

SUMMARY OF OECD TEST 2962-NEBRASKA SUMMARY 1084

CASE IH PUMA 220 DIESEL

CONTINUOUSLY VARIABLE TRANSMISSION

POWER TAKE-OFF PERFORMANCE(2100 Engine RPM)

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1110 rpm)						
192.6 (143.6)	2100	10.76 (40.73)	0.386 (0.235)	17.90 (3.53)	0.87 (3.31)	
Standard Power Take-off Speed (1000 rpm)						
205.8 (153.5)	1892	11.16 (42.23)	0.376 (0.228)	18.44 (3.63)	0.92 (3.49)	
Maximum Power (1 hour)						
209.6 (156.3)	1803	11.22 (42.50)	0.370 (0.225)	18.68 (3.68)	0.89 (3.37)	

VARYING POWER AND FUEL CONSUMPTION

192.6 (143.6)	2100	10.76 (40.73)	0.386 (0.235)	17.90 (3.53)	0.87 (3.31)	Air temperature
167.8 (125.1)	2151	9.57 (36.23)	0.395 (0.240)	17.53 (3.45)	0.78 (2.95)	86°F (30°C)
126.6 (94.4)	2164	7.88 (29.82)	0.430 (0.262)	16.06 (3.16)	0.61 (2.31)	Relative humidity
84.8 (63.2)	2176	6.12 (23.17)	0.499 (0.303)	13.86 (2.73)	0.41 (1.55)	56%
42.6 (31.8)	2185	4.41 (16.69)	0.715 (0.435)	9.67 (1.90)	0.22 (0.83)	Barometer
---	2200	2.70 (10.23)	---	---	0.08 (0.32)	29.5" Hg (99.8 kPa)

Maximum torque - 670 lb.-ft. (908 Nm) at 1500 rpm
 Maximum torque rise - 39.0%
 Torque rise at 1700 engine rpm - 34%
 Power increase at 1803 engine rpm - 9%

DRAWBAR PERFORMANCE (Unballasted - Front Drive Engaged) FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Temp. °F (°C) cool- ing med	Barom. inch Hg (kPa)
Power at Rated Engine Speed—6.2 mph (10.0 km/h)							
156.5 (116.7)	9585 (42.64)	6.12 (9.86)	2100	3.7	0.497 (0.302)	13.98 (2.75)	174 (79)
75% of Pull at Rated Engine Speed—6.2 mph (10.0 km/h)							
116.6 (86.9)	7160 (31.85)	6.11 (9.83)	2240	1.2	0.533 (0.324)	13.05 (2.57)	174 (79)
50% of Pull at Rated Engine Speed—6.2 mph (10.0 km/h)							
78.7 (58.7)	4790 (21.31)	6.16 (9.91)	2260	0.6	0.622 (0.378)	11.17 (2.20)	174 (79)
75% of Pull at Reduced Engine Speed—6.5 mph (10.5 km/h)							
114.5 (85.4)	7225 (32.14)	5.94 (9.57)	2020	1.2	0.480 (0.292)	14.47 (2.85)	180 (82)
50% of Pull at Reduced Engine Speed—6.5 mph (10.5 km/h)							
77.2 (57.6)	4775 (21.23)	6.06 (9.76)	2040	0.6	0.556 (0.338)	12.50 (2.46)	172 (78)

Location of tests: BLT Wieselburg, HBLFA Francisco Josephinum, Rotterhauser StraBe 1 AT 3250 Wieselburg, Austria

Dates of tests: July, 2015 to March, 2016.

Manufacturer: CNH Industrial N.V. Basildon, Essex SS14 3AD United Kingdom

CONSUMABLE FLUIDS: Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.831 Fuel weight 6.93 lbs/gal (0.829 kg/l) Diesel Exhaust Fluid (DEF) 32% aqueous urea solution DEF weight 9.08 lbs/gal (1.091 kg/l) Oil SAE 10W30 API service classification CJ-4 Transmission, hydraulic and front axle lubricant Case IH Akcela Hy-tran Ultraction fluid

ENGINE: Make F.P.T. Industrial Diesel Type six cylinder vertical with turbocharger and air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment Serial No. 001325024 Crankshaft lengthwise Rated engine speed 2100 Bore and stroke 4.094" x 5.197" (104.0 mm x 132.0 mm) Compression ratio 17.0 to 1 Displacement 410 cu in (6728 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter one full flow cartridge Oil cooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter two paper elements Exhaust DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler Cooling medium temperature control thermostat and variable speed fan

CHASSIS: Type front wheel assist Serial No. ZFES01197 Tread width rear 61.0" (1550 mm) to 87.8" (2230 mm) front 60.6" (1540 mm) to 89.0" (2260 mm) Wheelbase 113.5" (2884 mm) Hydraulic control system direct engine drive Transmission Continuously variable transmission with compound planetary gears. Four mechanical ranges are electrohydraulically controlled. Nominal travel speeds mph (km/h) forward - first - 0 - 7.5 mph (0 - 12 km/h), second - 0 - 11 mph (0 - 18 km/h), third - 0 - 24 mph (0 - 38 km/h), fourth - 0 - 31 mph (0 - 49.9 km/h) reverse - 0 - 9 mph (0 - 15 km/h), 0 - 21 mph (0 - 33 km/h) Clutch wet disc hydraulically actuated by foot pedal Brakes wet disc hydraulically actuated by two foot pedals that can be locked together Steering hydrostatic Power take-off 540 rpm at 1950 engine rpm or 1000 rpm at 1893 engine rpm Unladen tractor mass 19435 lb (8815 kg)

DRAWBAR PERFORMANCE AT 1800 ENGINE RPM

(Unballasted - Front Drive Engaged)

MAXIMUM POWER AT SELECTED TRAVEL SPEED SETTINGS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Consumption Hp.hr/gal (kW.h/l)	Temp. ^o F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4.3 mph (7.0 km/h)									
153.7 (114.6)	17785 (79.10)	3.24 (5.21)	1850	15.0	0.512 (0.311)	13.58 (2.67)	174 (79)	55 (13)	29.2 (99.0)
4.7 mph (7.5 km/h)									
164.9 (123.0)	17270 (76.83)	3.58 (5.76)	1800	9.7	0.486 (0.296)	14.30 (2.82)	178 (81)	59 (15)	29.2 (99.0)
5.0 mph (8.0 km/h)									
167.8 (125.1)	16260 (72.33)	3.87 (6.22)	1800	7.9	0.478 (0.291)	14.52 (2.86)	172 (78)	55 (13)	29.2 (99.0)
5.3 mph (8.5 km/h)									
171.1 (127.6)	15515 (69.01)	4.14 (6.66)	1800	7.4	0.473 (0.288)	14.67 (2.89)	174 (79)	57 (14)	29.2 (99.0)
5.6 mph (9.0 km/h)									
172.3 (128.5)	14635 (65.11)	4.41 (7.11)	1800	6.7	0.461 (0.280)	15.08 (2.97)	176 (80)	59 (15)	29.2 (99.0)
5.9 mph (9.5 km/h)									
173.0 (129.0)	13865 (61.67)	4.68 (7.53)	1800	6.5	0.452 (0.275)	15.38 (3.03)	178 (81)	55 (13)	29.2 (99.0)
6.2 mph (10.0 km/h)									
173.5 (129.4)	13180 (58.64)	4.94 (7.95)	1800	6.4	0.463 (0.281)	15.02 (2.96)	172 (78)	55 (13)	29.2 (99.0)
6.5 mph (10.5 km/h)									
173.5 (129.4)	12370 (55.02)	5.26 (8.46)	1800	5.7	0.460 (0.280)	15.13 (2.98)	174 (79)	61 (16)	29.2 (99.0)
6.8 mph (11.0 km/h)									
174.5 (130.1)	11940 (53.12)	5.48 (8.82)	1800	5.4	0.472 (0.287)	14.72 (2.90)	174 (79)	61 (16)	29.2 (99.0)
7.5 mph (12.0 km/h)									
174.3 (130.0)	10905 (48.50)	6.00 (9.65)	1800	5.1	0.472 (0.287)	14.72 (2.90)	171 (77)	61 (16)	29.2 (99.0)
8.1 mph (13.0 km/h)									
176.6 (131.7)	10150 (45.14)	6.52 (10.50)	1800	4.8	0.460 (0.280)	15.08 (2.97)	172 (78)	64 (18)	29.2 (99.0)
8.7 mph (14.0 km/h)									
179.2 (133.6)	9560 (42.53)	7.03 (11.31)	1800	4.6	0.445 (0.271)	15.63 (3.08)	171 (77)	61 (16)	29.2 (99.0)
9.3 mph (15.0 km/h)									
180.8 (134.8)	8990 (39.98)	7.54 (12.13)	1800	4.3	0.450 (0.274)	15.43 (3.04)	172 (78)	59 (15)	29.2 (99.0)
9.9 mph (16.0 km/h)									
182.2 (135.9)	8455 (37.62)	8.08 (13.00)	1800	4.1	0.447 (0.272)	15.53 (3.06)	174 (79)	57 (14)	29.2 (99.0)
10.6 mph (17.0 km/h)									
185.0 (138.0)	8055 (35.84)	8.61 (13.86)	1800	3.9	0.442 (0.269)	15.74 (3.10)	174 (79)	54 (12)	29.2 (99.0)

TIRES AND WEIGHT

Rear tires - No., size, ply & psi (kPa)

Front tires - No., size, ply & psi (kPa)

Height of Drawbar

Static Weight with operator- Rear

- Front

- Total

Tested Without Ballast

Two 710/70R38; **,16 (110)

Two 600/65R28; **,16 (110)

19.7 in (500 mm)

11400 lb (5170 kg)

8200 lb (3720 kg)

19600 lb (8890 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. This tractor did not meet the manufacturer's remote hydraulic flow claim of 39.6 GPM (150 l/min), nor 3 point lift capacity claim of 15000 lb (6804 kg). The manufacturer's remote hydraulic flow claim of 44.9 GPM (170 l/min), with optional pump, and 3 point lift claim of 9450 lbs (4268 kg), with 90 mm lift cylinders were not tested for verification. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **2962**, Nebraska Summary 1084, January 9, 2017.

Roger M. Hoy
Director

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Board of Tractor Test Engineers

The engine on this model is capable of operating at two different operating speeds - 2100 or 2200 rpm. To show the performance at each speed the PTO tests were conducted twice. The performance results observed at the 2200 rpm setting are shown below.

POWER TAKE-OFF PERFORMANCE(2200 Engine RPM)

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1163 rpm)						
185.2 (138.1)	2200	10.67 (40.39)	0.398 (0.242)	17.36 (3.42)	0.84 (3.19)	
Standard Power Take-off Speed (1000 rpm)						
205.8 (153.5)	1892	11.16 (42.23)	0.375 (0.228)	18.44 (3.63)	0.92 (3.49)	
Maximum Power (1 hour)						
209.6 (156.3)	1803	11.22 (42.50)	0.370 (0.225)	18.68 (3.68)	0.89 (3.37)	
VARYING POWER AND FUEL CONSUMPTION						
185.2 (138.1)	2200	10.67 (40.39)	0.398 (0.242)	17.36 (3.42)	0.84 (3.19)	Air temperature
159.7 (119.1)	2231	9.80 (37.10)	0.424 (0.258)	16.29 (3.21)	0.74 (2.82)	84°F (29°C)
121.4 (90.5)	2261	7.87 (29.78)	0.448 (0.273)	15.43 (3.04)	0.59 (2.22)	Relative humidity
81.8 (61.0)	2287	6.16 (23.31)	0.521 (0.317)	13.28 (2.62)	0.41 (1.56)	56%
41.2 (30.7)	2299	4.46 (16.88)	0.749 (0.456)	9.24 (1.82)	0.23 (0.89)	Barometer
---	2310	2.96 (11.20)	---	---	0.10 (0.38)	29.5" Hg (99.8 kPa)
Maximum torque - 670 lb.-ft. (908 Nm) at 1500 rpm						
Maximum torque rise - 51.5%						
Torque rise at 1803 engine rpm - 38%						
Power increase at 1803 engine rpm - 13%						

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)
At no load at 4.8mph (7.8 km/h)	68.0
Bystander	--

HYDRAULIC PERFORMANCE

CATEGORY: III

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: 14185 lbs (63.1 kN) Lift cylinders 2x110 mm

i) Sustained pressure of the open relief valve: 2915 psi (201 bar)
two outlet sets combined

ii) Pump delivery rate at minimum pressure: 38.3 GPM (145.0 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 34.2 GPM (129.4 l/min)

Delivery pressure: 2465 psi (170 bar)

Power: 49.2 HP (36.7 kW)

single outlet set

ii) Pump delivery rate at minimum pressure: 37.9 GPM (143.6 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 27.2 GPM (103.0 l/min)

Delivery pressure: 2465 psi (170 bar)

Power: 39.2 HP (29.2 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	32.1	815
B	17.9	454
C	15.1	383
D	14.6	372
E	10.9	277
F	10.6	270
G	36.4	925
H	1.7	43
I	17.3	440
J	25.8	655
K	24.1	612
L	48.2	1224
M	23.1	587
N	38.3	974
O	9.1	230
P	52.8	1340
Q	40.9	1040
R	38.2	970

