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BLT WIESELBURG

Akt Zl. 166/97

OECD-TEST-REPORT
for approbation according to OECD-Full Code (Code I)
Standard Code by the OECD-Coordinating Centre at
C.E.M.A.G.R.E.F.
Antony, Cedex

Number and date of approval: 1734 FULL CODE, 26th January 1998



Dieseltractor STEYR 9015.15 (40 km/h version)

Trade name: M 948 a (4 WD)

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

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Tractor manufacturer's name and address:	Case Steyr Landmaschinentechnik AG A-4300 St. Valentin, Austria
Location of tractor assembly:	St. Valentin
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer by agreement with BLT Wieselburg
Place of running-in:	St. Valentin
Duration of running-in:	130 hours
Location of test:	Wieselburg, Austria

SPECIFICATIONS OF TRACTOR

TRACTOR:

Make:	STEYR
Trade name:	M 948 a
Type:	9015.15
Model:	40 km/h version
Number of driving wheels:	4
Serial no.:	9015.15 - 01003
1st serial no.:	9015.15 - 01001

ENGINE:

Make:	Perkins
Model:	903-27 (CP 80928)
Type:	4 stroke diesel engine with direct injection
Serial no.:	CP80928U312532B

Cylinder:

Number/disposition:	3, vertical in line
Bore/stroke:	95/127 mm

Capacity:	2700 cm^3
Compression ratio:	17,5 : 1
Arrangement of valves:	Overhead valves
Cylinder liners:	None

Supercharging:

Make:	None
Model:	None
Type:	None
Pressure:	None

Fuel system:

Fuel feed system:	Fuel lift pump
Make, model and type of fuel filter:	LUCAS filter 218576A1, with water trap
Capacity of fuel tank:	73 l
Make, model and type of injection pump:	LUCAS distributer injection pump DP202
Serial no.:	92607MOG
Manufacturer's production setting of injection pump, flow rate and timing:	$51^{\pm 2}$ mm^3/stroke at pump speed of 1125 rev/min and full load $89^{\pm 2}$ before TDC
Make, model and type of injectors:	LUCAS LDS 2645A049
Injection pressure:	$30,0^{+0,5}$ MPa (300^{+5} bar)

Governor:

Make:	LUCAS LDS
Type:	Mechanical governor incorporated in injection pump
Governed range of engine speed:	From $800^{\pm 50}$ to $2400^{\pm 50}$ rev/min engine speed
Rated engine speed:	2250 rev/min

Air cleaner:

Location of air intake:	Inside the bonnet, in front of the radiator
Pre-cleaner:	Incorporated in main-cleaner
Main-cleaner:	
Make:	KNECHT or MANN & HUMMEL
Model:	KNECHT LPO 7045 S/10 or MANN & HUMMEL 44 200 92 921
Type:	Piclon combined filter, dry type with integrated cyclonic pre-cleaner with automatic dust-drain valve and change-able paper filter insert and additional safety cartridge
Service intervals:	
Pre-cleaner:	Visual control, each 250 hours
Main-cleaner paper insert:	Cleaning interval: when control lamp indication is shown Changing interval: 1 year
Maintenance indication:	Electric lamp indication, -65 mbar for indication

Lubrication system:

Type of feed pump:	Forced oil circulation, by gear pump
Type of filter:	STEYR 218520A1
Type of oilcooler:	None

Cooling system:

Type of coolant:	Water-frost protection mixture down to -20°C
Type of pump:	Centrifugal pump belt driven
Specification of fan:	Puller, 1 driving belt
Number of fan blades:	4
Fan diameter:	430 mm

Coolant capacity:	12 l
Type of temperature control:	Thermostat control and electrical coolant thermometer
Superpressure system:	0,7 bar

Starting system:

Make:	LUCAS
Model:	12 V 2,8 kW
Type:	Solenoid engaged screw push starter motor
Starter motor power rating:	2,8 kW
Cold starting aid:	Electrically, glow plug in inlet manifold
Safety device:	Electrically starting block system by engaged clutch

Electrical system:

Voltage:	12 V, negative earth
Generator:	Make: BOSCH Type: three phase type Power: 910 W/65 A - 14 V
Battery:	1 with 12 V/90 Ah lead acid type Rating: 90 Ah at 20 hours rating

Exhaust system:

Make:	ROTH
Model:	47.05.9611.0.00
Type:	Absorption-reflexion type
Location:	140 mm left of the median plane of engine, 1570 mm above centre of crankshaft end of bended exhaust tube

TRANSMISSION TO WHEELS:

Clutch:

Make:	CARRARO
Model:	PNH
Type:	Dry double clutch with 2 plates
Number of plates:	2
Diameter of plates:	295/280 mm
Method of operation:	2 plates incorporated in the same clutch housing are operated independent for p.t.o. and gear box

Gear box:

Make:	STEYR
Model:	TW 517
Type:	Mechanically acting gear box
Model:	as tested (40 km/h) 2 forward and 1 reverse group (FORWARD FAST, FORWARD NORMAL, REVERSE) combined with 4 speed change gear and reduction gear (ROAD - FIELD) Total: 16 forward and 8 reverse speeds
Arrangement:	1 lever for group gear (H, L, R) 1 lever for the 4 speed gear (1 - 4) 1 lever for the reduction gear (ROAD, NEUTRAL, FIELD)
Available options:	Synchronized 4 speed change gear top speed 30 km/h Total: 16 forward and 8 reverse speeds

Rear axle and final drives:

Make:	STEYR
Model:	517
Type:	Central axle, pinion and bevel gear, reduction by planetary gear in final drives

Differential lock:	Type: mechanically acting from half axle to differential housing Method of engagement: foot lever operated Method of disengagement: lockable and preselectable, selfdisengaging when not locked

Front axle and final drives:

Make:	CARRARO
Model:	20.10
Type:	Steering and driving axle, central type, integrated steering cylinder Driving shaft, pinion and bevel gear differential, half shafts, universal joints, planetary gears in wheel hubs
Differential lock:	Without differential lock Optional: automatically locking differential (multi-plate-lock-type)
Optional:	
Make:	SPICER (SIGE)
Model:	010 SSD
Front wheel drive:	Mechanically engaged, multi-plate-clutch in oil bath, hand lever operated, direct central jointless driving shaft to front axle

Total ratios and travelling speeds:

Gear no.	Group	Number of engine revolutions for one revolution of driving wheels		Nominal travelling speed at rated engine speed to 2250 rev/min *) km/h	
-	-	field L	road S	field L	road S
1	forward	280,01	83,79	1,94	6,48
2	normal	161,60	48,36	3,36	11,23
3	L	98,85	29,58	5,49	18,35
4		63,65	19,05	8,53	28,50
1	forward	211,94	63,42	2,56	8,56
2	fast	122,31	36,60	4,44	14,83
3	H	74,82	22,39	7,26	24,25
4		48,18	14,42	11,27	37,66
1		276,48	82,73	1,96	6,56
2	reverse	159,56	47,75	3,40	11,37
3	R	97,61	29,21	5,56	18,59
4		62,85	18,81	8,64	28,87

*) Calculated with rear tyre dynamic radius index of 640 mm (ISO 4251/1 - 1992)
test tyre equipment: rear 14,9 R 28
front 10,5 - 20

Number of revolutions of front wheels for one revolution of rear wheels: 1,408 (optional 1,332)

POWER TAKE-OFF:

Main power take-off:

Type: Independent and (optional) proportional to ground speed p.t.o.

Method of engagement: Hand lever operated, mechanically engaged dry disc clutch, driven by the 2nd plate of main clutch

Number of shafts: 1

Method of changing power take-off shaft speeds: Speed selection by hand lever and spur gears, no changing of shaft ends

Power take-off proportional to engine speed:

540 and 1000 rev/min

Location:	At rear of tractor
Diameter of power take-off shaft end:	34,9 mm
Number of splines:	6, in conformity with ISO R 500 - 1991, type I
Height above ground:	530 mm with tyre dynamic radius index of 640 mm
Distance from the median plane of the tractor:	0 mm
Distance behind rear wheel axis:	305 mm
P.t.o. speed at rated engine speed:	594 rev/min resp. 1056 rev/min
Engine speed at standard power take-off speeds:	2045 rev/min resp. 2130 rev/min
Ratio of rotation speeds (engine speed/ p.t.o.speed):	3,79 resp. 2,13
Power restriction and max. torque:	None
Direction of rotation (viewed from behind tractor):	Clockwise

Optional additional - 540E and 1000E rev/min:

P.t.o. speed at rated engine speed:	454 rev/min resp. 807 rev/min
Engine speed at economic standard p.t.o. speeds:	1510 rev/min
Ratio of rotation speeds (engine speed/p.t.o. speed):	4,96 resp. 2,79

Middle p.t.o.:	Optional, not on tested tractor
Location:	On the left side of the gear box, 90 mm below centre of crankshaft, 651 mm before rear axle, 186,5 mm left of median plane of tractor
Dimension of p.t.o. shaft end:	ISO R 500 - 1991, type I (34,9 mm, 6 splines)
P.t.o. speed at rated engine speed:	847 rev/min resp. 1109 rev/min
Engine speed at standard p.t.o. speed:	2029 rev/min resp. 1435 rev/min
Power restriction and max. torque:	None
Direction of rotation (viewed from behind tractor):	Clockwise
Front p.t.o.:	Optional
Location:	In front of tractor, direction frontwards, 679 mm above ground, 326 mm before front axle CARRARO (306 mm before front axle SIGE), in median plane. Driven directly from the engine by a propellershaft, hydraulical acting dry cone clutch and planetary gear transmission. Shaft end is blocked when cone clutch is disengaged.
Dimension of p.t.o. shaft end:	ISO R 500 - 1991, type I (34,9 mm, 6 splines)
P.t.o. speed at rated engine speed:	1073 rev/min
Ratio of rotation speed:	2,143
Power restriction and max. torque:	None
Direction of rotation (viewed from front of tractor):	Anticlockwise

Power take-off proportional to ground speed: Optional

Speed of shaft: The shifting position "540 - 1000" of the engine p.t.o.-shaft has no influence on the p.t.o.-shaft speed.

Travelling distance for one revolution of p.t.o. shaft: 0,103 m (with tyre dynamic radius index of 640 mm)

Location: At rear of tractor, same shaft end as p.t.o. proportional to engine speed

Number of p.t.o. shaft revolutions for one revolution of rear wheels: 38,95 rev

Direction of rotation with forward gear engaged (viewed from behind tractor): Clockwise

Stationary mode (reduction gear in neutral position - tractor not driving): Number of p.t.o. shaft revolutions at 2250 rev/min rated engine speed

Normal model, 40 km/h:

Group gear	L	S	R
Gear no.: 1	313	414	317
2	542	717	549
3	887	1171	898
4	1377	1819	1395
Direction of rotation	clockwise	clockwise	anticlockwise
	viewed from behind tractor		

POWER LIFT:

In the rear:

Make: Own make

Type: Draught control with two-stage pull, adjustment and upper link sensing, position control, floating position

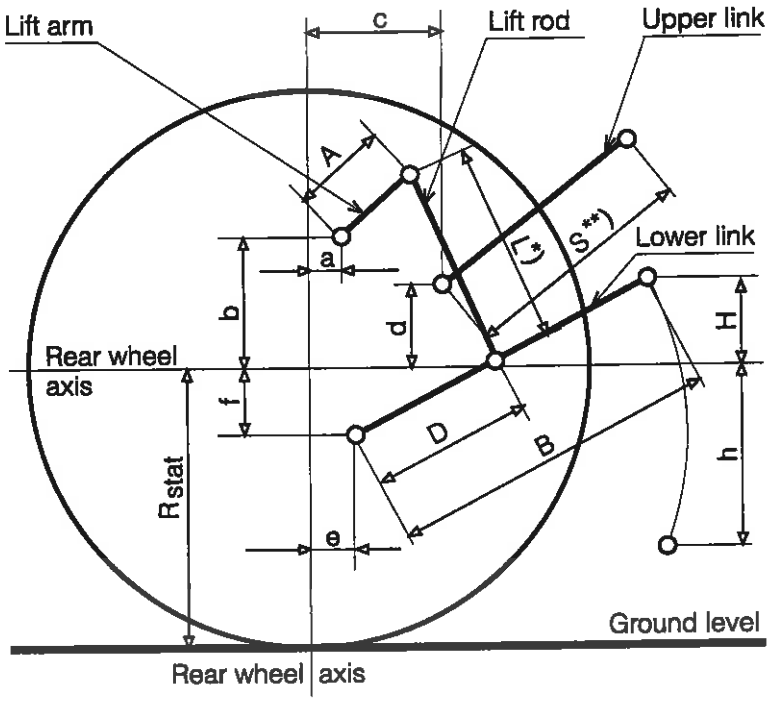
Type of hydraulic system: Open center type

Type and number of cylinder:	One single acting type 147 mm stroke, 75 mm diameter Optional: 2 additional single acting cylinder, 32 mm bore, 172 mm stroke
Type of linkage lock for transport:	Hydraulically by throttle valve
Relief valve pressure setting:	17,5 MPa (175 bar)
Opening pressure of cylinder safety valve:	24,0 MPa (240 bar)
Lift pump type:	Gear type pump
Transmission between pump and engine:	Pump directly driven by engine by gear transmission
Type and number of filter:	One filter cartridge in suction line, connected at the hydraulic housing
Site of oil reservoir:	Hydraulic housing
Type, number and location of tapping points:	Up to 4 tapping points (2 oil circuits for single or double acting cylinders), 384 mm behind rear axle, 484 - 556 mm above rear axle, max. 120 mm left or 121 mm right of median plane In accordance to ISO/DIS 5675 - 1979
Maximum volume of oil available to external cylinders:	5 l (optional 15 l)
In the front:	Not on tested tractor, hydraulic linkage, actuated by auxiliary valve of the power lift
Make:	HYDRAC
Type:	GR I
Type of hydraulic system:	Open center type, independent lower links with quick coupling ends cat. II fastened to a lifting frame
Type and number of cylinders:	2 single acting cylinder (optional: double acting) 139 mm stroke, 70/30 mm bore
Type of linkage lock for transport:	Hydraulically by non return valve

Optional:	In connection with front axle ZF
Make:	THANHOFER
Type:	GR I
Type of hydraulic system:	Open center type, independent lower links with quick coupling ends cat. II fastened on front axle
Type and number of cylinder:	2 single acting cylinder 168 mm stroke, 60/30 mm bore

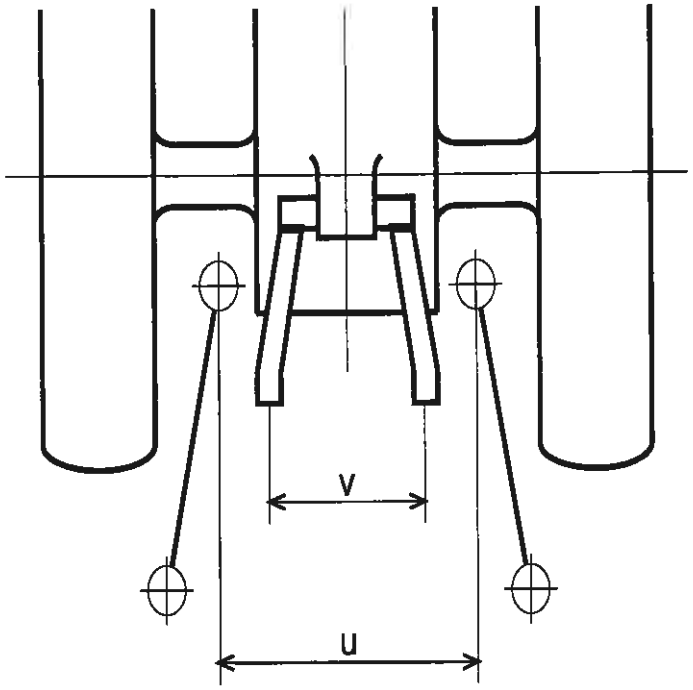
Three-point-linkage:

Category adapter: I/II; in conformity with ISO 730/1-1990



*) Left lift rod adjustable from 500 mm to 600 mm length be thread, right lift rod adjustable from 500 mm to 600 mm by thread.

**) Upper link length adjustable from 440 mm to 670 mm.



Dimensions of linkage geometry:

			Dimension of range mm	Settings used in test mm
Length of lift arms:		(A)	190/235	190/235
Length of lower links:		(B)	850	850
Distance of lift arm pivot points from rear wheel axis:	horizontally	(a)	53	53
	vertically	(b)	296	296
Horizontal distance between the lower link points:		(u)	515	515
Horizontal distance between the 2 lift arm end points:		(v)	510	510
Length of upper link:		(S)	440 - 670	650
Distance of upper link pivot point from rear wheel axis:	horizontally	(c)	293	293
	vertically	(d)	229	229
Distance of lower link pivot point from rear wheel axis:	horizontally	(e)	80	80
	vertically	(f)	190	190

Height of lower link hitch points relative to the rear wheel axis (515 mm above ground)*):

		Min. lift rod length **)	Min. lift rod length ***)	During test		Max. lift rod length	Max. lift rod length
Length of lift arms	(A) mm	190	235	190	235	190	235
Linkage distance of lift rod	(D) mm	420					
Length of lift rods	(L) mm	500		575	535	600	
Lowest position	(h) mm	240	350	440	440	485	230
Highest position	(H) mm	235	235	85	165	60	60

Height above ground of lower hitch points when locked in transport position*): Any height within lift range

*) With dynamic radius index 640 mm (ISO 4251/1 - 1992)
) Max. mech. advantage; *) Min. mech. advantage

TRAILER HITCH:

Type:	2125, on tested tractor	
Hole diameter:	32,5 mm	
Height above ground:	761/799 mm resp. 385/423 mm	
Distance of hitch point from rear wheel axis, horizontally:	450 mm resp. 370 mm	
Distance of hitch point from power take-off shaft end, vertically:	201/239 mm resp. -175/-137 mm	
horizontally:	145 mm resp. 65 mm	
Maximum vertical permissible load:	15 kN	
tractor fitted:	7,5 kN (depending on tyre dim.)	
Optional:	Height adjustable hitch	
	German	Italian
Type:	2145	23
Hole diameter:	32,5 mm	28,5 mm
Height above ground:	818/781/735/689/643/574/505/459/413/367 mm	
Distance of hitch point from rear wheel axis horizontally:	530 mm	484 mm
Distance of hitch point from power take-off shaft end, vertically:	258/221/175/129/83/14/-55/-101/-147/-193 mm	
horizontally:	225 mm	179 mm
Maximum vertical permissible load:	20 kN	15 kN
tractor fitted:	7,26 kN (depending on tyre dim.)	7,4 kN

HOLED DRAWBAR: Category II

Length:	825 mm
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 gound min.:	40 mm
max.:	875 mm
Horizontal distance to power take-off shaft end (rear):	625 mm

STEERING:

Make:	Zahnradfabrik Friedrichshafen (ZF) or DANFOSS, Nordborg
Model:	ZF 8492 974 626 or DANFOSS OSPC 125 OR
Type:	Hydrostatic steering with priority valve, common circuit with power lift
Method of operation:	Steering wheel acting on front wheels
Pump:	38 l/min (optional 48 l/min) at rated engine speed, common with power lift
Rams:	Incorporated in front axle, acting piston area 19,8 cm², stroke 193 mm Optional: acting piston area 20,6 cm², stroke 240 mm
Working pressure:	12,0 MPa (120 bar)

BRAKES:

Service brake:

Make:	Rear axle: SIRMAC Optional on front axle: KNOTT
Model:	Rear axle: 6 1/2" x 4 1/2" Optional on front axle: Type 13414
Type:	Rear axle: Multi disc brake in oil bath, 6 acting faces with 141,2 mm effective diameter each Optional on front axle: Calliper disc brake acting on front axle drive shaft piston area 18,1 cm²

Method of operation: Pedal operated, hydraulically transmission

Optional: front axle brake with hydraulic transmission

Trailer braking take-off: Optional, hydraulic trailer brake

Parking brake:

Type: Mechanically acting on the same discs as service brake

Method of operation: Hand lever with ratchet, mechanically transmission acting on separate linkage with service brake

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: 2117 mm with front axle CARRARO
2137 mm with front axle SIGE

Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front CARRARO	1368	1484	wheels turned around
Front SIGE	1514	1492	
Rear	1360	1492	

PROTECTIVE STRUCTURE:

Make:	CASE STEYR
Model:	125.05
Type:	Cab
Manufacturer's name and address:	Case Steyr Landmaschinen AG, A-4300 St. Valentin
Protective device:	Welded and screwed profile steel tube construction
Date of approval:	14th March 1997
OECD-approval no.:	CSS 0421/37 Front axle: CARRARO Seat: KLEPP-Elastomat 1050E
	CSS 0421/38 Front axle: CARRARO Seat: GRAMMER DS 85H1/3
	CSS 0421/41 Front axle: SIGE Seat: KLEPP Elastomat 1050E
	CSS 0421/42 Front axle: SIGE Seat: GRAMMER DS 85H1/3

DRIVER'S SEAT:

Make:	KLEPP	GRAMMER
Model:	Elastomat 1050 E	DS 85 H1/3
Type of suspension:	Mechanical, 2 tension springs	Mechanical, with a rubber bladder
Type of damping:	Hydraulically damping	Hydraulically damping
Range of adjustment, longitudinal:	170 mm	150 mm
vertical:	60 mm	60 mm

Optional:

Make:	GRAMMER
Model:	MSG 93-3B
Type of suspension:	Pneumatical, with a rubber bladder
Type of damping:	Hydraulically damping
Range of adjustment, longitudinal:	150 mm
vertical:	60 mm

MISCELLANEOUS:

Additional seat:	Own make
Location:	On left side of driver's seat
Number of places:	1

LIGHTING:

	*) Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Head lights	880	140 x 75	205
Side lights	1350	90 x 40	675
Rear lights	1405	90 x 40	848
Brake lights			
Direction indicators front	1390	90 x 40	675
Direction indicators rear	1445	90 x 40	848
Reflectors	1336 780	92 x 48 80 Ø	850 500

*) Measured with tyre dynamic radius index at rear 640 mm and 444 mm at front (ISO 4251/1 - 1992)

TEST CONDITIONS

Overall dimensions:

	Length	Width	Height at top of		
			exhaust silencer	protective structure	
				normal	high
	mm	mm	mm	mm	
Ballasted	3905	1890	2200	2230	2330
Unballasted	3562	1890	2200	2230	2330

*) Measured on the outside edges of the rear wheels

Ground clearance:
(unballasted tractor)

Clearance limiting part:
335 mm under the front axle
305 mm four wheel drive transmission
315 mm under the trailer hitch mounting plate

Tractor mass: With tanks full

		Without driver	With driver
		kg	kg
Unballasted	Front	1075	1085
	Rear	1705	1770
	Total	2780	2855
Ballasted	Front	1505	1515
	Rear	2305	2370
	Total	3810	3885

Ballast:

	Number of weights	Mass total kg	Water kg
Front	9	345	-
Rear	2 x (2 + 1)	325	360
Optional	-	-	-

Tyres and track width specifications:

Tyres:

	Front	Rear
Dimensions	10,5 - 20	14,9 R 28
Ply rating	6 PR	128 A8
Type	diagonal carcass	radial carcass
Max. load (tyre manufacturer's)	1610 kp resp. 2520 kp with 10 km/h speed limit	1800 kp resp. 2700 kp with 10 km/h speed limit
Max. load (tractor manufacturer's)	2200 kg	2700 kg
Inflation pressure (tyre manufacturer's)	2,5 bar	1,6 bar
Dynamic radius index	444 mm	640 mm
Chosen track width	1484 mm	1492 mm

Oil and lubrication:

Capacity and change interval:

	Capacity (dm^3)	Oil change (h)	Filter change (h)
Engine	7,5	250	250
Gear box and rear axle	24,0	1000	-
Front axle	5,0	1000	-
Rear axle	-	-	-
Final drive front	0,8 x 2	500	-
Final drive rear	-	1000	-
Hydraulic system	9,6 [19,6]	1000	1000
Steering	-	-	-

Specifications:

	Recommended:	Used during test:
Engine oil:		
Type:	Single or multi range viscosity oil	
Viscosity:	SAE 30 summer SAE 20 W-20 winter	
Classification:	API CC/MIL-L-46152 B or MIL-L-2104 B	As recommended
Transmission oils:		
Type:	Transmission oil	
Viscosity:	SAE 80 W	
Classification:	API GL 4, MIL-L-2105	As recommended
Hydraulic fluid:	Hydraulic oil ISO VG 46/HLP nach DIN 51524 I SO VG 68	
Steering oil:	As hydr. fluid	
Brake fluid:		
Type:	-	
Classification:	SAE J 170 3e FMVSS 116 DOT 3	
Grease:		
Type:	Lithium soap basis	
Classification:	NLGI 2 (multigrade grease)	
Number of lubrication points:	22	
Fuel:		
Type:	ELAN diesel fuel In conformity with national standard according to DIN 51601	
Density at 15°C:	0,843 g/cm³	

TEST RESULTS

COMPULSORY TEST:

Main power take-off performance:
Date and location of tests: 29.9.1997, Wieselburg, Austria
Type of dynamometer: SCHENCK eddy-current brake W 780

Main test on: ISO R 500 - 1991, type I (DIN 9611) - **540 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					
34,50	2250	594	8,96 10,63	259,5	3,25
Power at rated engine speed					
34,50	2250	594	8,96 10,63	259,5	3,25
Standard power take-off speed					
33,00	2044	540	8,35 9,91	253,0	3,33
PART LOADS					
(i) The torque corresponding to maximum power at rated engine speed					
34,50	2250	594	8,96 10,63	259,5	3,25
(ii) 85 % of torque obtained in i)					
30,20	2320	613	8,05 9,55	266,5	3,16
(iii) 75 % of torque defined in (ii)					
22,90	2347	620	6,60 7,83	288,5	2,92
(iv) 50 % of torque defined in (ii)					
15,50	2369	626	5,08 6,03	327,5	2,57
(v) 25 % of torque defined in (ii)					
7,80	2388	631	3,53 4,19	452,5	1,86
(vi) unloaded					
0	2403	635	2,29 2,72	-	-

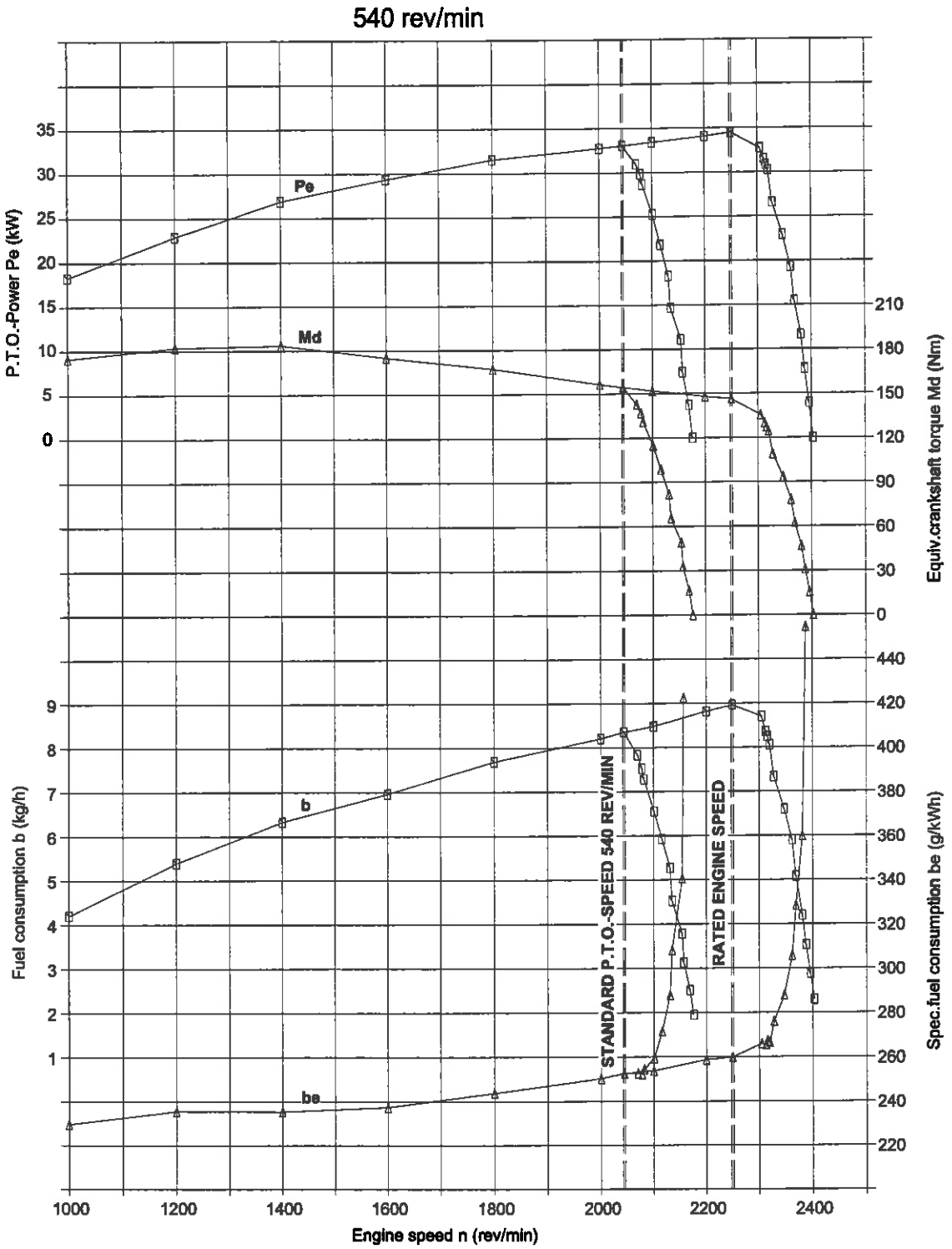
Power	Speed		Fuel consumption			Specific energy
	engine	p.t.o.	hourly		specific	
kW	rev/min	rev/min	kg/h	l/h	g/kWh	kWh/l
PART LOADS AT STANDARD POWER TAKE-OFF SPEED						
(i) The torque corresponding to maximum power available						
33,00	2044	540	8,35	9,91	253,0	3,33
(ii) 85 % of torque obtained at maximum power						
28,60	2082	550	7,28	8,64	254,5	3,31
(iii) 75 % of torque defined in (ii)						
21,80	2116	559	5,92	7,02	271,5	3,11
(iv) 50 % of torque defined in (ii)						
14,70	2135	564	4,52	5,36	307,5	2,74
(v) 25 % of torque defined in (ii)						
7,40	2157	570	3,13	3,71	423,0	1,99
(vi) unloaded						
0	2176	575	1,95	2,31	-	-

No load maximum engine speed: 2403 rev/min
Equivalent crankshaft torque
at maximum power: 146,2 Nm at rated engine speed
Maximum equivalent crankshaft torque: 183,5 Nm at 1400 rev/min of engine

Mean atmospheric conditions
temperature: 17°C
pressure: 998 mbar
rel. humidity: 55 %

Maximum temperatures
coolant: 77°C
engine oil: 104°C
fuel: 51°C
engine air intake: 19°C

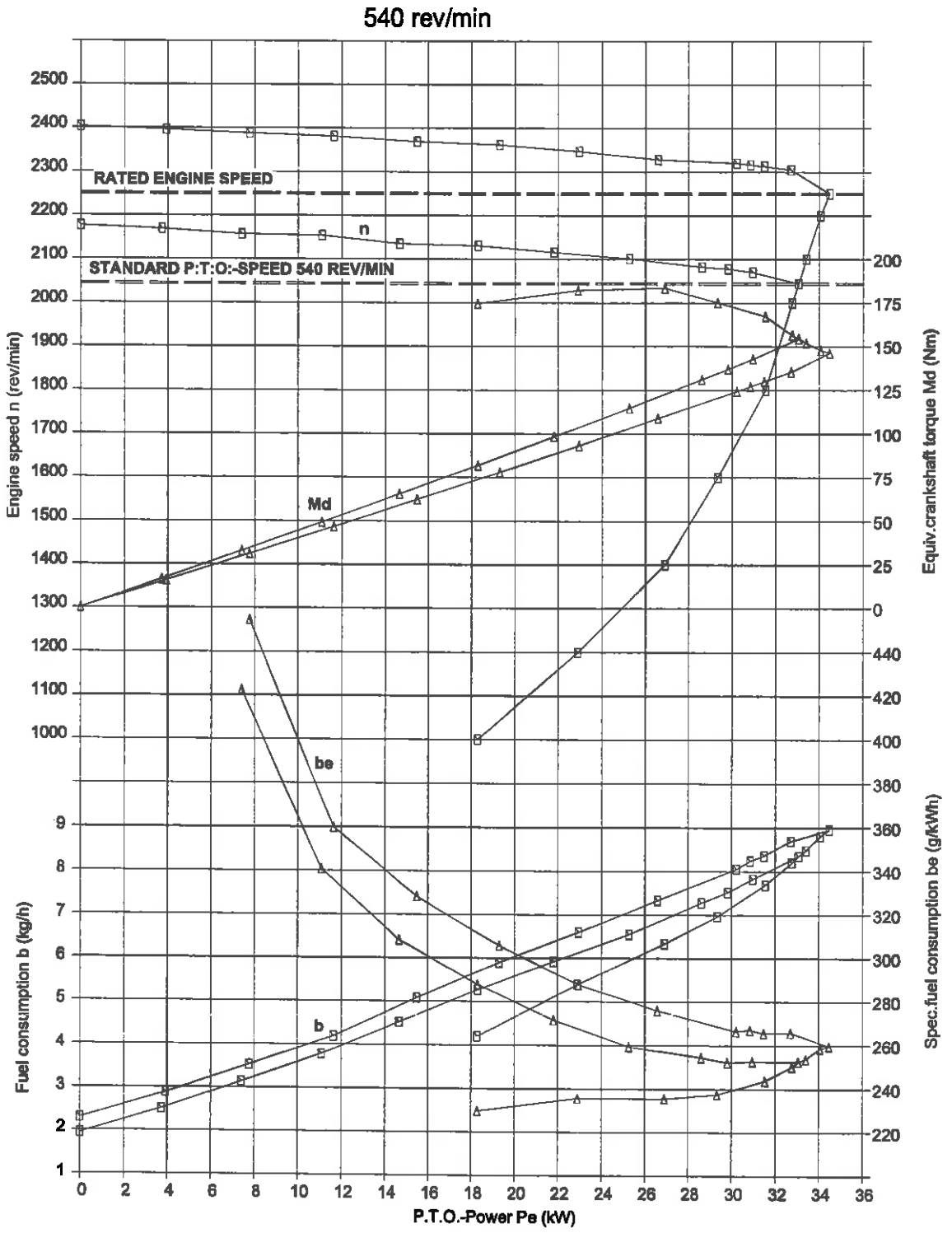
Bundesanstalt für Landtechnik Wieselburg/Erlauf, Austria	P.T.O.-test	Steyr Typ M948a (9015.15) Mot.Typ Perkins 903-27



engine ser.nr. : CP80928U312532B	atm. pressure: 998 mbar	fuel temp. :51 C	signature
tractor ser.nr.: 9015.15-01003	air temper. : 17 C	d.of tests :1997-09-29	
fuel : 0.843/15 C	coolant temp.: 77 C	test no. :	
engine oil : SAE 20 / SAE 30	oil temp. : 104 C	curves no. : 1	Haider/Zierfuß

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Bundesanstalt für Landtechnik Wieselburg/Erlauf, Austria	P.T.O.-test	Steyr Typ M948a (9015.15) Mot.Typ Perkins 903-27



engine ser.nr. : CP80928U312532B	atm. pressure: 998 mbar	fuel temp. :51 C	signature
tractor ser.nr.: 9015.15-01003	air temper. : 17 C	d.of tests :1997-09-29	
fuel : 0.843/15 C	coolant temp.: 77 C	test no. :	
engine oil : SAE 20 / SAE 30	oil temp. : 104 C	curves no. : 2	Haider/Zierfuß

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MKU713.DAT;2

HYDRAULIC POWER AND LIFTING FORCE:

Date of tests: 24.10.1997

Hydraulic power test:

Sustained pressure with relief valve open: 18,0 MPa (180 bar)

Pump delivery rate at minimum pressure (at rated engine speed): 30,8 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	25,4	16,7	7,1
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	25,3	17,0	7,2

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: 18,0 MPa (180 bar)

Remarks:

Flow rate corresponding to a hydraulic pressure equivalent up to 80 % (14,8 MPa) of the actual relief valve pressure setting is equal to pump delivery rate at minimum pressure (at rated engine speed).

By reasons of the characteristic of the hydraulic spool valves about 20 % control flow above 14,8 MPa are normal.

Power lift test: Without additional hydraulic cylinder

	at the hitch point	on the frame
		610 mm mast height
Height of lower hitch points above ground in down position *)	200/200 mm	200/200 mm
Vertical movement *)	610/530 mm	840/700 mm
Maximum corrected force exerted through full range *)	13,7/16,4 kN	8,5/10,7 kN
Corresponding pressure of hydraulic fluid	16,7 MPa (167 bar)	16,7 MPa (167 bar)
Moment about rear wheel axis *)	12,7/15,3 kNm	13,1/16,5 kNm
Maximum tilt angle of mast from vertical	-	from -6° to 0° and to +12°

With additional hydraulic cylinder

	at the hitch point	on the frame
		610 mm mast height
Height of lower hitch points above ground in down position *)	200/200 mm	200/200 mm
Vertical movement *)	610/530 mm	840/700 mm
Maximum corrected force exerted through full range *)	19,5/21,8 kN	11,6/14,8 kN
Corresponding pressure of hydraulic fluid	16,7 MPa (167 bar)	16,7 MPa (167 bar)
Moment about rear wheel axis *)	18,1/20,3 kNm	17,9/22,8 kNm
Maximum tilt angle of mast from vertical *)	-	from -6° to 0° and to +12°

*) Min.mech/max.mech. advantage

Linkage settings for test: See table and figure in specification

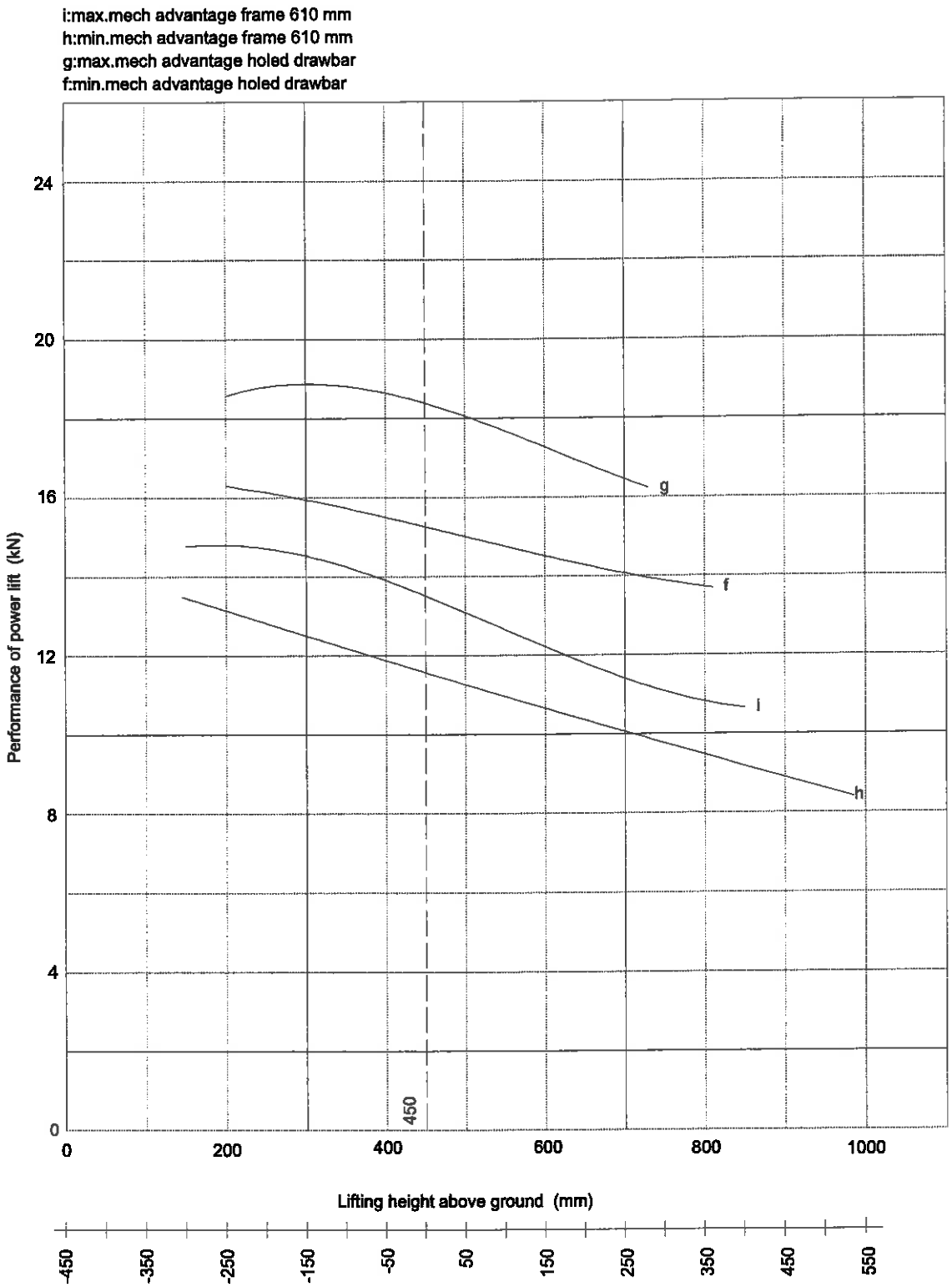
Without additional hydraulic cylinder

Lifting heights relative to the horizontal plane including the lower link pivot points														
mm		-300	-250	-200	-150	-75	0	+75	+150	+200	+275	+355	+395	+450	+530
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	max.mech. advantage		18,6	18,8	18,9	18,7	18,4	17,9	17,3	16,9	16,4				
	min.mech. advantage		16,3	16,1	16,0	15,6	15,3	14,9	14,5	14,3	14,00	13,7			
at the frame kN (610 mm mast hight)	max.mech. advantage	14,8	14,8	14,7	14,5	14,1	13,5	12,9	12,2	11,8	11,2	10,8	10,7		
	min.mech. advantage	13,5	13,1	12,8	12,5	12,0	11,6	11,1	10,7	10,4	9,9	9,4	9,2	8,9	8,5

With additional hydraulic cylinder

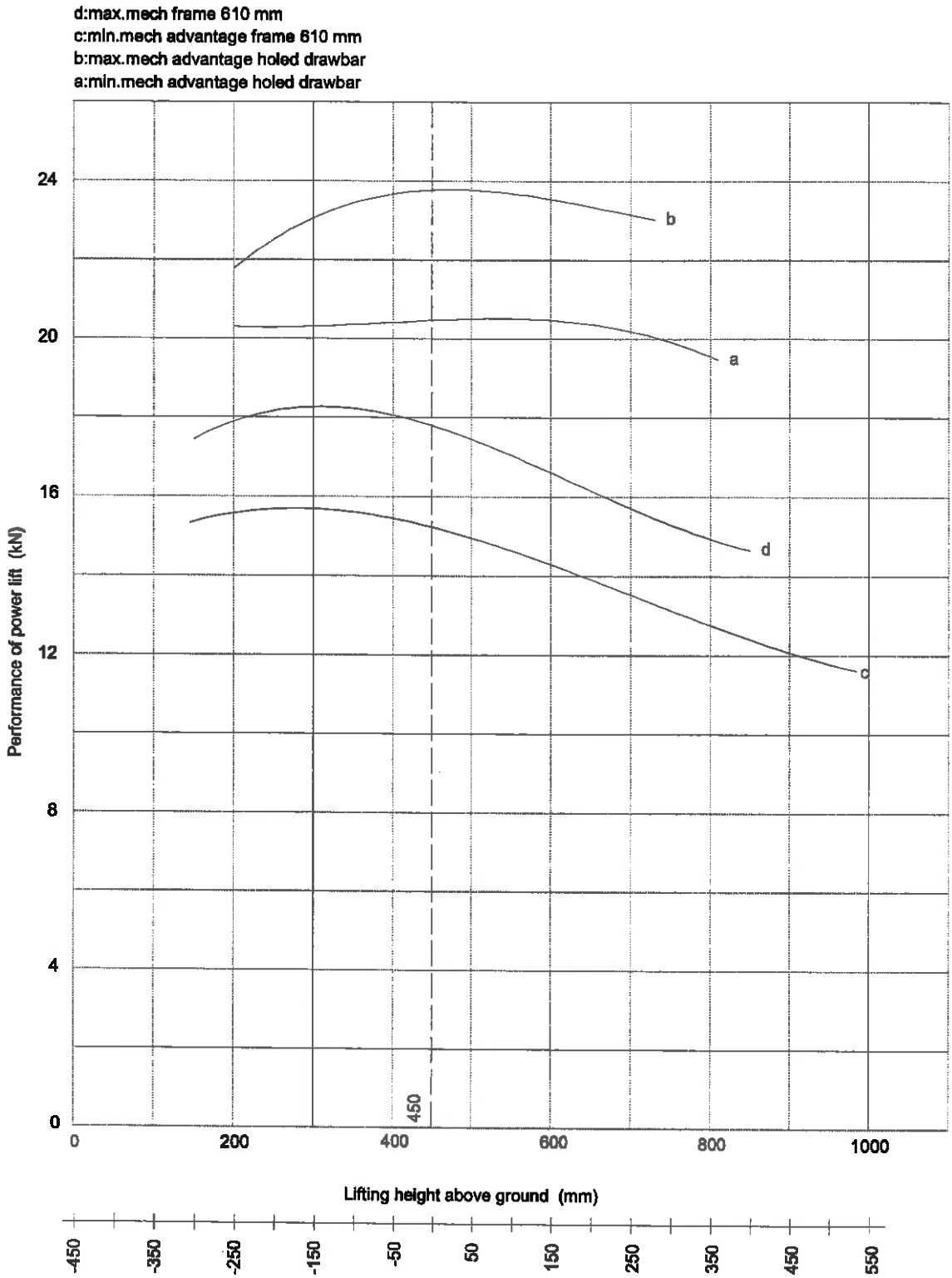
Lifting heights relative to the horizontal plane including the lower link pivot points															
mm		-300	-250	-200	-150	-75	0	+75	+150	+200	+275	+355	+395	+450	+530
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90 % of the actual relief valve 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	max.mech. advantage		21,8	22,5	23,1	23,6	23,8	23,7	23,5	23,4	23,1				
	min.mech. advantage	X	20,3	20,3	20,3	20,4	20,5	20,5	20,5	20,4	20,10	19,5	X		
at the frame kN (610 mm mast hight)	max.mech. advantage	17,4	17,9	18,2	18,3	18,2	17,8	17,3	16,6	16,2	15,5	14,9	14,8		
	min.mech. advantage	15,4	15,6	15,7	15,7	15,5	15,2	14,8	14,3	13,9	13,3	12,7	12,4	12,1	11,6

Performance of power lift: Without additional hydraulic cylinder



Height relative to the horizontal plane including the lower link pivot points (dyn. radius index 640 mm)

With additional hydraulic cylinder



Height relative to the horizontal plane including the lower link pivot points (dyn. radius index 640 mm)

Drawbar performance:

Date of test: 30.9.1997, 1.10.1997
9.10.1997

Type of track: Concrete

Height of drawbar above ground: unballasted 310 mm, ballasted 310 mm

Tyre inflation pressure: front: unballasted 175 kPa, ballasted 175 kPa
rear: unballasted 100 kPa, ballasted 100 kPa

Tyre sizes: front: 10,5 - 20, 6 PR; rear: 14,9 R 28, 128 A 8

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)													
L 1 L	12,48	26,47	1,69	2350	15,0	-	-	45	71	90	25	70	99,0
L 1 H	16,48	26,38	2,23	2336	15,0	422,5	1,99	45	70	91	25	70	99,0
L 2 L	21,42	26,51	2,92	2307	15,0	405,5	2,08	45	70	91	25	70	99,0
L 2 H	26,58	24,18	3,96	2250	10,3	337,0	2,50	50	73	99	25	68	99,0
L 3 L	27,35	19,40	5,08	2250	7,1	327,5	2,57	50	73	99	25	68	99,0
S 1 L	27,83	16,46	6,08	2250	5,6	322,0	2,62	48	72	99	25	69	99,0
L 3 H	27,20	14,27	6,88	2250	4,9	329,5	2,56	52	73	101	25	66	99,0
L 4 L	26,80	11,85	8,14	2250	4,0	334,5	2,52	52	73	101	25	66	99,0
S 1 H	27,28	12,02	8,17	2250	4,0	328,5	2,57	52	73	102	25	62	99,0
S 2 L	26,22	8,73	10,80	2250	3,2	341,5	2,47	52	73	102	25	62	99,0
L 4 H	25,58	8,45	10,91	2250	2,8	350,5	2,41	52	73	102	25	60	99,0

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
(ii) Maximum power in tested gears (ballasted tractor)													
L 1 L	16,11	34,05	1,69	2342	15,0	409,5	2,06	42	67	99	13	81	99,8
L 1 H	21,40	34,77	2,20	2315	15,0	385,0	2,19	41	68	98	13	81	99,8
L 2 L	26,31	32,89	2,88	2250	13,3	340,5	2,48	41	68	98	13	81	99,8
L 2 H	28,52	24,80	4,14	2250	6,4	314,0	2,68	45	70	98	13	81	99,8
L 3 L	28,58	19,85	5,18	2250	4,9	313,5	2,69	46	70	99	14	79	99,8
S 1 L	29,20	17,01	6,19	2250	4,0	307,0	2,75	46	67	99	14	79	99,8
L 3 H	28,50	14,75	6,95	2250	3,9	314,5	2,68	45	70	98	14	79	99,8
L 4 L	27,54	12,08	8,21	2250	3,2	325,5	2,59	42	68	95	14	79	99,8
S 1 H	28,49	12,44	8,24	2250	3,2	314,5	2,68	44	69	96	15	80	99,8
S 2 L	27,40	9,05	10,91	2250	2,3	327,9	2,58	49	71	98	15	78	99,8
L 4 H	26,44	8,70	10,94	2250	2,2	339,0	2,49	49	71	98	15	78	99,8
(iii) Five-hour-test at 75 % of pull at maximum power													
S 1 L	22,67	12,81	6,37	2313	3,0	369,0	2,29	49	69	99	14	90	99,5
(iv) Five-hour-test at pull corresponding to 15 % wheelslip in test (ii)													
L 1 H	20,80	34,80	2,15	2316	15,0	496,0	2,13	55	73	104	18	73	99,8

Oil consumption during 10 hours duration of tests (iii) and (iv): 39,3 g/h

TURNING AREA AND TURNING CIRCLE:

Wheel equipment: front: 10,5 - 20, 6 PR
rear: 14.9 R 28, 128 A 8

Track of wheel: front: 1484 mm
rear: 1492 mm

Results *)	With brakes		Without brakes	
	right-hand	left-hand	right-hand	left-hand
	m	m	m	m
Radius of turning area	3,31/3,49	3,35/3,49	4,33/3,86	4,33/3,85
Radius of turning circle	3,15/3,33	3,19/3,33	4,17/3,70	4,17/3,69

*) Four-wheel-drive switched: ON/OFF

LOCATION OF CENTRE OF GRAVITY:

	mm
Height above ground	975
Distance forward from the vertical plane containing the axis of the rear wheels	805
Distance from the median plane of the tractor, left-side	9

BRAKING:

Date of tests: 9.10. and 10.10.1997
Type of track: Concrete
Type of decelerometer: Moto-Meter Nr. 03382 (Kombi-Schreiber)

Tractor mass during brake tests (with driver):

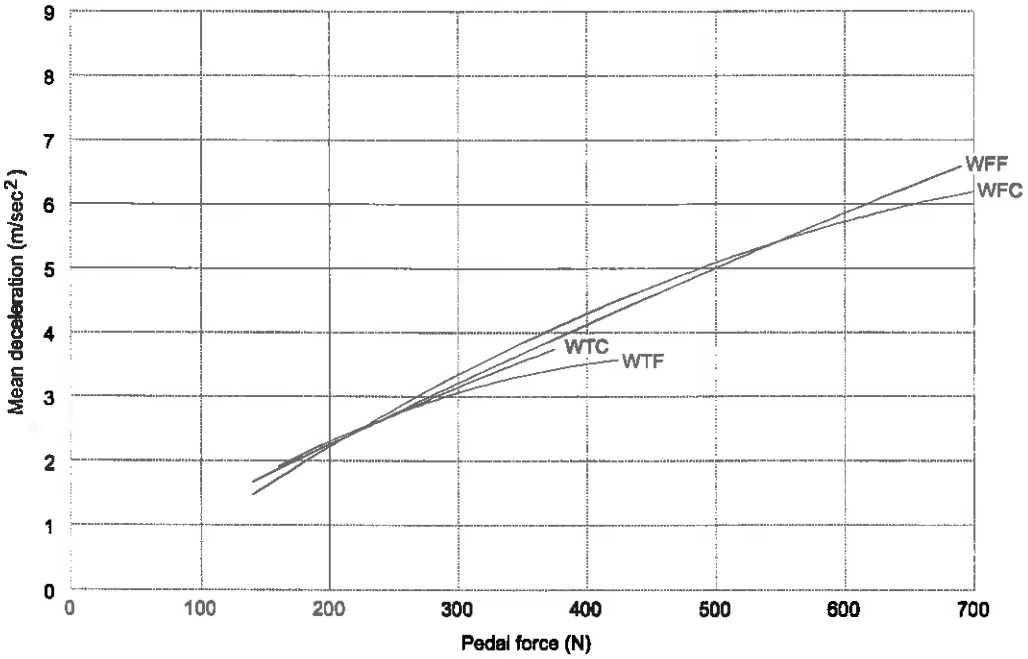
	Front kg	Rear kg	Total kg
Ballasted	1515	2370	3885
Unballasted	1085	1770	2855

Service brake:

Service brake:

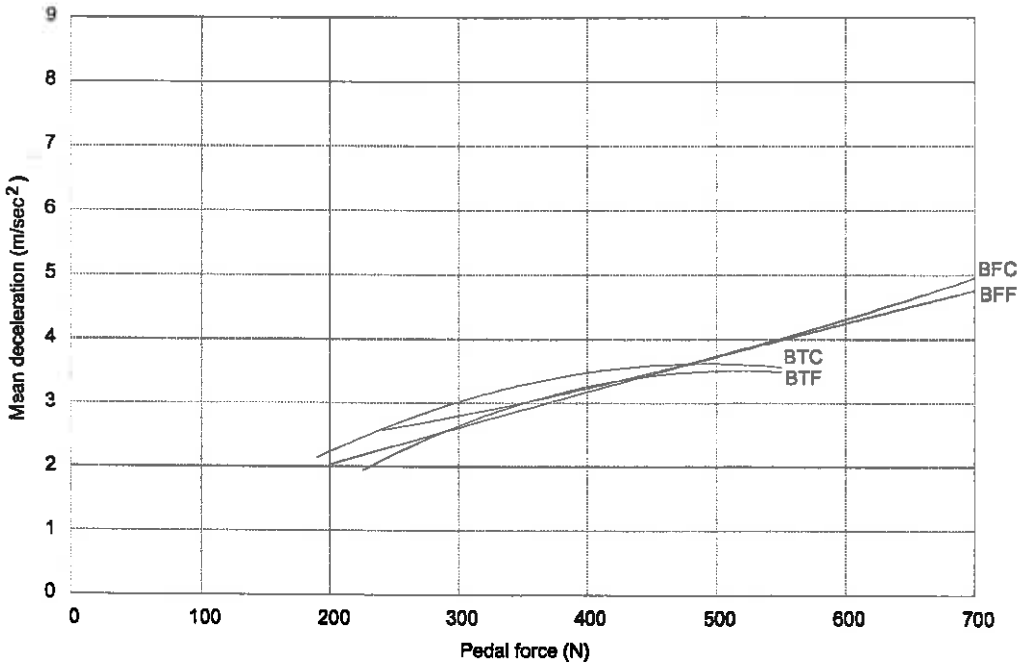
WFC... unballasted, 4WD, cold
WFF... unballasted, 4WD, fade

WTC... unballasted, 2WD, cold
WTF... unballasted, 2WD, fade



BFC... ballasted, 4WD, cold
BFF... ballasted, 4WD, fade

BTC... ballasted, 2WD, cold
BTF... ballasted, 2WD, fade



Speed before application of brakes: 38.00 km/h

The tractor brakes were heated by towing of the tractor for 1 km.

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Maximum deviation of tractor from its original course:	None
Abnormale vibration:	None

Parking brake device test:

	Ballasted tractor on 18 % slop	
Braking device control force	up	down
	170/170 N	170/170 N

Four-wheel-drive switched: ON/OFF

MEASUREMENT OF EXTERNAL NOISE LEVEL:

Date of test:	9.10.1997
Type of sound level meter:	BRÜEL & KJAER 2209 and 2308
Type of track:	Concrete
Gear number:	S 4 H
Travelling speed before acceleration:	28,5 km/h
Sound level:	81,5 dB(A)

REPAIRS: None

REMARKS: None

The head of department:

(Dipl.-Ing. H. Lampel)
Hofrat

Test and report carried out by:

(Ing. Hermann Schaufler)

Bundesanstalt für Landtechnik, Wieselburg a. d. Erlauf

The director of testing station:

(Dipl.-Ing. Dr. J. Schrottmaier)
Hofrat