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Australian tractor test report. No. 56. Zetor 5511

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No. 56 – ZETOR 5511

The Zetor 5511 is a general purpose farm tractor. With 43 drawbar horsepower and 51 h.p. at the P.T.O. at rated engine speed it comes within Class 5 of Australian Standard Classification of Wheeled Tractors for Agricultural Purposes, A.S. D10-1967. It is equipped with 18.4 x 28 pneumatic tyres. It has a five-speed gear box with a High and Low ratio change giving 10 forward and 2 reverse speeds.

The tractor is designed for either drawbar or linkage work; three-point linkage is supplied as standard equipment.

The tractor has a Zetor 4-cylinder 4-stroke, direct injection diesel engine of 190.4 cubic inches capacity, rated speed 2,200 r.p.m. The recommended fuel is distillate. The manufacturer's advertised value for power output of 60 shaft h.p. at rated speed appears to refer to a bare engine (see below).

Further details, including an abstract of the manufacturer's specifications are contained in the full Technical Report from which this abridgement has been made.

The test tractor

The test tractor was chosen at random from fully assembled stock at the Port Melbourne assembly plant of Australian Motor Industries Ltd., the Australian distributors of the model. It was run-in at Testing Station for 12 hours. Full power was measured in a 2-hour test after a further 30 hours of running on other tests; a check test on the P.T.O. at the end of the test programme showed no significant change in output during 38 hours of test running. The test values could not be reconciled with the manufacturer's ratings. The P.T.O. rating of 53.9 h.p. at rated speed is taken from a Belgian test report but this is metric h.p.; the equivalent British h.p. would be 53 h.p. It is assumed that the tractor in this test was a specially selected one, and that the bare engine rating of 60 h.p. is based on this.

Fuel pump calibration was within specified limits; governor setting 2,450 r.p.m., was as specified by the manufacturer. Fuel used was "Ampol Distillate" weighing 8.37 lb. per gallon.

Tractor identification numbers were: Serial No. 8539, Engine No. 5501/008227.

No water was added during the tests. Oil consumption for the 38 hours of test running was approximately 1½ pints. In trial running during the run-in period two injector nozzles were replaced. Also replaced were a flexible section of fuel line and radiator hose clips removed in the course of the test which were found unsatisfactory for re-use. A number of spring-washers broke when the nuts were removed in the course of test dismantling. The engine and the transmission were partly dismantled after the test, and found to be in satisfactory condition.

Drawbar tests were done with the tractor ballasted to the maximum recommended by the Company for normal agricultural drawbar work. Total weight, including the driver was 7,410 lb. (front axle, 2,120 lb.; rear axle 5,290 lb.). This weight included one ballast weight on each front (6.00 x 18) wheel, 75 per cent. water ballast in the rear (18.4 x 28) tyres, and a set of three ballast weights and weight carrier on each rear wheel.

Drawbar height was 18 in. The tests were done on a level tarmac road.

Further information on the effect on performance of varying drawbar height, weight, wheel equipment, road surfaces and other questions of the interpretation of tractor test data may be obtained from the Tractor Testing Officers at the University of Melbourne.

Inspection report

Power take-off

The P.T.O. gives 540 r.p.m. at 2,000 r.p.m. engine speed not at the engine rated speed of 2,200 r.p.m.; this is within the limit of

80 per cent. of rated speed specified in B.S. 1495 : 1964.

The P.T.O. is a standard 6 spline 1⅜ in. dia. live drive, with guard and cover according to B.S. 1495 : 1964, located centre rear, 27½ in. above the ground on 18.4 x 30 tyres. Control is by second throw of double clutch and hand lever forward of and below seat.

Clearance around P.T.O. generally accords with B.S. 1495, but clearance to drawbar is 6¼ in.; 8 in. is the minimum recommended.

For stationary work the P.T.O. can be driven through the gearbox giving a selection of speeds from 250 to 1,330 r.p.m. With the P.T.O. lever set for "ground speed" the P.T.O. makes 1 revolution for every 4 in. of forward travel of the tractor.

Belt pulley

The belt pulley unit mounts on the P.T.O. for rearward working, in either direction of rotation. As with the P.T.O. above, the pulley may be driven at a selection of speeds through the gearbox. At 2,000 engine r.p.m. in 5th gear speed of belt is 3,100 r.p.m. in accordance with B.S. 1495 : 1964. Pulley 9⅝ in. dia., 6 in. face width.

Performance summary

	Engine Crankshaft	P.T.O.	Belt Pulley	Drawbar (5th (L 3) Gear)
Manufacturer's rating*	60	....	....	48
Full power—h.p.	55	48	45	43
At engine speed—r.p.m.	2,200	2,000	2,000	2,200
Fuel economy—lb./h.p.-hr.	0.45	0.47	0.50	0.57
Fuel consumption—lb./hr.	24.3	22.4	22.3	24.3
—gal./hr.	2.9	2.7	2.7	2.9

* From current advertising.
Full crankshaft torque—at rated speed, 130 ft. lb.
—at 1,600 r.p.m., 134 ft. lb. (max.).
Best economy—0.40 lb./shaft h.p.-hr. at 75 per cent. load, at about 1,500 r.p.m.
High idle speed—as specified, 2,450 r.p.m.

Drawbar performance

Gear	At Maximum Power				
	d.b.h.p.	Engine (r.p.m.)	Pull (lb.)	Speed (m.p.h.)	Slip (%)
1 (L. 1)	10	2,430	5,200	0.75	14
2 (L. 2)	15	2,415	5,200	1.1	14
3 (L. 3)	21	2,400	5,200	1.5	14
4 (L. 4)	32	2,370	5,200	2.3	14
5 (H. 1)	41	2,300	5,200	3.0	14
6 (L. 5)	43*	2,200	4,200	3.8	10
7 (H. 2)	43*	2,200	3,500	4.6	7
8 (H. 3)	42*	2,200	2,400	6.5	5
9 (H. 4)	41*	2,200	1,500	10.3	3
10 (H. 5)	Road gear not tested				

* These correspond with engine at full power rated speed.

Gear	At Maximum Pull		
	Pull (lb.)	Engine (r.p.m.)	Limited by
1	6,000	....	Wheelslip
2	6,000	....	Wheelslip
3	6,000	....	Wheelslip
4	6,000	....	Wheelslip
5	6,000	....	Wheelslip
6	4,550	1,600	Engine torque
7	3,800	1,600	Engine torque
8	2,650	1,600	Engine torque
9	....	....	....
10	Road gears not tested		

Fuel consumption

Pull (lb.)	Speed (m.p.h.)	b.d.h.p.	Slip (%)	Fuel Consumption	
				gal./hr.	lb./ d.b.h.p. hr.
1,900	4.3	22	4	1.6	0.61
2,600	4.2	29	6	1.9	0.55
3,250	4.1	36	7	2.3	0.54
4,000	4.0	42	9	2.7	0.54

Hydraulics, three-point linkage

A gear pump in the rear axle housing supplies power for external hydraulic circuits, and the three-point linkage, and delivers 4.4 g.p.m. at 2,130 p.s.i. at 1,200 engine r.p.m. The control is by the same lever as the P.T.O. but the hydraulic pump alone may be selected.

The three-point linkage conforms with B.S. 1841 : 1951 for Category 2 implements. "Draught" control and "position" control are provided, and a mixed system in which some "draught" control is available while retaining "position" control. All controls are on the one quadrant. Speed of response is adjustable.

Drawbar

A fixed drawbar mounting plate 20 in. above ground is provided with 5—⅞ in. clearance holes 2¼ in. 4½ in. either side of centre. A swinging drawbar has 5 positions offsetting the drawbar pin 3 in. and 6 in. either side of centre. Height is not adjustable. Drawbar and clevis dimensions conform generally with B.S. 1495 : 1964.

Driver's accommodation

Access to the seat is from either side forward of the rear wheels with a footstep on left side. Flat footplates are provided either side of transmission housing.

The seat is a pressed metal bucket seat with removable cushion. It is mounted on a parallel motion linkage with springs and an adjustable friction damper. Springs may be re-fitted in alternative positions to suit the driver's weight. Fore-and-aft adjustment is 3½ in.

All controls are conveniently placed and easily operated, and conform generally to B.S. 1495 : 1964 except that the engine may be started with the tractor in gear and the decompressor "stop" control is not marked.

Operating features

Turning circles (minimum outside diameters on a consolidated gravel surface) with track widths front 54 in. and rear 59 in. were: no brakes, 27 ft., with brakes 22 ft. Ground clearance is 17½ in. under the front axle. Clearance is adjustable by adjustment of position of final drive housings.

Centre of gravity is 2 in. above and 25 in. ahead of the rear axle for the tractor as tested in the maximum weight condition. Front wheels have independent coil-spring suspensions.

Standard and optional features

Standard equipment includes tachometer incorporating an hour meter and road speed indications for road gear; water temperature and oil pressure gauges (metric units); ammeter; lighting equipment; fixed and swinging drawbar, three-point linkage, live P.T.O., differential lock.

Optional features fitted on the test tractor included belt pulley unit and wheel weights.

User's service

A good set of tools is supplied; illustrated Operator's Manual in English is available. Service is available throughout Australia from Australian Motor Industries Ltd. tractor dealers and agencies.

University of Melbourne,
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