Institut za mehanizaciju poljoprivrede - Zemun

O.E.C.D. Report Nº 926
Printed: June 1985

Report on Test in Accordance with O.E.C.D. STANDARD CODE for the Official Testing of Agricultural Tractors



Agricultural tractor IMT 5130 (2 WD)

Manufactured by: IMT – Industrija Mašina i Traktora
Novi Beograd – Yugoslavia

Date of test: October – November 1984

This Bulletin is based on engineering tests in accordance with the O.E.C.D. STANDARD–CODE for the Official Testing of Agricultural Tractors.

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

This Report has been aporoved by the O.E.C.D. Co–ordinating Centre (C.E.M.A.G.R.E.F., France) as being in accordance with the O.E.C.D. STANDARD – CODE.

Date of Approval: April 12th 1985

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Printed in Yugoslavia

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Tractor manufacturer:	IMT - Industrija Mašina i Traktora Novi Beograd - Yugoslavia
Submitted for test by:	The manufacturer
Selected by:	Representatives of IMP
Place of running-in:	Laboratory of IMP
Duration of running-in:	cca 8o hours

SPECIFICATION OF TRACTOR+

+Note:
This tractor was allready tested as 4 WD model (O.E.C.D. Test Report N° 927 for IMT-5136 tractor, approved on April 12th 1985).
According to O.E.C.D. Standard Code, in this test report data concerning Main power take-off performance and Power lift and hydraulic pump performances are identical to data given in N° 927 Test Report. (The p.t.o. performance check gave in comparison with previous data the differences in power, torque and fuel consumption between ±o,5 %).

TRACTOR

Make:	IMT
Model:	IMT - 513o
Type:	Standard-unit construction, four wheels, rear wheels driven
Serial N°:	4o1 ooo ool

ENGINE

Make:	PERKINS LTD., acc.to IMT specification
Model:	T 6.354.4
Type:	Four stroke, water cooled diesel, direct injection, turbochargered
Serial N°:	TU 8oo3o U 7o6237 K
Cylinders:	6, vertical, in-line, bore 98,4 mm, stroke 127 mm, displacement 5795 cm^3, compression ratio 16:1, overhead valves replaceable dry cast iron cylinder liners

Fuel system:	CAV membrane type feed pump with hand primer, camshaft driven, three CAV-DONIT paper element fuel filters, one on the suction side and two on the pressure side of feed pump, all filters with metalic sediment bowls; fuel tank capacity 215 l; CAV distributor type DPA 3362Fo12-451 injection pump, Serial N° R o5182 KA, manufacturers production setting 66 mm^3 per stroke at rated engine speed and full load; injection timing 28° before T.D.C.; CAV injector nozzles, model 5281636 GD, injection pressure 215 bar.
Governor:	CAV mechanical, all range, model LX 71575o/4-246o, incorporated in fuel injection pump, governed range of engine speed 75o to 246o rev/min, rated engine speed 225o rev/min.
Supercharger:	HOLSET 3LD Exhaust driven turbo supercharger, maximum supercharge pressure 1o5o mbar at maximum power.
Air cleaner:	Main DONALDSON-TPR dry paper element filter, model FHG 12-oo36, with maintenance indicator; Pre-cleaner DONALDSON, centrifugal, model PBH oo-o226, on the right hand side of engine, pre-cleaner above engine bonnet.
Lubrication system:	Forced feed from gear pump with strainer in sump, full flow replaceable paper element filter; total oil capacity 15,5 l; recommended oil quality acc. to MIL-L-21o4 C recommended oil viscosities: SAE 3o above 25°C SAE 2o between 0°C and 25°C SAE 1o below 0°C Recommended oil and filter change interval 2oo h, first change after 5o hours
Cooling system:	Water cooling with impeller pump; pump capacity 194 l/min at 225o rev/min engine speed; pressurized system set to o,4-o,5 bar overpressure;

	fan with 6 blades, 5o8 mm diameter; coolant capacity 3o l; temperature control by thermostat
Starting system:	Electrical LUCAS solenoid-engaged starter motor M5o, 12 V, 2,95 kW heating plug in intake manifold as aid for cold starting
Exhaust:	Vertical, above bonnet on the right hand side of the engine, silencer DONALDSON MOM o9-o158, 819 mm long, with elyptic cross-section 21o/292 mm; height of exhaust pipe above ground 272o mm, mouth shoving upwards with 88 mm dia.
Electrical system:	12 Volt, negative earth; LUCAS alternator 17 ACR, 12 V, 28 A; one lead acid battery 18o Ah 2o-hour rating

TRANSMISSION

Clutch:	Fichtel & Sachs GN 38o KR; dry, single disc type clutch, disc dia 38o mm; mechanically pedal operated
Gearbox:	Own make; mechanical, 5 forward and 1 reverse gear; 1st, 2nd and 4th gear with sliding gears, 3rd and 5th gear synchronized; low and high speed selector of epicyclic (planetary) type; N° of speeds (totally) lo forward 2 reverse
Rear axle and final drive:	Own make; Bevel gear drive with crown wheel and pinion; bevel gear type differential, with lock, pedal operated, self disengaging; planetary final drives in common housing with the rear axle
Front axle:	Own make, not propelled; standard axle type with tilting angle about 15° to either side.

Oil capacity: Gearbox, rear axle and final drives (with power lift-see page 5) 6o l

Recommended oil quality: Gearbox, rear axle and final drives: Hydraulic transmission oil JOHN DEERE J14 B, MF M-1135, or engine oil acc.to MIL-L-21o4 C
Recommended oil changing interval 8oo h;
oil filter cleaning interval 8oo h;

Total ratios and speeds

Gear	Total ratio engine driving wheel	Nominal travelling speed at rated engine speed	at standard p.t.o. speed 54o rev/min	looo rev/min
-	-	km/h	km/h	km/h
Forward speeds				
1 low	179,9o	3,91	3,49	3,79
2 low	129,38	5,38	4,8o	5,21
3 low	1o6,98	6,5o	5,8o	6,31
4 low	84,1o	8,27	7,38	8,o2
5 low	74,8o	9,3o	8,29	9,o2
1 high	59,3o	11,73	1o,46	11,37
2 high	43,13	16,13	14,39	15,64
3 high	35,65	19,51	17,4o	18,92
4 high	28,o2	24,82	22,14	24,o7
5 high	24,93	27,9o	24,89	27,oe
Reverse speeds				
low	162,8o	4,27	3,81	4,14
high	54,2o	12,83	11,45	12,45

Calculated with the rolling radius 82o mm, given in the tyre manufacturer`s specification

Power take-off

Main p.t.o.

Independent p.t.o.;
at rear of tractor in the median plane;
engine driven through a separate wet (in oil bath) multiplate clutch, located in the central housing:
operated by hand lever situated on the right side of the driver's seat:
height above ground 693 mm
(with rear wheel static radius 820 mm)
distance from rear axle center line:

horizontal	508 mm behind
vertical	127 mm below

direction of rotation clockwise, viewed from tractor rear;
two speeds are preselectable by changing the p.t.o. shaft end (the p.t.o. outlet is done with two coaxial shafts):

<u>540 rev/min</u> at 2007 rev/min engine speed (605 rev/min at 2250 rev/min engine speed - engine speed /p.t.o. speed ratio 3,717:1) is available through the outer shaft with the shaft end 29x34,9x8,7 mm ($1^3/8$"), 6 splines, acc.to ISO 500/1 and JUS M.L1.601;

<u>1000 rev/min</u> at 2182 rev/min engine speed (1031 rev/min at 2250 rev/min engine speed - engine speed /p.t.o. speed ratio 2,182:1) is available through the inner shaft with the shaft end 34,9 mm ($1^3/8$"), 21 splines, acc.to ISO 500/1 and JUS M.L1.601;

Power lift

Hydraulic system:

Own make;
Four cylinder piston pump of boxer type with 38 l/min delivery at 2250 rev/min engine speed, located in the central housing, driven by the p.t.o. shaft front end, with control valve at suction side;
control valve for lifting and sinking;

draught control, position control, both stepless mixable, floating positions;
opening pressure of relief valve 175 bar, sustained pressure by the opened relief valve 185-2oo bar;
two external single acting rams with 63 mm bore and 245 mm stroke;
two paars of external oil tappings, single or double acting, at rear of tractor;
Hydraulic oil tank in common with gearbox, oil capacity 6o l, max lo l may be taken off trough oil tappings when tractor is mooving, 18 l when tractor is stationary;
Oil filter on the suction side of the power lift pump is maintained every 8oo hours by washing.

Implement linkage: Three point linkage category II acc.to ISO 73o/1 (category III linkage available on request);
lift rods with fixed length 845 mm
lifting range above ground
from 34o mm to lolo mm
(rear wheels static radius 82o mm)

Pull atachment

Swinging drawbar: Height above ground 385 and 495 mm adjustable by turning drawbar;
diameter of clevis hole 37 mm (clevis with 36 mm diameter);
swingable about 23o mm to either side with fixing points in the median position and in four positions in 5o mm steps to either side;
fixing of drawbar with two clevis;

distance of clevis hole centre from rear axle axis:
horizontal 917 mm and 832 mm behind
vertical 325 mm and 435 mm below

from p.t.o. shaft end:
horizontal 4o9 mm and 324 mm behind
vertical 198 mm and 3o8 mm below

pivot point 7 mm behind rear axle;

Trailer hitch: Fixted;
height above ground 822, 857, 892, 927 and 962 mm; diameter of clevis hole 31 mm (clevis with 3o mm diameter);
distance of clevis hole centre

from rear axle axis:
horizontal 5o6 mm behind
vertical 2,37,72,1o7 and 142 mm above

from p.t.o. shaft end:
horizontal 2 mm in front
vertical 129,164,199,234 and 269 mm above

Maximum vertical permissible load 25 KN

Semitrailer hitch: Fixted;
max.permissible vertical load 3o KN
height above ground 495 mm;
vertical connection pin 58 mm long, with 43 mm diameter;
distance of pin top surface

from rear axle axis
horizontal 49o mm behind
vertical 325 mm below

from p.t.o. shaft end
horizontal 18 mm in front
vertical 198 mm below

Note: All pull atachment heights are given with the rear wheel static radius 82o mm.

Steering	DANFOSS; hydrostatic steering, model OSPB 1oo ON, with own oil circuit; engine driven gear pump with 6,66 cm^3/rev delivery, working pressure 12o bar; double acting ram with 5o mm bore and 28o mm stroke; oil capacity 13 l; recommended oil - GALAX D.A.C., or oil for automatic transmissions; oil changing interval 8oo h Oil filter in reverse line, maintained every 8oo hours by washing
Brakes	
Service brake:	model G.O.I.M.P.D. 8,75x7,4 ($2o^o$); hydraulically acting disc type brake on the rear differential half shafts, in oil bath, with six discs on each side, disc diameter 222,2/187,9 mm
Steering brakes:	Divided pedals of service brake, for normal use locked together
Parking brake:	Service brake, but mechanically acting, hand lever operated
Trailer brake:	Optional equipment, fitted on the tested tractor; make PPT; single line air brake, operated by pedal mounted valve; compressor with 75 mm bore 34 mm stroke, displacement 15o cm^3, driven by the engine at 28oo rev/min speed at rated engine speed (225o rev/min) compressor delivery o,29 m^3/min (at atmospheric pressure) at rated engine speed; pressure control valve with filter and coupling for tyre pressurizing, operating within 4,8-5,3 bar (opening pressure); compressed air tank with 2o l capacity; standardized coupling head;

Wheels

Steering wheels:	2 pneumatics in front 11,00-16, 8 ply, diagonal tyre casing; maximum permissible load per tyre 1320 daN at 2,5 bar inflation pressure and 30 km/h; track width adjustable from 1500 to 2000 mm in 100 mm steps; rims W10 x 16
Driving wheels:	2 pneumatics at rear 18,4-38, 8 ply, diagonal tyre casing; maximum permissible load per tyre 2380 daN at 1,1 bar inflation pressure and 30 km/h; track with adjustable from 1700 to 2200 mm steplessly; cast iron wheel discs; rims W14L - 38
wheel base:	2750 mm

Note: As optional equipment tractor may be fitted with
- steering wheels 7,50-20, 8 ply
- driving wheels 18,4 -34, 8 ply,
  or 9,5 -48,8 ply (duals)

Seat	Own make; upholstered seat with back rest; spring and shock absorber with possible adjustance from 60 to 120 daN; for and oft adjustable about 125 mm
Cab	Own make; cab with frame; drivers platform with six elastic supports (two in front-connected to the gearbox housing, four at rear-connected to the rear axle housing); windows with safety glasses; back and side windows may be opened
Number of grease points:	with grease 17 with oil 3

Dimensions

Total length:	4521 mm with horizontal lower links and without front ballast (front ballast may be fitted on the tractor, but manufacturer does not recommend use of it for drawbar work)
Maximum width:	2565 mm with maximum rear track setting (21oo mm) with and without rear ballast
Total height:	282o mm to the top of cab
Ground clearance:	46o mm below the swinging drawbar support (with tyre sizes: - front 11,oo-16; rear 18,4-38)
Lighting equipment:	Electrical, 12 Volt, negative earth

		Height above ground of centre mm	Size mm	Distance from outside edge of tractor to centre mm 1)
Head lights	2)	12oo	Ø 14o	86o
Side lights				
front	3)	181o	114 x 66	24o
rear	4)	182o	114 x 94	33o
Position lights				
front	3)	181o	114 x 66	24o
rear	4)	182o	114 x 94	33o
Stop lights	4)	182o	114 x 94	33o
Reflectors	5)	255o	Ø 14o	41o

1) with rear wheel track setting 17oo mm
2) unrestricted beam angle of Head lights in plan view 32°
3) in common box on the fender's front panel
4) in common box on the fender's rear panel
5) two reflectors at the rear of the cab

Running-time meter	Mechanical with tachometer combined, driven by the engine; reference engine speed for one really counted hour 15oo rev/min

TEST CONDITIONS

Masses (as during drawbar, brake and noise tests)

		without driver	with driver
Without ballast:	front	1835 kg	1850 kg
	rear	3480 kg	3540 kg
	total	5315 kg	5390 kg
Front ballast:	As recommended by the manufacturer, the tractor was tested without front ballast		
Rear ballast:	3 weights per wheel 50 kg each		300 kg
	water in tyres		740 kg
With ballast:	front	1835 kg	1850 kg
	rear	4520 kg	4580 kg
	total	6355 kg	6430 kg

Track setting

front	1600 mm
rear	1700 mm

FUELS AND LUBRICANTS USED IN TESTS

Fuel: INA Diesel-fuel D_2 in all tests

Specific gravity at 15°C	0,829 kg/l
Cetane number	56
Viscosity	5,0 cSt at 15°C

Engine oil: Galax Super (S3) SAE 30 (11 cSt at 98,9°C)

Transmission and power lift oil: Galax Traktol HT (8,7 cSt at 98,9°C)

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

Date and location of tests: 29th May 1984
Institute for Agricultural Mechanization - Zemun

Type of dynamometer: Hydraulic brake SCHENCK U1-3o

Power	Speed engine	Speed p.t.o.	Fuel consumption total		Fuel consumption specific	Specific energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
	MAXIMUM POWER					
	At 2-hour test					
85,7	2250	1031	28,02	23,14	270	3,06
	At standard p.t.o. speed					
84,2	2182	1000	27,42	22,65	269	3,07
	At speed recommended by the manufacturer for drawbar work					
85,7	2250	1031	28,02	23,14	270	3,06
	PART LOADS					
	Governor hand lever in position giving maximum power					
(i) 85 % of the torque at maximum power						
74,5	2302	1055	25,65	21,16	284	2,90
(ii) unloaded						
1,6	2423	1110	8,77	7,24	-	-
(iii) 50 % of the load defined in (i)						
38,6	2381	1091	16,69	13,78	357	2,31
(iv) maximum power						
85,7	2250	1031	28,02	23,14	270	3,06
(v) 25 % of the load defined in (i)						
19,3	2397	1098	12,49	10,31	534	1,55
(vi) 75 % of the load defined in (i)						
56,8	2340	1072	20,93	17,27	304	2,71

Power	Speed engine	Speed p.t.o.	Fuel consumption total	Fuel consumption total	Fuel consumption specific	Specific energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Governor setting giving standard p.t.o. speed at full load						
(i) 85 % of the torque at full load						
73,2	2233	1o23	24,83	2o,49	28o	2,95
(ii) unloaded						
1,5	2356	1o8o	8,7o	7,18	-	-
(iii) 5o % of the load defined in (i)						
37,9	2314	1o6o	16,o3	13,23	349	2,36
(iv) full load						
84,2	2182	1ooo	27,42	22,65	269	3,o7
(v) 25 % of the load defined in (i)						
19,1	2329	1o67	12,15	1o,o3	525	1,57
(vi) 75 % of the load defined in (i)						
55,8	2272	1o41	2o,17	16,64	298	2,77

STANDARD SPECIFIC FUEL CONSUMPTION: 284; 357; 28o; 349 g/kWh

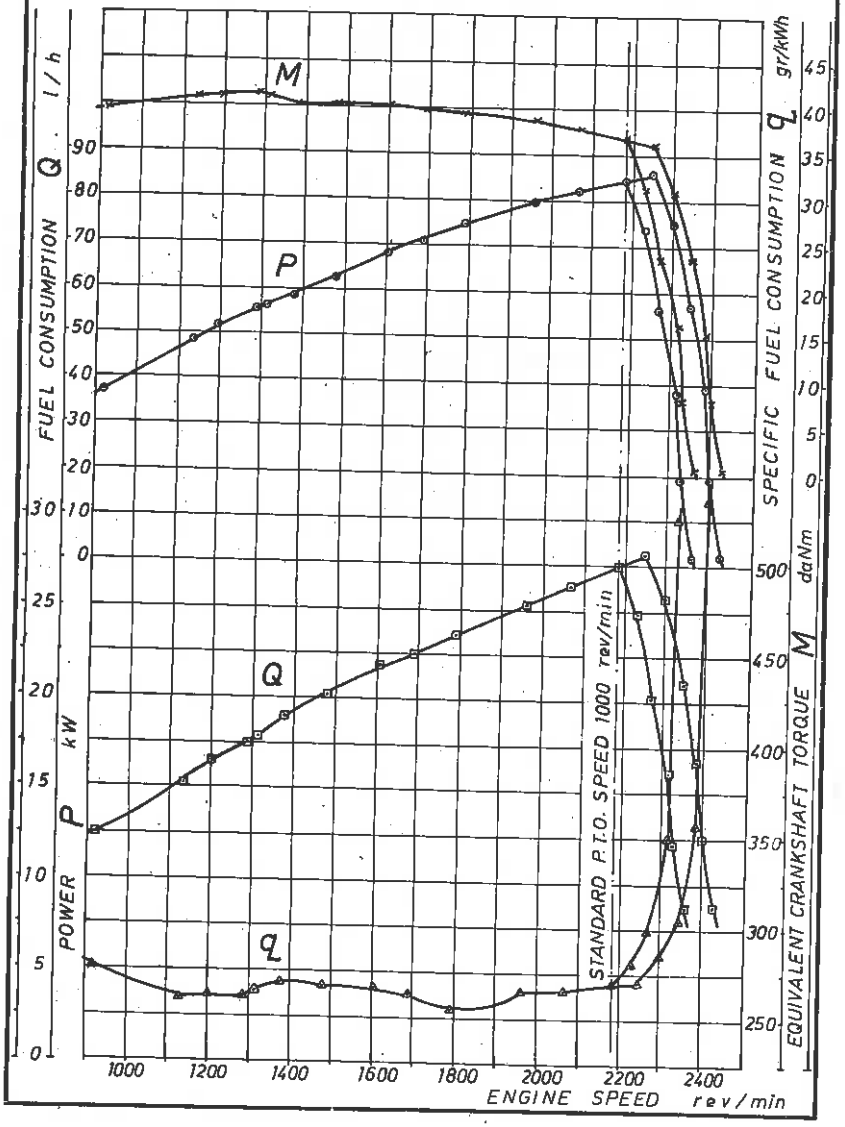
No load, maximum engine speed: 2435 rev/min

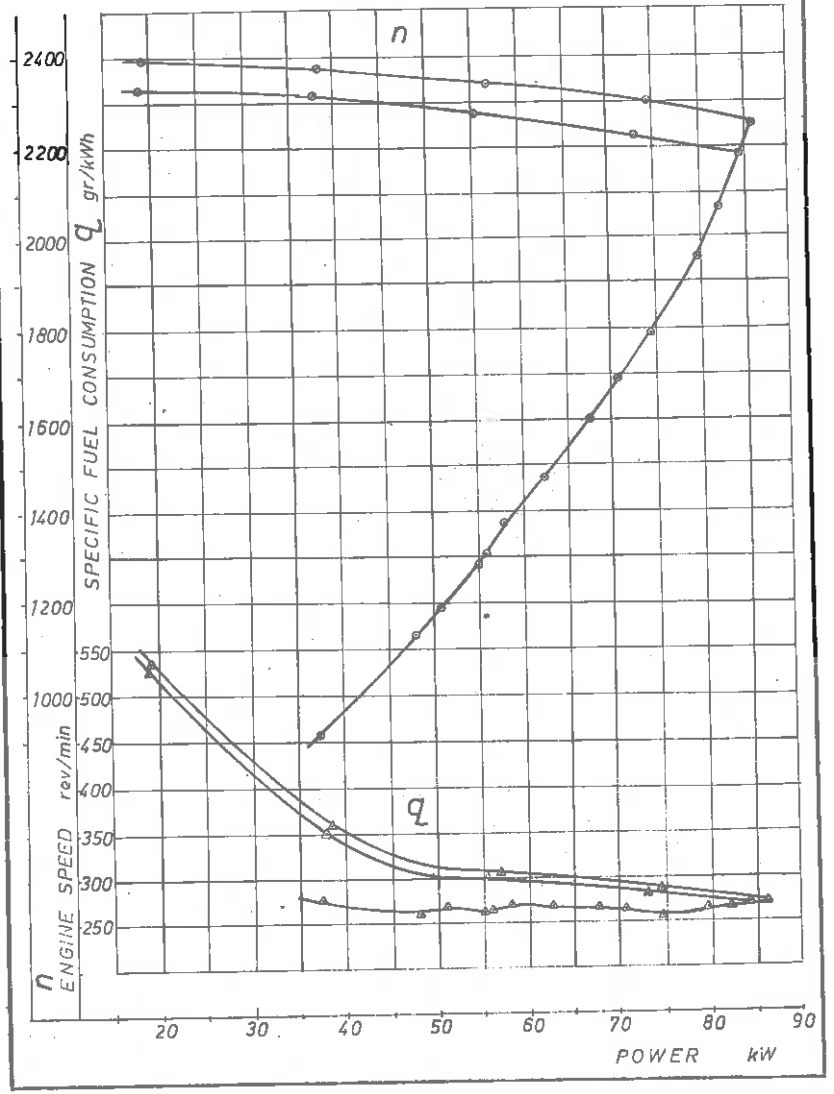
Equivalent crankshaft torque at maximum power: 363 Nm

Maximum equivalent crankshaft torque: 412 Nm at 1281 rev/min engine speed

Mean atmospheric conditions
- temperature: 23°C
- pressure: 997 mbar
- humidity: 63 %

Maximum temperatures
- coolant: 86 °C
- engine oil: 97 °C
- fuel: 25 °C
- air intake: 27 °C


M
P
Q
q
FUEL CONSUMPTION Q l/h
POWER P kW
SPECIFIC FUEL CONSUMPTION q gr/kWh
EQUIVALENT CRANKSHAFT TORQUE M daNm
STANDARD P.T.O. SPEED 1000 rev/min
ENGINE SPEED rev/min
1000 1200 1400 1600 1800 2000 2200 2400
0 5 10 15 20 25 30
0 10 20 30 40 50 60 70 80 90
250 300 350 400 450 500
0 5 10 15 20 25 30 35 40 45


n
q
2400
2200
2000
1800
1600
1400
1200
1000
550
500
450
400
350
300
250
SPECIFIC FUEL CONSUMPTION q gr/kWh
ENGINE SPEED n rev/min
20
30
40
50
60
70
80
90
POWER kW

(2) DRAWBAR PERFORMANCE

Date of test: 11th and 18th November 1984

Type of track: Tarmacadam

Note: The drawbar test was started with new, run-in tyres

Gear	Driving speed	Power	Drawbar pull	Engine speed	Slip of wheels	Specific energy	Specific fuel consumpt.	Temperatures: Fuel	Co-olant	Engine oil	Atmospheric condit.: Tempe-rature	Relative humidity	Pres-sure
-	km/h	kW	daN	rev/min	%	kWh/l	kg/kWh	°C	°C	°C	°C	%	mbar
1	2	3	4	5	6	7	8	9	10	11	12	13	14
(i) MAXIMUM POWER (unballasted) height of drawbar above ground 830 mm								tyre inflation pressure front 2,1 bar; rear 1,0 bar					
1 L	3,46	43,4	4515	2344	15,0	2,17	0,381	16	83	85	16	62	998
2 L	4,70	58,9	4515	2308	15,0	2,32	0,357	17	84	86	16	62	998
3 L	5,63	69,5	4445	2250	13,4	2,48	0,334	18	86	88	17	62	998
4 L	7,61	73,0	3455	2250	8,0	2,60	0,318	18	89	90	17	62	998
5 L	8,74	74,2	3055	2250	6,0	2,64	0,313	18	89	91	17	60	998
1 H	11,31	74,9	2385	2250	3,6	2,67	0,310	18	90	92	17	60	998
2 H	15,53	72,7	1685	2250	3,7	2,59	0,319	20	89	92	18	60	998
3 H	19,12	72,5	1365	2250	2,0	2,58	0,320	20	89	92	18	58	998
4 H	24,52	70,2	1030	2250	1,2	2,51	0,330	20	89	91	18	58	998
5 H	27,59	68,6	895	2250	1,1	2,45	0,338	20	89	91	18	58	998

Gear	Driving speed	Power	Drawbar pull	Engine speed	Slip of wheels	Specific energy	Specific fuel consumpt.	Temperatures Fuel	Coolant	Engine oil	Atmospheric condit. Temperature	Relative humidity	Pressure
-	km/h	kW	daN	rev/min	%	kWh/l	kg/kWh	°C	°C	°C	°C	%	mbar
1	2	3	4	5	6	7	8	9	10	11	12	13	14
			(ii) MAXIMUM POWER (ballasted)					tyre inflation pressure:					
			height of drawbar above ground 500 mm					front 2,1 bar; rear 1,1 bar					
1 L	3,45	49,3	5150	2335	15,0	2,23	0,370	17	83	86	17	64	996
2 L	4,60	65,9	5160	2265	15,1	2,39	0,346	18	85	89	17	64	996
3 L	5,95	72,9	4410	2250	8,5	2,60	0,318	18	87	90	17	64	996
4 L	7,86	74,7	3420	2250	5,0	2,67	0,310	18	89	92	17	64	996
5 L	8,93	74,9	3020	2250	4,0	2,67	0,310	19	90	92	17	62	996
1 H	11,40	74,4	2350	2250	2,8	2,65	0,312	20	90	93	18	62	996
2 H	15,85	72,7	1650	2250	1,7	2,59	0,319	20	89	92	18	60	996
3 H	19,26	71,7	1330	2250	1,3	2,53	0,327	20	89	92	18	60	996
4 H	24,57	68,2	1000	2250	1,0	2,43	0,340	20	90	91	18	59	996
5 H	27,68	66,1	860	2250	0,8	2,36	0,351	20	89	91	18	59	996

Gear	Driving speed	Power	Drawbar pull	Engine speed	Slip of wheels	Specific energy	Specific fuel consumpt.	Temperatures Fuel	Co-olant	Engine oil	Atmospheric condit. Tempe-rature	Relative humidity	Pres-sure
-	km/h	kW	daN	rev/min	%	kwh/l	kg/kWh	°C	°C	°C	°C	%	mbar
1	2	3	4	5	6	7	8	9	1o	11	12	13	14
			(iii) FIVE-HOUR TEST at 75 % of drawbar pull at maximum power in 4^{th}_{L} gear										
4 L	8,23	58,5	256o	231o	2,9	2,45	o,337	21	89	9o	18	58	lool
			(iv) FIVE-HOUR TEST at pull corresponding maximum wheel sleep in test (ii)										
2 L	-	-	515o	226o	-	-	-	21	9o	92	18	58	lool

Total oil consumption during ten hours duration of tests (iii) and (iv) was llo g/h

Test (iv) was carried out with additional ballast, the figures not quoted are therefore irrelevant

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment front: 11,00 - 16 8 ply
rear: 18,4 - 38 8 ply

Track of wheels front: 1600 mm
rear: 1700 mm

	Without brakes		With brakes	
	left-hand	right-hand	left-hand	right-hand
	m	m	m	m
Radius of turning space	4,92	4,86	4,28	4,25
Radius of turning circle	4,81	4,75	4,16	4,12

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	951 mm
Distance forward from rear axle axis	944 mm
Distance from tractor's median plane	2 mm to the left

(5) BRAKING PERFORMANCE

Date of test: 13th and 20th November 1984

Type of track: Tarmacadam

Mass of tractor with driver (kg)

	front	rear	total
unballasted	185o	354o	539o
ballasted	185o	458o	643o

Type 0 (ordinary cold service braking device performance) test

Speed before application of brakes 28,2 km/h

Ballasted	Braking device control force	daN	25	3o	35	4o	45
	Mean deceleration	m/s^2	1,85	2,35	2,8o	3,oo	3,15
Unballasted	Braking device control force	daN	2o	25	3o	35	4o
	Mean deceleration	m/s^2	2,3o	2,75	3,2o	3,3o	3,4o

Type I (fade) test

Speed before application of brakes 28,2 km/h

Ballasted	Braking device control force	daN	3o	35	4o	45	5o
	Mean deceleration	m/s^2	2,1o	2,7o	2,9o	3,oo	3,1o
Unballasted	Braking device control force	daN	25	3o	35	4o	45
	Mean deceleration	m/s^2	2,5o	3,o5	3,25	3,3o	3,35

Maximum deviation of tractor from its original course less than o,3 m to the right

No abnormal vibrations occured

The brakes were heated by towing the tractor with the braking force 1o% of the mass of tractor at the speed 22,5 km/h (8o% of the maximum speed)

Parking braking device test

	18 per cent slope		12 per cent slope with trailer of three tonnes	
	Up	Down	Up	Down
Braking device control force, daN	28	28	26	26

(6) AMBIENT NOISE EMITTED BY THE TRACTOR

Date of test: 12th November 1984
Type of track: Tarmacadam
Type of sound level meter: BRUEL &.KJAER mod.22o9

Results of test
Gear: 5th high
Travelling speed before acceleration: 21,5 km/h
Sound level: 89,5 dB(A)

(7) NOISE AT DRIVER'S EAR LEVEL

Date of test: 12th November 1984
Type of track: Tarmacadam
Type of sound level meter: BRUEL &.KJAER mod.22o9

Results of test

+) Tractor with cab and with vertical exhaust pipe

Gear	Drawbar pull at which the tractor developes the maximum sound level daN	Travelling speed. nominal km/h	efective km/h	Sound level dB(A)
1 L	44oo	3,91	3,3	89,8
2 L	43oo	5,38	5,o	9o,9
3 L	42oo	6,5o	6,1	9o,7
4 L+)	33oo	8,27	8,1	91,3
4 L+)	light load	8,27	8,3	9o,8
5 L	3ooo	9,3o	9,1	92,1
1 H	22oo	11,73	11,5	93,o
2 H	15oo	16,13	16,o	92,7
3 H	12oo	19,51	19,5	91,9
4 H	95o	24,82	25,o	91,4
5 H	8oo	27,9o	29,5	89,7

+) The 4th L low gear corresponds to the travelling speed nearest to 7,5 km/h

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date and location of test: 28th June 1984
Institute for Agricultural Mechanization - Zemun

Hydraulic fluid

Make and type: Galax Traktol HT
Viscosity: 8,7 cSt at 98,9°C
Viscosity index: over 85

Note: Power lift operates with the oil from the gearbox

Type of linkage lock for transport: hydraulic

Power lift

	Height of lower hitch point above ground in down position mm 1)	Vertical movement mm	Maximum force exerted through full range daN	Corresponding pressure of hydraulic fluid MPa (bar)	Moment about rear axle daNm 2)	Max.tilt angle of mast over range of lift deg.
At hitch points	300	670	3310	15,75 (157,5)	4060	-
On the frame	190	890	2450	15,75 (157,5)	4710	-11° 15' +11°

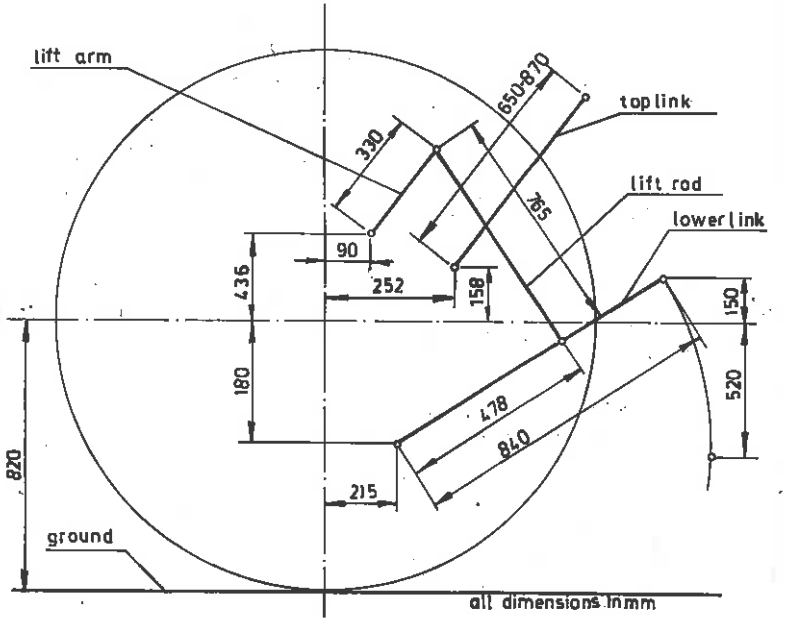
1) With the rear wheel static radius 820 mm
2) Calculated with the maximum force exerted through the full range of lower links movement and with maximum oil pressure (18,3 MPa)
3) The front of tractor does not lifts when maximum force is applied on the frame

Temperature of hydraulic fluid at start of test 64°C

Hydraulic pump performance

Opening pressure of the relief valve:	17,5 MPa (175 bar)
Sustained pressure with relief valve open: (pump was not stalled)	18,3 MPa (183 bar)
Pump delivery rate at minimum pressure, the governor control lever being set for maximum power:	38,8 l/min
Pump delivery rate at 9o% of relief valve setting, the governor control lever being set for maximum power:	34,9 l/min
Hydraulic power at 9o% of relief valve setting:	9,17 kW

Dimensions of linkage geometry
for the table on page 25



LIFTING FORCES

Lifting heights relative to horizontal lower links

mm	-45o	-4oo	-34o	-3oo	-2oo	-1oo	0	+1oo	+2oo	+3oo	+33o	+4oo	+44o
						At hitch points							
daN	-	-	34oo	346o	349o	357o	359o	358o	354o	341o	331o	-	-
						At test frame (61o mm behind lower link hitch points)							
daN	25oo	255o	-	257o	261o	268o	268o	268o	261o	257o	-	25oo	245o

1° The forces are measured at sustained pressure with relief valve open (18,3 MPa) and calculated on the pressure 15,75 MPa which corresponds 9o% of relief valve setting

2° The hydraulic fluid temperature during the test was 64°C - 68°C

Linkage geometry when connected to the standard frame

Projected length in side view

lower links	840 mm
lift arms	330 mm
lift rods	765 mm
top link	825 mm
Distance of lift rod connection point from pivot point of lower link	478 mm

The folloving dimensions are given relative to the rear wheel centre line, situated 820 mm above the ground level:

Lower link pivot point	215 mm behind,	180 mm below
Top link pivot point	252 mm behind,	158 mm above
Lift arm pivot point	90 mm behind,	436 mm above
Maximum and minimum height of lower link hitch points	150 mm above,	520 mm below
Height of lower link hitch points when locked in transport position	190 mm above	