ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

O.E.C.D. no. **1306** full code

Test in accordance with the O.E.C.D. Full Code for the official testing of agricultural tractors.



Report test of: **SAME ANTARES 130 VDT "4WD"**

Submitted for test by: S+L+H S.p.A
V.le Cassani 15
24047 Treviglio (BG) (Italy)

Date of O.E.C.D. approval: 19 March 1991
Period of test: November 1990

ISMA - SOP Treviglio - Via Milano 43 - TREVIGLIO (BG) - ITALY

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All stated dimensions and tests refer to tyre size 16.9/30 (6 ply) at front and 20.8/38 (8 ply) at rear, as well as to track widths 1720 mm at front and 1840 mm at rear.

- Tractor manufacturer

. Name: S+L+H S.p.A.;
. Address: V. Cassani 15 - 24047 Treviglio (BG) - ITALY;
- Location of tractor assembly: Treviglio (BG) - ITALY;
- Submitted for test by: the manufacturer;
- Selected by: the manufacturer with the agreement of ISMA;
- Place of running in: Treviglio (BG) - ITALY;
- Duration of running in: 50 hours.
- Location of test: I.S.M.A. - Via Milano 43 - Treviglio (BG) - ITALY

I - SPECIFICATION OF TRACTOR

TRACTOR

- Make: SAME;
- Model: ANTARES 130 VDT "4WD";
- Type: Wheeled tractor, unit construction, all wheels drive tractor;
- Number of driving wheels: 4;
- Serial number: 1008;
- First serial number: 1001.

ENGINE

- Make: S+L+H;
- Model: 1000.6 AT;
- Type: aircooled 4-stroke diesel engine, direct injection, turbo charged;
- Serial number: 1017.

Cylinders

- Number/disposition: 6, vertical, in-line;
- Bore/stroke: 105 x 115.5 mm;
- Capacity: 6000 cm^3;
- Compression ratio: 16/1;
- Arrangement of valves: overhead;
- Cylinder liners: without liners.

Supercharging

- Make: SCHWITZER;
- Model: S2B;
- Type: turbo charger;
- Supercharging pressure: 93 kPa.

Fuel system

- Fuel feed system: AC corone fuel feed pump;
- Make, model and type of fuel filter: FIAMM FNA 225/00;
- Capacity of fuel tank: 210 dm^3;
- Make, model and type of injection pump: BOSCH PFR 1K 90A 503, immersed pump, one per cylinder, without serial number, in line injection pump;
- Manufacturer's production setting of injection pump:
.flow rate: 58 +/-2 mm /stroke at rated speed and full load corresponding 26.41 dm^3/h;
.timing: 16±0.5 before TDC;
- Make, model and type of injectors: BOSCH DLLA 150 S 925 multihole injecton nozzles;
- Injection pressure: 18 +/- 1 MPa.

Governor

- Make: S+L+H;
- Model: 526.16;
- Type: electronic;
- Governor range of engine speed: from 650 to 2718 rev/min.;
- Rated engine speed: 2500 rev/min.

Air cleaner

- Main filter
. make: DONALDSON;
. model: FLG 10-0220;
. type: dry paper element filter;
. location: front of engine ;
- Maintenance indicator: with the warning lamp on the dashboard.

Lubrication system

- Type of feed pump: forced feed from gear pump;
- Total oil capacity including filter: 15.0 dm^3;
- Oil change period: 150 hrs;
- Type of filter: FIAMM FT 48 03 IN;
- Number: 2;
- Filter change period: 300 hrs;
- Oil specifications: see page 23.

Cooling system

- Type and detail: air cooling with axial blower;
- Specification of fan: propeller fan driven by engine shaft;
- Number of fan blades: 13;
- Fan diameter: 320 mm;
- Type of temperature control: none.

Starting system

- Make: BOSCH;
- Model: JF 12 V;
- Type: electromagnetic engagement;
- Starter motor power rating: 3.0 kW;
- Safety device: preventig engine start in gear;
- Starting system for low temperatures: none.

Electrical equipment

- Voltage: 12 V;
- Generator:
 .make: BOSCH ;
 .model: K1 14 V 65 A;
 .type: alternator :
 .power: 780 W;
- Battery: 1 lead acid;
 .capacity: 143 Ah at 20 hours rating.

Exhaust system

- Make: S+L+H;
- Model: 83683.3;
- Type: one reflection absorption chamber;
- Location: on the left hand side of engine cowling, vertical position;
- Height of outlet above ground: 2905 mm.

TRANSMISSION

Clutch: utilized only for travelling of tractor

- Make: own make;
- Model: 526.23;
- Type: single disk dry clutch;
- Number of plates: 1;
- Plates diameter: 330 mm;
- Control system: hydraulically operated by pedal.

Gear box

- Make: own make;
- Model: 526.22;
- Type: mechanical syncromesh speed change gear with electro hydraulically shifted reduction gear (hi/lo);
- Arrangenent: six speeds forward, with four ranges of speeds, one reduction gear (hi/lo) and one reverse group;
- Number of speeds : 48 forward and 48 reverse;
- Available options: 36 forward and 36 reverse or 24 forward and 24 reverse.

Rear axle and final drives

- Make: own make;
- Model: 526.44;
- Type: bevel gear differential and epicyclic final drive;

Differential lock

- Make: own make;
- Model: 526.35;
- Type: electrohydraulic;
- Control system: by push button.

Differential lock (optional, fitted on test tractor)

- Make: own make;
- Model: SBA original SAME system;
- Type: electrohydraulic;
- Control system: engaged by push button, disengaged by push button or automatically when steering angle exceeds 17 degrees, or when forward speed exceeds 15 km/h.

Front axle and final drives

- Make: own make;
- Model: 526.43;
- Type: S + L + H system with central shaft, bevel gear drive, differential and epicyclic final drives;

Differential lock

- Make: own make;
- Model: 526.46;
- Type: electrohydraulic;
- Control system: by push botton.

Differential lock (optional, fitted on test tractor)

- Make: own make;
- Model: SBA original SAME system;
- Type: electrohydraulic;
- Control system: engaged by push button, disengaged by push button or automatically when steering angle exceeds 17 degrees, or when forward speed exceeds 15 km/h.

Transmission lubrication

- Gear box, rear axle, final drives, power lift and hydraulic system (in common).
  . total capacity including filter: 75 dm^3;
  . change period: 1200 hrs;
  . filter change period: 2400 hrs or when the filter clogging warning lamp is lighted;
- Front axle and final drives
  . total capacity: 18 dm^3;
  . change period: 1200 hrs;

- Recommended oil: see page 23.

Total ratios and speeds FORWARD

Gear Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at a rated engine speed of 2500 rev/min (*) km/h
1 R lo	4127.3	0.195
1 R hi	3537.6	0.228
2 R lo	3200.8	0.252
2 R hi	2743.5	0.294
3 R lo	2482.2	0.327
3 R hi	2110.4	0.382
4 R lo	1920.5	0.420
4 R hi	1646.1	0.490
5 R lo	1459.2	0.552
1 S lo	1375.8	0.586
5 R hi	1250.7	0.644
1 S hi	1179.2	0.683
6 R lo	1137.1	0.709
2 S lo	1066.9	0.756
6 R hi	974.5	0.827
2 S hi	914.5	0.881
3 S lo	820.7	0.982
3 S hi	703.5	1.145
4 S lo	640.2	1.259
4 S hi	548.7	1.469
5 S lo	486.4	1.657
5 S hi	416.9	1.933
1 N lo	397.4	2.027
6 S lo	379.0	2.126
1 N hi	340.7	2.365
6 S hi	324.9	2.480
2 N lo	308.2	2.614
2 N hi	264.2	3.050
3 N lo	237.1	3.399
3 N hi	203.2	3.965
4 N lo	184.9	4.357
4 N hi	158.5	5.084
5 N lo	140.5	5.734
5 N hi	120.4	6.690
6 N lo	109.5	7.359
6 N hi	93.9	8.586
1 F lo	86.5	9.314
1 F hi	74.2	10.866
2 F lo	67.1	12.010
2 F hi	57.5	14.012
3 F lo	51.6	15.612
3 F hi	44.2	18.215
4 F lo	40.3	20.016
4 F hi	34.6	23.353
5 F lo	30.6	26.343
5 F hi	26.2	30.734
6 F lo	23.8	33.807
6 F hi	20.4	39.442

(*) Calculated with a tyre dynamic radius index of 855 mm. (pnematic tyred tractor only)(ISO 4251/1 -1984)- Number of rev. of front wheels for one rev. of rear wheels: 1.2571.

Total ratios and speeds REVERSE

Gear Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine engine speed of 2500 rev/min (*)km/h
1 R lo	3906.7	0.206
1 R hi	3348.5	0.241
2 R lo	3029.7	0.266
2 R hi	2596.9	0.310
3 R lo	2330.6	0.346
3 R hi	1997.6	0.403
4 R lo	1817.8	0.443
4 R hi	1558.1	0.517
5 R lo	1381.3	0.583
1 S lo	1302.2	0.619
5 R hi	1183.9	0.681
1 S hi	1116.2	0.722
6 R lo	1076.3	0.749
2 S lo	1009.9	0.798
6 R hi	922.5	0.873
2 S hi	865.6	0.931
3 S lo	776.9	1.037
3 S hi	665.9	1.210
4 S lo	605.9	1.330
4 S hi	519.4	1.552
5 S lo	460.4	1.750
5 S hi	394.6	2.042
1 N lo	376.2	2.142
6 S lo	358.8	2.246
1 N hi	322.5	2.499
6 S hi	307.5	2.620
2 N lo	291.8	2.762
2 N hi	250.1	3.222
3 N lo	224.4	3.590
3 N hi	192.4	4.189
4 N lo	175.1	4.603
4 N hi	150.0	5.371
5 N lo	133.0	6.058
5 N hi	114.0	7.068
6 N lo	103.6	7.775
6 N hi	88.8	9.071
1 F lo	81.9	9.840
1 F hi	70.2	11.480
2 F lo	63.5	12.688
2 F hi	54.4	14.803
3 F lo	48.9	16.494
3 F hi	41.9	19.243
4 F lo	38.1	21.146
4 F hi	32.7	24.672
5 F lo	29.0	27.830
5 F hi	24.8	32.470
6 F lo	22.6	35.715
6 F hi	19.3	41.669

(*) Calculated with a tyre dynamic radius index of 855 mm (pneumatic tyred tractor only)(ISO 4251/1 -1984) - Number of rev. of front wheels for one rev. of rear wheles: 1.2571

POWER TAKE-OFF

Power take-off proportional to engine speed

- Type: independent, at rear of tractor, in tractor's median plane, engaged or disengaged by push button. Driven by multiplate wet clutch independent of travel clutch; ISO Standard 500-1979.
- Number of shafts: 1;
- Method of changing power take-off shaft ends and speeds: it is possible, through 6 screws, to mount one PTO shaft end at 6 or 21 splines. Speed selection by external hand lever.

1) 540 rev/min

- Dimension ISO Standard 500-1979 type 1 (35 mm - 6 splines);
- PTO speed at rated engine speed: 605 rev/min;
- Engine speed at standard power take-off speed: 2229 rev/min;
- Ratio of rotation speeds (engine speed/pto speed): 4.1278.

2) 1000 rev/min

- Dimension ISO Standard 500-1979 type 2 (35 mm - 21 splines);
- PTO speed at rated engine speed: 1033 rev/min;
- Engine speed at standard power take-off speed: 2421 rev/min;
- Ratio of rotation speeds (engine speed/pto speed): 2.4211.

Secondary Power take-off

- Type: independent, at front of tractor, in tractor's median plane, engaged or disengaged by push button. Driven by multiplate wet clutch independent of travel clutch; ISO Standard 500-1979.
- Number of shafts: 1;
- Dimension: ISO Standard 500-1979 type 2 (35 mm - 21 splines);
- Method of changing power take-off shaft ends and speed: none;
- Ratio of rotation speeds (engine speed/pto speed): 2.400

	P.T.O. rear	P.T.O. front	unit
- Height above ground	850	825	mm
- Distance from the median plane of the tractor	0	0	mm
- Distance behind rear axle or forward from frontexle	475	690	mm
- Direction of rotation (viewed facing driving end)	clockwise	anticlockwise	

Power take-off proportional to ground speed

- location at rear of tractor, in tractor's median plane, engaged or disengaged by hand level at the left hand side of the seat.
- Number of shafts: 1;
- Travelling distance for one revolution of power take-off shaft: 214 mm;
- Number of power take-off shatf revolutions for one revolution of rear driving wheels .....: 25;
- Direction of rotation with forward gear engaged (viewed facing driving end) .....: clockwise.

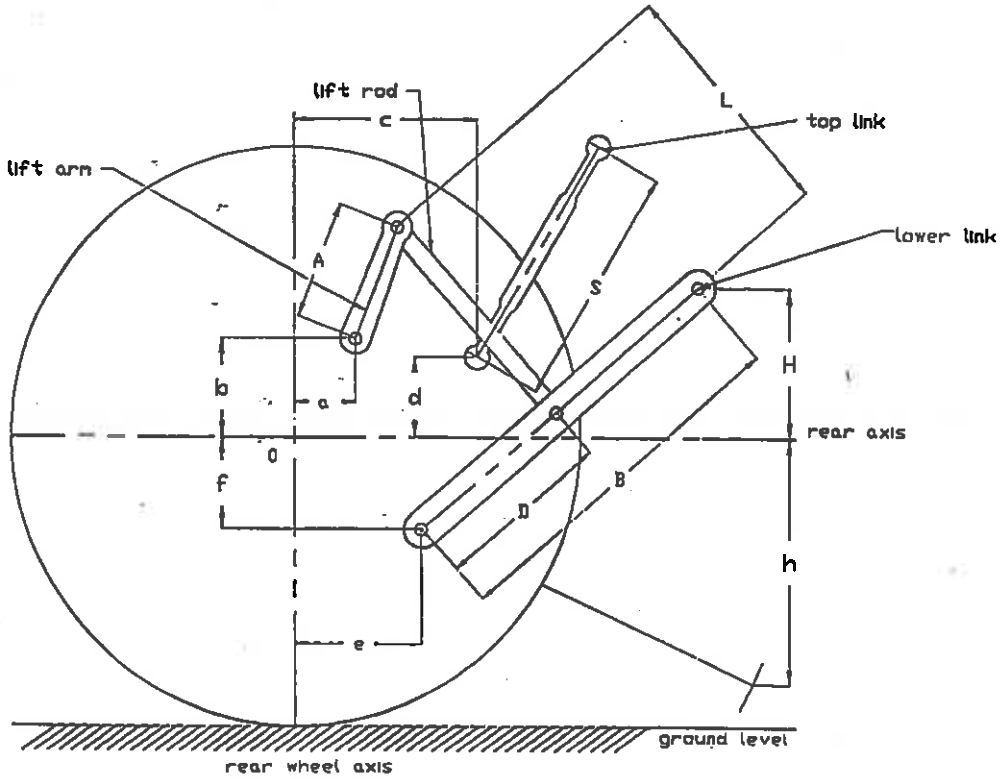
REAR POWER LIFT

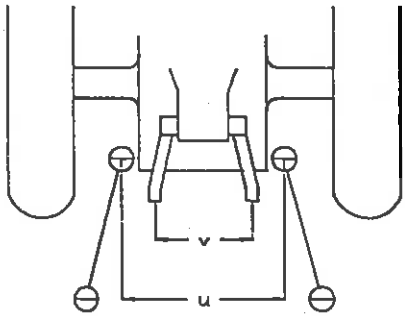
- Make: S+L+H;
- Model: 526.59-electronic control;
- Type: load sensing;
- Type of hydraulic system: open centre system;
- Type and number of cylinders: 1 internal single acting, and 2 external single acting;
- Type of lock for transport: mechanical, with screwed tie rods that lock the lower links;
- Rilief valve pressure setting: 18.0 0.5 MPa;
- Opening pressure of anti-shock valve: 21.0 MPa;
- Lift pump type: hydraulic rotary pump, driven by engine shaft,
- pump make BOSCH HY/ZFS 11/22.5 R206V;
- Trasmission between pump and engine: mechanical;
- Type and number of filters: 1, repeceable paper cartridge;
- Change interval: 2400 hrs or when the filter clogging warning lamp is lighted;
- Oil capacity: 75 dm^3;
- Site of oil reservoir: gear box;
- Position, type and No. of additional oil plugs: 3 ways distributor at rear of tractor;
- Maximum volume of oil available to external cylinders: 15 dm^3;

- Recommended oil: see page 23.

Three-point linkage

- Category: 2 in conformity with ISO 730/1 - 1977;
- Category adapter: none .


lift rod
c
L
top link
lift arm
lower link
A
S
H
b
a
d
rear axis
0
f
B
D
h
e
ground level
rear wheel axis


v
u

REAR POWER LIFT

Dimensions of linkage geometry (when connected to the standard frame)

	Dimension or range (mm)	Settings used in test (mm)
Length of lift arms	(A) 280	280
Length of lower links	(B) 840	840
Distance of lift arm pivot point from rear wheel axis (behind)	(a) 135 :horizontally (b) 402 :vertically	135 402
Horizontal distance between the 2 lower link points	(u) 550	550
Horizontal distance between the 2 lift arm end points	(v) 580	580
Length of upper link	(S) from 500 to 770	720
Distance of upper link pivot point from rear wheel axis	(c) 335 :horizontally (d) 217 282 347 :vertically	335 282
Distance of lower link pivot point from rear wheel axis	(e) 220 :horizontally (f) 230 :vertically	220 230
Distance of lower link pivot point to lift rod pivot points on lower links	(D) 430 470	430
Length of lift rods	(L) from 730 to 870	744
Height of lower hitch points relative to the rear wheel axis		
- in Low position	(h) from 20 to 747	655
- in High position	(H) from 173 to 300	75
- Height above ground of lower hitch points when locked in transport position (*)		930

(*) Assuming the dynamic radius index = 855 mm (ISO 4251/1 - 1984)
(pneumatic tyred tractors only)

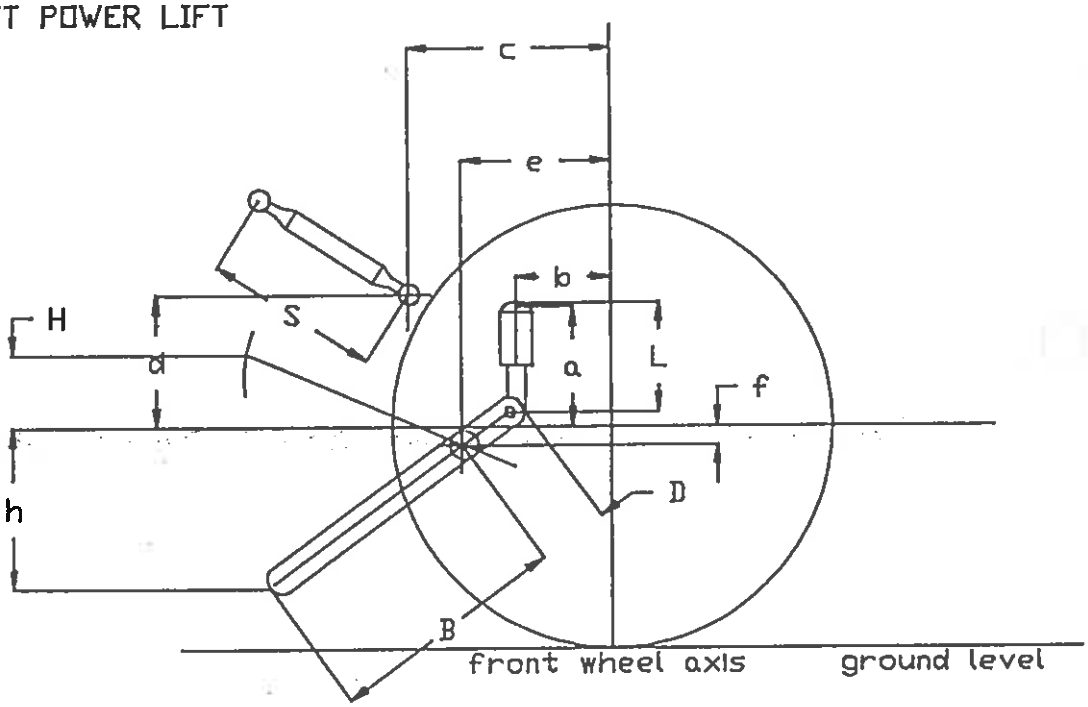
FRONT POWER LIFT

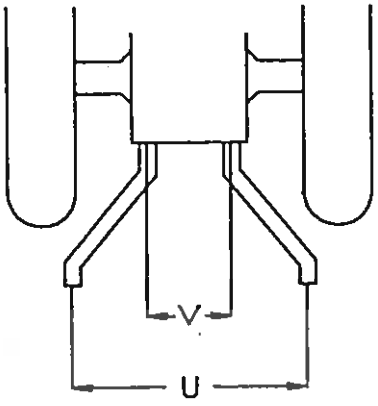
- Make: S+L+H;
- Model: ORIGINAL SAME SYSTEM;
- Type : 526-59 FRONT;
- Type and number of cylinders: 2 at single acting;
- Type of lock for transport: none;
- Relief valve pressure setting: 18.0±0.5 MPa;
- Opening pressure of anti-shock valve: 21.0 MPa;
- Lift pump type: Bosch hydraulic rotary pump, driven by engine shaft;
- Transmission between pump and engine: mechanical;
- Type and number of filters: 1 replaceable paper cartridge;
- Change interval: when the warning lamp is lighted;
- Oil capacity: 75 dm^3;
- Site of oil reservoir: gear box.
- Recommended oil: see page 23.

Three-point linkage

- Category: 2 in conformity with ISO 730/1 - 1977;
- Category adapter: none .

FRONT POWER LIFT





FRONT POWER LIFT

Dimensions of linkage geometry (when connected to the standard frame)

		Dimension or range (mm)	Settings used in test (mm)
Length of lower links	(B)	920	920
Distance of cylinders :horizontally	(a)	328	328
pivot point from front :vertically	(b)	320	320
wheel axis (behind)			
Horizontal distance between the 2 lower link points	(u)	870	870
Horizontal distance between the 2 lift arm end points	(v)	360	360
Length of upper link	(S)	from 510 to 690	599
Distance of upper link :horizontally	(c)	625-640	640
pivot point from front :vertically	(d)	360-420	420
wheel axis			
Distance of lower link :horizontally	(e)	470	470
pivot point from front :vertically	(f)	60	60
wheel axis			
Distance of lower link pivot point to cylinders pivot points on lower links	(D)	180	180
Length of cylinders			
- In Low position	(L)	329	329
- In High position	(L)	503	503
Height of lower hitch points relative to the front wheel axis			
- In Low poshion	(h)		495
- In High position	(H)		230
- Height above ground of lower hitch points (*)			925

(*) Assuming the dynamic radius index = 695 mm (ISO 4251/1 - 1984) (pneumatic tyred tractors only)

SWINGING DRAWBAR

Optional, not fitted on tractor tested;
- Type: 97313;
- Height above ground (tyre size: 20.8/38): max 565 mm
  min 490 mm;
- Type of adjustment: reversible;
- Distance of hitch point from rear wheel axis, horizontally: 815 mm;
- Distance of hitch point from power take-off shaft end
  .vertically .....: 290 - 365 mm below;
  .horizontally ...: 485 mm behind;
- Lateral adjustment (centre of clevis)
  .right hand ....: 270 mm;
  .left hand .....: 270 mm;
- Distance of pivot point from rear wheel axis, horizontally: 485 mm forward;
- Diameter of drawbar pin hole: 33 mm;
- Maximum vertical permissible load: not specified.

HOLED DRAWBAR

- Number of holes: 7;
- Distance between holes: 100 mm;
- Hole diameter: 28.5 mm;
- Thickness/width of the drawbar:30-80 mm;
- Height above ground,(tyre size: 20.8/38) min 300 mm;
  max 1050 mm;
- Horizontal distance behind power take-off shaft end: 590 mm;
- Diameter of the pinhole: 28 mm.

TRAILER HITCH

- Type: SAME DGM-GA 1189/C;
- Hole diameter: 28 mm;
- Height above ground: 625 min. 790 max. mm;
- Distance of hitch point from rear wheel axis, horizontally: 560 mm;
- Distance of hitch point from power take-off shaft end
  . vertically : 175 mm below, 20 mm above;
  . orizontally : 110 mm;
- Maximum vertical permissible load: 14.7 kN.

STEERING

- Specification: hydrostatic steering with BOSCH hydraulic gear pump HY/ZFS 11/11 L201, two double acting rams acting directly on front axle.
- Make: DANFOSS;
- Model: ORBITROL OSPC 160 OR;
- Type: hydrostatic;
- Working pressure: 15 MPa;
- Oil capacity: 75 dm^3;
- Oil change period: 1200 hrs;
- Filter change period: 2400 hrs or when the warning lamp is lighted;
- Recommended oil: see page 23.

BRAKES

Service brake

- Make: S+L+H;
- Model: 526.54;
- Type: oil bath disc, total 6 discs, 4 at front (2 for wheel) and 2 at rear (1 for wheel), all mounted before the final drive. front disc dia = 224 mm , rear disc dia = 280 mm,
  . FRENDO HDT 303 lining material;
- Method of operation: hydraulically actuated with 2 pedals;
- Trailer braking take-off: none.

Parking brake

- Type: fully independent of service brake, 4 oil bath disc mounted on the pinion shaft in the gear box, ISOBOND SINTERIX lining material;
- Method of operation: mechanical by hand lever .

Steering brake : divided pedal of service brake, for normal use locked together.

STEERING WHEELS

- Number: 2 ;
- Location : at front ;
- Track widths: 1800 min. - 2060 max. mm;
- Adjustment: changing the position of the rims with respect to the disc.

DRIVING WHEELS

- Number: 4 ;
- Location: 2 at front and 2 at rear;
- Rear track widths: 1750 min. 2250 max. mm;
- Adjustment: changing the position of the rims in respect to the disc.

WHEELBASE: 2750 mm.

PROTECTIVE STRUCTURE

Specifications

- OECD approval number: CSD 1261/10;
- date of approval: 21.02.1990;
- location and country of test of protective structure: I.I.A. Università degli studi di Milano - ITALY;
- the reference mass and wheelbase used for calculating impact energies and crushing forces were: 5250 kg 2750 mm;
- Make: S+L+H;
- Model: C 32;
- Type: cab, not tiltable;
- Manufacturer's name: S+L+H S.p.A.
  . address: V.le F. Cassani 15 - 24047 Treviglio (BG) - ITALY;
- Protective device: cab.

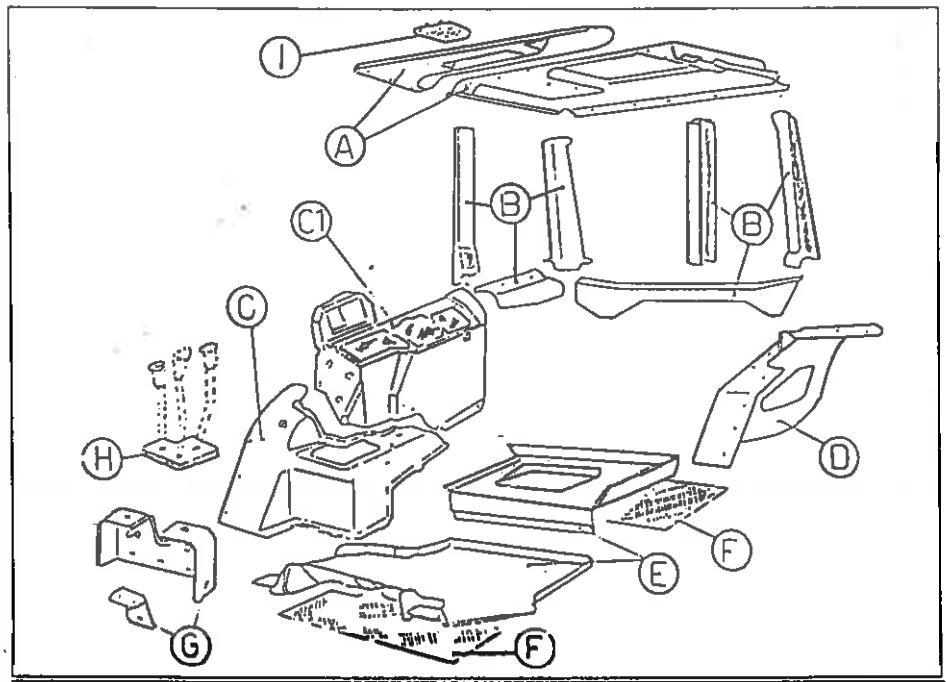
Materials used in the construction and dimensions

- Interior padding: see the next table;
- Glass: security glass, tickness 5 and 6 mm;
  doors: 43 R - 000589;
  windscreen: 43 R - 000589;
  windows: 43 R - 000589;
- Windscreen wipers: OSLV, parallelogram type;
- Direction indicators: COBO E3;
- Heaters and ventilators: BORLETTI;
- Draught proofing: rubber GMTA 20 - 70 P, SP 550 and PEC 75.

DRIVER'S SEAT

- Make: KAB;
- Model: U Series XH2;
- Type: upholstered seat with back rest ;
- Type of suspension: adjustable spring ;
- Type of damping: shock absorber ;
- Range of adjustment, longitudinal 150 mm; vertical ... 60 mm.

PASSENGER'S SEAT : none.



A) Porous 5060 g/m .,Thickness 1520 mm. + Tassel AD 12001400 g/m ., thickness 6 mm. + textil fiber + T.N.T.

B) Pur low density (250300 kg/m .) coated with expanded laminated PVC

C) Polypropylene thickness 3mm - internal covered with polyurethan foam ,thickness 30 mm and bitumen sheet.

C1) Polypropylene thickness 3mm - internal covered with polyurethan foam thickness 30 mm.

D) Tassel AD 14001600 g/m + PVC thickness 12 + 22

E) Rubber 23 kg/m , thickness 5 mm. + polyurethan foam thickness 20 mm. thermoplastic film.

F) Bitumen, thickness 5 mm. + polyrethan foam thickness 20 mm. + thermoplastic film

G) Rubber + Tassel AB x AD 8001000 g/m . + Tassel AB x BD 1400 g/m . - thickness 23 mm

H) Polyrethan foam thickness 30 mm + bitumen shet

I) Polyrethan foam thickness 30 mm.

LIGHTING

Lighting system in accordance with E.E.C. 78/933

	Height above ground of centre with tyre (*) (mm)	Size (mm)	Distance from out side edge of tractor to centre at 1840 mm trak width mm
Headligths	1340	170*110	1020
Front park. lights	1840	110*35	350
Front finger post	1875	110*35	350
Rear park. lights	1865	115*70	390
Rear finger post	1840	75*105	290
Stop	1840	75*105	485
Reflectors	1815	110*35	390

(*) Tyre size: 16.9/30 front - 20.8/38 rear.

TEST CONDITIONS

Overall dimensions with tyres 16.9/30 front and 20.8/38 rear

	Length (mm)	Width (mm) min	Width (mm) max	Height (mm) at top of exaust sil.	Height (mm) at top of protec. struc.
Without ballast	5140	2250	2500	2905	2890
With ballast	5255	2250	2500	2905	2890

. Ground clearance (unballasted tractor): 520 mm;
. Clearance-limiting part: front axle.

Tractor mass (with tanks full, with cab, water in tyres none)

	Units	Front	Rear	Total
Without driver				
Without ballast	kg	2165	2795	4960
With ballast	kg	2760	2880	5660
With driver				
Without ballast	kg	2180	2855	5035
With ballast	kg	2795	2940	5735

Ballast

	no. of weights	total weight (kg)	water (kg)
front	1	400	-
rear	3 + 3	300	-
additional	-	-	-

Tyres and track width specifications

		front	rear
- Tyres			
. dimensions		16.9/30	20.8/38
. ply rating		6	8
. type		radial	radial
. maximum load (tyre manufacturer's)	daN	1491	2425
. maximum load (tractor manufact.)	daN	1446	2400
. inflation pressure (tyre manufact.)	kPa	130	130
. dynamic radius index	mm	695	855
- Chosen track width	mm	1720	1840
- Tyres on request		18.9/30	18.4/38
		420.70/20	480.70/38

Oils, lubrication and fuel - Capacity and change interval

	capacity dm^3	oil change h	filter change h
Engine	15	150	300
Gear box	75	1200	2400 (*)
Front axle	13	1200	-
Final drives (front)	5	1200	-
Rear axle and final drives ...in common with gear box			
Hydraulic system		"	"
Other (steering, etc.)		"	"

(*) Or when the warning lamp is lighted

Fuel and lubricants reccomended and used in tests all in accordance with API NORM.

Fuel
- Type: AGIP DIESEL, DIN 51601
  (in accordance with the national standard)
- Specific gravity at 15 C: 0.832 g/cm.

Engine oil
- Type: AGIP DIESEL SIGMA S SAE 30;
- Viscosity: 12.50 cSt;
- Classification: API SE - CD .

Transmission oil

	front axle and final drive	rear axle, final drive and gear box
-Type	AGIP ROTRA THT	AGIP ROTRA THT
-Viscosity	11.50 cSt	11.50 cSt
-Viscosity index	95	95
-Classification	API GL 4	API GL 4

Hydraulic fluid
- Type: AGIP ROTRA THT;
- Viscosity: 11.50 cSt;
- Classification: API GL 4.

Steering oil
- Type: AGIP ROTRA THT;
- Viscosity: 11.50 cSt;
- Classification: API GL 4.

Grease
- Type: GREASE 30;
- Number of lubrication points: 10.

II - TEST RESULTS

COMPULSORY TESTS RESULTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 13.11.1990 - I.S.M.A. TREVIGLIO (BG) ITALY
- Type of dynamometer: ZOELLNER 350 AC

Power	Speed		Fuel consumption			Specific
	Engine	P.T.O.	Hourly		Specific	Energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
MAXIMUM POWER - 2 HOUR TEST						
89.2	2500	1033	26.41	21.97	246	3.38
POWER AT RATED ENGINE SPEED						
89.2	2500	1033	26.41	21.97	246	3.38
STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
89.2	2416	998	25.78	21.45	241	3.46
PART LOADS						
i) The torque corresponding to maximum power at rated engine speed						
89.2	2500	1033	26.41	21.97	246	3.38
ii) 85% of torque obtained in i)						
77.8	2584	1067	24.15	20.10	258	3.22
iii) 75% of torque defined in ii)						
59.1	2624	1084	20.29	16.88	286	2.91
iv) 50% of torque defined in ii)						
40.0	2658	1098	16.40	13.64	341	2.44
v) 25% of torque defined in ii)						
20.1	2682	1108	11.93	9.93	494	1.68
vi) unloaded						
0	2718	1123	7.99	6.65	-	-

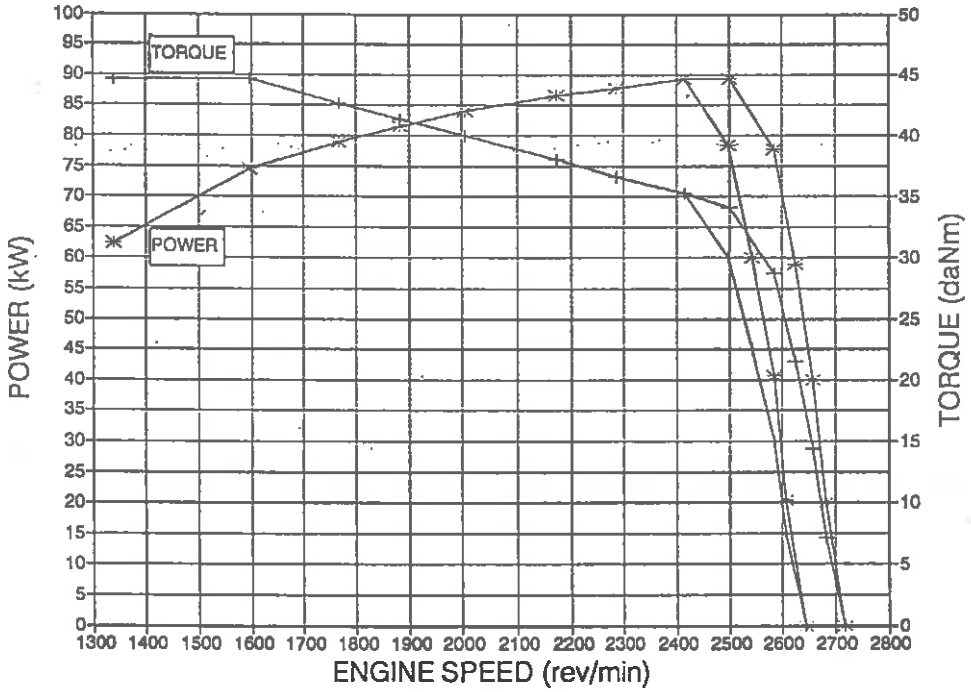
PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min)

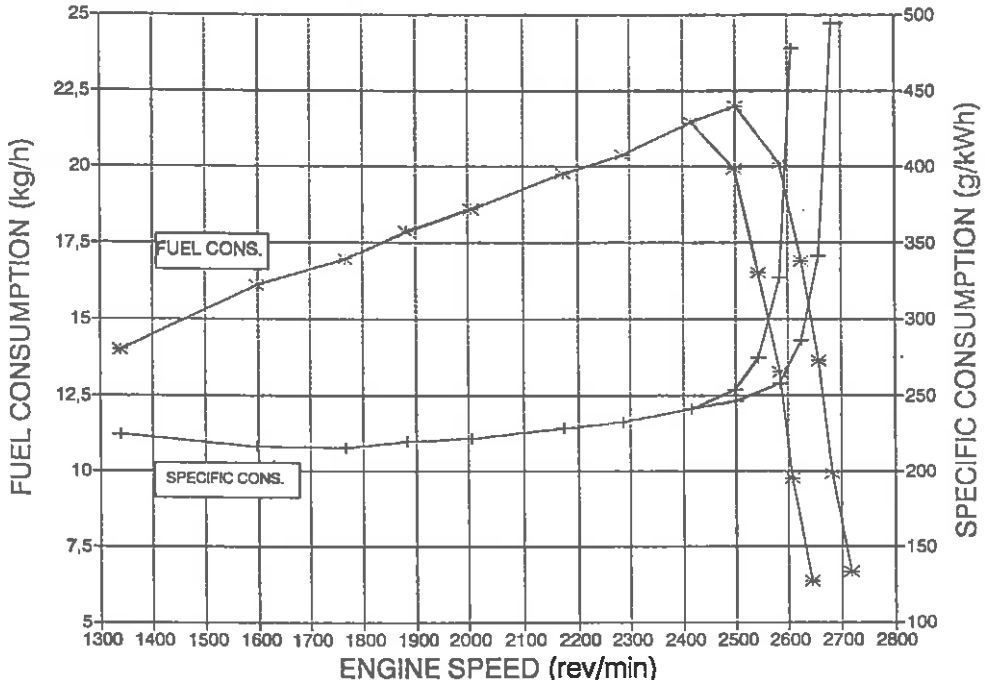
Power	Speed		Fuel consumption			Specific Energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
i) The torque corresponding to maximum power available						
89.2	2416	998	25.78	21.45	241	3.46
ii) 85% of torque obtained at maximum power						
78.5	2499	1032	23.94	19.92	254	3.28
iii) 75% of torque defined in ii)						
60.0	2544	1051	19.85	16.51	275	3.02
iv) 50% of torque defined in ii)						
40.6	2585	1068	15.94	13.27	327	2.55
v) 25% of torque defined in ii)						
20.4	2607	1077	11.72	9.75	478	1.74
iv) unloaded						
0	2645	1092	7.62	6.34	-	-

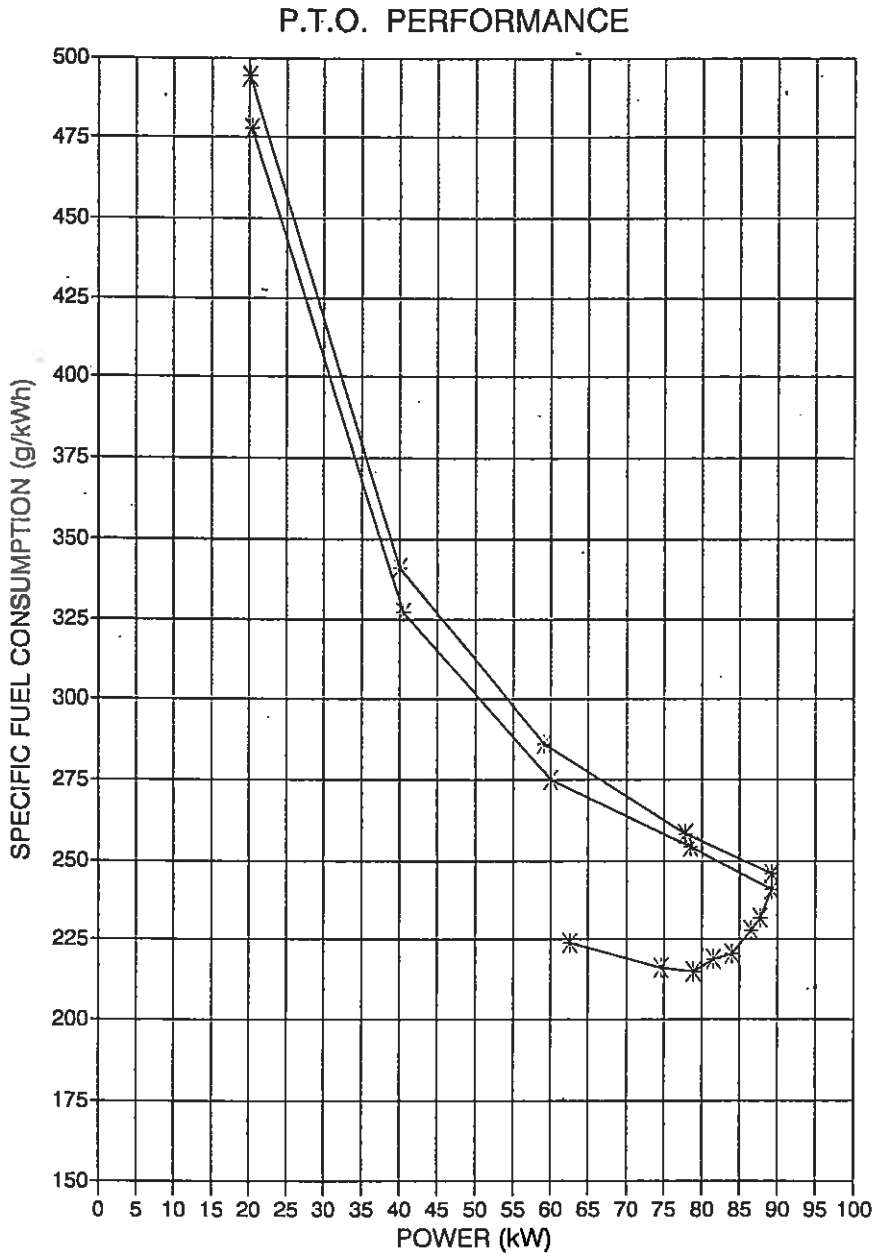
STANDARD SPECIFIC FUEL CONSUMPTION: 258/341/254/327 g/kWh

- No load maximum engine speed: 2718 rev/min
- Torque (1) at maximum power at rated engine speed: 34.08 daNm
- Maximum torque (1) (engine speed: 1597 rev/min) 44.63 daNm
- Mean atmospheric conditions:
  - Temperature ..... 20 C
  - Pressure ..... 100.9 kPa
  - Relat. humidity ..... 73 %
- Maximum temperatures: Coolant ..... 87 C
  - Engine oil ..... 136 C
  - Fuel ..... 31 C
  - Engine air intake ..... 37 C

(1) The torque is the equivalent crankshaft torque.


TORQUE
POWER
POWER (kW)
TORQUE (daNm)
ENGINE SPEED (rev/min)


FUEL CONS.
SPECIFIC CONS.
FUEL CONSUMPTION (kg/h)
SPECIFIC CONSUMPTION (g/kWh)
ENGINE SPEED (rev/min)


P.T.O. PERFORMANCE
SPECIFIC FUEL CONSUMPTION (g/kWh)
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
POWER (kW)

2) POWER LIFT AND HYDRAULIC POWER TEST

- Date and location of tests: 14.11.90 - ISMA Treviglio (BG)

2.1 REAR POWER LIFT

		at hitch point	on the frame
Height of lower hitch point above ground in down position	mm	200	200
vertical movement	mm	730	772
Maximum corrected force exerted through full range	daN	4454	4866
Corresponding pressure of hydraulic fluid	MPa	18.5	18.5
Moment about rear axle	daNm	4721	8126
Maximum tilt angle of mast over range of lift	degrees	--	3

Lifting heights relative to the horizontal lower links

mm	-425	-400	-300	-200	-100	0	100	200	300	305	347
Lifting forces at hitch points daN	4454	4610	4660	4905	5072	5248	5395	5690	5737	5784	--
Lifting forces at test frame daN	4866	4873	4909	4989	5170	5243	5311	5317	5320	--	5322

2.2 FRONT POWER LIFT

		at hitch point	on the frame
Height of lower hitch point above ground in down position	mm	200	200
vertical movement	mm	725	725
Maximum corrected force exerted through full range	daN	1607	1207
Corresponding pressure of hydraulic fluid	MPa	18.5	18.5
Moment about front axle	daNm	1944	2197
Maximum tilt angle of mast over range of lift	degress	--	0

Lifting heights relative to the horizontal lower links

mm	-435	-400	-300	-200	-100	0	100	200	290
Lifting forces at hitch points daN	2260	2207	2092	1977	1882	1795	1722	1649	1607
Lifting forces at test frame daN	2293	2158	2046	1834	1682	1545	1406	1334	1207

2.3) HYDRAULIC POWER TEST

Sustained pressure with relief valve open: 18.5 MPa;
Pump delivery rate at min pressure: 61.2 l/min;

Hydraulic power	flow rate kW	l/min	pressure MPa	oil temp. C
At 90% of the actual relief valve setting	16.21	57.2	17.0	60
Maximum	16.60	56.9	17.5	61

. opening pressure of the relief valve: 12.0 MPa

Tapping point used for test : at rear of tractor;
Hydraulic fluid: see page 23.

3) DRAWBAR PERFORMANCE

- Date of test: 20 to 23.11.1990
- Type of track: concrete
- Type and size of tyres front: 16.9/30 - 6 ply; rear : 20.8/38 - 8 ply

Height of drawbar above ground: 675 mm (unballasted) - 670 mm (ballasted)
Tyre inflation pressure: unballasted .front: 130 kPa .rear: 130 kPa
ballasted .front: 130 kPa .rear: 130 kPa

Gear	Power	Drawbar pull	Speed	Eng. speed	Slip of wheel	Specific ener. cons.		Temperatures fuel	col.	eng.	Atm. cond. temp.	hum.	press.
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	C	C	C	C	%	kPa
3.1) MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1R lo	1.70	3432	0.18	2692	15	0.182	4579	39	75	96	8	85	97.7
1R hi	2.02	3495	0.21	2690	15	0.208	4006	39	75	96	9	85	97.7
2R lo	2.21	3469	0.23	2684	15	0.225	3692	40	77	96	9	84	97.4
2R hi	3.16	4254	0.27	2682	15	0.317	2626	39	77	94	9	85	97.5
3R lo	3.54	4279	0.30	2681	15	0.353	2356	39	80	95	9	83	97.4
3R hi	4.04	4187	0.35	2679	15	0.395	2104	38	80	94	11	80	97.6
4R lo	4.50	4246	0.38	2682	15	0.439	1895	39	78	94	11	79	97.9
4R hi	5.21	4215	0.45	2681	15	0.482	1727	39	78	95	12	79	97.9
5R lo	5.85	4194	0.50	2681	15	0.535	1566	38	81	97	11	77	97.8
1S lo	6.02	4076	0.53	2681	15	0.548	1518	38	83	96	11	77	97.8
5R hi	6.68	4119	0.58	2675	15	0.604	1377	38	79	92	12	75	97.9
1S hi	7.12	4141	0.62	2675	15	0.644	1292	39	79	93	12	73	98.2
6R lo	7.39	4142	0.64	2674	15	0.627	1327	38	79	93	12	68	98.2
2S lo	7.89	4155	0.68	2672	15	0.602	1382	37	77	97	11	71	97.9
6R hi	8.41	4050	0.75	2671	15	0.608	1368	38	81	97	13	71	98.0
2S hi	9.17	4146	0.80	2671	15	0.662	1257	38	83	96	13	72	98.0
3S lo	10.43	4241	0.89	2664	15	0.717	1161	37	79	96	13	69	98.4
3S hi	12.30	4292	1.03	2662	15	0.825	1008	37	79	94	13	69	97.8
4S lo	13.70	4349	1.13	2662	15	0.913	911	37	76	94	12	67	97.8
4S hi	15.72	4286	1.32	2658	15	1.006	827	38	81	94	12	67	97.9
5S lo	17.86	4337	1.48	2649	15	1.126	739	37	81	93	13	67	97.9
5S hi	20.80	4328	1.73	2649	15	1.308	636	36	78	94	14	70	97.9
1N lo	21.51	4271	1.81	2646	15	1.316	632	36	80	94	14	70	98.2
6S lo	22.75	4315	1.90	2642	15	1.377	604	35	76	96	13	70	98.2
1N hi	25.42	4337	2.11	2640	15	1.522	547	35	78	96	14	73	98.0
6S hi	26.42	4302	2.21	2638	15	1.570	530	35	81	92	14	73	97.8
2N lo	26.96	4166	2.33	2637	15	1.602	519	36	82	92	15	73	98.3
2N hi	30.76	4080	2.72	2634	15	1.777	468	34	81	90	15	75	98.7
3N lo	32.26	3845	3.02	2630	15	1.754	474	35	76	93	15	72	98.8
3N hi	34.36	3514	3.52	2630	15	1.856	448	34	78	93	13	66	99.2
4N lo	44.62	4210	3.82	2594	15	2.018	412	33	79	96	14	66	99.2
4N hi	54.33	4173	4.69	2580	10	2.367	352	33	79	96	14	67	99.1
5N lo	64.59	3807	5.16	2576	12	2.216	375	33	76	93	14	71	98.8
5N hi	67.04	3869	6.21	2536	8	2.535	328	33	78	92	13	73	98.8
6N lo	66.92	3530	6.83	2511	7	2.486	336	34	78	92	13	73	98.7
6N hi	67.16	3015	8.02	2504	6	2.490	334	33	82	95	13	72	98.4
1F lo	72.38	2994	8.71	2503	6	2.689	309	33	79	95	11	72	97.7
1F hi	73.24	2572	10.25	2505	5	2.733	304	33	79	94	12	71	97.9
2F lo	69.08	2196	11.33	2503	5	2.589	321	33	79	94	11	71	97.9

Gear	Power	Draw pull	Speed	Eng. speed	Slip of wheel	Specific ener.cons.		Temperatures fuel	cool.	eng.	Atm. cond temp.	hum.	pres.
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	C	C	C	C	%	kPa
1R lo	1.85	3756	0.18	2692	15	0.193	4317	36	75	95	11	87	99.6
1R hi	2.16	3748	0.21	2690	15	0.221	3757	35	75	95	11	87	99.6
2R lo	2.39	3754	0.23	2692	15	0.248	3350	36	77	95	13	83	99.7
2R hi	3.23	4364	0.27	2687	15	0.320	2598	36	77	96	11	83	99.7
3R lo	3.53	4272	0.30	2688	15	0.350	2376	36	80	94	12	82	99.4
3R hi	4.26	4434	0.35	2684	15	0.417	1993	35	80	96	12	82	99.5
4R lo	5.10	4833	0.38	2682	15	0.493	1687	37	84	97	12	83	99.5
4R hi	5.98	4864	0.44	2680	15	0.562	1481	37	84	97	14	81	98.9
5R lo	6.74	4872	0.50	2676	15	0.595	1397	39	86	99	14	81	99.4
1S lo	7.52	5117	0.53	2678	15	0.665	1251	38	83	99	15	80	98.8
5R hi	7.79	4839	0.58	2673	15	0.655	1270	38	79	99	15	80	98.9
1S hi	8.66	5063	0.62	2674	15	0.730	1139	37	79	97	14	83	99.0
6R lo	8.93	5044	0.64	2670	15	0.646	1288	37	82	96	14	83	99.0
2S lo	9.63	5103	0.68	2670	15	0.685	1215	35	78	95	15	79	98.7
6R hi	10.57	5127	0.74	2666	15	0.733	1135	35	78	95	16	79	98.7
2S hi	10.94	4976	0.79	2670	15	0.765	1088	37	80	95	16	81	98.7
3S lo	12.04	4930	0.88	2662	15	0.801	1038	36	80	97	15	81	98.3
3S hi	14.00	4921	1.02	2659	15	0.896	928	36	85	97	15	81	98.5
4S lo	15.72	5036	1.12	2654	15	0.991	840	36	79	96	15	80	98.5
4S hi	18.39	5061	1.31	2652	15	1.146	726	34	78	95	13	77	98.5
5S lo	20.83	5091	1.47	2647	15	1.293	643	36	79	95	13	77	98.2
5S hi	24.16	5066	1.72	2644	15	1.478	563	34	79	93	12	78	98.2
1N lo	25.21	5041	1.80	2643	15	1.533	543	34	76	93	12	75	98.6
6S lo	26.05	4982	1.88	2639	15	1.554	535	35	76	93	14	76	98.6
1N hi	29.22	5028	2.09	2636	15	1.736	479	35	79	95	13	76	98.5
6S hi	31.16	5125	2.19	2630	15	1.752	475	37	80	95	12	73	97.0
2N lo	32.81	5126	2.31	2627	15	1.826	456	34	76	97	12	73	97.3
2N hi	37.29	5004	2.68	2621	15	1.939	429	33	77	98	12	74	97.3
3N lo	41.43	5021	2.97	2605	15	2.004	415	34	77	94	11	69	97.6
3N hi	48.13	5030	3.45	2592	15	2.176	382	34	83	96	11	66	98.2
4N lo	51.64	4934	3.77	2580	15	2.203	378	34	76	96	13	66	98.2
4N hi	59.76	4969	4.33	2541	15	2.313	360	34	76	96	12	70	98.4
5N lo	67.66	4626	5.27	2504	7	2.547	327	38	79	92	12	70	98.5
5N hi	69.70	4043	6.21	2499	6	2.624	317	37	78	92	11	73	98.5
6N lo	69.79	3592	7.00	2511	4	2.592	321	37	81	94	11	73	98.3
6N hi	70.31	3119	8.12	2501	4	2.606	319	38	81	94	10	75	98.3
1F lo	71.03	2895	8.84	2508	4	2.650	314	37	79	93	10	75	98.1
1F hi	72.84	2523	10.39	2505	3	2.718	306	37	79	93	9	74	98.1
2F lo	69.11	2145	11.60	2503	2	2.590	321	35	74	94	11	73	98.4

3.2) MAXIMUM POWER IN TESTED GEARS (ballasted tractor)

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of wheel	Specific ener.cons.		Temperatures fuel	cool.eng.		Atm. cond temp.	hum.	pres.
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	C	C	C	C	%	kPa
3.3.1) FIVE HOUR TEST at 75% of pull at maximum power													
6N lo	54.18	2687	7.26	2573	3	2.210	377	39	81	98	13	69	99.3
3.3.2) FIVE HOUR TEST at pull corresponding to 15% wheelslip with additional ballast 300 kg													
4N hi	85.49	4952	4.76	2563	(*)	(*)	(*)	37	83	100	15	71	98.7

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2: 86 g/h .
(*) Having the test been carried out with additional ballast, these figures are irrelevant.

4) TURNING AREA AND TURNING CIRCLE

Wheel equipment front: 19.9/30 - 6 ply;
rear : 20.8/38 - 8 ply.

Track width front: 1720 mm;
rear : 1840 mm.

	With brakes on four wheels		Without brakes	
	right hand (m)	left hand (m)	right hand (m)	left hand (m)
radius of turning area	5.50	5.43	5.68	5.62
radius of turning circle	5.09	5.00	5.25	5.21

5) LOCATION OF CENTRE OF GRAVITY

Height above ground ..... 1023 mm
Distance forward from rear wheel axis .... 1191 mm
Distance from tractor's median plane ..... 0 mm

6) BRAKING PERFORMANCE

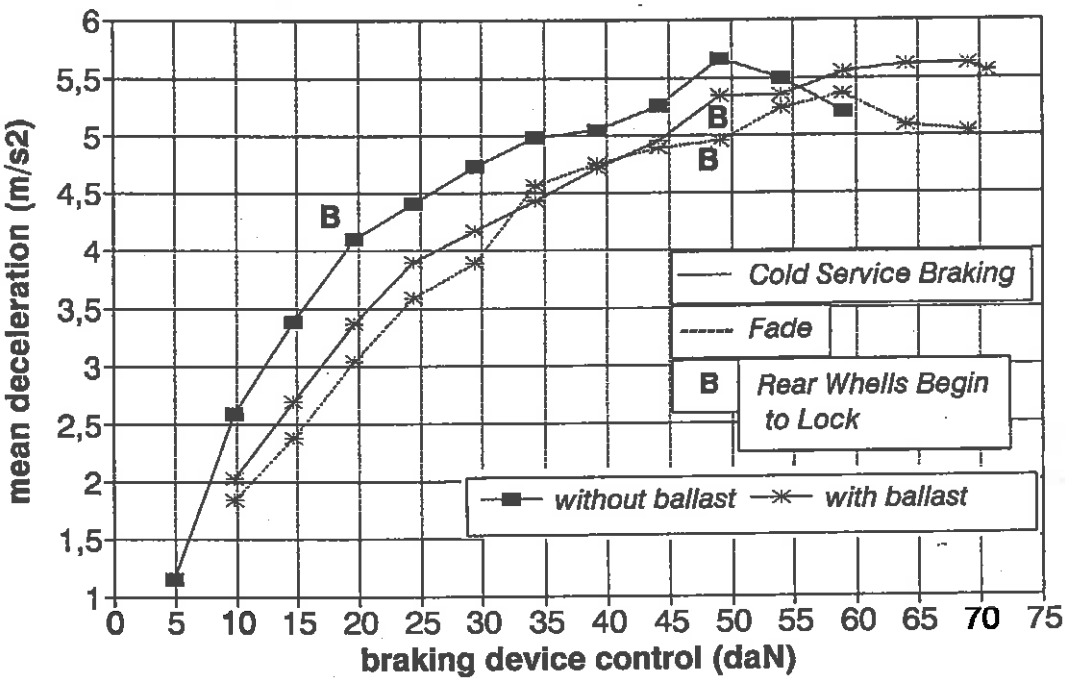
Date of test: 30.11.1990;
Type of track: asphalt;
Type of decelerometer: PEISELER.

Tractor masses during test (*)

	front axle (kg)	rear axle (kg)	total (kg)
without ballast	2180	2865	5045
with ballast	2580	5465	8045

(*) Tractor carrying a driver and the decelerometer (85 kg)

6.1) SERVICE BRAKES (all wheels braked)



Speed before application of brakes (unballasted tractor): 42.2 km/h.
Speed before application of brakes (ballasted tractor): 42.2 km/h.
The tractor brakes were heated by towing of the tractor for 1 km.
Maximum deviation of tractor from its original course: no significant deviation.
Abnormal vibration: none .

6.2) PARKING BRAKING DEVICE TEST

Ballasted tractor on 18% slope

	up	down
Braking device control force daN	12.80	13.74

7) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 30.11.1990
Type of sound level meter
. make: BRÜEL & KJAER;
. model: 2231;
. type: impulse precision sound level meter;
Type of track: concrete.
Results of test
No. gear used: 6F hi;
Travelling speed before acceleration: 32.0 km/h;
Sound level: 86.4 dB(A).

APPENDIX

MEASUREMENT OF NOISE IN THE PROTECTIVE STRUCTURE

Results of OECD test no. CSD 1261/10/NM 0402
(tractor fitted with 36 forward + 36 reverse speed gear box)

Date of test: 18.06.1990
Location: ISMA - SOP TREVIGLIO (BG) - Via Milano 43 - ITALY
Type of sound level meter
. make: BRÜEL & KJAER;
. model: 2231;
. type: impulse precision sound level meter;
Type of track: concrete.

TABLE FOR NOISE LEVELS AT DRIVER'S EAR POSITION - O.E.C.D. code V

gear	brake-load daN	trav.speed km/h	sound level dB(A) a	b	driving wheels
Unloaded test in the gear giving the speed nearest to 7.5 km/h					
6N lo	0	8.0	76.0	86.2	4
Unloaded test in the gear giving the maximum speed					
6F hi	0	42.4	76.9	86.2	4
Loaded test with nominal travelling speed nearest to 7.5 km/h					
6N lo	2568	7.2	77.1	87.8	4

a - all openings closed;
b - all openings open.

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

REPAIRS AND REMARKS: none.

TEST CARRIED OUT BY
(P.a. Giovanni LAMORATTA)

THE DIRECTOR OF TESTING STATION
(Prof. Giuseppe COLZANI)

HEAD OF ISMA - ROMA
(Prof. Alfio CAMMILLI)

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