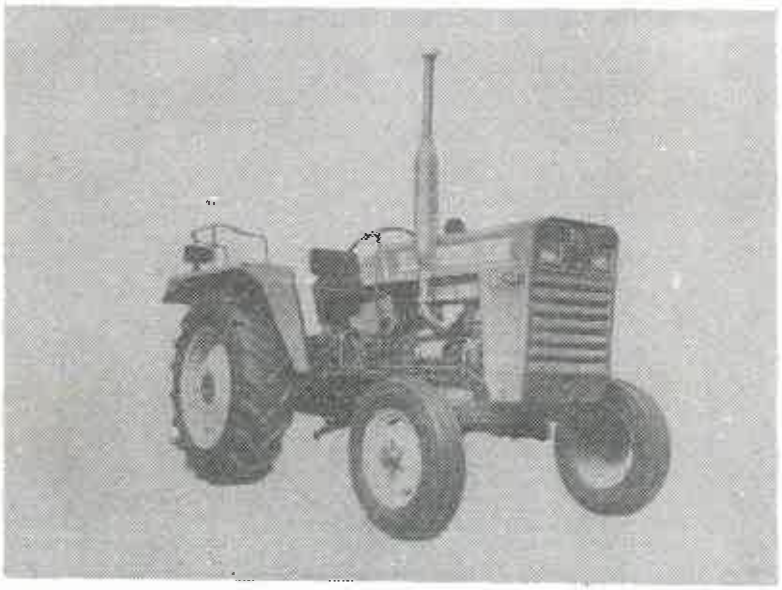
COTTEC

CHINA
OFFICIAL TRACTOR
TEST AND
EVALUATION CENTRE

Address: Luoyang
tractor research institute
Luoyang, Henan, China
Tel: 221001
Cable: 4282
Telex: 473048 LTRI CN

OECD TEST REPORT OF SH—50(2WD) AGRICULTURAL TRACTOR (CODE I)

Report on test in accordance with the OECD standard code for the official testing of agricultural tractor performance (C(87)53(Final), Code I)



OECD Approval
No. 1239
Date Feb. 26, 1990

Tested Tractor
Make: Shanghai Tractor Works
Model: Shang Hai-50
Type: Standard

Submitted for test by
Name: Shanghai Tractor Works
Address: Shanghai, China
Tel: 5480006 Cable: 8230

This report includes 25 pages and may only be duplicated as a whole

SH—50 COTTEC Test No. 891433 OECD No. 1239

TABLE OF CONTENTS

Page

SPECIFICATIONS OF TRACTOR ..... (3)

TEST CONDITIONS ..... (12)

TEST RESULTS ..... (15)

COMPULSORY TESTS ..... (15)

1. Main power take-off performance ..... (15)

2. Hydraulic power and lifting force ..... (17)

3. Drawbar performance ..... (19)

4. Turning area and turning circle ..... (20)

5. Location of centre of gravity ..... (20)

6. Braking ..... (20)

7. Measurement of external noise level ..... (21)

OPTIONAL TEST ..... (21)

8. Performance in a hot atmosphere ..... (21)

REPAIRS AND ADJUSTMENTS DURING TESTS ..... (23)

REMARKS ..... (23)

ANNEX I Main power take-off test curves ..... (24)

This report has been approved by the OECD Co-ordinating Centre in Paris (CEMAGREF) on Feb. 26, 1990 Approved No. 1239

SH—50 COTTEC Test No. 891433 OECD No. 1239

Tractor manufacturer' s name and address:	Shanghai Tractor Works Shanghai, China
Location of tractor assembly:	The manufacturer
Submitted for test by:	The manufacturer
Selected for test by:	The manufacturer with the agreement of the COTTEC
Place of running-in:	COTTEC, Luoyang, Henan, China
Duration of running-in:	40 hours
Location of test:	COTTEC, Luoyang, Henan, China

SPECIFICATIONS OF TRACTOR

TRACTOR

—Make:	Shanghai Tractor Works
—Model:	Shang Hai—50
—Type:	Standard
—Number of driving wheels:	2
—Serial No. :	7372
—1st Serial No. :	110517

ENGINE

—Make:	Shanghai Internal Combusion Engine Works
—Model:	495A
—Type:	4 stroke, water cooling, spherical combusion chamber
—Serial No. :	11710

Cylinders

—Number:	4	
—Disposition:	Vertical, in line	
—Bore/Stroke:	95/115	mm
—Capacity:	3260	cm^3
—Compression ratio:	16.5/1	
—Arrangement of valves:	Overhead, in line	
—Cylinder liners:	Dry type	

Fuel system

—Fuel feed system:	Forced feed type	
—Fuel filter:		
. Make:	Huangpu Automobile Accessory Works	
. Model /type:	C0708, replaceable paper catridge	
—Capacity of fuel tank:	62	dm^3
—Injection pump		
. Make:	Shanghai Injector and Plunger Pump Works	
. Model/type:	No. 1, plunger pump, in line	
. Serial No. :	1144	
—Manufacturer' s production setting of injection pump:		
. Flow rate (rated engine speed and full load):	12. 0	dm^3/h
. Timing:	25°—27° before T. D. C.	
—Injectors:		
. Make:	Shanghai Injector and Plunger Pump Works	
. Model/Type:	Long-neck closed single-hole	
. Injection pressure:	17. 2	MPa

Governor

—Make:	Shanghai Injector and Plunger Pump Works	
—Model/type:	Mechanical, Incorporated into fuel injection pump	
—Governed range of engine speed:	550～2160	rev/min
—Rated engine speed:	2000	rev/min

Air cleaner

. Make:	Shanghai Automobile Accessory Works	
. Model/Type:	Centrifugal stack cap	
. Location of air intake:	Above bonnet	
—Main cleaner:		
• Make:	Shanghai Automobile Accessory Works	
• Model/Type:	Oil bath with mesh screen	
• Location of intake:	Below bonnet	
—Maintenance indicator:	None	

Lubrication system

—Type of feed pump:	Rotor	
—Type & Number of filter(s):	Full flow, paper, replaceable, 1	

Cooling system

—Type of coolant:	Water	

—Type of pump:	Centrifugal, belt driven	
—Description of fan:	Axial flow type, belt driven,	
—Number of fan blades:	4	
—Fan diameter:	380	mm
—Coolant capacity:	5.7	dm^3
—Type of temperature control:	Thermostat	
—Superpressure system	None	

Starting system

—Make:	Shanghai Automobile Electrical Machinery Factory	
—Model/Type:	2Q2C D. C. solenoid pre-engaged	
—Starter motor power rating:	1.84	kW
—Cold starting aid:	Electorthermic plug	
—Safety device:	Main shift lever in neutral position	

Electrical system

—Voltage:	12 (Negative earth)	V
—Generator:		
. Make:	Shanghai 2nd Automobile Electrical Machinery Factory	
. Model/Type:	2JF200, alternator, belt driven	
. Power:	0.20	kW
—Battery (number of accumulators):		
. Model/Type:	3—Q(A)—150, Lead acid	
. Number:	2	
. Rating:	150	Ah at 20 hours rating

Exhaust system

—Make:	Own make	
—Model/Type:	SH—50, expension type silencer	
—Location:	Left-hand side of engine, vertical	

TRANSMISSION TO WHEELS

Clutch

—Make:	Own make	
—Model/Type:	Dry, dual-acting	
—Number of plate(s):	2	
—Diameter of plate(s):	295 for travel / 246 for P. T. O.	mm

—Method of operation: Mechanically by pedal

Gear box

—Make: Own make
—Model/Type: SH—50, Spur gear
—Arrangement: (3+1)×2 compound, planetary reduction
—Number of gears: 6 forwards and 2 reverses
—Available options: Creeper device

Rear axle and final drives

—Make: Own make
—Model/Type: Crown wheel and pinion bevel gear differential, spur gear final drives
—Differential lock:
- Type: Mechanical
- Method of engagement: Manual by level
- Method of disengagement: Self-disengaging

Front axle and final drives

—Make: Shanghai Tractor Chassis Works
—Model/Type: Balanced arm type, telescopic axle
—Available options: Front wheel drive axle

Total ratios and travelling speeds

Gear No.	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed * at rated engine speed of 2000 rev/min km/h
1	L	207.24	2.15
2	L	125.63	3.54
3	L	66.29	6.71
4	H	51.82	8.58
5	H	31.40	14.17
6	H	16.57	26.85
R_1	L	157.05	2.83
R_2	H	39.26	11.33

* Calculated with a tyre dynamic radius index of 590 mm (ISO 4251/1—1984)

POWER TAKE-OFF

Main power take—off

—Type:	Semi-independent	
—Method of engagement:	By hand level	
—Number of shafts:	1	
—Method of changing power take-off shaft ends and speeds:	None	

Power take-off proportional to engine speed

540 rev/min

—Location:	At rear of the tractor	
—Diameter of power take-off shaft end:	35	mm
—Number of splines:	6, in conformity with ISO 500/1979	
—Height above ground:	560	mm
—Distance from the median plane of the tractor:	0	mm
—Distance behind rear wheel axis:	322	mm
—PTO speed at rated engine speed:	563	rev/min
—Engine speed at standard power take-off speed:	1918	rev/min
—Ratio of rotation speeds (engine speed/p. t. o. speed):	3. 5524	
—Power restriction and maximum torque: (Manufacturers recommendation)	33kW 348 N·m	
—Direction of rotation(viewed from behind tractor):	Clockwise	

POWER LIFT

—Make:	Own make	
—Type of hydraulic system:	Integral, open centre system	
—Type and number of cylinders:	Single acting, 1	
—Type of linkage lock for transport:	Mechanical	
—Relief valve pressure setting:	17. 2	MPa
—Life pump type:	4 plungers, double row	
—Transmission between pump and engine:	Driven from gear box	
—Type and number of filter(s):	Metal mesh filter, 1	
—Site of oil reservior:	Common with rear axle	
—Tapping point(s)		
• Type:	Thread	
• Number:	1	
• Location:	On the rockshaft housing	

—Maximum volume of oil available to external cylinders: 14.0 dm^3

Three point linkage

—Category: II to ISO 730/1—1977

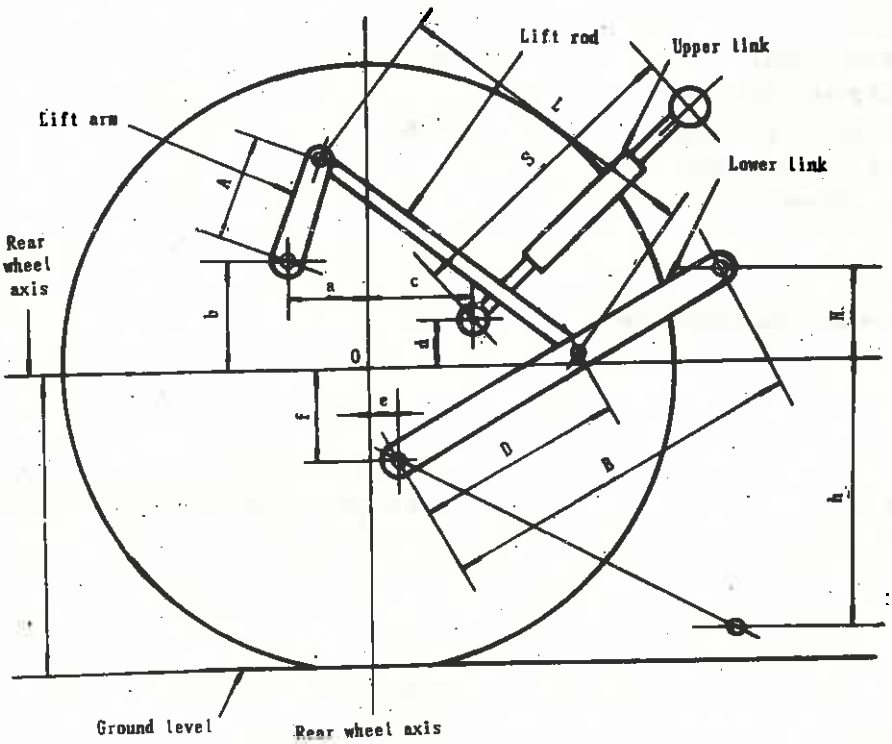
—Category adapter: None

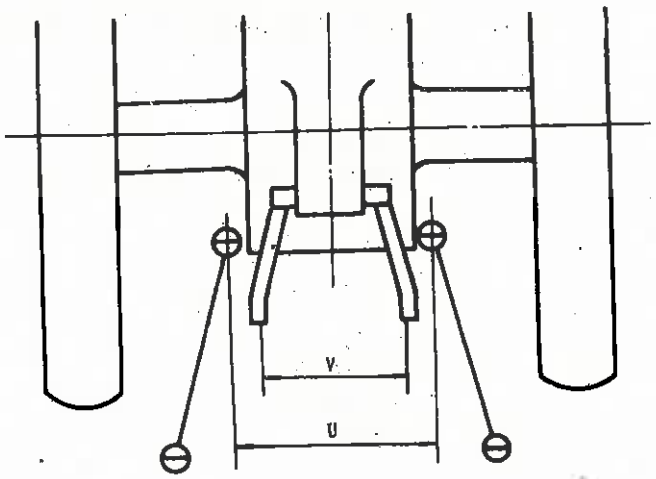
—Linkage geometry: See next page and following table

			Dimension or range * mm	Setting used in test mm
Length of lift arms		(A)	230	
Length of lower links		(B)	800	800
Distance of lift arm pivot point from rear wheel axis:	Horizontally	(a)	314	
	Vertically	(b)	315.5	
Horizontal distance between the 2 lower link points		(u)	500	
Horizontal distance between the 2 lift arm end points		(v)	532	
Length of upper link		(S)	from 500 to 827	622
Distance of upper link pivot point from rear wheel axis:	Horizontally	(c)	120, 126	
	Vertically	(d)	278, 348	
Distance of lower link pivot point from rear wheel axis:	Horizontally	(e)	—58	
	Vertically	(f)	125	
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	423	
Length of lift rods		(L)	from 642 to 718	700
Height of lower hitch points relative to the rear wheel axis:				
in low position		(h)	from 220 to 462	390
in high position		(H)	from 366 to 238	250
Height above ground of lower hitch points when locked in transport position			from 946 to 820	

* Assuming (r) with a tyre dynamic radius index of 590 mm (ISO 4251/1—1984)

Linkage geometry:





TRAILER HITCH

—Type:	Fixed	
—Hole diameter:	32	mm
—Height above ground:	500	mm
—Distance of hitch point from rear wheel axis, horizontally:	576	mm
—Distance of hitch point from power take-off shaft end:		
. Vertically:	90	mm
. Horizontally:	254	mm
—Maximum vertical permissible load:	8.0	kN

STEERING

—Make:	Shanghai Gear Works
—Model/Type:	Screw and nut recirculating ball, two drag rods
—Method of operation:	Manual operated

BRAKES

—Make:	Own make
—Model/Type	Dry disc, double plates
—Method of operation:	By pedals, coupled or independent
—Trailer braking take-off:	Air brake, operated by tractor pedals

Parking brake

—Type:	Mechanical
—Method of operation:	Pedals locked by ratchet

WHEELS

—Number		
. Front:	2, steering	
. Rear:	2, driving	
—Wheelbase:	1900	mm

—Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	1313	1513	Telescopic axle
Rear	1346	1498	Reversing wheels and off-set lug rims

DRIVER'S SEAT

—Make: Own make
—Model/Type: SH-50 Suspension seat
—Type of suspension: Leaf spring
—Type of damping None
—Range of adjustment:
. Longitudinal: 45 mm
. Vertical: 0 mm

MISCELLANEOUS

—Additional seat: On the left and right fender
—Number of places: 2

LIGHTING

	Height above ground of center mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlight	1270	140×90	170
Sidelight	1145	130×40	320
Rearlight	1490	140×90	650
Brakelight	1310	100×70	650

SH—50 COTTEC Test No. 891433 OECD No. 1239

TEST CONDITIONS

OVERALL DIMENSIONS

	Length mm	Width		Height at top of	
		Minimum mm	Maximum mm	protective structure mm	exhaust silencer mm
Ballasted	3058	1585	1840	—	2290
Unballasted	3058	1585	1690	—	2295

GROUND CLEARANCE(unballasted tractor): 400 mm

—Clearance limiting part: Under the engine oil sump

TRACTOR MASS

Without protective structure:

	Ballasted		Unballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	844	856	764	775
Rear	1505	1568	1145	1209
Total	2349	2424	1909	1984

BALLAST

	Weights		Water kg
	Number	Total mass kg	
Front	4	80	—
Rear	12	360	—
Optional	—	—	—

TYRE SPECIFICATIONS

	Front	Rear
Tyres:		
Dimensions	6.00—16	12.4—28
Ply rating	6	6
Type	Cross ply	Cross ply
Maximum load (tyre manufacturer's)	4.6 kN	10.0 kN
Inflation pressure (tyre manufacturer's)	250 kPa	140 kPa
Dynamic radius index	346 mm	590 mm
Chosen track width:	1313 mm	1346 mm

OILS AND LUBRICATION

Capacity and change interval:

	Capacity dm^3	Oil change h	Filter change h
Engine	10	125	125
Gear box	34	1000	—
Rear axle	Common with gear box		1000
Final drive (rear)	Common with gear box		1000
Hydraulic system	Common with gear box		—
Steering	1	1000	—

SH—50　　COTTEC Test No. 891433　　OECD No. 1239

Specifications:

	Recommended	Used during test
Engine oil		
Type:	SAE 10W/30	CA 30
Viscosity:	9.3～12.5 cSt at 100℃	10.0～12.5 cSt at 100℃
Classification:	API CC	GB 5323—85
Transmission oil		
Type:	SAE 80W 90	Hyperbola gear oil No.18
Viscosity:	13.5～24.0 cSt at 100℃	18～22 cSt at 100℃
Classification:	API GL—4	SY 8074—83
Hydraulic fluid		(China standard)
Type:		
Viscosity:	Same as trans. oil	Same as trans. oil
Classification:		
Steering oil		
Type:		
Viscosity:	Same as trans. oil	Same as trans. oil
Classification:		

Grease

—Type: Multi—purpose grease

—Number of lubrication points: 13

Fuel

—Type: No. 0 diesel fuel in conformity with GB 252-87 (China standard)

—Density at 15°C: 0.848 g/cm³

TEST RESULTS

COMPULSORY TESTS RESULTS

1. MAIN POWER TAKE-OFF

—Date and location of tests: Sep. 14, 1989, COTTEC

—Type of dynamometer: LPA—Bedienpult 250 elec. dynamometer

Power	Speed		Fuel consumption			Specific energy
	Engine	P. T. O.	Hourly		Specific	
kW	rev/min	rev/min	kg/h	1/h	g/kW • h	kW • h/l
1. 1 MAXIMUM POWER—TWO HOURS TEST						
35. 64	1980	557	8. 80	10. 38	247	3. 43
1. 2 POWER AT RATED ENGINE SPEED						
33. 38	2000	563	8. 24	9. 72	247	3. 43
1. 3 STANDARD POWER TAKE-OFF SPEED (540±10 rev/min)						
34. 82	1920	540	8. 57	10. 11	246	3. 45
1. 4 PART LOADS						
1. 4. 1 The torque corresponding to max. power at rated engine speed						
33. 38	2000	563	8. 24	9. 72	247	3. 43
1. 4. 2 85% of the torque obtained in 1. 4. 1						
28. 76	2027	571	7. 13	8. 41	248	3. 42
1. 4. 3 75% of the torque defined in 1. 4. 2						
21. 62	2032	572	5. 50	6. 48	254	3. 34
1. 4. 4 50% of the torque defined in 1. 4. 2						
14. 63	2061	580	4. 24	5. 00	290	2. 92
1. 4. 5 25% of the torque defined in 1. 4. 2						
7. 42	2091	589	3. 08	3. 63	415	2. 04
1. 4. 6 Unloaded						
0. 00	2116	596	2. 24	2. 64	—	—

SH—50 COTTEC Test No. 891433 OECD No. 1239

Power kW	Speed		Fuel consumption			Specific energy kW • h/l
	Engine rev/min	P. T. O. rev/min	Hourly kg/h	Hourly 1/h	Specific g/kW • h	
1. 5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED						
1. 5. 1 The torque corresponding to maximum power						
34. 82	1920	540	8. 57	10. 11	246	3. 45
1. 5. 2 85% of the torque obtained in 1. 5. 1						
30. 15	1956	551	7. 44	8. 40	247	3. 43
1. 5. 3 75% of the torque defined in 1. 5. 2						
22. 82	1974	556	5. 73	6. 78	251	3. 38
1. 5. 4 50% of the torque defined in 1. 5. 2						
15. 38	1995	562	4. 28	5. 05	278	3. 05
1. 5. 5 25% of the torque defined in 1. 5. 2						
7. 78	2018	568	3. 03	3. 57	389	2. 18
1. 5. 6 Unloaded						
0. 00	2052	578	2. 16	2. 55	—	—

—No load maximum engine speed:	2116	rev/min
—Equivalent crankshaft torque at maximum power:	171. 9	N • m
—Maximum Equivalent crankshaft torque: (Engine speed: 1326 rev/min)	192. 9	N • m
—Mean atmospheric conditions		
. Temperature:	28	℃
. Pressure:	100. 8	kPa
. Relative humidity:	55. 0	%
—Maximum temperatures		
. Coolant:	95	℃
. Fuel:	60	℃
. Engine air intake:	40	℃
. Engine oil:	100	℃

2. HYDRAULIC POWER AND LIFTING FORCE

—Date of test: Sep. 20, 1989

2.1 HYDRAULIC POWER TEST

—Sustained pressure with relief valve open: 17.2 MPa

—Pump delivery rate at minimum pressure: 21.0 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power	19.67	15.3	5.02
Flow rate and hydyaulic pressure corresponding to max. hydraulic power	21.18	15.0	5.29

—Tapping point used for test: On the rockshaft housing

—Temperature of hydraulic fluid: 64 ℃

—Opening pressure of the unloading valve: None MPa

—Closing pressure of the unloading valve: None MPa

2.2 POWER LIFT TEST

		At the hitch point	On the frame
Height of lower hitch points above ground in down position	mm	200	140
Vertical movement	mm	640	760
Maximum corrected force exerted throught full range	kN	10.1	9.8
Corresponding pressure of hydraulic fluid	MPa	15.0	15.0
Moment about rear wheel axle	kN • m	7.49	13.25
Maximum tilt angle of mast from vertical	degrees	—	8.9

—Linkage setting for test: see above table and figures

Lifting heights relative to the horizontal plane inculding the lower link pivot points										
mm	—315	—265	—200	—100	0	100	200	319	400	440
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting or to maximum power delivered by the hydraulic system, which is lower)										
At the hitch point kN		10.1	10.8	11.7	12.2	12.8	13.0	13.4		
Corresponding pressure: 15.0 MPa										
At the frame kN	10.1	10.5	11.0	11.0	10.9	10.8	10.5	10.2	10.0	9.8
Corresponding pressure: 15.0 MPa										

3. DRAWBAR PERFORMANCE

—Date of tests: Sep. 22—24, 1989

—Type of track: Concrete

Height of drawbar above ground:
Unballasted: 505 mm
Ballasted: 490 mm

Tyre inflation pressure:
Front: 245 kPa
Rear: 137 kPa

Gear and range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kW • h	kW • h/l	℃	℃	℃	℃	%	kPa
3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
2(L2)	13.10	14.55	3.24	2086	15.0	382	2.22	40	77	81	24	69	100.1
3(L3)	24.81	14.64	6.10	2060	15.0	313	2.71	41	78	81	25	69	100.1
4(H1)	29.72	13.97	7.66	1980	13.2	300	2.83	41	78	83	25	69	100.1
3.2 MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1(L1)	9.32	16.87	1.99	2098	14.9	457	1.86	41	76	80	25	70	100.5
2(L2)	15.13	16.81	3.24	2079	14.9	362	2.34	41	78	81	25	70	100.5
3(L3)	28.28	16.97	6.00	2034	15.0	312	2.72	42	79	83	25	70	100.5
4(H1)	30.51	14.03	7.83	1968	10.4	294	2.88	42	79	84	26	70	100.5
3.3 TEN—HOUR TEST (ballasted tractor)													
3.3.1 FIVE-HOUR TEST at 75% of pull at maximum power													
3(L3)	23.11	12.70	6.55	2063	8.3	326	2.60	35	74	78	23	63	100.4
3.3.2 FIVE-HOUR TEST at pull corresponding to 15% wheelslip without additional ballast.													
3(L3)	28.91	16.95	6.14	2043	—	—	—	39	77	84	22	68	100.4

Oil consumption during ten hours duration of tests 3.3.1 and 3.3.2 : 40 g/h

4. TURNING AREA AND TURNING CIRCLE

Details of wheel equipment:

	Tyre size	Track mm
Front	6.00—16	1313
Rear	12.4—28	1346

	With brakes		Without brakes	
	Right hand m	Left hand m	Right hand m	Left hand m
Radius of turning area	2.96	2.90	3.23	3.20
Radius of turning area	2.85	2.79	3.12	3.09

5. LOCATION OF CENTRE OF GRAVITY

—Height above ground:	691	mm
—Distance forward from the vertical plane containing the axle of the rear wheels:	742	mm
—Distance from the median plane of the tractor:	L 4.5	mm

6. BRAKING

—Date of tests:	Sep. 26, 1989	
—Type of track:	Concrete	
—Speed before application of brakes:	26.3	km/h

6.1 COLD SERVICE BRAKING DEVICE TEST

Ballasted tractor	Braking device control force N	288	281	357	433	502	547
	Mean deceleration m/s^2	2.39	3.02	3.48	3.57	3.61	3.61
Unballasted tractor	Braking device control force N	152	228	315	338	395	456
	Mean deceleration m/s^2	0.28	2.52	3.40	3.45	3.43	3.45

6.2 FADE TEST

Ballasted tractor	Braking device control force N	148	224	308	380	456	532
	Mean deceleration m/s^2	0.67	1.35	2.02	2.65	3.45	3.61

—Maximum deviation of tractor from its original course: 0 mm
—Abnormal vibration: None
—The brakes were heated by: Driving

6.3 PARKING BRAKING DEVICE TEST

	Up	Down
Braking device control force N		

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

—Date of tests: Sep. 26, 1989
—Sound level meter, Make/Model/Type: B & K 2209
—Type of track: Concrete
—Gear number: 6
—Travelling speed before acceleration: 19.51 Km/h
—Sound level: 83.0 dB(A)

OPTIONAL TEST RESULTS

8. PERFORMANCE IN A HOT ATMOSPHERE

—Date and location of test: Sep. 16, 1989, COTTEC
—Limiting temperatures specified by manufacturer:
• Coolant: 98 ℃
• Engine oil: 110 ℃
—Special epuipment fitted for the test: None
—Fuel:
• Type: 0#
• Density at 15 ℃ 0.848 g/cm^3
• Cetane number: >50

SH—50 COTTEC Test No. 891433 OECD No. 1239

—Engine oil:

- Type: CA 40
- Viscosity: 12.5—16.3 cSt. at 100℃

—Transmission oil:

- Type: Hyperbola gear oil
- Viscosity: 18—22 cSt. at 100℃

—Results of tests:

Ambient temperature ℃	Loss of power at the P. T. O. %	P. T. O. speed rev/min	Temperature		Atmospheric pressure Pa
			Coolant ℃	Engine oil ℃	
36	0	563	93	107	99.3
38	0.79	563	94	108	99.3
40	0.93	563	96	109	99.3
42	2.31	563	97	112	99.3
At the standard P. T. O speed					
37	0	540	93	105	99.3
39	0.40	540	98	108	99.3
41	0.60	540	98	110	99.3

SH—50 COTTEC Test No. 891433 OECD No. 1239

REPAIRS AND ADJUSTMENTS DURING TESTS:

None

REMARKS:

In COTTEC the safety limit speed of drawbar testing equipment is 12 km/h, so we make only drawbar power test in the gears which the speed is below 12 km/h.

Director of the COTTEC
Senior engineer

罗光辉

Luo Guanghui

Vice-director of the COTTEC
Senior engineer

孙殿俊

Sun Dianjun

Vice-director of the COTTEC
Senior engineer

朱荫梧

Zhu Yinwu

Responsible engineer for these tests:
Senior engineer

钱 进

Qian Jin

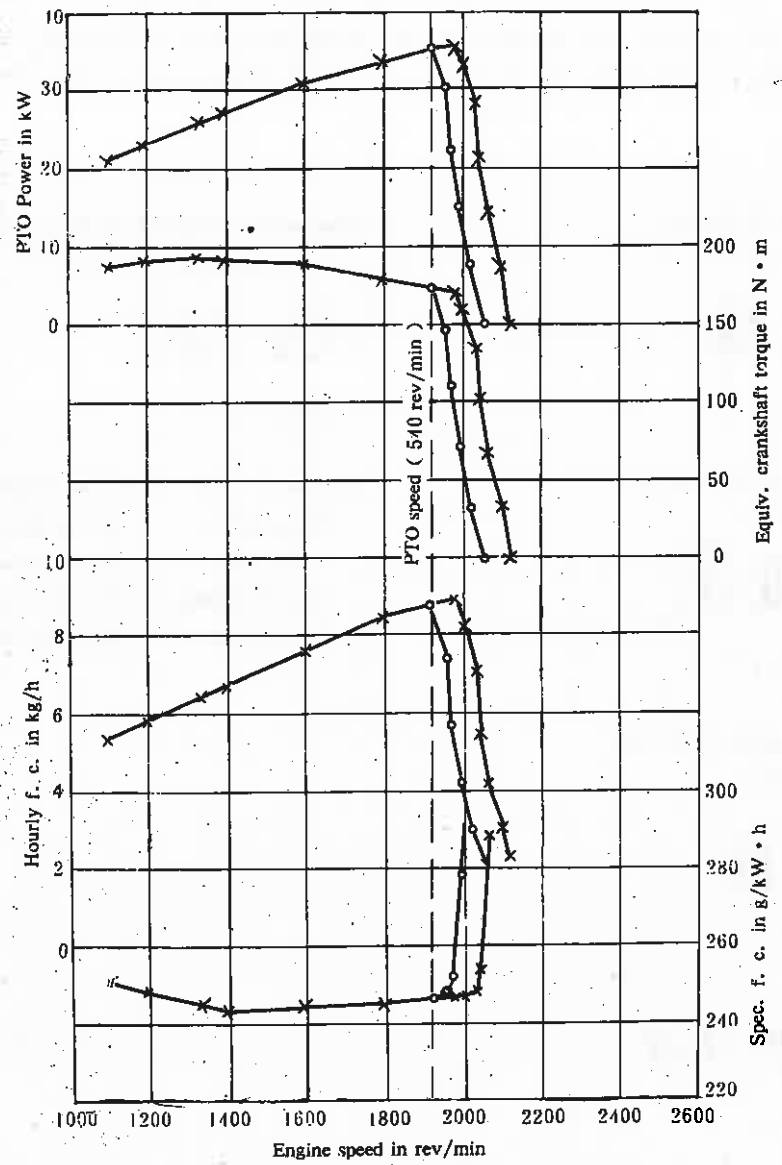
Members of the tractor test board:

Zhang Hui,	Zhang Wanbao
Yuan Wei,	Xie Zhiqiao
Yan Xiaofang,	Shi Guoquan
Zhao Baodao.	Fan Jianhua

Date: 1989.12.28

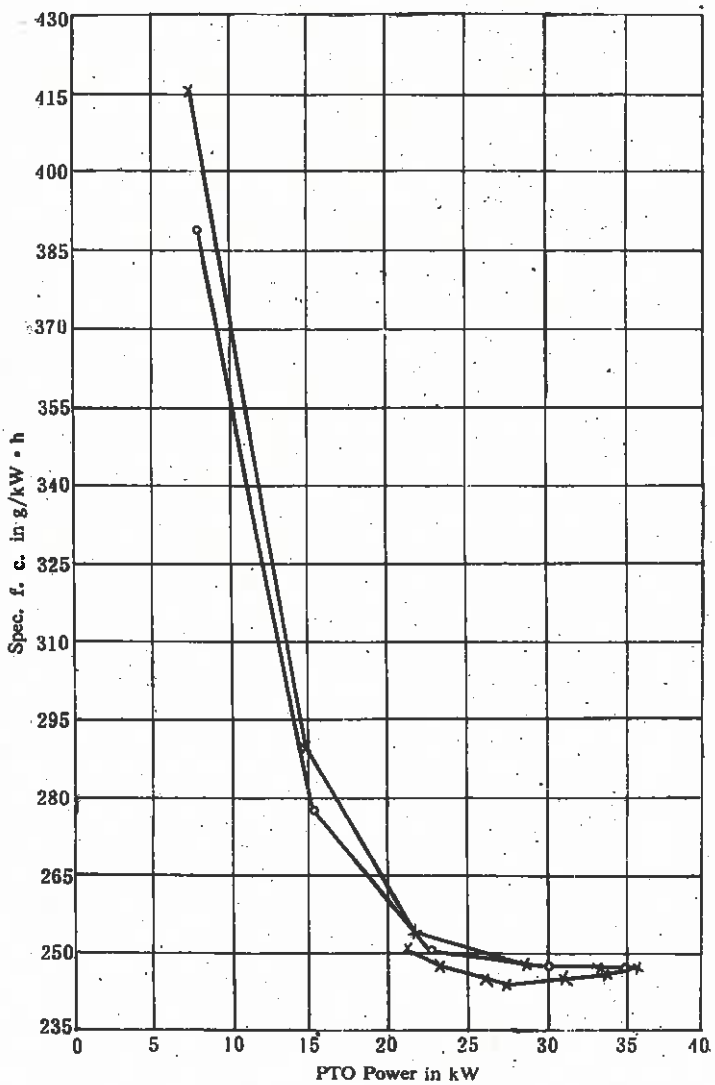
ANNEX I

MAIN POWER TAKE-OFF TEST CURVES



SH—50 COTTEC Test No. 891433 OECD No. 1239

MAIN POWER TAKE-OFF TEST CURVES



Printed in 613, Luoyang, China