OECD APPROVAL # 1268
(Restricted code)
Date of approval:July 16, 1990

CENTER FOR AGRICULTURAL EQUIPMENT
DEPARTMENT OF AGRICULTURAL ENGINEERING
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - EAST CAMPUS

REPORT ON TEST IN ACCORDANCE WITH OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTOR PERFORMANCE

CATERPILLAR CHALLENGER 65, RUBBER TRACKED TRACTOR.



MANUFACTURED BY: Caterpillar Inc.
100 N.E. Adams Street
Peoria, Illinois 61629, USA

NEBRASKA TEST NO.1613

Test date: September - October 1988

This test report provides the results of the tests conducted in accordance with the OECD Restricted Test Code for the Official Testing of Agricultural Tractor Performance - C(87)53 Final - Annex II.

The Caterpillar Challenger 65 was tested in accordance with the procedures of the OECD restricted test (Code II) for wheeled tractors i.e drawbar tests were conducted on concrete and slip was limited to 15% because the rubber tracked tractor is a type of agricultural tractor that is not fully covered by the present OECD codes.

This report has been approved by the OECD Coordinating Centre in Paris (CEMAGREF) on July 16, 1990

Caterpillar Challenger 65, rubber-tracked tractor
OECD # 1268

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SPECIFICATION OF TRACTOR.

Manufacturers name/address	:	Caterpillar Inc. 100 N.E. Adams Street Peoria , Illinois 61629, USA
Submitted for test by	:	The manufacturer.
Selected for test by	:	The manufacturer in agreement with the test station.
Place of running in	:	Caterpillar proving grounds.
Duration of running in	:	99 hours
Location of test	:	Center for Agricultural Equipment, University of Nebraska Lincoln, Nebraska, USA

TRACTOR.

Make	Caterpillar
Model	Challenger 65
Type	Unit construction, Track laying
Number of driving members	Two rubber tracks.
Serial number	*7YC00742*
1st Serial number	This model is the 1st of the 7YC series

ENGINE.

Make	Caterpillar
Model	3306 DITA
Type	Diesel, turbocharged and aftercooled.
Serial Number	08Z45452
Cylinders	
Number & Disposition	6, in-line, vertical
Bore x Stroke	120.6 x 152.4 mm (4.75 x 6.00 in)
Cubic capacity	10450 cu.cm (638 cu.in)
Compression Ratio	15 to 1
Arrangement of valves	Overhead
Cylinder liners	Wet, replaceable
Super charging/Intercooling	
Make/Model/Type	Schwitzer,S4DS011-1.42VIF, Exhaust gas driven.
Pressure	100-136 kPa (14.5-19.7 psi) at rated engine speed and load
Intercooler	Charge air heat exchanger with engine coolant.
Fuel System	
Feed system	Engine driven transfer pump
Make/Type/Model of filters	Primary - washable screen; Secondary - Caterpillar paper element, 1P2299
Fuel tank capacity	630 liter (166 US gallons)

Make/Model/Type of Injection Pump	Caterpillar NSFS - 10 mm
Production setting of pump	157 +/- 5 cu.mm/stroke @ 2100 rpm, using 1.6 mm I.D.x 788 mm length line.
Flow Rate (at 2100 engine rpm and full load)	42.2 - 46.6 Kg/hr (92.9 - 102.6 lb/hr)
Make/Model/Type of injectors	Caterpillar part # 8N7003
Injection pressure	90 MPa (13000 psi)
Timing	14 degrees before TDC

Governor

Make/Model/Type	Caterpillar mechanical.
Governed engine speed range	From 880 to 2280 rev/min
Rated engine speed	2100 rev/min
high-idle speed range	2280 +/- 60 rev/min

Air Cleaner.

Pre-cleaner	
Make/Model/Type	Caterpillar 8N6883
Air intake location	Right front, above hood.
Main Cleaner	
Make/Model/Type	Caterpillar,7W5316, dry paper dual element
Maintenance indicator	Restriction gage on engine.

Lubrication system.

Type of feed pump	Gear pump
Type of filters	Spin - on, Caterpillar 1W3300
Number	One
Oil cooler	Heat exchanger with engine coolant

Cooling System.

Type of coolant	Liquid
Type of pump & drive	Centrifugal, belt driven
Fan specification	Schwitzer, direct drive
Number of fan blades	8
Fan diameter	914 mm (36 in.)
Coolant system capacity	42 liter (44 qt)
Type of temperature control	Thermostat
Superpressure system	48 kPa (7 psi)

Starting system.

Make/Model/Type of starter	Delco 42MT ,electric
Power Rating	5.6 kW (7.5 hp)
Cold starting aid	Ether spray in intake manifold.
Safety device	Transmission neutral switch.

Electrical System.	
Voltage & grounding.	12 Volt DC;negative ground
Generator	
Make/Model/Type	Delco 27SI-belt driven
Power rating	100 Ampere at 2200 engine rev/min
Batteries	
Number & connection	2-12V batteries in parallel
Rating	100 Ampere-hours per battery at 20 hour rating.
Exhaust system.	
Make/Model/Type	Donaldson, (Cat.Part No.7W6186) expansion chamber
Location	Underhood muffler; vertical exhaust pipe, right front side.

TRANSMISSION.

Clutch. (travel)	
Make/Type	Caterpillar, wet disc,integral with transmission.
Number of plates	6
Plate diameter	190 mm (7.5 in)
Method of operation	Hydraulic, foot pedal.
Gear Box.	
Make/Type	Caterpillar, direct drive, powershift
Arrangement	Four rotating countershaft clutches and four stationary planetary clutches
Number of gears	10 forward and 2 reverse, controlled by a single hand lever
Oil cooler	heat exchanger with engine coolant
Available options	none
Rear axle and final drives.	
Make/Type	Caterpillar/outboard single reduction pinion and bull gear
Differential Lock	Not applicable

Gear ratios and travel speeds.

Gear Number	Number of Engine revolutions for one revolution of the driving wheels	Nominal travel speed at rated engine speed of 2100 rev/min [km/h]	[mph]
1 fwd	99.535	4.2	2.6
2 fwd	65.923	6.4	4.0
3 fwd	55.880	7.5	4.7
4 fwd	48.798	8.6	5.3
5 fwd	42.491	9.9	6.1
6 fwd	37.009	11.3	7.0
7 fwd	32.320	13.0	8.1
8 fwd	28.143	14.9	9.3
9 fwd	21.773	19.2	12.0
10 fwd	14.421	29.1	18.1
1 rev	135.731	3.1	1.9
2 rev	57.942	7.2	4.5

POWER - TAKE - OFF.

Main Power-Take-Off.

Type	Independent
Method of engagement	Multiplate wet clutch hydraulically actuated by hand lever, independent of main drive clutch
Number of shafts	One

Standard PTO.

Location	Rear of tractor in vertical center plane.
Diameter of shaft	45 mm (1.75 in.)
Number of splines	20; conforms to ISO 500/1979.
Height above ground	724 mm (28.5 in.)
Distance from median plane of tractor	0 mm
Distance behind rear axle	382 mm (15.0 in.)
PTO Speed @ rated engine speed	1025 rev/min
Engine speed @ standard PTO speed	2050
Ratio of Engine rpm to PTO rpm	2.05 to 1
Direction of Rotation (viewed facing driving end)	Clockwise.

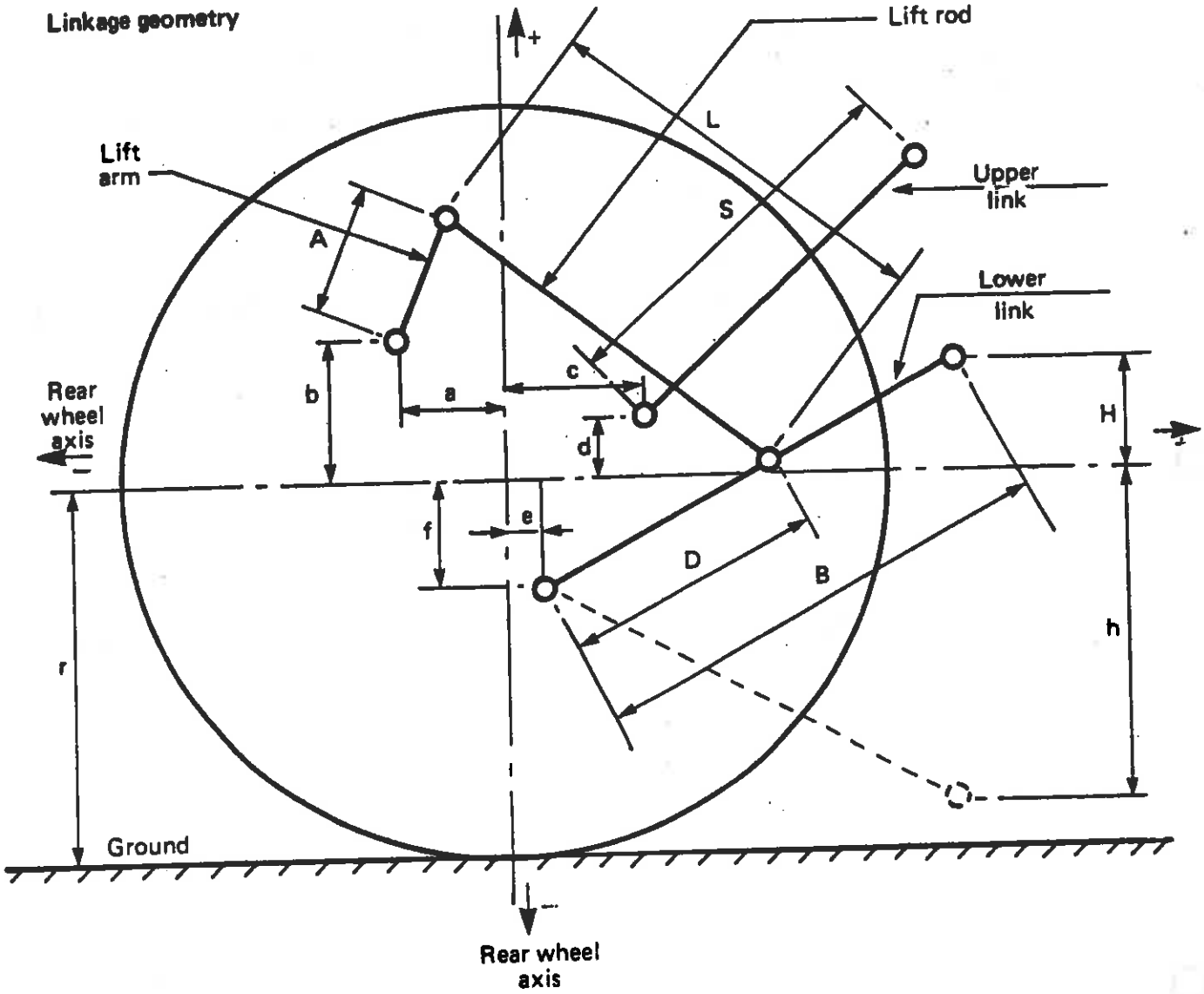
POWER LIFT.

Make	Caterpillar
Type of hydraulic system	Closed center; load sensing
Number/Type of cylinders	Two single acting, external.
Type of linkage lock for transport	Electrohydraulic position control
Compensator setting	17.6 +/- 0.35 MPa (2550 +/- 50 psi)
Opening pressure of cylinder safety valve	20.7 +/- 0.5 MPa (3000 +/- 72 psi)
Lift pump type	Cessna load sensing piston pump
Power transmission to pump	Gear drive from transmission.
Type/Number of filters	1 spin-on cartridge
Location of oil reservoir	Behind cab
Number/Type/Location of tapping points.	3 pairs of ISO standard couplings at rear of tractor (A 4th set is optional)
Max. oil volume available for external cylinders.	40 l (10.6 gal)

THREE POINT LINKAGE

Category 3 in conformity with ISO 730/1-1977
Category adapter - none

Linkage geometry



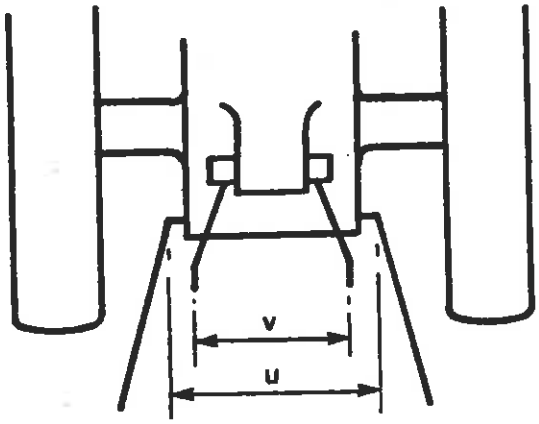


Table 1. - Linkage geometry dimensions.

		Dimension or range [mm]	Dimension or range [in]	Settings used on test [mm]	Settings used on test [in]
Category		III			
Height of Rear axle above ground	(r)	600	23.6		
Length of lift arms	(A)	545	21.5	same	
Length of lower links	(B)	765	30.1	same	
Distance of lift arm pivot from rear wheel axis: horizontal	(a)	225	8.9	same	
Distance of lift arm pivot from rear wheel axis: vertical	(b)	415	16.3	same	
Horizontal distance between the 2 lower link points	(u)	860	33.9	same	
Horizontal distance between the 2 lift arm end points	(v)	1040	40.9	same	
Length of upper link	(s)	640 to 740	25.2 to 29.1	648	25.5
Distance of upper link pivot from rear axle centerline: horizontal	(c)	370	14.6	same	
Distance of upper link pivot from rear axle centerline: vertical	(d)	422	16.6	same	
Distance of lower link pivot from rear wheel axis: horizontal	(e)	265	10.4	same	
Distance of lower link pivot from rear wheel axis: vertical	(f)	98	3.9	same	
Distance of lower link pivot points to lift rod pivot points on lower links.	(D)	535	21.1	same	
Length of lift rods	(L)	560 to 660	22.0 to 26.0	657	25.9
Height of lower hitch points relative to rear axle: In low position	(h)	230 to 375	9.1 to 14.8	371	14.6
Height of lower hitch points relative to rear axle: In high position	(H)	470 to 350	18.5 to 13.8	362	14.3
Height above ground of lower hitch points when locked in transport position.		950 to 1070	37.4 to 42.1	962	37.9

SWINGING DRAWBAR.

Type		Oscillating
Height above ground		424 mm (16.7 in)
Adjustments		None
Distance of hitch point from rear axle:	horizontal	840 mm (33.1 in)
	vertical	174 mm (6.9 in)
Distance of hitch point from PTO shaft end:	Vertical	299 mm (11.8 in)
	Horizontal	509 mm (20.0 in)
Lateral adjustment;	Right side	134 mm (5.3 in)
	Left side	134 mm (5.3 in)
Distance of pivot point from rear axle;	horizontal	730 mm (28.7 in)
Diameter of drawbar pin hole		40 mm (1.6 in)
Maximum vertical static permissible load;		18 kN (4050 lb)

STEERING.

Make/Model/Type	Caterpillar differential steer
Method of operation	Linde piston pump and motor, pilot activated valves controlled by steering wheel.
Working pressure	42.0 MPa (6090 psi)
Oil cooler	Radiator ahead of main radiator

BRAKE SYSTEM.

Service brake.

Make/Model/Type	Caterpillar, caliper, dry disc
Method of operation	Manual/Hydraulic; foot pedal control.

Parking brake.

Type	Caliper, dry disc.
Method of operation	Manual/mechanical, hand lever.

TRACKS

Number.	Two
Width of single track belt	626 mm (24.6 in)
Crawler base (Wheel base)	2718 mm (107.0 in)
Track guage	2150 mm (84.6 in)
Track guage adjustment	None

CAB STRUCTURE.

Make/model/type	Caterpillar//3W5036/Cab
Manufacturers name/address	Caterpillar Inc. 100 N.E. Adams street Peoria, Ill. 61629, USA
Protective device	Cab, not tiltable.
OECD approval number	None.

DRIVER'S SEAT.

Make/Model/Type	Grammer/D585H/90AR
Type of suspension	Adjustable spring suspension with swivel and fore/aft isolators
Type of damping	Hydraulic
Range of adjustment	
Longitudinal	150 mm (5.9 in.)
Vertical	15 mm (0.6 in.)

LIGHTING.

	Height above ground of center		Size	Distance from outside edge to median plane of tractor	
	[mm]	[in]	[mm]	[mm]	[in]
Headlights	886	34.9	105 x 165	1280	50.4
Side lights	None				
Rear lights	886	34.9	109.5 x 109.5	1092	43.0
Rear reflectors	886	34.9	50 x 64	1182	46.5
Stop lights	886	34.9	109.5 x 109.5	979	38.5

TEST CONDITIONS.

Overall dimensions.

Length	5718 mm (225.1 in)
Width- Minimum	2862 mm (112.7 in)
Height - Top of Cab	3284 mm (129.3 in)
- Top of exhaust	3492 mm (137.5 in)
Ground clearance	422 mm (16.6 in)
Clearance-limiting part	Drawbar anchor point

Tractor Mass (with Cab)

		Without driver		With driver	
		[kg]	[lb]	[kg]	[lb]
Unballasted	Total	15068	33220	15143	33385

Note: This tractor has no facilities for adding ballast.

TRACK SPECIFICATIONS.

Make	Caterpillar
Dimensions	
Belt (track) width	626 mm (24.6 in)
Belt (track) length	8598 mm (338.5 in)
Ground contact length	2718 mm (107.0 in)
Chosen track guage	2150 mm (84.6 in) not adjustable
Track drive	Solid rubber lugged steel wheels
Air pressure in front idlers	620 kPa (90 psi)

Oils and Lubrication.

Capacity and change interval:

	Capacity liter	Capacity quart	Oil change hrs	Filter change hrs
Engine (w/o filter)	25	26	250	250
Transmission	55	58	1000	500
Differential/final drive	93	98	1000	--
Hydraulic system	61	64	1000	1000
Steering system	35	37	1000	1000

Oil and Lubricant specifications:

	Recommended	Used during test
Engine oil		
Type	Caterpillar CXP	same
Viscosity	SAE 15W40	
Classification	API-CD	
Transmission		
Type	Caterpillar CXP	same
Viscosity	SAE 30W	
Classification	CD/TO-2	
Hydraulic fluid		
Type	Caterpillar CXP	same
Viscosity	SAE 10W	
Classification	HYDO	
Grease		
Number of lubrication points	24	

Fuel.

Type/grade	Diesel Fuel "Premier";grade 2-D
Density (Pto test)	0.828 g/cubic-cm (6.910 lbs/gallon) at 15°C (59°F)
(Drawbar test)	Same as Pto test.
Cetane number	51.2
Viscosity	2.33 cSt at 37.8°C (100°F)

COMPULSORY TESTS.

(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 rev/min).

Date of tests : September 2, 1988
Location of tests : Center for Agricultural Equipment, University of Nebraska, Lincoln, Nebraska.
Type of Dynamometer: Eaton Dynamatic 2025 D.G.

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
1.1 Maximum power - 2 hour test.						
177.41 (237.91)	1900	927	52.96 (13.99)	43.85 (96.68)	0.247 (0.406)	3.35 (17.00)
1.2 Power at rated engine speed.- 1 hour						
173.21 (232.29)	2101	1025	54.66 (14.44)	45.25 (99.77)	0.261 (0.430)	3.17 (16.09)
1.3 Maximum power at standard PTO speed.(1000 rev/min)						
176.21 (236.30)	2049	1000	54.35 (14.36)	45.01 (99.22)	0.255 (0.420)	3.24 (16.46)

1.4 Part Loads - Governor hand lever set for maximum power at rated engine speed.

Power kW (hp)	Speeds engine rev/min	PTO rev/min	Fuel Consumption hourly l/h (gal/h)	hourly kg/h (lb/h)	specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at maximum power at rated engine speed.						
173.21 (232.29)	2101	1025	54.66 (14.44)	45.25 (99.77)	0.261 (0.430)	3.17 (16.09)
(ii) 85% of the torque obtained in (i).						
149.57 (200.58)	2148	1047	49.63 (13.11)	41.10 (90.60)	0.275 (0.452)	3.01 (15.30)
(iii) 75% of the torque defined in (ii).						
115.62 (155.05)	2192	1070	41.25 (10.90)	34.16 (75.30)	0.295 (0.486)	2.80 (14.23)
(iv) 50% of the torque defined in (ii).						
78.33 (105.04)	2240	1092	33.20 (8.77)	27.49 (60.60)	0.351 (0.577)	2.36 (11.98)
(v) 25% of the torque defined in (ii).						
39.72 (53.27)	2272	1108	24.16 (6.38)	20.00 (44.10)	0.504 (0.828)	1.64 (8.35)
(vi) Unloaded.						
0.40 (0.54)	2302	1124	17.58 (4.65)	14.56 (32.10)	36.495 (59.997)	0.02 (0.12)

1.5 Part Loads - Governor hand lever set for maximum power at standard PTO speed.

Power kW (hp)	Speeds engine rev/min	Speeds PTO rev/min	Fuel Consumption hourly l/h (gal/h)	Fuel Consumption hourly kg/h (lb/h)	Fuel Consumption specific kg/kW.h (lb/hp.h)	Specific energy kW.h/l (hp.h/gal)
(i) Torque obtained at standard PTO speed						
176.21 (236.30)	2049	1000	54.35 (14.36)	45.01 (99.22)	0.255 (0.420)	3.24 (16.46)
(ii) 85% of the torque obtained in (i).						
154.58 (207.30)	2114	1032	50.13 (13.24)	41.50 (91.50)	0.268 (0.441)	3.08 (15.66)
(iii) 75% of the torque defined in (ii).						
118.52 (158.94)	2162	1055	41.74 (11.03)	34.56 (76.20)	0.292 (0.479)	2.84 (14.41)
(iv) 50% of the torque defined in (ii).						
80.81 (108.37)	2212	1079	32.05 (8.47)	26.54 (58.50)	0.328 (0.540)	2.52 (12.80)
(v) 25% of the torque defined in (ii).						
41.08 (55.09)	2250	1097	24.49 (6.47)	20.28 (44.70)	0.494 (0.811)	1.68 (8.52)
(vi) Unloaded.						
0.20 (0.26)	2282	1113	16.11 (4.25)	13.34 (29.40)	67.512 (110.988)	0.01 (0.06)

No load maximum engine speed		2302 rev/min
Equivalent engine torque:		
	at rated engine speed	787 Nm(2200 rev/min)
	at maximum power	891 Nm(1900 rev/min)
	at maximum torque	1002 Nm(1400 rev/min)
Mean atmospheric conditions:		
	Temperature-dry bulb	26°C (80°F)
	Relative humidity	58 %
	Barometer	98.21 kPa(29.00 in.Hg)

Maximum temperatures:

Thermostat housing	91°C (196°F)
Engine oil pan	99°C (210°F)
Fuel at injection pump	61°C (142°F)
Engine air intake	32°C (90°F)
Trans./Hydr.oil	67°C (152°F)

Turbocharger boost pressure

at rated engine speed	107 kPa (15.5 psi)
at maximum power	110 kPa (16.0 psi)

2. POWER LIFT AND HYDRAULIC PUMP PERFORMANCE TEST.

Date of test: September 15, 1988
Location:CAE/UNL, Lincoln, Nebr.

2.1 HYDRAULIC POWER TEST - Hydraulic pump performance.

i. Sustained pressure with relief valve open. 17.2 MPa (2500 psi)

ii. Pump delivery rate @ minimum pressure & rated engine speed. 106.7 l/min (28.2 gpm)

iii.

	Flow rate l/min (gal/min)	Pressure Mpa (psi)	Power kW (hp)
At 90% of relief valve setting	96.9 (25.6)	15.5 (2250)	25.1 (33.6)
At maximum hydraulic power	96.9 (25.6)	15.5 (2250)	25.1 (33.6)

Tapping point(s) Two hydraulic outlets combined

Hydraulic fluid temperature:

in oil reservoir	60°C (141°F)
at flow meter	64°C (147°F)

2.2 POWER LIFT TEST.

This test was conducted at the Caterpillar facility under supervision by staff of the Center for Agricultural Equipment. Date of test: October 11, 1988.

		Hitch points	Frame
Lower hitch points above ground - down position:	[mm/inch]	229/9.0	229/9.0
Vertical movement:	[mm/inch]	731/28.8	810/31.9
Maximum corrected force through full range:	[kN/lb]	72.0/16185	54.8/12313
Corresponding pressure:	[kPa/psi]	15327/2223	
Moment about rear axle:	[kN.m/lb.ft]	87.8/64738	100.2/73876
Maximum mast tilt angle:	[deg]	--	7.4

Lifting height relative to horizontal position of lower links.

	[mm]	-267	-201	-99	0	99
	[in]	-10.5	-7.9	-3.9	0	3.9
Corrected lift forces						
Hitch point.	[kN]	125.7	115.6	107.9	101.5	96.3
	[lb]	28251	25980	24263	22808	21652
at frame	[kN]	127.0	113.6	103.3	94.9	87.5
	[lb]	28548	25537	23224	21335	19673

Lifting height relative to horizontal position of lower links.

	[mm]	198	300	394	465	544
	[in]	7.8	11.8	15.5	18.3	21.4
Corrected lift forces						
Hitch point	[kN]	91.0	85.5	79.9	72.0	--
	[lb]	20459	19230	17956	16185	--
at frame	[kN]	80.2	71.6	62.9	60.9	54.8
	[lb]	18028	16103	14142	13699	12313

3. DRAWBAR PERFORMANCE.

Location: CAE/UNL, Lincoln, Nebr.

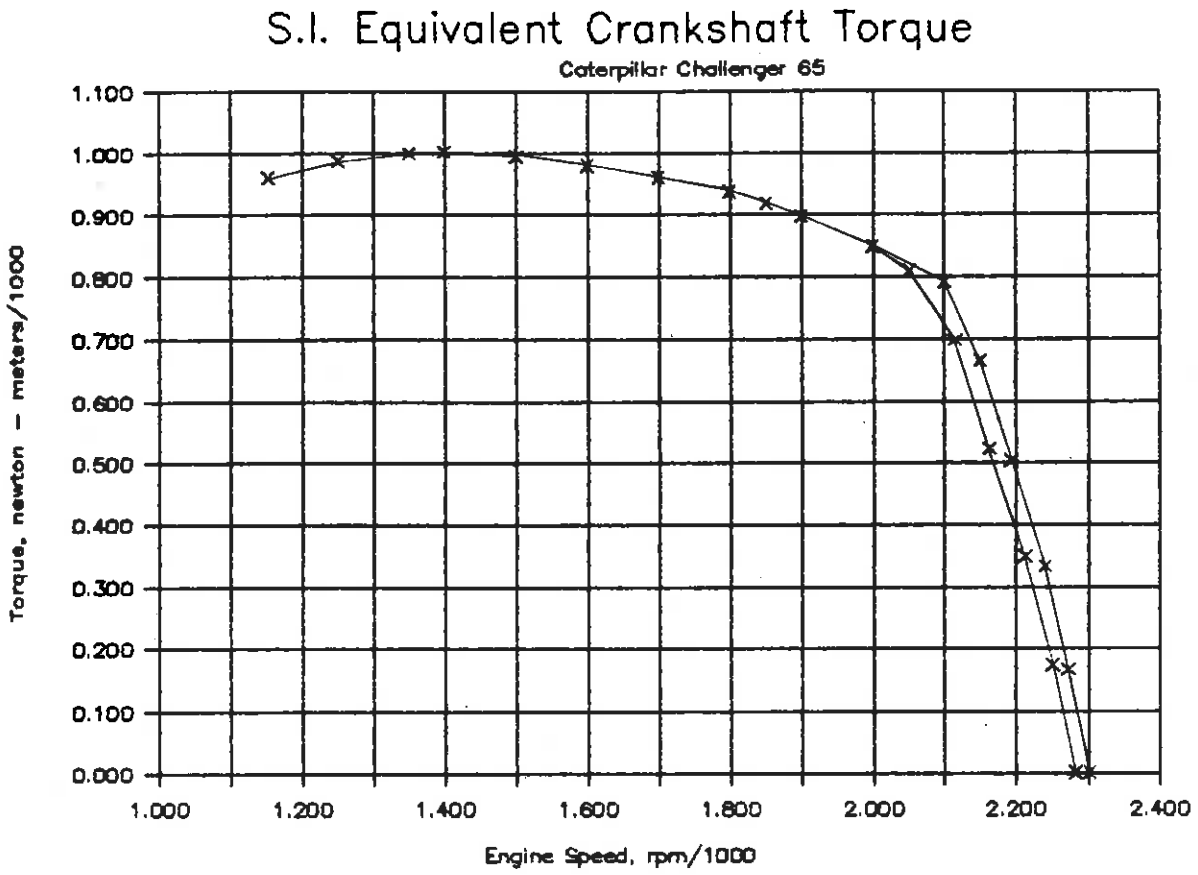
Date of tests: 06-Sep-88 12-Sep-88 Fuel density: 0.828 kg/l
Type of track: concrete

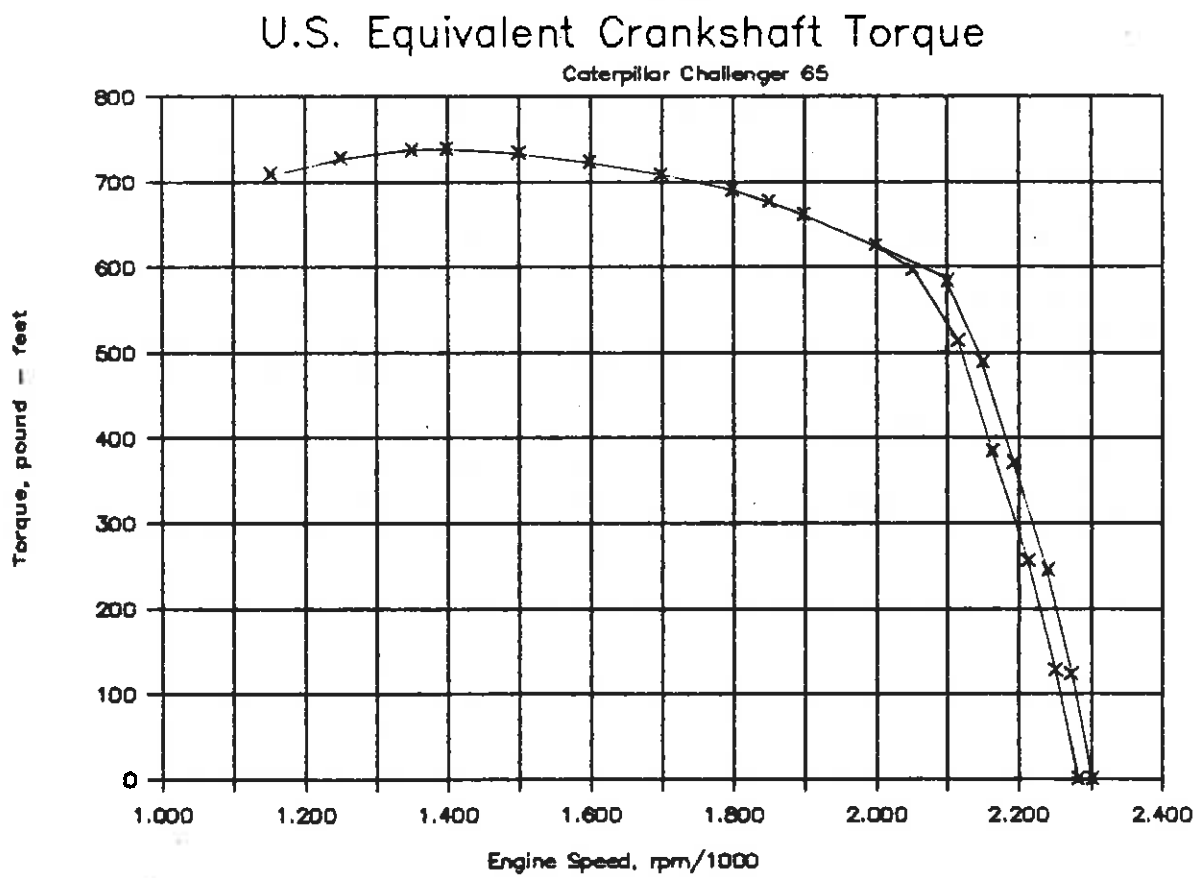
Gear	Speed	Power	Pull	Engine Speed	Slip	SFC		Temperature, °C					Rel hum	Pressure
	km/h	kW	kN	rev/min	%	kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	%	kPa
I. Maximum Power (unballasted, RPM 1900) Drawbar height: 419 mm														
1st	3.44	139.12	145.38	2004	13.66%	0.325	2.55	54	83	94	19	13	50	97.09
2nd	5.52	156.36	101.92	1901	3.37%	0.281	2.94	57	84	96	21	12	32	98.14
3rd	6.59	159.38	87.08	1900	2.14%	0.276	3.00	56	84	96	21	12	32	98.17
4th	7.59	159.22	75.52	1902	1.72%	0.276	3.00	56	85	96	22	13	34	98.14
5th	8.72	158.05	65.27	1897	1.41%	0.278	2.98	56	85	96	22	13	34	98.10
6th	10.04	156.14	55.97	1899	1.14%	0.280	2.95	56	85	96	23	13	30	98.07
7th	11.52	155.33	48.54	1900	1.04%	0.283	2.93	56	86	96	24	13	26	98.07
8th	13.25	153.23	41.62	1900	0.88%	0.288	2.87	56	86	96	24	13	26	98.04
IIy. Short Term Part Load Tests														
(1) Maximum power														
3rd	6.59	159.38	87.08	1900	2.14%	0.276	3.00	56	84	96	21	12	32	98.17
(2) 75% of pull at maximum power														
3rd	7.49	135.76	65.29	2142	1.46%	0.305	2.71	56	83	95	24	13	26	97.90
(3) 75% of maximum power at reduced engine speed														
4th	7.47	135.39	65.28	1866	1.46%	0.281	2.95	53	84	94	25	13	22	97.87
(4) 50% of pull at maximum power														
3rd	7.74	93.58	43.54	2203	0.93%	0.349	2.37	55	82	93	26	14	24	97.83
(5) 50% of pull at maximum power reduced engine speed														
4th	7.74	93.62	43.53	1926	0.99%	0.311	2.66	53	81	92	26	14	24	97.80

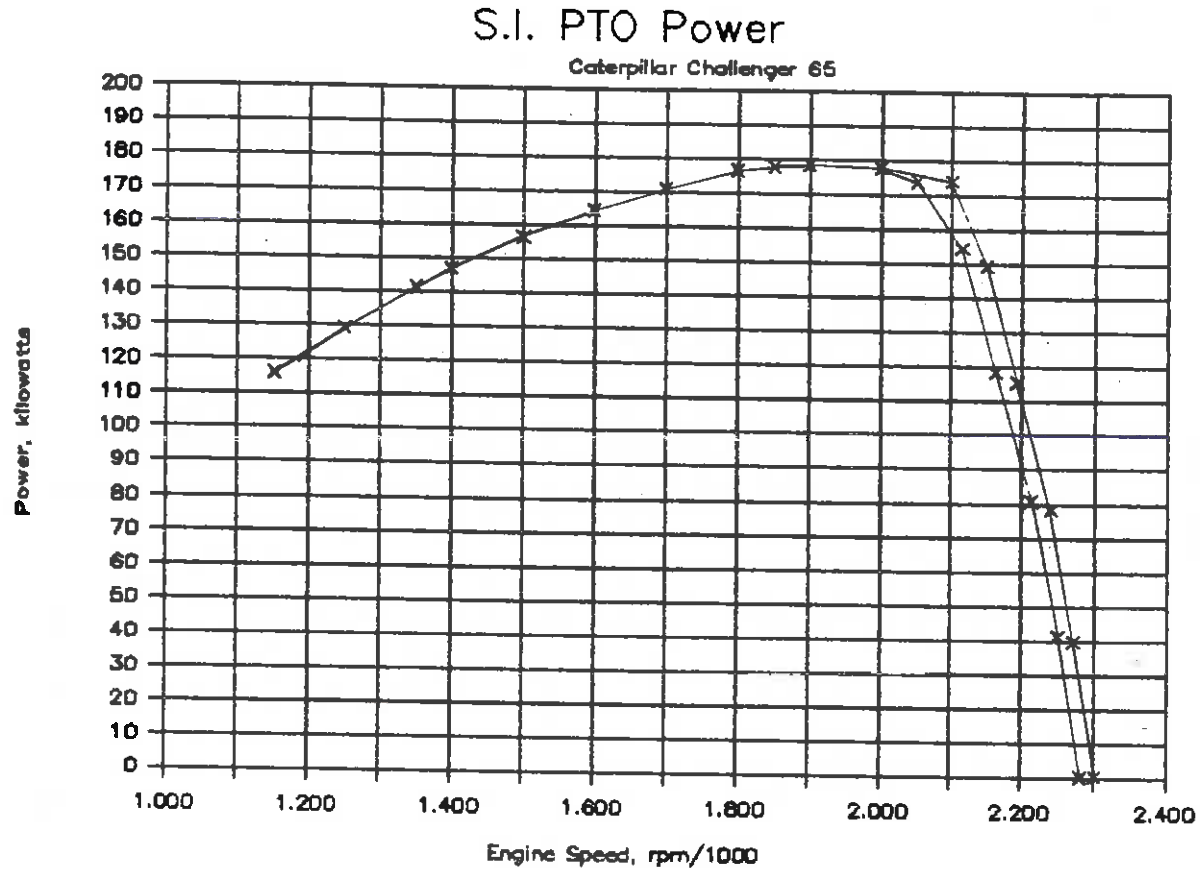
OECD Drawbar Data (US)

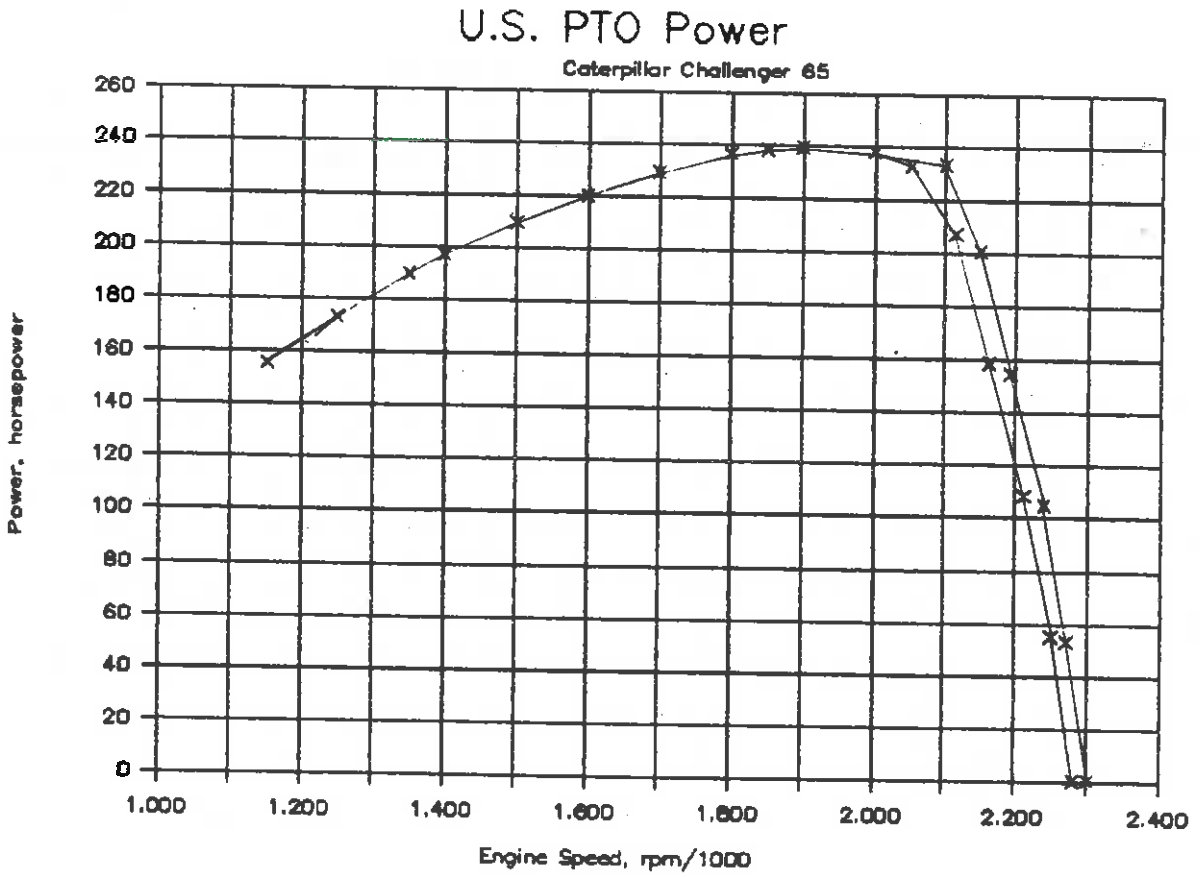
Date of tests: 06-Sep-88 12-Sep-88 Fuel density: 6.910 lb/gal
Type of track: concrete

Gear	Speed	Power	Pull	Engine Speed	Slip	SFC		Temperature, °F				Pressure
	mph	hp	lb	rpm	%	lb/hp-hr	hp-hr/gal	Fuel	Coolant	Oil	Dry	Wet	in Hg
I. Maximum Power (unballasted, RPM 1900) Drawbar height: 16.5 in													
1st	2.14	186.56	32684	2004	13.66%	0.534	12.95	130	181	201	66	55	28.87
2nd	3.43	209.68	22912	1901	3.37%	0.462	14.95	134	184	204	70	54	28.98
3rd	4.09	213.73	19577	1900	2.14%	0.454	15.22	133	184	204	69	54	28.99
4th	4.72	213.52	16978	1902	1.72%	0.454	15.23	132	185	205	71	55	28.98
5th	5.42	211.95	14674	1897	1.41%	0.457	15.11	133	185	205	72	55	28.97
6th	6.24	209.39	12583	1899	1.14%	0.461	14.99	133	186	206	74	56	28.96
7th	7.16	208.30	10912	1900	1.04%	0.465	14.88	133	186	205	75	56	28.96
8th	8.23	205.48	9358	1900	0.88%	0.474	14.58	132	186	206	76	56	28.95
IIy. Short Term Part Load Tests													
(1) Maximum power													
3rd	4.09	213.73	19577	1900	2.14%	0.454	15.22	133	184	204	69	54	28.99
(2) 75% of pull at maximum power													
3rd	4.65	182.06	14678	2142	1.46%	0.502	13.77	132	182	203	76	56	28.91
(3) 75% of pull at maximum power reduced engine speed													
4th	4.64	181.56	14676	1866	1.46%	0.461	14.98	128	183	202	77	56	28.90
(4) 50% of pull at maximum power													
3rd	4.81	125.49	9789	2203	0.93%	0.574	12.03	131	179	200	78	57	28.89
(5) 50% of pull at maximum power reduced engine speed													
4th	4.81	125.54	9785	1926	0.99%	0.512	13.50	128	178	198	78	57	28.88


S.I. Equivalent Crankshaft Torque
Caterpillar Challenger 65
Torque, newton - meters/1000
1.100
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
Engine Speed, rpm/1000

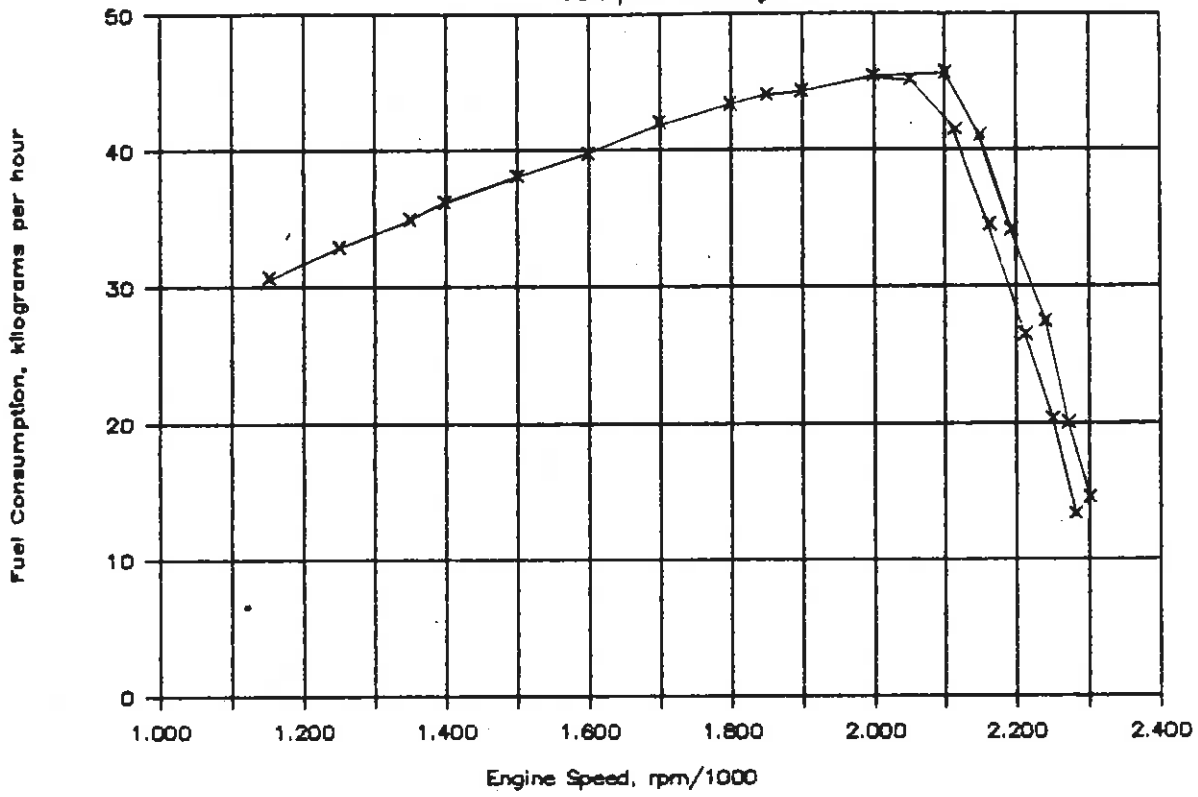

U.S. Equivalent Crankshaft Torque
Caterpillar Challenger 65
Torque, pound - feet
800
700
600
500
400
300
200
100
0
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
Engine Speed, rpm/1000


S.I. PTO Power
Caterpillar Challenger 65
Power, kilowatts
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
Engine Speed, rpm/1000


U.S. PTO Power
Caterpillar Challenger 65
Power, horsepower
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
Engine Speed, rpm/1000

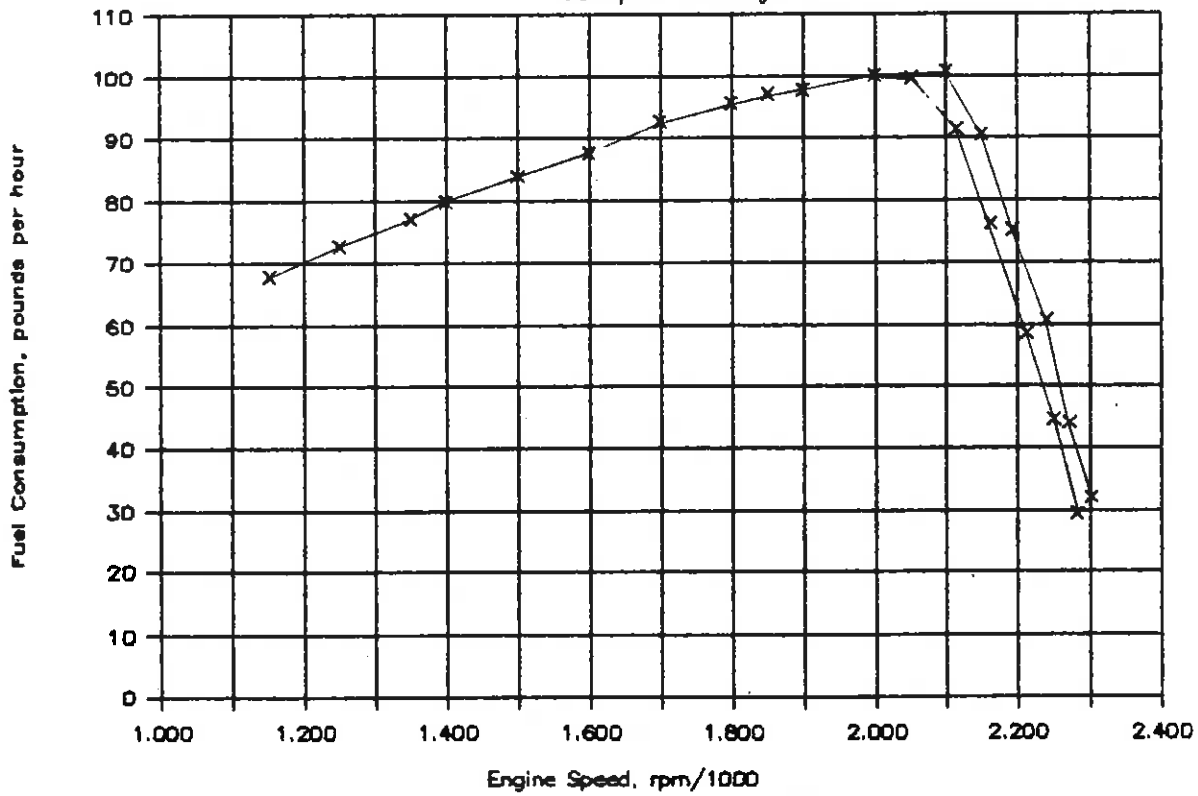
S.I. Fuel Consumption

Caterpillar Challenger 65

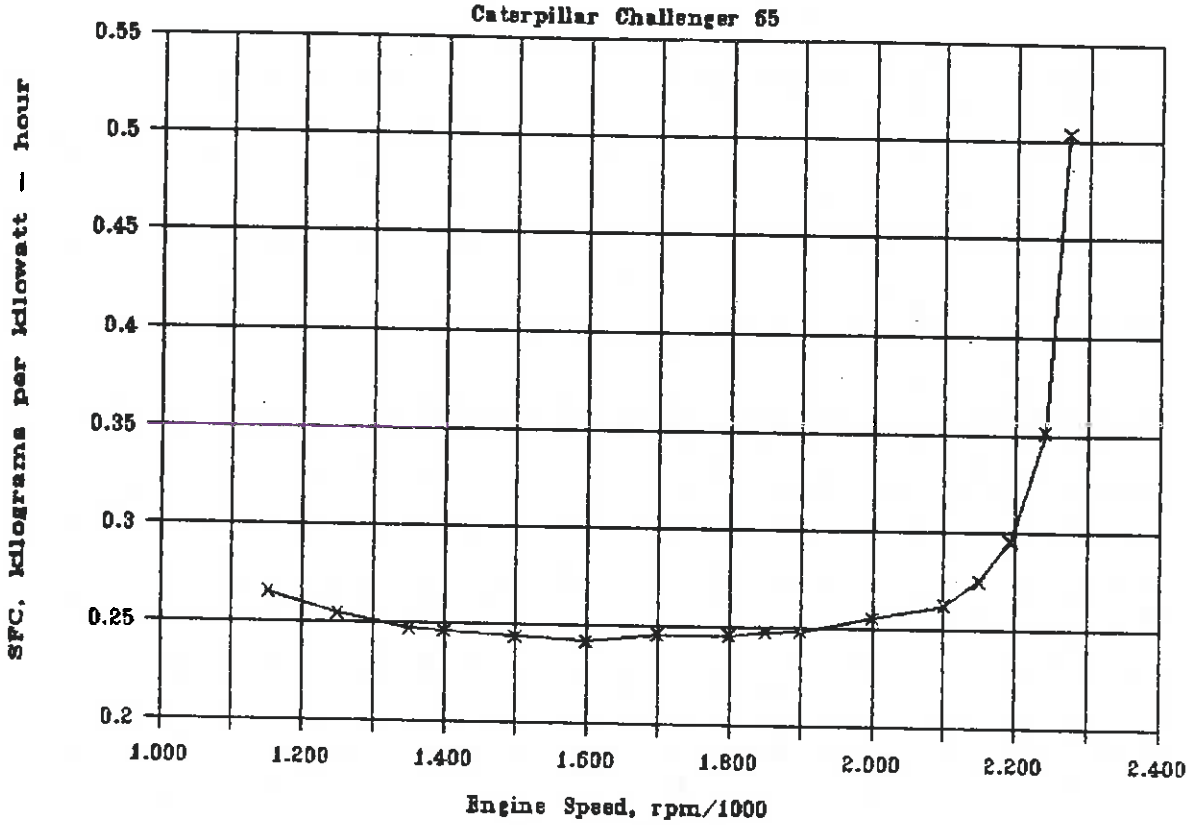


U.S. Fuel Consumption

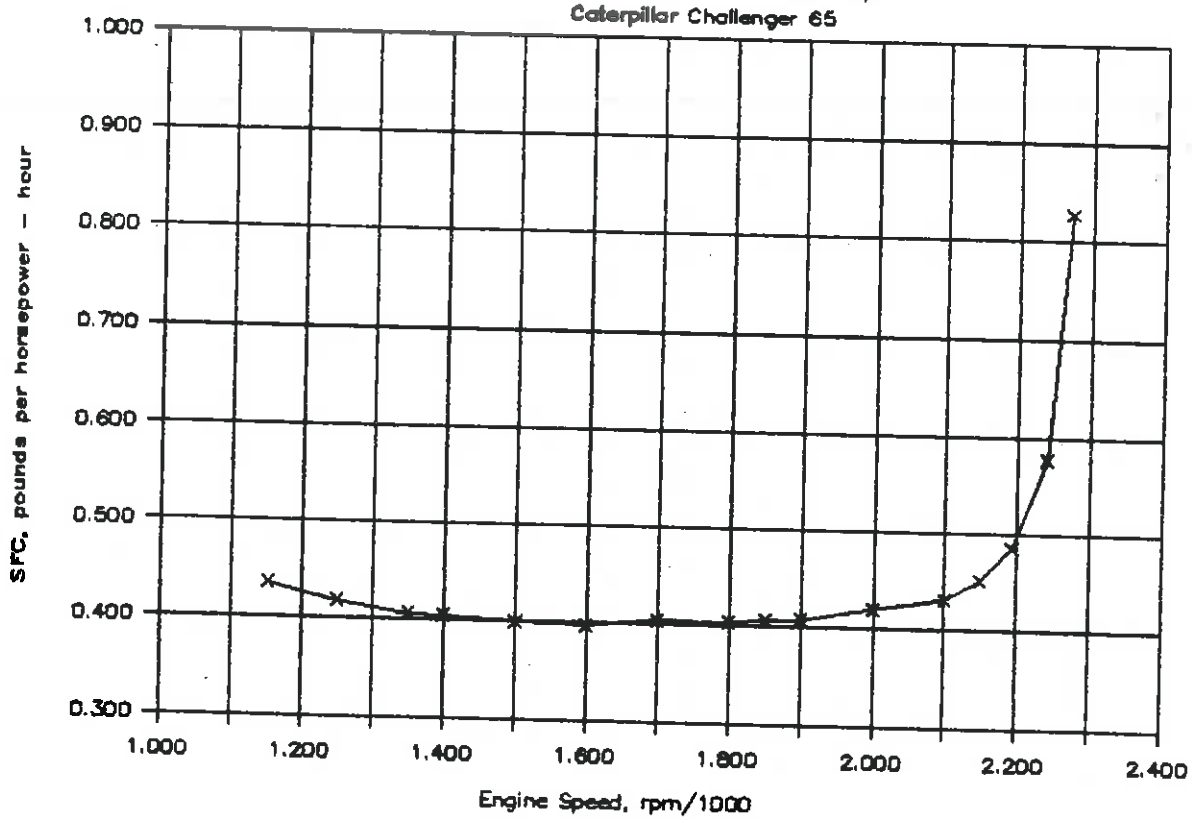
Caterpillar Challenger 65

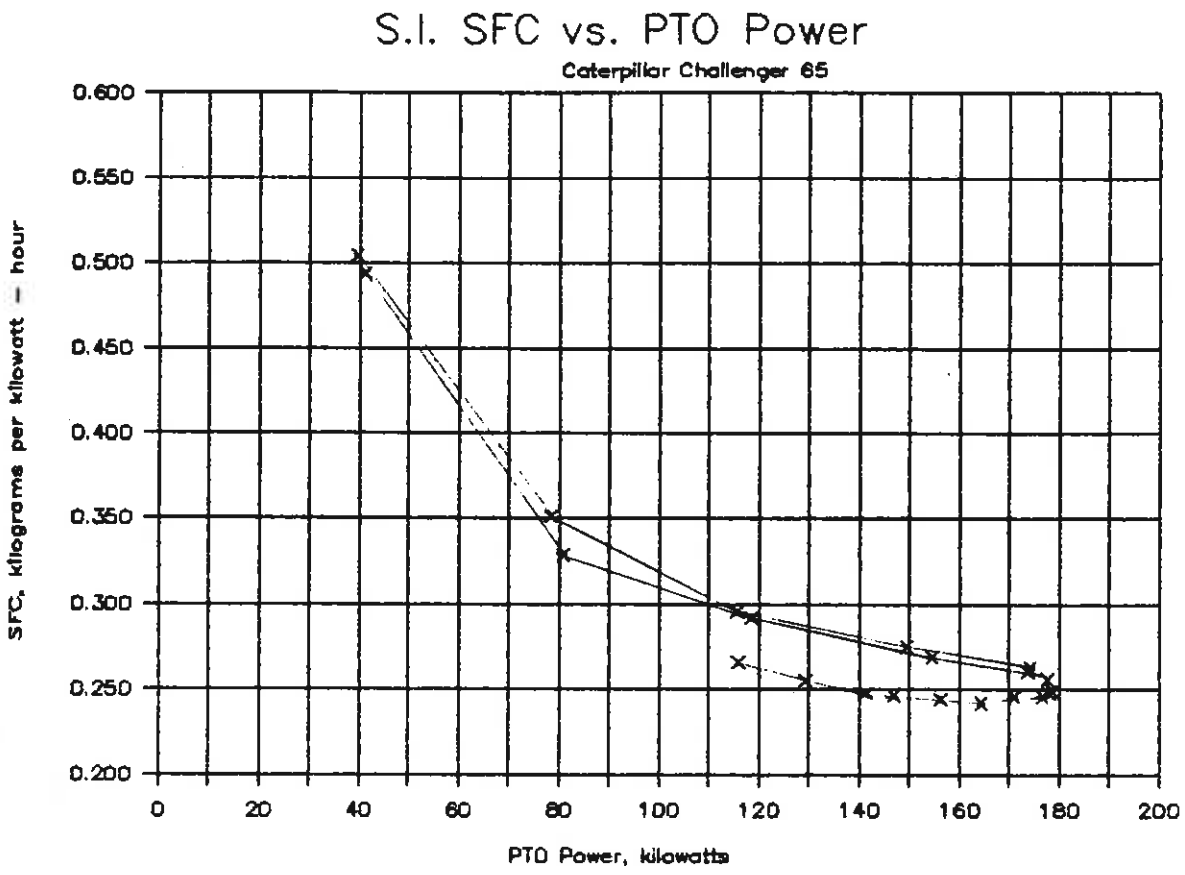


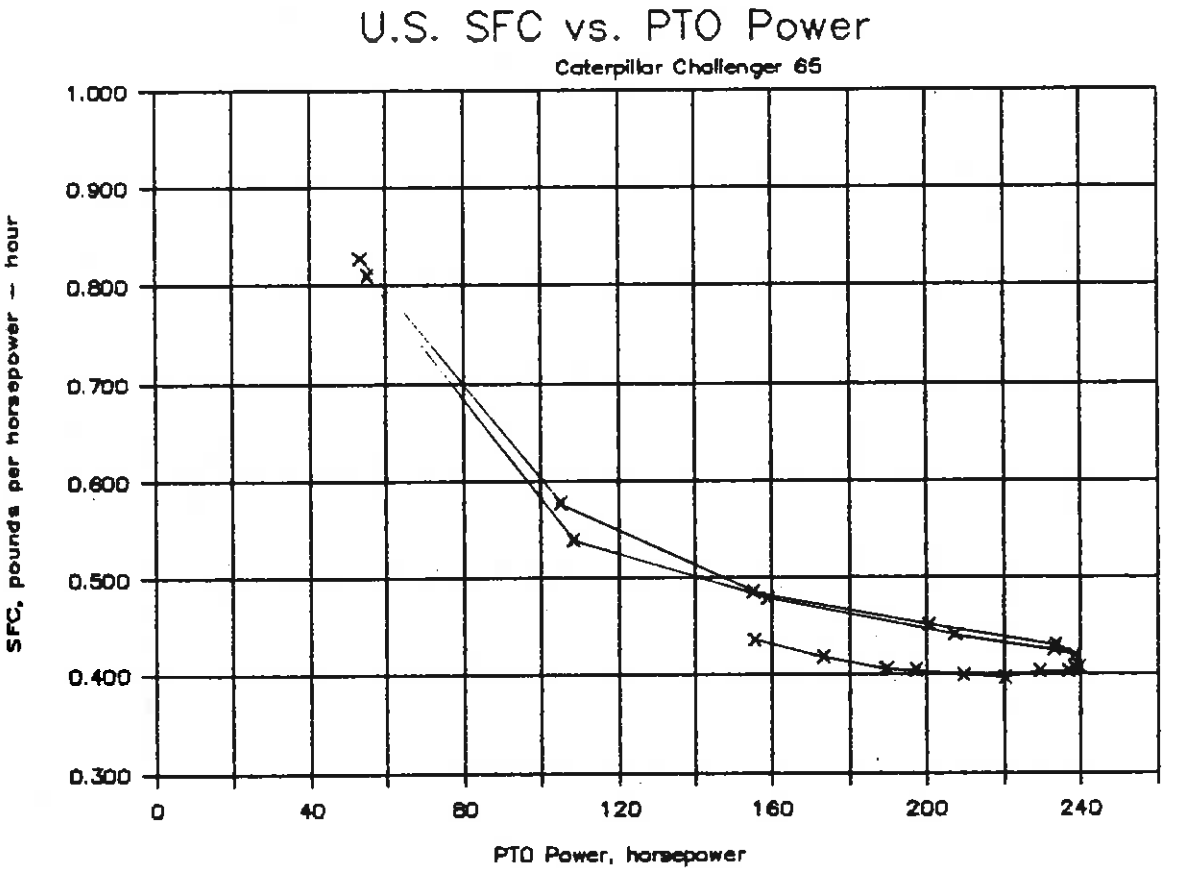
Specific Fuel Consumption (SI)



U.S. Specific Fuel Consumption




S.I. SFC vs. PTO Power
Caterpillar Challenger 65
SFC, kilograms per kilowatt - hour
0.600
0.550
0.500
0.450
0.400
0.350
0.300
0.250
0.200
0
20
40
60
80
100
120
140
160
180
200
PTO Power, kilowatts


U.S. SFC vs. PTO Power
Caterpillar Challenger 65
SFC, pounds per horsepower - hour
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0
40
80
120
160
200
240
PTO Power, horsepower

4. OPTIONAL TEST RESULTS

4.1 DRAWBAR PERFORMANCE AT 2100 RPM

Date of tests: 06-Sep-88 12-Sep-88 Fuel density: 0.828 kg/l
Type of track: concrete

Gear	Speed	Power	Pull	Engine Speed	Slip	SFC		Temperature, °C					Rel hum	Pressure
	km/h	kW	kN	rev/min	%	kg/kW.h	kW.h/l	Fuel	Coolant	Oil	Dry	Wet	%	kPa
II. Maximum Power (unballasted, RPM 2100) Drawbar height: 419 mm														
1st	3.93	144.46	132.41	2116	6.78%	0.311	2.66	55	81	93	17	12	55	97.12
2nd	6.17	152.47	88.98	2101	2.29%	0.295	2.81	56	83	95	21	12	32	98.17
3rd	7.32	153.83	75.67	2100	1.62%	0.292	2.84	56	83	95	21	12	32	98.17
4th	8.40	153.92	65.98	2099	1.46%	0.293	2.82	57	84	95	22	13	34	98.14
5th	9.66	152.72	56.89	2099	1.14%	0.296	2.80	57	84	95	22	13	34	98.10
6th	11.11	149.67	48.48	2098	1.04%	0.301	2.75	57	84	96	23	13	30	98.10
7th	12.74	148.63	42.00	2098	0.88%	0.304	2.73	57	84	95	24	13	26	98.07
8th	14.65	145.38	35.72	2099	0.77%	0.310	2.67	57	84	95	24	13	26	98.04

Date of tests: 06-Sep-88 12-Sep-88 Fuel density: 6.910 lb/gal
Type of track: concrete

Gear	Speed	Power	Pull	Engine Speed	Slip	SFC		Temperature, deg F					Pressure
	mph	hp	lb	rpm	%	lb/hp-hr	hp-hr/gal	Fuel	Coolant	Oil	Dry	Wet	in Hg
Maximum Power (unballasted, RPM 2100) Drawbar height: 16.5 in													
1st	2.44	193.73	29766	2116	6.78%	0.512	13.51	131	179	199	63	53	28.68
2nd	3.83	204.46	20005	2101	2.29%	0.485	14.25	134	182	203	70	54	28.99
3rd	4.55	206.28	17012	2100	1.62%	0.480	14.41	134	182	203	69	54	28.99
4th	5.22	206.42	14834	2099	1.46%	0.482	14.34	134	183	203	71	55	28.98
5th	6.00	204.80	12790	2099	1.14%	0.486	14.21	135	183	204	72	55	28.97
6th	6.91	200.71	10899	2098	1.04%	0.494	13.98	134	184	205	73	55	28.97
7th	7.92	199.32	9442	2098	0.88%	0.499	13.85	135	184	204	75	56	28.96
8th	9.10	194.96	8031	2099	0.77%	0.510	13.54	134	184	204	76	56	28.95