COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

Address:
Luoyang Tractor
Research Institute
Luoyang, Henan,China
Tel: 86 379 4270001
Fax: 86 379 4270817

OECD TEST REPORT OF DONGFANGHONG LF 80-90(4WD) AGRICULTURAL TRACTOR (CODE 1)

Report on test in accordance with the OECD standard code for the official testing of agricultural tractor performance



OECD Approval
No. 1/1 954 Full Code
Date: 16/05/2001

Tested Tractor
Make: Dongfanghong Model:LF80-90 Type: 4WD

Submitted for test by
Name: China Yituo Group Co.,Ltd Address: Luoyang, Henan, China Tel: 86 379 4972392 Fax:86 379 4212638

This report includes 30 pages and may only be duplicated as a whole

TABLE OF CONTENTS

Page

1.SPECIFICATIONS OF TRACTOR .....(3)
2.TEST CONDITIONS .....(17)
3.COMPULSORY TESTS.....(20)
3.1. Main power take-off performance.....(20)
3.2. Hydraulic power and lifting force.....(22)
3.3. Drawbar performance.....(24)
3.4. Turning area and turning circle.....(25)
3.5. Location of centre of gravity.....(25)
3.6. Braking.....(25)
3.7. Measurement of external noise level.....(26)
4. OPTIONAL TESTS.....(27)
4.1 Low temperature starting.....(27)
5.REPAIRS AND ADJUSTMENTS DURING TESTS .....(27)
6.REMARKS.....(27)
7.ANNEX Main power take-off test curves 1.....(29)
8.ANNEX Main power take-off test curves 2.....(30)

This report has been approved by the O.E.C.D. Co-ordinating Centre (CEMAGREF)in Antony(France) on 16/05/2001 Approved No. 1/1 954 Full Code.

Tractor manufacturer's name and address:	China Yituo Group Co. Ltd. Luoyang, Henan, China
Location of tractor assembly:	The manufacturer
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer with the agreement of the COTTEC
Place of running-in:	COTTEC, Luoyang, Henan, China
Duration of running-in:	60 hours
Location of test:	COTTEC, Luoyang, Henan, China

1. SPECIFICATIONS OF TRACTOR

1.1 Identification

-Make:	Dongfanghong
-Model:	LF80-90
-Type:	4WD
-Number of driving wheels:	4
-Serial No.:	990273
-1st Serial No.:	990273

1.2 Engine

-Make:	own make
-Model:	LR4105TF-1A
-Type:	4-stroke,water cooling ,direct injection
-Serial No.:	9923356

1.2.1 Cylinders

-Number:	4
-Disposition:	Vertical,in line
-Bore/Stroke:	105/125 mm/mm
-Capacity:	4330 cm^3
-Compression ratio:	17

-Arrangement of valves: Overhead,in line

-Cylinder liners: Wet

1.2.2 Supercharging None

1.2.3 Fuel system

-Fuel feed system: Forced feed type

-Make of fuel filter: Yangzhou Agricultural Machinery Accessory works

-Model of fuel filter: C07085

-Type of fuel filter: Paper cartridge,replaceable

-Capacity of fuel tank: 95 dm^3

-Injection pump:

. Make: Own make

. Model/type: I Serial, 4-cylinder plunger

. Serial No. : 3290

-Manufacturer's production setting of injection pump:

. Flow rate(at rated engine speed and full load): 17.5 ± 0.5 dm^3 /h

.Timing: 22 ± 1 before T.D.C.

-Injectors:

.Make: Lucas Diesel Systems

. Model/type: Long neck,single hole

.Injection pressure: 20 ± 0.5 MPa

1.2.4 Governor

- Make: Own make

- Model/type: Mechanical,centrifugal

- Governed range of engine speed: 600～2590 rev/min

-Rated engine speed: 2400 rev/min

1.2.5 Air cleaner

-Pre-cleaner	None
-Main-cleaner	
.Make:	Bangbu Air-cleaner Works
.Model/type:	Oil bath
.Location of air intake:	Above front hood
.Maintenance indicator:	None

1.2.6 Lubrication system

-Type of feed pump:	JX0811A Gear pump
-Type & Number of filter(s):	FL100 Full flow, Centrifugal,1

1.2.7 Cooling system

-Type of coolant:	Water
-Type of pump:	Centrifugal,belt driven
-Description of fan:	Axial flow type,belt driven
-Number of fan blades:	4
-Fan diameter:	Φ450 mm
-Coolant capacity:	16 dm^3
-Type of temperature control:	Thermostat
-Superpressure system:	125.5～135.3 kPa

1.2.8 Starting system

-Make:	Hubei Automobile Electrical MachineryFactory
-Model/Type:	QD154E,D.C. solenoid engaged
-Starter motor power rating:	3.7 kW
-Cold starting aid:	Eletrothermic plug
-Safety device:	Main shift lever in neutral position

1.2.9 Electrical system

-Voltage:	12 (Negative earth) V
-Generator:	
.Make:	Hubei Automobile Electrical Machinery Factory
.Model/Type:	JF2521A,Altermator,belt driven
.Power	0.5 kW
-Battery(number of accumulators):	
.Model/Type:	6-QA-150,Lead accumulator
.Number:	1
.Rating:	150 Ah at 20 hours rating

1.2.10 Exhaust system

-Make:	Own make
-Model/Type:	6RTF240100-1,expansion type,silencer
-Location:	Right-hand side of the engine,vertical

1.3 Transmission to wheels

1.3.1 Clutch(Travel and Power Take-off)

-Make:	Shanghai Clutch Plant
-Model/Type:	Single plate,dry,constant engaging
-Number of plate(s):	1
-Diameter of plate(s):	280 mm
-Method of operation:	Mechanically actuated by pedal

1.3.2 Gear box

-Make:	Own make
-Model/Type:	DFH 4×(3+1) , Mechanical
-Description:	12 forward speed gear,4 reverse speed gear, main gear is constant-mesh,helical cylindrical gear,synchro gear shifting,auxiliary gear is constant-mesh cylindrical gear,engaging sleeve gear shifting.

	Forward	Reverse
Number of gears	4	4
Number of ranges/groups	3	1
Total of arrangements	12	4

-Available options None

1.3.3 Rear axle and final drives

-Make: Own make

-Model/Type: Helical gear type differential and single stage epicyclic gear type final drives

-Differential lock

.Type: Mechanical,two planet gear

.Method of engagement: Mechanically actuated by pedal

.Method of disengagement: Hydraulic release mechanism,brake by pedal controlled

1.3.4 Front axle and final drives

-Make: Own make

-Model/Type: Helical gear type differential and single stage epicyclic gear type final drives

-Differential lock: None

1.3.5 Total ratios and travelling speeds

gear No.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed(*) at rated engine speed of 2400 rev/min km/h
1	L-1	396.51	1.70
2	L-2	249.65	2.70
3	L-3	204.26	3.30
4	L-4	129.63	5.20
5	M-1	168.51	4.00
6	M-2	108.72	6.20
7	M-3	88.69	7.60
8	M-4	55.71	12.10
9	H-1	70.95	9.50
10	H-2	46.17	14.60
11	H-3	37.45	18.00
12	H-4	23.65	28.50
R1	R1	153.20	4.40
R2	R2	97.69	6.90
R3	R3	80.25	8.40
R4	R4	50.68	13.30
(*)Calculted with the dynamic radius index of 745 mm(ISO 4251/1-1992).			

Number of revolutions of front wheels for one revolution of rear-wheels: 1.32

1.4 Power take-off

1.4.1 Main power take-off

-Type:	Independent
-Method of engagement:	By hand lever
-Number of shafts:	1
-Method of changing power take-off shaft ends speeds:	Manually by exchanging p.t.o.shafts

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 rev/min

-Location :	At rear of the tractor
-Diameter of power take-off shaft end:	35 mm
-Number of splines:	6, in conformity with ISO 500/1991
-Height above ground:	690 mm
-Distance from the median plane of the tractor:	0 mm
-Distance behind rear wheel axis:	503 mm
-PTO speed at rated engine speed:	589 rev/min
-Engine speed at standard power take-off speeds:	2198 rev/min
- Ratio of rotation speeds (engine speed/p.t.o. speed):	4.071
-Power restriction and maximum torque (Manufacturer' s recommendation):	54.8 kW 1168 N.m
-Direction of rotation(viewed from behind tractor):	Clockwise

Power take-off at 1000 rev/min

-Location :	At rear of the tractor
-Diameter of power take-off shaft end:	35 mm
-Number of splines:	21, in conformity with ISO 500/1991
-Height above ground:	690 mm

-Distance from the median plane of the tractor: 0 mm

-Distance behind rear wheel axis: 503 mm

-PTO speed at rated engine speed: 1008 rev/min

-Engine speed at standard power take-off speeds: 2381 rev/min

- Ratio of rotation speeds (engine speed/p.t.o. speed): 2.381

-Power restriction and maximum torque (Manufacturer' s recommendation): 54.8 kW 683 N.m

-Direction of rotation(viewed from behind tractor): Clockwise

1.4.1.2 Power take-off proportional to ground speed: **None**

1.4.2 Optional power take-off: **None**

1.5 Hydraulic power lift

-Make: Own make

-Model: None

-Type: Hydraulic,three hitch point

-Type of hydraulic system: Open centre system

-Type and number of cylinders: Single acting,1

-Type of linkage lock for transport: Hydraulic

-Relief valve pressure setting: 15.5~16.5 MPa

-Opening pressure of cylinfer safety valve: 19.6 MPa

-Lift pump type: Gear pump

-Transmission between pump and engine: Driven by engine cam shaft

-Type and number of filters: Cartridge type

-Site of oil reservoir: Transmission housing

-Tapping points:

.Type:	Thread
.Number:	1～3 sets
.Location:	Rear of tractor
-Maximum volume of oil available to external cylinders:	16 dm^3

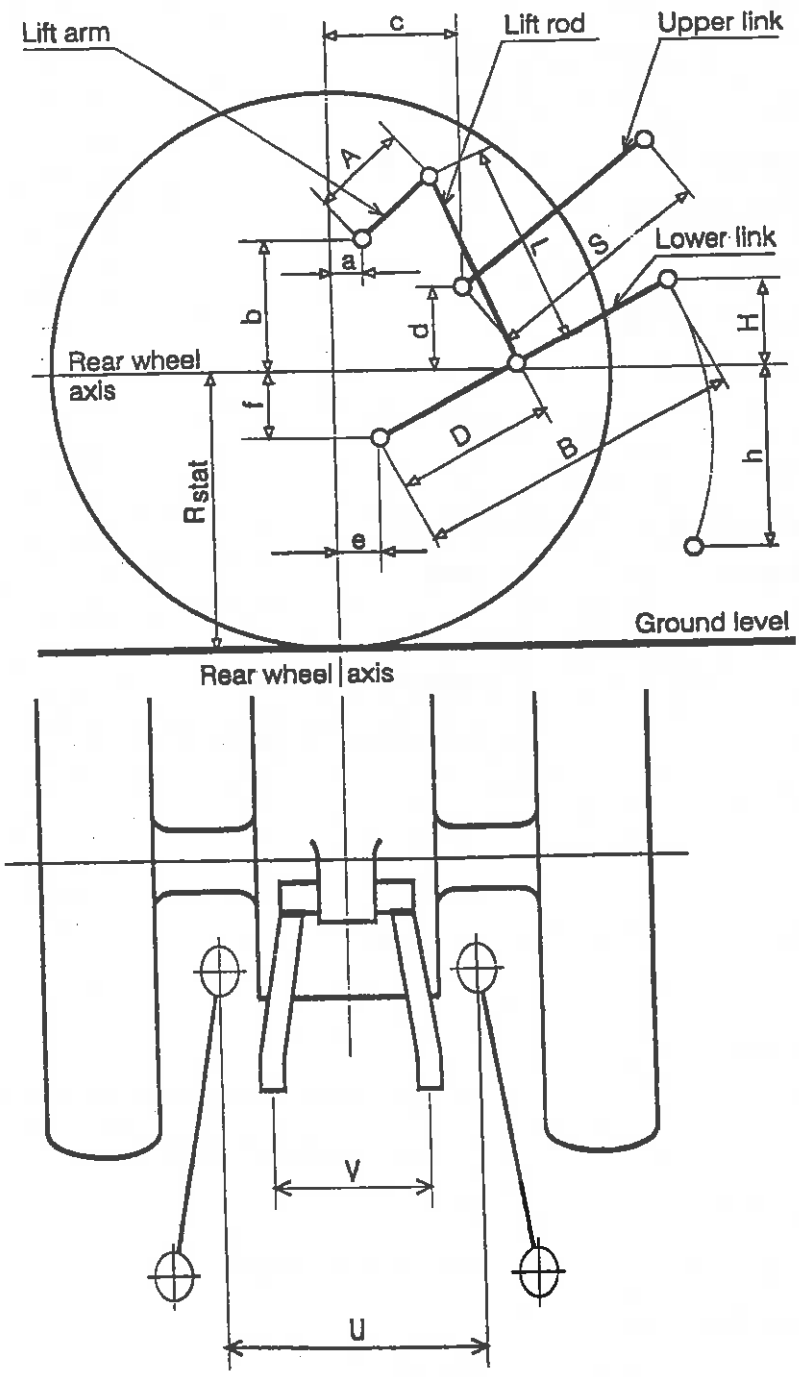
1.6 Three point linkage

-Category:	2,in conformity with ISO730-1:1994+Cor.1:1995
-Category Adapter:	None
-Linkage geometry:	See next page and following table

		Dimension or range(*) mm	Setting used in test mm
Length of lift arms	(A)	250	250
Length of lower links	(B)	955	955
Distance of lift arm pivot point from rear wheel axis: Horizontally	(a)	-180	-180
Vertically	(b)	295	295
Horizontal distance between the 2 lower link point:	(u)	510	510
Horizontal distance between the 2 lift arms end points:	(v)	430	430
Length of uppe link:	(S)	from 580 to 870	710
Distance of upper link pivot point from rear wheel axis: Horizontally	(c)	395	395
Vertically	(d	from 180 to 247	195
Distance of lower link pivot point from rear wheel axis: Horizontally	(e)	135	135
Vertically	(f)	195	195
Distance of lower link pivot point to lift rod pivot points on lwer links:	(D)	460	460
Length of lift rods:	(L)	from 510 to 640	622
Height of lower hitch points relative to the rear wheel axis: in low position	(h)	from 212 to 622	560
in high position	(H)	from 75 to 330	95
Height above ground of lower hitch points when locked in transport position:		from 1065 to 810	-----
(*)Assuming r=745 mm rear tyre dynamic radius index of ISO 4251/1-1992			

Table 1.1 Dimensions of linkage geometry when connected to the standard frame

Lift test-linkage geometry:



Figures 1.1

1.7 Swinging drawbar:	**None**
1.8 Trailer hitch	
-Type:	Fixed
-Hole diameter:	Φ35 mm
-Height above ground:	440 mm
-Distance of hitch point from rear wheel axis,horizontally:	608 mm
-Distance of hitch point from power take-off shaft end:	
.Vertically:	230 mm
.Horizontally:	102 mm
-Maximum vertical load:	8.0 kN
1.9 Holed drawbar:	**None**
1.10 Steering	
-Make:	Jining Hydrostatic Plant
-Model/Type:	BZZI-100, Hydrostatic steering system
-Method of operation	
.Pump:	Gear pump
.Ram:	1,double acting ram actuating directly on front axle
-Working pressure:	6.5 MPa
1.11 Brakes	
1.11.1 Service brake	
-Make:	Hangzhou Podwer Metallurgy Research Institute
-Model/Type:	Dry double plates mechanical
-Method of operation:	By pedals
-Trailer braking take-off:	Pneumatic braking,operated by tractor pedals
1.11.2 Parking brake	
-Type:	Mechanical
-Method of operation:	Depressed by brake pedals and ratched by hand lever

1.12 Wheels

-Number

.Front: 2,steering and driving

.Rear: 2,driving

-Wheelbase: 2305 mm

-Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1671	2002	Reversing wheels and off-set lug rims
Rear	1406	2098	Reversing wheels and off-set lug rims

1.13 Protective structure

-Make: China Yituo

-Model: 1.02/885131339

-Type: Protective Cab

-Manufacturer's name and address: China Yituo Group Co. Ltd

-Protective device: None

-OECD approval

.Approval number: 4/0 671

.Date of approval: April 23, 2001

.Nos. of minor modification certificates,if any: None

1.14 Seat

1.14.1Driver' s seat

-Make: Grammer seating(Xiamen) Ltd

-Model: DS 85H/90

-Type: Adjustable suspension

-Seat and steering wheel reversible: No

-Type of suspension: Mechanical

-Type of damping: None

-Range of adjustment:

.Longitudinal: 150 mm

.Vertical: 60 mm

-Safety belt: None

1.14.2 Optional driver' s seat(s): None

1.14.3 Passenger seat: None

1.15 Lighting

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Head lights	1135	175×115	176
Side lights	1550	113×75	795
Rear lights	1810	Φ140	875
Reflectors	1640	180×60	705

2 TEST CONDITIONS

2.1 Overall dimensions

	Lenght mm	Width		Height at top of	
		Minimum mm	Maximum mm	Protective structure mm	Exhaust silencer mm
Ballasted	3950	1990	2165	2545	2740
Unballasted	3645	1990	2165	2537	2730

2.2 Ground Clearance(unballasted tractor)

-Clearance limiting part: Under the front axle 420 mm

2.3 Tractor mass

-Mass(with protective structure and full fuel tank):

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	1632	1648	2144	2162
Rear	2173	2232	2376	2434
Total	3805	3880	4520	4596

2.4 Ballast

	Weights		Water kg
	Number	Total mass kg	
Front	10	415	—
Rear	6	300	—
Optional	—	—	—

2.5 Track specifications: **None**

2.6 Tyres and track width specifications

	Front	Rear
Tyres		
.dimensions	11.2-28	16.9-34
.ply rating	6	6
.type	R-1	R-1
.maximum load (tyre manufacturer's)	11.0 kN	16.1 kN
.maximum load (tractor manufacturer' s)	11.0 kN	16.1 kN
.inflation pressure(tyre manufacturer' s)	180kPa	150 kPa
.dynamic radius index	565 mm	745 mm
Chosen track width	1140 mm	1100 mm

2.7 Fuel

-Type: Standard diesel fuel in conformity with GB 10327(China standard)

-Density at 15 ℃ 0.824 g/cm^3

2.8 Oils and lubricants

2.8.1 Capacity and change interval

	Capacity	Oil change	Filter change
	dm^3	h	h
Engine	15	200	200
Gear box, rear axle and final drives ,in common with hydraulic system	49	800	—
Front axle and final drives	8.5	1600	—
Steering	1.2	800	—

2.8.2 Specifications

	Recommended	Used during test
Engine oil .Type: .Viscosity: .Classification:	 SAE20 or10 W-30 11.4cSt at 100 ℃ API-CC	Same
Transmission oil,Hydraulic fluid,Steering oil .Type: .Viscosity: .Classification:	 SAE 80W/90 9.3cSt at 100 ℃ API GL-4	Same

2.8.3 Grease

-Number of lubrication points: **10**

3 COMPULSORY TESTS RESULTS

3.1 Main power take-off

-Date and location of tests: Nov. 10,2000,COTTEC

-Type of dynamometer: LPA-Bedienpult 250 Elec. dynamometer:

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kW.h	kW.h/l
3.1.1 MAXIMUM POWER -TWO-HOUR TEST						
56.78	2402	590	14.95	17.63	263	3.24
3.1.2 POWER AT RATED ENGINE SPEED						
56.78	2402	590	14.95	17.63	263	3.24
3.1.3 STANDARD POWER TAKE-OFF SPEED (540±10 rev/min)						
55.24	2198	540	13.87	16.36	251	3.39
3.1.4 PART LOADS 3.1.4.1 the torque corresponding to maximum power at rated engine speed						
56.78	2402	590	14.95	17.63	263	3.24
3.1.4.2 85 % of torque obtained in 3.1.4.1						
49.07	2443	600	12.97	15.29	264	3.22
3.1.4.3 75 % of torque defined in 3.1.4.2						
37.37	2479	609	10.74	12.66	287	2.97
3.1.4.4 50 % of torque defined in 3.1.4.2						
25.28	2520	619	8.65	10.20	342	2.49
3.1.4.5 25 % of torque defined in 3.1.4.2						
12.80	2553	627	6.61	7.79	516	1.65
3.1.4.6 Unloaded						
1.00	2593	637	4.94	5.83	—	—

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	l/h	g/kW.h	kW.h/l
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						
55.24	2198	540	13.87	16.36	251	3.39
3.1.5.2 85 % of torque obtained in 3.1.5.1						
47.89	2243	551	12.16	14.34	254	3.36
3.1.5.3 75 % of torque defined in 3.1.5.2						
36.53	2280	560	9.79	11.54	268	3.18
3.1.5.4 50 % of torque defined in 3.1.5.2						
24.77	2320	570	8.00	9.43	323	2.64
3.1.5.5 25 % of torque defined in 3.1.5.2						
12.63	2361	580	6.32	7.45	500	1.70
3.1.5.6 Unloaded						
0.92	2394	588	4.79	5.65	—	—

-No load maximum engine speed: 2593 rev/min

-Torque(equivalent crankshaft) at maximum power

. At rated engine speed: 225.7 Nm

.At 2-hour test: 225.7 Nm

-Maximum torque(equivalent crankshaft) : 284.2 Nm

(engine speed:1556 rev.min)

Mean atmospheric conditions	
Temperature	17 ℃
Pressure	100.1 kPa
Relative humidity	58 %
Maximum Temperature:	
Coolant	82 ℃
Engine oil	82 ℃
Fuel	22 ℃
Engine air intake	16 ℃

3.2 Hydraulic power and lifting force

-Date and location of test: Nov. 20,2000 COTTEC

3.2.1 Hydraulic power test

-Sustained pressure with relief valve open: 19.0 MPa

-Pump stalled: Not applicable,open center system

-Pump delivery rate at minimum pressure: 40.1 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	30.2	17.1	8.61
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	35.2	16.4	9.62

-Tapping point used for test: At rear part of the tractor

-Temperature of hydraulic fluid: 64 ℃

-Opening pressure of the unloading valve: Not available

-Closing pressure of the unloading valve: Not available

3.2.2 Power lift test

-Linkage settings for test -Table 1.1 and Figures 1.1

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	185 mm	90 mm
Vertical movement: without lifting force: with lifting force:	 670 mm 655 mm	 920 mm 860 mm
Maximum corrected force exerted throught full rang	25.58 kN	15.58 kN
Corresponding pressure of hydraulic fluid	17.1 MPa	17.1 MPa
Moment about rear wheel axle	27.88 kN.m	26.05 kN.m
Maximum tilt angle of mast from vertical	—	10.4 ^{0}

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-460	-365	-300	-200	-100	0	100	200	290	300	390
Lifting forces (the values of force measured are correspond to a hydraulic pressure equivalent to 90 % of the actual relief value pressure setting of the hydraulic lifting system)											
kN	—	31.76	34.03	36.19	36.92	36.10	34.60	34.28	25.58	—	—
At the frame, Corresponding pressure 17.1 MPa											
kN	28.20	—	29.50	28.92	27.90	26.05	25.49	24.40	—	22.38	15.58

3.3 Drawbar performance

-Date of tests: Nov. 18,2000

-Type of track: Concrete

	Height of drawbar above ground	Tyre inflation pressure	
		Front	Rear
	mm	kPa	kPa
Unballasted	500	160	150
Ballasted	500	160	150

Gear number and range	Power	Drawbar pull	Speed	Engine speed	Slip wheels	Specific fuel consum-ption	Specific energ	Temperatures			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Tempe-rature	Relative humidity	Press-ure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	℃	℃	℃	℃	%	kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
L-4	42.95	33.47	4.62	2416	15.12	330	2.58	12	70	82	10	52	101.3
M-1	33.81	33.35	3.65	2468	15.12	347	2.46	12	72	85	10	52	101.3
M-2	46.92	29.58	5.71	2360	11.97	316	2.70	12	75	92	10	52	101.3
M-3	47.53	23.60	7.25	2358	8.55	312	2.73	12	78	93	10	52	101.3
M-4	46.54	14.14	11.85	2356	5.57	319	2.67	13	79	95	10	52	101.3
H-1	48.47	19.28	9.05	2362	6.99	304	2.80	13	80	95	11	52	101.3
3.3.2 MAXIMUM POWER IN TESTED GEARS(ballasted tractor)													
L-1	17.07	38.16	1.61	2523	15.10	473	1.81	14	68	77	12	52	101.5
L-2	25.97	38.01	2.46	2496	15.03	383	2.23	14	70	79	12	52	101.5
L-3	31.60	37.93	2.99	2488	15.03	357	2.39	14	73	85	12	52	101.5
L-4	46.30	36.00	4.63	2360	13.89	321	2.66	14	75	88	12	52	101.4
M-1	38.62	38.09	3.65	2448	15.05	332	2.57	14	75	87	12	52	101.4
M-2	47.40	29.32	5.82	2360	9.38	314	2.71	15	79	93	12	52	101.4
M-3	47.75	23.55	7.30	2351	7.16	310	2.75	15	81	95	12	52	101.4
M-4	46.87	14.12	11.95	2362	4.83	316	2.70	15	81	96	12	52	101.4
H-1	48.77	18.96	9.26	2365	5.74	302	2.82	15	81	96	12	52	101.4
3.3.3 FIVE-HOUR TESTS													
3.3.3.1 FIVE-HOUR TEST at 75 % of pull at maximum power(at rated engine speed)													
M-3	38.41	18.1	7.64	2450	5.40	315	2.71	16	75	86	13	52	101.3
3.3.3.2 FIVE-HOUR TEST at pull corresponding to 15 % wheelslip													
M-1	38.37	37.84	3.65	2451	14.90	332	2.57	17	74	86	14	52	101.2

Oil consumption during ten hours duration of tests 3.3.3.1 and 3.3.3.2: 78.0 g/h

3.4 Turning area and turning circle

	Without brakes	
	Right-hand	Left-hand
	m	m
Radius of turning area	4.42	4.44
Radius of turning circle	4.29	4.31

3.5 Location of centre of gravity

-Height above ground: 799 mm

-Distance from the vertical plane containing the axis of the rear-wheels: 985 mm

-Distance from the median longitudinal plane of the tractor: 7 mm

-If the angle of suspension of the tractor is less then 20° ,indicate its value: None

3.6 Braking

-Date of tests: Nov. 18,2000

3.6.1 Cold service braking device test

	Speed before application of brakes	Braking device control force	Mean deceleration
	km/h	kN	m/s^2
Ballasted tractor	28.6	0.11	0.52
	28.7	0.21	1.50
	28.7	0.30	2.50
	28.6	0.40	3.05
	28.7	0.48	3.12
	28.8	0.55.	3.18
Unballasted tractor	28.6	0.11	0.64
	28.6	0.22	1.70
	28.7	0.30	2.69
	28.8	0.40	3.17
	28.7	0.48	3.24
	28.8	0.55	3.33

-Maximum deviation of tractor from its original course: 0 mm

-Abnormal vibration: None

-Brake heating method: Driving

3.6.2 Fade test

Speed before application of brakes	Braking control force kN	Mean deceleration m/s²
28.8km/h	0.12	0.38
	0.22	1.29
	0.30	2.21
	0.40	2.84
	0.48	2.92
	0.55	3.00

-Maximum deviation of tractor from its original course: 0 mm

-Abnormal vibration: None

-Brake heating method: Driving

3.6.3 Parking braking device test

	Uphill	Downhill
Braking device control force	0.295 kN	0.295 kN

3.7 Measurement of external noise

-Date of tests: 9th December,2000

-Sound level meter, make/mode/type: B & K 2209

-Type of track: Concrete

-Gear number: H4

-Travelling speed before accceleration: 22.5 km/h

-Sound level: 91 dB(A)

4 OPTIONAL TEST RESULTS

4.1 Low temperature starting

-Date of tests:	8th Jan.,2001
-Detail of the starting aids used for the tests,battery included:	None
-Fuel	
.Type	-35#
.Octane or cetane number:	>50
.Pour-point and other specifications:	-30 ℃
-Engine oil	
.Type:	SAE20 or10 W-30
.Viscosity and other specifications:	11.4cSt at 100 ℃
-Test results	
.Starting procedure used for the tests:	O.E.C.D CODE 1 -March 2000
.Lowest temperature at which the engine started:	-10.0 ℃

5 REPAIRS None

6 REMARKS

In COTTEC the safety limit speed of drawbar testing equipment is 12 km/h, so we only do drawbar power in the gears which the speed is below 12 km/h.

ANNEX

MAIN POWER TAKE-OFF TEST CURVES 2

