2008

Nebraska Summary: S651 Massey Ferguson 8680

Nebraska Tractor Test Laboratory
University of Nebraska-Lincoln, tractortestlab@unl.edu

SUMMARY OF OECD TEST 2499–NEBRASKA SUMMARY 651
MASSEY FERGUSON 8680 DIESEL
DYNA VT TRANSMISSION
E3 SCR ENGINE TECHNOLOGY

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—1081 rpm)					
281.2 *(209.7)*	2200	15.01 *(56.82)*	0.372 *(0.227)*	18.73 *(3.69)*	
Standard Power Take-off Speed(1000 rpm)					
307.0 *(228.9)*	2035	15.69 *(59.39)*	0.357 *(0.217)*	19.56 *(3.85)*	
Maximum Power (1 hour)					
316.6 *(236.1)*	1850	15.60 *(59.07)*	0.343 *(0.209)*	20.30 *(4.00)*	
VARYING POWER AND FUEL CONSUMPTION					
281.2 *(209.7)*	2200	15.01 *(56.82)*	0.372 *(0.227)*	18.73 *(3.69)*	Air temperature
241.6 *(180.2)*	2224	13.11 *(49.61)*	0.379 *(0.230)*	18.43 *(3.63)*	71°F *(22°C)*
182.0 *(135.7)*	2234	10.28 *(38.92)*	0.394 *(0.240)*	17.70 *(3.49)*	Relative humidity
121.9 *(90.9)*	2244	7.63 *(28.88)*	0.437 *(0.266)*	15.97 *(3.15)*	44%
61.2 *(45.6)*	2252	5.10 *(19.32)*	0.582 *(0.354)*	11.98 *(2.36)*	Barometer
-- --	2260	2.68 *(10.14)*	-- --	-- --	30.1" Hg *(101.9 kPa)*

Maximum Torque - 1056 lb.-ft. *(1432 Nm)* at 1500 rpm
Maximum Torque Rise - 57.4%
Torque rise at 1800 engine rpm - 37%
Power increase at 1850 engine rpm - 12.6%

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 9									
240.7 *(179.5)*	17340 *(77.13)*	5.21 *(8.38)*	2200	1.7	0.435 *(0.264)*	16.05 *(3.16)*	174 *(79)*	61 *(16)*	29.4 *(99.4)*
75% of Pull at Maximum Power—Turtle 9									
188.5 *(140.6)*	12985 *(57.76)*	5.44 *(8.76)*	2216	1.2	0.447 *(0.272)*	15.58 *(3.07)*	185 *(85)*	63 *(17)*	29.4 *(99.4)*
50% of Pull at Maximum Power—Turtle 9									
127.9 *(95.4)*	8635 *(38.42)*	5.56 *(8.94)*	2234	0.5	0.489 *(0.297)*	14.26 *(2.81)*	183 *(84)*	63 *(17)*	29.4 *(99.4)*
75% of Pull at Reduced Engine Speed—Turtle 12									
189.2 *(141.1)*	13005 *(57.85)*	5.46 *(8.79)*	1706	0.8	0.409 *(0.249)*	17.06 *(3.36)*	180 *(82)*	63 *(17)*	29.3 *(99.3)*
50% of Pull at Reduced Engine Speed—Turtle 12									
128.1 *(95.5)*	8620 *(38.34)*	5.57 *(8.96)*	1710	0.4	0.439 *(0.267)*	15.89 *(3.13)*	181 *(83)*	63 *(17)*	29.3 *(99.3)*

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

Dates of tests: October 2008 - March, 2009

Manufacturer: AGCO S.A. ZA n2 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)*** 0.838 **Fuel weight** 6.97 lbs/gal *(0.8359 kg/l)* **Oil SAE** 10W40 **API service classification** CI4 **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, air to air intercooler and SCR technology **Serial No.** T00767 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.370" x 5.709" *(111.0 mm x 145.0 mm)* **Compression ratio** 16.7 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 with duals **Serial No.** T007901 **Tread width** rear 60.0" *(1525 mm)* to 101.8" *(2585 mm)* front 60.8" *(1545 mm)* to 89.2" *(2265 mm)* **Wheelbase** 122.2" *(3105 mm)* **Hydraulic control system** direct engine drive **Transmission** CVT. A combination of mechanical and hydrostatic sections allow an infinite speed adjustment within the ranges noted. The transmission has two mechanical ranges. **Nominal travel speeds mph *(km/h)*** forward: Low range 0-17 *(0-28)*, high range 0-25 *(0-40)* reverse: Low range 0-10 *(0-16)*, high range 0-24*(0-38)* **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 2038 engine rpm or 1000 rpm at 2033 engine rpm **Unladen tractor mass** 25795 lb *(11700 kg)*

DRAWBAR PERFORMANCE

(Unballasted - Front Drive Engaged)
MAXIMUM POWER AT SELECTED SPEEDS

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)*
					Turtle 6				
213.6 *(159.3)*	26680 *(118.68)*	3.00 *(4.83)*	2144	14.9	0.494 *(0.301)*	14.11 *(2.78)*	161 *(72)*	55 *(13)*	29.3 *(99.3)*
					Turtle 7.5				
256.4 *(191.2)*	27005 *(120.13)*	3.56 *(5.73)*	1846	7.5	0.424 *(0.258)*	16.44 *(3.24)*	189 *(87)*	54 *(12)*	29.3 *(99.3)*
					Turtle 9				
266.1 *(198.4)*	23060 *(102.58)*	4.33 *(6.96)*	1851	4.0	0.411 *(0.250)*	16.95 *(3.34)*	176 *(80)*	55 *(13)*	29.3 *(99.2)*
					Turtle 11				
267.5 *(199.5)*	17365 *(77.24)*	5.78 *(9.30)*	1852	2.1	0.408 *(0.248)*	17.11 *(3.37)*	176 *(80)*	57 *(14)*	29.3 *(99.2)*
					Turtle 13				
265.9 *(198.3)*	14980 *(66.64)*	6.66 *(10.71)*	1850	1.6	0.410 *(0.250)*	17.00 *(3.35)*	183 *(84)*	59 *(15)*	29.3 *(99.3)*
					Turtle 15				
263.2 *(196.3)*	13030 *(57.97)*	7.57 *(12.19)*	1852	1.3	0.415 *(0.253)*	16.80 *(3.31)*	185 *(85)*	57 *(14)*	29.3 *(99.3)*
					Turtle 17				
261.5 *(195.0)*	11310 *(50.31)*	8.67 *(13.95)*	1855	1.0	0.419 *(0.255)*	16.65 *(3.28)*	183 *(84)*	55 *(13)*	29.3 *(99.3)*
					Rabbit 11				
263.5 *(196.5)*	17030 *(75.76)*	5.80 *(9.34)*	1851	1.7	0.414 *(0.252)*	16.85 *(3.32)*	181 *(83)*	55 *(13)*	29.3 *(99.3)*
					Rabbit 13				
266.2 *(198.5)*	14795 *(65.81)*	6.75 *(10.86)*	1851	1.2	0.410 *(0.249)*	17.02 *(3.35)*	181 *(83)*	55 *(13)*	29.3 *(99.3)*
					Rabbit 15				
267.9 *(199.8)*	12930 *(57.51)*	7.77 *(12.50)*	1853	1.0	0.408 *(0.248)*	17.11 *(3.37)*	185 *(85)*	55 *(13)*	29.3 *(99.3)*
					Rabbit 17				
267.0 *(199.1)*	11340 *(50.44)*	8.83 *(14.21)*	1854	0.7	0.409 *(0.249)*	17.06 *(3.36)*	178 *(81)*	55 *(13)*	29.3 *(99.3)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: This tractor injects D.E.F. (Diesel exhaust fluid/Urea) into the exhaust system. This rate was measured at a maximum of 3% of the diesel fuel consumption.

NOTE 2: The performance figures on this report are the result of replacing the electronic engine control module of the Massey Ferguson 8670 with the Massey Ferguson 8680 module.

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 15% power bulge.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. **2499,** Nebraska Summary 651, December 8, 2009.

Roger M. Hoy
Director

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

TRACTOR SOUND LEVEL WITH CAB	**dB(A)**
At no load in Turtle - 4.6 mph *(7.5 km/h)*- no load	71.0
Bystander	---

TIRES, BALLAST AND WEIGHT	**With Ballast**	**Without Ballast**
Rear Tires - No., size, ply & psi(*kPa)*	Six 480/80R46;***;10(*70)*	Four 480/80R46;***;9(*65)*
Ballast - Triples (total)	2955 lb *(1340 kg)*	None
- Cast Iron (total)	2290 lb *(1040 kg)*	None
Front Tires - No., size, ply & psi(*kPa)*	Four 420/90R30;**;10(*70)*	Two 420/90R30;**;9(*60)*
Ballast - Duals (total)	1170 lb *(530 kg)*	None
- Cast Iron (total)	2535 lb *(1150 kg)*	None
Height of Drawbar	19.5 in (*500 mm)*	19.5 in (*500 mm)*
Static Weight with operator - Rear	20305 lb *(9210 kg)*	15280 lb *(6930 kg)*
- Front	14605 lb *(6625 kg)*	10680 lb *(4845 kg)*
- Total	34910 lb(*15835 kg)*	25960 lb(*11775 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)*	Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—Turtle 7.5									
235.5 *(175.6)*	18620 *(82.83)*	4.74 *(7.63)*	2200	1.7	0.446 *(0.271)*	15.63 *(3.08)*	180 *(82)*	59 *(15)*	29.4 *(99.6)*
75% of Pull at Maximum Power—Turtle 7.5									
180.4 *(134.5)*	13950 *(62.06)*	4.85 *(7.80)*	2222	1.0	0.461 *(0.281)*	15.13 *(2.98)*	176 *(80)*	59 *(15)*	29.4 *(99.6)*
50% of Pull at Maximum Power—Turtle 7.5									
122.2 *(91.1)*	9315 *(41.44)*	4.92 *(7.91)*	2233	0.4	0.509 *(0.309)*	13.71 *(2.70)*	171 *(77)*	57 *(14)*	29.4 *(99.6)*
75% of Pull at Reduced Engine Speed—Turtle 9									
181.6 *(135.4)*	13980 *(62.18)*	4.87 *(7.84)*	1903	0.9	0.427 *(0.260)*	16.34 *(3.22)*	169 *(76)*	57 *(14)*	29.4 *(99.6)*
50% of Pull at Reduced Engine Speed—Turtle 9									
122.3 *(91.2)*	9295 *(41.34)*	4.94 *(7.94)*	1909	0.2	0.469 *(0.286)*	14.86 *(2.93)*	167 *(75)*	57 *(14)*	29.4 *(99.6)*

MAXIMUM POWER AT SELECTED SPEEDS

Turtle 5									
221.3 *(165.0)*	36320 *(161.56)*	2.29 *(3.68)*	1834	15.2	0.491 *(0.299)*	14.21 *(2.80)*	185 *(85)*	48 *(9)*	28.9 *(97.9)*
Turtle 6									
252.6 *(188.4)*	30920 *(137.53)*	3.06 *(4.93)*	1850	5.2	0.431 *(0.262)*	16.19 *(3.19)*	182 *(83)*	46 *(8)*	28.9 *(97.9)*
Turtle 7.5									
259.2 *(193.3)*	24595 *(109.40)*	3.95 *(6.36)*	1850	2.8	0.420 *(0.256)*	16.60 *(3.27)*	190 *(88)*	61 *(16)*	29.4 *(99.5)*
Turtle 9									
266.2 *(198.5)*	21820 *(97.06)*	4.57 *(7.36)*	1851	2.4	0.410 *(0.249)*	17.01 *(3.35)*	180 *(82)*	55 *(13)*	29.5 *(99.8)*
Turtle 11									
261.4 *(194.9)*	16495 *(73.37)*	5.94 *(9.56)*	1851	1.6	0.418 *(0.254)*	16.67 *(3.29)*	174 *(79)*	57 *(14)*	29.5 *(99.8)*
Turtle 13									
260.6 *(194.3)*	14225 *(63.28)*	6.87 *(11.05)*	1852	0.9	0.419 *(0.254)*	16.66 *(3.28)*	189 *(87)*	57 *(14)*	29.4 *(99.5)*
Turtle 15									
256.7 *(191.4)*	12430 *(55.29)*	7.74 *(12.46)*	1853	0.6	0.424 *(0.258)*	16.45 *(3.24)*	185 *(85)*	57 *(14)*	29.4 *(99.5)*
Turtle 17									
253.2 *(188.8)*	10815 *(48.10)*	8.78 *(14.13)*	1854	0.5	0.431 *(0.262)*	16.19 *(3.19)*	183 *(84)*	57 *(14)*	29.4 *(99.5)*
Rabbit 11									
251.8 *(187.8)*	15950 *(70.94)*	5.92 *(9.53)*	1852	1.3	0.433 *(0.264)*	16.09 *(3.17)*	178 *(81)*	46 *(8)*	28.9 *(97.9)*
Rabbit 13									
252.4 *(188.2)*	13680 *(60.85)*	6.92 *(11.14)*	1852	1.1	0.432 *(0.263)*	16.14 *(3.18)*	183 *(84)*	48 *(9)*	28.9 *(97.9)*
Rabbit 15									
252.0 *(187.9)*	11750 *(52.27)*	8.04 *(12.94)*	1852	0.8	0.432 *(0.263)*	16.14 *(3.18)*	185 *(85)*	45 *(7)*	28.9 *(97.9)*
Rabbit 17									
250.5 *(186.8)*	10540 *(46.89)*	8.91 *(14.34)*	1854	0.8	0.435 *(0.265)*	16.04 *(3.16)*	183 *(84)*	46 *(8)*	28.9 *(97.9)*

HYDRAULIC PERFORMANCE

CATEGORY: IVN	
Quick Attach: No	
OECD Static test	
Maximum force exerted through whole range:	24590 lbs *(109.4 kN)*
i) Sustained pressure at compensator cutoff:	3190 psi *(220 bar)*
	three outlet sets combined
ii) Pump delivery rate at minimum pressure and rated engine speed:	51.0 GPM *(193.2 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	46.8 GPM *(177.1 l/min)*
Delivery pressure:	2770 psi *(191 bar)*
Power:	75.6 HP *(56.4 kW)*
	single outlet set
ii) Pump delivery rate at minimum pressure and rated engine speed:	27.9 GPM *(105.5 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	26.1 GPM *(98.9 l/min)*
Delivery pressure:	2655 psi *(183 bar)*
Power:	40.5 HP *(30.2 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	35.8	*910*
B	14.6	*370*
C	19.1	*484*
D	15.9	*405*
E	15.6	*395*
F	13.0	*330*
G	36.4	*925*
H	2.0	*50*
I	16.5	*420*
J	23.4	*595*
K	28.7	*730*
L	52.4	*1330*
M	29.8	*757*
N	42.9	*1090*
O	9.1	*230*
P	50.4	*1280*
Q	38.7	*983*
R	37.0	*940*