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Test 1431: Ford 6610 and 6710 (16x8) Diesel 8 and 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1431 — FORD 6610 (16 X 8) DIESEL ALSO FORD 6710 (16 X 8) DIESEL 16 SPEED ALSO 8 SPEED

POWER TAKE-OFF PERFORMANCE

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

MAXIMUM POWER AND FUEL CONSUMPTION

Rated Engine Speed—Two Hours (PTO Speed—596 rpm)								
72.30 (53.91)	2099	4.773 (18.068)	0.455 (0.277)	15.15 (2.984)	207 (97.2)	56 (13.2)	75 (23.8)	28.857 (97.445)
Standard Power Take-off Speed (540 rpm)—One Hour								
69.20 (51.60)	1900	4.485 (16.978)	0.447 (0.272)	15.43 (3.039)	211 (99.7)	55 (12.9)	75 (23.9)	28.860 (97.456)

VARYING POWER AND FUEL CONSUMPTION—Two Hours

63.88 (47.64)	2182	4.145 (15.691)	0.448 (0.272)	15.41 (3.036)	194 (90.3)	55 (12.8)	76 (24.2)	.....
0.00 (0.00)	2268	1.288 (4.876)	.....	.....	152 (66.4)	54 (12.5)	75 (23.9)	.....
32.78 (24.44)	2240	2.653 (10.043)	0.558 (0.340)	12.35 (2.434)	164 (73.3)	54 (11.9)	74 (23.6)	.....
73.44 (54.76)	2100	4.854 (18.374)	0.456 (0.277)	15.13 (2.980)	202 (94.2)	53 (11.7)	75 (23.9)	.....
16.52 (12.32)	2255	1.931 (7.310)	0.806 (0.491)	8.55 (1.685)	158 (70.3)	53 (11.7)	74 (23.1)	.....
48.48 (36.15)	2209	3.341 (12.647)	0.475 (0.289)	14.51 (2.858)	176 (80.0)	53 (11.7)	76 (24.2)	.....
Av Au	39.18 2209	3.035 (11.489)	0.534 (0.325)	12.91 (2.543)	174 (79.1)	54 (12.2)	75 (23.9)	28.845 (97.405)

DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

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 (6L) Gear											
61.37 (45.77)	3544 (15.76)	6.49 (10.45)	2098	5.06	4.658 (17.632)	0.523 (0.318)	13.18 (2.596)	196 (90.8)	53 (11.7)	70 (21.1)	29.000 (97.929)
75% of Pull at Maximum Power—Ten Hours 11th (6L) Gear											
50.13 (37.39)	2715 (12.08)	6.92 (11.14)	2203	3.60	3.904 (14.778)	0.537 (0.327)	12.84 (2.530)	175 (79.7)	53 (11.7)	66 (18.9)	28.788 (97.213)
50% of Pull at Maximum Power—Two Hours 11th (6L) Gear											
34.08 (25.42)	1811 (8.05)	7.06 (11.36)	2224	2.65	3.135 (11.869)	0.634 (0.386)	10.87 (2.141)	149 (64.7)	44 (6.7)	50 (9.7)	29.065 (98.148)
50% of Pull at Reduced Engine Speed—Two Hours 13th (7L) Gear											
34.19 (25.49)	1811 (8.05)	7.08 (11.40)	1524	2.57	2.610 (9.879)	0.527 (0.320)	13.10 (2.580)	168 (75.3)	47 (8.1)	57 (13.6)	29.075 (98.182)

MAXIMUM POWER IN SELECTED GEARS

52.61 (39.23)	7948 (35.35)	2.48 (3.99)	2161	14.87	5th (3L) Gear		163 (72.8)	41 (5.0)	45 (7.2)	28.990 (97.895)
56.89 (42.42)	6608 (29.39)	3.23 (5.20)	2100	11.40	6th (3H) Gear		193 (89.4)	53 (11.7)	70 (21.1)	29.040 (98.064)
59.19 (44.13)	5937 (26.41)	3.74 (6.02)	2100	9.33	7th (4L) Gear		196 (91.1)	53 (11.7)	70 (21.1)	29.050 (98.097)
60.42 (45.06)	5223 (23.23)	4.34 (6.98)	2098	7.76	8th (5L) Gear		197 (91.4)	53 (11.7)	70 (21.1)	29.060 (98.131)
58.41 (43.56)	4410 (19.61)	4.97 (7.99)	2100	6.35	9th (4H) Gear		195 (90.6)	52 (11.1)	70 (21.1)	29.070 (98.165)
60.12 (44.83)	3952 (17.58)	5.70 (9.18)	2099	5.73	10th (5H) Gear		195 (90.3)	50 (10.0)	66 (18.9)	29.140 (98.401)
62.64 (46.71)	3620 (16.10)	6.49 (10.44)	2097	5.10	11th (6L) Gear		193 (89.2)	52 (11.1)	69 (20.6)	29.100 (98.266)
59.97 (44.72)	2650 (11.79)	8.49 (13.66)	2100	3.60	12th (6H) Gear		194 (89.7)	52 (11.1)	70 (21.1)	29.080 (98.199)

Department of Agricultural Engineering

Dates of Test: April 13 to May 4, 1982

Manufacturer: FORD MOTOR COMPANY,
Ford Tractor Operations, 2500 East Maple
Road, Troy, Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.5 (rating taken from oil company's
inspection data) **Specific gravity converted to 60°/**
60° (15°/15°) 0.8283 Fuel weight 6.897 lbs/gal
(0.827 kg/l) Oil SAE 30 API service classifica-
tion SE/SF-CC/CD To motor 1.851 gal (7.005 l)
Drained from motor 1.599 gal (6.055 l) Trans-
mission and final drive lubricant Ford 134 fluid
Total time engine was operated 58.5 hours.

ENGINE: Make Ford Diesel **Type** four cylin-
der vertical **Serial No.** *E644056* **Crankshaft**
lengthwise **Rated rpm** 2100 **Bore and stroke** 4.4"
× 4.4" (112 mm × 112 mm) **Compression ratio**
16.3 to 1 **Displacement** 268 cu in (4392 ml) **Start-**
ing system 12 volt **Lubrication pressure** **Air**
cleaner two paper elements **Oil filter** one full
flow paper cartridge **Oil cooler** engine coolant
heat exchanger for crankcase oil, radiator for
transmission and hydraulic oil, radiator for power
steering fluid **Fuel filter** one paper element **Muf-**
fler vertical **Cooling medium temperature con-**
trol one thermostat.

CHASSIS: **Type** standard **Serial No.**
C680989 **Tread width** rear 60" (1525 mm) to 90"
(2285 mm) front 52" (1320 mm) to 80" (2032 mm)
Wheel base 87.5" (2223 mm) **Center of gravity**
(without operator or ballast, with minimum tread,
with fuel tank filled and tractor serviced for op-
eration) Horizontal distance forward from center-
line of rear wheels 28.2" (716 mm) Vertical dis-
tance above roadway 32.9" (837 mm) Horizontal
distance from center of rear wheel tread 0" (0 mm)
to the right/left **Hydraulic control system** direct
engine drive **Transmission** selective gear fixed
ratio with partial (2) range operator controlled
powershift **Advertised speeds mph (km/h)** first
1.3 (2.2) second 1.7 (2.8) third 2.0 (3.1) fourth 2.5
(4.0) fifth 2.9 (4.6) sixth 3.7 (5.9) seventh 4.2 (6.7)
eighth 4.8 (7.7) ninth 5.4 (8.7) tenth 6.1 (9.9)
eleventh 6.9 (11.2) twelfth 8.9 (14.4) thirteenth
10.2 (16.3) fourteenth 13.1 (21.0) fifteenth 14.8
(23.7) sixteenth 19.0 (30.6) reverse 1.7 (2.8), 2.2
(3.6), 2.5 (4.1), 3.3 (5.3), 3.7 (6.0), 4.8 (7.7), 5.4
(8.7), 6.9 (11.2) **Clutch** single plate dry disc oper-
ated by foot pedal **Brakes** wet multiple disc oper-
ated by two foot pedals which can be locked
together **Steering** power assist **Turning radius**
(on concrete surface with brake applied) right
120" (3.05 m) left 120" (3.05 m) (on concrete sur-
face without brake) right 138" (3.51 m) left 138"
(3.51 m) **Turning space diameter** (on concrete
surface with brake applied) right 249" (6.32 m) left
249" (6.32 m) (on concrete surface without brake)
right 294" (7.47 m) left 294" (7.47 m) **Power take-**
off 540 rpm at 1900 engine rpm.

LUGGING ABILITY IN 11th (6L) GEAR

Crankshaft Speed rpm	2097	1891	1680	1474	1268	1054
Pull—lbs (kN)	3620 (16.10)	3811 (16.95)	3990 (17.75)	4069 (18.10)	3949 (17.57)	3754 (16.70)
Increase in Pull %	0	5	10	12	9	4
Power—Hp (kW)	62.64 (46.71)	59.27 (44.20)	54.95 (40.98)	49.08 (36.60)	41.06 (30.62)	32.48 (24.22)
Speed—Mph (km/h)	6.49 (10.44)	5.83 (9.39)	5.16 (8.31)	4.52 (7.28)	3.90 (6.28)	3.24 (5.22)
Slip %	5.10	5.38	5.66	5.80	5.66	5.52

TRACTOR SOUND LEVEL WITHOUT CAB

Maximum Available Power—Two Hours	95.5	96.0
75% of Pull at Maximum Power—Ten Hours		95.5
50% of Pull at Maximum Power—Two Hours		96.0
50% of Pull at Reduced Engine Speed—Two Hours		93.0
Bystander in 15th (8L) gear		88.5

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

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 (6L) Gear											
63.07 (47.04)	3446 (15.33)	6.86 (11.05)	2098	2.55	4.640 (17.563)	0.507 (0.309)	13.59 (2.678)	182 (83.3)	52 (11.1)	57 (13.6)	29.140 (98.401)

MAXIMUM POWER IN SELECTED GEARS

60.07 (44.80)	8162 (36.30)	2.76 (4.44)	2164	8.16	5th (3L) Gear			182 (83.1)	54 (12.2)	61 (16.1)	29.130 (98.368)
61.14 (45.59)	6431 (28.61)	3.57 (5.74)	2101	5.01	6th (3H) Gear			187 (86.1)	54 (12.2)	61 (16.1)	29.130 (98.368)
62.49 (46.60)	5769 (25.66)	4.06 (6.54)	2100	4.35	7th (4L) Gear			185 (84.7)	54 (12.2)	60 (15.6)	29.130 (98.368)
63.27 (47.18)	5086 (22.62)	4.66 (7.51)	2100	3.76	8th (5L) Gear			187 (86.1)	54 (12.2)	60 (15.6)	29.130 (98.368)
60.80 (45.34)	4310 (19.17)	5.29 (8.51)	2100	3.08	9th (4H) Gear			185 (85.0)	54 (12.2)	59 (15.0)	29.140 (98.401)
61.58 (45.92)	3805 (16.92)	6.07 (9.77)	2103	2.78	10th (5H) Gear			184 (84.4)	54 (12.2)	59 (15.0)	29.140 (98.401)
63.67 (47.48)	3475 (15.46)	6.87 (11.06)	2100	2.55	11th (6L) Gear			184 (84.4)	53 (11.7)	58 (14.4)	29.140 (98.401)
60.65 (45.23)	2563 (11.40)	8.87 (14.28)	2097	2.02	12th (6H) Gear			183 (83.9)	54 (12.2)	59 (15.0)	29.140 (98.401)

LUGGING ABILITY IN 11th (6L) GEAR

Crankshaft Speed rpm	2100	1902	1683	1478	1260	1057
Pull—lbs (kN)	3475 (15.46)	3731 (16.60)	3903 (17.36)	3981 (17.71)	3889 (17.30)	3714 (16.52)
Increase in Pull %	0	7	12	15	12	7
Power—Hp (kW)	63.67 (47.48)	61.83 (46.11)	57.16 (42.63)	51.16 (38.15)	42.60 (31.77)	34.18 (25.49)
Speed—Mph (km/h)	6.87 (11.06)	6.21 (10.00)	5.49 (8.84)	4.82 (7.75)	4.11 (6.61)	3.45 (5.55)
Slip %	2.55	2.63	2.78	2.93	2.78	2.78

BIAS PLY TIRES

TIRES, BALLAST AND WEIGHT

Rear Tires

—No., size, ply & psi (kPa)

—Liquid (each)

—Cast Iron (each)

Front Tires

—No., size, ply & psi (kPa)

—Liquid (each)

—Cast Iron (each)

Height of Drawbar

Static Weight with Operator—Rear

—Front

—Total

With Ballast

Two 18.4-34; 6; 16 (110)

950 lb (431 kg)

340 lb (154 kg)

Two 7.50-18; 6; 40 (275)

None

135 lb (61 kg)

21 in (535 mm)

7250 lb (3289 kg)

2450 lb (1111 kg)

9700 lb (4400 kg)

Without Ballast

Two 18.4-34; 6; 16 (110)

None

None

Two 7.50-18; 6; 40 (275)

None

None

21 in (535 mm)

4670 lb (2118 kg)

2180 lb (989 kg)

6850 lb (3107 kg)

RADIAL PLY TIRES

With Ballast

Two 18.4R34; 6; 16 (110)

950 lb (431 kg)

278 lb (126 kg)

Two 7.50-18; 6; 40 (275)

None

135 lb (61 kg)

21 in (535 mm)

7250 lb (3289 kg)

2450 lb (1111 kg)

9700 lb (4400 kg)

Without Ballast

Two 18.4R34; 6; 16 (110)

None

None

Two 7.50-18; 6; 40 (275)

None

None

21 in (535 mm)

4795 lb (2175 kg)

2180 lb (989 kg)

6975 lb (3164 kg)



Ford 6610 (16 X 8) Diesel

REPAIRS and ADJUSTMENTS: During the lugging test the throttle linkage clip became disconnected. Test continued after the clip was reconnected.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 162°F (72.2°C). Eight gears were chosen between 15% slip (bias ply tires), stability limit with radial ply tires and 10 mph (16.1 km/h). This tractor did not attain the estimated 15.54 HP-HR per gallon fuel economy at rated engine speed as claimed by the manufacturer.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1431.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Robert W. Kleis, Acting Dean and Director