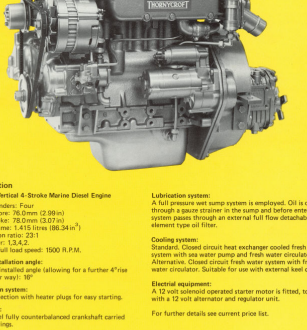
THORNYCROFT

MARINE ENGINES

TYPE 80



Specification

80 Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinder bore: 76.0mm (2.99in)
Piston Stroke: 78.0mm (3.07in)
Swept volume: 1.415 litres (86.34in^3)
Compression ratio: 23:1
Firing order: 1,3,4,2.
Minimum full load speed: 1500 R.P.M.

Engine Installation angle:
Maximum installed angle (allowing for a further 4° rise when under way): 10°

Combustion system:
Indirect injection with heater plugs for easy starting.

Crankshaft:
Forged steel fully counterbalanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter.

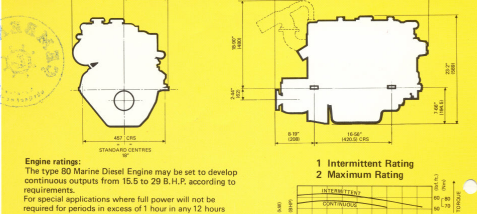
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator.
Alternative. Closed circuit fresh water system with fresh water circulator. Suitable for use with external keel cooler.

Electrial equipment:
A 12 volt solenoid operated starter motor is fitted, together with a 12 volt alternator and regulator unit.

For further details see current price list.

Power Ratings: *26 kW (35 bhp) Maximum*
24 kW (32 bhp) Intermittent.
22 kW (29 bhp) Continuous.

Type 80 Engine with Hurth HBW 100 Gearbox: Weight 179 kg. (395 lbs)



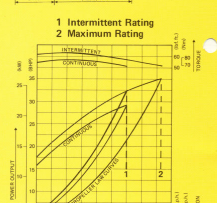
Engine ratings:
The type 80 Marine Diesel Engine may be set to develop continuous outputs from 15.5 to 29 B.H.P. according to requirements.
For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 32 B.H.P. at 3000 R.P.M.
A maximum rating of 35 B.H.P. at 3600 R.P.M. is also available for approved applications.
NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 2% for each 5½° C (10° F) above 30° C (85° F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS5514/1.

Continuous full power ratings and corresponding fuel consumption

B.H.P.		15.5	21.3	26	29
R.P.M.		1500	2000	2500	3000
Approx. fuel cons.	g.p.h.	1.05	1.30	1.52	
	l.p.h.	3.54	4.76	5.90	6.90

Stern gear
Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.
Where existing shafting is to be retained the propeller and half coupling can be bored to suit.
The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

1 Intermittent Rating
2 Maximum Rating



Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter
Direct Drive	254 – 305 mm	10" – 12"	25 mm 1"
1·5:1	330 – 381 mm	13" – 15"	25 mm 1"
2:1	406 – 457 mm	16" – 18"	38 mm 1½"
2·5:1	457 – 508 mm	18" – 20"	38 mm 1½"
3:1	533 – 584 mm	21" – 23"	38 mm 1½"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request

All drawings, dimensions, weights, fuel consumptions and other data contained in this leaflet are approximate only and, whilst they are substantially correct, are subject to alteration without notice. The outline arrangement drawings are not to scale.
We reserve the right to make any variations in the above specification that we may consider desirable to effect improvements, or which may be necessary through circumstances beyond our control. No such improvements, however, will be considered retrospective for engines already delivered. All orders placed with us or any of our Authorised Dealers or Distributors will be deemed to have been given on this understanding.

Leaflet No. MS-02-80

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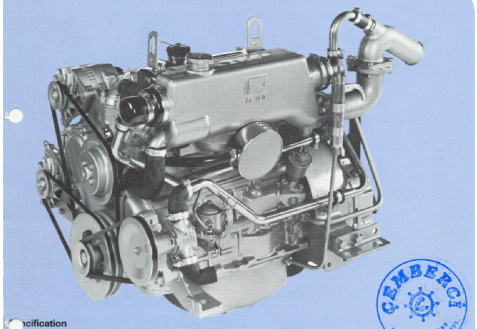
THORNYCROFT
MARINE ENGINES

TYPE 108/2R



Specification

Type: 108/2 Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinder bore: 80·25 mm (3·15 in)
Piston Stroke: 89 mm (3·5 in)
Swept volume: 1·799 litres (109·8 in³)
Compression ratio: 21·5:1
Firing order: 1,3,4,2.
Minimum full load speed: 1500 R.P.M.

Engine installation angle:
Maximum installed angle (allowing for a further 4° rise when under way): 15°.

Combustion system:
Indirect injection with heater plugs for easy starting.

Crankshaft:
Forged steel fully counterbalanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator. Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

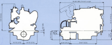
Electrical equipment:
A 12 volt Lucas solenoid operated starter motor is fitted, together with a 12 volt Lucas alternator and regulator unit.

For further details see current price list.

NOTE: Additional alternator as illustrated is an optional extra.

Power Ratings: 37·3 Kw (50bhp) Special Peak
35·0Kw (47bhp) Intermittent.
28·3Kw (38bhp) Continuous

Type 108/2 Engine with PRM 'Delta' Gearbox: Weight 248 kg. (547lbs)



Engine ratings

The type 108/2M Marine Diesel Engine may be set to develop continuous outputs from 21 to 38 B.H.P. according to requirements.

For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 47 B.H.P. at 3600 R.P.M.

A special peak rating of 50 B.H.P. at 4000 R.P.M. is also available for approved applications.

NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 2% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS649:1958

Continuous full power ratings and corresponding fuel consumption					
B.H.P.		21	27	33	38
R.P.M.		1500	2000	2500	3000
Approx. fuel cons.	G.P.H.	1·15	1·39	1·67	1·88
	l.p.h.	5·22	6·32	7·59	9

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.

Where existing shafting is to be retained the propeller and half coupling can be bored to suit.

The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive/Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter	
Direct Drive	305-381mm	12-15"	32mm	1¼"
1·5:1	356-432mm	14-17"	32mm	1¼"
2:1	406-483mm	16-19"	38mm	1½"
2·5:1	483-559mm	19-22"	38mm	1½"
3:1	559-635mm	22-25"	38mm	1½"

NOTE: Shaft sizes for Lloyd's/Department of Trade applications on request.

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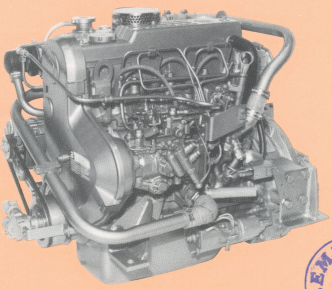
MARINE ENGINES

TYPE 110



Specification

Type: 110 Vertical 4-Stroke Marine Diesel Engine

No. Cylinders: Four
Cylinder Bore: 82·5mm
Piston Stroke: 82·0mm
Swept Volume: 1·753 litres
Compression Ratio: 21·5:1
Firing Order: 1, 3, 4, 2.
Minimum full load speed: 1000 R.P.M.

Engine installation angle:

Maximum installed angle (allowing for a further 4° rise when under way): 15° Flywheel Down.

Combustion system:

Indirect injection with automatic excess fuel device for cold starting.

Crankshaft:

S.G. Iron, fully counterbalanced crankshaft carried in five main bearings.

Lubrication system:

A full pressure wet sump system is employed. Oil is drawn through a gauze strainer from the sump, passing through a raw water cooled engine oil cooler, a full flow detachable element oil filter and relief valve to the lubrication points.

Cooling systems:

Standard closed circuit fresh water cooling system, thermostatically controller for engine jacket and exhaust manifold cooling. The fresh water cooling system is used in conjunction with an engine driven sea water pump, heat exchanger to a wet exhaust outlet elbow.

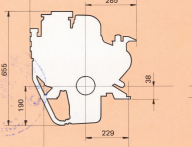
Alternatively, a closed circuit fresh water cooling system with circulating pump, engine oil cooler and wet exhaust manifold used in conjunction with external keel cooler.

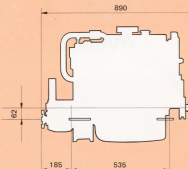
Electrical equipment:

Standard 12 volt earth return system, axial engagement starter motor, 55 amp alternator, cold start device and fuel shut off solenoid valve.

Power Ratings: 56bhp (42kW) at 4000rpm, two speed governor
47bhp (35kW) at 3600rpm, all speed governor

Type 110 Engine with Hurth HBW100 gearbox: Weight 176 kg (386 lbs)





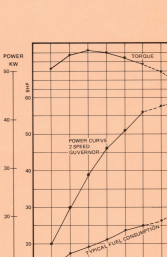
Engine ratings

The Type 110 Engine may be set to develop continuous power outputs from 15 to 53 B.H.P.
For applications where full power is required for short periods i.e. 1 hour in every 12 hours of consecutive running, the engine can be supplied at the intermittent rating of 56 B.H.P. at 4800 R.P.M.

Note: All horsepower ratings quoted are measured at the engine flywheel. Due allowance must be made for transmission losses. For tropical use, it is necessary to de-rate the engine by 2% for each 5½°C above 30°C air temperature at sea level. Further de-rating for humidity may be necessary in accordance with BS5514/1.

Power ratings and corresponding fuel consumption figures. (110 Two speed governor).

POWER			TYPICAL FUEL CONSUMPTION	
RPM	BHP	KW	LITRES/HR	GALL/HR
4000	56	42	13.6	3.0
3500	51	38	12.2	2.7
3000	46	34	10.4	2.3
2500	39	29	8.6	1.9
2000	30	22	6.8	1.5
1500	20	15	3.1	0.7



Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and manganese bronze propeller.
Where existing shafting is to be retained the propellor and half coupling can be bored to suit.

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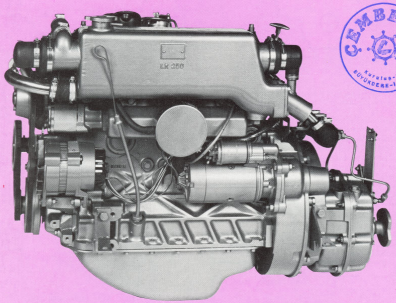
MARINE ENGINES

TYPE 140R



Specification

Type: 140 Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinder bore: 90·5 mm (3·56 in)
Piston Stroke: 88·9 mm (3·5 in)
Swept volume: 2·29 litres (139·6 in³)
Compression ratio: 21:1
Firing order: 1,3,4,2.
Minimum full load speed: 1500 R.P.M.

Engine installation angle:
Maximum installed angle (allowing for a further 4° rise when under way): 15°.

Combustion system:
Indirect injection with heater plugs for easy starting.

Crankshaft:
S.G. Iron fully counterbalanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

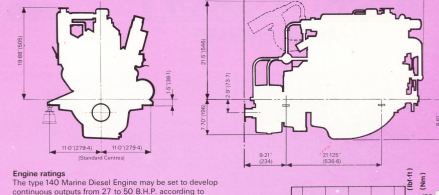
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator. Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

Electrical equipment:
A 12 volt Lucas solenoid operated starter motor is fitted, together with a 12 volt Lucas alternator and regulator unit.

For further details see current price list.

Power Ratings: 44·7 kW (60 bhp) Intermittent.
37·3 kW (50 bhp) Continuous.

Type 140 Engine with PRM 'Delta' Gearbox: Weight 322 kg. (710 lbs)

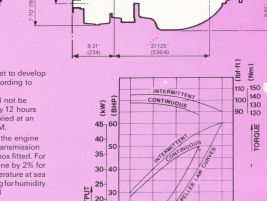


Engine ratings

The Type 140 Marine Diesel Engine may be set to develop continuous outputs from 27 to 50 B.H.P. according to requirements.

For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 60 B.H.P. at 3500 R.P.M.

NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 2% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS649:1958



Continuous full power ratings and corresponding fuel consumption					
B.H.P.		27	36	44	50
R.P.M.		1500	2000	2500	3000
Approx. fuel cons.	g.p.h.	1.45	1.94	2.37	2.75
	l.p.h.	6.61	8.81	10.77	12.51

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass stemtube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.

Where existing shafting is to be retained the propeller and half coupling can be bored to suit.

The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits,with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter
Direct Drive	305-406mm	12-16"	32mm 1¼"
1·5:1	381-432mm	15-17"	32mm 1¼"
2:1	483-533mm	19-21"	38mm 1½"
2·5:1	533-584mm	21-23"	38mm 1½"
3:1	610-660mm	24-26"	38mm 1½"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request.

All drawings, dimensions, weights, fuel consumptions and other data contained in this leaflet are approximate only and, whilst they are substantially correct, are subject to alteration without notice. The outline arrangement drawings are not to scale.
We reserve the right to make any variations in the above specification that we may consider desirable to effect improvements, or which may be necessary through circumstances beyond our control. No such improvements, however, will be considered retrospective for engines already delivered. All orders placed with us or any of our Authorised Dealers or Distributors will be deemed to have been given on this understanding.

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Leaflet No. MS-01-140

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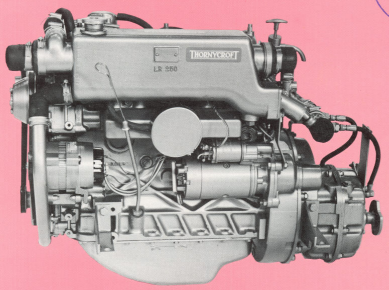
MARINE ENGINES

TYPE 150



Specification

Type: 150 Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinders bore: 90.5mm (3.56in)
Piston Stroke: 97.0mm (3.82in)
Swept volume: 2.5 litres (152in^3)
Compression ratio: 21:1
Firing order: 1,3,4,2
Minimum full load speed: 1000 R.P.M.

Engine installtion angle:
Maximum installed angle (allowing for a further 4° rise when under way): 15°.

Combustion system:
Indirect injection with heater plugs for easy starting.

Crankshaft:
S.G. Iron fully counterbalanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

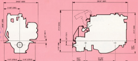
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator.
Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

Electrical equipment:
A 12 volt Lucas solenoid operated starter motor is fitted, together with a 12 volt Lucas alternator and regulator unit.

For further details see current price list.

Power Ratings: 49 kW (66 bhp) Intermittent.
41 kW (55 bhp) Continuous.

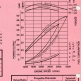
Type 150 Engine with PRM 'Delta' Gearbox: Weight 322 kg. (710 lbs)



Engine ratings

The type 150 Marine Diesel Engine may be set to develop continuous outputs from 25 to 55 B.H.P. according to requirements.
For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 66 B.H.P. at 3500 R.P.M.
NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 3% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS649:1958

Continuous full power ratings and corresponding fuel consumption					
B.H.P.		25	36	46	55
R.P.M.		1500	2000	2500	3000
Approx. fuel cons.	g.p.h.	1.26	1.74	2.23	2.81
	l.p.h.	5.73	7.91	10.1	12.8



Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.
Where existing shafting is to be retained the propeller and half coupling can be bored to suit.
The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter	
Direct Drive	305-381mm	12-15"	32mm	1¼"
1·5:1	406-457mm	16-18"	32mm	1¼"
2:1	483-533mm	19-21"	38mm	1½"
2·5:1	533-584mm	21-23"	38mm	1½"
3:1	610-660mm	24-26"	45mm	1¾"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request.

Leaflet No. MS-01-180

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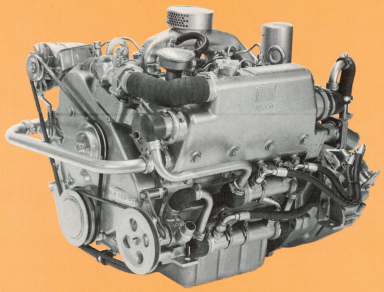
MARINE ENGINES

TYPE 152



Specification

Type: 152 Vertical 4-Stroke Marine Diesel Engine
No. of cylinders: Four
Cylinder bore: 93.7 mm (3.69in)
Piston Stroke: 90.5mm (3.56in)
Swept volume: 2.5 litres (152in³)
Compression ratio: 19.1:1
Firing order: 1,3,4,2.
Minimum full load speed: 1000 R.P.M.

Engine Installation angle:
Maximum installed angle (allowing for a further 4° rise when under way): 15°.

Combustion system:
Direct injection with automatic excess fuel and solenoid stop controls.

Crankshaft:
S.G. Iron fully counterbalanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

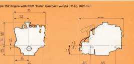
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator.
Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

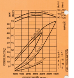
Electrical equipment:
A 12 volt Lucas solenoid operated starter motor is fitted, together with a 12 volt Lucas alternator and regulator unit.

For further details see current price list.

Power Ratings: 52 kW (70 bhp) Intermittent.
41 kW (55 bhp) Continuous.

Type 152 Engine with PRM 'Delta' Gearbox: Weight 315 kg. (695 lbs)





Engine ratings

The type 152 Marine Diesel Engine may be set to develop continuous outputs from 23 to 55 B.H.P. according to requirements.

For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 70 B.H.P. at 4000 R.P.M.

NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 3% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS5514/1.

Continuous full power ratings and corresponding fuel consumption					
B.H.P.		23	34	45	55
R.P.M.		1500	2000	2500	3000
Approx. fuel cons.	g.p.h.	1.26	1.8	2.34	2.64
	l.p.h.	5.73	8.18	10.6	12.0

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.

Where existing shafting is to be retained the propeller and half coupling can be bored to suit.

The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter	
Direct Drive	305-381mm	12-15"	32mm	1¼"
1·5:1	406-457mm	16-18"	32mm	1¼"
2:1	483-533mm	19-21"	38mm	1½"
2·5:1	533-584mm	21-23"	38mm	1½"
3:1	610-660mm	24-26"	45mm	1¾"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request.

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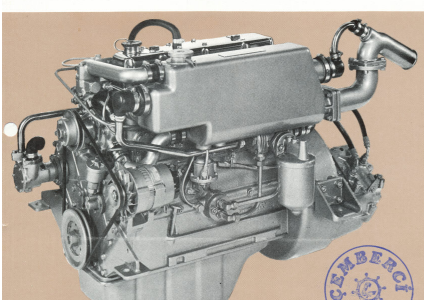
MARINE ENGINES

TYPE 230R



ecification

Type: 230R Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinder bore: 98 mm (3·858 in)
Piston Stroke: 125 mm (4·921 in)
Swept volume: 3·77 litres (230·2 in³)
Compression ratio: 16·8:1
Firing order: 1,2,4,3.
Minimum full load speed: 1250 R.P.M.

Engine installation angle:
Maximum installed angle (allowing for a further 3 nse when under way): 12°.

Combustion system:
Direct injection with excess fuel device for cold starting.

Crankshaft:
Forged steel dynamically balanced crankshaft carried in five bearings.

Lubrication system:
A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

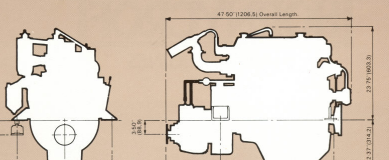
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator. Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

Electrical equipment:
A 12 volt Lucas solenoid operated starter motor is fitted, together with a 12 volt Lucas alternator and regulator unit.

For further details see current price list.

Power Ratings: 55·2 kW (74 bhp) Intermittent.
47·0 kW (63 bhp) Continuous.

Type 230R Engine with PRM 160 Gearbox: Weight 487 kg. (1074lbs)

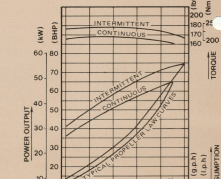


Engine ratings

The type 230 Marine Diesel Engine may be set to develop continuous outputs from 36 to 63 B.H.P. according to requirements.

For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 74 B.H.P. at 2500 R.P.M.

NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 2% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS649:1958



Continuous full power ratings and corresponding fuel consumption					
B.H.P.		36	43	56	63
R.P.M.		1250	1500	2000	2400
Approx. fuel cons.	g.p.h.	1·68	1·96	2·69	3·25
	l.p.h.	7·64	8·91	12·23	14·78

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stem gear is of the water lubricated type incorporating a high tensile brass sternstube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.

Where existing shafting is to be retained the propeller and half coupling can be bored to suit.

The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits,with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter
Direct Drive	356-432mm	14·17"	32mm 1¼"
1·5:1	457-483mm	18·19"	38mm 1½"
2:1	559-584mm	22·23"	38mm 1½"
2·5:1	660mm	26"	44mm 1¾"
3:1	711mm	28"	44mm 1¾"

NOTE: Shaft sizes for Lloyd s B Department of Trade applications on request

All drawings, dimensions, weights, fuel consumptions and other data contained in this leaflet are approximate only and, whilst they are substantially correct, are subject to alteration without notice. The outline arrangement drawings are not to scale.
We reserve the right to make any variations in the above specification that we may consider desirable to effect improvements, or which may be necessary through circumstances beyond our control. No such improvements, however, will be considered retrospective for engines already delivered. All orders placed with us or any of our Authorised Dealers or Distributors will be deemed to have been given on this understanding.

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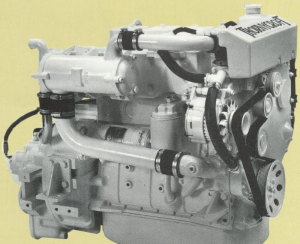
Leaflet No. MS-05-230

THORNYCROFT
MARINE ENGINES

TYPE 238



Specification

Type: 238 Vertical 4-Stroke Marine Diesel Engine

No. of Cylinders: Four
Cylinder Bore: 102mm (4·02 in)
Piston Stroke: 120mm (4·72 in)
Swept Volume: 3·92 litres (239 in³)
Compression Ratio: 17·5:1
Firing Order: 1, 2, 4, 3.
Minimum full load speed: 1500 R.P.M.

Engine installation angle:

Maximum installed angle (allowing for a further 3° rise when under way):15°

Combustion System:

Direct injection with excess fuel device for cold starting.

Crankshaft:

Forged steel crankshaft with integral counterweights carried in five bearings.

Lubrication system:

A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil temperature stabiliser.

Cooling system:

Standard: Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator.
Alternative: Closed circuit fresh water system with fresh water circulator suitable for use with an external keel cooler.

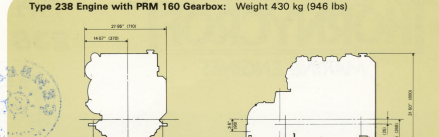
Electrical equipment:

A 12 volt insulated axial engagement starter is fitted as standard together with a 12 volt alternator and regulator unit. Alternative 24 volt electrical equipment is also available.

For further details see current price list.

Power Ratings: 60 kW (80 bhp) High Output.
56 kW (76 bhp) Intermittent.

Type 238 Engine with PRM 160 Gearbox: Weight 430 kg (946 lbs)

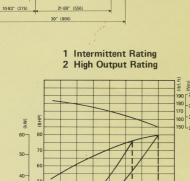


Engine ratings

Intermittent Rating: This power rating is intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Reduced power operation must be at least 200 RPM below rated RPM. This rating is in accordance with BS5514/1 (ISO 3046) and is for applications that operate less than 3000 hours per year.

High Output Rating: This power rating is for use in variable load applications where full power is limited to two hours out of every six hours of operation. Reduced power operation must be at least 200 RPM below rated RPM. This rating is in accordance with BS5514/1 (ISO 3046) and is for applications that operate less than 600 hours per year.

Note: All horsepower ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to de-rate the engine by 2% for each 5½ºC (10ºF) above 30ºC (85ºF) air temperature at sea level.



Intermittent full power ratings and corresponding fuel consumption				
B.H.P.	52·5	61	71	76
R.P.M.	1500	1800	2200	2500
Approx fuel cons. g.p.h.	2·24	2·64	3·17	3·41
Approx fuel cons. l.p.h.	10·2	12·0	14·4	15·5

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with stainless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.
Where existing shafting is to be retained the propeller and half coupling can be bored to suit.
The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter
Direct Drive	330–356mm	13"–14"	32mm 1¼"
1·5:1	406–432mm	16"–17"	32mm 1¼"
2:1	508–533mm	20"–21"	38mm 1½"
2·5:1	584–610mm	23"–24"	38mm 1½"
3:1	660–686mm	26"–27"	44mm 1¾"

NOTE: Shaft sizes for Lloyd's B Department of Trade applications on request.

All drawings, dimensions, weights, fuel consumptions and other data contained in this leaflet are approximate only and, whilst they are substantially correct, are subject to alteration without notice. The outline arrangement drawings are not to scale.
We reserve the right to make any variations in the above specification that we may consider desirable to effect improvements, of which may be necessary through circumstances beyond our control. No such improvements, however, will be considered retrospective for engines already delivered. All orders placed with us or any of our Authorised Dealers or Distributors will be deemed to have been given on this understanding.

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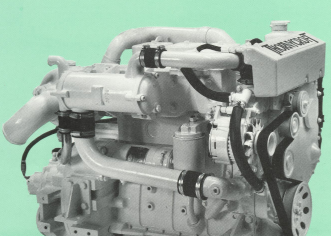
Leaflet No. MS-01-238

THORNYCROFT

MARINE ENGINES

TYPE T238



Specification

Type: T238 Vertical 4-Stroke Turbocharged Marine Diesel Engine:

No. of Cylinders: Four
Cylinder Bore: 102mm (4·02 in)
Piston Stroke: 120mm (4·72 in)
Swept Volume: 3·92 litres (239 in³)
Compression Ratio: 16·5:1
Firing Order: 1, 2, 4, 3.
Minimum full load speed: 1500 R.P.M.

Engine installation angle:

Maximum installed angle (allowing for a further 3° rise when under way): 15°

Combustion System:

Direct injection with excess fuel device for cold starting.

Crankshaft:

Forged steel crankshaft with integral counterweights carried in five bearings.

Lubrication system:

A full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil temperature stabiliser.

Cooling system:

Standard: Closed circuit heat exchanger cooled fresh water syst with sea water pump and fresh water circulator.

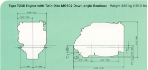
Electrical equipment:

A 12 volt insulated axial engagement starter is fitted as standard together with a 12 volt alternator and regulator unit. Alternative 24 volt electrical equipment is also available.

For further details se current price list.

Power Ratings: 112 kW (150 bhp) High Output.
97 kW (130 bhp) Intermittent.

Type T238 Engine with Twin Disc MG502 Down-angle Gearbox: Weight 460 kg (1012 lbs)

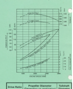


Engine ratings

Intermittent Rating: This power rating is intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Reduced power operation must be at least 200 RPM below rated RPM. This rating is in accordance with BS5514/1 (ISO 3046) and is for applications that operate less than 3000 hours per year.

High Output Rating: This power rating is for use in variable load applications where full power is limited to two hours out of every six hours of operation. Reduced power operation must be at least 200 RPM below rated RPM. This rating is in accordance with BS5514/1 (ISO 3046) and is for applications that operate less than 800 hours per year.

Note: All horsepower ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted.



Intermittent full power ratings and corresponding fuel consumption				
B.H.P.		110	122	130
R.P.M.		2050	2300	2500
Approx. fuel cons.	g.p.h.	4·66	5·10	5·45
	l.p.h.	21·2	23·2	24·8

Stern gear

Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.

Where existing shafting is to be retained the propeller and half coupling can be bored to suit.

The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter	
Direct Drive	356–381mm	14"–15"	32mm	1¼"
1·5:1	457–483mm	18"–19"	38mm	1½"
2:1	559–584mm	22"–23"	44mm	1¾"
2·5:1	635–660mm	25"–26"	44mm	1¾"
3:1	711–737mm	28"–29"	51mm	2"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request.

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Leaflet No. ME-01-T238

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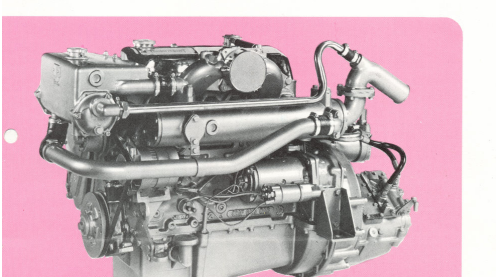
MARINE ENGINES

TYPE 251



Specification

Type: 251 Vertical 4-Stroke Marine Diesel Engine

No. of cylinders: Four
Cylinder bore: 107·2 mm (4·22 in)
Piston Stroke: 114·9 mm (4·524 in)
Swept volume: 4·165 litres (254 in³)
Compression ratio: 16:1
Firing order: 1,2,4,3.
Minimum full load speed: 1250 R.P.M.

Engine installation angle:
Maximum installed angle (allowing for a further 3° rise when under way):
With Shallow Sump 12°. With Front Well Sump 15°.

Combustion system:
Direct injection with excess fuel device for cold starting.

Crankshaft:
Forged steel dynamically balanced crankshaft carried in five bearings.

Lubrication system:
a full pressure wet sump system is employed. Oil is drawn through a gauze strainer in the sump and before entering the system passes through an external full flow detachable element type oil filter and an oil cooler.

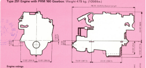
Cooling system:
Standard. Closed circuit heat exchanger cooled fresh water system with sea water pump and fresh water circulator.
Alternative. Closed circuit fresh water system with external keel cooler and fresh water circulator.

Electrical equipment:
A12 volt Lucas solenoid operated starter is fitted as standard together with a 12 volt Lucas alternator and regulator unit.
Alternative 24 volt electrical equipment is available.
For further details see current price list.

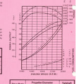
NOTE: Additional spring starter as illustrated is an optional extra.

Power Ratings: 63·4 kW (85 bhp) Intermittent.
57·7 kW (77 bhp) Continuous.

Type 251 Engine with PRM 160 Gearbox: Weight 479 kg. (1056 lbs.)



Engine ratings
The type 251 Marine Diesel Engine may be set to develop continuous outputs from 39·5 to 77·3 B.H.P. according to requirements.
For special applications where full power will not be required for periods in excess of 1 hour in any 12 hours consecutive running, the engine can be supplied at an intermittent rating of 85 B.H.P. at 2600 R.P.M.
NOTE: All horse power ratings quoted are at the engine flywheel. Due allowance must be made for transmission losses which will depend on the type of gearbox fitted. For tropical use it is necessary to derate the engine by 2% for each 5½°C (10°F) above 30°C (85°F) air temperature at sea level. In some parts of the world further derating for humidity is necessary in accordance with BS649:1958



Continuous full power ratings and corresponding fuel consumption					
B.H.P.		39·5	61·8	72·9	77·3
R.P.M.		1250	1800	2200	2600
Approx. fuel cons.	g.p.h.	1·92	2·83	3·36	3·65
	l.p.h.	8·72	12·9	15·3	16·6

Stern gear
Complete stern gear can be supplied in materials to suit individual requirements. Standard stern gear is of the water lubricated type incorporating a high tensile brass sterntube with cutless rubber bearings, a stainless steel tailshaft and a manganese bronze propeller.
Where existing shafting is to be retained the propeller and half coupling can be bored to suit.
The following table gives tailshaft and approximate propeller diameters for various reduction ratios. The propeller details are for general guidance only since each installation must be considered on its own merits, with particular attention to hull form, required performance and propeller aperture.

Drive Ratio	Propeller Diameter (Depending on application)		Tailshaft Diameter	
Direct Drive	381-406mm	15-16"	32mm	1¼"
1·5:1	457-483mm	18-19"	38mm	1½"
2:1	559-584mm	22-23"	44mm	1¾"
2·6:1	660mm	26"	44mm	1¾"
3:1	711mm	28"	51mm	2"

NOTE: Shaft sizes for Lloyd's & Department of Trade applications on request.

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