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January 2005

Nebraska Summary 547: Massey Ferguson 8470 Diesel Dyna-Step Transmission

Nebraska Tractor Test Lab

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SUMMARY OF OECD TEST 2323–NEBRASKA SUMMARY 547

MASSEY FERGUSON 8470 DIESEL

DYNA-STEP TRANSMISSION

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—1082 rpm)					
228.5 (170.4)	2201	14.23 (53.88)	0.433 (0.263)	16.05 (3.16)	
Standard Power Take-off Speed(1000 rpm)					
247.9 (184.1)	2034	14.00 (53.00)	0.395 (0.240)	17.61 (3.47)	
Maximum Power (2 hours)					
249.3 (185.9)	2001	14.18 (53.67)	0.395 (0.240)	17.58 (3.46)	
VARYING POWER AND FUEL CONSUMPTION					
228.5 (170.4)	2201	14.23 (53.88)	0.433 (0.263)	16.05 (3.16)	Air temperature
203.4 (151.7)	2305	13.63 (51.61)	0.465 (0.283)	14.92 (2.94)	66°F (19°C)
153.5 (114.5)	2319	10.41 (39.41)	0.471 (0.287)	14.75 (2.91)	Relative humidity
102.9 (76.7)	2329	7.65 (28.97)	0.517 (0.315)	13.44 (2.65)	30%
51.6 (38.5)	2339	5.34 (20.22)	0.719 (0.437)	9.66 (1.90)	Barometer
--	2350	3.04 (11.49)	--	--	29.6" Hg(100.1 kPa)
--			--	--	
Maximum Torque - 763 lb.-ft.(1035 Nm) at 1499 rpm					
Maximum Torque Rise - 40.0%					
Torque rise at 1800 engine rpm - 29%					

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)	Hp.hr/gal (kW.h/l)	Temp.°F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—Turtle 14									
200.5 (149.5)	11720 (52.14)	6.42 (10.33)	2203	3.7	0.502 (0.306)	13.84 (2.73)	189 (87)	62 (17)	29.6 (100.3)
75% of Pull at Maximum Power—Turtle 14									
158.9 (118.5)	8715 (38.77)	6.84 (11.00)	2306	2.5	0.530 (0.323)	13.10 (2.58)	190 (88)	62 (17)	29.6 (100.3)
50% of Pull at Maximum Power—Turtle 14									
108.5 (80.9)	5825 (25.92)	6.98 (11.23)	2319	1.6	0.581 (0.354)	11.95 (2.36)	190 (88)	62 (17)	29.6 (100.3)
75% of Pull at Reduced Engine Speed—Turtle 15									
160.1 (119.4)	8760 (38.97)	6.85 (11.03)	2032	2.6	0.467 (0.284)	14.87 (2.93)	192 (89)	62 (17)	29.6 (100.3)
50% of Pull at Reduced Engine Speed—Turtle 15									
108.4 (80.8)	5820 (25.89)	6.98 (11.24)	2044	1.5	0.511 (0.311)	13.60 (2.68)	190 (88)	62 (17)	29.6 (100.3)

Location of tests: DLG - Test Centre, Technology and Farm inputs, Max-Eyth-Weg 1, D-64823 Gross-Umstadt, Germany

Dates of tests: May - July, 2005

Manufacturer: AGCO S.A. BP 60307, Avenue Blaise Pascal, 60026 Beauvais, France

FUEL and OIL: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.835 **Fuel weight** 6.95 lbs/gal (0.8328 kg/l) **Oil SAE 10W40 API service classification** CH4 **Transmission and hydraulic lubricant** BP STOU 10W/40 **Front axle lubricant** SAE 85W90 API GL5

ENGINE: **Make** Sisu Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** P08256 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.370" x 5.709" (111.0 mm x 145.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 513 cu in (8419 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, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat and variable speed fan

CHASSIS: **Type** front wheel assist **Serial No.** N167999 **Tread width** rear 66.9" (1699 mm) to 91.6" (2326 mm) front 72.5" (1692 mm) to 78.6" (2116 mm) **Wheelbase** 121.1" (3075 mm) **Hydraulic control system** direct engine drive **Transmission** AGCO Dynastep. A combination of mechanical and hydrostatic sections are electronically controlled to give the travel speeds shown. The transmission has two mechanical ranges. **Nominal travel speeds mph (km/h)** Forward: Low range 1st-1.1 (1.8), 2nd-1.4 (2.2), 3rd-1.6 (2.6), 4th-1.9 (3.0), 5th-2.1 (3.4), 6th-2.4 (3.8), 7th-2.6 (4.2), 8th-3.0 (4.8), 9th-3.4 (5.4), 10th-3.7 (6.0), 11th-4.2 (6.8), 12th-4.8 (7.8), 13th - 5.6 (9.0), 14th - 6.5 (10.4), 15th - 7.3 (11.8), 16th - 8.3 (13.4), 17th - 9.6 (15.4), 18th - 11.1 (17.8), 19th-12.8 (20.6), 20th-14.8 (23.8), 21st-17.0 (27.4) High range: 1st - 2.4 (3.8), 2nd - 2.6 (4.2), 3rd - 3.0 (4.8), 4th - 3.4 (5.4), 5th - 3.7 (6.0), 6th - 4.2 (6.8), 7th - 4.7 (7.6), 8th - 5.3 (8.6), 9th-6.0 (9.6), 10th - 6.6 (10.6), 11th-7.3 (11.8), 12th-8.2 (13.2), 13th - 9.2 (14.8), 14th-10.3 (16.6), 15th-11.7 (18.8), 16th - 13.3 (21.4), 17th - 15.0 (24.2), 18th - 17.0 (27.4), 19th-19.4 (31.2), 20th-22.0 (35.4), 21st-25.0 (40.2) Reverse Low range: 1.1 (1.8), 1.4 (2.2), 1.6 (2.6), 1.9 (3.0), 2.1 (3.4), 2.4 (3.8), 2.6 (4.2), 3.0 (4.8), 3.4 (5.4), 3.7 (6.0), 4.2 (6.8), 4.8 (7.8), 5.6 (9.0), 6.5 (10.4), 7.3 (11.8), 8.3 (13.4), 9.6 (15.4), 11.1 (17.8)

DRAWBAR PERFORMANCE

(Unballasted - Front Drive Engaged) MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel lb/hp.hr (kg/kW.h)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
193.9 (144.6)	20105 (89.44)	3.62 (5.82)	2016	15.0	Turtle 11 0.517 (0.314)	13.45 (2.65)	192 (89)	54 (12)	29.6 (100.4)
207.1 (154.4)	17945 (79.82)	4.33 (6.97)	2002	8.7	Turtle 12 0.480 (0.292)	14.47 (2.85)	192 (89)	68 (20)	29.8 (100.9)
210.1 (156.7)	15600 (69.39)	5.05 (8.13)	2001	6.3	Turtle 13 0.470 (0.286)	14.77 (2.91)	192 (89)	68 (20)	29.8 (100.9)
215.8 (160.9)	13720 (61.04)	5.90 (9.49)	2001	4.5	Turtle 14 0.461 (0.280)	15.08 (2.97)	183 (84)	55 (13)	29.7 (100.5)
214.6 (160.0)	12100 (53.82)	6.65 (10.71)	2002	3.8	Turtle 15 0.463 (0.282)	15.01 (2.96)	185 (85)	52 (11)	29.6 (100.4)
214.6 (160.0)	10770 (47.90)	7.47 (12.02)	2002	3.3	Turtle 16 0.464 (0.282)	14.97 (2.95)	187 (86)	52 (11)	29.6 (100.4)
211.9 (158.0)	9490 (42.21)	8.37 (13.48)	2000	2.9	Turtle 17 0.469 (0.285)	14.82 (2.92)	189 (87)	52 (11)	29.6 (100.4)
193.0 (143.9)	18005 (80.08)	4.02 (6.47)	2003	8.7	Rabbit 7 0.515 (0.313)	13.50 (2.66)	190 (88)	68 (20)	29.8 (100.9)
203.3 (151.6)	16020 (71.27)	4.76 (7.66)	2002	6.3	Rabbit 8 0.489 (0.298)	14.21 (2.80)	189 (87)	68 (20)	29.8 (100.9)
203.2 (151.5)	14340 (63.79)	5.31 (8.55)	2001	4.7	Rabbit 9 0.483 (0.294)	14.40 (2.84)	181 (83)	68 (20)	29.9 (101.4)
204.2 (152.3)	13310 (59.20)	5.75 (9.26)	2002	4.2	Rabbit 10 0.480 (0.292)	14.47 (2.85)	187 (86)	68 (20)	29.9 (101.4)
206.9 (154.3)	12075 (53.71)	6.43 (10.34)	2001	3.7	Rabbit 11 0.473 (0.288)	14.67 (2.89)	189 (87)	68 (20)	29.9 (101.4)
208.1 (155.2)	10520 (46.79)	7.42 (11.94)	2003	2.8	Rabbit 12 0.472 (0.287)	14.72 (2.90)	192 (89)	68 (20)	29.9 (101.4)
212.3 (158.3)	9645 (42.91)	8.25 (13.28)	2002	2.7	Rabbit 13 0.466 (0.284)	14.91 (2.94)	189 (87)	66 (19)	29.8 (100.9)
211.3 (157.6)	8515 (37.87)	9.31 (14.99)	2005	2.4	Rabbit 14 0.469 (0.286)	14.80 (2.92)	190 (88)	66 (19)	29.8 (100.9)

High range: 2.4 (3.8), 2.6 (4.2), 3.0 (4.8), 3.4 (5.4), 3.7 (6.0), 4.2 (6.8), 4.7 (7.6), 5.3 (8.6), 6.0 (9.6), 6.6 (10.6), 7.3 (11.8), 8.2 (13.2), 9.2 (14.8), 10.3 (16.6), 11.7 (18.8) **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** multiple wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1588 engine rpm or 1000 rpm at 2033 engine rpm **Unladen tractor mass** 20370 lb (9240 kg)

NOTE: The performance figures on this report are the result of replacing the electronic engine control module of the Massey Ferguson 8480 with the Massey Ferguson 8470 module.

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 claim of 39.0 GPM (147 lpm) flow at the remote outlets. The performance figures on this summary were taken from a test conducted under the OECD Code II test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Report No. **2323**, Nebraska Summary 547, August 23, 2006.

Leonard L. Bashford
Director

M.F. Kocher
V.I. Adamchuk
J.A. Smith
Board of Tractor Test Engineers

TIRES, BALLAST AND WEIGHT

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

Ballast - Duals (total)

- Cast iron (total)

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

Ballast - Liquid (total)

- Cast Iron (total)

Height of Drawbar

Static Weight with operator - Rear

- Front

- Total

With Ballast

Four 520/85R46; **, 9 (60)

2390 lb (1084 kg)

3260 lb (1479 kg)

Two 480/70R34; **, 23 (160)

None

2990 lb (1357 kg)

20.5 in (520 mm)

17680 lb (8020 kg)

11495 lb (5215 kg)

29175 lb (13235 kg)

Without Ballast

Two 650/85R38; ***, 12 (80)

None

None

Two 600/70R28; ***, 12 (80)

None

None

20.5 in (520 mm)

12630 lb (5730 kg)

7905 lb (3585 kg)

20535 lb (9315 kg)

DRAWBAR PERFORMANCE
(Ballasted - 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)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F cool- ing med	Temp. °C Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—Turtle 13									
193.1 (144.0)	12955 (57.63)	5.59 (8.99)	2201	3.6	0.521 (0.317)	13.35 (2.63)	189 (87)	75 (24)	29.3 (99.1)
75% of Pull at Maximum Power—Turtle 13									
156.0 (116.3)	9725 (43.25)	6.02 (9.68)	2313	2.6	0.545 (0.331)	12.76 (2.51)	187 (86)	70 (21)	29.3 (99.1)
50% of Pull at Maximum Power—Turtle 13									
105.5 (78.7)	6445 (28.68)	6.14 (9.88)	2324	1.7	0.619 (0.377)	11.22 (2.21)	189 (87)	66 (19)	29.2 (99.0)
75% of Pull at Reduced Engine Speed—Turtle 14									
156.6 (116.8)	9710 (43.20)	6.05 (9.73)	2021	2.6	0.484 (0.294)	14.37 (2.83)	190 (88)	68 (20)	29.2 (99.0)
50% of Pull at Reduced Engine Speed—Turtle 14									
106.1 (79.1)	6445 (28.66)	6.17 (9.93)	2030	1.7	0.527 (0.320)	13.20 (2.60)	190 (88)	66 (19)	29.2 (99.0)
MAXIMUM POWER IN SELECTED GEARS									
Turtle 8									
184.1 (137.3)	27190 (120.94)	2.54 (4.09)	2071	15.0	0.547 (0.333)	12.69 (2.50)	187 (86)	70 (21)	29.3 (99.2)
Turtle 9									
198.3 (147.9)	25310 (112.59)	2.94 (4.73)	2001	10.6	0.501 (0.305)	13.86 (2.73)	187 (86)	70 (21)	29.3 (99.2)
Turtle 10									
199.8 (149.0)	22855 (101.67)	3.28 (5.28)	2001	9.1	0.496 (0.302)	14.01 (2.76)	192 (89)	77 (25)	29.4 (99.5)
Turtle 11									
206.4 (153.9)	20550 (91.42)	3.77 (6.06)	2001	6.8	0.479 (0.292)	14.50 (2.86)	191 (88)	77 (25)	29.4 (99.5)
Turtle 12									
209.2 (156.0)	17530 (77.98)	4.48 (7.20)	2000	5.3	0.475 (0.289)	14.62 (2.88)	191 (88)	72 (22)	29.4 (99.5)
Turtle 13									
210.0 (156.6)	15355 (68.30)	5.13 (8.25)	2001	4.3	0.472 (0.287)	14.72 (2.90)	192 (89)	73 (23)	29.4 (99.6)
Turtle 14									
209.6 (156.3)	13615 (60.55)	5.77 (9.29)	2000	3.7	0.473 (0.288)	14.67 (2.89)	192 (89)	75 (24)	29.4 (99.6)
Turtle 15									
207.7 (154.9)	11610 (51.64)	6.71 (10.80)	2002	3.0	0.477 (0.290)	14.57 (2.87)	189 (87)	73 (23)	29.4 (99.6)
Turtle 16									
206.2 (153.8)	10260 (45.65)	7.54 (12.13)	2001	2.6	0.482 (0.293)	14.42 (2.84)	191 (88)	72 (22)	29.4 (99.6)
Turtle 17									
204.0 (152.1)	8905 (39.60)	8.59 (13.82)	2000	2.2	0.489 (0.297)	14.21 (2.80)	191 (88)	72 (22)	29.4 (99.6)
Rabbit 7									
197.1 (147.0)	17430 (77.52)	4.24 (6.82)	2001	5.0	0.503 (0.306)	13.81 (2.72)	191 (88)	70 (21)	29.4 (99.5)
Rabbit 8									
201.2 (150.0)	16525 (73.51)	4.57 (7.35)	2002	4.7	0.492 (0.299)	14.12 (2.78)	191 (88)	72 (22)	29.4 (99.5)
Rabbit 9									
206.0 (153.6)	14625 (65.05)	5.28 (8.50)	2001	3.8	0.482 (0.293)	14.42 (2.84)	183 (84)	66 (19)	29.4 (99.6)
Rabbit 10									
208.3 (155.3)	13060 (58.10)	5.98 (9.62)	2002	3.5	0.477 (0.290)	14.57 (2.87)	187 (86)	64 (18)	29.4 (99.6)
Rabbit 11									
209.3 (156.1)	11915 (53.01)	6.59 (10.60)	2001	3.1	0.473 (0.288)	14.67 (2.89)	191 (88)	64 (18)	29.4 (99.6)
Rabbit 12									
209.5 (156.2)	10565 (47.00)	7.43 (11.96)	2002	2.7	0.473 (0.288)	14.67 (2.89)	192 (89)	64 (18)	29.4 (99.6)
Rabbit 13									
208.4 (155.4)	9335 (41.52)	8.37 (13.48)	2002	2.4	0.477 (0.290)	14.57 (2.87)	192 (89)	64 (18)	29.4 (99.6)
Rabbit 14									
207.3 (154.6)	8370 (37.23)	9.29 (14.95)	2002	2.0	0.479 (0.292)	14.50 (2.86)	192 (89)	62 (17)	29.4 (99.6)

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At no load in Turtle - 4.6 mph (7.5 km/h) - no load	70.0
Bystander	---

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III

Quick Attach: None

Maximum force exerted through whole range: 14648 lbs (65.2 kN)

i) Opening pressure of relief valve: NA

Sustained pressure of the open relief valve: 2875 psi (192 bar)

ii) Pump delivery rate at minimum pressure: 36.9 GPM (139.8 l/min)

iii) Pump delivery rate at maximum

hydraulic power: 35.0 GPM (132.5 l/min)

Delivery pressure: 2335 psi (161 bar)

Power: 47.7 HP (35.6 kW)

	OECD test		SAE test	
	inch	mm	inch	mm
A	31.9	809	30.4	773
B	14.2	360	14.2	360
C	17.7	449	17.7	449
D	15.4	390	15.4	390
E	11.8	300	8.9	225
F	13.0	330	13.0	330
G	36.2	920	36.2	920
H	3.4	85	3.4	85
I	15.7	400	18.7	475
J	23.2	590	23.2	590
K	26.8	680	26.8	680
L	50.4	1281	50.4	1281
M	27.9	709	27.9	709
N	41.1	1045	41.1	1045
O	9.0	230	8.0	203
P	50.2	1275	45.2	1150
Q	39.3	999	38.5	978
R	34.3	872	34.8	886

THREE POINT HITCH PERFORMANCE SAE Test

Observed Maximum Pressure psi. (bar)

2800 (193)

Location:

lift cylinder

Hydraulic oil temperature: °F (°C)

150 (66)

Location:

hydraulic sump

Category:

III

Quick attach:

None

SAE Static Test—System pressure 2520 psi (174 Bar)

Hitch point distance to ground level in. (mm)	8.2 (208)	16.1 (409)	24.1 (612)	32.1 (815)	40.0 (1016)
Lift force on frame lb	16994	18242	18320	18191	16921
" " " " " (kN)	(75.6)	(81.1)	(81.5)	(80.9)	(75.3)

