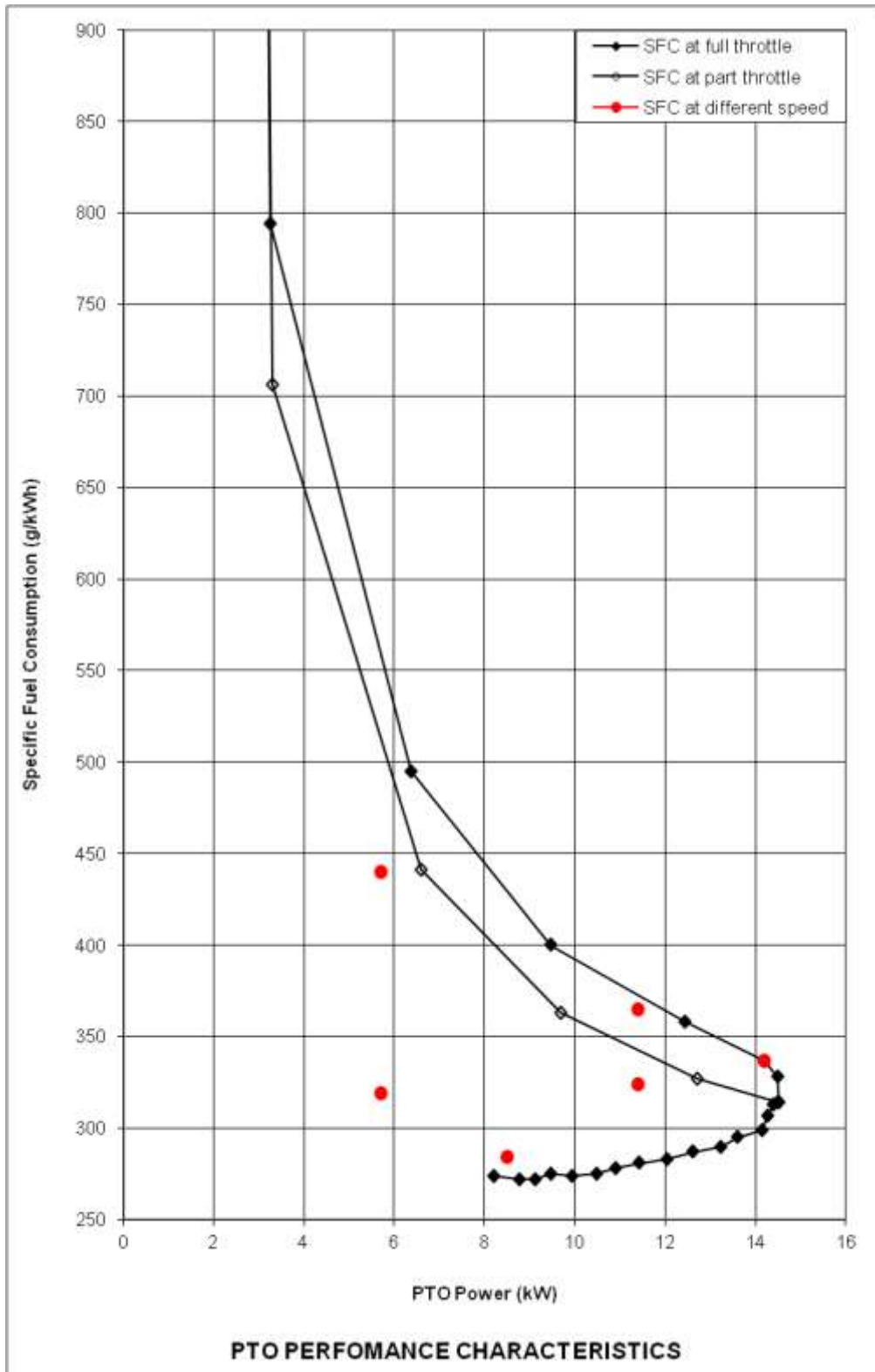
-Coolant : 81°C

-Engine oil : 90°C

-Fuel : 29°C

-Engine air intake : 64°C





3.2.1 Hydraulic Power and Lifting force Test:

Date of tests : 24.04.2019 and 25.04.2019

3.2.1.1 Hydraulic Fluid Data:

- Hydraulic fluid type : UTTO

- Viscosity index : 90.0 (Typ) at 40°C
(ISO 3448: 1992+ corr 1: 1993)

- Viscosity at 65 °C : 31.55 cSt

3.2.1.2 Compulsory Reporting (Test Results):

1	2	Press- ure, (MPa)	Reservoir oil Temp. °C		Engine speed, (rev/min)	Flow rate, (l/min)	Power, (kW)
			(min.)	(max.)			
3	4	5	6	7	8		
1.	Rated Engine speed (Manufacturer's specification)	--	--	--	2700	--	--
2.	Maximum (sustained) pressure with relief valve open as measured at the coupler. Pump stalled- No	20.0	60	70	2809	0.0	0.0
3.	Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power.	18.0	69		2819	19.6	5.9
4.	Maximum available flow and maximum power from one coupler pair	17.5	68		2823	20.9	6.1
5.	Maximum available flow and maximum power from coupler pairs operating simultaneously (flow through two or in over coupler pair if required)	Not applicable	Not applicable		Not applicable	Not applicable	Not applicable

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3.2.2 Power Lift Test:

-Linkage settings for test - See Table at Page 11, and Fig. 1.1 & 1.2

	At hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement:		
- Without lifting force	420 mm	420 mm
- With lifting force	395 mm	385 mm
Maximum corrected force exerted through full range	6.58 kN	5.49 kN
Corresponding pressure of hydraulic fluid	18.0 MPa	18.0 MPa
Moment about rear wheel axle	4.47 kNm	7.08 kNm
Maximum tilt angle of mast from vertical	--	16.5 degree

Lifting height relative to the horizontal plane including the lower link pivot points:									
mm	-135	-100	-50	0	+100	+150	+250	+255	260
Lifting forces (the values of the force measured have been corrected to correspond to a hydraulic pressure equivalent to 90% of actual relief valve pressure setting of the hydraulic lift system.)									
At the hitch point in (kN)	6.58	7.14	7.63	7.97	8.47	8.65	8.90	8.97	9.04
Corresponding pressure 18.0 MPa:									
At the frame in (kN)	5.61	5.93	6.25	6.33	6.22	6.14	5.49	--	--
Corresponding pressure 18.0 MPa									

3.3 Drawbar power and fuel consumption test (unballasted tractor):

Date(s) of tests : 20.04.2019

Type of track : Concrete

Height of drawbar above ground, (mm)	Tyre inflation pressure	
	Front	Rear
	[kPa]	[kPa]
400	215	85

DRAWBAR TEST RESULTS

Gear Number & Range	Draw-bar power	Draw-bar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific Energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	R.H.	Pressure
	(kW)	(kN)	(km/h)	(rev/Min)	(rev/Min)	(%)	(g/kWh)	(kWh/l)	(°C)	(°C)	(°C)	(°C)	(%)	(kPa)
3.3.1 Maximum Power in tested Gears (Unballasted tractor)														
3L	6.3	8.01	2.81	2817	3775	15.1	571	1.47	40	84	99	26	32	98.6
1M	7.9	8.06	3.51	2795	3745	15.0	516	1.62	39	83	101	25	36	98.5
2M	11.0	8.23	4.80	2704	3623	15.0	444	1.88	40	84	100	25	34	98.5
3M	11.7	4.77	8.79	2498	3347	5.7	438	1.91	38	83	97	23	34	98.5
1H	11.5	6.15	6.70	2503	3354	8.6	431	1.94	39	84	98	24	34	98.5
2H	10.5	3.81	9.90	2498	3347	4.3	470	1.78	38	84	98	23	37	98.4

Remark: Maximum power in the gear '3H' was not measured because forward speed in this gear exceeded the safety limit of testing equipment.

Gear Number & Range	Draw-bar power	Draw-bar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific Energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	R.H.	Pressure
	(kW)	(kN)	(km/h)	(rev/Min)	(rev/Min)	(%)	(g/kWh)	(kWh/l)	(°C)	(°C)	(°C)	(°C)	(%)	(kPa)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
3.3.2 Fuel Consumption:														
3.3.2.1 In selected gear / speed setting nearest 7.5 km/h, at maximum power at rated engine speed:														
1H	11.3	5.56	7.34	2700	3618	7.1	431	1.94	39	84	97	24	33	98.5
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed:														
1H	8.8	4.17	7.59	2766	3706	6.3	511	1.64	41	84	100	27	30	98.6
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed:														
1H	6.2	2.79	7.99	2814	3771	3.0	592	1.41	44	84	99	28	30	98.6
3.3.2.1.3 Higher gear / speed setting at reduced engine speed: Same pull and traveling speed as in 3.3.2.1.1:														
3M	8.8	4.17	7.60	2156	2889	5.5	410	2.04	44	84	95	29	30	98.6
3.3.2.1.4 Same gear / speed selection as 3.3.2.1.3 at reduced engine speed: Same pull and traveling speed as in 3.3.2.1.2:														
3M	6.2	2.79	7.99	2226	2983	3.8	486	1.72	45	83	94	29	29	98.6
3.3.2.2 In selected gear/speed nearest between 7 km/h and 10 km/h at rated engine speed:														
3M	11.1	4.18	9.56	2699	3617	5.1	438	1.91	38	83	97	23	35	98.5
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed:														
3M	8.7	3.13	9.94	2771	3713	3.9	507	1.65	46	84	101	30	29	98.6
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed:														
3M	6.0	2.10	10.26	2813	3769	2.3	623	1.34	47	83	101	30	28	98.6
3.3.2.2.3 Higher gear / speed setting at reduced engine speed: Same pull and traveling speed as in 3.3.2.2.1:														
2H	8.6	3.13	9.94	2488	3334	3.5	460	1.82	49	84	99	31	24	98.5
3.3.2.2.4 Same gear / speed selection as 3.3.2.2.3 at reduced engine speed: Same pull and traveling speed as in 3.3.2.2.2:														
2H	6.0	2.09	10.27	2528	3388	1.9	601	1.39	51	84	98	32	25	98.4

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4. OPTIONAL TESTS RESULTS

4.1 Waterproofing test:

Date of tests : 02.05.2019
 Water level from ground to top : 400
 Gear number : M-2

Test result:

Parts	Checking method (describe in accordance with test procedures)	Result (Pass/Fail/Not Applied for)
Wheel axles	Visual Method	Pass
Brake assembly	Visual Method	Pass
Clutch housing	Visual Method	Pass

Statement : The tractor is a waterproof tractor in accordance with the code.

5. REPAIR AND ADJUSTMENTS PRIOR TO TESTS

Sl. No.	Particular	Hours of run
--None--		

6. REMARKS

--None--

TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA

TESTING AUTHORITY



RAJNEESH PATEL
 AGRICULTURAL ENGINEER



Y. K. RAO
 SENIOR AGRICULTURAL ENGINEER



J. J. R. NARWARE
 DIRECTOR

The report compiled by: **Shri Pratyush Satya**, Senior Technical Assistant

Annexure-I**Data sheet of the Power take-off curves:**

Index	Power kW	Speed		Engine torque Nm	Fuel Consumption	
		Engine min ⁻¹	PTO min ⁻¹		Hourly l/h	Specific g/kWh
Full load and varying speed: Maximum power, power at rated engine speed, power at standard power take-off speed and to the torque corresponding to an engine speed from high idle down to 50% of rated engine speed or at least 15% below the point at which maximum torque occurs, whichever is lower.						
3.1.1	14.5	2503	540	55.4	5.45	314
3.1.2	14.2	2698	582	50.4	5.72	337
1.1	14.5	2601	561	53.3	5.69	328
1.2	14.4	2452	529	56.1	5.40	313
1.3	14.3	2401	518	56.8	5.24	307
1.4	14.2	2299	496	58.8	5.06	299
1.5	13.6	2202	475	59.0	4.80	295
1.6	13.2	2100	453	60.1	4.59	290
1.7	12.6	1998	431	60.2	4.32	287
1.8	12.0	1901	410	60.5	4.08	283
1.9	11.4	1799	388	60.7	3.84	281
1.10	10.9	1701	367	61.2	3.63	278
1.11	10.5	1599	345	62.6	3.44	275
1.12	9.9	1502	324	63.2	3.25	274
1.13	9.5	1451	313	62.3	3.11	275
1.14	9.1	1400	302	62.1	2.97	272
1.15	8.8	1349	291	62.1	2.86	272
1.16	8.2	1275	275	61.5	2.69	274
3.1.4 Part loads: the governor control set for maximum power, at rated speed						
3.1.4.1	14.2	2698	582	50.4	5.72	337
3.1.4.2	12.4	2782	600	42.7	5.32	358
3.1.4.3	9.5	2814	607	32.1	4.53	400
3.1.4.4	6.4	2842	613	21.4	3.77	495
3.1.4.5	3.3	2879	621	10.8	3.08	794
3.1.4.6	0.2	2921	630	0.6	2.48	1035
3.1.5 Part loads: the governor control set for maximum power, at standard power take-off speed						
3.1.5.1	14.5	2503	540	55.4	5.45	314
3.1.5.2	12.7	2564	553	47.2	4.96	327
3.1.5.3	9.7	2605	562	35.4	4.21	363
3.1.5.4	6.6	2638	569	23.7	3.48	441
3.1.5.5	3.3	2680	578	11.9	2.79	706
3.1.5.6	0.2	2726	588	0.7	2.18	9100
3.1.6 Part loads: the governor control set for maximum power, at different engine speeds						
3.1.6.1	14.2	2698	582	50.4	5.72	337
3.1.6.2	11.4	2796	603	38.8	4.98	365
3.1.6.3	11.4	2429	524	44.9	4.41	324
3.1.6.4	5.7	2429	524	22.4	3.00	440
3.1.6.5	8.5	1618	349	50.3	2.88	284
3.1.6.6	5.7	1618	349	33.7	2.18	319