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Test 1334: Belarus 7100 Diesel (K-701) 16-Speed

Nebraska Tractor Test Lab

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NEBRASKA TRACTOR TEST 1334 — BELARUS 7100 DIESEL (K-701) 16 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—1003 rpm)								
269.62 (201.05)	1900	17.010 (64.392)	0.447 (0.272)	15.85 (3.122)	182 (83.1)	54 (12.1)	75 (23.9)	29.010 (97.962)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
236.57 (176.41)	1962	15.097 (57.150)	0.452 (0.275)	15.67 (3.087)	170 (76.9)	54 (12.5)	76 (24.2)	..... .....
0.00 (0.00)	2102	4.849 (18.355)	..... .....	..... .....	173 (78.3)	55 (12.8)	76 (24.7)	..... .....
122.29 (91.19)	2028	9.486 (35.907)	0.549 (0.334)	12.89 (2.540)	172 (77.8)	56 (13.1)	76 (24.4)	..... .....
271.53 (202.48)	1900	17.001 (64.354)	0.443 (0.270)	15.97 (3.146)	182 (83.1)	54 (12.2)	74 (23.6)	..... .....
62.54 (46.64)	2074	7.265 (27.500)	0.822 (0.500)	8.61 (1.696)	168 (75.6)	54 (12.2)	76 (24.2)	..... .....
181.03 (134.99)	2002	12.190 (46.144)	0.477 (0.290)	14.85 (2.925)	172 (77.5)	54 (12.2)	74 (23.6)	..... .....
Av 145.66 <i>Av (108.62)</i>	2011	10.981 <i>(41.568)</i>	0.534 <i>(0.325)</i>	13.26 <i>(2.613)</i>	173 <i>(78.2)</i>	54 <i>(12.5)</i>	75 <i>(24.1)</i>	..... .....

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 8th (R3-P2) Gear											
249.69 (186.20)	15973 (71.05)	5.86 (9.43)	1899	3.87	16.848 (63.777)	0.478 (0.291)	14.82 (2.920)	175 (79.4)	35 (1.4)	42 (5.3)	29.010 (97.962)
75% of Pull at Maximum Power—Ten Hours 8th (R3-P2) Gear											
206.41 (153.92)	12401 (55.16)	6.24 (10.04)	2009	3.14	14.383 (54.444)	0.493 (0.300)	14.35 (2.827)	170 (76.6)	22 (-5.6)	23 (-5.0)	29.219 (98.668)
50% of Pull at Maximum Power—Two Hours 8th (R3-P2) Gear											
136.90 (102.09)	7995 (35.56)	6.42 (10.33)	2043	1.91	10.896 (41.247)	0.563 (0.343)	12.56 (2.475)	177 (80.6)	31 (-0.5)	34 (0.8)	28.940 (97.726)
50% of Pull at Reduced Engine Speed—Two Hours 12th (R3-P4) Gear											
137.68 (102.67)	8026 (35.70)	6.43 (10.35)	1409	1.95	9.042 (34.228)	0.465 (0.283)	15.23 (3.000)	178 (81.1)	35 (1.4)	40 (4.4)	28.980 (97.861)
MAXIMUM POWER IN SELECTED GEARS											
201.41 (150.19)	30845 (137.21)	2.45 (3.94)	1971	12.85	3rd (R1-P3) Gear			181 (82.5)	32 (0.0)	38 (3.3)	29.080 (98.199)
234.31 (174.73)	30139 (134.07)	2.92 (4.69)	1900	10.53	4th (R1-P4) Gear			177 (80.3)	33 (0.6)	39 (3.9)	29.080 (98.199)
259.15 (193.25)	22784 (101.35)	4.27 (6.86)	4899	5.57	5th (R2-P1) Gear			180 (82.2)	37 (2.8)	43 (6.1)	28.700 (96.916)
259.46 (193.48)	20367 (90.60)	4.78 (7.69)	1899	4.88	6th (R3-P1) Gear			171 (77.2)	37 (2.8)	43 (6.1)	28.690 (96.882)
252.73 (188.46)	18046 (80.27)	5.25 (8.45)	1896	4.19	7th (R2-P2) Gear			178 (81.1)	37 (2.8)	44 (6.7)	28.680 (96.848)
258.60 (192.84)	16523 (73.50)	5.87 (9.45)	1900	3.64	8th (R3-P2) Gear			172 (77.5)	35 (1.7)	42 (5.6)	29.000 (97.929)
252.74 (188.47)	14819 (65.92)	6.40 (10.29)	1899	3.24	9th (R2-P3) Gear			174 (78.9)	37 (2.8)	43 (6.1)	28.700 (96.916)
256.98 (191.63)	13521 (60.15)	7.13 (11.47)	1900	2.92	10th (R3-P3) Gear			174 (78.9)	37 (2.8)	43 (6.1)	28.700 (96.916)
258.99 (193.13)	12542 (55.79)	7.74 (12.46)	1900	2.76	11th (R2-P4) Gear			174 (78.9)	37 (2.8)	43 (6.1)	28.700 (96.916)
259.36 (193.41)	11292 (50.23)	8.61 (13.86)	1898	2.52	12th (R3-P4) Gear			180 (81.9)	37 (2.8)	43 (6.1)	28.700 (96.916)

Department of Agricultural Engineering

Dates of Test: November 17-30, 1979

Manufacturer: KIROV PLANT, Leningrad, USSR

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8500 **Fuel weight** 7.078 lbs/gal (0.848 kg/l) **Oil SAE 30 API service classification** SB-SE/CA-CD **To motor** 9.518 gal (36.029 l) **Drained from motor** 8.216 gal (31.100 l) **Transmission and final drive lubricant** SAE 30 **Total time engine was operated** 40.5 hours

ENGINE: Make YAMZ Diesel **Type** twelve cylinder vee **Serial No.** 73193 **Crankshaft** lengthwise **Rated rpm** 1900 **Bore and stroke** 5.118" × 5.512" (130 mm × 140 mm) **Compression ratio** 16.5 to 1 **Displacement** 1360 cu in (22300 ml) **Starting system** 24 volt **Lubrication** pressure **Air cleaner** four paper elements in parallel with aspirator **Air compressor** direct engine drive **Oil filter** two fiber elements **Oil cooler** separate radiators for crankcase and transmission oil **Fuel filter** two steel mesh primary elements and two paper secondary elements **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermo-hydraulic fan.

CHASSIS: **Type** Four wheel drive **Serial No.** 705472 **Tread width** rear 83.3" (2115 mm) front 83.3" (2115 mm) **Wheel base** 126" (3200 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 85.0" (2160 mm) Vertical distance above roadway 43.3" (1100 mm) Horizontal distance from center of rear wheel tread 0.4" (10 mm) to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (4) range operator controlled powershift **Advertised speeds mph (km/h)** first 1.8 (2.9) second 2.2 (3.5) third 2.6 (4.2) fourth 3.2 (5.1) fifth 4.4 (7.1) sixth 4.8 (7.8) seventh 5.3 (8.6) eighth 5.9 (9.5) ninth 6.4 (10.3) tenth 7.1 (11.5) eleventh 7.7 (12.4) twelfth 8.6 (13.8) thirteenth 11.9 (19.2) fourteenth 14.5 (23.3) fifteenth 17.4 (28.0) sixteenth 21.0 (33.8) reverse 3.2 (5.1), 3.9 (6.2), 4.6 (7.4), 5.5 (8.9), 8.6 (13.8), 10.4 (16.7), 12.6 (20.2), 15.1 (24.3) **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** expanding shoe pneumatically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake applied) right 283" (7.18 m) left 283" (7.18 m) **Turning space diameter** (on concrete surface without brake applied) right 598" (15.19 m) left 598" (15.19 m) **Power take-off** 1003 rpm at 1900 engine rpm.

LUGGING ABILITY IN 8th (R3-P2) GEAR

Crankshaft Speed rpm	1900	1711	1517	1327	1134	947
Pull—lbs (kN)	16523 (73.50)	17514 (77.91)	18624 (82.84)	18704 (83.20)	17559 (78.11)	16029 (71.30)
Increase in Pull %	0	6	13	13	6	-3
Power—Hp (kW)	258.60 (192.84)	246.29 (183.66)	231.52 (172.65)	203.25 (151.56)	163.58 (121.98)	125.11 (93.30)
Speed—Mph (km/h)	5.87 (9.45)	5.27 (8.49)	4.66 (7.50)	4.07 (6.56)	3.49 (5.62)	2.93 (4.71)
Slip %	3.64	3.95	4.26	4.26	3.95	3.79

TRACTOR SOUND LEVEL WITH CAB

dB(A)

Maximum Available Power—Two Hours	90.5
75% of Pull at Maximum Power—Ten Hours	90.0
50% of Pull at Maximum Power—Two Hours	91.0
50% of Pull at Reduced Engine Speed—Two Hours	88.0
Bystander in 15th (R4-P3) gear	94.0

TIRES, BALLAST AND WEIGHT

Rear Tires	—No., size, ply & psi (kPa)
Ballast	—Liquid (each)
	—Cast Iron (each)
Front Tires	—No., size, ply & psi (kPa)
Ballast	—Liquid (each)
	—Cast Iron (each)

Tested Without Ballast

Two 720-665/28.1-26P 12; 18 (125)
None
None
Two 720-665/28.1-26P 12; 24 (165)
None
None

Height of Drawbar

22 in (560 mm)

Static Weight with Operator—Rear

11260 lb (5108 kg)

Front

21200 lb (9616 kg)

Total

32460 lb (14724 kg)

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 139°F (59.3°C). Ten gears were chosen between 15% slip and 10 mph (16.1 km/h). The pull in 3rd (R1-P3) gear was limited to avoid tractor bouncing. The PTO reduction case had to be cooled with a fan in order to prevent overheating. Variations in the Drawbar Test Data can be attributed to cycling of the cooling fan.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1334**.

LOUIS I. LEVITICUS

Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



Belarus 7100 Diesel