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## Test 1502: Ford 1710 (12x4) Manual Diesel 12-Speed

Nebraska Tractor Test Lab

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA TRACTOR TEST 1502—FORD 1710 (12x4) MANUAL 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—602 rpm)								
23.88 (17.81)	2700	1.873 (7.090)	0.549 (0.334)	12.75 (2.512)	211 (99.6)	67 (19.4)	75 (24.0)	29.040 (98.064)
* Standard Power Take-off Speed (540 rpm)—One Hour								
22.19 (16.55)	2420	1.654 (6.261)	0.521 (0.317)	13.42 (2.643)	207 (97.4)	67 (19.4)	75 (23.7)	29.035 (98.047)

## VARYING POWER AND FUEL CONSUMPTION—Two Hours

20.71 (15.44)	2755	1.629 (6.166)	0.550 (0.335)	12.71 (2.504)	200 (93.1)	67 (19.4)	76 (24.4)	.....
0.00 (0.00)	2852	0.656 (2.483)	.....	.....	166 (74.4)	68 (20.0)	78 (25.3)	.....
10.59 (7.90)	2818	1.110 (4.202)	0.733 (0.446)	9.54 (1.880)	172 (78.1)	68 (20.0)	76 (24.4)	.....
24.09 (17.96)	2703	1.882 (7.124)	0.547 (0.333)	12.80 (2.521)	210 (98.9)	68 (20.0)	76 (24.7)	.....
5.31 (3.96)	2835	0.879 (3.327)	1.158 (0.705)	6.04 (1.190)	168 (75.8)	67 (19.4)	76 (24.7)	.....
15.73 (11.73)	2790	1.363 (5.160)	0.607 (0.369)	11.54 (2.273)	177 (80.6)	67 (19.4)	74 (23.6)	.....
<b>Av</b> <b>Av</b>	<b>12.74</b> <b>(9.50)</b>	<b>2792</b> <b>(4.743)</b>	<b>1.253</b> <b>(0.419)</b>	<b>0.689</b> <b>(2.003)</b>	<b>182</b> <b>(83.5)</b>	<b>67</b> <b>(19.7)</b>	<b>76</b> <b>(24.6)</b>	<b>29.020</b> <b>(97.996)</b>

## DRAWBAR PERFORMANCE

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 9th (3-3) Gear											
19.98 (14.90)	1317 (5.86)	5.69 (9.16)	2699	5.89	1.759 (6.660)	0.616 (0.375)	11.36 (2.237)	183 (83.9)	50 (10.0)	63 (17.2)	29.175 (98.520)
75% of Pull at Maximum Power—Ten Hours 9th (3-3) Gear											
16.17 (12.06)	1029 (4.58)	5.89 (9.48)	2750	4.32	1.504 (5.691)	0.651 (0.396)	10.76 (2.119)	182 (83.4)	56 (13.1)	68 (20.0)	28.907 (97.615)
50% of Pull at Maximum Power—Two Hours 9th (3-3) Gear											
11.04 (8.23)	686 (3.05)	6.04 (9.72)	2780	3.00	1.230 (4.655)	0.780 (0.474)	8.98 (1.768)	172 (77.8)	53 (11.4)	70 (20.8)	29.120 (98.334)
50% of Pull at Reduced Engine Speed—Two Hours 11th (4-2) Gear											
11.03 (8.23)	685 (3.05)	6.04 (9.72)	1773	2.85	0.923 (3.495)	0.586 (0.356)	11.95 (2.354)	172 (77.5)	54 (11.9)	70 (21.1)	29.085 (98.216)

## MAXIMUM POWER IN SELECTED GEARS

17.12 (12.76)	2700 (12.01)	2.38 (3.83)	2738	14.88	6th (2-3) Gear			174 (78.6)	41 (5.0)	45 (7.2)	29.170 (98.503)
20.37 (15.19)	2344 (10.42)	3.26 (5.24)	2700	11.25	7th (3-1) Gear			175 (79.4)	44 (6.7)	50 (10.0)	29.180 (98.536)
20.62 (15.38)	1794 (7.98)	4.31 (6.94)	2699	7.88	8th (3-2) Gear			174 (78.9)	45 (7.2)	51 (10.6)	29.190 (98.570)
20.81 (15.52)	1372 (6.10)	5.69 (9.16)	2700	5.91	9th (3-3) Gear			175 (79.2)	47 (8.3)	54 (12.2)	29.180 (98.536)
21.02 (15.68)	1116 (4.96)	7.06 (11.37)	2700	4.78	10th (4-1) Gear			174 (78.9)	47 (8.3)	54 (12.2)	29.180 (98.536)
20.62 (15.37)	849 (3.77)	9.11 (14.66)	2701	3.76	11th (4-2) Gear			174 (78.9)	46 (7.8)	52 (11.1)	29.190 (98.570)

Department of Agricultural Engineering

Dates of Test: October 17-31, 1983

Manufacturer: ISHIKAWAJIMA-SHIBAURA  
MACHINERY COMPANY LTD. Tokyo, Japan

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel  
Cetane No. 47.0 (rating taken from oil company's  
inspection data) Specific gravity converted to 60°/  
60° (15°/15°) 0.8404 Fuel weight 6.997 lbs/gal  
(0.839 kg/l) Oil SAE 15W-40 API service classi-  
fication SE-SF, CC-CD To motor 1.116 gal  
(4.226 l) Drained from motor 0.941 gal (3.562 l)  
Transmission and final drive lubricant Ford  
M2C-134-B fluid Total time engine was operated  
34.0 hours.

**ENGINE:** Make Shibaura Diesel Type three  
cylinder vertical Serial No. \*H843-19361\*  
Crankshaft lengthwise Rated rpm 2700 Bore  
and stroke 3.31" × 3.31" (84 mm × 84 mm) Com-  
pression ratio 23 to 1 Displacement 85.2 cu in  
(1396 ml) Starting system 12 volt Lubrication  
pressure Air cleaner one paper element Oil fil-  
ter one full flow cartridge Fuel filter one paper  
element Muffler vertical Cooling medium  
temperature control one thermostat.

**CHASSIS:** Type standard Serial No.  
\*1710\*UL00849\* Tread width rear 43.3" (1100  
mm) to 58.7" (1490 mm) front 43.5" (1105 mm) to  
57.5" (1460 mm) Wheel base 63" (1600 mm) Cen-  
ter of gravity (without operator or ballast, with  
minimum tread, with fuel tank filled and tractor  
serviced for operation) Horizontal distance for-  
ward from center-line of rear wheels 23.8" (605  
mm) Vertical distance above roadway 30.7" (780  
mm) Horizontal distance from center of rear wheel  
tread 0" (0 mm) to the right/left Hydraulic control  
system direct engine drive Transmission selec-  
tive gear fixed ratio Advertised speeds mph (km/  
h) first 0.8 (1.2) second 1.0 (1.5) third 1.3 (2.0)  
fourth 1.7 (2.8) fifth 2.2 (3.5) sixth 2.8 (4.5)  
seventh 3.8 (6.0) eighth 4.8 (7.7) ninth 6.2 (10.0)  
tenth 7.6 (12.2) eleventh 9.7 (15.6) twelfth 12.5  
(20.1) reverse 0.9 (1.4), 2.0 (3.2), 4.3 (7.0), 8.7  
(14.0) 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 92.5" (2.35 m) left 92.5"  
(2.35 m) (on concrete surface without brake) right  
100.4" (2.55 m) left 100.4" (2.55 m) Turning space  
diameter (on concrete surface with brake applied)  
right 193" (4.90 m) left 193" (4.90 m) (on concrete  
surface without brake) right 209" (5.30 m) left 209"  
(5.30 m) Power take-off 540 rpm at 2420 engine  
rpm.

**REPAIRS and ADJUSTMENTS:** No repairs or  
adjustments.

# LUGGING ABILITY IN 9th (3-3) GEAR

Crankshaft Speed rpm	2700	2432	2166	1894	1617	1347
Pull—lbs (kN)	1372 (6.10)	1482 (6.59)	1501 (6.68)	1549 (6.89)	1580 (7.03)	1531 (6.81)
Increase in Pull %	0	8	9	13	15	12
Power—Hp (kW)	20.81 (15.52)	20.16 (15.04)	18.16 (13.54)	16.35 (12.19)	14.22 (10.60)	11.50 (8.57)
Speed—Mph (km/h)	5.69 (9.16)	5.10 (8.21)	4.54 (7.30)	3.96 (6.37)	3.38 (5.43)	2.82 (4.53)
Slip %	5.91	6.24	6.43	6.70	6.79	6.70

# TRACTOR SOUND LEVEL WITHOUT CAB

	dB(A)
Maximum Available Power—Two Hours	90.5
75% of Pull at Maximum Power—Ten Hours	90.5
50% of Pull at Maximum Power—Two Hours	90.5
50% of Pull at Reduced Engine Speed—Two Hours	86.5
Bystander in 12th (4-3) gear	80.0

# TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
<b>Rear Tires</b>	—No., size, ply & psi (kPa)	Two 11.2-24; 6; 14 (95)	Two 11.2-24; 6; 14 (95)
Ballast	—Liquid (each)	240 lb (109 kg)	None
	—Cast Iron (each)	230 lb (104 kg)	None
<b>Front Tires</b>	—No., size, ply & psi (kPa)	Two 5.00-15; 4; 32 (220)	Two 5.00-15; 4; 32 (220)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	50 lb (23 kg)	None
<b>Height of Drawbar</b>		13.5 in (345 mm)	13.5 in (345 mm)
<b>Static Weight with Operator—Rear</b>		2510 lb (1138 kg)	1570 lb (712 kg)
—Front		1000 lb (454 kg)	900 lb (408 kg)
—Total		3510 lb (1592 kg)	2470 lb (1120 kg)

**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 140°F (59.9°C). Six 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. 1502.

LOUIS I. LEVITICUS  
Engineer-in-Charge

K. VON BARGEN  
W. E. SPLINTER  
L. L. BASHFORD

Board of Tractor Test Engineers



**Ford 1710 (12x4) Manual Diesel**