ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

CASE INTERNATIONAL 2130 E "4WD"
TEST no. 058.

O.E.C.D. no. 1274

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



Report test of: CASE INTERNATIONAL 2130 E "4WD"

Submitted for test by: JI CASE GmbH
Industriestr. 39-40, 4040 Neuss
GERMANY

Date of O.E.C.D. approval: 05.09.1990
Period of test: April 1990

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

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The tractor CASE INTERNATIONAL 2130 E, serial no. CGC 58602525, Code 586 ABAGAE had been tested in 2 variants:
As model 2130 E "4WD" and as model 2130 E "2WD".

Model 2130 E "2WD" was converted into model 2130 E "4WD" by mounting the front axle drive and by exchange of front axle and steering.

All stated dimensions and tests referred to tyre sizes 7.50/18(6 ply) at front and 13.6/28 (6 ply) at rear, as well as to track widths 1099 mm at front and 998 mm at rear.

- Tractor manufacturer
. Name: JI CASE GmbH;
. Address: Industriestr. 39-40, 4040 Neuss GERMANY;
- Location of tractor assembly: CARRARO S.p.A. ROVIGO ITALY;
- Submitted for test by: the manufacturer;
- Selected by: the manufacturer with the agreement of ISMA;
- Place of running in: Campodarsego (PD) - ITALY;
- Duration of running: 50 hours.
- Location of test: I.S.M.A. Via Milano, 43 - Treviglio (BG) ITALY

I - SPECIFICATION OF TRACTOR

TRACTOR

- Make: CASE INTERNATIONAL;
- Model: 2130 E "4WD";
- Type: Wheeled tractor, unit construction, all wheels drive tractor;
- Number of driving wheels: 4;
- Serial number: CGC 58602525, Code: 586 ABAGAE;
- First serial number: CGC 58600001, Code: 586 ACAGAE.

ENGINE

- Make: SAME;
- Model: 1000.3A/55;
- Type: aircooled 4 stroke diesel engine direct injection;
- Serial number: 06875.

Cylinders

- Number/disposition: 3, vertical in line;
- Bore/stroke: 105/115,5 mm;
- Capacity: 3000 cm^3 ;
- Compression ratio: 17.1 / 1;
- Arrangement of valves: overhead;
- Cylinder liners: without liners.

Supercharging none.

Fuel system

- Fuel feed system: AC corone fuel feed pump;
- Make, model and type of fuel filter: FIAMM FNA 160/00 ;
- Capacity of fuel tank: 60 dm³ ;
- 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: 56+/-2 mm³ /stroke at rated speed and full load corresponding to 11.82 dm³/h;
  .timing: 18+/-0.5 before TDC;
- Make, model and type of injectors: BOSCH KBE 58 S 4/4 ;
- Injectors pressure: 18 +/-1 MPa.

Governor

- Make: SAME;
- Model: 065.1652.4;
- Type: mechanical variable speed;
- Governor range of engine speed: from 675 to 2549 rev/min.;
- Rated engine speed: 2350 rev/min.

Air cleaner

- Main filter
  . make: VF VIRGIS;
  . model: 1530236C1;
  . type: dry paper element filter;
  . location: behind 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: 6,2 dm³ ;
- Oil change period: 150 hrs;
- Type of filter: FIAMM FT 4803 IN;
- Number: 1;
- Filter change period: 300 hrs;
- Oil specifications: see page 18.

ooling 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: 220 mm;
- Type of temperature control: none.
- Warming indicator: with the warning lamp on the dashboard.

tarting system

- Make: BOSCH;
- Model: JF R 12 V;
- Type: electromagnetic engagement;
- Starter motor power rating: 2.4 kW;
- Safety device: preventig engine from starting in gear;
- Starting system for low temperatures: none.

lectrical equipement

- Voltage: 12 V;
- Generator:
  . make: BOSCH;
  . model: K1 R 14V 55A;
  . type: alternator;
  .power: 630 W;
- Battery: 1 lead acid;
  .capacity: 100 Ah at 20 hours.

xhaust system

- Make: IMA SAF;
- Model: 196783C1;
- Type: at chamber reflection absorption;
- Location: on the left hand side of engine cowling, horizontal position;
- Height of outlet above ground: 500 mm.

TRANSMISSION

Clutch: utilized only for travelling of tractor.

- Make: OMG;
- Model: 121947;
- Type: double disk dry clutch;
- Number of plates: 2;
- Plates diameter: 280 mm;
- Control system: by pedal for transmission, by lever for p.t.c

Gear box

- Make: CARRARO;
- Model: 121947;
- Type: mechanical no-syncromesh speed change gear;
- Arrangement: four speeds forward with three ranges of speed and one reverse group;
- Number of speeds : 12 forward and 12 reverse;
- Available options: 8 forward and 8 reverse.

Rear axle and final drives

- Make: CARRARO;
- Model: 121266/1;
- Type: bevel gear differential and epicyclic reduction final drives.

Differential lock

- Make: CARRARO;
- Model: 121266/1;
- Type: mechanical;
- Control system: engaged or disengaged by pedal.

Front axle and final drives

- Make: CARRARO;
- Model: 121310;
- Type: central shaft with bevel gear drive, differential and epicylic reduction gear final drives;

Differential lock

- none

Transmission lubrication

- Gear box, rear axle, final drives, power lift and hydraulic system (in common);
  . total capacity including filter: 38 dm³;
  . change period: 1000 hrs;
  . filter change period: 1000 hrs;
- Front axle and final drive:
  . total capacity: 5.1 dm³;
  . change period: 1000 hrs;

- Recommended oil: see page 18.

Total rations and speeds

Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at a rated engine speed of 2350 rev/min (*) (km/h)
	FORWARD		
1	S	1140.223	0.47
2	S	769.196	0.70
3	S	526.198	1.03
4	S	374.442	1.44
1	N	244.283	2.21
2	N	164.982	3.27
3	N	112.753	4.79
4	N	80.238	6.73
1	F	56.375	9.58
2	F	38.071	14.19
3	F	26.019	20.76
4	F	18.516	29.18
	REVERSE		
1	S	1359.167	0.40
2	S	917.696	0.59
3	S	627.336	0.86
4	S	446.429	1.21
1	N	291.274	1.85
2	N	196.702	2.75
3	N	134.432	4.02
4	N	95.668	5.65
1	F	67.216	8.05
2	F	45.393	11.90
3	F	31.023	17.42
4	F	22.077	24.47

(*) Calculated with a tyre dynamic radius index of 610 mm.
ISO 4251/1 - 1984)
- Number of revolutions of front wheels for one revolution of rear wheels: 1.5367.

)WER TAKE-OFF

Power take-off proportional to engine speed

- Type: independent, at rear of tractor, in tractor's median plane, engaged or disengaged by hand lever.
  Driven by multiplate wet clutch independent from travel clutch; ISO Standard 500-1979.
- Number of shafts: 1;
- Method of changing of speed: speed selection by external hand lever;
- Location : at rear of tractor;

	P.T.O.
- Height above ground (with tyre size 13.6/28) ..	610 mm
- Distance from the median plane of the tractor ..	0 mm
- Distance behind rear axle.....	387 mm
- Direction of rotation (viewed facing driving end):	clockwise

) 540 rev/min

- Dimension: ISO Standard 500-1979 type 1 (35 mm - 6 splines);
- PTO speed at rated engine speed .....: 600 rev/min;
- Engine speed at standard power take-off speed: 2115 rev/min;
- Ratio of rotation speeds (engine speed/pto speed): 3.916666;
- Maximum power and torque transmissible: 55 kW and 97 daNm.

) 1000 rev/min

- Dimension: ISO Standard 500-1979 type 2 (35 mm - 21 splines);
- PTO speed at rated engine speed .....: 1116 rev/min;
- Engine speed at standard power take-off speed: 2105 rev/min;
- Ratio of rotation speeds (engine speed/pto speed): 2.105734
- Maximum power and torque transmissible: 55 kW and 52 daNm.

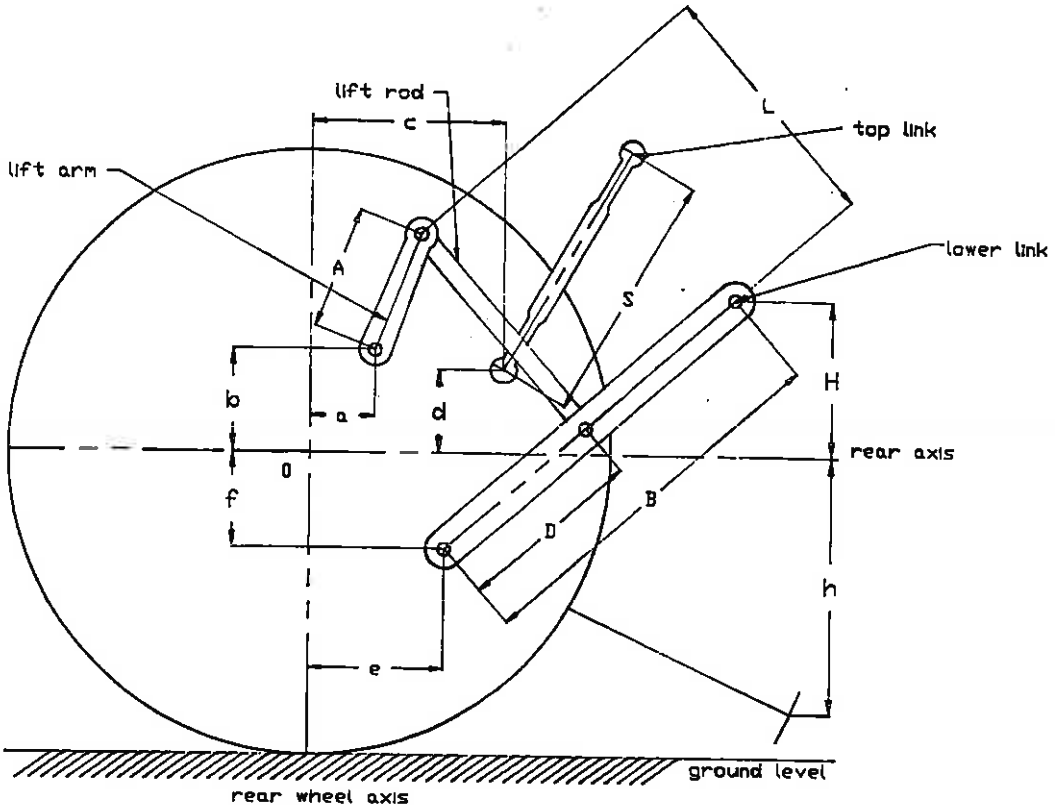
Power take-off proportional to ground speed : none.

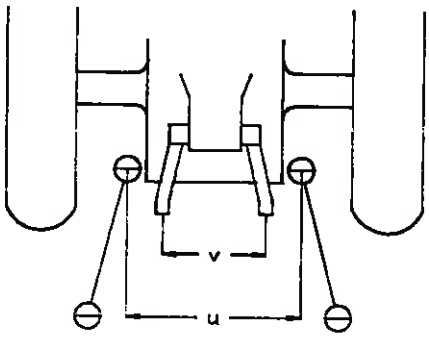
POWER LIFT

- Make: MITA;
- Model: M 60 SRF;
- Type: load sensing;
- Type of hydraulic system: open centre system;
- Type and number of cylinders: 1 internal hydraulic jack at single effect;
- Type of lock for transport: mechanical, with screwed tie rods that lock the lower links;
- Relief valve pressure setting: 18 +/- 1 MPa;
- Opening pressure of anti-shock valve: 20 MPa;
- Lift pump type: hydraulic rotary pump, driven by engine shaft;
- Transmission between pump and engine: mechanical;
- Type and number of filters: 1, repeaceable paper cartridge;
- Changing: when the filter clogging warning lamp is lighted;
- Oil capacity: 38 dm^3 in common with gear box;
- Site of oil reservoir : gear box;
- Position, type and No. of additional oil plugs: 4 ways distributor at rear of tractor;
- Maximum volume of oil available to external cylinders: 4 dm^3 ;
- Recommended oil: see page 18.

Three-point linkage

- Category: 1 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

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

		Dimension or range (mm)	Settings used in test (mm)
Length of lift arms	(A)	260	260
Length of lower links	(B)	848	848
Distance of lift arm :horizontally	(a)	25	25
Pivot point from rear :vertically	(b)	306	306
wheel axis (behind)			
Horizontal distance between the 2 lower link points	(u)	479	479
Horizontal distance between the 2 lift arm and points	(v)	375	375
Length of upper link	(S)	from 500 to 780	681
Distance of upper link :horizontally	(c)	244	244
pivot point from rear :vertically	(d)	261	261
wheel axis			
Distance of lower link :horizontally	(e)	72	72
pivot point from rear :vertically	(f)	192	192
wheel axis			
Distance of lower link pivot point to lift rod pivot points on lower links	(D)	496	496
Length of lift rods	(L)	from 500 to 670	600
Height of lower hitch points relative to the rear wheel axis			
- in Low position	(h)	from 191 to 568	410
- in High position	(H)	from 153 to 395	165
Height above ground of lower hitch points when locked in transport position (*)			775

(*) Assuming the dynamic radius index = 610 mm (ISO 4251/1 - 1984)

SWINGING DRAWBAR : not fitted.

HOLED DRAWBAR : not fitted.

TRAILER HITCH

- Type: J.I CASE;
- Hole diameter: 28 mm;
- Height above ground: 373 min. - 733 max. mm;
- Distance of hitch point from rear wheel axis, horizontally: 515 mm;
- Distance of hitch point from power take-off shaft end
  . vertically : below 237 mm, above 122 mm;
  . horizontally : 130 mm;
- Maximum vertical permissible load: 1471 daN.

STEERING

- Specification: hydrostatic steering with SAVER SUNDESTRAND gear pump, one steering cylinder at double effect acting directly on front axle.
- Make: DANFOSS;
- Model: OSPC 80 LS with priority valve OLSA 40;
- Type: hydrostatic;
- Working pressure: 1.1 MPa;
- Oil capacity: 17 dm^3, in common with hydraulic system;
- Oil change period: 1000 hrs;
- Filter change period: 1000 hrs;
- Recommended oil: see page 18.

BRAKES

Service brake

- Make: SIRMAC;
- Model: 1967573C1;
- Type: oil immersed multiplate disc, 4 per side total 8 discs, mounted before each epicyclic reduction gear. SK Welman HDT 303 lining material, rear disc diameter 165,25 mm;
- Method of operation: mechanical acting with 2 pedals;
- Trailer braking take-off: none.

Parking brake

- Type: mechanical acting on the service brake;
- Method of operation: mechanically by hand lever.

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

STEERING WHEELS

- Number: 2;
- Location : at front;
- Track widths: 1099 min. - 1280 max. mm;
- Regulation: changing the position of the rims with respect to the disc.

RIVING WHEELS

- Number: 4;
- Location: 2 at front and 2 at rear;
- Rear track widths: 850 min. 1648 max. mm;
- Regulation: changing the position of the rims with respect to the disc.

EELBASE: 1945 mm.

OLL - BAR

pecifications

- NFU approval number: 013501
- Make: CARRARO;
- Model: X 260-4;
- Type: tiltable;
- Manufacturer's name: CARRARO S.p.A.;
  . address: Via Olmo, 29 - Campodarsego (PD) ITALY;
- Protective device: roll-bar tiltable.

aterials used in the construction and dimensions

See N.F.U. (France) Test Report on Protective Structures.

RIVER'S SEAT

- Make: SIFRA;
- Model: 15 M;
- Type: upholstered seat;
- Type of suspension: adjustable spring;
- Type of damping: shock absorber;
- Range of adjustment, longitudinal 210 mm;
  vertical ... 100 mm.

ASSENGER'S SEAT : none.

LIGHTING

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

	Height above ground of centre with tyre (*) (mm)	Size (mm)	Distance from outside edge of tractor to centre at 998 mm track width (mm)
Headligths	1060	155*90	548
Front park. lights	1403	120*40	85.5
Front finger post	1443	120*40	85.5
Rear park. lights	1443	120*40	85.5
Rear finger post	1403	120*40	85.5
Stop	1443	120*40	85.5
Reflectors	1148	88*52	214.5

(*) Tyre size: 7.50/18 front - 13.6/28 rear.

TEST CONDITIONS

Overall dimensions with tyres 7.50/18 front and 13.6/28 rear

	Length (mm)	Width (mm) min	Width (mm) max	Height (mm) at top of protect. struct.
Without ballast	3464	1157	1977	2354

- Ground clearance (unballasted tractor): 278 mm;
- Clearance-limiting part: front axle.

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

	Units	Front	Rear	Total
Without driver				
Without ballast	kg	990	1170	2160
With ballast	kg	-	-	-
With driver				
Without ballast	kg	1000	1235	2235
With ballast	kg	-	-	-

Ballast

	no. of weights	total weight (kg)	water (kg)
Front	-	-	-
Rear	-	-	-
Additional	-	-	-

Tyres and track width specifications

Tyres	front	rear
. dimensions	7.50/18	13.6/28
. ply rating	6	6
. type	radial	radial
. maximum load (tyre manufacturer's) daN	932	1403
. maximum load (tractor manufact.) daN	932	1403
. inflation pressure (tyre manufact.)kPa	225	160
. dynamic radius index .....mm	405	610
Chosen track width .....mm	1099	998
Tyres on request	-	pr
	-	pr
	-	pr

Oils, lubrication and fuel
Capacity and change interval

	capacity dm³	oil change h	filter change h
Engine	9.2	150	300
Gear box	38	1000	1000
Front axle and final drives ...	5.1	1000	-
Rear axle and final drives	in common with gear box		
Hydraulic system	"	"	
Other (steering, etc.)	"	"	

Fuel and lubricants recommended and used in tests

Fuel
- Type: AGIP DIESEL, DIN 51601;
  (in accordance with the national standard)
- Specific gravity at 15° C: 0.828 g/cm³.

Engine oil
- Type: AGIP 15/W40 Super Diesel;
- Viscosity: 15.6 cSt;
- Classification: API SE-CD.

Transmission oil

	front axle and final drive	rear axle, final drive and gear box
-Type -Viscosity -Viscosity index -Classification	ELF BF12 10.50 cSt 146	ELF BF12 10.50 cSt 146

Hydraulic fluid
- Type: ELF BF12;
- Viscosity: 10.50 cSt;
- Classification:

Steering oil
- Type: ELF BF12;
- Viscosity: 10.50 cSt;
- Classification:

Grease
- Type:ESSO BEACON 2;
- Number of lubrication points: 15.

II - TEST RESULTS

A. COMPULSORY TESTS RESULTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 11.04.1990 - I.S.M.A.
  TREVIGLIO (BG) ITALY
- Type of dynamometer: ZOELLNER B 500

ver	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						
38.1	2338	597	11.82	9.79	257	3.22
POWER AT RATED ENGINE SPEED						
38.1	2338	597	11.82	9.79	257	3.22
STANDARD POWER TAKE-OFF SPEED (540 +/- 10 rev/min)						
37.7	2120	541	11.21	9.28	246	3.33
PART LOADS						
i) The torque corresponding to maximum power at rated engine speed						
38.1	2338	597	11.82	9.79	257	3.22
ii) 85% of torque obtained in i)						
33.1	2380	608	10.01	8.28	250	3.31
iii) 75% of torque defined in ii)						
25.2	2432	621	8.16	6.76	268	3.09
iv) 50% of torque defined in ii)						
17.3	2460	628	6.72	5.56	321	2.57
v) 25% of torque defined in ii)						
8.6	2500	638	4.90	4.05	471	1.76
vi) unloaded						
0	2549	651	3.14	2.60	-	-

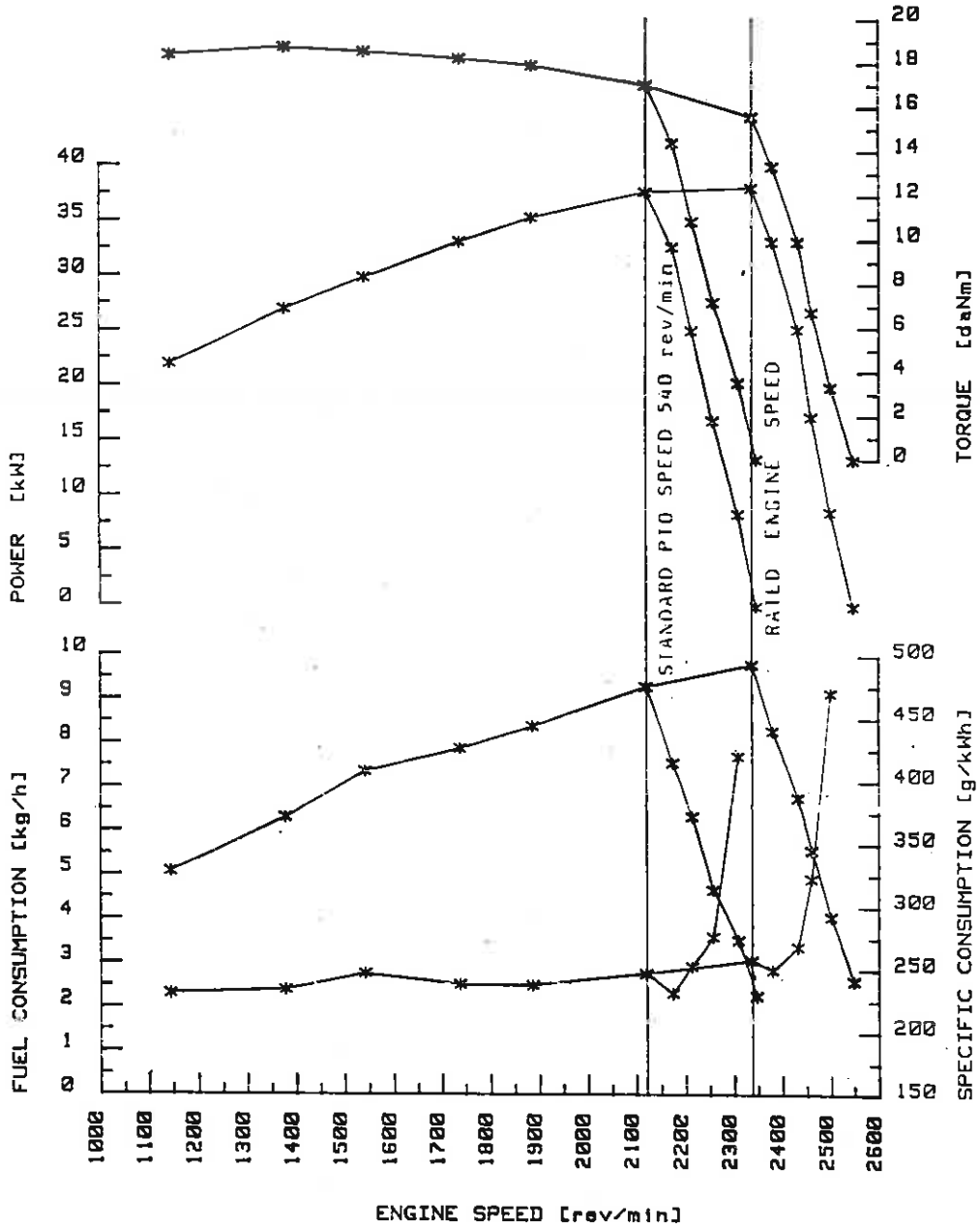
PART LOADS AT STANDARD POWER TAKE-OFF SPEED (540 rev/min)

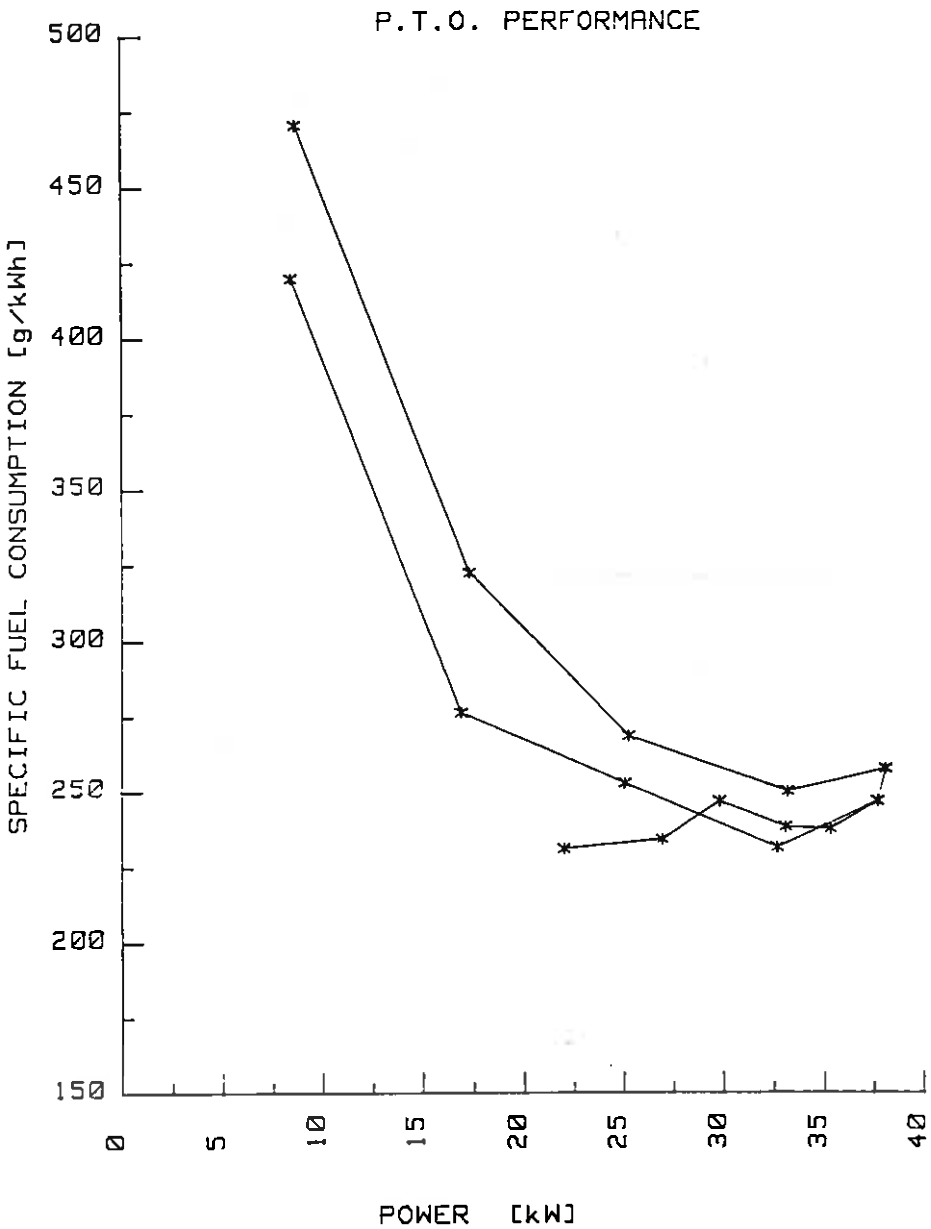
Power	Speed		Fuel consumption			Specific
	Engine	P.T.O.	Hourly		Specific	Energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
i) The torque corresponding to maximum power available						
37.7	2120	541	11.21	9.28	246	3.36
ii) 85% of torque obtained at maximum power						
32.6	2174	555	9.11	7.54	231	3.58
iii) 75% of torque defined in ii)						
25.0	2214	565	7.64	6.32	253	3.27
iv) 50% of torque defined in ii)						
16.8	2257	576	5.61	4.65	277	2.99
v) 25% of torque defined in ii)						
8.4	2309	590	4.25	3.52	419	1.97
iv) unloaded						
0	2347	599	2.73	2.26	-	-

STANDARD SPECIFIC FUEL CONSUMPTION: 250/321/231/277 g/kWh

- No load maximum engine speed: 2549 rev/min
- Torque (1) at maximum power: 15.56 daNm
- Maximum torque (1) (engine speed: 1378 rev/min) 18.65 daNm
- Mean atmospheric conditions: Temperature ..... 22 C°
  Pressure ..... 99.0 kPa
  Relat. humidity ... 84 %
- Maximum temperatures: Coolant ..... 87 C°
  Engine oil ..... 132 C°
  Fuel ..... 29 C°
  Engine air intake ..... 23 C°

(1) The torque is the equivalent crankshaft torque.


POWER [kW]
TORQUE [daNm]
FUEL CONSUMPTION [kg/h]
SPECIFIC CONSUMPTION [g/kWh]
STANDARD PTO SPEED 540 rev/min
RATED ENGINE SPEED
ENGINE SPEED [rev/min]


P.T.O. PERFORMANCE
SPECIFIC FUEL CONSUMPTION [g/kWh]
500
450
400
350
300
250
200
150
0
5
10
15
20
25
30
35
40
POWER [kW]

2) POWER LIFT AND HYDRAULIC POWER TEST

- Date and location of tests: 04.04.1990 - ISMA Treviglio (BG)

2.1 POWER LIFT

		at hitch point	on the frame
Height of lower hitch point above ground in down position	mm	200	200
vertical movement	mm	575	603
Maximum corrected force exerted trough full range	daN	2869	2279
Corresponding pressure of hydraulic fluid	MPa	18.5	18.5
Moment about rear axle	daNm	2639	3487
Maximum tilt angle of mast over range of lift	degress	--	3

Lifting heights relative to the horizontal lower links

mm	-218	-200	-100	0	100	200	300	357	385	400	500
Lifting forces at hitch points daN	3139	3132	3120	3084	3081	2929	2914	2869	---	---	---
Lifting forces at test frame daN	2773	2766	2753	2648	2595	2477	2354	---	2279	---	---

2.2 HYDRAULIC POWER TEST

Sustained pressure with relief valve open: 19.0 MPa;
Pump delivery rate at min pressure: 39.9 l/min;

Hydraulic power	kW	flow rate l/min	pressure MPa	oil temp. °C
At 90% of the actual relief valve setting	10.3	37.0	17.0	63
Maximum	10.5	36.8	17.5	65

. opening pressure of the relief valve: 18.0 MPa

Tapping point used for test : at rear of tractor;
Hydraulic fluid: see page 18.

3) DRAWBAR PERFORMANCE

- Date of test: 17.04.1990
- Type of track: concrete
- Type and size of tyres front: 7.50/18 - 6 ply
  rear : 13.6/28 - 6 ply

Height of drawbar above ground: 445 mm (unballasted)

Tyre inflation pressure: unballasted .front: 225 kPa .rear: 160 kPa

3.1) MAXIMUM POWER IN TESTED GEARS (unballasted tractor)

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of whell	Specific ener.cons.	fuel cool.eng.	Temperatures temp.		Atm. cond. hum.	pres
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	°C	°C	°C	%	kPa
1S	1.9	1720	0.4	2502	15	0.423	1947	21	55	90	17	78	100.1
2S	3.1	1870	0.6	2487	15	0.660	1258	20	55	90	17	78	100.3
3S	4.4	1750	0.9	2485	15	0.863	955	20	54	92	17	78	100.3
4S	6.7	1863	1.3	2465	15	1.155	716	20	54	93	19	77	100.1
1N	10.4	1874	2.0	2456	15	1.576	529	22	54	93	19	77	100.1
2N	14.9	1855	2.9	2427	15	1.862	443	22	54	92	19	77	100.2
3N	21.1	1853	4.1	2386	15	2.269	365	22	55	93	19	77	99.9
4N	28.2	1692	6.0	2350	11	2.452	337	21	55	92	20	78	99.9
1F	29.4	1176	9.0	2350	6	2.513	330	22	54	92	20	78	99.9
2F	26.5	693	13.7	2350	3	2.296	360	22	54	92	20	77	99.9

4) TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of wheel	Specific ener.cons.	fuel cool.eng.	Temperatures temp.	hum.	Atm. cond pres
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	°C	°C	°C	°C	%	KPa
4.1) Selected gear at maximum power													
(*	29.4	1176	9.0	2350	6	2.513	330	22	54	92	20	78	99.9
4.1.1) 75% of pull at maximum power at rated speed													
1F	22.8	882	9.3	2382	4	2.351	351	21	52	91	20	77	99.9
4.1.2) 50% of pull at maximum power at rated speed													
1F	15.8	588	9.7	2433	2	2.136	389	22	52	91	20	78	100.2
4.1.3) next higher gear giving the same pull as in 4.1.1 red. eng. speed													
2F	23.0	880	9.4	1628	4	2.644	313	23	51	90	21	77	99.9
4.1.4) next higher gear giving the same pull as in 4.1.2. red. eng. speed													
(	15.9	590	9.7	1639	2	2.839	289	23	50	90	20	79	100.0

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of wheel	Specific ener.cons.	fuel	Temperatures cool.eng.		temp.	hum.	Atm. cond pres
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	°C	°C	°C	%	KPa
4.2) Selected gear nearest to 7.5 Km/h												
4N	28.2	1692	6.0	2350	11	2.452	337	21	55	92	20	78	99..
4.2.1) 75% of pull at maximum power at rated speed												
4N	22.6	1270	6.4	2396	6	2.379	350	22	53	92	21	77	100.0
4.2.2) 50% of pull at maximum power at rated speed												
4N	15.7	846	6.7	2429	4	2.039	408	21	53	91	21	76	99.7
4.2.3) next higher gear giving the same pull as in 4.2.1 red. eng. speed												
1F	23.0	1270	6.5	1703	6	2.839	291	23	53	91	21	76	99.9
4.2.4) next higher gear giving the same pull as in 4.2.2 red. eng. speed												
1F	15.7	845	6.7	1716	4	2.661	312	23	52	90	22	77	99..

REPAIRS AND REMARKS: none.

TEST CARRIED OUT BY
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