

**CROWN**

**Specifications**

**TSP Series**

Turret Stockpicker

# TSP Series





TSP Series

Specifications

General Information	1.	<b>Manufacturer</b>	Crown Equipment Corporation			
	1.2	<b>Model</b>	1.5 TSP			
	1.3	<b>Prime Mover</b>	electric		48 Volt 72 Volt	
	1.4	<b>Operator Type</b>			seat, stand	
	1.5	<b>Load Capacity*</b>		Q t	1.5	
	1.6	<b>Load Centre</b>		c mm	600	
	1.8	<b>Load Distance</b>		X mm	386	
	1.9	<b>Wheel Base</b>		y mm	see table 2	
	2.1	<b>Weight</b>	less battery		kg	see table 1
Tyres	3.1	<b>Tyre Type</b>			polyurethane	
	3.2	<b>Tyres</b>	front		mm	ø 380 x 205
	3.3	<b>Tyres</b>	rear		mm	ø 330 x 140
	3.4	<b>Additional Wheels</b>	guide rollers		mm	ø 150 x 50
	3.5	<b>Wheels</b>	number (x = driven) front / rear			2 / 2x
	3.6	<b>Track Width</b>	front	b10	mm	1115 – 1625
	3.7	<b>Track Width</b>	rear	b11	mm	890
Dimensions	4.2	<b>Mast</b>	collapsed height	h1	mm	see table 1
	4.3	<b>Free Lift</b>	TN-mast	h2	mm	see table 1
			FF-mast			see table 1
	4.4	<b>Lift Height</b>	lift + aux. lift	h3	mm	see table 1
	4.5	<b>Mast</b>	extended height	h4	mm	see table 1
	4.8	<b>Operator Stand Height</b>	lowered / raised	h7	mm	510 / see table 1
	4.11	<b>Aux. Lift</b>		h9	mm	1750
	4.13	<b>Cabin Width</b>			mm	1320 / 1475
	4.13a	<b>Operator Platform Width</b>		b4	mm	see table 3
	4.15	<b>Lowered Fork Height</b>		h13	mm	75
	4.17	<b>Traverse Frame Width***</b>			mm	see table 3
	4.19	<b>Overall Length</b>		l1	mm	see table 2
	4.20	<b>Head Length</b>		l2	mm	see table 2
	4.21	<b>Width overall***</b>	front / rear	b1/b2	mm	1320 – 1830 / 1285
	4.22	<b>Fork Dimensions</b>	non-telescopic	thxwxl	mm	45 x 100 x 800, 950, 1150
			telescopic	thxwxl	mm	55 x 150 x 950, 1150
	4.24a	<b>Fork Carriage</b>	non-telescopic	b8	mm	100, 125, 150
	4.24b	<b>Fork Extension</b>	telescopic	b8	mm	100 to 215 in 13mm increments
	4.25	<b>Width Across Forks</b>	fork type	b5	mm	telescopic non-telescopic
			<b>For Load Handler</b>	from 686 to 1372		546 to 762 381 to 762
			<b>For Load Handler</b>	from 915 to 1372		851 to 1067 381 to 1067
<b>For Load Handler</b>			from 1220 to 1372		1156 to 1372 381 to 1372	
4.27	<b>Width Across Guide Rollers</b>		b6	mm	32 mm – 220mm greater than 4.21 in 6.35mm increments	
4.32	<b>Ground Clearance</b>	centre wheelbase	m2	mm	50	
4.33	<b>Clear Aisle Width</b>	telescopic forks	Ast	mm	see table 3	
4.33a	<b>Clear Aisle Width</b>	non telescopic forks	Ast	mm	see table 3	
4.34a	<b>Intersecting Aisle</b>			mm	see table 2	
4.35	<b>Turning Radius</b>		Wa	mm	see table 2	
4.38	<b>Load Handler Length</b>	standard	l8	mm	585 / 685	
		available in 76 mm increments**			762 to 1372	
Performance	5.1	<b>Travel Speed****</b>	w. / w.o. load		km/h	9.6 / 9.6
	5.2	<b>Lift Speed</b>	main mast w. / w.o load		m/s	0.25 / 0.30 0.32 / 0.39
	5.2a	<b>Lift Speed</b>	aux. mast w. / w.o load		m/s	0.21 / 0.28 0.30 / 0.39
	5.3	<b>Lower Speed</b>	main mast w. / w.o load		m/s	0.41 / 0.41
	5.3a	<b>Lower Speed</b>	aux. mast w. / w.o load		m/s	0.28 / 0.17
5.10	<b>Brake</b>					electric – hydraulic
Motors	6.1	<b>Traction Motor</b>	60 min. rating		kW	2 x 5.3 2 x 5
	6.2	<b>Lift Motor</b>	15 % on time		kW	11.3 18
	6.3	<b>Maximum Battery Size</b>				see table 2
	6.4	<b>Battery Voltage</b>	nominal capacity K5		V/Ah	48 / 900, 1200 (2x) 36 / 600, 700, 800
	6.5	<b>Battery Weight</b>	minimum		kg	1425, 1760 (2x) 735, 805, 950
Misc.	8.1	<b>Type of Controller</b>				SCR

\* Capacity derating is dependant upon combination of load centre, overall width, 180° traverse/fork extend, battery compartment size, lift height, and travel speed.

\*\* Capacity may be subject to derating.

\*\*\* Overall width front in 25mm increments available.

\*\*\*\* Limitations apply. Please read "electrical" section in the technical information portion of this specification sheet.

Table 1

4.2	<b>Collapsed Height</b>	h1	mm	3175	3330	3480	3635	3785	3940	4090	4245	4395	4550	4700	4855	5005	5160
4.3	<b>Free Lift FN □</b>	h2	mm	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825
4.3	<b>Free Lift TF ■</b>	h2	mm	2105	2260	2410	2565	2715	2870	3020	3175	3325	3475	3630	3780	3935	4085
4.4	<b>Lift Height ■</b>	h3	mm	5255	5560	5865	6170	6475	6780	7085	7390	7695	8000	8305	8610	8915	9220
4.5	<b>Extended Height</b>	h4	mm	6325	6630	6935	7240	7545	7850	8155	8460	8765	9070	9375	9680	9985	10290
4.8	<b>Op. Stand Height raised</b>	h7	mm	4015	4320	4625	4930	5235	5540	5845	6150	6455	6760	7065	7370	7675	7980
2.1	<b>Truck Weight TF/TN ▲◆</b>	B	kg	5210	5255	5300	5340	5385	5430	5475	5515	5560	5605	5650	5690	5735	5780
		C	kg	5245	5290	5330	5375	5420	5465	5505	5550	5595	5640	5680	5725	5770	5815
		D	kg	5280	5320	5365	5410	5455	5495	5540	5585	5630	5670	5715	5760	5805	5845

4.2	<b>Collapsed Height</b>	h1	mm	5310	5465	5615	5770	5920	6075	6225	6380	6530	6685	6835	6985	7140	7290
4.3	<b>Free Lift TN □</b>	h2	mm	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825
4.3	<b>Free Lift TF ■</b>	h2	mm	4240	4390	4545	4695	4850	5000	5155	5305	5460	5610	5765	5915	6070	6220
4.4	<b>Lift Height ■</b>	h3	mm	9525	9830	10135	10440	10745	11050	11350	11655	11965	12265	12570	12875	13180	13485
4.5	<b>Extended Height</b>	h4	mm	10595	10900	11205	11510	11815	12120	12425	12730	13035	13335	13640	13945	14250	14555
4.8	<b>Op. Stand Height raised</b>	h7	mm	8285	8590	8895	9200	9505	9810	10110	10415	10725	11025	11330	11635	11940	12245
2.1	<b>Truck Weight TF/TN ▲◆</b>	B	kg	5825	5865	5910	5955	6000	n.a.								
		C	kg	5855	5900	5945	5990	6030	6075	6155	6195	6240	6285	6330	n.a.	n.a.	n.a.
		D	kg	5890	5935	5980	6020	6065	6110	6155	6195	6240	6285	6330	6390	6480	6570

▲ Truck weight less battery and 1320mm platform width  
 ◆ Add 87 kg for platform width 1475mm

□ Auxiliary lift only  
 ■ Including auxiliary lift

Table 2

		48 Volt		2 x 36 Volt		
		B*	C*	B*	C	D
<b>6.3 Maximum Battery Size</b>	Compartment Size					
	Ampere Hours	900	1200	600	700	800
	Length Each	690	840	345	405	460
	Width Each	985	985	980	975	985
	Height Each	790	790	790	790	790
<b>6.5 Battery Weight</b>	min. kg	1425	1760	2x 735	2x 803	2x 946
<b>Load Width 4.38 800 1000 Handler Length 585</b>	4.35 Turning Radius	2690	2840	2690	2840	2940
	1.9 Wheel Base	2115	2250	2115	2250	2335
	4.19 Overall Length	3790	3925	3790	3925	4015
	4.20 Head Length	2795	2930	2795	2930	3015
	4.34a Intersecting Aisle	4500	4600	4500	4600	4700
<b>1200 685</b>	1.9 Wheel Base	2115	2250	2115	2250	2335
	4.19 Overall Length	3890	4025	3890	4025	4115
	4.20 Head Length	2795	2930	2795	2930	3015
	4.34a Intersecting Aisle	4600	4700	4600	4700	4800

Table 3

4.13	<b>Cabin Width</b>		mm	1320	1475	1475
4.13a	<b>Operator Platform Width</b>	Standard / Option **	mm	1320/1420,1525	1475/1575,1675	1625/n.available
4.17	<b>Traverse Frame Width</b>	in 25 mm increments	mm	1320 - 1450	1475 - 1600	1625 - 1750
4.33	<b>Clear Aisle Width telescopic Forks</b>		mm	1525 - 1880	1675 - 2030	1830 - 2185
4.33a	<b>Clear Aisle Width non-telescopic Forks</b>	100 mm Fork Carriage	mm	1525 - 1650	1675 - 1805	1830 - 1955
		125 mm Fork Carriage	mm	1575 - 1700	1725 - 1855	1880 - 2005
		150 mm Fork Carriage	mm	1625 - 1750	1775 - 1905	1930 - 2055

\*\* with bolt on extensions

**Standard Equipment**

1. 48 or 72-volt fused electrical system.
2. SCR controlled lift and drive motors.
3. Electric power steering.
4. Microprocessor controlled.
5. 350-amp battery connector.
6. Emergency power disconnect.
7. Color-coded wiring.
8. Chain slack sensors.
9. Hour meters independently recording key on, traction, lift, steer and accessories.
10. Start-up time and run time diagnostics.
11. Diagnostic history with optional service terminal.
12. Battery discharge indicator with lift interrupt.
13. Maximum travel speed programmed to meet the application's specs.
14. Gradual reduction in maximum travel speed as primary lift is increased.
15. Seated or standing operation automatically selected by operator's position.
16. Swivel seat which pivots up for standing operation.
17. Powered seat height positioning.
18. Hinged side gates.
19. Key switch.
20. Horn.
21. Two-speed fan.
22. Cab light.
23. Work lights.
24. Rear view mirror.
25. Flashing light.
26. Infinite hydraulic control of raise/lower, traverse and pivot.
27. Manual lowering valve located in power unit.
28. Solid four-point suspension.
29. Rigid tubular mast.
30. Third mast chain.
31. 70 mm diameter battery rollers.
32. Dual drive units.
33. Four-wheel braking automatically switched to two-wheel at slower speeds.
34. Egress-System.

**Optional Equipment**

1. Wire guidance.
2. Rail guidance.
3. End of aisle control system.
4. Extended load handler lengths and carriage widths.
5. Extending or non-extending forks.
6. Programmable fork height limits with overrides.
7. Non-marking tires.
8. Power source and mounting brackets for CRT.
9. Fire extinguisher.
10. Service Terminal.
11. Tilting fork carriage non-telescopic forks only.
12. Hydraulic fork positioner, non-telescopic forks only.

**Travel Speeds**

Maximum travel speed on guidance is 9.6 km/h to 3960 mm fork elevation. Gradual speed reduction to 1.6 km/h above 9450 mm fork elevation. Travel speed is limited to 1.6 km/h under any of the following conditions:

1. Forks are elevated above 785 mm on the auxiliary mast.
2. Forks are not at full pivot.
3. Load handler traverse extend are not at clear-aisle travel position.

Travel speed is disabled under any or the following conditions:

1. Forks are not at full pivot and above 4570 mm.
2. Not on guidance and above 6095 mm.
3. Not on guidance, forks not at clear-aisle travel position above 2360 mm and steering turned greater than 10°.
4. The TN travel speed is disabled, whenever out of guided aisle and primary lift is raised, unless otherwise specified.

**Wheels and Tyres**

Large, high-load capacity polyurethane press-on tyres. Load wheels – 380 mm diameter x 205 mm wide. Drive wheels – 330 mm diameter x 140 mm wide. Guide wheels – 150 mm diameter x 50 mm wide molded-on hub, non-press-on.

**Suspension**

Four-point solid suspension with long wheel base and wide spread of load and drive wheels improve truck capacity, reduce effect of uneven floors, and improve floor load distribution.

**Load Handler**

Forks are incrementally adjustable. Fork carriage pivots through 180° permitting pick-up and deposit from either side or front. Cylinders are equipped with hydraulic cushion stops to automatically reduce speed at end of pivot. Cross-over relief valves reduce excess pressure should forks be force-pivoted. Pivot lock engages at full rotated position to prevent drift. Forks can be elevated on the auxiliary mast to permit stacking close to the ceiling. Lift cylinder, hydraulic hoses, and electrical cables are protected within the profile of the structure, or behind removable covers. Vertical side alignment of the mast is maintained by gear racks and pinions. Traverse movement of the auxiliary mast and extend-retract movement of the telescopic forks are automatically sequenced, requiring only one operator control.

**Brakes**

Two force levels of mechanical braking provide smooth stopping at elevated heights. This is achieved by the truck automatically switching from four wheel to two wheel braking at slower truck speeds. Braking can also be accomplished by proportional plugging which permits the operator to control rate of deceleration when extended stopping distance is acceptable.

**Operator Cabs and Controls**

Seated and standing operator positions are ergonomically blended into one cab design. Operating mode is automatically set by the position of the operator. Seat pivots 15 ° toward either side and is powered up and down for comfort positioning. Lower seat cushion pivots upward to form a backrest for standing.

Hand control consoles are located at each side of the operator away from the pick rails to permit free operator movement. The left console levers permit infinite variable control of primary and auxiliary raise-lower, traverse-fork extend and pivot. Extend and retract of telescopic forks are automatically sequenced to the traverse control. Traverse and pivot can be simultaneously operated for pivoting the load in a minimum amount of aisle space. Steer wheel position indicator is located next to steering arm.

Programmable fork height limits are available for raise and lower. Both lower and one raise limit can be overridden by the operator. The right console area includes a forward-reverse travel speed twist grip and control buttons for fork height limit override, horn, primary power emergency disconnect and power key. Controls permitting emergency fork movement and a storage compartment are located below the hinged console cover.

The truck can be stopped by activation of foot-operated brake, twist grip control of proportional plugging, parking brake, emergency disconnect or power key. Separate brake control as a sit-down and a stand-up type of truck are provided. Foot rest pedals for seated operator fold out of the way. Standing operator floor-pedals are nearly flush for clear movement through the area.

The gates must be closed and the palm-pressure button and foot pedals require the operator be in position during any load handling function.

A two-speed fan, cab light and two work-lights are located in the overhead consoles. Other controls and feed-back include display indicators for load handler clear aisle travel position, master service-required light, open gate warning light, palm button and foot pedals light, service calibration, fork height limit override light, parking brake release switch with status light, wire guidance switch and status lights (optional) and discharge indicator with low voltage lift interrupt to reduce truck and battery maintenance.

### Primary Mast

Elevated load sway due to mast twisting, plus forward and side bowing are minimized through the use of closed cross-section mast construction. Rolled 'I'-beams continuously welded to a flat and a formed plate create a full length, deep cross-section mast capable of resisting front and side loading equally well. Lift cylinders, hoses, cable and chain within the mast are readily accessible for service. Built-in sensors in primary mast detect slack chain and shut down primary lower, auxiliary lower, pivot and traverse functions.

### Drive Units-Steering

Steerable dual drive units with fixed mounted traction motors minimize wear and maintenance on electrical cables. Full electrical power steering uses servomotors for turning the drive wheels. Drive wheels are automatically centred on trucks equipped with aisle-guide rollers.

### Hydraulics

Maximum lowering speed is limited by pressure-compensating flow controls and velocity fuses. Integrated hydraulic cylinder cushions soften primary mast staging and bottom stop when lowering. All lift cylinder rams are plated and retract into the hydraulic oil for additional corrosion protection when forks are lowered. Primary mast emergency lowering valve and load handler emergency power switch are located in the power unit.

### Electrical

Heavy duty 48 or 72 volt electrical power system reduces current requirements for improved efficiency. SCR controlled lift and drive motors. Each controller provides current limiting motor protection in addition to the fuses. Two on-board micro-computers are integrated into the truck to provide maximum load handling through-put and smooth truck performance. Serial data link communications between the elevated cab and the lower power unit minimizes the number of electrical conductors through the mast. Long life solid state encoders and LVDT are used in place of potentiometers. Travel speed is sensed and regulated to precise rate. Height sensor provides input for a programmed gradual reduction in maximum allowable travel speed as the primary lift is elevated. Maximum lift and lower speeds are reduced near full lift and lower to provide a soft stop. On-board software includes truck calibration, system diagnostics and trouble isolation capabilities accessible by an optional plug-in terminal.

### Safety Regulations

Conforms to European safety standards.

Dimensions and performance data given may vary due to manufacturing tolerances. Performance is based on an average size vehicle and is affected by weight, condition of truck, how it is equipped and the conditions of the operating area. Crown products and specifications are subject to change without notice.

