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Test 1444: Yanmar YM336D and YM336 Diesel 12-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1444 — YANMAR YM336D DIESEL ALSO YANMAR YM336 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—622 rpm)									
26.98 (20.12)	2600	1.946 (7.366)	0.503 (0.306)	13.87 (2.731)	175 (79.2)	60 (15.8)	76 (24.6)	28.847 (97.411)	
* Standard Power Take-off Speed (540 rpm)—One Hour									
25.63 (19.11)	2257	1.797 (6.802)	0.489 (0.297)	14.27 (2.809)	180 (82.0)	60 (15.8)	76 (24.4)	28.810 (97.287)	
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
23.77 (17.73)	2697	1.747 (6.613)	0.512 (0.312)	13.61 (2.681)	164 (73.6)	60 (15.6)	76 (24.4)	..... .....
0.00 (0.00)	2764	0.641 (2.426)	..... .....	..... .....	140 (60.3)	60 (15.3)	75 (23.9)	..... .....
11.99 (8.94)	2720	1.093 (4.137)	0.636 (0.387)	10.97 (2.161)	148 (64.7)	60 (15.3)	74 (23.6)	..... .....
27.53 (20.53)	2600	1.979 (7.491)	0.501 (0.305)	13.91 (2.741)	170 (76.4)	60 (15.6)	74 (23.6)	..... .....
6.04 (4.50)	2736	0.865 (3.274)	0.998 (0.607)	6.99 (1.374)	145 (62.8)	60 (15.6)	75 (23.9)	..... .....
17.91 (13.36)	2706	1.385 (5.243)	0.539 (0.328)	12.93 (2.548)	154 (67.8)	60 (15.6)	74 (23.6)	..... .....
Av Av	14.54 (10.84)	2704	1.285 (4.864)	0.616 (0.375)	11.32 (2.229)	154 (67.6)	60 (15.4)	75 (23.8)	28.793 (97.231)

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 10th (4-1) Gear											
22.46 (16.75)	1341 (5.97)	6.28 (10.11)	2600	5.18	1.972 (7.464)	0.612 (0.372)	11.39 (2.244)	176 (79.7)	59 (14.7)	71 (21.7)	28.975 (97.844)
75% of Pull at Maximum Power—Ten Hours 10th (4-1) Gear											
18.19 (13.56)	1026 (4.56)	6.65 (10.70)	2713	3.79	1.707 (6.460)	0.654 (0.398)	10.66 (2.100)	163 (72.7)	61 (16.3)	66 (19.0)	28.891 (97.561)
50% of Pull at Maximum Power—Two Hours 10th (4-1) Gear											
12.45 (9.28)	684 (3.04)	6.83 (10.99)	2746	2.34	1.291 (4.886)	0.723 (0.440)	9.64 (1.900)	166 (74.2)	68 (19.7)	77 (25.0)	28.745 (97.068)
50% of Pull at Reduced Engine Speed—Two Hours 11th (4-2) Gear											
12.48 (9.31)	684 (3.04)	6.84 (11.01)	1890	2.26	1.094 (4.139)	0.611 (0.372)	11.41 (2.248)	167 (75.0)	68 (19.7)	79 (25.8)	28.740 (97.051)
MAXIMUM POWER IN SELECTED GEARS											
18.11 (13.51)	3086 (13.73)	2.20 (3.54)	2700	15.00	7th (3-1) Gear			159 (70.3)	53 (11.7)	60 (15.6)	28.990 (97.895)
21.98 (16.39)	2561 (11.39)	3.22 (5.18)	2599	11.24	8th (3-2) Gear			166 (74.4)	56 (13.3)	64 (17.8)	28.990 (97.895)
22.35 (16.67)	1973 (8.78)	4.25 (6.84)	2600	7.97	9th (3-3) Gear			174 (78.9)	57 (13.9)	67 (19.4)	28.990 (97.895)
23.00 (17.15)	1374 (6.11)	6.28 (10.10)	2601	5.26	10th (4-1) Gear			172 (77.8)	56 (13.3)	66 (18.9)	28.990 (97.895)
21.72 (16.20)	876 (3.89)	9.30 (14.97)	2600	3.37	11th (4-2) Gear			175 (79.2)	57 (13.9)	68 (20.0)	28.980 (97.861)

LUGGING ABILITY IN 10th (4-1) GEAR

Crankshaft Speed rpm	2601	2351	2079	1812	1561	1265
Pull—lbs (kN)	1374 (6.11)	1462 (6.50)	1559 (6.93)	1592 (7.08)	1620 (7.21)	1586 (7.05)
Increase in Pull %	0	6	13	16	18	15
Power—Hp (kW)	23.00 (17.15)	22.03 (16.43)	20.71 (15.44)	18.37 (13.70)	16.08 (11.99)	12.77 (9.52)
Speed—Mph (km/h)	6.28 (10.10)	5.65 (9.09)	4.98 (8.02)	4.33 (6.96)	3.72 (5.99)	3.02 (4.86)
Slip %	5.26	5.59	5.91	6.13	6.34	6.24

Department of Agricultural Engineering

Dates of Test: June 15-23, 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 1.517 gal (5.741 l)
Drained from motor 1.247 gal (4.722 l) Trans-
mission and hydraulic lubricant J.D. 303 fluid or
equivalent Front axle lubricant SAE 90 Total
time engine was operated 41.0 hours.

ENGINE: Make Yanmar Diesel Type three
cylinder vertical Serial No. 3T84A-400377
Crankshaft lengthwise Rated rpm 2600 Bore
and stroke 3.31" × 3.54" (84 mm × 90 mm) Com-
pression ratio 21 to 1 Displacement 91.3 cu in
(1496 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.
336D-40253 Tread width rear 45.3" (1150 mm) to
59.1" (1500 mm) front 44.9" (1140 mm) Wheel
base 68.9" (1750 mm) Center of gravity (without
operator or ballast, with minimum tread, with fuel
tank filled and tractor serviced for operation)
Horizontal distance forward from center-line of
rear wheels 28.6" (726 mm) Vertical distance above
roadway 24.7" (628 mm) Horizontal distance from
center of rear wheel tread 0.3" (8.6 mm) to the left
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 0.3 (0.4)
second 0.4 (0.6) third 0.5 (0.8) fourth 1.0 (1.6)
fifth 1.5 (2.4) sixth 1.9 (3.0) seventh 2.6 (4.2)
eighth 3.8 (6.0) ninth 4.8 (7.7) tenth 6.9 (11.0)
eleventh 10.0 (16.1) twelfth 12.7 (20.4) reverse 0.4
(0.6), 1.4 (2.2) 3.6 (5.7) 9.4 (15.2) Clutch single
plate dry disc operated by foot pedal Brakes
drum and shoe operated by two foot pedals which
can be locked together Steering power assist
Turning radius (on concrete surface with brake
applied) right 101" (2.56 m) left 101" (2.56 m) (on
concrete surface without brake) right 109" (2.76
m) left 109" (2.76 m) Turning space diameter (on
concrete surface with brake applied) right 216"
(5.49 m) left 216" (5.49 m) (on concrete surface
without brake) right 232" (5.89 m) left 232" (5.89
m) Power take-off 540 rpm at 2257 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	89.5
75% of Pull at Maximum Power—Ten Hours		88.5
50% of Pull at Maximum Power—Two Hours		88.5
50% of Pull at Reduced Engine Speed—Two Hours		86.0
Bystander in 12th (4-3) gear		78.0

DRAWBAR PERFORMANCE (Front Wheel Drive Engaged)

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption			Temp. °F (°C)			
					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	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th (4-1) Gear											
21.42 (15.97)	1236 (5.50)	6.50 (10.46)	2600	3.56	1.936 (7.329)	0.630 (0.383)	11.06 (2.179)	178 (80.8)	61 (15.8)	75 (23.6)	28.935 (97.709)

MAXIMUM POWER IN SELECTED GEARS

16.98 (12.66)	3911 (17.39)	1.63 (2.62)	2709	14.83	6th (2-3) Gear			151 (66.1)	52 (11.1)	55 (12.8)	28.990 (97.895)
22.05 (16.44)	1867 (8.30)	4.43 (7.13)	2600	5.64	9th (3-3) Gear			176 (80.0)	57 (13.9)	68 (20.0)	28.980 (97.861)
22.08 (16.47)	1279 (5.69)	6.48 (10.42)	2598	3.90	10th (4-1) Gear			170 (76.7)	56 (13.3)	65 (18.3)	28.990 (97.895)

TIRES, BALLAST AND WEIGHT

		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Two 12.4/11-28; 4; 14 (95)	Two 12.4/11-28; 4; 14 (95)
Ballast	—Liquid (each)	293 lb (133 kg)	None
	—Cast Iron (each)	300 lb (136 kg)	None
Front Tires	—No., size, ply & psi (kPa)	Two 8-16; 6; 22 (150)	Two 8-16; 6; 22 (150)
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	215 lb (97 kg)	None
Height of Drawbar		16 in (405 mm)	16 in (405 mm)
Static Weight with Operator—Rear		3235 lb (1467 kg)	2050 lb (930 kg)
	—Front	1785 lb (810 kg)	1355 lb (615 kg)
	—Total	5020 lb (2277 kg)	3405 lb (1545 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 149°F (65.2°C). Five gears were chosen between 15% slip and 10 mph (16.1 km/h). One scratch was found on the front cylinder wall during final inspection.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1444**.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

L. L. BASHFORD

Board of Tractor Test Engineers



Yanmar YM336D Diesel

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