

Tractor Test and Power Museum, The Lester F. Larsen

UNL Larsen Tractor Museum Archives

University of Nebraska - Lincoln

Year 2006

Nebraska Summary 559: Massey
Ferguson 5470 DYNA 4 Diesel 16-Speed

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SUMMARY OF OECD TESTS 2358 & 2359—NEBRASKA SUMMARY 559 MASSEY FERGUSON 5470 DYNA 4 DIESEL 16 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—1100 rpm)					
108.0 (80.5)	2200	6.25 (23.66)	0.413 (0.251)	17.26 (3.40)	
Standard Power Take-off Speed(1000 rpm)					
110.5 (82.4)	2000	6.01 (22.75)	0.387 (0.236)	18.38 (3.62)	
Maximum Power (1 hour)					
110.6 (82.5)	1980	5.98 (22.65)	0.385 (0.234)	18.48 (3.64)	

VARYING POWER AND FUEL CONSUMPTION

108.0 (80.5)	2200	6.25 (23.66)	0.413 (0.251)	17.26 (3.40)	Air temperature
92.9 (69.3)	2240	5.57 (21.08)	0.426 (0.259)	16.70 (3.29)	66°F (19°C)
71.6 (53.4)	2284	4.69 (17.77)	0.466 (0.284)	15.27 (3.01)	Relative humidity
47.9 (35.7)	2304	3.49 (13.23)	0.519 (0.316)	13.71 (2.70)	53%
24.5 (18.3)	2356	2.55 (9.67)	0.739 (0.450)	9.63 (1.90)	Barometer
--	2399	1.74 (6.57)	--	--	30.1" Hg (101.8 kPa)

Maximum Torque - 346.4 lb.-ft. (469.7 Nm) at 1150 rpm
Maximum Torque Rise - 34.4%
Torque rise at 1750 engine rpm - 26%

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—9th(3A) Gear									
88.5 (66.0)	5775 (25.7)	5.75 (9.25)	2200	5.7	0.510 (0.310)	13.91 (2.74)	183 (84)	57 (14)	29.8 (100.8)
75% of Pull at Maximum Power—9th(3A) Gear									
69.6 (51.9)	4315 (19.2)	6.05 (9.73)	2280	4.3	0.552 (0.336)	12.84 (2.53)	183 (84)	57 (14)	29.8 (100.8)
50% of Pull at Maximum Power—9th(3A) Gear									
47.1 (35.1)	2865 (12.8)	6.16 (9.91)	2290	3.0	0.635 (0.386)	11.17 (2.20)	183 (84)	57 (14)	29.8 (100.8)
75% of Pull at Reduced Engine Speed—10th(3B) Gear									
69.1 (51.5)	4295 (19.1)	6.03 (9.71)	1858	4.7	0.512 (0.312)	13.85 (2.73)	181 (83)	57 (14)	29.8 (100.8)
50% of Pull at Reduced Engine Speed—10th(3B) Gear									
47.5 (35.4)	2880 (12.8)	6.18 (9.94)	1881	3.6	0.624 (0.379)	11.37 (2.24)	181 (83)	57 (14)	29.8 (100.8)

Location of tests: Groupement d'Antony, Parc de Touvoie, BP 44 Antony, Cedex, France 92163
Dates of tests: May, 2006

Manufacturer: AGCOS.A. BP 307, Avenue Blaise Pascal, 60026 Beauvais, France

FUEL and OIL: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.855
Fuel weight 7.12 lbs/gal (0.853 kg/l) **Oil SAE 15W40 API service classification** CH4
Transmission and hydraulic lubricant BP Terrac Tractan 9 fluid **Front axle lubricant** API GL5 - SAE 85W140

ENGINE: Make Sisu Diesel **Type** four cylinder vertical with turbocharger and air to air intercooler
Serial No. P07427 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.252" x 4.724" (108.0 mm x 120.0 mm) **Compression ratio** 18.5 to 1 **Displacement** 268 cu in (4397 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** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat and variable speed fan

CHASSIS: Type 2WD and FWA **Serial No.** M299101 **Tread width** rear 60.6" (1640 mm) to 82.0" (2083 mm) front 2WD - 53.7" (1363 mm) to 85.5" (2172 mm), FWA - 69.6" (1769 mm) to 83.9" (2132 mm) **Wheelbase** 2WD - 97.4" (2474 mm) FWA - 97.4" (2474 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.22 (1.96) second 1.50 (2.42) third 1.83 (2.95) fourth 2.25 (3.62) fifth 2.90 (4.66) sixth 3.56 (5.73) seventh 4.34 (6.99) eighth 5.34 (8.60) ninth 5.88 (9.46) tenth 7.23 (11.64) eleventh 8.82 (14.19) twelfth 10.85 (17.46) thirteenth 13.56 (21.82) fourteenth 16.68 (26.84) fifteenth 20.34 (32.74) sixteenth 25.02 (40.27) reverse 1.22 (1.96), 1.50 (2.42), 1.83 (2.95), 2.25 (3.62), 2.90 (4.66), 3.56 (5.73), 4.34 (6.99), 5.34 (8.60), 5.88 (9.46), 7.23 (11.64), 8.82 (14.19), 10.85 (17.46), 13.56 (21.82), 16.68 (26.84), 20.34 (32.74), 25.02 (40.27) **Clutch** multiple wet 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 1980 engine rpm or 1000 rpm at 2000 engine rpm **Unladen tractor mass** 2WD - 9545 lb (4330 kg), FWA - 10385 lb (4710 kg)

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/lp.hr (kg/kW.h)	Consumption Hp.ltr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
4th(1D)Gear									
52.4 (39.1)	9510 (42.3)	2.07 (3.32)	2282	14.8	0.654 (0.398)	10.85 (2.14)	181 (83)	55 (13)	29.7 (100.7)
5th(2A)Gear									
67.5 (50.3)	9420 (41.9)	2.69 (4.32)	2279	13.7	0.566 (0.344)	12.54 (2.47)	181 (83)	57 (14)	29.8 (100.8)
6th(2B)Gear									
80.9 (60.3)	9060 (40.3)	3.35 (5.39)	2218	10.0	0.534 (0.325)	13.29 (2.62)	181 (83)	57 (14)	29.8 (100.8)
7th(2C) Gear									
90.1 (67.2)	8560 (38.1)	3.95 (6.35)	2134	9.5	0.499 (0.303)	14.22 (2.80)	181 (83)	57 (14)	29.8 (100.8)
8th(2D) Gear									
91.2 (68.0)	7440 (33.1)	4.60 (7.40)	1978	9.0	0.477 (0.290)	14.87 (2.93)	183 (84)	57 (14)	29.8 (100.8)
9th(3A) Gear									
91.5 (68.2)	6665 (29.6)	5.15 (8.28)	1979	6.2	0.477 (0.290)	14.87 (2.93)	183 (84)	57 (14)	29.8 (100.8)
10th(3B)Gear									
89.7 (66.9)	5245 (23.3)	6.41 (10.32)	1981	5.3	0.485 (0.295)	14.62 (2.88)	183 (84)	57 (14)	29.8 (100.8)
11th(3C)Gear									
88.6 (66.1)	4205 (18.7)	7.90 (12.71)	1980	4.3	0.489 (0.297)	14.52 (2.86)	185 (85)	57 (14)	29.8 (100.8)
12th(3D)Gear									
83.5 (62.3)	3285 (14.6)	9.54 (15.35)	1981	5.8	0.514 (0.312)	13.81 (2.72)	183 (84)	59 (15)	29.8 (100.8)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with official OECD test procedures. The manufacturer's optional remote hydraulic flow claim of 23.6 GPM (89.7 lpm) was not verified. 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 Reports No. **2358 & 2359**, Nebraska Summary 559, December 15, 2006.

Roger M. Hoy
 Director

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

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	2WD dB(A)	Engaged dB(A)
At no load in 7th(2C) gear	75.0	75.0
Bystander in 16th(4D) gear	--	--

Tested without ballast

TIRES AND WEIGHT

	Front Wheel Assist	2WD
Rear tires - No., size, ply & psi(kPa)	Two 18.4R38; **,16(110)	Two 18.4R38; **,16(110)
Front tires - No., size, ply & psi(kPa)	Two 14.9R28; **,15(100)	Two 10.00-16; 8; 30(210)
Height of Drawbar	22.8 in (580 mm)	31.5 in (800 mm)
Static Weight with operator- Rear	6305 lb (2860 kg)	6260 lb (2840 kg)
- Front	4245 lb (1925 kg)	3450 lb (1565 kg)
- Total	10550 lb (4785 kg)	9710 lb (4405 kg)

DRAWBAR PERFORMANCE
(Unballasted - 2WD)
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)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—10th(3B) Gear									
82.7 (61.7)	4415 (19.6)	7.02 (11.30)	2201	6.3	0.538 (0.327)	13.20 (2.60)	185 (85)	66 (19)	30.0 (101.7)
75% of Pull at Maximum Power—10th(3B) Gear									
65.4 (48.8)	3310 (14.7)	7.41 (11.93)	2277	4.4	0.579 (0.352)	12.24 (2.41)	185 (85)	66 (19)	30.0 (101.7)
50% of Pull at Maximum Power—10th(3B) Gear									
44.1 (32.9)	2195 (9.8)	7.54 (12.14)	2284	3.0	0.704 (0.428)	10.07 (1.98)	183 (84)	66 (19)	30.0 (101.7)
75% of Pull at Reduced Engine Speed—11th(3C) Gear									
65.3 (48.7)	3305 (14.7)	7.41 (11.92)	1873	5.1	0.546 (0.332)	12.99 (2.56)	183 (84)	66 (19)	30.0 (101.7)
50% of Pull at Reduced Engine Speed—11th(3C) Gear									
44.0 (32.8)	2180 (9.7)	7.57 (12.17)	1883	3.6	0.637 (0.387)	11.14 (2.19)	181 (83)	66 (19)	30.0 (101.7)
MAXIMUM POWER IN SELECTED GEARS									
4th(1D) Gear									
40.8 (30.4)	7440 (33.1)	2.06 (3.31)	2287	15.2	0.719 (0.437)	9.86 (1.94)	181 (83)	63 (17)	30.0 (101.7)
5th(2A) Gear									
51.4 (38.3)	7215 (32.1)	2.67 (4.30)	2285	14.3	0.638 (0.388)	11.12 (2.19)	181 (83)	63 (17)	30.0 (101.7)
6th(2B) Gear									
64.2 (47.9)	7105 (31.6)	3.39 (5.45)	2281	11.4	0.582 (0.354)	12.18 (2.40)	183 (84)	64 (18)	30.0 (101.7)
7th(2C) Gear									
75.5 (56.3)	6900 (30.7)	4.10 (6.60)	2231	10.1	0.542 (0.329)	13.10 (2.58)	183 (84)	64 (18)	30.0 (101.7)
8th(2D) Gear									
83.8 (62.5)	6225 (27.7)	5.05 (8.12)	2188	9.7	0.534 (0.325)	13.29 (2.62)	185 (85)	66 (19)	30.0 (101.7)
9th(3A) Gear									
87.6 (65.3)	6250 (27.8)	5.26 (8.46)	2075	8.6	0.506 (0.308)	14.01 (2.76)	183 (84)	66 (19)	30.0 (101.7)
10th(3B) Gear									
88.0 (65.6)	5305 (23.6)	6.22 (10.01)	1972	7.3	0.485 (0.295)	14.62 (2.88)	185 (85)	66 (19)	30.0 (101.7)
11th(3C) Gear									
86.6 (64.6)	4205 (18.7)	7.73 (12.44)	1979	6.2	0.491 (0.299)	14.45 (2.85)	185 (85)	66 (19)	30.0 (101.7)
12th(3D) Gear									
82.3 (61.4)	3180 (14.2)	9.71 (15.62)	1988	5.1	0.519 (0.316)	13.65 (2.69)	187 (86)	68 (20)	30.0 (101.7)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: II

Quick Attach: None

Maximum force exerted through whole range: 8405 lbs (37.4 kN)

i) Opening pressure of relief valve: NA

Sustained pressure of the open relief valve: one outlet set 2770 psi (191 bar) two outlet sets combined 2770 psi (191 bar)

ii) Pump delivery rate at minimum pressure: 14.9 GPM (56.4 l/min) 16.1 GPM (61.0 l/min)

iii) Pump delivery rate at maximum hydraulic power: 14.6 GPM (55.2 l/min) 14.1 GPM (53.3 l/min)

Delivery pressure: 2235 psi (154 bar) 2320 psi (160 bar)

Power: 19.0 hp (14.2 kW) 19.0 Hp (14.2 kW)

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi. (bar)	2770 (191)
Location:	lift cylinder
Hydraulic oil temperature: °F (°C)	152 (67)
Location:	hydraulic valve
Category:	II
Quick attach:	none

SAE Static Test—System pressure 2490 psi (172 Bar)

Hitch point distance to ground level in. (mm)	10.2 (259)	15.0 (381)	22.0 (559)	29.0 (737)	36.0 (914)
Lift force on frame lb	18747	15849	14310	12789	11421
" " " " " " (kN)	(83.4)	(70.5)	(63.7)	(56.9)	(50.8)

HITCH DIMENSIONS AS TESTED—NO LOAD

	SAE test		OECD test	
	inch	mm	inch	mm
A	24.8	629	25.8	655
B	11.6	295	11.6	295
C	13.9	353	13.9	353
D	13.0	330	13.0	330
E	7.9	200	7.9	200
F	10.2	260	10.2	260
G	30.3	770	32.5	825
H	1.4	35	1.4	35
I	16.2	413	16.2	413
J	20.1	510	22.3	565
K	24.2	615	21.4	544
L	41.2	1046	41.2	1046
M	22.5	571	22.5	571
N	37.2	946	37.2	946
O	8.0	203	7.7	196
P	40.2	1020	46.3	1175
Q	33.5	850	34.5	876
R	29.0	737	28.3	720

