

Tractor Test and Power Museum, The Lester F. Larsen

UNL Larsen Tractor Museum Archives

University of Nebraska - Lincoln

Year 2006

Test 1874: John Deere 8430 IVT

NEBRASKA OECD TRACTOR TEST 1874—SUMMARY 528

JOHN DEERE 8430 DIESEL INFINITELY VARIABLE TRANSMISSION

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1050 rpm)					
253.01 (188.67)	2100	14.11 (53.41)	0.390 (0.237)	17.93 (3.53)	
Standard Power Take-off Speed(1000 rpm)					
272.59 (203.27)	2001	14.79 (56.00)	0.379 (0.231)	18.44 (3.63)	
Maximum Power (1 hour)					
283.18 (211.17)	1800	15.04 (56.94)	0.371 (0.226)	18.82 (3.71)	

VARYING POWER AND FUEL CONSUMPTION

253.01 (188.62)	2100	14.11 (53.41)	0.390 (0.237)	17.93 (3.53)	Air temperature
220.39 (164.34)	2154	12.78 (48.36)	0.405 (0.246)	17.25 (3.40)	75°F(24°C)
165.89 (123.71)	2164	10.43 (39.48)	0.439 (0.267)	15.91 (3.13)	Relative humidity
111.24 (82.95)	2174	8.07 (30.54)	0.507 (0.308)	13.79 (2.72)	15%
55.57 (41.44)	2183	6.07 (22.96)	0.763 (0.464)	9.16 (1.80)	Barometer
1.56 (1.17)	2191	4.15 (15.70)	18.546 (11.281)	0.38 (0.07)	29.02" Hg(98.27 kPa)

Maximum Torque - 914 lb.-ft. (1239 Nm) at 1450 rpm
 Maximum Torque Rise - 44.4%
 Torque rise at 1701 engine rpm - 39%

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—4.7 mph (7.5 km/h)									
211.26 (157.54)	18371 (81.72)	4.31 (6.94)	2101	3.97	0.450 (0.274)	15.54 (3.06)	190 (88)	55 (13)	28.96 (98.07)
75% of Pull at Maximum Power—4.7 mph (7.5 km/h)									
164.40 (122.59)	13732 (61.08)	4.49 (7.23)	2158	2.70	0.489 (0.297)	14.29 (2.82)	201 (94)	71 (22)	28.74 (97.33)
50% of Pull at Maximum Power—4.7 mph (7.5 km/h)									
111.10 (82.85)	9145 (40.68)	4.56 (7.33)	2167	1.65	0.555 (0.338)	12.60 (2.48)	189 (87)	71 (22)	28.74 (97.33)
75% of Pull at Reduced Engine Speed—Auto mode									
163.86 (122.19)	13741 (61.12)	4.47 (7.20)	1695	2.72	0.454 (0.276)	15.39 (3.03)	202 (94)	71 (22)	28.74 (97.33)
50% of Pull at Reduced Engine Speed—Auto mode									
111.26 (82.97)	9230 (41.06)	4.52 (7.27)	1400	1.64	0.457 (0.278)	15.30 (3.01)	197 (92)	71 (22)	28.74 (97.33)

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: March 16 - April 5, 2006

Manufacturer: John Deere Tractor Works, 3500 East Donald St., P.O. Box 270, Waterloo Ia, 50704-0270

FUEL, OIL and TIME: Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8395 Fuel weight 6.990 lbs/gal (0.838 kg/l) Oil SAE 15W-40 API service classification CH-4 Transmission and hydraulic lubricant John Deere Hy-Gard fluid Front axle lubricant John Deere Hy-Gard fluid Total time engine was operated: 33.5 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.** *RG6090L001331* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.661" x 5.354" (118.4 mm x 136.0 mm) **Compression ratio** 16.3 to 1 **Displacement** 548 cu in (8984 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and water separator **Fuel cooler** radiator for pump inlet fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 94.8 - 104.7 lb/h (43.0 - 47.5 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 26.8 - 31.2 psi (185 - 215 kPa) as measured 28.8 psi (198 kPa)

CHASSIS: Type front wheel assist with duals **Serial No.** *RW8430D001412* **Tread width** rear 60.0" (1524 mm) to 128.9" (3270 mm) front 64.0" (1625 mm) to 87.6" (2225 mm) **Wheelbase** 118.9" (3020 mm) **Hydraulic control system** direct engine drive **Transmission** Infinitely variable with four mechanical ranges and automatic shifting between ranges. **Nominal travel speeds mph (km/h)** forward - 0-25.0 mph, (0-40 km/h) reverse - 0-12.5 mph (0-20 km/h) **Clutch** a foot pedal controls the hydrostatic oil flow **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 1000 rpm at 2000 engine rpm **Unladen tractor mass** 25490 lb (11562 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED - 2100 RPM
MAXIMUM POWER AT SELECTED SPEED SETTINGS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/lp.hr (kg/kW.h)	Hp.ltr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
184.89 (137.88)	24704 (109.89)	2.81 (4.52)	2114	3.2 mph (5.2 km/h) 11.62	0.507 (0.308)	13.79 (2.72)	184 (84)	48 (9)	28.64 (96.99)
200.29 (149.35)	22301 (99.20)	3.37 (5.42)	2099	3.7 mph (6.0 km/h) 7.44	0.480 (0.292)	14.58 (2.87)	194 (90)	50 (10)	28.68 (97.12)
208.07 (155.16)	19291 (85.81)	4.04 (6.51)	2103	4.3 mph (7.0 km/h) 4.89	0.462 (0.281)	15.12 (2.98)	197 (92)	52 (11)	28.71 (97.22)
211.26 (157.54)	18371 (81.72)	4.31 (6.94)	2101	4.7 mph (7.5 km/h) 3.97	0.450 (0.274)	15.54 (3.06)	190 (88)	55 (13)	28.96 (98.07)
213.02 (158.85)	17014 (75.68)	4.70 (7.56)	2101	5.0 mph (8.0 km/h) 3.28	0.443 (0.269)	15.79 (3.11)	187 (86)	53 (12)	28.98 (98.14)
211.96 (158.06)	14975 (66.61)	5.31 (8.54)	2102	5.6 mph (9.0 km/h) 2.84	0.450 (0.274)	15.54 (3.06)	194 (90)	54 (12)	28.97 (98.10)
213.18 (158.97)	13496 (60.03)	5.92 (9.53)	2099	6.2 mph (10.0 km/h) 2.32	0.443 (0.270)	15.76 (3.11)	187 (86)	43 (6)	29.02 (98.27)
210.83 (157.22)	12117 (53.90)	6.52 (10.50)	2098	6.8 mph (11.0 km/h) 2.06	0.451 (0.275)	15.48 (3.05)	190 (88)	44 (7)	29.03 (98.31)
209.85 (156.48)	11035 (49.09)	7.13 (11.48)	2097	7.5 mph (12.0 km/h) 1.88	0.444 (0.270)	15.75 (3.10)	194 (90)	44 (7)	29.03 (98.31)
208.93 (155.80)	10111 (44.97)	7.75 (12.47)	2101	8.1 mph (13.0 km/h) 1.66	0.451 (0.274)	15.50 (3.05)	195 (90)	45 (7)	29.04 (98.34)
207.73 (154.91)	9328 (41.49)	8.35 (13.44)	2099	8.7 mph (14.0 km/h) 1.56	0.459 (0.279)	15.24 (3.00)	198 (92)	49 (9)	29.02 (98.27)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE: Manual mode was selected by placing the AutoPowr(IVT) selector in the OFF position. Auto mode was selected by placing the Autopowr (IVT) selector in position 3.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 115°F(46°C). This tractor had a power bulge of 11.9% which did not meet the manufacturer's claim of 13% power bulge. The performance figures on this summary were taken from a test conducted under the OECD Code II test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1874**, Nebraska Summary 528, August 7, 2006.

Leonard L. Bashford
 Director

M.F. Kocher
 V.I. Adamchuk
 J.A. Smith
 Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load at 4.6 mph (7.5 km/h)	72.0	71.8
Transport speed-no load		76.5
Bystander		86.8

TIRES, BALLAST AND WEIGHT

	With Ballast	Without Ballast
Rear Tires - No., size, ply & psi(kPa)	Six 480/80R46;***;9(60)	Four 480/80R46;***;9(60)
Ballast - Triples (total)	2120 lb (962 kg)	None
- Cast Iron (total)	4440 lb (2014 kg)	None
Front Tires - No., size, ply & psi(kPa)	Four 420/90R30;***;13(90)	Two 420/90R30;***;23(160)
Ballast - Duals (total)	1300 lb (589 kg)	None
- Cast Iron (total)	385 lb (175 kg)	None
Height of Drawbar	17.5 in (445 mm)	18.0 in (455 mm)
Static Weight with operator - Rear	21140 lb (9589 kg)	14820 lb (6722 kg)
- Front	12770 lb (5792 kg)	10845 lb (4919 kg)
- Total	33910 lb(15381 kg)	25665 lb(11641 kg)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED - 1800 RPM
MAXIMUM POWER AT SELECTED SPEED SETTINGS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Temp. °F(°C)	Air dry bulb	Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med		
					3.2 mph (5.2 km/h)				
184.49 (137.57)	24684 (109.80)	2.80 (4.51)	2112	11.69	0.511 (0.311)	13.68 (2.69)	185 (85)	49 (9)	28.66 (97.05)
					3.7 mph (6.0 km/h)				
200.40 (149.44)	23040 (102.49)	3.26 (5.25)	2073	9.20	0.489 (0.298)	14.29 (2.81)	198 (92)	52 (11)	28.70 (97.19)
					4.3 mph (7.0 km/h)				
222.07 (165.59)	22466 (99.93)	3.71 (5.97)	1986	7.66	0.462 (0.281)	15.13 (2.98)	205 (96)	53 (12)	28.73 (97.29)
					4.7 mph (7.5 km/h)				
228.38 (170.31)	22172 (98.63)	3.86 (6.22)	1950	7.26	0.451 (0.274)	15.49 (3.05)	202 (95)	53 (12)	28.74 (97.33)
					5.0 mph (8.0 km/h)				
234.19 (174.64)	21114 (93.92)	4.16 (6.69)	1912	5.83	0.445 (0.271)	15.71 (3.10)	205 (96)	53 (12)	28.98 (98.14)
					5.6 mph (9.0 km/h)				
240.37 (179.24)	20319 (90.38)	4.44 (7.14)	1800	5.44	0.439 (0.267)	15.94 (3.14)	205 (96)	54 (12)	28.97 (98.10)
					6.2 mph (10.0 km/h)				
243.75 (181.77)	18203 (80.97)	5.02 (8.08)	1805	3.69	0.430 (0.261)	16.26 (3.20)	205 (96)	43 (6)	29.02 (98.27)
					6.8 mph (11.0 km/h)				
245.45 (183.03)	16622 (73.94)	5.54 (8.91)	1800	3.16	0.423 (0.257)	16.51 (3.25)	203 (95)	44 (7)	29.03 (98.31)
					7.5 mph (12.0 km/h)				
246.28 (183.65)	15240 (67.79)	6.06 (9.75)	1799	2.79	0.424 (0.258)	16.49 (3.25)	206 (96)	45 (7)	29.03 (98.31)
					8.1 mph (13.0 km/h)				
245.66 (183.19)	14002 (62.28)	6.58 (10.59)	1798	2.45	0.422 (0.256)	16.58 (3.27)	204 (96)	46 (8)	29.04 (98.34)
					8.7 mph (14.0 km/h)				
245.69 (183.21)	12959 (57.65)	7.11 (11.44)	1799	2.21	0.422 (0.257)	16.56 (3.26)	202 (94)	51 (11)	29.00 (98.21)
					9.3 mph (15.0 km/h)				
245.35 (182.96)	12049 (53.60)	7.64 (12.29)	1799	2.05	0.427 (0.259)	16.39 (3.23)	201 (94)	52 (11)	28.99 (98.17)
					9.9 mph (16.0 km/h)				
244.12 (182.04)	11223 (49.92)	8.16 (13.13)	1799	1.82	0.427 (0.260)	16.35 (3.22)	201 (94)	53 (12)	28.98 (98.14)

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED - AUTO MODE
MAXIMUM POWER AT SELECTED SPEED SETTINGS

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)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
3.2 mph (5.2 km/h)									
181.72 (135.51)	24364 (108.38)	2.80 (4.50)	1880	13.03	0.500 (0.304)	13.98 (2.75)	196 (91)	49 (9)	28.67 (97.09)
3.7 mph (6.0 km/h)									
197.53 (147.30)	22277 (99.09)	3.33 (5.35)	1920	7.67	0.469 (0.285)	14.92 (2.94)	203 (95)	51 (11)	28.69 (97.16)
4.3 mph (7.0 km/h)									
206.31 (153.84)	19250 (85.63)	4.02 (6.47)	1916	4.91	0.446 (0.271)	15.68 (3.09)	203 (95)	53 (12)	28.72 (97.26)
4.7 mph (7.5 km/h)									
211.12 (157.43)	18385 (81.78)	4.31 (6.93)	1976	4.05	0.441 (0.268)	15.87 (3.13)	203 (95)	55 (13)	28.96 (98.07)
5.0 mph (8.0 km/h)									
212.33 (158.33)	17044 (75.81)	4.67 (7.52)	1988	3.57	0.442 (0.269)	15.82 (3.12)	201 (94)	53 (12)	28.98 (98.14)
5.6 mph (9.0 km/h)									
212.79 (158.68)	15007 (66.75)	5.32 (8.56)	1974	2.88	0.435 (0.265)	16.05 (3.16)	201 (94)	54 (12)	28.96 (98.07)
6.2 mph (10.0 km/h)									
213.08 (158.89)	13468 (59.91)	5.93 (9.55)	1983	2.40	0.433 (0.263)	16.16 (3.18)	198 (92)	43 (6)	29.02 (98.27)
6.8 mph (11.0 km/h)									
212.43 (158.41)	12131 (53.96)	6.57 (10.57)	1994	2.12	0.442 (0.269)	15.80 (3.11)	200 (93)	44 (7)	29.03 (98.31)
7.5 mph (12.0 km/h)									
211.44 (157.67)	11043 (49.12)	7.18 (11.56)	1995	1.89	0.436 (0.265)	16.03 (3.16)	200 (93)	45 (7)	29.03 (98.31)
8.1 mph (13.0 km/h)									
210.31 (156.83)	10109 (44.97)	7.80 (12.56)	1986	1.67	0.447 (0.272)	15.64 (3.08)	200 (93)	46 (8)	29.04 (98.34)
8.7 mph (14.0 km/h)									
208.67 (155.61)	9302 (41.38)	8.41 (13.54)	1994	1.47	0.445 (0.271)	15.70 (3.09)	204 (96)	50 (10)	29.01 (98.24)

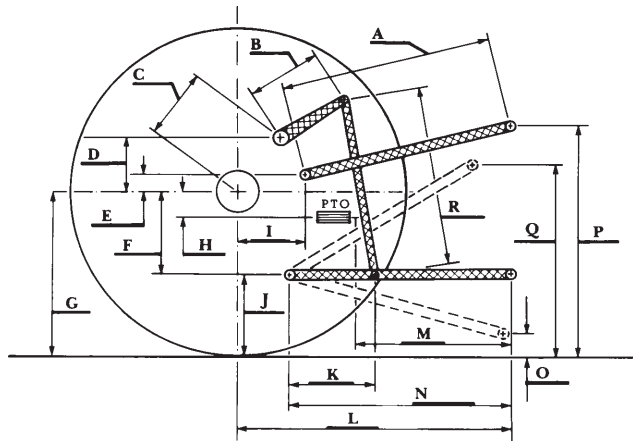
DRAWBAR PERFORMANCE
BALLASTED- FRONT DRIVE ENGAGED - 1800 RPM
MAXIMUM POWER AT SELECTED SPEED SETTINGS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
178.48 (133.09)	34671 (154.23)	1.93 (3.11)	2123	12.48	0.524 (0.319)	13.33 (2.63)	195 (91)	54 (12)	28.68 (97.12)
212.01 (158.09)	32283 (143.60)	2.46 (3.96)	2043	7.16	0.471 (0.286)	14.86 (2.93)	204 (95)	56 (13)	28.67 (97.09)
227.50 (169.65)	31181 (138.70)	2.74 (4.40)	1950	6.24	0.453 (0.276)	15.43 (3.04)	202 (95)	60 (16)	28.66 (97.05)
236.84 (176.61)	30313 (134.84)	2.93 (4.72)	1801	5.98	0.446 (0.271)	15.66 (3.09)	202 (94)	62 (17)	28.65 (97.02)
242.94 (181.16)	26144 (116.29)	3.48 (5.61)	1800	4.46	0.432 (0.263)	16.19 (3.19)	201 (94)	63 (17)	28.64 (96.99)
245.01 (182.70)	24836 (110.48)	3.70 (5.95)	1800	3.96	0.429 (0.261)	16.29 (3.21)	201 (94)	64 (18)	28.64 (96.99)
246.77 (184.02)	23024 (102.42)	4.02 (6.47)	1801	3.51	0.428 (0.260)	16.35 (3.22)	201 (94)	65 (18)	28.64 (96.99)
247.69 (184.70)	20420 (90.83)	4.55 (7.32)	1802	2.95	0.427 (0.260)	16.37 (3.23)	201 (94)	66 (19)	28.63 (96.95)
247.62 (184.65)	18316 (81.47)	5.07 (8.16)	1800	2.58	0.425 (0.259)	16.44 (3.24)	201 (94)	67 (19)	28.63 (96.95)
247.25 (184.38)	16579 (73.75)	5.59 (9.00)	1801	2.32	0.428 (0.261)	16.32 (3.22)	202 (95)	68 (20)	28.63 (96.95)
245.48 (183.05)	15059 (66.98)	6.11 (9.84)	1801	2.09	0.425 (0.258)	16.45 (3.24)	201 (94)	69 (21)	28.62 (96.92)
244.05 (181.99)	13813 (61.45)	6.63 (10.66)	1799	1.94	0.431 (0.262)	16.23 (3.20)	201 (94)	70 (21)	28.62 (96.92)
241.36 (179.98)	12627 (56.17)	7.17 (11.54)	1805	1.77	0.438 (0.266)	15.98 (3.15)	201 (94)	71 (22)	28.62 (96.92)
241.26 (179.91)	11782 (52.41)	7.68 (12.36)	1802	1.65	0.441 (0.268)	15.84 (3.12)	201 (94)	72 (22)	28.61 (96.88)
241.06 (179.76)	11057 (49.18)	8.18 (13.16)	1796	1.52	0.439 (0.267)	15.91 (3.13)	201 (94)	73 (23)	28.60 (96.85)

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY:	III	IVN
Quick Attach: Yes		
Lift cylinders:	<u>1x112 mm&1x100 mm</u>	<u>2x112 mm</u>
Maximum force exerted through whole range:	17719 lbs (78.8 kN)	18326 lbs (81.5 kN)
	<u>63 cc pump</u>	<u>85 cc pump</u>
i) Sustained pressure at compensator cutoff:	2980 psi (205 bar)	2990 psi (206 bar)
	two outlet sets combined three outlet sets combined	
ii) Pump delivery rate at minimum pressure and rated engine speed:	46.6 GPM(176.3 l/min)	61.9 GPM(234.3 l/min)
iii) Pump delivery rate at maximum hydraulic power:	47.0 GPM(177.8 l/min)	62.0 GPM(234.7 l/min)
Delivery pressure:	2479 psi (171 bar)	2444 psi (169 bar)
Power:	67.9 HP (50.7 kW)	88.4 HP (65.9 kW)
	single outlet set	
ii) Pump delivery rate at minimum pressure and rated engine speed:	42.1 GPM(159.3 l/min)	38.3 GPM(145.0 l/min)
iii) Pump delivery rate at maximum hydraulic power:	38.9 GPM(147.2 l/min)	33.6 GPM(127.2 l/min)
Delivery pressure:	2155 psi (149 bar)	2084 psi (144 bar)
Power:	48.9 HP (36.5 kW)	40.9 HP (30.5 kW)

HITCH DIMENSIONS AS TESTED—NO LOAD



	Category III		Category IVN	
	inch	mm	inch	mm
A	29.3	744	27.1	689
B	20.5	520	20.5	520
C	20.9	532	20.9	532
D	18.9	480	18.9	480
E	7.3	185	12.0	304
F	14.4	365	14.4	365
G	35.6	905	37.0	940
H	7.9	200	7.9	200
I	20.7	525	21.9	555
J	21.2	540	22.6	575
K	21.2	540	23.2	590
L	53.4	1357	56.6	1438
*L'	57.6	1462	62.5	1588
M	26.5	674	29.7	755
N	42.6	1081	45.7	1162
O	9.0	230	9.0	230
P	45.2	1149	49.7	1262
Q	39.4	1001	40.7	1035
R	42.8	1087	43.5	1106

*L' to quick attach ends



JOHN DEERE 8430 IVT DIESEL