ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

CASE INTERNATIONAL 2140 E "4WD"
TEST no. 047.

O.E.C.D. no. 1278

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



Report test of: CASE INTERNATIONAL 2140 E "4WD"

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

Date of O.E.C.D. approval: 10.09.1990
Period of test: March 1990

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

ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

CASE INTERNATIONAL 2140 E "4WD"
TEST no. 047.

O.E.C.D. no. 1278

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



Report test of: CASE INTERNATIONAL 2140 E "4WD"

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

Date of O.E.C.D. approval: 10.09.1990
Period of test: March 1990

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

TABLE OF CONTENTS

- Specification of tractor ..... page 3
- Power take-off performance ..... page 20
- Power lift and hydraulic power test ..... page 24
- Drawbar performance ..... page 25

The tractor CASE INTERNATIONAL 2140 E, serial No. CGC 58702528, Code 587 ABAGAE had been tested in 2 variants:
As model 2140 E "4WD" and as model 2140 E "2WD".

Model 2140 E "2WD" was converted into model 2140 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 10.5/18 (6 ply) at front and 14.9/28 (6 ply) at rear, as well as to track widths 1098 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: 2140 E "4WD";
- Type: Wheeled tractor, unit construction, all wheels drive tractor;
- Number of driving wheels: 4;
- Serial number: CGC 58702528, Code: 587 ABAGAE;
- First serial number: CGC 58700001, Code:587 ACAGAE.

ENGINE

- Make: SAME;
- Model: 1000.4A/65;
- Type: aircooled 4 stroke diesel engine direct injection;
- Serial number: 18693.

Cylinders

- Number/disposition: 4, vertical in line;
- Bore/stroke: 105/115,5 mm;
- Capacity: 4000 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: 49+/-2 mm³ /stroke at rated speed and full load corresponding to 13.81 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 2524 rev/min.;
- Rated engine speed: 2350 rev/min.

Air cleaner

- Main filter
  . make: VF VIRGIS;
  . model: 1967771C1;
  . 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: 9.2 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.

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

arting system

- Make: BOSCH;
- Model: IF R 12 V;
- Type: electromagnetic engagement;
- Starter motor power rating: 3 kW;
- Safety device: preventig engine from starting in gear;
- Starting system for low temperatures: none.

Electrical 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.

Exhaust system

- Make: IMA SAF;
- Model: 124390;
- Type: at chamber reflection absorption;
- Location: on the left hand side of engine cowling, horizontal position;
- Height of outlet above ground: 530 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.o.;

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 epicyclic 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	0.50
2	S	769.196	0.74
3	S	526.198	1.08
4	S	374.442	1.51
1	N	244.283	2.32
2	N	164.982	3.44
3	N	112.753	5.03
4	N	80.238	7.07
1	F	56.375	10.06
2	F	38.071	14.89
3	F	26.019	21.79
4	F	18.516	30.62
	REVERSE		
1	S	1359.167	0.42
2	S	917.696	0.62
3	S	627.336	0.90
4	S	446.429	1.27
1	N	291.274	1.95
2	N	196.702	2.88
3	N	134.432	4.22
4	N	95.668	5.93
1	F	67.216	8.43
2	F	45.393	12.49
3	F	31.023	18.27
4	F	22.077	25.68

(*) Calculated with a tyre dynamic radius index of 640 mm.
ISO 4251/1 - 1984)
- Number of revolutions of front wheels for one revolution of rear wheels: 1.5367.

OWER 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 independet 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 14.9/28) ..	640 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 : none.

- 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.

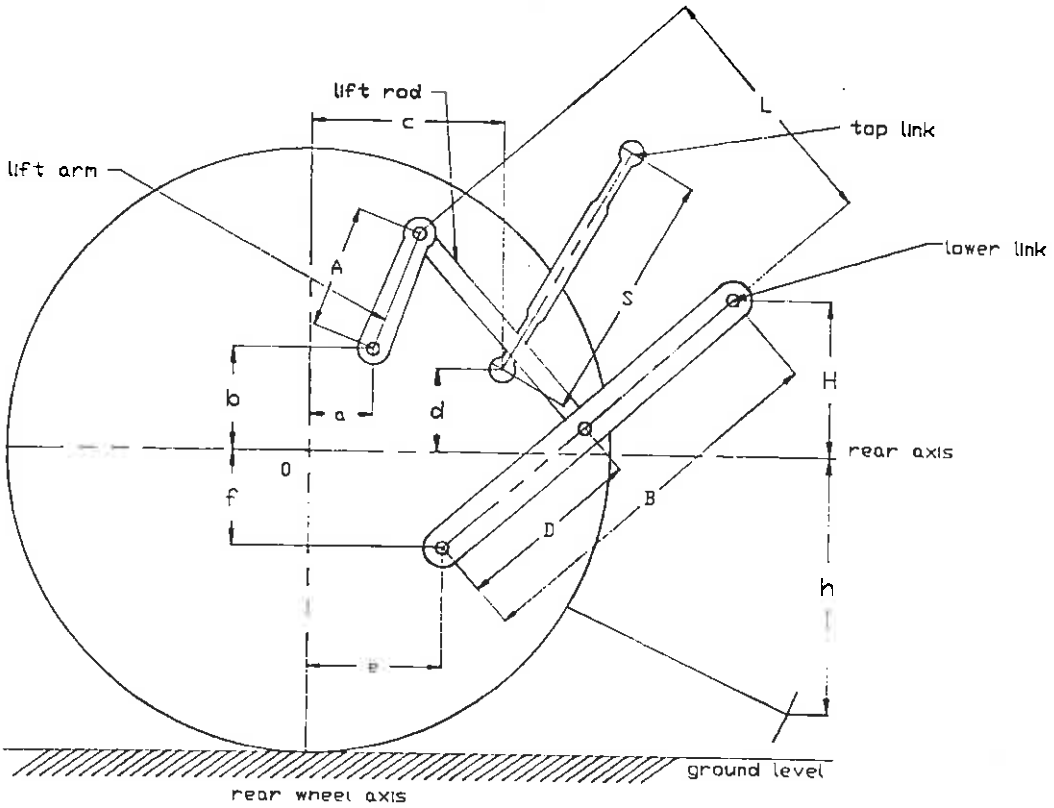
Power take-off proportional to ground speed : none.

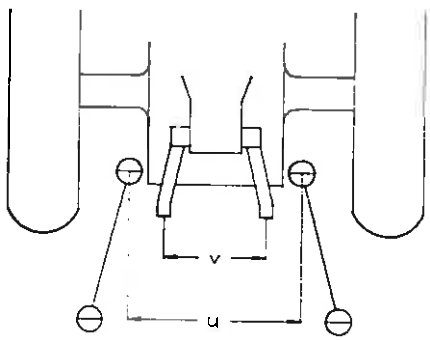
POWER LIFT

- 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 simgle 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	685
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	620
Height of lower hitch points relative to the rear wheel axis			
- in Low position	(h)	from 174 to 554	440
- in High position	(H)	from 43 to 307	125
Height above ground of lower hitch points when locked in transport position (*)			765

(*) Assuming the dynamic radius index = 640 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: 403 min. - 763 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: 1098 min. - 1280 max. mm;
- Regulation: 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: 998 min. 1598 max. mm;
- Regulation: changing the position of the rims with respect to the disc.

WHEELBASE: 2075 mm.

ROLL - BAR

Specifications

- NFU approval number: 013601;
- 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.

Materials used in the construction and dimensions

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

DRIVER'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.

PASSENGER'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	1059	155*90	560
Front park. lights	1426	120*40	157.5
Front finger post	1446	120*40	157.5
Rear park. lights	1446	120*40	157.5
Rear finger post	1426	120*40	157.5
Stop	1446	120*40	157.5
Reflectors	1171	88*52	226.5

(*) Tyre size: 10.5/18 front - 14.9/28 rear.

TEST CONDITIONS

Overall dimensions with tyres 10.5/18 front and 14.9/28 rear

	Length (mm)	Width (mm) min	Width (mm) max	Height (mm) at top of protect. struc.
Without ballast	3594	1371	1995	2512

- Ground clearance (unballasted tractor): 302 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	1090	1180	2270
With ballast	kg	--	--	--
With driver				
Without ballast	kg	1100	1245	2345
With ballast	kg	--	--	--

Ballast

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

Tyres and track width specifications

	front		rear
- Tyres			
. dimensions	10.5/18		14.9/28
ply rating	6		6
. type	implement		radial
. maximum load (tyre manufacturer's) daN	1403		1579
. maximum load (tractor manufact.) daN	1103		1579
. inflation pressure (tyre manufact.)kPa	220		140
. dynamic radius index .....mm	425		640
- Chosen track width .....mm	1098		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: 0.832 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.

I - TEST RESULTS

A. COMPULSORY TESTS RESULTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

- Date and location of test: 14.03.1990 - I.S.M.A. TREVIGLIO (BG) ITALY
- Type of dynamometer: ZOELLNER 350 AC

ower	Speed		Fuel consumption			Specific
	Engine	P.T.O.	Hourly	Specific		Energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
AXIMUM POWER - 2 HOUR TEST						
43.8	2350	1116	13.81	11.49	262	3.17
OWER AT RATED ENGINE SPEED						
43.8	2350	1116	13.81	11.49	262	3.17
TANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
43.0	2123	1008	12.50	10.40	242	3.44
ART LOADS						
) The torque corresponding to maximum power at rated engine speed						
43.8	2350	1116	13.81	11.49	262	3.17
i) 85% of torque obtained in i)						
.2	2425	1151	11.80	9.82	257	3.24
ii) 75% of torque defined in ii)						
28.7	2448	1162	9.61	8.00	278	2.99
v) 50% of torque defined in ii)						
19.5	2473	1175	7.64	6.36	326	2.55
) 25% of torque defined in ii)						
9.8	2503	1189	5.85	4.87	495	1.67
i) unloaded						
0	2524	1198	4.18	3.48	-	-

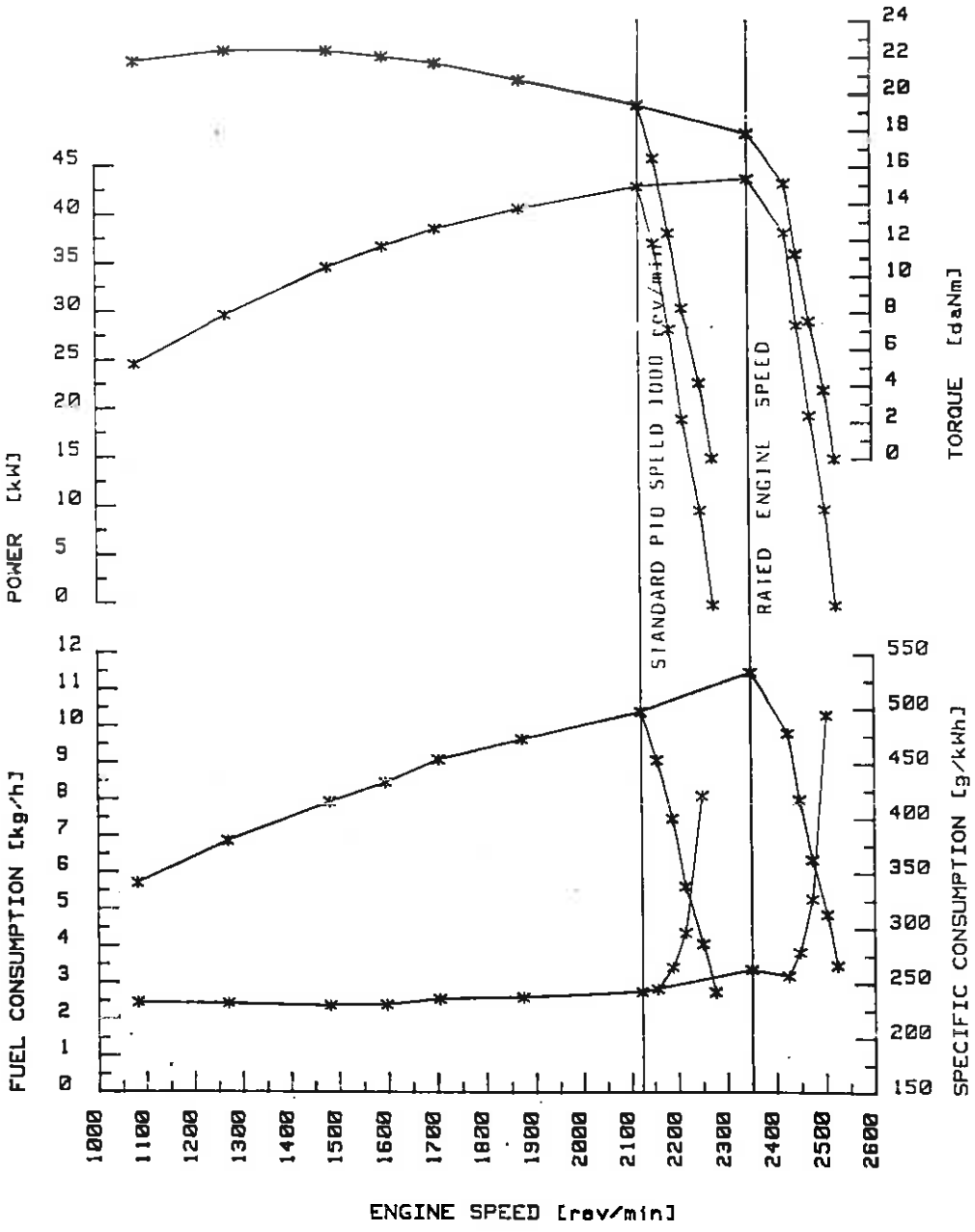
PART LOADS AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min)

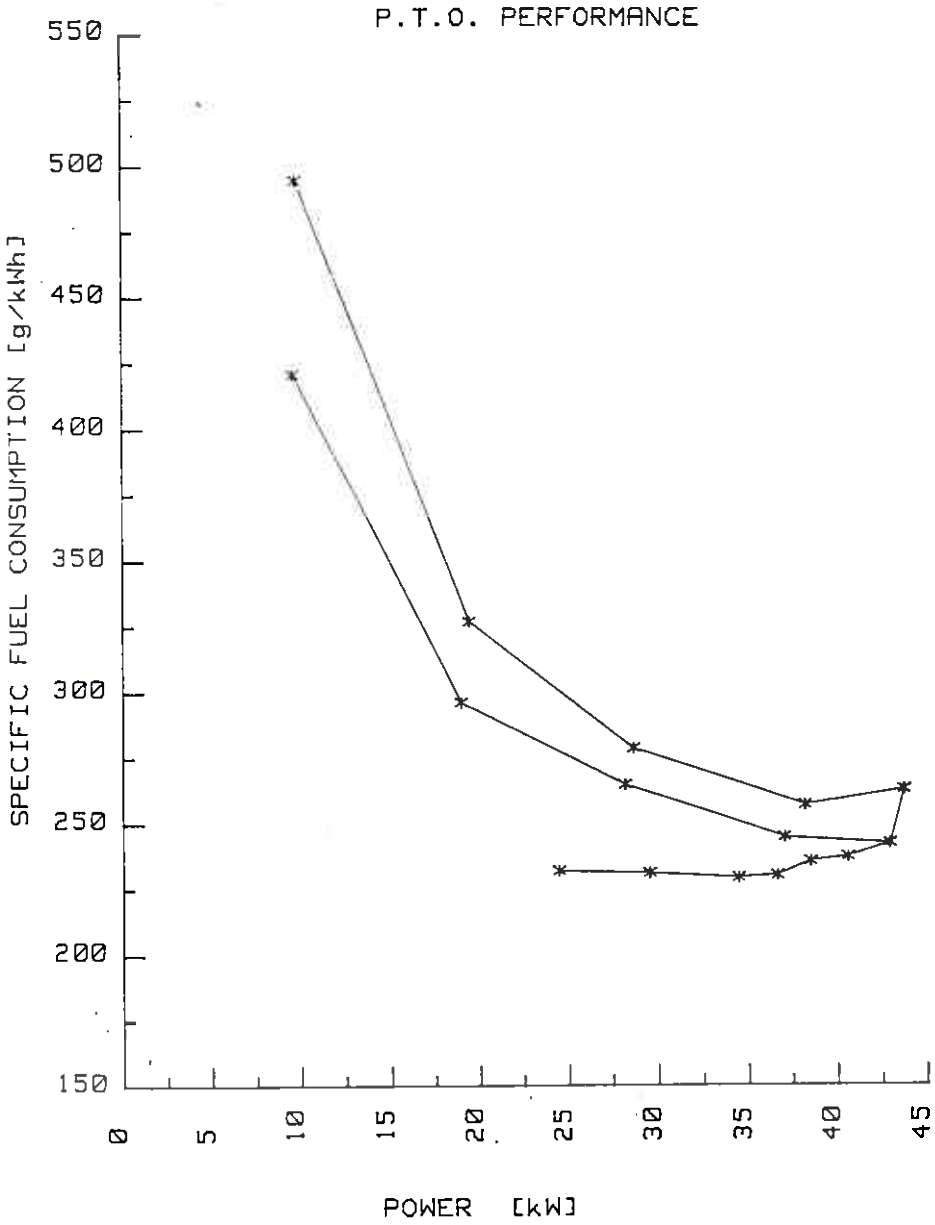
Power	Speed		Fuel consumption			Specific
	Engine	P.T.O.	Hourly		Specific	Energy
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
i) The torque corresponding to maximum power available						
43.0	2123	1008	12.50	10.40	242	3.44
ii) 85% of torque obtained at maximum power						
37.1	2157	1024	10.90	9.07	245	3.40
iii) 75% of torque defined in ii)						
28.3	2188	1039	8.99	7.48	265	3.15
iv) 50% of torque defined in ii)						
19.0	2215	1052	6.77	5.63	296	2.81
v) 25% of torque defined in ii)						
9.7	2250	1069	4.89	4.07	421	1.98
iv) unloaded						
0	2275	1081	3.30	2.75	-	-

STANDARD SPECIFIC FUEL CONSUMPTION: 257/326/245/296 g/kWh

- No load maximum engine speed: 2524 rev/min
- Torque (1) at maximum power: 17.80 daNm
- Maximum torque (1) (engine speed: 1270 rev/min) 22.26 daNm
- Mean atmospheric conditions: Temperature ..... 18 C°
  Pressure ..... 100.3 kPa
  Relat. humidity ... 72 %
- Maximum temperatures: Coolant ..... 97 C°
  Engine oil ..... 123 C°
  Fuel ..... 28 C°
  Engine air intake ..... 26 C°

(1) The torque is the equivalent crankshaft torque.


POWER [kW]
TORQUE [daNm]
FUEL CONSUMPTION [kg/h]
SPECIFIC CONSUMPTION [g/kWh]
STANDARD PTO SPEED 1000 rev/min
RATED ENGINE SPEED
ENGINE SPEED [rev/min]


P.T.O. PERFORMANCE
SPECIFIC FUEL CONSUMPTION [g/kWh]
550
500
450
400
350
300
250
200
150
0
5
10
15
20
25
30
35
40
45
POWER [kW]

POWER LIFT AND HYDRAULIC POWER TEST

Date and location of tests:16.03.1990 - ISMA Treviglio (BG)

.1 POWER LIFT

		at hitch point	on the frame
eight of lower hitch point bove ground in down position	mm	200	200
ertical movement	mm	565	578
aximum corrected force xerted trough full range	daN	2653	1998
orresponding pressure of ydraulic fluid	MPa	17.5	17.5
oment about rear axle	daNm	2441	3057
aximum tilt angle of mast ver range of lift	degress	--	3

ifting heights relative to the horizontal lower links

m	-247	-200	-100	0	100	200	300	318	331	400	500
ifting forces at hitch points aN	2900	2863	2815	2795	2796	2676	2661	2653	--	--	--
ifting forces at test frame aN	2607	2600	2501	2384	2178	2055	2018	--	1998	--	--

.2) HYDRAULIC POWER TEST

stained pressure with relief valve open: 18.0 MPa;
mp delivery rate at min pressure:40.2 l/min;

ydraulic power	kW	flow rate l/min	pressure MPa	oil temp. °C
90% of the actual relief lve setting	8.5	32.4	16.0	64
aximum	9.2	37.5	15.0	65

opening pressure of the relief valve: 16.0 MPa

pping point used for test : at rear of tractor;
ydraulic fluid: see page 18.

3) DRAWBAR PERFORMANCE

- Date of test: 19.03.1990
- Type of track: concrete
- Type and size of tyres front: 10.5/18 - 6 ply
  rear : 16.9/28 - 6 ply

Height of drawbar above ground: 460 mm (unballasted)

Tyre inflation pressure: unballasted .front: 220 kPa .rear: 140 kPa

3.1) MAXIMUM POWER IN TESTED GEARS (unballasted tractor)

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of whell	Specific ener.cons.	fuel	Temperatures cool.	eng.	Atm. cond. temp.	hum.	pres
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	°C	°C	°C	%	kPa
1S	2.1	1894	0.4	2519	15	0.396	2104	24	53	89	17	76	99.9
2S	3.1	1835	0.6	2514	15	0.553	1506	24	53	89	18	77	99.9
3S	5.0	1793	1.0	2508	15	0.847	982	24	53	90	18	76	100.1
4S	7.3	1882	1.4	2500	15	1.123	741	25	53	90	18	76	100.1
1N	11.3	1937	2.1	2489	15	1.527	545	24	54	92	18	76	99.9
2N	16.0	1854	3.1	2470	15	1.758	473	25	54	92	18	75	99.9
3N	23.1	1847	4.5	2449	15	2.159	385	25	55	93	19	75	99.9
4N	32.4	1912	6.1	2393	15	2.400	346	25	54	95	19	75	100.0
1F	36.5	1383	9.5	2357	6	2.664	312	25	54	94	18	75	99.9
2F	31.9	787	14.6	2353	2	2.435	342	25	54	95	18	74	99.7

) TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS

ear	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
) Selected gear at maximum power												
1F	36.5	1383	9.5	2357	6	2.664	312	25	54	94	18	74	99.7
.1.1) 75% of pull at maximum power at rated speed												
1F	29.0	1034	10.1	2444	3	2.377	350	24	56	95	17	74	99.8
.1.2) 50% of pull at maximum power at rated speed												
1F	20.0	686	10.5	2465	1	2.000	416	23	55	95	17	74	99.8
.1.3) next higher gear giving the same pull as in 4.1.1 red. eng. speed												
2F	28.6	1040	9.9	1609	3	2.778	300	23	55	94	17	74	99.8
4) next higher gear giving the same pull as in 4.1.2. red. eng. speed												
2F	19.9	685	10.4	1663	1	2.584	322	23	55	92	17	74	99.7

Gear	Power	Draw. pull	Speed	Eng. speed	Slip of wheel	Specific ener.cons.	fuel	Temperatures cool.eng.		Atm. cond temp.	hum.	pres
	kW	daN	km/h	rev/min	%	kWh/l	g/kWh	°C	°C	°C	%	KPa
4.1) Selected gear nearest to 7.5 Km/h												
4N	32.4	1912	6.1	2393	15	2.400	346	25	54	95	19	75	100.0
4.1.1) 75% of pull at maximum power at rated speed												
4N	27.4	1430	6.9	2444	6	2.383	349	24	55	94	18	74	99.8
4.1.2) 50% of pull at maximum power at rated speed												
4N	19.1	942	7.3	2464	2	2.099	396	24	55	95	18	74	99.8
4.1.3) next higher gear giving the same pull as in 4.2.1 red. eng. speed												
1F	27.4	1431	6.9	1716	6	2.915	285	25	54	94	19	73	99.9
4.1.4) next higher gear giving the same pull as in 4.2.2 red. eng. speed												
1F	18.8	942	7.2	1727	2	2.612	317	25	55	94	19	73	99.9

EPAIRS 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)

ext and graphics processed by: P.a. Gianluigi ROZZONI
oftware written by: Ing. Giampaolo GIACOMETTI