GEPRÜFT

PROT. Nr.

O.E.C.D. Report No.: 1168

Bundesanstalt für Landtechnik

A-3250 Wieselburg, Austria

Dieseltractor STEYR 397.45

Trade name:

STEYR 8180 a (4 WD)



Date of approval: 17.1.1989

This report has been approved by the O.E.C.D. Coordinating Centre (CEMAGREF, France) as being in accordance with the O.E.C.D. Test Code

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Tractor manufacturer's name and address:	STEYR-DAIMLER-PUCH AG., Steyr, Austria STEYR-HELLAS ABE., Sindos, Greece
Location of tractor assembly:	Steyr
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer by agreement with BLT-Wieselburg
Place of running-in:	Steyr, Austria
Duration of running-in:	100 hours
Location of test:	Wieselburg, Austria

SPECIFICATIONS OF TRACTOR

TRACTOR:

Make:	STEYR-DAIMLER-PUCH AG.
Trade name:	STEYR 8180 a
Model:	Diesel-tractor STEYR 397.45
Type:	Wheel tractor, unit construction
Number of driving wheels:	4
Serial no.:	397.45 - 04657
1st serial no.:	397.45 - 4628

ENGINE:

Make:	Own make
Model:	WD 612.96
Type:	4 stroke diesel engine with direct injection and exhaust turbo supercharger
Serial no.:	612.96 - 701

Cylinder:

Number/disposition:	6, vertical in line
Bore/stroke:	108/120 mm
Capacity:	6596 cm^3
Compression ratio:	16,5 : 1
Arrangement of valves:	Overhead valves
Cylinder liners:	Slip-fit dry cylinder liners

Supercharging:

Make:	GARRET
Model:	BCC STEYR-replacement no. 612.60.11.0164
	Optional: SCHWITZER STEYR-replacement no. 612.60.11.0193
Type:	Exhaust turbo-supercharger
Pressure:	Up to 1510 mbar

Fuel system:

Fuel feed system:	Fuel feed by pump (incorporated in injection pump)
Make, model and type of fuel filter:	Pre-cleaner: Optional, on tested tractor PUROLATOR PFC 220
	Main filter: PUROLATOR PER 247-F Changeable filter element with water trap
Capacity of fuel tank:	appr. 240 l
Make, model and type of injection pump:	BOSCH inline injection pump PES 6 MW 100/720 RS 1145
Serial no.:	744 74 872, 0403 476 058
Manufacturer's production setting of injection pump, flow rate and timing:	$82^{\pm 2}$ mm^3/stroke at 1100 rev/min and full load $15^{\pm 1°}$ before TDC
Make, model and type of injectors:	BOSCH DLLA 150 S 1091 Multi hole injection nozzles
Injection pressure:	$22{,}5^{+0{,}8}_{-0}$ MPa (225^{+8}_{-0} bar)

Governor:

Make:	BOSCH
Model:	RSV 250 - 1100 MW 1 A 323
Type:	Variable speed governor, mechanically acting, incorporated in injection pump
Governed range of engine speed:	From 600 to 2380 rev/min engine speed
Rated engine speed:	2200 rev/min

Air cleaner:

Location of air intake:	Above the bonnet, above the motor
Pre-cleaner:	
Make:	PUROLATOR or MANN & HUMMEL
Model:	PUROLATOR LVE 080/5 P or MANN & HUMMEL 48 096 67 900
Type:	Cyclon type with transparent dust container
Main cleaner:	
Make:	PUROLATOR or MANN & HUMMEL
Model:	PUROLATOR LP 120 S/1 MANN & HUMMEL 45 325 65 444
Type:	Dry type with changeable element PUROLATOR paper insert: PM 1709 MANN & HUMMEL paper insert: C 20 325/2 KNECHT paper insert: AG 74 Optional: Additional safety element PUROLATOR paper insert: AF 3101 MANN & HUMMEL paper insert: CF 1000 KNECHT paper insert: SE 120
Location:	Inside the bonnet
Service intervals:	
Cyclonic pre-cleaner:	Cleaning interval: 500 hours and visual control
Main-cleaner paper insert:	Cleaning interval: when control lamp indication Changing interval: after 5 cleaning indications or 1 year
Safety element:	Changing interval: after 5 main-cleaner paper inserts, 2 years, or if main-cleaner was defect
Maintenance indicator:	Electric lamp indication, -65 mbar for indication PUROLATOR LES 065 IP

Lubrication system:

Type of feed pump:	Gear pump
Type of filter:	Strainer in sump, paper filter in full flow
Number:	1
Type of coolant:	Oil cooler for motor lubrication system situated inside the engine block on left side, in main flow of water cooling system

Cooling system:

Type of coolant:	Double circuit water cooling with longtime frost protection down to -20°C with a tubular radiator
Type of pump:	Centrifugal pump, 2 driving belts
Specification of fan:	Puller, visco controlled speed, 2 belts driven, visco clutch fan-boss EATON 240
Number of fan blades:	10
Fan diameter:	550 mm
Coolant capacity:	appr. 27 l
Type of temperature control:	Thermostat control with electrical cooling water thermometer and sight glass for level indication Speed control of fan by a termostatic-visco fan-boss
Superpressure system:	Max. 50 kPa (0,5 bar)

Starting system:

Make:	BOSCH
Model:	0 001 367 010 JF
Type:	Solenoid engaged screw push starter motor
Starter motor power rating:	3 kW, 12 V
Cold starting aid:	Own make Electrically, glow plug in intake pipe
Safety device:	Electrically starting block system by engaged gear

Electrical system:

Voltage:	12 V, negative earth
Generator:	Make: BOSCH A 120 402 127 Type: three phase type K 1-14 V 23/55 A Power: 14 V, 55 A = 770 W
Battery:	2 with 12 V, lead acid type Rating: 2 x 88 Ah = 176 Ah at 20 hours rating

Exhaust system:

Make:	EBERSPÄCHER
Model:	T 16.47.486.01.0.00 STEYR-replacement no. 397 540042
Type:	Reflexion-absorption type
Location:	170 mm left of median plane, 2800 resp. 2960 mm height above ground with flap open

TRANSMISSION TO WHEELS:

Clutch:

Main clutch:	For travel alone
Make:	FICHTEL & SACHS AG.
Type:	Dry clutch with torsion antivibrator
Number of plates:	1, equipped with ceramic lining
Diameter of plate:	350 mm
Method of operation:	Mechanical acting, pedal operated
P.t.o. clutch:	
Make:	Own make
Type:	Wet multiplate clutch
Number/diameter of plates:	11/135 mm
Method of operation:	Hydraulically engaged, hand-switch operated
Front wheel drive clutch:	
Make:	STEYR
Type:	Wet multiplate clutch
Number/diameter of plates:	21/135 mm
Method of operation:	Hydraulically engaged, hand-switch operated In case of Optistop, as on tested tractor, electrically-hydraulically engaged, push button operated, control lamp indication

Gearbox:

Make:	Own make
Model:	TW 397
Type:	Mechanical acting gear box
Lubrication:	See "switching aid"
Arrangement:	Synchronized group gear with 3 forward and 1 reverse group combined with a synchronized 4 speed change gear
Number of gears:	Totally: 12 forward and 4 reverse speeds
Available options:	On tested tractor Torque amplifier group; speed reduction ratio: 1,25, electrically-hydraulically engaged multiplate clutches, switched by a push button, control lamp indication Super crawler group; speed reduction ratio: 8,44, mechanically engaged by a hand lever

Fitted with both optional groups:
Totally 36 forward and 12 reverse speeds
Optionally instead of super crawler group also crawler group, with speed reduction ratio 3,79, available
Gears with crawler group engaged are provided only for works requiring no major traction load of the transmission (cultivating, p.t.o. shaft driven implements with low tractive force)

Rear axle and final drives:

Make:	Own make
Model:	TW 397
Type:	Central driving type Pinion and bevel gear, bevel gear differential, planetary final gears
Differential lock:	Type: mechanically dog clutch, acting from half axle to differential housing Method of engagement: hydraulically engaged, pull-button operated, electric control lamp Method of disengagement: not self-disengaging

Front axle and final drives:

Make:	Own make
Type:	Central driving steering axle Front wheel drive clutch - central propeller shaft, pinion and bevel gear, bevel gear differential, double joints, planetary final gears in wheel hubs
Differential lock:	Type: mechanically dog clutch acting from halfaxle to differential housing Method of engagement: hydraulically engaged, pull-button operated, electric control lamp Method of disengagement: not self-disengaging

Switching aid:

Make:	Own make
Type:	Oil circuit for gear box lubrication, for switching the differential locks in rear and front axle, for front wheel drive clutch, p.t.o. clutch and optional equipment (i.e. torque amplifier group switching). BOSCH gear pump, directly driven by engine Delivery rate: 41 l/min at 1,8 MPa (18 bar) and 2200 rev/min rated engine speed Oil cooler, situated before the water cooler Common oil filter with hydraulic power lift circuit

Total ratios and travelling speeds: 40 km/h model with torque amplifier group and crawler group, as tested

Group	Gear no.	Number of engine revolutions for one revolution of driving wheels				Nominal travelling speed at rated engine speed of 2200 rev/min *) km/h			
		normal N	torque amplifier group **) T	super crawler group ***) SC	crawler group ***) C	normal N	torque amplifier group T	super crawler group SC	crawler group C
forward slow L	1	253,09	317,56	2137,23	958,77	2,80	2,23	0,33	0,74
	2	180,24	226,15	1522,05	682,94	3,93	3,14	0,47	1,04
	3	130,82	164,14	1104,71	495,69	5,42	4,32	0,64	1,43
	4	93,92	117,85	793,13	356,01	7,55	6,02	0,89	1,99
forward medium M	1	152,06	190,79	1284,02	575,96	4,66	3,72	0,55	1,23
	2	108,29	135,87	914,43	410,26	6,55	5,22	0,78	1,73
	3	78,60	98,62	663,70	297,77	9,02	7,19	1,07	2,38
	4	56,43	70,80	476,50	213,87	12,57	10,02	1,49	3,32
forward fast S	1	50,71	63,63	428,24	192,10	13,98	11,14	1,66	3,69
	2	36,12	45,31	304,97	136,84	19,63	15,65	2,33	5,20
	3	26,21	32,89	221,35	99,32	27,05	21,56	3,20	7,14
	4	18,82	23,61	158,92	71,33	37,68	30,03	4,46	9,94
reverse R	1	146,42	183,71	1236,41	554,69	4,84	3,86	0,57	1,28
	2	104,27	130,83	880,53	395,12	6,80	5,42	0,81	1,79
	3	75,68	94,96	639,09	286,78	9,37	7,47	1,11	2,47
	4	54,34	68,18	458,83	205,97	13,05	10,40	1,55	3,44

*) Calculated with a tyre dynamic radius index 855 mm
**) Optional
***) Optional "super crawler" or "crawler group", not provided for works with major traction load

Number of revolutions of front wheels for one revolution of rear wheels:	1,3102

POWER TAKE OFF:

Main power take-off:

Type:	Independent p.t.o.
Method of engagement:	Wet multi-plate clutch, hydraulically engaged, switched by a pull-button
Number of shafts:	One
Method of changing power take-off shaft ends and speeds:	Optional, not on tested tractor Turning of the p.t.o. end piece for 1000 rev/min and 540 rev/min

Power take-off proportional to engine speed:

Standard:	As on tested tractor: 1000 rev/min
Optional:	1000 rev/min and 540 rev/min
Location:	In rear of tractor
Diameter of power take-off shaft end:	35 mm
Number of splines:	21, in conformity with ISO R 500-1979, type II for 1000 rev/min p.t.o. and optional (not on tested tractor): 6, in conformity with ISO R 500-1979, type I for 540 rev/min p.t.o.
Height above ground:	720 mm with tyre dynamic radius index of 855 mm
Distance from the median plane of the tractor:	0 mm
Distance behind rear wheel axle:	445 mm (with optional 540 rev/min, 1000 rev/min p.t.o. 565 mm)
P.t.o. speed at rated engine speed:	1205 rev/min (optional 1205 rev/min and 633 rev/min)
Engine speed at standard power take-off speed:	1826 rev/min (optional 1826 rev/min and 1877 rev/min)
Ratio of rotation speeds (engine speed/p.t.o. speed):	1,826 (optional 1,826 resp. 3,476)

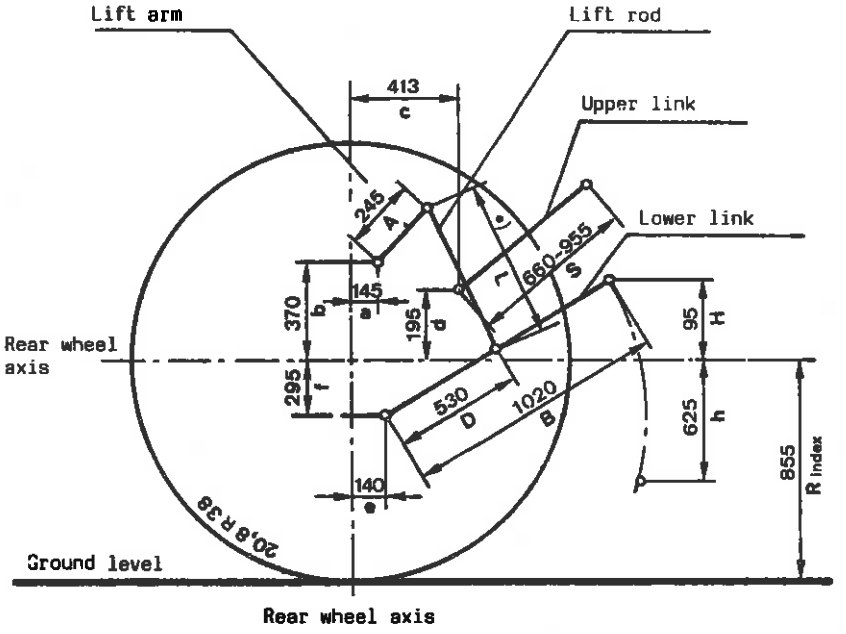
Power restriction of p.t.o. 540:	Max. 51,5 kW
Direction of rotation (viewed facing driving end):	Clockwise

POWER LIFT:

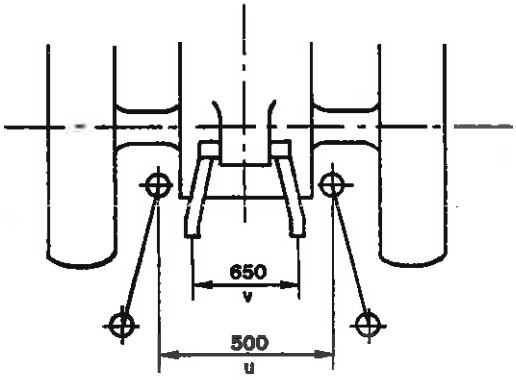
Make:	Own make
Type:	Three point linkage with electronic position control, draft control or mixed adjustment of power lift. Sensitivity, height of lifting and lowering speed selectable. Quick lifting, reset of the setted dates and accelerated lowering to setpoint of the power lift can be switched. Safety switch.
Type of hydraulic system:	Open center type
Type and number of cylinders:	Single acting hydraulic cylinder inside the block, stroke and diameter: 165/105 mm and two additional single acting working cylinders outside, stroke and diameter: 195/70 mm
Type of linkage lock for transport:	Hydraulically by throttle valve
Relief valve pressure setting:	18,0 MPa (180 bar)
Opening pressure of cylinder safety valve:	24,5 MPa (245 bar)
Lift pump type:	Gear type pump
Transmission between pump and engine:	Pump directly driven by engine, not declutchable
Type and number of filter:	One filter in suction part, common with switching aid oil circuit
Site of oil reservoir:	Gear box
Type, number and location of tapping points:	Up to 8 tapping points (4 independent oil circuits for double acting cylinders) 410 mm behind rear axle, 300 - 495 mm above rear axle, 120 - 190 mm right of median plane. In accordance to ISO/DIS 5675 - 1979
Maximum volume of oil available to external cylinders:	25 l in stationary mode 10 l in driving mode

Three-point linkage:

Category: III, in conformity with ISO 730/1 - 1977
STEYR SIMPLEMATIK standard linkage, double hole lift arms (with additional working cylinders max.mech. advantage not useable)



*) Right lift rod length adjustable from 700 - 860 mm by gear and thread
Left lift rod adjustable from 710 - 825 mm by a thread



Dimensions of linkage geometry:

			Dimension of range mm	Settings used in test mm
Length of lift arms:		(A)	245 or 188 (only useable without additional working cylinders)	245
Length of lower links:		(B)	1020	1020
Distance of lift arm pivot points from rear wheel axis:	horizontally	(a)	145 rearwards	145
	vertically	(b)	370 above	370
Horizontal distance between the 2 lower link points:		(u)	500	500
Horizontal distance between the 2 lift arm end points:		(v)	650	650
Length of upper link:		(S)	from 660 to 955	740
Distance of upper link pivot point from rear wheel axis:	horizontally	(c)	413	413
	vertically	(d)	195	195
Distance of lower link pivot point from rear wheel axis:	horizontally	(e)	140 rearwards	140
	vertically	(f)	295 below	295
Distance of lower link pivot points to lift rod pivot points on lower links:		(D)	530	530
Length of lift rods:		(L)	700 - 860 right 710 - 825 left	812
Height of lower hitch points relative to the rear wheel axis:				
in low position;		(h)	410/655	625
in high position:		(H)	260/80	95
(lift rod length 710/825 mm)				
Height above ground of lower hitch points when locked in transport position*):			Any height within lift range	

*) with dynamic radius index 855 mm

SWINGING DRAWBAR:

	Optional, not on tested tractor
Type:	Fork type
Height above ground:	510 mm with 855 mm dynamic radius index
Type of adjustment:	Changing holes with bolts
Distance of hitch point form rear wheel axis, horizontally:	985 mm resp. 785 mm
Distance of hitch point from power take-off shaft end, vertically:	210 mm below
horizontally:	540 mm resp. 340 mm
Lateral adjustment, right hand:	435 mm resp. 360 mm } ± 22° from median plane
left hand:	435 mm resp. 360 mm }
Distance of pivot point from rear wheel axis, horizontally:	160 mm before
Diameter of drawbar pin hole:	28 mm
Maximum vertical permissible load:	15 kN

HITCH:

	Optional, not on tested tractor
Hitch hook diameter:	48 mm
Height above ground:	527 mm with 855 mm dynamic radius index
Distance of hitch point from rear wheel axis, horizontally:	550 mm rearwards
Distance of pivot point relative to rear axle:	0 mm
Distance of hitch point from power take-off shaft end, vertically:	193 mm below
horizontally:	35 mm rearwards

Swinging drawbar in combination with hitch:

Height above ground:	465 mm with 855 mm dynamic radius index
Distance of hitch point from rear wheel axis, horizontally:	940 mm
Distance of pivot point from rear wheel axis:	0 mm
Distance of hitch point from power take-off shaft end, vertically:	255 mm below
horizontally:	495 mm rearwards
Diameter of drawbar pin hole:	28 mm

TRAILER HITCH:

ROCKINGER, model 271 U 150 H (standard type)

Type:	Fork type
Hole diameter:	31 mm
Height above ground:	895 mm
Distance of hitch point from rear wheel axis, horizontally:	565 mm resp. 620 mm
Distance of hitch point from power take-off shaft end, vertically:	175 mm above
horizontally:	20 mm rearwards
Maximum vertical permissible load:	15 kN

ROCKINGER, model 248 U 150 B (automatic type)

Type:	Fork type
Hole diameter:	31 mm
Height above ground:	895 mm
Distance of hitch point from rear wheel axis, horizontally:	565 mm resp. 595 mm
Distance of hitch point from power take-off shaft end, vertically:	175 mm above
horizontally:	20 mm rearwards
Maximum vertical permissible load:	15 kN

Optional (not on tested tractor):	Mounting console for vertical adjustment of trailer hitch, for ROCKINGER, model 271 U 150 H (standard type) and ROCKINGER, model 248 U 150 B (automatic type)
Height above ground:	915/965/1015 mm
Distance of hitch point from rear wheel axis, horizontally:	749 mm rearwards
Distance of hitch point from power take-off shaft end, vertically:	195/245/295 mm above
horizontally:	304 mm rearwards

Towing hitch:

	Own make
Type:	Fork type
Hole diameter:	35 mm
Height above ground:	840 mm
Distance from front axle:	1015 mm frontwards

HOLED DRAWBAR:

	Category II
Number of holes (with central hole):	7
Distance between holes:	115 mm
Hole diameter:	33 mm
Thickness/width of the drawbar:	30/80 mm
Height above ground min.:	200 mm with lift rod length 825 mm
max.:	1115 mm with lift rod length 710 mm
Horizontal distance to power take-off shaft end (rear):	1160 mm

STEERING:

Make:	ZF-SCHWÄBISCH GMÜND
Model:	ZF 8493
Type:	Hydrostatic steering
Method of operation:	Steering wheel acting on front wheels
Pump:	Gear pump, directly driven by engine
Rams:	2, double acting, stroke/dia: 250/45 mm - 18 mm
Working pressure:	10 MPa (100 bar)

BRAKES:

Service brake:

Make:	GIRLING
Type:	Hydraulically activated, Optistop four wheel brake, pedal operated
	Rear axle: Hydraulically activated multi disc brake in oil bath, 12 acting faces with 198,5 mm effective diameter each
	Front axle: Automatically activated four wheel drive when service brake is activated; electrically-hydraulically acting on front wheel drive clutch
	Front axle brake: Optional only when tractor is fitted with air pressure brake system
	Hydraulically activated Simplex drum brake, drum: 400 mm dia, 100 mm width Front axle brake is hydraulically activated and air pressure assisted Separate circuit of brake fluid for front and rear axle
Trailer braking take-off:	Optional, not on tested tractor In conformity with national regulations Pressure air system: High pressure air system, one or one and two line system, air compressor V-belt driven Storage pressure: $1{,}8^{+0{,}2}_{-0}$ MPa (18^{+2}_{-0} bar) Storage volume: 20 l Working pressure: 0,74 MPa (7,4 bar) two line system 0,56 MPa (5,6 bar) one line system
	Optional, not on tested tractor (export to France): Oil braking system, activated by service brake Trailer-connection: NFU 16-006 100 bar oil pressure at 3 m/s^2 deceleration

Parking brake:

Type:	Mechanically acting on the wet disc brakes in the rear axle; when motor is not in action the front wheel clutch is locked and the parking brake is acting on the front wheels too.
Method of operation:	Hand lever with ratchet
	Optional equipment: Independent from service brake, acting on a separate packet of discs
Steering assistance brake:	Operated by divided pedal of service brake, pedals disconnectable by a flap

WHEELS:

Number:	Front: 2, steering and driving function Rear: 2, driving function
Wheelbase:	2700 mm

Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1894	2526	wheels turned around
Rear	1900	1904	wheels turned around

PROTECTIVE STRUCTURE:

Make:	Own make
Model:	STEYR 120.11
Manufacturer's name and address:	STEYR-DAIMLER-PUCH AG., Steyr, Austria
Protective device:	On tested tractor, full closed cab, not tiltable
OECD-approval no.:	CSS 015/4

DRIVER'S SEAT:

Make:	BOSTROM
Type:	Viking 301 E low back; tested on tractor according to national regulation (Prot.Nr. 005/75)
Type of suspension:	X-lever suspression with torsion springs, adjustable to driver's weight

Type of damping:	Hydraulically damping
Range of adjustment,	
longitudinal:	190 mm
vertical:	80 mm
or	
Make:	ISRINGHAUSEN
Type:	Derby GI 5000; tested on tractor according to national regulation (Prot.Nr. 096/76)
Type of suspension:	X-lever construction with two tension coil springs, adjustable to driver's weight
Type of damping:	Hydraulically damping
Range of adjustment,	
longitudinal:	155 mm
vertical:	3 steps adjustable, independent in front and rear
or	
	On tested tractor
Make:	GRAMMER
Type:	DS 85 H/90 AR; tested on tractor according to national regulation (Prot.Nr. 059/80)
Type of suspension:	X-lever construction with 2 tension coil springs (force transmission by curve-disc and ball bearing)
Type of damping:	Hydraulically damping
Range of adjustment,	
longitudinal:	155 mm
vertical:	3 steps adjustable, inclineable left and right 8°

MISCELLANEOUS:

Additional seat	
Location:	Left side of driver seat
Number of places:	1

LIGHTING:

	*) Height above ground of centre mm	Size mm	Distance from outside edge to median plane of tractor mm
Head lights	1035	140 x 120	227
Side lights	1875	112 x 40	858
Rear lights	1815	95 x 65	1057
Brake lights			
Direction indicators front	1910	112 x 40	858
Direction indicators rear	1815	95 x 65	1140
Reflectors	1620 670	105 x 60 75 dia	1170 607

*) Measured with tyre dyn. radius index at rear 855 mm and 670 mm at front

TEST CONDITIONS

Overall dimensions:

	Length	Width *)	Height at top of	
			exhaust silencer **)	protective structure ***)
	mm	mm	mm	
With and without ballast	5125	2470	2800/2960	2880/3020

*) Measured on the outside edges of the mudguards
**) Without flap/with flap open
***) With roof hatch open

Ground clearance:
(unballasted)

Clearance limiting part:
610 mm below the gear box
505 mm below the front steering tie rod
565 mm below the oil filter of hydraulic
465 mm below the lower link mounting console

Tractor mass: With tank full

		Without driver	With driver
		kg	kg
Unballasted	Front	2665	2693
	Rear	3347	3394
	Total	6012	6087
Ballasted	Front	3618	3646
	Rear	5200	5247
	Total	8818	8893

Ballast: Heavy ballast, on tested tractor

	Number of weights	Mass total kg	Water kg
Front	18	750	-
Rear	20 half pieces + 2 cover plates	976	1080
Additional	-	-	-

Normal ballast, not on tested tractor

	Number of weights	Mass total kg	Water kg
Front	18 + 1	385	-
Rear	4 full-pieces + 2 cover plates	500	1060
Additional	-	-	-

Tyres and track width specifications:

Tyres:

	Front wheels	Rear wheels
Dimensions	18,4 R 26 rim: W 15 L x 26	20,8 R 38 rim: DW 18 x 38
Ply rating	8	8
Type	radial carcass	radial carcass
Max. load (tyre manufacturer's)	22,2 kN (2265 kp)	30,3 kN (3090 kp)
Max. load (tractor manufacturer's)	43,2 kN (4400 kp)	58,9 kN (6000 kp)
Inflation pressure (tyre manufacturer's)	140 kPa (1,4 bar)	130 kPa (1,3 bar)
Dynamic radius index	670 mm	855 mm
Track width	1894 mm	1900 mm

Possible combinations of tyres:

Track width rear/front	Front wheels	Rear wheels
1894/1900 mm by reversed wheels: 2526/1900 mm	18,4 - 26	18,4 - 38

Oil and lubrication:

Capacity and change interval:

	Capacity (dm^3)	Oil change (h)	Filter change (h)
Engine	14,0	250	250
Gear box	85,0	1000 or 2 years	1000 or 2 years
Front axle	15 differential drive 2 x 1,5 final drive	1000	-
Rear axle	common with gear box	-	-
Hydraulic system	common with gear box and rear axle	-	-
Steering	2,5	check oil level	1000
Brake	0,7	2000 or 2 years	-
Number of lubrication points	20	to lubricate each 60	-

Specifications:

	Recommended:	Used during test:
Engine oil:		
Type:	One range viscosity oil	
Viscosity:	SAE 30 summer SAE 10 W/40 winter	
Classification:	API CD, MIL-L-2104 C	SHELL RIMULA X 15 W 40
Transmission oils:		
Type:	Universal oil	
Viscosity:	SAE 10 W/40	
Classification:	API GL 4, MIL-L-2104 C STUO	ELAN automatic HGN
Hydraulic fluid:	Common with transmission oil	
Steering oil:		
Type:	Hydraulic oil or automatic transmission oil	
Classification:	ATF Dexron II D	SHELL
Transmission oil of front axle:		
Type:	Transmission oil	
Viscosity:	SAE 90, 85 W 90	
Classification:	API GL 5, MIL-L-2105 B/C	SHELL SPIRAX EP 90
Brake fluid:		
Type:	-	
Classification:	SAE J 1703e FMVSS 116 DOT 3	ATE DOT 3
Grease:		
Type:	Lithium soap basis	
Classification:	NLGI 2 (multigrade grease)	

Number of lubrication points:	20
Fuel:	ELAN diesel fuel
Type:	In conformity with national standard according to DIN 51601
Density at 15°C:	0,841 g/cm^3

REPAIRS: -

REMARKS: -

TEST RESULTS

COMPULSORY TEST:

Main power take-off performance

Date and location of tests: 30.11.1987
Type of dynamometer: SCHENCK eddy current brake W 780

Main test on: ISO R 500 - 1979, type 2 (DIN 9611) - 1000 rev/min

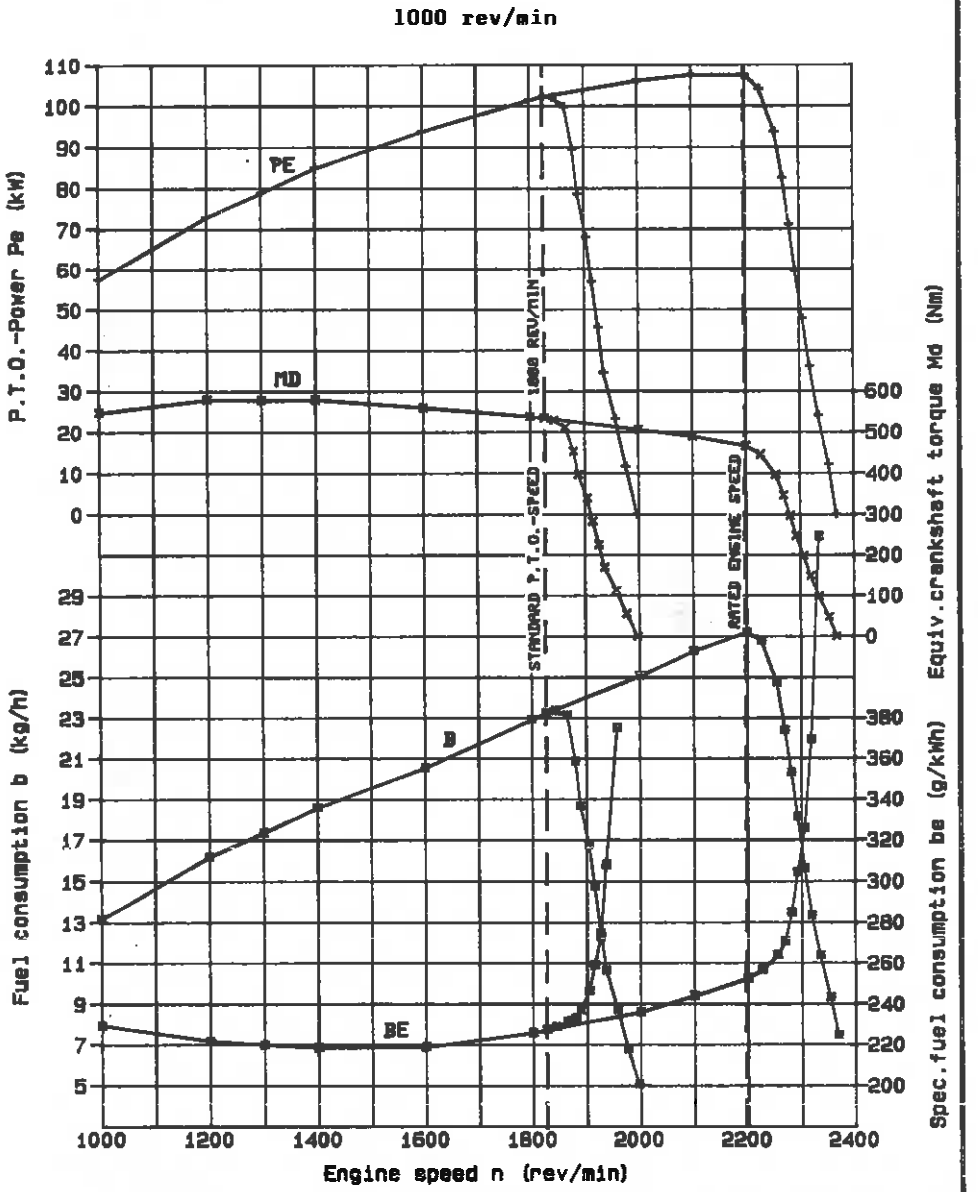
Power	Speed		Fuel consumption		Specific energy
	engine	p.t.o.	hourly	specific	
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
MAXIMUM POWER					
Maximum power - 2 hours test					
107,73	2200	1205	27,24 32,39	253,0	3,326
Power at rated engine speed					
107,73	2200	1205	27,24 32,39	253,0	3,326
Standard power take-off speed					
102,4	1826	1000	23,29 27,69	227,5	3,698
PART LOADS					
(i) the torque corresponding to maximum power at rated engine speed					
107,73	2200	1205	27,24 32.39	253,0	3,326
(ii) 85 % of torque obtained in (i)					
93,86	2255	1235	24,77 29,45	264,0	3,187
(iii) 75 % of torque defined in (ii)					
71,25	2282	1250	20,32 24,16	285,0	3,506
(iv) 50 % of torque defined in (ii)					
47,99	2306	1263	15,64 18,60	326,0	2,580
(v) 25 % of torque defined in (ii)					
24,30	2335	1279	11,40 13,56	469,5	1,792
(vi) unloaded					
0	2368	1297	7,49 8,91	-	-

Power	Speed		Fuel consumption		Specific energy
	engine	p.t.o.	hourly	specific	
kW	rev/min	rev/min	kg/h l/h	g/kWh	kWh/l
PART LOADS AT STANDARD POWER TAKE-OFF SPEED					
(i) The torque corresponding to maximum power available					
102,4	1826	1000	23,29 27,69	227,5	3,698
(ii) 85 % of torque obtained at maximum power					
89,56	1879	1029	20,87 24,82	233,0	3,608
(iii) 75 % of torque defined in (ii)					
68,09	1904	1043	16,80 19,98	247,0	3,408
(iv) 50 % of torque defined in (ii)					
45,87	1925	1054	12,51 14,88	272,5	3,083
(v) 25 % of torque defined in (ii)					
23,33	1957	1072	8,75 10,40	375,0	2,243
(vi) unloaded					
0	1094	1998	5,09 6,05	-	-

No load maximum engine speed: 2368 rev/min
Equivalent crankshaft torque
at maximum power: 467,60 Nm
Maximum equivalent crankshaft torque: 581,4 Nm at 1200 rev/min

Mean atmospheric conditions	temperature:	15°C
	pressure:	998 mbar
	rel. humidity:	90 %
Maximum temperatures	coolant:	90°C
	engine oil:	106°C
	fuel:	26°C
	engine air intake:	31°C

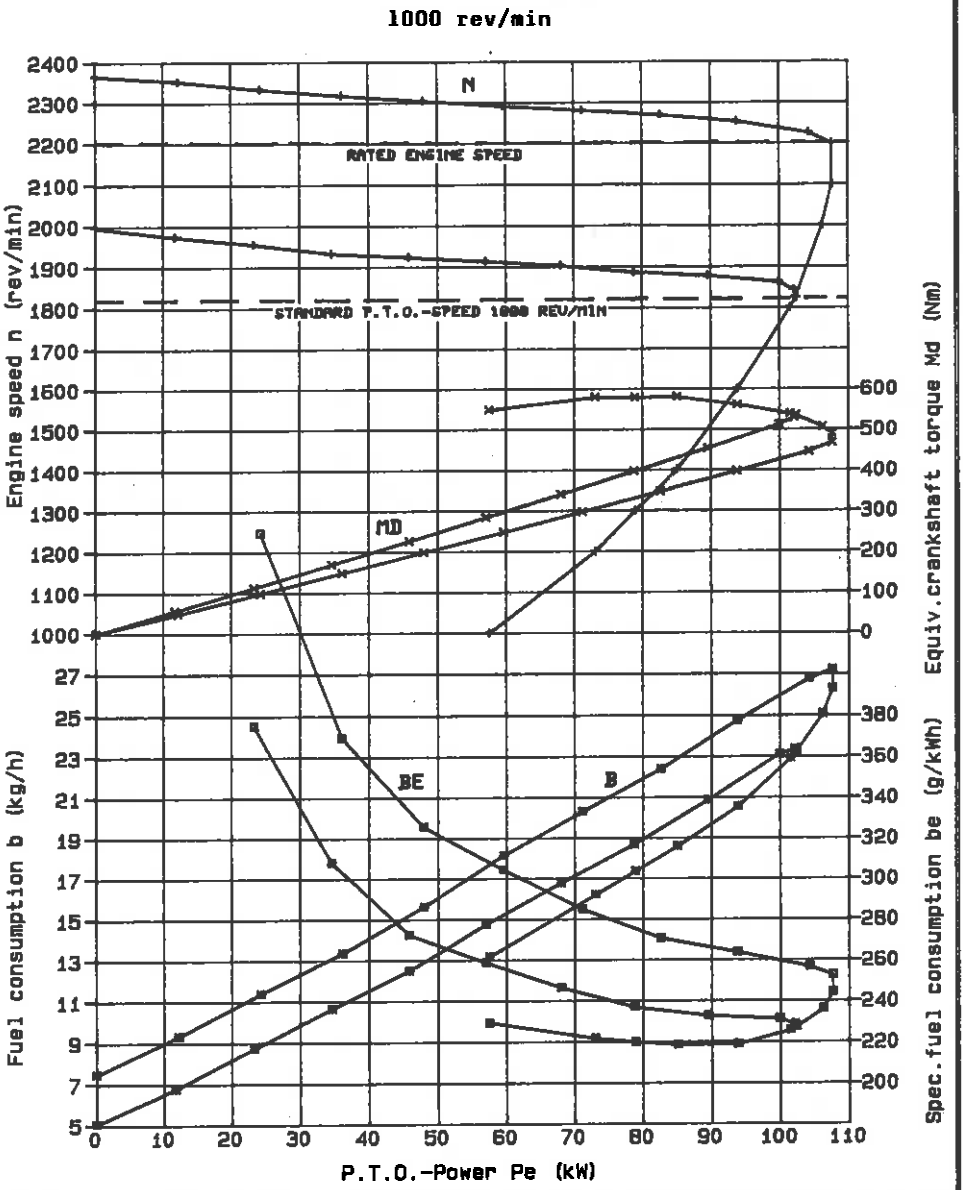
BUNDESANSTALT FÜR LANDTECHNIK Wieselburg/Erlauf, Austria Prot.Nr.: 101/87	P.T.O.-test	STEYR-DIESELTRACTOR TYP 397.45 (8180A) MOT.TYP STEYR WD612.96



engine ser.nr. : 612.96.701	atm. pressure: 980 MBAR	fuel temp. : 25 C	signature
tractor ser.nr.: 397.45-04857	air temper. : 15 C	d.of tests : 1987-11-30	
fuel : 0.841/15 C	coolant temp.: 90 C	test no. : 780-386-87	
engine oil : RIMULA X 15W40	oil temp. : 106 C+	curves no. : 1	LUSER

16-DEC-87 EDV-PROG: MKL - DATEI: MKU190 Z1000

BUNDESANSTALT FÖR LANDTECHNIK Wieselburg/Erlauf, Austria Prot.Nr.: 101/87	P.T.O.-test	STEYR-DIESELTRACTOR TYP 397.45 (8180A) MOT.TYP STEYR WD612.96



engine ser.nr. : 612.96.701	atm. pressure: 998 MBAR	fuel temp. : 26 C	signature
tractor ser.nr.: 397.45-04657	air temper. : 15 C	d.of testn : 1987-11-30	
fuel : 0.841/15 C	coolant temp.: 90 C	test no. : 780-386-87	
engine oil : RIMULA X 15W40	oil temp. : 106 C+	curves no. : 2	LUBER

HYDRAULIC POWER AND LIFTING FORCE:

Date of tests: 17.12.1988

Hydraulic power test:

Sustained pressure with relief valve open: 17,7 MPa (177 bar) pump stalled not

Pump delivery rate at minimum pressure (at rated engine speed): 52,4 l/min

	Flow rate	Pressure	Power
	l/min	MPa	kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 % of the actual relief valve pressure setting and corresponding hydraulic power	51,4	16,7	14,3
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	51,3	17,7	15,1

Tapping point used for test: At rear of tractor

Temperature of hydraulic fluid, if different from 65° ± 5°C: -

Opening pressure of the unloading valve: 18,5 MPa (185 bar)

Closing pressure of the unloading valve: 17,7 MPa (177 bar)

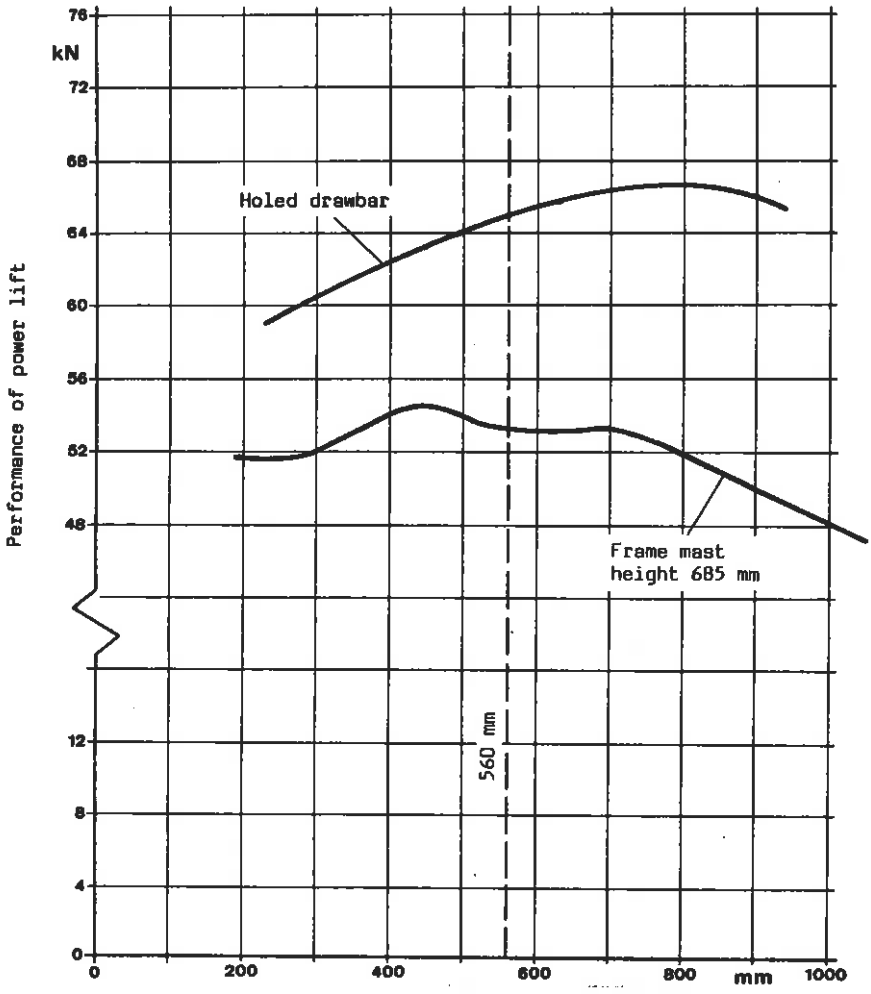
Power lift test:

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	230 mm	230 mm
Vertical movement	720 mm	720 mm
Maximum corrected force exerted through full range	59,2 kN	47,1 kN
Corresponding pressure of hydraulic fluid	16,7 MPa (167 bar)	16,7 MPa (167 bar)
Moment about rear wheel axis	68,7 kNm	83,4 kNm
Maximum tilt angle of mast from vertical (+)	-	from -3° to 0° and to +13,5°

Linkage settings for test: See table and figure in specifications

Lifting heights relative to the horizontal plane including the lower link pivot points														
mm	-370	-330	-265	-225	-150	-75	0	75	150	225	300	390	420	490
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90 % of the actual relief valve pressure setting or to maximum power delivered by the hydraulic system, which is lower)														
Corresponding pressure: 16,7 MPa (167 bar)														
at the hitch point kN		59,2	60,4	61,2	62,5	63,8	64,9	65,8	66,4	66,6	66,4	65,5		
at the frame (685 mm mast height) kN	51,7	51,7	52,1	52,8	54,3	54,2	53,3	53,2	53,2	52,0	50,6	49,4	48,3	47,1

Performance of power lift:



Drawbar performance:

Date of tests: 30.12.1987 and 28.1.1988

Type of track: concrete

Height of drawbar above ground: unballasted 500 mm, ballasted 110 mm

Tyre inflation pressure: front: unballasted 110 kPa, ballasted 120 kPa
rear: unballasted 110 kPa, ballasted 110 kPa

Tyre sizes: front 18,4 R 26, rear 20,8 R 38

Gear	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmosph. conditions		
								Fuel	Coolant	Engine oil	Temperature	Rel.humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
(i) Maximum power in tested gears (unballasted tractor)													
M 1N	66,72	57,42	4,18	2260	15,0	364,5	2,31	20	82	97	8	72	100
M 2T*)	76,64	56,71	4,86	2251	12,0	317,5	2,65	22	81	98	9	68	100
L 3N	77,67	57,44	4,87	2250	15,0	313,0	2,69	26	78	95	9	70	100
L4T*)	84,94	56,35	5,43	2221	13,6	313,5	2,68	26	82	99	9	69	100
M 2N	92,77	54,29	6,15	2200	9,3	291,5	2,89	26	80	99	9	69	100
M 3T	92,75	48,42	6,90	2200	7,4	291,6	2,88	27	79	98	9	69	100
L 4N	89,42	44,23	7,28	2200	7,0	302,5	2,78	27	79	98	9	69	100
M 3N	95,78	39,18	8,80	2200	5,7	282,5	2,98	28	80	98	9	69	100
M 4T	86,91	31,83	9,83	2200	5,0	311,0	2,70	27	77	96	9	68	100
S 1T	93,58	30,59	11,01	2200	4,4	289,0	2,91	29	80	96	9	68	100
M 4N	93,47	26,98	12,47	2200	4,0	289,5	2,91	29	80	96	9	68	100

*) In these gears it was not possible to get 15 % wheel-slip

Gear	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmosph. conditions		
								Fuel	Coolant	Engine oil	Tempe-rature	Rel.hu-midity	Pres-sure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
(ii)	Maximum power in tested gears (ballasted tractor)												
L 1 T	47,52	84,41	2,03	2301	15,0	-	-	33	83	95	25	54	99,2
L 1 N	59,17	84,41	2,52	2293	15,0	-	-	33	80	92	25	54	99,2
L 2 T	65,75	84,40	2,80	2285	15,0	299,0	2,82	31	82	99	22	64	99,2
M 1T*)	80,08	84,38	3,42	2255	11,9	304,0	2,77	6	82	96	4	84	98,4
L 2N*)	84,28	84,20	3,60	2243	11,9	317,5	2,65	9	75	92	4	86	98,4
L 3 T	88,82	84,13	3,80	2200	13,5	304,5	2,76	9	75	93	4	85	98,4
M 1 N	97,00	80,10	4,36	2200	8,4	279,0	3,02	10	77	96	7	85	98,4
M 2 T	94,25	67,87	5,00	2200	6,0	287,0	2,93	13	82	97	4	85	98,4
L 3 N	98,00	68,12	5,22	2200	5,6	276,0	3,05	13	82	97	4	85	98,4
L 4 T	89,77	55,31	5,84	2200	4,8	301,5	2,79	14	81	96	5	85	98,4
M 2 N	98,63	55,61	6,38	2200	4,4	274,0	3,07	14	80	97	5	85	98,4
M 3 T	97,74	49,92	7,05	2200	3,8	277,0	3,04	14	83	97	4	85	98,4
L 4 N	88,73	43,06	7,42	2200	3,8	305,0	2,76	15	81	95	6	83	98,4
M 3 N	98,82	39,93	8,91	2200	3,2	273,5	3,07	15	82	96	5	83	98,4
M 4 T	87,57	31,71	9,94	2200	2,7	309,0	2,72	15	82	95	6	84	98,4
S 1 T	93,87	30,49	11,08	2200	2,5	288,0	2,92	17	79	96	5	80	98,4
M 4 N	94,45	27,18	12,51	2200	2,4	286,5	2,94	18	83	95	5	84	98,4
(iii)	Five-hour-test at 75 % of pull at maximum power												
M 3 N	74,48	29,90	8,97	2226	3,0	358,5	2,35	27	82	101	5	78	98,0
(iv)	Five-hour-test at pull corresponding to 15 % wheelslip in test (ii)												
L 2 T	65,77	84,41	2,81	2285	15,0	298,5	2,82	35	83	103	27	53	99,2

Oil consumption during 10 hours duration of tests (iii) and (iv): 64,2 g/h
*) In these gears it was not possible to get 15 % wheel-slip

TURNING AREA AND TURNING CIRCLE:

Wheel equipment: front: 18,4 R 26, 8 PR, rim: W 15 L x 26
rear: 20,8 R 38, 8 PR, rim: DW 18 x 38

Track of wheel: front: 1894 mm
rear: 1900 mm

Results *)	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
	m	m	m	m
Radius of turning area	4,97/4,90	4,87/5,58	6,63/6,29	6,78/6,40
Radius of turning circle	4,76/4,69	4,66/5,37	6,42/6,08	6,57/6,19

*) Four wheel drive switched: ON/OFF

LOCATION OF CENTRE OF GRAVITY:

	mm
Height above ground	1101
Distance forward from the vertical plane containing the axis of the rear wheels	1194,5
Distance from the median plane of the tractor, left-side	6,0

BRAKING:

Date of tests: 29.1.1988
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)

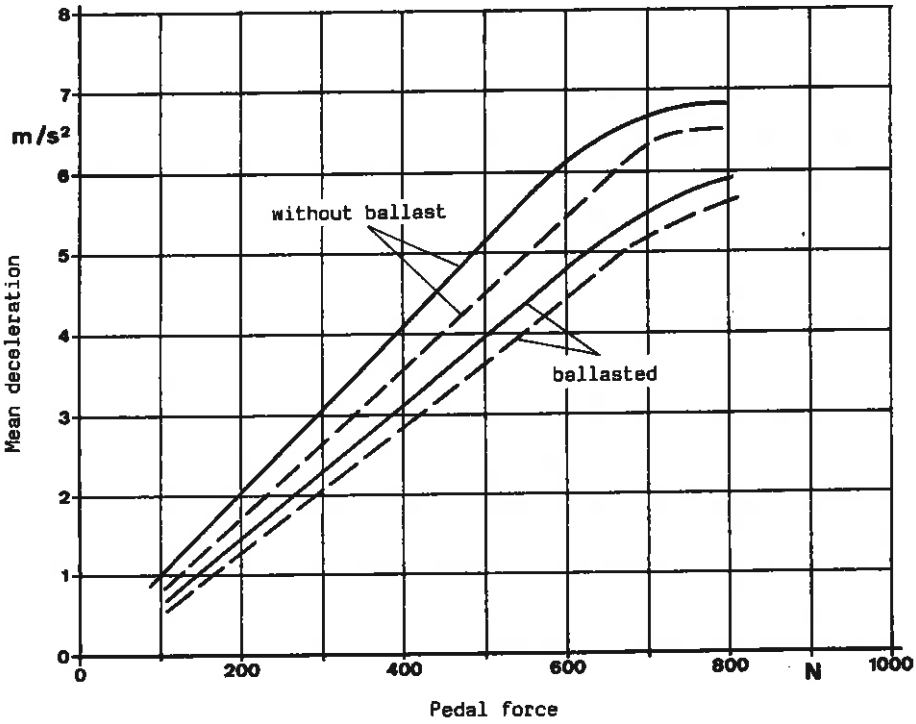
Tractor mass during brake tests (with driver):

	Front kg	Rear kg	Total kg
Ballasted	5260	3633	8893
Unballasted	2680	3407	6087

Service brake:

Tractor equipped with Optistop, four-wheel-drive automatically switched-on when service brake is activated.

Type-0-test (cold brakes)———— , Type-I(fade test)— — — — —



Speed before application of brake: 40,5 km/h
The tractor brakes were heated by towing of the tractor for 1 km.

Maximum deviation of tractor from its original course: None

Abnormal vibration: None

Parking brake device test:

	Ballasted tractor on 18 % slop	
Braking device control force	up	down
	210 N	210 N

MEASUREMENT OF EXTERNAL NOISE LEVEL:

Date of tests:	7.1.1988
Type of sound level meter:	BRÜEL & KJAER 2209 and 2308
Type of track:	Concrete
Gear number:	S 4 normal
Travelling speed before acceleration:	30,5 km/h
Sound level:	85 dB(A)

OPTIONAL TEST RESULTS

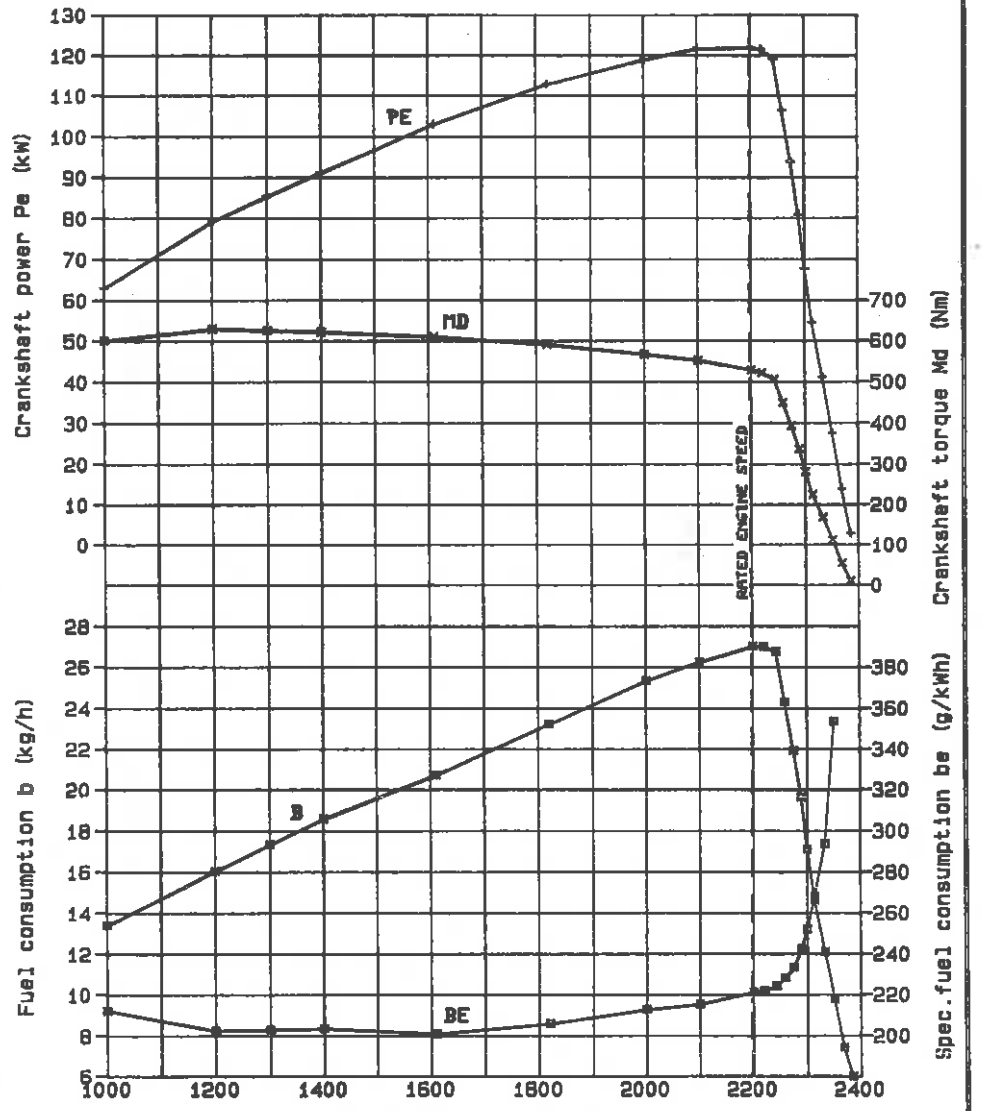
Engine performance

Date and location of test: 3.11.1987
Type of dynamometer: SCHENCK eddy-current brake type W 780

Power	Engine speed	Fuel consumption		Specific energy
		hourly	specific	
kW	rev/min	kg/h 1/h	g/kWh	kWh/l
Maximum power - 2 hours test				
122,10	2200	27,05 32,16	221,5	3,797
Power at rated engine speed				
122,10	2200	27,05 32,16	221,5	3,797
Standard power take-off speed				
102,40	1826	23,29 27,69	227,5	3,698
Part loads				
(i) the torque corresponding to maximum power at rated engine speed				
122,10	2200	27,05 32,16	221,5	3,797
(ii) 85 % of torque obtained in (i)				
106,56	2259	24,33 28,93	228,5	3,683
(iii) 75 % of torque defined in (ii)				
80,98	2289	19,64 23,35	242,5	3,468
(iv) 50 % of torque defined in (ii)				
54,56	2314	14,64 17,41	268,5	3,134
(v) 25 % of torque defined in (ii)				
27,72	2351	9,80 11,65	353,5	2,379
(vi) unloaded				
0	2385	6,02 7,16	-	-

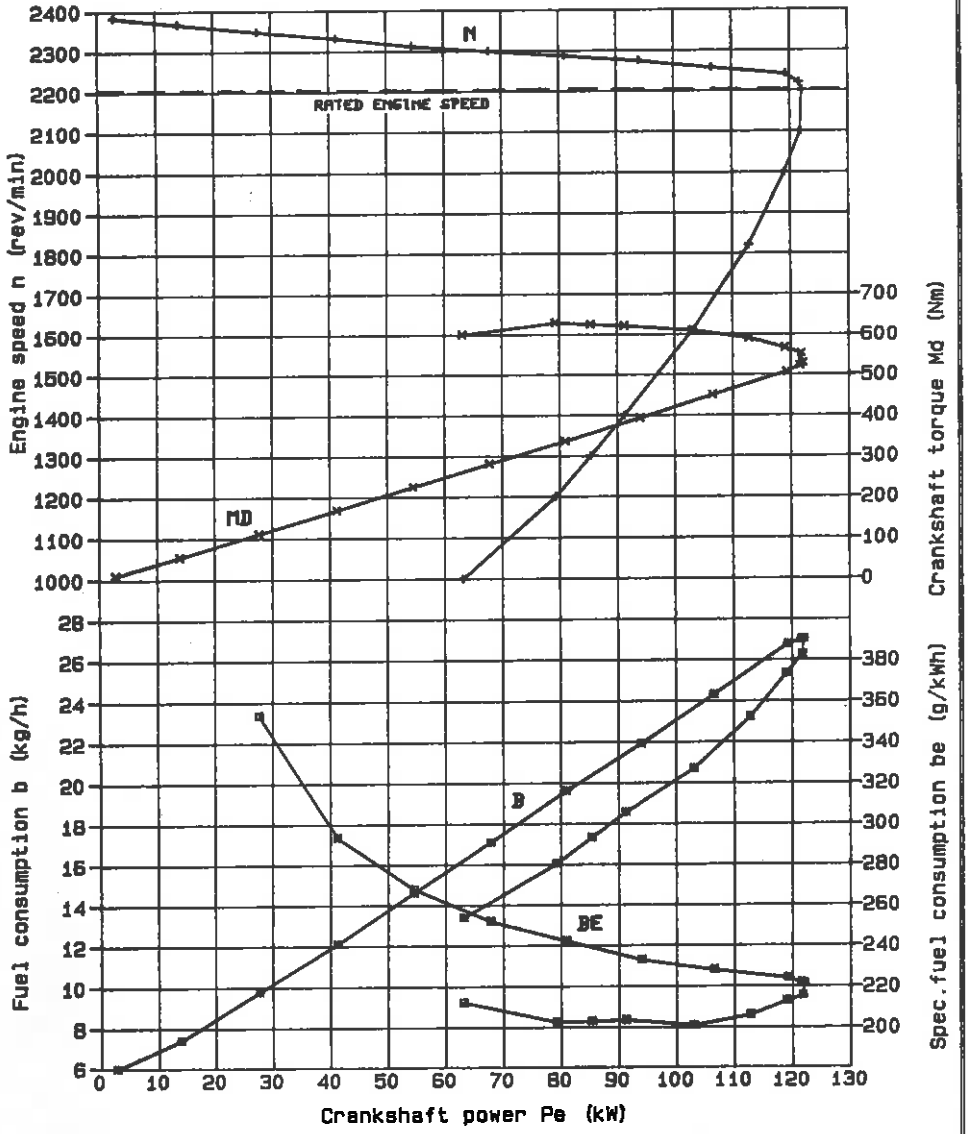
Optimum fuel consumption: 197 g/kWh at 1400 rev/min and 71,4 kW
No load maximum engine speed: 2385 rev/min
Torque at maximum power: 530 Nm
Maximum torque: 631,6 Nm at 1200 rev/min
Mean atmospheric conditions: temperature: 15°C
pressure: 1005 mbar
relative humidity: 80 %
Maximum temperatures: coolant: 79°C
engine oil: 105°C
fuel: 27°C
engine air intake: 30°C

BUNDESANSTALT FÜR LANDTECHNIK Wieselburg/Erlauf, Austria Prot.Nr.: 101/87	Engine-test	STEYR-DIESELTRACTOR TYP 397.45 (8180A) MOT.TYP STEYR WD612.96



engine ser.nr. : 612.98.701	atm. pressure:	fuel temp. : 27 C	signature	
tractor ser.nr.: 397.45-04657	air temper. : 15 C	d.of tests : 1987-11-03		
fuel : 0.841/15 C	coolant temp.: 79 C	test no. :		
engine oil : RIMULA X 15W40	oil temp. : 105 C	curves no. : 3	LUSER	

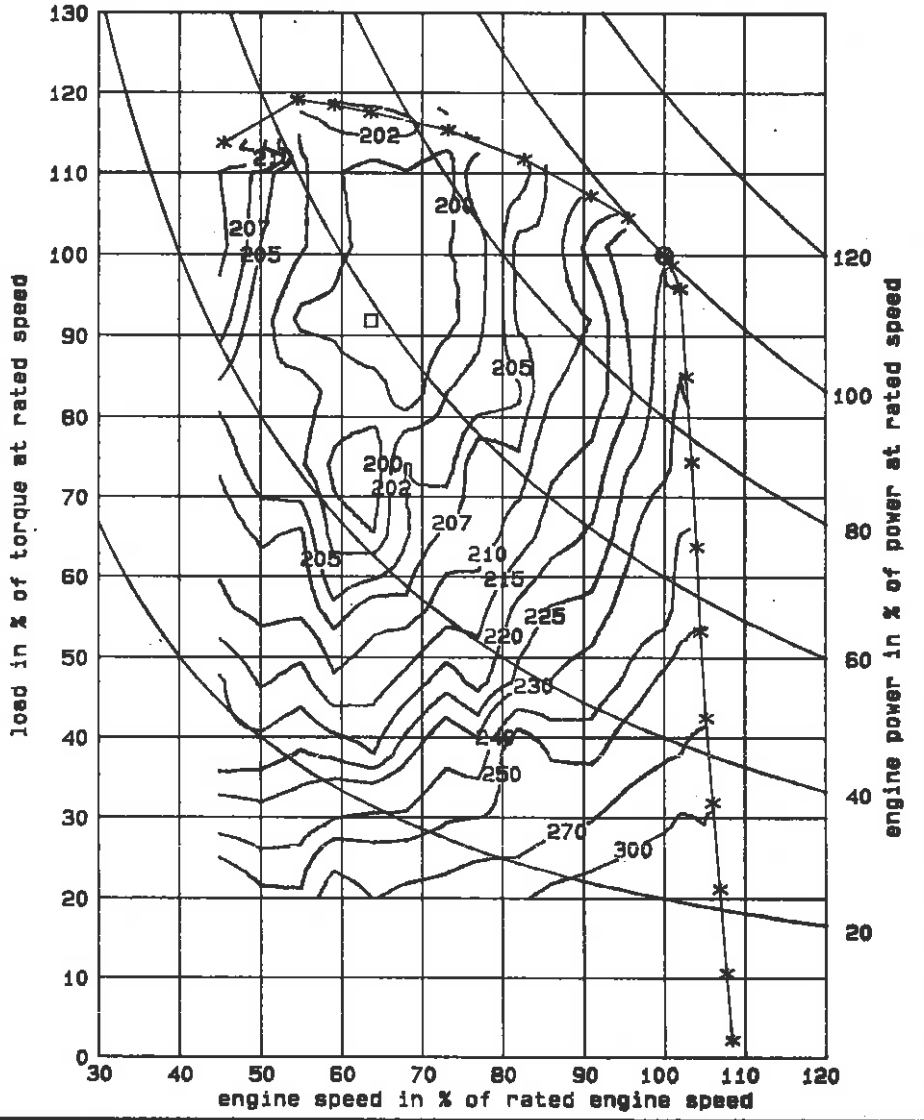
BUNDESANSTALT FÖR LANDTECHNIK Wieselburg/Erlauf, Austria Prot.Nr.: 101/87	Engine-test	STEYR-DIESELTRACTOR TYP 397.45 (8180A) MOT.TYP STEYR WD612.96



engine ser.nr. : 612.96.701	atm. pressure:	fuel temp. : 27 C	signature
tractor ser.nr.: 397.45-04657	air temper. : 15 C	d.of tests : 1987-11-03	
fuel : 0.841/15 C	coolant temp.: 79 C	test no. :	
engine oil : RIMULA X 15W40	oil temp. : 105 C	curves no. : 4	LUGER

BUNDESANSTALT FÜR LANDTECHNIK Wieselburg/Erlauf, Austria Prot.Nr.: 101/87	ENGINE PERFORMANCE CHARACTERISTIC	STEYR-DIESELTRACTOR TYP 397.45 (8180A) MOT.TYP STEYR WD612.96

□ ....min. fuel 197.18 g/kWh at n = 1400. rev/min
Md = 487.01 Nm, P = 71.4 kW
⊛ ....N = 2200. rev/min, Md = 530.0 Nm, P = 122.1 kWh



engine ser.nr. : 612.96.701	atm. pressure: 1000 MBAR	fuel temp. : 27 C	signature
tractor ser.nr.: 397.45-04657	air temper. : 15 C	d.of tests : 1987-11-03	
fuel : 0.841/15 C	coolant temp.: 79 C	test no. :	
engine oil : RIMULA X 15W40	oil temp. : 105 C	curves no. : 5	LUBER

EDV-AKOSWKL-WKL11-WKU198

ANNEX

OECD NOISE TEST

The noise test on the driver's ear was made in conformity to the OECD-standard code.

Name and address of manufacturer of protective structure:	STEYR-DAIMLER-PUCH AG. A-4400 Steyr
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer in agreement with BLT-Wieselburg
Make/type of protective structure:	STEYR, cabine STEYR 120-11
Make/type of tractor to which it is fitted:	STEYR 397.45 Trade name: STEYR 8180 a (4 WD)
Location and date of test:	Wieselburg, 7.1.1988
Make/model/type of sound level meter:	BRÜEL & KJAER type 2203 Writer: type 2308
Type of track:	Concrete

STRENGTH TEST REPORT REFERENCE

The protective structure has been approved in accordance with the OECD-Standard codes.

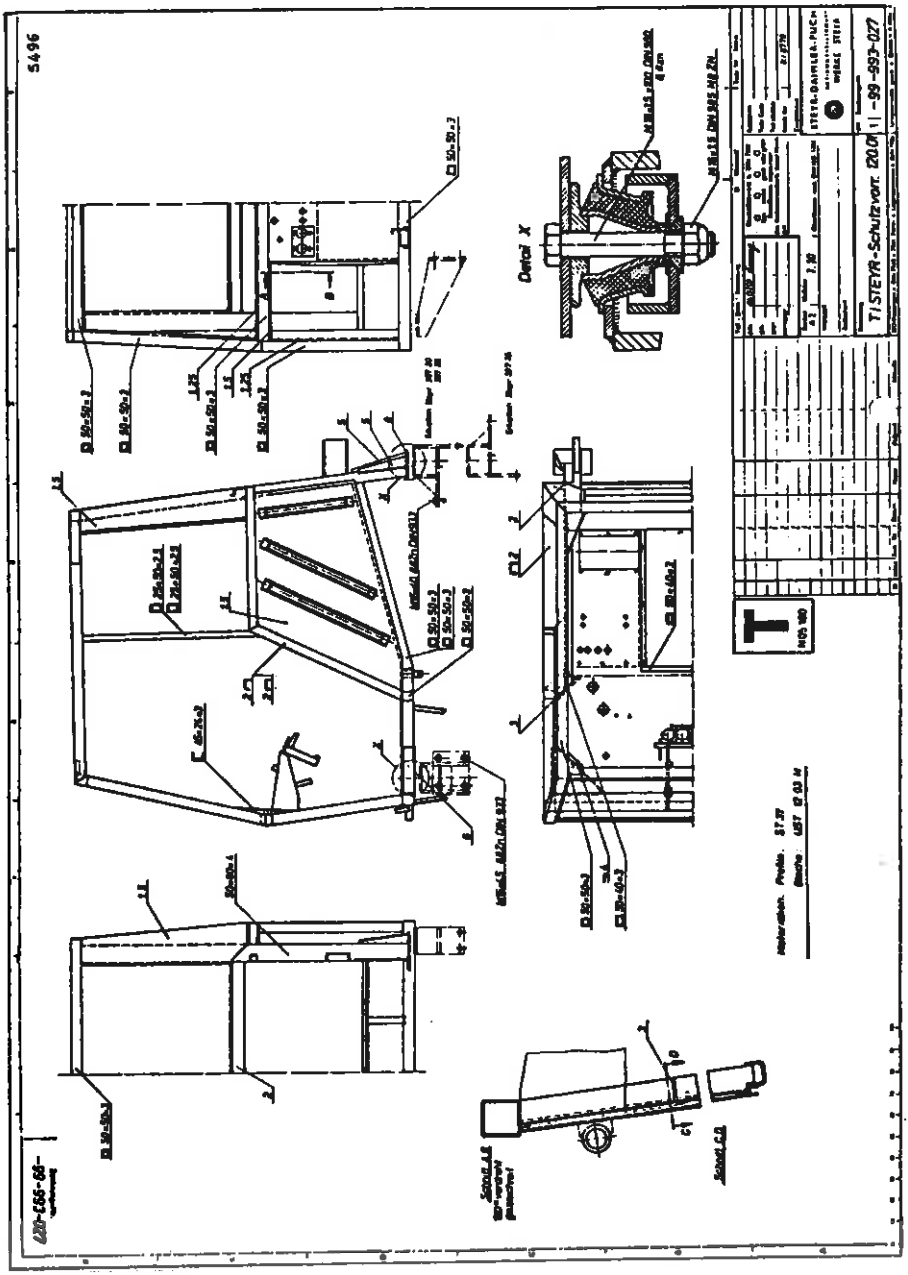
Approval number:	OECD: CSS 015/4
Date of approval:	25.10.1984 - original approbation 18.12.1987 - extension of approbation
Location and country of test of the protective structure:	CEMAGREF, Antony, France
Mass used for calculating load energies and crushing forces:	5910 kg

SPECIFICATION OF TEST TRACTOR

Serial number	397.45 - 04657
First serial number	397.45 - 4628
Mass of unballasted tractor, with protective structure fitted, without driver	
- front:	2665 kg
- rear	3347 kg
- total:	6012 kg
Tyre sizes:	
Front:	18,4 R 26
Rear:	20,8 R 38
Make/model/type of seat:	Grammer DS 85 H / 90 AR
Position of exhaust pipe:	Mouth upwards, 2960 mm above ground
Brief description of transmission including number of gears:	

	Reference:	Checked:
Engine setting:	2200 1/min	2200 1/min
Maximum p.t.o. power:	107,73 kW	107,73 kW
Corresponding engine speed:	2200 1/min	2200 1/min
No load engine speed:	2368 1/min	2368 1/min

SPECIFICATION OF PROTECTIVE STRUCTURE



Brief description:

The safety frame model 120.01 and the safety cab model 120.11 are made of steel tubes which are welded with steel sheets to a unit. The safety frame model is fitted with front window and roof. The safety cab is additionally cladded with steel sheets and security glass and the inside is padded with acoustic damping material. In the roof is a escape hatch (650 mm x 500 mm) and the rear window is also provided for escape opening. On the left side of the cab is a doorway. Both, cab and frame are mounted on the tractor by means of 4 rubber elements.

Details of material used for sound proofing the protective structure:

Interior padding	acoustic damping and isolating material
Roof:	35 mm
Mudguards:	(side cladding) 26 mm
Floor:	rubber mat (5 mm)
Rear panel:	11 mm
Front panel:	-
Gearbox:	-
Instrument panel and steering column:	-
Glass:	SECURITY glass (5,00 mm) SECURITY glass (6,50 mm)
Draught proofing:	-
Windscreen wipers:	SWF 400 - 499, 12 V
Direction indicators:	-
Heaters and ventilators:	HORNKOHL & WOLF

TEST RESULTS

Gear	Drawbar pull at which the tractor develops the maximum sound level kN	Measured travelling speed km/h	Sound level dB(A)
Unloaded test in the gear giving the speed nearest to 7,5 km/h			
L 4 N	-	8,28	83,0
Unloaded test in the gear giving the maximum speed			
S 4 N	-	38,88	84,0
Tests with the drawbar pull for which the tractor gives the maximum sound level (combination of gear giving the nearest nominal speed to 7,5 km/h and also in any gear with a sound level increase of at least 1 dB(A)			
L 1 N	47,58	2,81	82,0
L 2 N	44,25	3,90	83,5
L 3 N	35,55	5,54	83,5
L 4 N	30,71	7,57	83,0
L 1 T	38,21	2,28	83,5
L 2 T	35,09	3,21	83,5
L 3 T	40,59	4,47	84,0
L 4 T	47,06	5,95	81,0
M 1 N	25,92	4,87	84,0
M 2 N	19,95	6,87	84,0
M 3 N	19,48	9,17	83,0
M 4 N	23,44	12,80	83,0
M 1 T	39,00	3,78	82,0
M 2 T	44,48	5,18	83,5

Gear	Drawbar pull at which the tractor develops the maximum sound level kN	Measured travelling speed km/h	Sound level dB(A)
M 3 T	40,55	7,17	83,0
M 4 T	26,83	9,98	83,0
S 1 N	19,58	14,08	83,0
S 2 N	15,61	20,01	82,0
S 3 N	13,59	27,98	81,5
S 4 N	-	38,88	84,0
S 1 T	27,68	11,33	81,0
S 2 T	19,76	15,94	84,0
S 3 T	7,44	22,15	82,0
S 4 T	13,13	30,71	82,0