

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F. Larsen

January 2001

Test 1793: Massey Ferguson 2220 Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

Nebraska Tractor Test Lab, "Test 1793: Massey Ferguson 2220 Diesel 12-Speed" (2001). *Nebraska Tractor Tests*. 2190.

<https://digitalcommons.unl.edu/tractormuseumlit/2190>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NEBRASKA TRACTOR TEST 1793
MASSEY FERGUSON 2220 DIESEL
12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed (PTO speed 586 rpm)					
58.38 (43.53)	2250	3.64 (13.79)	0.439 (0.267)	16.02 (3.16)	
Maximum Power (2 Hours)					
58.46 (43.59)	2297	3.69 (13.98)	0.444 (0.270)	15.84 (3.31)	
Standard Power Take-off Speed (540 rpm)					
57.33 (42.75)	2072	3.43 (12.98)	0.420 (0.256)	16.72 (3.29)	
VARYING POWER AND FUEL CONSUMPTION					
58.38 (43.53)	2250	3.64 (13.79)	0.439 (0.267)	16.02 (3.16)	Air temperature
51.63 (38.50)	2326	3.42 (12.93)	0.465 (0.283)	15.12 (2.98)	82°F (28°C)
39.26 (29.27)	2360	2.86 (10.83)	0.512 (0.311)	13.72 (2.70)	Relative humidity
26.32 (19.63)	2386	2.22 (8.40)	0.593 (0.361)	11.86 (2.34)	58%
13.43 (10.01)	2405	1.54 (5.83)	0.804 (0.489)	8.74 (1.72)	Barometer
0.60 (0.45)	2433	1.02 (3.87)	11.929 (7.256)	0.59 (0.12)	28.74" Hg (97.33 kPa)
Maximum Torque - 169 lb.-ft. (229 Nm) at 1498 rpm					
Maximum Torque Rise - 24.0%					
Torque rise at 1800 engine rpm - 13%					

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 7th (3M) gear	88.5	88.6
Bystander	--	--

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 17.5L-24; 10; 20 (140)
Two 10.5/80-18; 10; 24 (165)
15.0 in (380 mm)
2915 lb (1322 kg)
2210 lb (1002 kg)
5125 lb (2324 kg)

Location of Test: Nebraska Tractor Test
Laboratory, University of Nebraska, Lincoln
Nebraska, 68583-0832

Dates of Test: May 10-18, 2001

Manufacturer: AGCO Corporation, 4205 River
Green Parkway, Duluth Ga. 30096-2568 USA

FUEL and OIL: Fuel No. 2 Diesel Specific
gravity converted to 60°/60° F (15°/15°C)
0.8349 Fuel weight 7.027 lbs/gal (0.842 kg/l) Oil
SAE 15W40 API service classification CD/CF-4
Transmission and hydraulic lubricant AGCO
Power fluid 821 XL Front axle lubricant AGCO
Gear Lube 715 Total time engine was operated
13.0 hours

ENGINE: Make Perkins Diesel Type three
cylinder vertical with turbocharger Serial No.
CR809066 U327415D Crankshaft lengthwise
Rated engine speed 2250 Bore and stroke 3.74"
x 5.00" (95.0 mm x 127.0 mm) Compression ratio
17.3 to 1 Displacement 165 cu in (2700 ml)
Starting system 12 volt Lubrication pressure
Air cleaner two paper elements Oil filter one
full flow cartridge Oil cooler engine coolant heat
exchanger for crankcase oil Fuel filter one paper
element Muffler underhood Exhaust vertical
Cooling medium temperature control thermostat

ENGINE OPERATING PARAMETERS:
Fuel rate: 24.7 - 26.3 lb/h (11.2 - 11.9 kg/h) High
idle: 2350 - 2450 rpm Turbo boost: nominal
11.0 - 13.0 psi (76 - 90 kPa) as measured 12.0 psi
(83 kPa)

CHASSIS: Type front wheel assist Serial No.
*DDBM G23523 *Tread width rear 53.3" (1355
mm) to 72.8" (1850 mm) front 56.4" (1480 mm)
to 64.4" (1636 mm) Wheelbase 78.6" (1996 mm)
Hydraulic control system direct engine drive
Transmission selective gear fixed ratio Nominal
travel speeds mph (km/h) first 0.86 (1.38) second
1.15 (1.85) third 1.64 (2.64) fourth 2.19 (3.52) fifth
2.30 (3.70) sixth 3.01 (4.85) seventh 4.39 (7.06)
eighth 5.86 (9.43) ninth 6.26 (10.07) tenth 8.39
(13.50) eleventh 11.96 (19.24) twelfth 15.95
(25.67) reverse 0.87 (1.40), 1.16 (1.87), 1.66
(2.67), 2.21 (3.56), 2.31 (3.72), 3.11 (5.00), 4.43
(7.13), 5.90 (9.50), 6.33 (10.18), 8.47 (13.63), 12.08
(19.44), 16.13 (25.95) Clutch single dry disc
operated by foot pedal Brakes multiple wet disc
hydraulically operated by two foot pedals that
can be locked together Steering hydrostatic
Power take-off 540 rpm at 2070 engine rpm
Unladen tractor mass 4950 lb (2245 kg)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum Force Exerted

Through Whole Range:

with 2 lift assist cylinders
2574 lbs (11.4 kN) 4266 lbs (19.0 kN) (at the frame)
3838 lbs (17.1 kN) 6430 lbs (28.6 kN) (at the hitch points)

- i) Opening pressure of relief valve: NA
Sustained pressure of the open relief valve: 2720 psi (188 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed: 10.2 GPM (38.6 l/min)
iii) Pump delivery rate at maximum hydraulic power: 9.0 GPM (34.1 l/min)
Delivery pressure: 2475 psi (171 bar)
Power: 13.0 HP (9.7 kW)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar) 2720 (187)
Location: lift cylinder
Hydraulic oil temperature: °F (°C) 164 (73)
Location: hydraulic sump
Category: II
Quick attach: none

SAE Static Test System pressure 2450 psi (169 Bar)

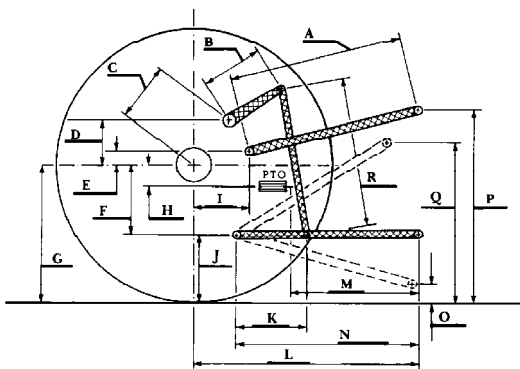
Hitch point distance to ground level in. (mm)	7.7 (195)	15.0 (381)	22.0 (559)	29.0 (737)	35.0 (889)
Lift force on frame lb	4509	4248	3902	3384	3119
" " " " " (kN)	(20.1)	(18.9)	(17.4)	(15.1)	(13.9)

With 2 lift assist cylinders

Hitch point distance to ground level in. (mm)	8.0 (203)	15.0 (381)	22.0 (559)	29.0 (737)	35.0 (889)
Lift force on frame lb	7713	7002	6372	5612	4964
" " " " " (kN)	(34.3)	(31.1)	(28.3)	(25.0)	(22.1)

	SAE TEST		OECD TEST	
	inch	mm	inch	mm
A	22.6	575	23.3	590
B	9.4	240	9.4	240
C	11.5	293	11.5	293
D	10.4	264	10.4	264
E	11.7	296	11.7	296
F	7.3	185	7.3	185
G	26.2	665	26.2	665
H	0.8	20	0.8	20
I	10.9	278	10.9	278
J	18.9	480	18.9	480
K	14.6	370	14.6	370
L	34.6	879	34.6	879
M	21.0	533	21.0	533
N	29.9	760	29.9	760
O	8.0	205	8.0	205
P	36.6	930	41.6	1055
Q	32.5	825	32.5	825
R	20.2	515	20.2	515

HITCH DIMENSIONS AS TESTED NO LOAD



Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska Lincoln
Darrell Nelson, Dean and Director

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor did not meet the manufacturer's 3 point lift claim of 4628 lbs (2100 kg), optionally 7487 lbs (3400 kg) at the lower link ends. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 137°F (59°C).

We, the undersigned, certify that this is a true and correct report of Official Tractor Test No. **1793**, June 11, 2001.

Brent T. Sampson
Test Engineer

L. L. Bashford
M. F. Kocher
G.J. Hoffman
Board of Tractor Test Engineers



Massey Ferguson 2220