



T SERIES

variable speed 1500 - 2500 r/min

TR Water Pump Engines

TR1 | TR2 | TR3



OVERVIEW

Lister Petter has been closely associated with the pump industry for decades. The T series legendary performance and reliability powers industrial, municipal, agricultural water supply and irrigation pumps produced from some of the world's leading pump manufactures.

Available with both hand and electric start options, making the T series the perfect platform for OEMs, packagers and end users water conveying needs.

Note: This engine does not comply with Harmonised International Regulated Emissions Limits.

BASIC ENGINE CHARACTERISTICS

 diesel fuelled and approved for operation on biodiesel, that conforms with ASTM D6751 and EN14214, concentrations of up to 20%

4.1 - 25.9 kW | 5.5 - 34.7 bhp

- direct fuel injection
- 1, 2 or 3 cylinders
- air cooled
- naturally aspirated
- designed for continuous operation in ambient temperatures up to 40°C (104°F)

DESIGN FEATURES AND EQUIPMENT

- medium duty air cleaner *
- inlet and exhaust manifolds *
- self-vent fuel system with individual fuel injection pumps
- fuel filter and mechanical fuel lift pump *
- self-regulating plunger type lubricating oil pump
- spin-on lubricating oil filter
- decompressor levers *
- flywheel
- flywheel housing with SAE4 flange *
- 250 hour service intervals
- mechanical governing:
- variable speed 900-2500 r/min
- 40mm flywheel mounted driveshaft
- engine mounted exhaust silencer
- engine starting handle *
- Cobalt Blue paint finish **
- operators' handbook (English) *

OPTIONAL ITEMS

- 12V/24V electric start and battery charge windings ¹
- starting panels and instrumentation gauges
- engine temperature and pressure protection switches and solenoids
- heavy duty cyclonic air cleaner
- 13.5 litre engine mounted fuel tank

A range of options allows you to select a specification that matches your requirements, please consult your Lister Petter distributor.

¹ 12V charge windings only

* Optional items; ** Other paint finishes are available

POWER OUTPUTS TO ISO3046 CONTINUOUS NET POWER (IFN)

Model	r/min	1000	1200	1500	1800	2000	2200	2500
TD1	kW	4.1	4.7	5.5	6.7	7.3	7.9	8.6
TR1	bhp	5.5	6.3	7.4	9.0	9.8	10.5	11.5
TDO	kW	6.4	8.7	11.0	13.1	14.5	15.7	17.3
TR2	bhp	8.6	11.6	14.7	17.6	19.4	21.0	23.2
TR3	kW	10.0	13.1	16.8	20.2	22.2	23.7	25.9
IND	bhp	13.4	17.6	22.5	27.1	29.8	31.8	34.7

TORQUE TO ISO3046 CONTINUOUS NET POWER (IFN) 1200 Model r/min 1000 1500 1800 2000 2200 2500 39.2 37.4 35.0 35.5 34.9 34.1 32.8 Nm TR1 lbf ft 28.9 27.6 25.8 26.2 25.7 25.1 24.2 Nm 61.1 69.0 70.0 69.5 69.2 68.1 66.1 TR2 51.3 lbf ft 45.1 50.9 51.6 51.1 50.3 48.7 Nm 95.5 104.2 106.9 107.2 106.0 102.9 98.9 TR3 lbf ft 70.4 76.9 78.9 79.0 78.2 75.9 73.0

TR1TR2TR3Type of fuel injectionDirectDirectDirectNumber of cylinders123AspirationNaturalNaturalNaturalDirection of rotation looking or UAnti clockwiseAnti clockwiseAnti clockwiseNominal cylinder boremm98.4298.42Mm98.4298.4298.42Nominal cylinder boremm101.6101.6StrokeIm101.6101.6101.6Total cylinder capacitylitre0.7731.552.32Minimum idling speedr/min850850850Number of flywheel ring geart110110110Crankshaft end thrust (maximum continuous)kgf132132Ibf2.002.553.0Totackase vacuum (minimumImfa2.02.9Lubricating oil pressure (mean with the oil at 110°C (230°F)Dare2.02.0Lubricating oil pressure at ideMari2.02.02.0Lubricating oil pre	TECHNICAL DATA							
Number of cylinders 1 2 3 Aspiration Natural Natural Natural Direction of rotation looking on flywheel end Anti clockwise Anti clockwise Anti clockwise Anti clockwise Anti clockwise Nominal cylinder bore mm 98.42 98.42 98.42 Nominal cylinder bore in 3.875 3.875 3.875 Stroke in 4.0 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 Total cylinder capacity in ³ 47.17 94.35 141.52 Compression ratio r/min 850 850 850 Number of flywheel ring gear text 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) libf 290 290 290 Crankcase vacuum (average) bar 3.5 4.6 7.5 in H ₂ O 1.4 1.8 2.9 2	TR1 TR2 TR3							
AspirationNaturalNaturalNaturalDirection of rotation looking on fireAnti clockwiseAnti clockwiseAnti clockwiseNominal cylinder boremm98.4298.4298.42in3.8753.8753.875Strokein3.8753.875StrokeIin4.04.04.0Total cylinder capacityIitre0.7731.552.32in 347.1794.35141.52Compression ratior/min850850Number of flywheel ring geart ettre110110110Crankshaft end thrust (maximum continuous)kgf132132132Orankcase vacuum (minimum)Ibf2.002.902.90Crankcase vacuum (average)bar2.02.02.0Lubricating oil pressure (mean) with the oil at 110°C (230°F)bar2.02.02.0Lubricating oil pressure at idlebar1.01.01.01.0	Type of fuel injection	Direct	Direct	Direct				
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Direction of rotation looking on ity wheel end clockwise clockwise clockwise clockwise Nominal cylinder bore mm 98.42 98.42 98.42 in 3.875 3.875 3.875 Stroke in 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 Total cylinder capacity litre 0.773 1.55 2.32 Compression ratio 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 Number of flywheel ring gear tert 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 Ibf 290 290 290 Crankcase vacuum (minimum) in H ₂ O 0.8 1.0 1.2 Icrankcase vacuum (average) mbar 3.5 4.6 7.5 in H ₂ O 0.8 1.0 1.2 3.5 Lubricating oil pressure (mean) bar 2.0 2.0 2.0	Aspiration		Natural	Natural	Natural			
Nominal cylinder bore in 3.875 3.875 3.875 Stroke in 3.875 3.875 3.875 Stroke in 4.0 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 Total cylinder capacity in ³ 47.17 94.35 141.52 Compression ratio 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 Number of flywheel ring gear text 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 It H ₂ O 0.8 1.0 1.2 3.0 1.2 Crankcase vacuum (minimum) mbar 2.0 2.90 290 290 Crankcase vacuum (average) mbar 3.5 4.6 7.5 3.0 It H ₂ O 0.8 1.0 1.2 3.5 3.6 3.5 Crankcase vacuum (average) bar 3.5 4.6 7.	Direction of rotation looking on f	lywheel end						
in 3.875 3.875 3.875 Stroke mm 101.6 101.6 101.6 in 4.0 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 Compression ratio in ³ 47.17 94.35 141.52 Compression ratio r/min 850 850 Number of flywheel ring gear teet 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 Ibf 290 290 290 Crankcase vacuum (minimum) mbar 2.0 2.5 3.0 in H ₂ O 0.8 1.0 1.2 1.2 Crankcase vacuum (average) mbar 3.5 4.6 7.5 in H ₂ O 1.4 1.8 2.9 2.9 Lubricating oil pressure (mean) bar 2.0 2.0 2.0 with the oil at 110°C (230°F) bar 1.0 1.0 1.0	Nominal cylindor horo	mm	98.42	98.42	98.42			
Stroke in 4.0 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 Total cylinder capacity in ³ 47.17 94.35 141.52 Compression ratio 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 Number of flywheel ring gear teett 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) lbf 290 290 290 Crankcase vacuum (average) mbar 3.5 4.6 7.5 in H ₂ O 0.4 1.8 2.9 29 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0	Normal cylinder bore	in	3.875	3.875	3.875			
in 4.0 4.0 4.0 Total cylinder capacity litre 0.773 1.55 2.32 in ³ 47.17 94.35 141.52 Compression ratio 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 Number of flywheel ring gear test 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) mbar 2.0 2.5 3.0 Crankcase vacuum (average) mbar 3.5 4.6 7.5 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0	Stroko	mm	101.6	101.6	101.6			
Total cylinder capacity in 3 47.17 94.35 141.52 Compression ratio 15.5:1 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 850 Number of flywheel ring gear teeth 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) lbf 290 290 290 Crankcase vacuum (average) mbar 2.0 2.5 3.0 Crankcase vacuum (average) mbar 3.5 4.6 7.5 in H ₂ O 0.4 1.8 2.9 2.0 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0	SUOKE	in	4.0	4.0	4.0			
In 3 47.17 94.35 141.52 Compression ratio 15.5:1 15.5:1 15.5:1 Minimum idling speed r/min 850 850 Number of flywheel ring gear teeth 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) mbar 2.0 2.5 3.0 Crankcase vacuum (average) mbar 3.5 4.6 7.5 In H ₂ O 0.4 1.8 2.9 2.9 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0 1.0	Tatal a dia day cana situ	litre	0.773	1.55	2.32			
Minimum idling speed r/min 850 850 850 Number of flywheel ring gear teeth 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Crankcase vacuum (minimum) mbar 2.0 2.5 3.0 Crankcase vacuum (average) mbar 3.5 4.6 7.5 In H ₂ O 0.4 1.8 2.9 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0	Total cylinder capacity	in ³	47.17	94.35	141.52			
Number of flywheel ring gear teeth 110 110 110 Crankshaft end thrust (maximum continuous) kgf 132 132 132 Ibf 290 290 290 290 Crankcase vacuum (minimum) mbar 2.0 2.5 3.0 In H ₂ O 0.8 1.0 1.2 Crankcase vacuum (average) mbar 3.5 4.6 7.5 In H ₂ O 1.4 1.8 2.9 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0	Compression ratio		15.5:1	15.5:1	15.5:1			
	Minimum idling speed	r/min	850	850	850			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Number of flywheel ring gear tee	eth	110	110	110			
Intraction </td <td>Crankshaft end thrust</td> <td>kgf</td> <td>132</td> <td>132</td> <td>132</td>	Crankshaft end thrust	kgf	132	132	132			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	(maximum continuous)	lbf	290	290	290			
in H_2O 0.8 1.0 1.2 Crankcase vacuum (average) mbar 3.5 4.6 7.5 in H_2O 1.4 1.8 2.9 Lubricating oil pressure (mean) with the oil at 110°C (230°F) bar 2.0 2.0 2.0 Lubricating oil pressure at idle bar 1.0 1.0 1.0		mbar	2.0	2.5	3.0			
Crankcase vacuum (average)in H201.41.82.9Lubricating oil pressure (mean) with the oil at 110°C (230°F)bar2.02.02.0Lubricating oil pressure at idlebar1.01.01.0	Crankcase vacuum (minimum)	in H_2O	0.8	1.0	1.2			
In H_2O 1.41.82.9Lubricating oil pressure (mean) with the oil at 110°C (230°F)bar2.02.0Ibf ft²292929Lubricating oil pressure at idlebar1.01.0	(mbar	3.5	4.6	7.5			
Lubricating oil pressure at idleLubricating oil pressure at idleLubricating oil pressure at idleLubricating oil pressure at idle	Crankcase vacuum (average)	in H_2O	1.4	1.8	2.9			
with the oil at 110°C (230°F) Ibf ft² 29 29 29 Lubricating oil pressure at idle bar 1.0 1.0 1.0	Lubricating oil pressure (mean)	bar	2.0	2.0	2.0			
Lubricating oil pressure at idle		lbf ft ²	29	29	29			
Lubricating oil pressure at Idle	ta bata di angli angli ang ang ang ang	bar	1.0	1.0	1.0			
lbf ft ² 14.5 14.5 14.5	Lubricating oil pressure at idle	lbf ft ²	14.5	14.5	14.5			

* For fixed speed engines the powers at these speeds are the same.

Notes:

1. Power ratings (measured at the fl ywheel) and fuel consumptions, apply to a fully run-in, non-derated engine without power absorbing accessories or transmission equipment.

2. The overload capability applies to a fully run-in engine. This is normally attained after a running period of about 50 hours.

RATING DEFINITIONS TO ISO 3046

ISO Standard Conditions

Barometric pressure 100 kPa Relative humidity 30% Ambient air temperature at the inlet manifold 25°C

Fixed Speed: Continuous Power (ICN)

The power in kW which the engine is capable of delivering continuously at the stated crankshaft speed, under ISO 3046 standard conditions, measured at the flywheel without power-absorbing accessories, provided that the engine is overhauled and maintained in good operating condition and that fuel to BS EN 590 Class A1 or A2, and lubricating oils to the correct performance specification and viscosity classification as recommended by Lister Petter Limited are used.

Fixed Speed (Fuel Stop): Overload Power (ICXN)

The maximum power in kW which the engine is capable of delivering intermittently at the stated crankshaft speed for a period not exceeding one hour in any period of twelve hours of continuous running, immediately after working at the continuous power, under ISO 3046 standard conditions and with the provisions specified for continuous power in item (1) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

Variable Speed (Fuel Stop): Continuous Power (IFN)

The maximum power in kW which the engine is capable of delivering continuously at the stated crankshaft speed, under ISO 3046 standard conditions, and with the provisions specified in item (1) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

Variable Speed (Fuel Stop): Overload Power (IOFN)

The maximum power in kW which the engine is capable of delivering intermittently at the stated crankshaft speed for a period not exceeding one hour in any period of twelve hours of continuous running, immediately after working at the continuous power, under ISO 3046 standard conditions and with the provisions specified for continuous power in item (3) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

Derating

For non-standard site conditions, reference should be made to relevant BS, ISO & DIN standards.

Note: Minimum full load speed 1500 r/min.

ENGINE EXHAUST SYSTEM DETAIL

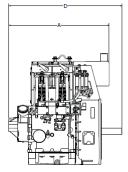
Parameter	Engine Model			
Falameter	TR1	TR2	TR3	
Maximum allowed back pressure (kPa)		10.3		
Maximum Bosch smoke level at rated output	5.5			
Exhaust gas temperature, continuous (°C)	520	520	520	
Exhaust gas temperature, overload (°C at 1500 rpm)	550	550	550	
Exhaust pipe diameter - recommended O/D		48		

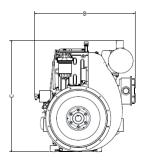
ENGINE LUBRICATING OIL SYSTEM DETAIL						
Parameter		Engine Model				
Falameter	TR1	TR2	TR3			
Lubrication method		Pressure				
Sump capacity (L)	2.7	4.0	5.5			
Total capacity (L)	3.2	4.5	6.0			
Oil filter type	Full flow paper element					
Oil consumption (g/kW h)	≤ 0.25					
Lubrication oil temperature (°C)	120 (max. 135)					
Lubrication oil pressure at running conditions (kPa)	100-450					
Oil pump type	Plunger type					
Maximum operation angle (degrees)	Front/Rear/ Fuel Pump Up 15 / Manifold Down - 10					

ENGINE COOLING DETAIL							
Parameter	Engine Model						
Falameter	TR1	TR2	TR3				
Cooling method	Air						
Cooling fan	Flywheel						
Cooling package operating temperatures (°C)		40					
Maximum Cooling Airflow (litres/sec)	160	220	330				
Maximum Cowling Pressure (mmWG)	97	12	20				
Ducting Sectional Area cm ²	140	330	530				

VARIABLE SPEED I APPROXIMATE FUEL CONSUMPTION I 100% LOAD								
Model	r/min	1000	1200	1500	1800	2000	2200	2500
TR1	g/kWhr	253	243	239	240	242	243	245
	l/h	1.2	1.4	1.6	1.9	2.1	2.3	2.5
TR2	g/kWhr	249	240	236	237	238	239	241
	l/h	1.9	2.5	3.1	3.7	4.1	4.5	5.0
TDO	g/kWhr	246	238	230	229	231	234	237
TR3	l/h	2.9	3.7	4.6	5.5	6.1	6.6	7.3

APPROXIMATE DIMENSIONS AND WEIGHT





		TR1	TR2	TR3
Drywoight	kg	153	185	230
Dry weight	lb	337	408	507
Length (A)	mm	476	623	749
without fuel tank	in	18.7	24.5	29.5
Width (P)	mm	624	624	646
Width (B)	in	24.6	24.6	25.4
Height (C)	mm	692	692	692
Height (C)	in	27.2	27.2	27.2
	mm	493	702	829
Total length (D)	in	19.4	27.6	32.6

TYPICAL PACKING CASE DIMENSIONS

	Packir	Container quantities				
Engine	Length (mm)	Width (mm)	Height (mm)	Gross weight (kg)	20ft	40ft
TR1	770			180	60	120
TR2	//0	550	850	235	00	120
TR3	880				52	104
Note: Optional accessories require the use of wider packing cases. TR1 engines fitted with fuel lift pumps TR1, TR2 and TR3 engines with starting panels and ducting.						
All	800	670	850	See above	30	66



Head Office

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Production Facility

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MADE IN BRITAIN

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Lister Petter Power Systems have made efforts to ensure that the information in this data sheet is accurate but reserve the right to amend specifications and information without notice and without obligation or liability.