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Test 1442: Yanmar YM226D and YM226 Diesel 9-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1442 — YANMAR YM226D DIESEL ALSO YANMAR YM226 DIESEL 9 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—583 rpm)								
19.42 (14.48)	2600	1.317 (4.985)	0.473 (0.288)	14.74 (2.905)	187 (86.1)	62 (16.4)	76 (24.2)	28.963 (97.805)
Standard Power Take-off Speed (540 rpm)—One Hour								
17.87 (13.33)	2409	1.186 (4.489)	0.463 (0.282)	15.07 (2.969)	193 (89.4)	61 (16.1)	75 (24.1)	28.945 (97.743)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
16.88 (12.59)	2659	1.183 (4.478)	0.489 (0.297)	14.26 (2.812)	186 (85.8)	60 (15.8)	76 (24.4)	..... .....
0.00 (0.00)	2774	0.439 (1.662)	..... .....	..... .....	163 (72.8)	61 (16.1)	76 (24.4)	..... .....
8.63 (6.44)	2721	0.792 (2.998)	0.640 (0.389)	10.90 (2.148)	168 (75.8)	60 (15.8)	76 (24.2)	..... .....
19.50 (14.54)	2605	1.329 (5.031)	0.475 (0.289)	14.67 (2.890)	188 (86.4)	61 (16.1)	76 (24.2)	..... .....
4.36 (3.25)	2744	0.602 (2.279)	0.963 (0.586)	7.24 (1.426)	168 (75.6)	61 (16.1)	77 (25.0)	..... .....
12.81 (9.55)	2692	0.981 (3.713)	0.534 (0.325)	13.06 (2.572)	174 (79.2)	61 (16.1)	76 (24.4)	..... .....
Av Av (7.73)	10.36 2699	0.888 (3.361)	0.597 (0.363)	11.67 (2.300)	175 (79.3)	61 (16.0)	76 (24.4)	28.910 (97.625)

DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

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 7th (3-1) Gear											
15.38 (11.47)	1205 (5.36)	4.79 (7.71)	2597	8.52	1.291 (4.886)	0.585 (0.356)	11.92 (2.347)	183 (83.6)	60 (15.6)	73 (22.8)	28.885 (97.540)
75% of Pull at Maximum Power—Ten Hours 7th (3-1) Gear											
12.62 (9.41)	953 (4.24)	4.97 (7.99)	2656	7.26	1.154 (4.370)	0.638 (0.388)	10.93 (2.154)	172 (77.6)	63 (17.4)	66 (18.7)	28.721 (96.987)
50% of Pull at Maximum Power—Two Hours 7th (3-1) Gear											
8.80 (6.56)	635 (2.82)	5.20 (8.37)	2707	4.71	0.950 (3.596)	0.753 (0.458)	9.26 (1.824)	169 (76.1)	65 (18.3)	68 (20.0)	28.750 (97.084)
50% of Pull at Reduced Engine Speed—Two Hours 8th (3-2) Gear											
8.80 (6.56)	634 (2.82)	5.20 (8.38)	1813	4.34	0.771 (2.918)	0.611 (0.372)	11.42 (2.249)	175 (79.4)	67 (19.4)	72 (21.9)	28.650 (96.747)

MAXIMUM POWER IN SELECTED GEARS

12.29 (9.16)	2073 (9.22)	2.22 (3.58)	2659	14.87	5th (2-2) Gear			170 (76.4)	55 (12.8)	57 (13.9)	28.880 (97.523)
15.01 (11.19)	1821 (8.10)	3.09 (4.97)	2599	13.08	6th (2-3) Gear			172 (77.5)	57 (13.9)	61 (16.1)	28.870 (97.490)
16.14 (12.04)	1266 (5.63)	4.78 (7.70)	2598	8.69	7th (3-1) Gear			177 (80.6)	58 (14.4)	66 (18.9)	28.900 (97.591)
15.55 (11.60)	795 (3.54)	7.34 (11.81)	2598	5.88	8th (3-2) Gear			179 (81.7)	58 (14.4)	68 (20.0)	28.910 (97.625)

LUGGING ABILITY IN 7th (3-1) GEAR

Crankshaft Speed rpm		2598	2337	2087	1820	1547	1287
Pull—lbs (kN)		1266 (5.63)	1329 (5.91)	1450 (6.45)	1418 (6.31)	1349 (6.00)	1251 (5.56)
Increase in Pull %		0	5	15	12	7	-1
Power—Hp (kW)		16.14 (12.04)	15.18 (11.32)	14.66 (10.93)	12.48 (9.31)	10.14 (7.56)	7.88 (5.88)
Speed—Mph (km/h)		4.78 (7.70)	4.28 (6.89)	3.79 (6.10)	3.30 (5.31)	2.82 (4.54)	2.36 (3.80)
Slip %		8.69	9.03	9.93	10.10	9.60	9.03

Department of Agricultural Engineering

Dates of Test: June 10-21, 1982

Manufacturer: YANMAR DIESEL ENGINE
CO., LTD, 1-32, Chayamachi, Kita-ku, Osaka,
Japan

FUEL, OIL AND TIME: Fuel No. 2 Diesel
Cetane No. 46.6 (rating taken from oil company's
inspection data) Specific gravity converted to 60°
60° (15°/15°) 0.8375 Fuel weight 6.973 lbs/gal
(0.836 kg/l) Oil SAE 30 API service classifica-
tion SE/SF-CC/CD To motor 0.942 gal (3.564 l)
Drained from motor 0.832 gal (3.150 l) Trans-
mission and hydraulic lubricant J.D. 303 fluid or
equivalent Front axle lubricant SAE 90 Total
time engine was operated 43.5 hours.

ENGINE: Make Yanmar Diesel Type three
cylinder vertical Serial No. 3T75H-00415
Crankshaft lengthwise Rated rpm 2600 Bore
and stroke 2.95" × 3.35" (75 mm × 85 mm) Com-
pression ratio 22.5 to 1 Displacement 68.7 cu in
(1126 ml) Starting system 12 volt Lubrication
pressure Air cleaner one paper element with cen-
trifugal precleaner Oil filter one full flow
cartridge Fuel filter one paper element Muffler
vertical Cooling medium temperature control
one thermostat.

CHASSIS: Type front wheel assist Serial No.
226D-40458 Tread width rear 39.4" (1000 mm) to
47.4" (1204 mm) front 36.3" (922 mm) Wheel base
61.0" (1550 mm) Center of gravity (without oper-
ator or ballast, with minimum tread, with fuel tank
filled and tractor serviced for operation) Horizontal
distance forward from center-line of rear
wheels 26.1" (664 mm) Vertical distance above
roadway 23.1" (586 mm) Horizontal distance from
center of rear wheel tread 0.2" (4 mm) to the right
Hydraulic control system direct engine drive
Transmission selective gear fixed ratio with par-
tial (3) range operator controlled powershift
Advertised speeds mph (km/h) first 0.8 (1.2)
second 1.1 (1.8) third 1.6 (2.6) fourth 1.8 (2.8)
fifth 2.6 (4.2) sixth 3.6 (5.9) seventh 5.4 (8.7)
eighth 8.0 (12.9) ninth 11.2 (18.0) reverse 1.2
(2.0), 2.8 (4.5) 8.6 (13.8) Clutch single plate 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 91.3" (2.32 m) left 91.3" (2.32 m) (on concrete
surface without brake) right 98.8" (2.51 m) left
98.8" (2.51 m) Turning space diameter (on con-
crete surface with brake applied) right 195" (4.95
m) left 195" (4.95 m) (on concrete surface without
brake) right 210" (5.33 m) left 210" (5.33 m) Power
take-off 540 rpm at 2409 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or
adjustments.

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)	Front Wheel Drive Disengaged dB (A)
Maximum Available Power—Two Hours	90.0	89.0
75% of Pull at Maximum Power—Ten Hours		89.0
50% of Pull at Maximum Power—Two Hours		87.5
50% of Pull at Reduced Engine Speed—Two Hours		84.0
Bystander in 9th (3-3) gear		75.5

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool- ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 7th (3-1) Gear											
15.13 (11.29)	1140 (5.07)	4.98 (8.02)	2600	6.19	1.273 (4.818)	0.586 (0.357)	11.89 (2.342)	185 (84.7)	62 (16.4)	75 (23.9)	28.860 (97.456)

MAXIMUM POWER IN SELECTED GEARS

10.83 (8.07)	2644 (11.76)	1.54 (2.47)	2696	14.77	4th (2-1) Gear			168 (75.3)	52 (11.1)	53 (11.7)	28.880 (97.523)
16.21 (12.09)	1225 (5.45)	4.96 (7.99)	2598	6.40	7th (3-1) Gear			178 (80.8)	58 (14.4)	65 (18.3)	28.900 (97.591)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 9.5-24; 4; 14 (95)	Two 9.5-24; 4; 14 (95)
Ballast	—Liquid (each)	158 lb (71 kg)	None
	—Cast Iron (each)	220 lb (100 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 6-14; 4; 28 (195)	Two 6-14; 4; 28 (195)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	162 lb (74 kg)	None
Height of Drawbar		12.5 in (315 mm)	12.5 in (315 mm)
Static Weight with Operator—Rear		2135 lb (968 kg)	1380 lb (626 kg)
	—Front	1245 lb (565 kg)	920 lb (417 kg)
	—Total	3380 lb (1533 kg)	2300 lb (1043 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 144°F (62.1°C). Four 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 1442.

LOUIS I. LEVITICUS
Engineer-in-Charge

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

Board of Tractor Test Engineers



Yanmar YM226D Diesel

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