INSTITUTE FOR MECHANIZATION, TECHNOLOGY AND BUILDINGS IN AGRICULTURE ZAGREB, YUGOSLAVIA

TEST BULLETIN: O.E.C.D.No. 1046

Report on test in accordance with O.E.C.D. Standard Code for the Official Testing of Agricultural Tractors

AGRICULTURAL TRACTOR

TORPEDO RX 100 (4 WD)

Date of approval:	6th March 1987
Manufactured by:	Torpedo, Rijeka, Yugoslavia
Date of test:	October-November 1986

This report has been approved by the O. E. C. D. Coodinating Centre (CEMAGREF, Antony, France) as being in accordance with the O. E. C. D. Standard Code for the Official Testing of Agricultural Tractor Performance.

Date of approval: 6th March 1987 Serial No. 1046

This bulletin is based on engineering test in accordance with O.E.C.D. Tractor Code. It does not contain evaluation of the performance of the tractor on practical farm work.

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In this report all measurements are given in SI units. The relation with former Technical System of Units is given by following relations:

Forces:	1 N = 0.102 kp or 1 kp = 9.81 N
Powers:	1 kW = 1.36 HP or 1 HP = 0.736 kW
Pressures:	100 kPa = 1.02 kp/cm^2 = 750.1 mm Hg or 1 kp/cm^2 = = 98.1 kPa

Tractor manufacturer's name and adress:	Torpedo, Industrijska 19, 51000 Rijeka
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer in agreement with the Institute
Place of running-in:	Zagreb
Duration of running-in:	50 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	Torpedo, Rijeka
Model:	RX 100
Type:	4 wheel drive, unit construction
Serial No.:	34248
1st serial No.:	32271

Engine

Make:	Torpedo, Rijeka
Model:	F6L 912 RX 100
Type:	Naturally aspirated, 4-stroke diesel engine, air cooled, direct igniton
Serial No.:	102581
Cylinders:	6, vertical in-line
Bore/Stroke:	100×120 mm
Capacity:	5652 cm^3
Compression ratio:	17:1
Cylinder liners:	Interchangeable cylinders
Valves:	Overhead

Fuel system

Fuel feed system:	Piston fuel feed pump with sediment bowl, integral with injection pump
Fuel filters:	2, with replaceable cartridge
Capacity of fuel tank:	125 l
Injection pump:	In-line, Rikard Benčić, Rijeka BR 26 T8-12a 69 CII RVF
Serial No.:	2.86–2998
Manufacturer's production setting of injection pump:	50 mm^3/stroke at rated engine speed
Injection timing:	32° before TDC
Make, type and model of injectors:	IPM; Y DLLA 149 S 394, 4 hole
Injection pressure:	17.6 ±8 MPa

Governor

Make:	Rikard Benčić – Rijeka
Type:	Mechanical, centrifugal
Governed range of speed:	650–2450 rev/min
Rated engine speed:	2300 rev/min

Air cleaner

Pre-cleaner

Type:	Centrifugal dust trap
Location:	Under bonnet, front of the engine

Main

Make:	KRON
Type:	Horizontal, dry, with replaceable cartridge
Location:	Front of the engine
Maintenance indicator:	Yes

Lubrication system

Type of feed pump:	Gear
Total oil capacity:	15 l
Oil change period:	200 hours
Type of oil filter:	With replaceable cartridge
Filter change period:	200 hours
Recommended oil:	acc. MIL-L-2104 B or C
Recommended viscosities:	Winter SAE 10 W Summer SAE 20 W/20 All-weather SAE 30

Cooling system

Type of cooling system:	Air
Fan:	Belt driven via hydraulic clutch
Number of blades:	10
Fan diameter:	275 mm

Starting system

Safety device:	Gear selector lever to be in neutral position
Make:	ISKRA
Type:	Electrical, solenoid engaged
Starter motor power rating:	12 V; 3 kW
Cold starting aid:	Flame plug in inlet manifold

Electrical system

Voltage:	12 V
Generator:	Alternator

Rating:	14 V; 55 A
Batteries:	1, lead acid type
Rating:	110 Ah at 20 hours rating

Exhaust system

Make:	Own
Type	Apsorption silencer, 1080×220×100 mm
Location:	Left-hand side of engine, vertical
Height of outlet above ground:	2820 mm

TRANSMISSION

Clutch

Make:	OMG – Gorizia
Type:	Dry, dual disc clutch
Number of plates:	2
Diameter of plates:	305 mm
Method od operation:	Driving clutch mechanically by pedal; p.t.o. clutch mechanically by hand lever

Gearbox

Make:	Own
Type:	TWT 360
Arrangement:	5 forward speeds × 3 forward + 1 reverse group gears; optional creep group not fitted on tested tractor (5 forward × 4 forward + 1 reverse group gears)
Number of speeds:	15 forward + 5 reverse (optionally 20 forward + 5 reverse)
Sinchromesh gears:	5 forward speeds; medium and reverse group gears

Rear axle and final drives

Make:	Own
Type:	Bevel gear drive with crown wheel and pinion; bevel gear differential; spur gear reduction final drives

Differential lock

Type:	Mechanical
Method of operation:	Manual by pedal
Method of disengagement:	Self-disengaging

Front axle and final drives

Make:	Own
Type:	Bevel gear drive with crown wheel and pinion; bevel gear differential; planetary reduction gear final drives in wheel hubs
Differential lock:	None

Transmission oil

Gear box and rear final drives:	40 l
Change period	500 hours
Recommended oil:	SAE 15 W 40 HD engine oil acc. API service classiffication: service CC, CD

Front axle

Differential:	12 l
Final drives:	2×3 l
Change period:	500 hours
Recommended oil:	Acc. API service clasiffication service GL-5, viscosity SAE 90

Power take-off

Type:	Independent p.t.o. driven by the second disc of the dual disc clutch
Method of engagement:	By hand lever
Number of shafts:	2; 1 for 540 rev/min; 1 for 1000 rev/min
Method of changing p.t.o. speeds:	By coupling proper propeller shaft to proper p.t.o. shaft
Location:	At rear of tractor
Direction of rotation (viewed facing driving end):	Clockwise

(i) 540 rev/min

Diameter of p.t.o.	34.9 mm with 6 splines; ISO 500 type 1
Engine to p.t.o. ratio:	4.06
P.t.o. speed at rated engine speed:	567 rev/min
Engine speed at standard p.t.o. speed:	2192 rev/min
Distance from the median plane of the tractor:	50 mm to right
Distance behind rear axle:	523.5 mm
Tyre sizes, Front, Rear:	11.2/10-28; 18.4/15-34
Height above ground:	620 mm

Total ratios and speeds:

Group	Gear	Number of engine revolutions for one revolution of driving wheel	Nominal travelling speed for rated speed of the engine 2300 rev/min
Creep, K (optional, not fitted)	1	1758.73	0.39
	2	1151.92	0.60
	3	939.53	0.73
	4	647.94	1.06
	5	527.96	1.30
Low, L	1	329.29	2.08
	2	215.68	3.18
	3	175.91	3.89
	4	121.32	5.65
	5	98.85	6.93
Medium, Z	1	162.51	4.22
	2	106.44	6.44
	3	86.81	7.89
	4	59.87	11.44
	5	48.78	14.04
High, S	1	80.25	8.54
	2	52.56	13.03
	3	42.87	15.98
	4.	29.57	23.17
	5	24.09	28.44
Reverse, R	1	132.41	5.17
	2	86.72	7.90
	3	70.73	9.68
	4	48.78	14.04
	5	39.75	17.23

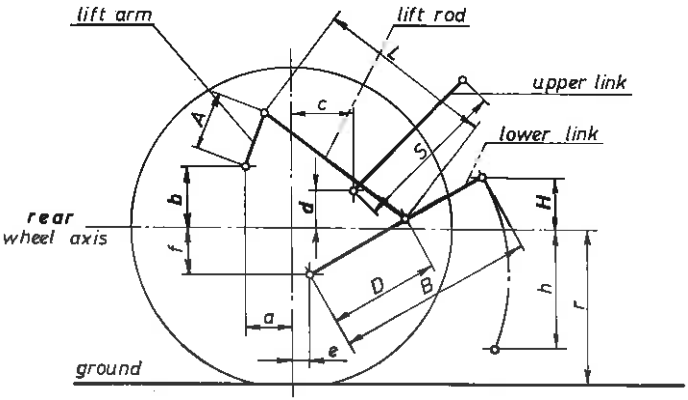
Calculated with tyre radius index of 790 mm

(ii) 1000 rev/min

Diameter of p.t.o.	34.9 mm with 21 splines; ISO 500 type 2
Engine to p.t.o. ratio:	2.214
P.t.o. speed at rated engine speed:	1039 rev/min
Engine speed at standard p.t.o. speed:	2214 rev/min
Distance from the median plane of the tractor:	50 mm to left
Distance behind rear axle:	523.5 mm
Tyre sizes, Front, Rear:	11.2/10-28; 18.4/15-34
Height above ground:	605 mm

LINKAGE DIMENSIONS FOR THE LIFTING TEST

Rear tyres (size 18.4/15-34) loaded radius:	(r)	775 mm
Front tyres (size 11.2/10-28) loaded radius:	(r')	610 mm
Length of lift arms:	(A)	330 mm
Length of lower links:	(B)	940 mm
Distance of lift arm pivot point from rear wheel centre line		
horizontally:	(a)	–120 mm
vertically:	(b)	412 mm
Horizontal distance between the two lower link points:	(u)	530 mm
Horizontal distance between the two lift arm points:	(v)	620 mm
Length of upper link:	(S)	725 mm
Distance of upper pivot point from rear wheel centre line		
horizontally:	(c)	383 mm
vertically:	(d)	202 mm
Distance of lower link pivot points from rear wheel centre line		
horizontallly:	(e)	147 mm
vertically:	(f)	246 mm
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	570 mm
Length of lift rods:	(L)	807 mm
Height of lower hitch points:		
– in low position	(h)	577 mm
– in high position	(H)	145 mm
Height of lower hitch points when locked in transport position:		Any height within lift range


lift arm
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upper link
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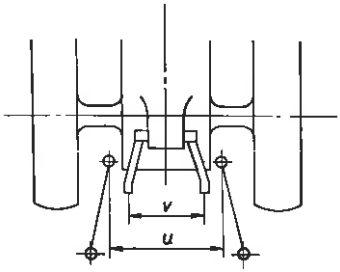

v
u

Power lift

Make:	Own
Type:	K 45.5
Type and number of cylinders:	One internal single acting two external single acting
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	17.5 MPa
Opening pressure of cylinder safety valve	22.0–25.0 MPa
Lift pump type:	Gear pump, BOSCH type HY/ZFFS 16/11, gear driven from the engine
Oil filters:	2; 1 in power lift unit, 1 in oil cooler circuit
Time between oil changes:	1500 hours
Time between filter changes:	500 hours
Oil capacity:	14 l
Site of reservoir:	Power lift housing
Type and number of tapping points:	4, quick release at rear of tractor
Maximum volume of oil available to external cylinders:	7 l
Recommended oil:	SAE 20 engine oil acc. MIL-L-2104

Three-point linkage

Category:	2 acc. to ISO 730
Controls:	Drought and position control, lower link sensing; floating position

Swinging drawbar

Height above ground:	390, 500, 600 mm
Tyre sizes, Front, Rear:	11.2/10-28; 18.4/15-34
Type of adjustment:	Inverting drawbar
Distance of hitch point from rear axle centre:	1580, 1650, 1720 mm
Distance of hitch point from p.t.o. shaft ends:	
vertically:	185/200 mm
horizontally:	300 mm
Lateral adjustment:	170 mm left and right

Distance of pivot point from rear axle horizontally:	380 mm
Diameter of drawbar pin hole:	30 mm

Holed bar

Height above ground,	
maximum:	1082 mm
minimum:	86 mm
Tyre sizes, Front, Rear:	11.2/10-28; 18.4/15.34
Horizontal distance to p.t.o. shaft ends:	563 mm
Number of holes:	9
Hole diameter:	32 mm
Thickness and width of drawbar:	30 mm × 80 mm

Trailer hitch

Height above ground:	800 or 840 mm
Tyre sizes, Front, Rear:	11.2/10-28; 18.4/15-34
Distance of hitch point from rear axle centre:	602 mm
Distance of hitch point from p.t.o. shaft ends vertically maximum:	235/200 mm
minimum:	195/180 mm
Maximum permissible vertical load:	20 kN
Diameter of pin hole:	32 mm

Steering

Method of operation:	Hydrostatic power system with hand operated steering motor powered by gear pump mounted on the engine, single acting cylinder on front axle
Make:	Prva Petoletka – Trstenik
Working pressure:	16 MPa
Oil:	Transmission oil from gearbox

Brakes

Service brake

Type:	Single dry disc brakes on rear axle half shafts
Method of operation:	Hydraulic by independent or coupled pedals

Parking brakes

Type:	Drum brakes on rear axle half-shafs
Method of operation:	Hand lever with ratchet acting mechanically
Trailer brakes:	Optional pneumatic system operated by tractor pedals

Wheels

Front wheels:	2, steering and driving wheels
Make:	Sava – Ruma
Size:	11.2/10-28
Ply rating:	8
Type of casing:	Cross ply
Maximum permissible load on each tyre:	13.05 kN at 230 kPa overpressure
Track widths:	1670-2270 mm in steps of 100 mm
Method of adjustment:	Reversing wheels and off-set lug rims
Rear wheels:	2, driving wheels
Make:	Sava-Ruma
Size:	18.4/15-34
Ply rating:	10
Type of casing:	Cross ply
Maximum permissible load on each tyre:	29.9 kN at 180 kPa overpressure
Track widths:	1760-2260 mm in steps of 100 mm
Method of adjustment:	Reversing wheels and off-set lug rims

Wheelbase 2690 mm

Protective structure

Make:	Torpedo – Progres
Model:	Torpedo – Progres RX 120
Manufacturer's name and adress:	Torpedo – Progres, Jastrebarsko, Yugoslavia
Protective device:	Fully closed cab, not tilting
O.E.C.D. approval number:	CSD 01028/2–a(c)

Description

The protective structure is made of square steel tubes reinforced with steel plates as mudguards and roof. It is joined with tractor body by four rubber supports. The cabin has safety glass door and windows, noise insulation and heathing – ventilating unit.

Driver's seat

Make:	Grammer DS 85 H/90A
Type of suspension:	Paralelogram linkage
Type of damping:	Hydraulic
Range of adjustment:	
Longitudinal:	150 mm
Vertical:	60 mm
Back rest:	20°

Passenger's seat

Number of places:	One
Location:	Behind driver

Lighting

Tyre sizes:

Front:	11.2/10-28
Rear:	18.4/15-34

Lighting equipment in accordance with the national regulation

	Height from ground to centre mm	Dimensions mm	Distance from outside edge of tractor to centre at track width of 1870 mm
Headlights	1040	175×125	955
Side lights	1850	120× 70	285
Rear lights	1620	115× 95	280
Front reflector	2615	Ø 140	460
Rear reflector	1750	Ø 140	600

TEST CONDITIONS

Tyres

Front:	11.2/10-28
Rear:	18.4/15-34

Track setting

Front:	1875 mm
Rear:	1870 mm

Overall dimensions

	Length m	Width m	Height at top of exhaust silencer m	Height at top of protective structure m
With ballast	4.52	2.59	2.82	2.65
Without ballast	4.28	2.34	2.82	2.65

Ground clearance: 390 mm limited by front axle

Tractor mass and ballasting

Tractor mass
(without driver but with tanks full – with cab)

	Front	Rear	Total
Without ballast, kg	2000	3080	5080
With ballast, kg	2750	3730	6480

Ballast

	No of weights	Total mass, kg
Front	15	600
Rear	16	800

FUELS AND LUBRICANTS USED DURING TESTS

Laboratory and track tests:
Fuel — INA D-2 acc. JUS B.H 2.411
Density at 15°C 0.833 kg/1

Engine, transmission, hydraulic and steering oil
Type: — INA AGRINA SAE 15W/30
Viscosity: — 11.0 mm/s^2 at 100°C

Front axle
Type: — INA Hypenol SAE 90
Viscosity: — 194 mm/s^2 at 40°C

Recommended grease: — INA LIS-2
Number of lubrification points: — 14

COMPULSORY TESTS

(1) Main power take-off preformance

Date and location of tests: 1986. 10. 09. Zagreb

Type of dynamometer: SCHENK hydraulic dynamometer U1–40

Power	Speed		Fuel consumption			Specific energy
	Engine	p.t.o.	Hourly		Specific	
kW	rev/min	rev/min	1/h	kg/h	kg/kWh	kWh/1
MAXIMUM POWER – 2 HOUR TEST						
69.3	2316	1046	21.07	17.55	0.253	3.29
POWER AT RATED ENGINE SPEED						
69.3	2316	1046	21.07	17.55	0.253	3.29
POWER AT STANDARD TAKE-OFF SPEED						
67.4	2214	1000	20.1	16.75	0.248	3.36
PART LOADS						
(i) The torque corresponding to maximum power at rated engine speed						
69.3	2316	1046	21.07	17.55	0.253	3.29
(ii) 85% of the torque obtained in (i)						
60.2	2353	1063	18.26	15.21	0.253	3.29
(iii) 75% of the torque defined in (ii)						
45.3	2376	1073	14.67	12.22	0.270	3.09
(iv) 50% of the torque defined in (ii)						
30.4	2420	1093	11.15	9.29	0.306	2.72
(v) 25% of the torque defined in (ii)						
15.7	2442	1103	7.95	6.62	0.421	1.98
(vi) Unloaded						
3.6	2466	1114	5.71	4.75	1.319	0.63

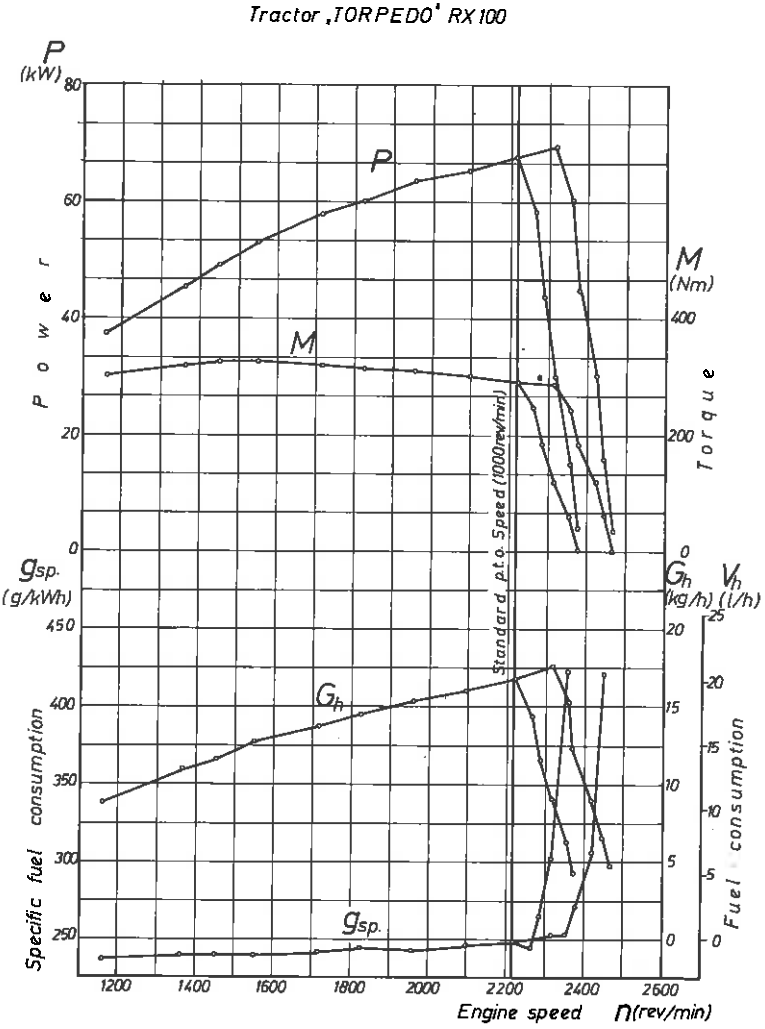
PART LOADS – the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (1000 rev/min)

Power	Speed		Fuel consumption			Specific energy
	Engine	p.t.o.	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	kg/kWh	kWh/l
(i) The torque corresponding to maximum power at standard p.t.o. speed						
67.4	1000	2214	20.1	16.75	0.248	3.36
(ii) 85% of the torque obtained in (i)						
58.2	1022	2263	17.2	14.33	0.246	3.39
(iii) 75% of the torque defined in (ii)						
44.1	1032	2285	13.92	11.6	0.263	3.17
(iv) 50% of the torque defined in (ii)						
29.9	1047	2318	10.81	9.01	0.301	2.77
(v) 25% of the torque defined in (ii)						
14.9	1063	2353	7.53	6.28	0.423	1.97
(vi) Unloaded						
3.9	1073	2376	5.03	4.19	1.234	0.68

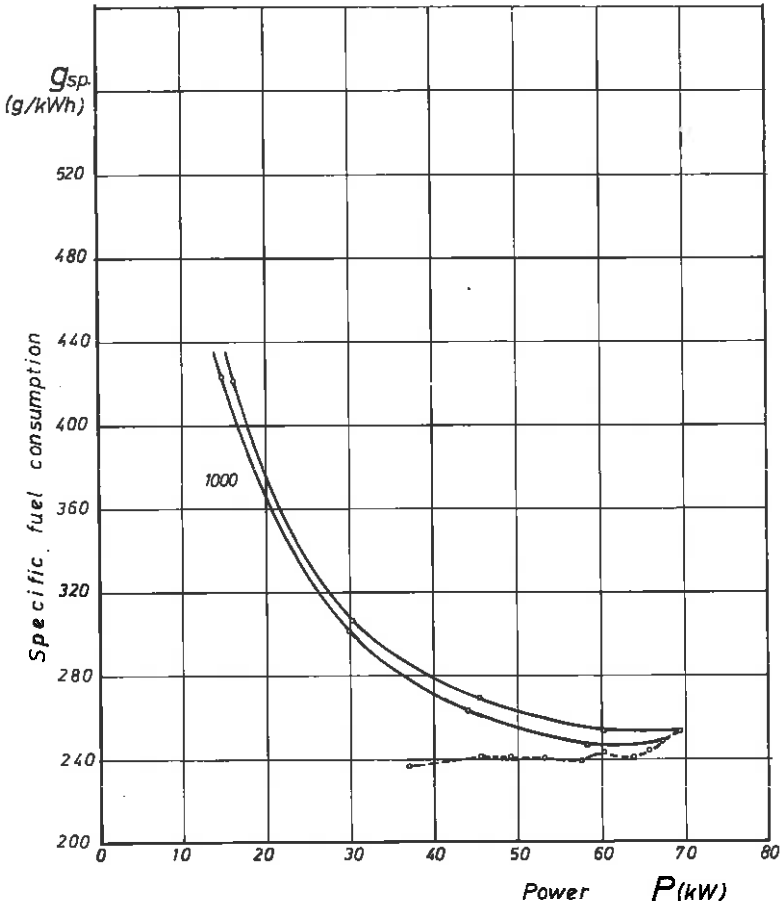
Standard specific fuel consumption, kg/kWh

a) 0.253
b) 0.306
c) 0.246
d) 0.301

No load maximum engine speed:	2466 rev/min	
Equivalent crankshaft torque at maximum power:	286 Nm	
Maximum equivalent crankshaft torque:	327 Nm at 1550 rev/min engine speed	
Mean atmospheric conditions:	temperature	20°C
	pressure	101,3 kPa
	relative humidity	68%
Maximum temperature:	engine head	96°C
	engine oil	98°C
	fuel	22°C
	air intake	22°C


Tractor „TORPEDO" RX 100
P
(kW)
80
60
40
20
0
P
M
M
(Nm)
400
200
0
Power
Torque
Standard p.t.o. Speed (1000 rev/min)
$g_{sp.}$
(g/kWh)
450
400
350
300
250
G_h
V_h
(kg/h)
(l/h)
20
15
10
5
0
25
20
15
10
5
0
G_h
$g_{sp.}$
Specific fuel consumption
Fuel consumption
1200
1400
1600
1800
2000
2200
2400
2600
Engine speed n (rev/min)

Tractor „TORPEDO" RX 100



(2) Drawbar preformance

Date of tests: 1986. 10. 29. – 11. 05.

Type of track: Concrete

Gear	Speed	Power	Drawbar pull	Engine speed	Wheel-slip	Specific fuel consum-ption	Specific energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Oil	Tempe-rature	Relative humidity	Pressure
	km/h	kW	kN	rev/min	per cent	kg/kWh	kWh/l	°C	°C	°C	°C	per cent	kPa
(i) Maximum power (unballasted)						Height of drawbar above ground: 620 mm tyre inflation pressure: front: 130 kPa rear: 110 kPa							
L1	1.86	22.1	42.7	2425	15.2	0.400	2.08	14	–	74	12	48	98.6
L2	2.83	33.8	43.0	2390	15.0	0.345	2.41	16	–	78	14	48	98.6
L3	3.35	39.7	42.7	2370	15.2	0.335	2.49	17	–	78	15	48	98.6
Z1	3.74	44.4	42.7	2368	15.1	0.325	2.56	20	–	81	15	50	98.6
L4	4.85	58.0	43.0	2325	15.0	0.315	2.64	21	–	86	16	50	98.6
Z2	5.71	60.0	37.8	2292	10.3	0.304	2.74	24	–	84	17	50	98.6
L5	6.29	60.0	34.3	2290	9.0	0.290	2.87	26	–	88	17	50	98.6
Z3	7.29	60.9	30.1	2298	7.8	0.290	2.87	27	–	90	17	50	98.6
S1	8.29	66.6	28.9	2282	7.2	0.280	2.98	19	–	76	15	52	98.6
Z4	10.98	67.4	22.1	2260	5.0	0.275	3.03	23	–	79	15	52	98.6
S2	12.86	67.9	19.0	2273	4.1	0.270	3.09	20	–	80	14	54	98.6
Z5	13.43	66.0	17.7	2258	3.6	0.273	3.05	21	–	81	14	53	98.6
S3	16.07	66.5	14.9	2286	3.0	0.278	3.00	22	–	82	14	55	98.6

(ii) Maximum power (ballasted)

Height of drawbar above ground: 480 mm
Tyre inflation pressure: front: 140 kPa
rear: 120 kPa

L1	1.83	27.8	54.9	2405	15.0	0.362	2.13	13	–	68	14	55	98.7
L2	2.74	41.8	54.9	2367	15.0	0.318	2.62	14	–	72	14	55	98.7
L3	3.31	50.5	54.9	2353	15.0	0.310	2.69	15	–	70	15	52	98.7
Z1	3.58	54.2	54.5	2336	15.1	0.312	2.67	17	–	72	16	52	98.7
L4	5.06	64.7	46.1	2310	9.7	0.287	2.90	18	–	78	18	50	98.7
Z2	5.94	63.2	38.3	2318	7.3	0.290	2.87	18	–	78	18	50	98.7
L5	6.45	65.8	36.4	2316	6.6	0.280	2.98	16	–	66	18	48	98.7
Z3	7.44	63.8	30.9	2335	6.0	0.283	3.17	17	–	69	18	48	98.7
S1	8.24	66.8	29.2	2320	5.4	0.274	3.04	16	–	73	19	48	98.7
Z4	10.98	68.0	22.3	2301	3.1	0.270	3.09	16	–	72	19	46	98.7
S2	12.95	68.7	19.1	2335	2.9	0.267	3.12	17	–	74	18	48	98.7
Z5	13.43	66.0	17.7	2298	2.6	0.275	3.03	17	–	74	18	48	98.7
S3	15.65	66.1	15.2	2292	2.3	0.270	3.07	17	–	74	18	50	98.7
(iii) Five hour test at 75 per cent of pull at maximum power (ii)													
Z3	7.66	50.0	23.5	2368	3.8	0.336	2.48	27	–	91	13	65	98.7
(iv) Five hour test at pull corresponding to 15 per cent of wheelslip in test (ii)													
Z1	3.62	54.7	54.4	2340	–	–	–	42	–	97	10	54	99.3

Oil consumption during ten hours' testing (iii) and (iv): 75 g/h

(3) Turning space and turning circle

Details of wheel equipment: Tractor with ballast
Tyres: front: 11.2/10-28
rear: 18.4/15-34
Track of wheels:
front: 1875 mm
rear: 1870 mm

	With brakes		Without brakes	
	Left-hand	Right-hand	Left-hand	Right-hand
Radius of turning space, m	5.23	5.64	6.10	6.14
Radius of turning circle, m	5.11	5.46	5.90	5.99

(4) Location of centre of gravity

Height above ground: 1015 mm
Distance forward from the vertical plane containing the axis of the rear wheels: 1055 mm
Distance from the median plane: 7 mm to left

(5) Braking

Date of tests: 1986. 10. 31.
Tractor masses during brake test

	Front	Rear	Total
Unballasted, kg	2010	3140	5150
Ballasted, kg	2730	3770	6500

Type 0 (ordinary cold service braking device performance) test
Speed before application of brakes: 31.0 km/h

						locked
Ballasted	Braking device control force, N	186	245	324	422	589
	Mean deceleration m/s²	1.4	1.6	2.5	2.8	4.7
Unballa-sted	Braking device control force, N	108	206	235	255	422
	Mean deceleration, m/s²	0.6	1.6	2.6	3.7	5.4

Type 1 (fade) test

					locked
Braking device control force, N	147	167	226	353	471
Mean deceleration, m/s²	1.6	1.8	2.6	4.0	5.1

Maximum deviation of tractor from its original course: Ø m
Abnormal vibrations: None
The brakes were heated by: By applying force of 140 N to brake pedal and driving tractor for 1 km

Parking braking device test

	18 per cent slope		12 per cent slope with trailer of 3.0 tonnes	
	up	down	up	down
Braking device control force, N	135	130	145	135

(6) Measurement of external noise level

Date of test:	1986. 10. 29.
Type of sound level meter:	Brüel & Kjaer Type 2232
Type of track:	Concrete
Results of test:	
Gear:	S5
Travelling speed before acceleration:	23.3 km/h
Sound level:	87.3 dB(A)

(7) Noise measurement at the driver's ear

Date of tests:	1986. 10. 29.
Type of sound level meter:	Brüel & Kjaer Type 2232
Type of track:	Concrete
Cab fitted:	Yes

Results of tests:

Gear	Drawbar pull at which the tractor develops the maximum sound level, kN	Measured travelling speed, km/h	Sound level, dB(A)
Z3	30.1	7.29	84.2
Z2	light load	8.37	83.3
S5	light load	31.0	82.4

The Z3 gear corresponds to the nominal travelling speed nearest to 7.5 km/h.

(8) Lifting force and hydraulic power

Date and location of test:	1986. 10. 10, Zagreb
Hydraulic fluid	
Make and type:	INA AGRINA SAE 15W-30
Viscosity:	11 mm/s^2 at 100°C
Viscosity index:	135
Hydraulic fluid temperature at beginnig of test	60°C

Lifting heights relative to the horizontal plane including the lower link pivot points

mm	–248	–238	–157	–83	–76	0	47	87	165	246	322	407

Lifting forces at hitch points (corresponding pressure 15.6 MPa)

kN		42.4	43.7		44.1	44.6	44.1		44.1	44.1	41.5	

Lifting forces at test frame (corresponding pressure 15.6 MPa)

kN	41.9		41.9	41.1		41.1		40.2	37.5	36.2	34.9	33.1

Power lift test

	Height of lower hitch points above ground in down position mm	Vertical movement mm	Maximum corrected force exerted through full range kN	Corresponding pressure of hydraulic fluid MPa	Moment about rear axle kNm	Max. angle of mast over range of lift degrees
At hitch points	198	722	41.5	15.6	41.5	–
On the frame	181	817	33.1	15.6	56.2	8

Hydraulic power test

Sustained pressure with relief valve open: 17.3 MPa
Pump delivery rate at minimum pressure: 44 l/min
Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding power:

Flow rate 36 l/min
Pressure 15.6 MPa
Power 9.4 kW

Flow rate and hydraulic pressure corresponding to maximum hydraulic power:

Flow rate 41.5 l/min
Pressure 14.0 MPa
Power 9.7 kW

Tapping point used for test: at rear of the tractor

REMARKS: No comment

4th December 1986

Head of Testing Division **Director**

dipl. ing. Janko Dobričević **dr Josip Gašparac**