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Test 1552: Massey-Ferguson 1020 Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1552—MASSEY FERGUSON 1020 DIESEL 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption		Temperature °F (°C)			Barometer inch Hg (kPa)
		gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cooling medium	Air wet bulb	Air dry bulb

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed — Two hours (PTO Speed—588 rpm)								
17.08 (12.73)	2353	1.377 (5.213)	0.562 (0.342)	12.40 (2.443)	202 (94.4)	57 (13.6)	75 (23.8)	28.81 (97.27)

Standard Power Take-off Speed (540 rpm) — One Hour								
16.24 (12.11)	2162	1.296 (4.907)	0.557 (0.339)	12.53 (2.468)	204 (95.4)	57 (13.6)	75 (24.0)	28.78 (97.19)

VARYING POWER AND FUEL CONSUMPTION — Two Hours

15.09 (11.25)	2443	1.174 (4.445)	0.543 (0.330)	12.85 (2.531)	188 (86.4)	57 (13.6)	75 (23.9)	.....
0.00 (0.00)	2539	0.413 (1.563)	.....	.....	161 (71.7)	56 (13.3)	76 (24.2)	.....
7.56 (5.64)	2453	0.736 (2.785)	0.679 (0.413)	10.27 (2.024)	166 (74.4)	56 (13.3)	75 (23.9)	.....
17.34 (12.93)	2350	1.420 (5.374)	0.571 (0.347)	12.22 (2.406)	200 (93.1)	56 (13.3)	75 (23.9)	.....
3.85 (2.87)	2500	0.585 (2.215)	1.059 (0.644)	6.59 (1.298)	161 (71.7)	56 (13.3)	75 (23.6)	.....
11.30 (8.43)	2441	0.921 (3.485)	0.568 (0.346)	12.28 (2.418)	168 (75.6)	57 (13.6)	75 (23.6)	.....
Av 9.19 Au (6.85)	2454	0.875 (3.311)	0.664 (0.404)	10.51 (2.070)	174 (78.8)	56 (13.4)	75 (23.8)	28.77 (97.14)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power — Two Hours 11th (H2) Gear											
14.33 (10.68)	1071 (4.76)	5.02 (8.07)	2350	7.87	1.383 (5.235)	0.673 (0.409)	10.36 (2.041)	185 (84.7)	49 (9.4)	61 (16.1)	28.84 (97.39)
75% of Pull at Maximum Power — Ten Hours 11th (H2) Gear											
11.32 (8.44)	808 (3.59)	5.25 (8.45)	2423	6.44	1.084 (4.103)	0.668 (0.406)	10.44 (2.057)	169 (76.1)	48 (8.7)	61 (15.8)	29.03 (98.02)
50% of Pull at Maximum Power — Two Hours 11th (H2) Gear											
7.92 (5.90)	545 (2.42)	5.45 (8.77)	2453	4.13	0.843 (3.192)	0.743 (0.452)	9.39 (1.850)	162 (72.2)	47 (8.1)	54 (12.2)	29.02 (98.00)
50% of Pull at Reduced Engine Speed — Two Hours 12th (H3) Gear											
7.90 (5.89)	544 (2.42)	5.45 (8.77)	1666	4.07	0.705 (2.668)	0.622 (0.378)	11.22 (2.210)	168 (75.3)	50 (9.7)	60 (15.3)	28.99 (97.89)

MAXIMUM POWER IN SELECTED GEARS

13.94 (10.39)	1771 (7.88)	2.95 (4.75)	2392	15.00	9th (L3) Gear		176 (79.7)	50 (10.0)	62 (16.7)	28.92 (97.66)
14.00 (10.44)	1640 (7.30)	3.20 (5.15)	2349	13.34	10th (H1) Gear		187 (85.8)	50 (10.0)	62 (16.7)	28.89 (97.56)
14.59 (10.88)	1093 (4.86)	5.01 (8.06)	2350	8.08	11th (H2) Gear		183 (83.9)	50 (10.0)	62 (16.7)	28.86 (97.46)
14.45 (10.78)	715 (3.18)	7.58 (12.20)	2349	5.35	12th (H3) Gear		185 (84.7)	50 (10.0)	62 (16.7)	28.88 (97.52)

LUGGING ABILITY IN 11th (H2) GEAR

Crankshaft Speed rpm		2350	2115	1881	1648	1413	1177
Pull—lbs (kN)		1093 (4.86)	1079 (4.80)	1114 (4.96)	1144 (5.09)	1107 (4.92)	997 (4.43)
Increase in Pull %		0	-1	2	5	1	-9
Power—Hp (kW)		14.59 (10.88)	12.95 (9.66)	11.85 (8.84)	10.67 (7.95)	8.88 (6.62)	6.72 (5.01)
Speed—Mph (km/h)		5.01 (8.06)	4.50 (7.25)	3.99 (6.42)	3.50 (5.63)	3.01 (4.84)	2.53 (4.07)
Slip %		8.08	8.08	8.41	8.49	8.16	7.24

Department of Agricultural Engineering

Dates of Test: March 13 - 22, 1985

Manufacturer: TOYOSHA COMPANY, LTD., 55
Joshiji-16, Kadoma City, Osaka, Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 48.3 (rating taken from oil company's
inspection data) Specific gravity converted to 60/
60°F (15/15°C) 0.8376 Fuel weight 6.974 lbs/gal
(0.836 kg/l) Oil SAE 30 API service classification
SE, SF, CC To motor 0.984 gal (3.726 l) Drained
from motor 0.763 gal (2.889 l) Transmission and
final drive lubricant Massey Ferguson Permatran
III fluid Total time engine was operated 49.5
hours.

ENGINE: Make Toyosha Diesel Type three cyl-
inder vertical Serial No. CS112M00858 Crank-
shaft lengthwise Rated rpm 2350 Bore and stroke
2.953" × 3.347" (75 mm × 85 mm) Compression
ratio 23 to 1 Displacement 68.7 cu in (1126 ml)
Starting system 12 volt Lubrication pressure Air
cleaner one paper element Oil filter one full flow
cartridge Fuel filter one paper element Muffler
vertical Cooling medium temperature control one
thermostat.

CHASSIS: Type front wheel assist Serial No.
40386 Tread width rear 37.0" (940 mm) to 41.7"
(1060 mm) front 38.0" (965 mm) Wheel base 56.7"
(1440 mm) Center of gravity (without operator or
ballast, with minimum tread, with fuel tank filled
and tractor serviced for operation) Horizontal dis-
tance forward from center- line of rear wheels
26.0" (660 mm) Vertical distance above roadway
25.0" (635 mm) Horizontal distance from center of
rear wheel tread 0.1" (2 mm) to the left Hydraulic
control system direct engine drive Transmission
selective gear fixed ratio Advertised speeds mph
(km/h) first 0.3 (0.5) second 0.4 (0.7) third 0.6 (1.0)
fourth 0.7 (1.1) fifth 1.0 (1.6) sixth 1.4 (2.3) sev-
enth 1.6 (2.6) eighth 2.3 (3.8) ninth 3.5 (5.6) tenth
3.7 (6.0) eleventh 5.5 (8.9) twelfth 8.1 (13.0) re-
verse 0.6 (0.9), 1.4 (2.2), 3.4 (5.4), 7.9 (12.7) Clutch
single dry disc operated by foot pedal Brakes drum
and shoe operated by two foot pedals which can
be locked together Steering mechanical Turning
radius (on concrete surface with brake applied)
right 89.0" (2.26 m) left 89.0" (2.26 m) (on concrete
surface without brake) right 99.2" (2.52 m) left 99.2"
(2.52 m) Turning space diameter (on concrete sur-
face with brake applied) right 194" (4.92 m) left
194" (4.92 m) (on concrete surface without brake)
right 214" (5.44 m) left 214" (5.44 m) Power take-
off 540 rpm at 2162 engine rpm Unladen tractor
mass 2050 lb (930 kg).

REPAIRS AND ADJUSTMENTS: The air fil-
ter was replaced during preliminary PTO tests.

TRACTOR SOUND LEVEL WITHOUT CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
Maximum Available Power—Two Hours	91.0	89.5
75% of Pull at Maximum Power—Ten Hours		89.5
50% of Pull at Maximum Power—Two Hours		89.0
50% of Pull at Reduced Engine Speed—Two Hours		87.5
Bystander in 12th (H3) gear		75.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			Barom. inch Hg (kPa)
					gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Cool- ing med	Air wet bulb	Air dry bulb	
Maximum Available Power — Two Hours 11th (H2) Gear											
14.59 (10.88)	1055 (4.69)	5.19 (8.35)	2349	5.71	1.389 (5.260)	0.664 (0.404)	10.50 (2.069)	181 (82.5)	47 (8.1)	56 (13.1)	28.84 (97.37)
MAXIMUM POWER IN SELECTED GEARS											
12.27 (9.15)	2237 (9.95)	2.06 (3.31)	2418	14.77	8th (L2) Gear			173 (78.1)	50 (10.0)	62 (16.7)	28.94 (97.73)
14.77 (11.02)	1068 (4.75)	5.19 (8.35)	2350	5.80	11th (H2) Gear			182 (83.3)	47 (8.3)	57 (13.9)	28.83 (97.35)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 8.3-24; 4; 22 (150)	Two 8.3-24; 4; 22 (150)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	325 lb (148 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 6-14; 4; 28 (195)	Two 6-14; 4; 28 (195)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	25 lb (11 kg)	None
Height of Drawbar		12.5 in (320 mm)	12.5 in (320 mm)
Static Weight with Operator—Rear		1940 lb (880 kg)	1290 lb (585 kg)
	—Front	990 lb (449 kg)	940 lb (426 kg)
	—Total	2930 lb (1329 kg)	2230 lb (1011 kg)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi (kPa)	2050 (14130)	
Location	lift cylinder	
Hydraulic oil temperature °F (°C)	154 (68)	
Location	pump inlet	
	Maximum Lift Capacity	Lift Capacity for Transport
QUICK ATTACH	no	
CATEGORY	I	*not measured
LOAD lbs (kg)	1544 (700)	
TIME sec	2.30	
HITCH POINT MOVEMENT in (mm)		
Lowest position	8.0 (203)	
Top of timed range	30.1 (765)	
Highest position	** 30.3 (768)	
LOAD CG MOVEMENT in (mm)		
Lowest position	8.6 (219)	
Top of timed range	30.6 (776)	
Highest position	30.8 (783)	

*Implement load capacity for transport purposes not specified by manufacturer.

**The observed highest position, 30.3 in. (768 mm) is less than the minimum height for highest position for Cat I, 32 in. (813 mm) specified by ASAE Standard S217.10.

The relief valve pressure was adjusted during the hitch test.

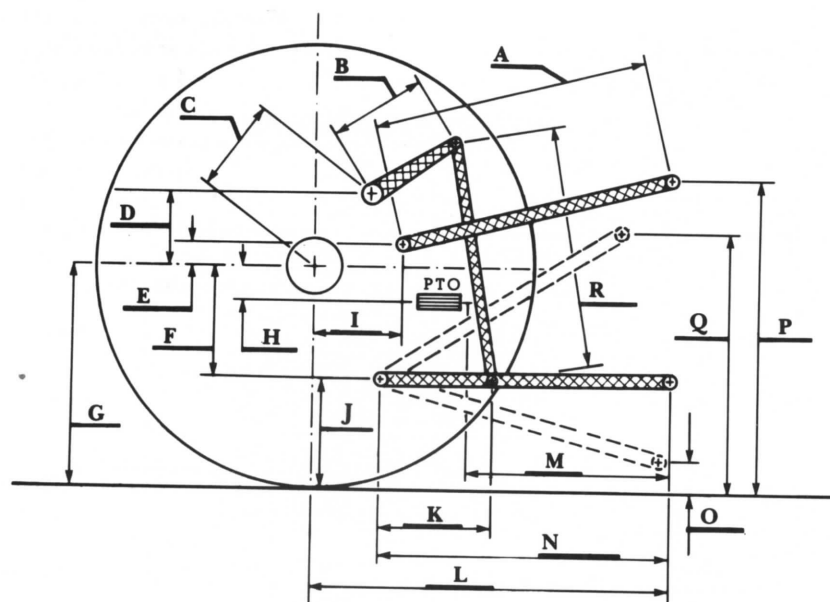
REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 140°F (60.1°C). Four gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 1552, June 13, 1985.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
L. L. BASHFORD
T. L. THOMPSON

Board of Tractor Test Engineers



Hitch Dimensions as Tested — No Load

	inch	mm
A	21.3	540
B	10.6	270
C	14.7	372
D	14.4	366
E	15.2	386
F	4.5	114
G	18.5	470
H	2.8	71
I	8.8	222
J	14.0	356
K	13.8	350
L	30.1	764
M	20.4	518
N	25.6	650
O	6.3	159
P	32.0	813
Q	30.3	768
R	20.1	511



Massey Ferguson 1020 Diesel

Agricultural Research Division
 Institute of Agriculture and Natural Resources
 University of Nebraska—Lincoln
 Irvin T. Omtvedt, Dean and Director