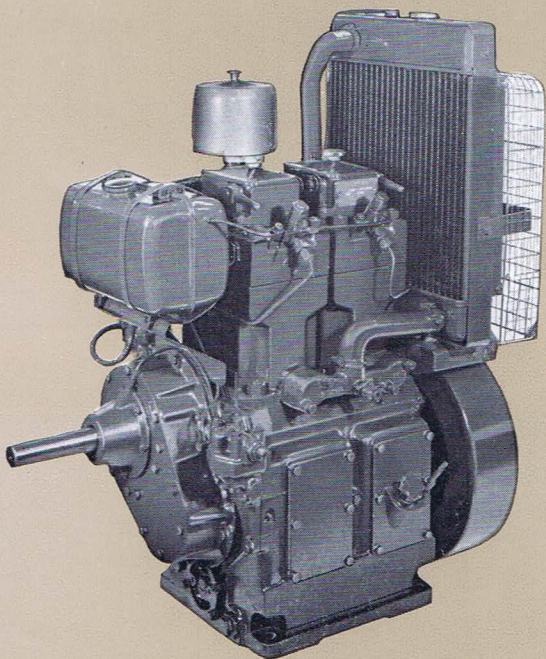


PETTER



THE QUEEN'S AWARD
TO INDUSTRY



water cooled
diesel
engines
for all
purposes

type **PHW**

Engine rating
4 - 16.4 bhp
1 and 2 cylinders



 HAWKER SIDDELEY
COMPANY

type **PH1W**

This reliable and well proven range of Petter engines produces 8.2 bhp from the PH1W and 16.4 bhp from the PH2W, both at 2000 rev/min.

Direct fuel injection ensures quick, easy starting — a feature of all Petter diesels. These engines are suitable for driving plant and equipment in territories where water cooling is particularly in demand.

Five basic drive arrangements, SAE5 Bellhousing, Speed Increasing Gear and Hydraulic Pump adaptor, offer customers a wide choice of specification for all kinds of plant and machinery.

Also available are aircooled PH1 and PH2 units of similar design and performance.

Petter agents and representatives in most parts of the world offer an efficient spares and service organisation.

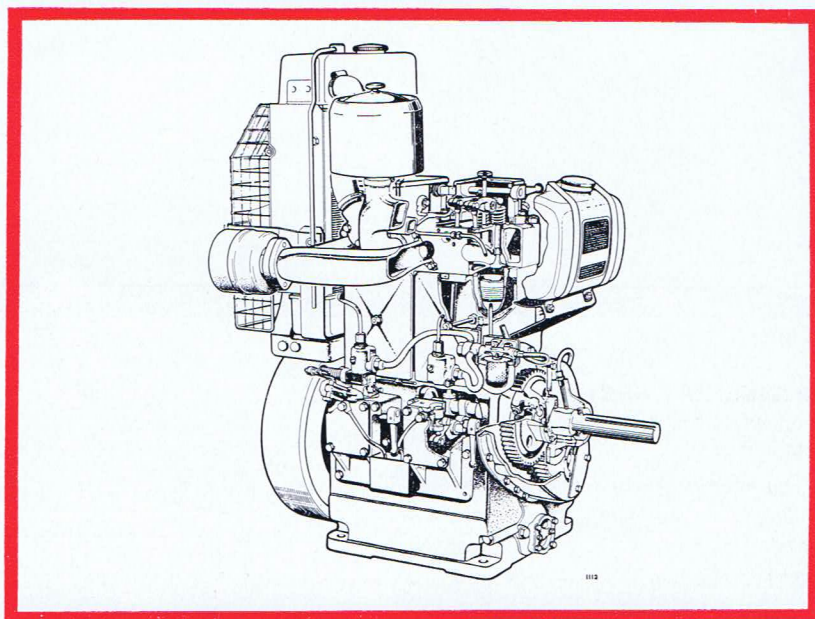
Power users are invited to obtain advice which is freely available from the Technical Department.

Vertical, overhead valve, compression ignition, four stroke, direct injection	
Bore (nominal)	3 $\frac{7}{16}$ in (87.3mm)
Stroke	110mm (4.33in)
Cubic capacity PH1W	40.2 in ³ (659 cm ³)
PH2W	80.4 in ³ (1318 cm ³)
Compression ratio	16.5 : 1
Bore-stroke ratio	1 : 1.26
Compression pressure	535 lb/in ² (37.61 kg/cm ²)
Firing pressure at constant load (max)	1050 lb/in ² (73.82 kg/cm ²)
bmp at 2000 rev/min (continuous rating 'A')	80.8 lb/in ² (5.68 kg/cm ²)
Constant torque ('A' rating) PH1W	21.9 lb ft (3.02 kg m)
PH2W	43.8 lb ft (6.05 kg m)
Maximum torque 'B' rating PH1W	26.2 lb ft (3.62 kg m)
(at 1700 rev/min) PH2W	52.4 lb ft (7.24 kg m)
Maximum torque 'C' rating PH1W	28.57 lb ft (3.98 kg m)
(at 1700 rev/min) PH2W	57.15 lb ft (7.96 kg m)
Piston speed at 2000 rev/min (mean)	1443 ft/min (7.33 m/sec)
Mechanical efficiency	74%
Brake thermal efficiency	32%
Fuel	A high grade light distillate diesel fuel in accordance with B.S. specification No. 2869 : 1958 Class A
Fuel tank capacity (engine mounted)	1 $\frac{1}{2}$ gal (6.8 litres)
Lubricating oil	Heavy duty detergent with minimum performance as specified by British Defence Specification 2101B or U.S. Specification MIL/L/2104A
Lubricating oil viscosity	SAE 10 or 10W
U.K. Winter (Below 5°C [41°F])	} or 10W/30 multigrade
U.K. Summer (From 5°C to 32°C [41°F to 90°F])	
Tropical (Above 32°C [90°F])	
Lubricating oil capacity PH1W	5 pints (2.84 litres)
PH2W	12 pints (6.8 litres)
Lubricating oil consumption	0.0055 pints/bhph (2.72 g/CVh)
Cooling tank capacities	
Temperature: PH1W	48 gal (218 litres)
PH2W	120 gal (545 litres)
Tropical: PH1W	120 gal (545 litres)
PH2W	240 gal (1090 litres)
Weight of standard dry engine PH1W	393 lb (178 kg)
PH2W	551 lb (250 kg)

		PH1W ONE-CYLINDER ENGINE						PH2W TWO-CYLINDER ENGINE					
rev/min	Crankshaft drive	1000	1200	1500	1650	1800	2000	1000	1200	1500	1650	1800	2000
rev/min	Camshaft drive	500	600	750	825	900	1000	500	600	750	825	900	1000
bhp at rated speed	Continuous 'A'	4	5	6.25	6.75	7.5	8.2	8	10	12.5	13.5	15	16.4
	Intermittent 'B'	4.4	5.5	6.9	7.4	8.2	9	8.8	11	13.8	14.8	16.5	18
	Maximum 'C'	4.8	6	7.5	8.1	9	9.8	9.6	12	15	16.2	18	19.7
Cyclic Variation at 'A' rating	Standard Flywheel	1/27	1/37	1/58	1/72	1/84	1/106	1/23	1/31	1/49	1/60	1/70	1/90
	Heavy Flywheel	1/42	1/58	1/90	1/112	1/131	—	1/35	1/48	1/75	1/93	1/109	—

Standard Equipment

Automatic overload prevention mechanism
 Dust-proof dipstick and oil filler
 Fuel filter (with replaceable paper element)
 Fuel pump rack covers
 Fuel tank (with strainer)
 Heavy duty air cleaner (with replaceable paper element)
 Lubricating oil pump strainer
 Operator's handbook
 Set of joints for decarbonising
 Set of tools
 Silencer ('pepper pot' type)
 Starting handle



Optional Extras

Acoustic silencer and spark arrestor
 Clutch (Industrial, overcentre wet type—see MARK III and MARK IV drive)
 Complete set of joints
 Electric starting (12 or 24 volt)
 Engine protection shut down equipment (low oil pressure, high oil temperature, and high water temperature)
 Filter element packs
 Flexible coupling (Pilot bored—shaft mounted or for use with SAE5 bell-housing)
 Flywheel guard (not with heavy flywheel)
 Foundation bolts
 Fuel feed pump (mechanical type)
 Heavy flywheel

Hydraulic pump adaptors
 Idler speed control (500-600 rev/min)
 Linked decompressors
 Lubricating oil filter (with replaceable paper element)
 Lubricating oil pressure gauge
 Nozzle cleaning kit
 Power housing
 Provision for side mounting crankcase feet
 Pulleys (5in and 7in diameter x 7in flat face)
 Radiator (temperate or tropical)
 Reverse rotation
 Revolution or hour counters and Tachometers
 SAE5 adaptor (for use with MARK II drive)

Spares packs for 2000 or 4000 hours operation
 Speed increasing gear (1.61 : 1 and 1.86 : 1 ratios available)
 Stop control
 Stop solenoids
 Sump drain pump
 Variable speed control (Cable or ratchet type—from rated speed down to 500-600 rev/min)
 Water thermostat valve
 2 : 1 reduction (for use with MARK III and MARK IV direct drive only)

Approximate Shipping Specification—with standard equipment

Type	Cooling	Weight (Net)		Weight (Gross)		Packing Case Size		Cubic Capacity		Ocean Tons	Ocean Tonnes
		lb	kg	lb	kg	in	mm	ft ³	m ³	40ft ³ =1 ton	35ft ³ =1 tonne
PH1W	Tank	406	182	530	240	32×22×33	813×559×838	13.4	0.382	0.335	0.354
	Radiator	474	215	626	284	44×24×36	1118×610×914	22.0	0.623	0.550	0.628
PH2W	Tank	569	256	760	343	42×25×34	1068×635×863	20.7	0.585	0.518	0.591
	Radiator	677	305	852	385	44×26×41	1118×660×1041	27.1	0.767	0.678	0.775

Heaviest part handled during maintenance: Flywheel PH1/2W 132 lb (60 kg)

Illustrations, weights and measurements are approximate and we reserve the right to make modifications which may be considered necessary. In compiling this leaflet, every care has been taken, but the specification and details must not be regarded as binding.

PETTERS LIMITED



STAINES, MIDDLESEX, ENGLAND.

Telephone: Staines 51333

Telex: 23871

Telegrams: DIESEL STAINES TELEX

Publication 3015/9

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ENGINE RATINGS:

For engines operating under standard conditions of:

Temperature: 29.4°C (85°F) maximum.
Altitude: Up to 500ft (150m) above sea level.

Relative Humidity: 60% maximum.

Derating: Engines operating under conditions in excess of the above maxima, must be derated in accordance with B.S. 649 : 1958.

Maximum Rating 'C': For periods up to five minutes. Power governed by fuel pump setting at rated speed. For APPROVED variable load and speed applications.

Intermittent Rating 'B': For one hour in any 12 hours continuous running. Power governed by fuel pump setting at rated speed. British Standard 1 hour rating (B.S. 649 : 1958). German DIN 6270 'B' rating. U.S. Commercial Standard CS. 102E-42. For STANDARD variable and fixed speed engines.

Continuous Rating 'A': The continuous power permitted at rated speed. British Standard rating (B.S. 649 : 1958). German DIN 6270 'A' rating. U.S. Commercial Standard CS. 102E-42.

GOVERNING:

Centrifugal. In accordance with B.S. Specification 649 : 1958. Governor guarantee: Momentary 10%, Permanent 4½%. Fixed rated speeds covered by a series of interchangeable governor springs. (±5% adjustment). Variable speed available as optional extra.

STARTING:

By hand. Electric starting (12 or 24 volt) available as optional extra.

Starter motor PH1W 12V — 50Ah
battery capacity PH2W 12V — 65Ah

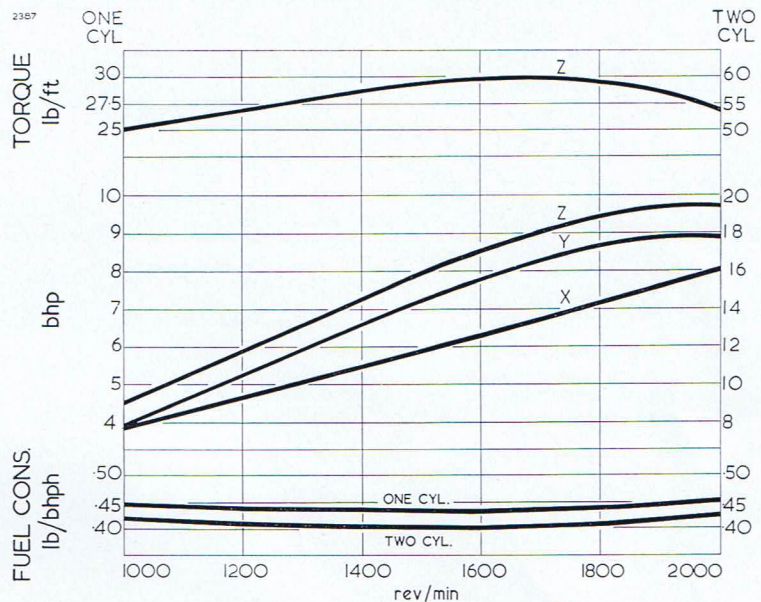
Starting torque:

To break oil seal PH1W 21 lb ft (2.90 kg m)
 at 15.5°C (60°F) PH2W 23 lb ft (3.18 kg m)

To pull over PH1W 32 lb ft (4.42 kg m)
compression at PH2W 35 lb ft (4.84 kg m)
 15°C (60°F)

ROTATION:

Standard rotation is CLOCKWISE looking on the flywheel and is indicated by arrows on the diagrams. Reverse rotation engines are available as an optional extra.



- X CONTINUOUS RATING - FIXED SPEED ENGINES.
 - Y INTERMITTENT RATING - VARIABLE SPEED ENGINES SET AT 2000 rev/min.
 - Z MAXIMUM RATING - VARIABLE SPEED ENGINES SET AT 2000 rev/min.
- DETAILS OF OTHER SPEEDS ON REQUEST.

When a radiator is fitted, engine powers must be reduced in accordance with the following table:

Engine Type	Rated Speed (rev/min)	Reduction for Fan Power (bhp)	Engine Type	Rated Speed (rev/min)	Reduction for Fan Power (bhp)
PH2W (Temperate)	1000	0.15	PH2W (Tropical)	1000	0.2
	1200	0.2		1200	0.3
	1500	0.25		1500	0.55
	1650	0.4		1650	0.7
PH1W (All climates)	1800	0.5	1800	0.9	
	2000	0.75	2000	1.2	

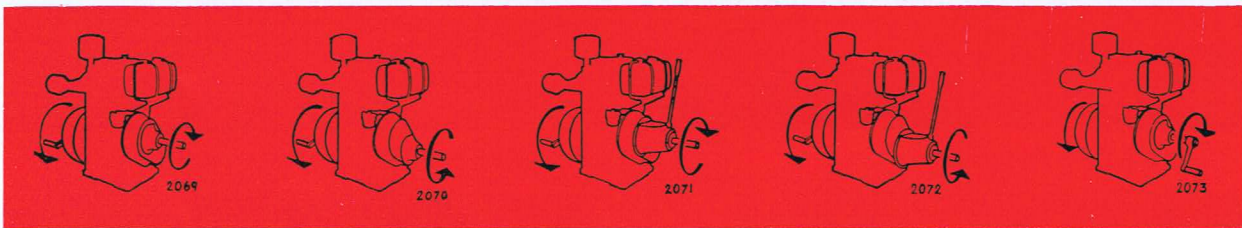
*Specific Fuel Consumption (Subject to 5% tolerance)

Engine Type	Rated Speed (rev/min)	Continuous Rating 'A'		½ Continuous Rating 'A'		Intermittent Rating 'B'			
		lb/bhph	g/CVh g/PSH	lb/bhph	g/CVh g/PSH	lb/bhph	g/CVh g/PSH		
PH1W	1000	0.463	210	0.464	210	0.524	238	0.476	216
	1200	0.444	202	0.45	204	0.514	233	0.452	205
	1500	0.432	196	0.442	201	0.504	228	0.438	199
	1650	0.432	196	0.441	200	0.502	228	0.436	198
	1800	0.439	199	0.443	201	0.512	232	0.444	202
	2000	0.457	207	0.475	215	0.522	236	0.46	209
PH2W	1000	0.433	196	0.434	197	0.494	224	0.446	202
	1200	0.414	188	0.42	190	0.484	219	0.422	191
	1500	0.402	182	0.412	187	0.474	214	0.408	185
	1650	0.402	182	0.411	187	0.472	214	0.406	184
	1800	0.409	186	0.412	187	0.482	218	0.414	187
	2000	0.427	194	0.43	195	0.492	223	0.432	195

* Based on a fuel having a Specific Gravity of 0.84

Alternative Arrangements of Drive

All the alternative driving shafts have identical diameters and keyways, and may be used for belt, chain drive or coupling. The clutch is of the hand operated, multiple disc, positive action type running in oil. It is mounted on the gear cover and is provided with an extension shaft. When a belt or chain drive is used, a bearer should be fitted to the base of the clutch housing. This clutch is available at extra cost. SAE5 Bellhousing available on Mark II.



MARK I

Drive at half engine speed on camshaft extension at end remote from flywheel. Starting handle at flywheel end.

MARK II

Drive at engine speed on crankshaft extension at end remote from flywheel. Starting handle at flywheel end.

MARK III

Clutch drive at half engine speed on camshaft extension at end remote from flywheel. Starting handle at flywheel end.

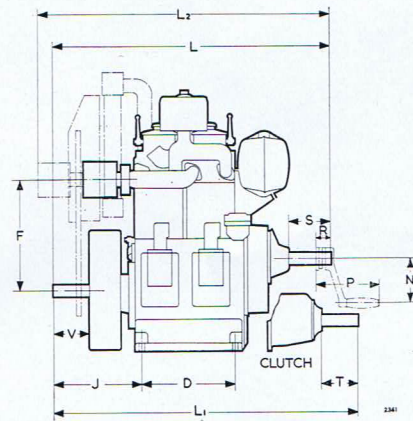
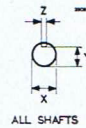
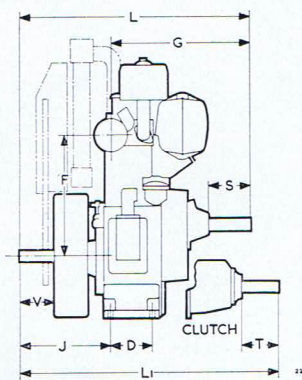
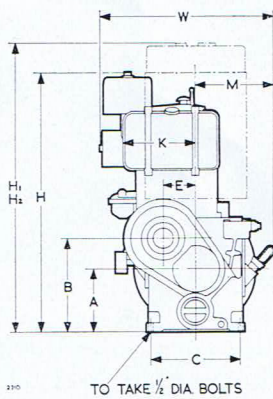
MARK IV

Clutch drive at engine speed on crankshaft extension at end remote from flywheel. Starting handle at flywheel end.

MARK V

Drive at engine speed on crankshaft at flywheel end. Starting handle on half speed extension at end remote from flywheel.

Principal Dimensions



TYPE	A	B	C	D	E	F	G	H	H ₁	H ₂ *	J	K	L	L ₁	L ₂	M	N	P	R	S	T	V	W	X	Y	Z	
PH1W	in	8	11 3/8	11 1/2	5 1/2	4	15 3/8	17 5/8	33	36 5/8	—	11 3/32	—	29 1/8	33 7/8	—	10 1/2	7 1/2	8 3/8	2	5 7/16	4 3/4	4 7/16	22 3/8	1 1/2	1 1/2	3/8
	mm	203	301	292	140	102	390	454	838	937	—	299	—	757	860	—	260	184	213	51	138	121	113	568	38	34	9
PH2W	in	8	11 3/8	11 1/2	11 3/8	4	14 3/8	—	33 3/8	36 3/8	39 1/4	12 3/32	9 7/8	36 7/16	40 1/2	38	10 1/2	7 1/2	8 3/8	2	5 7/16	4 3/4	4 7/16	22 3/8	1 1/2	1 1/2	3/8
	mm	203	301	292	295	102	367	—	861	937	1008	312	251	925	1028	965	260	184	213	51	138	121	113	568	38	34	9

* H₂ = Tropical radiator

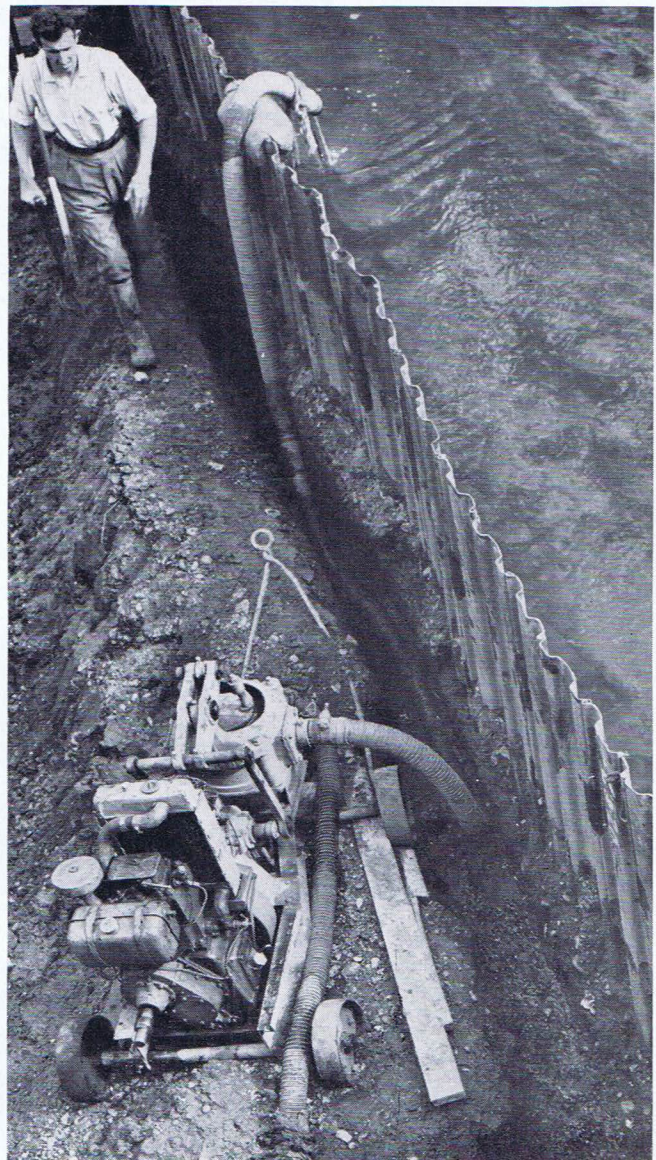


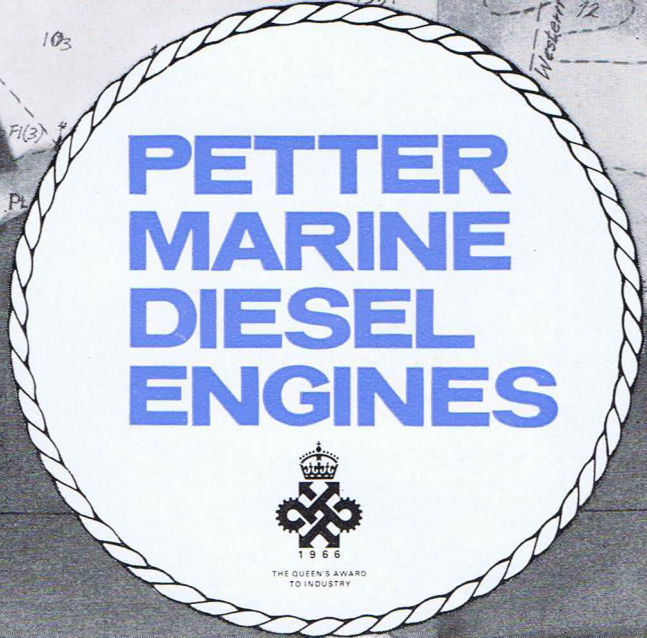
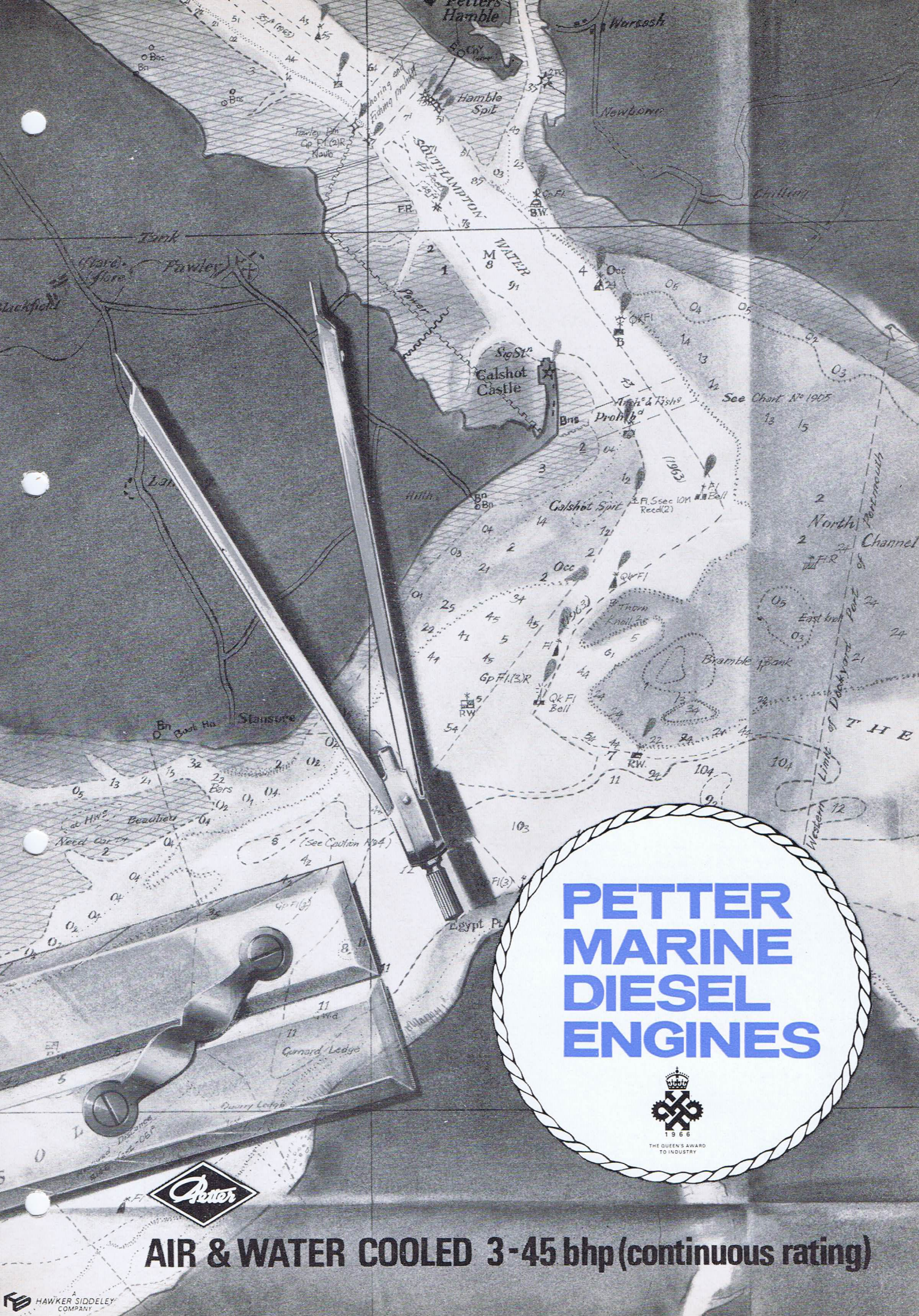
Petter diesels power a wide range of plant and equipment and illustrated here are some of the many applications

The following range of Petter air cooled industrial diesel engines is available:

Type	bhp	rev/min
AA1	1.5 to 3.5	1500 to 3600
DA1	4.25 to 6.5	1800 to 3000
BA1	6.75 to 10	1800 to 3000
PAZ1	1.5 to 3	1000 to 1800
PH*	4 to 16.4	1000 to 2000
PJ*	5 to 45	1000 to 2000

*Water cooled version available.





PETTER MARINE DIESEL ENGINES



AIR & WATER COOLED 3-45 bhp (continuous rating)



Petters are a power in marine diesels, from the outstanding AA1 (3 bhp)—the baby of the family to the robust PJ4 (45 bhp) there is an engine to suit your every requirement.

If you would like to know more about this fine range of air and water cooled diesels, please write for detailed literature.



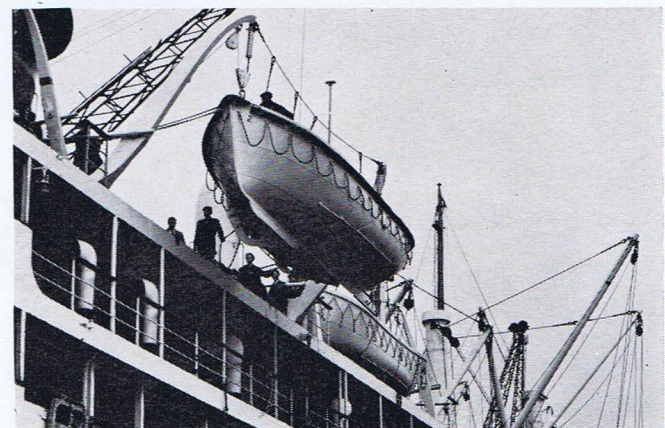
A Hamble River workboat powered by a Petter AA1M aircooled diesel engine.



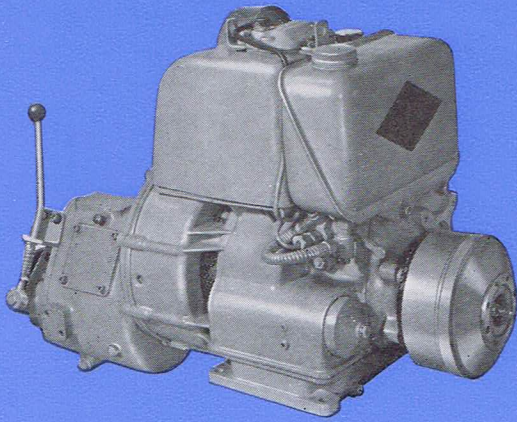
This workboat operating in Aberdeen Harbour is powered by a Petter PH2 aircooled diesel engine.



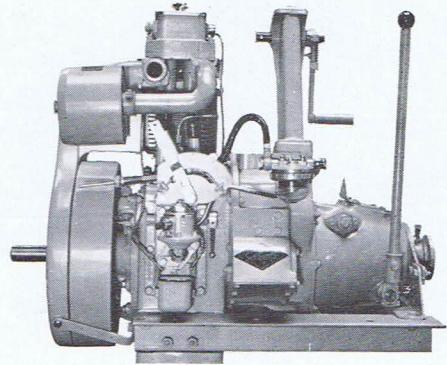
The Lulworth Fisher powered by a Petter PJ3W watercooled diesel unit. The engine is also used to drive the capstan for net hauling.



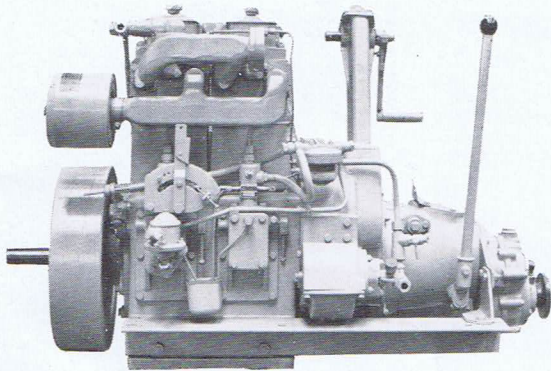
Petter marine diesels are used extensively in ship's lifeboats where dependability is essential. This craft is fitted with an AVA aircooled unit.



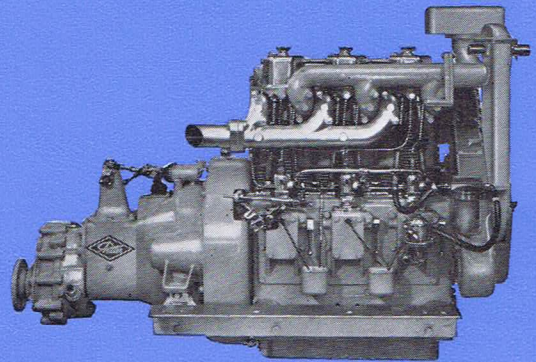
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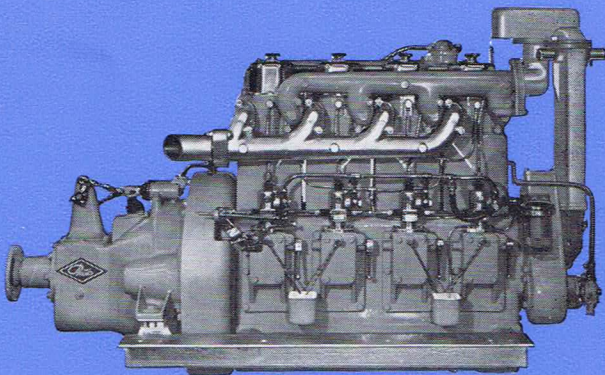
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3



4



5

- 1 AA1M 3 bhp at 3000 rev/min
- 2 AVAM 5-6.5 bhp at 1500 to 2000 rev/min
- 3 PH2WM 12.5-16.4 bhp at 1500 to 2000 rev/min
- 4 PJ3M 25.5-33.75 bhp at 1500 to 2000 rev/min
- 5 PJ4WM 34-45 bhp at 1500 to 2000 rev/min

Illustrations, weights and measurements are approximate and we reserve the right to make modifications which may be considered necessary. In compiling this leaflet, every care has been taken, but the specifications and details must not be regarded as binding.

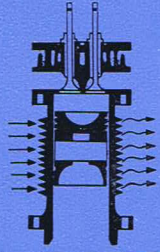
PETTERS LIMITED



Hamble, Southampton, England
 Telephone: Hamble 2061
 Telex: 47626
 Telegrams: Petter Hamble Telex

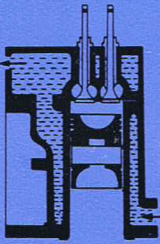
FRANS VAN BODEGRAVEN N.V.
BUNSCHOTENWEG 126
ROTTERDAM - TEL. 29 00 33

Air Cooled



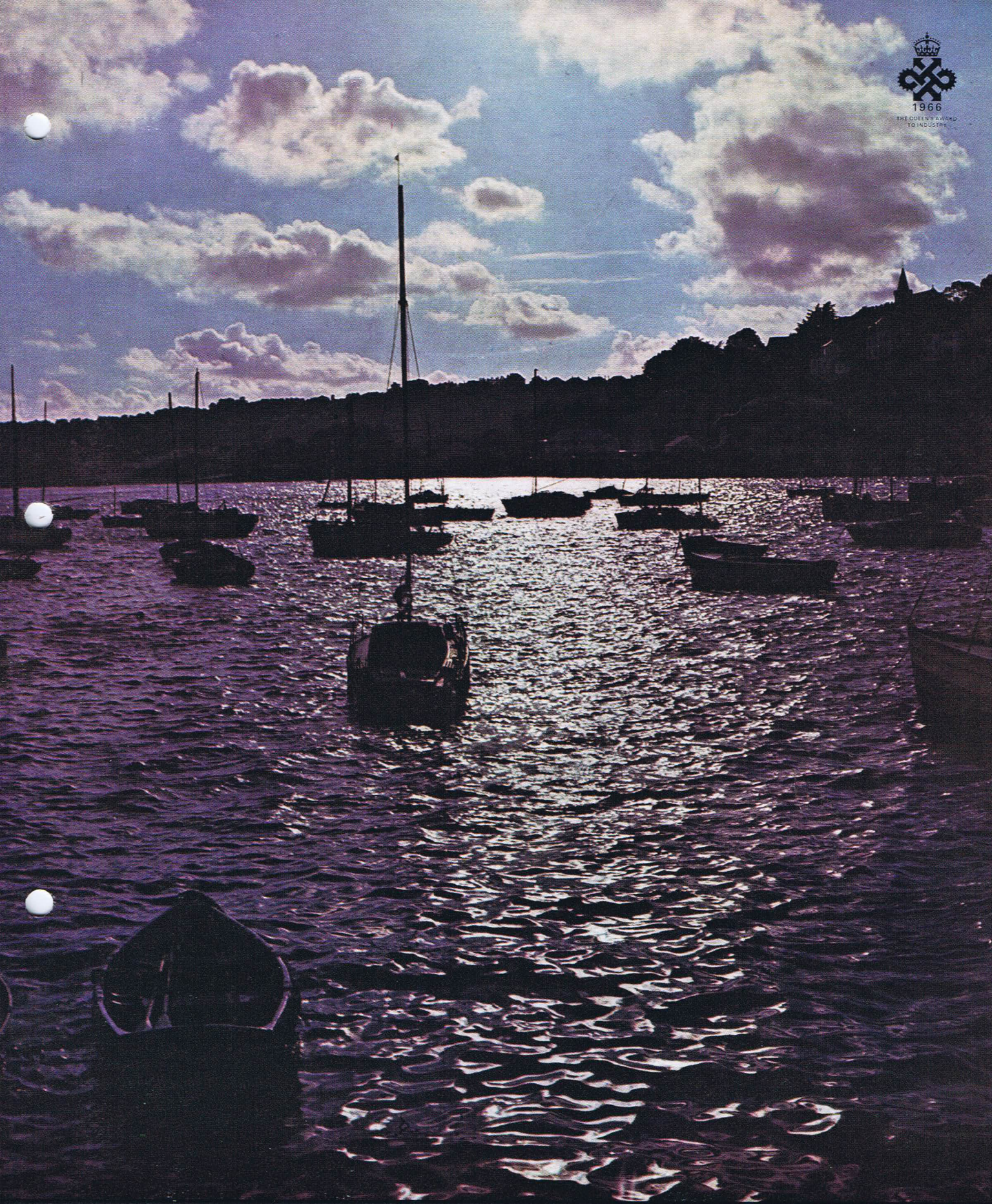
	Number of cylinders	BHP				PRINCIPAL DIMENSIONS						NETT WEIGHT			
		1500		1800		CV 2000	PS 3000	length		height		width		lbs	kg
								in	mm	in	mm	in	mm		
AA1M	1	—	—	—	3.0	26	660	19	483	13½	343	170	77		
AVA1M	1	5	6	6.5	—	40½	1029	30½	775	21 ⁹ / ₁₆	548	595	270		
AVA2M	2	10	12	13	—	47 ¹ / ₈	1197	30½	775	21 ⁷ / ₈	556	741	336		
PH1M	1	6.25	7.5	8.2	—	40½	1029	30½	775	21 ⁹ / ₁₆	548	599	272		
PH2M	2	12.5	15	16.4	—	47 ¹ / ₈	1197	30½	775	21 ⁷ / ₈	556	745	338		
PJ1M	1	8.5	10	11.25	—	40 ²³ / ₃₂	1038	30 ¹ / ₈	765	21 ¹³ / ₁₆	554	700	318		
PJ2M	2	17	20	22.5	—	51 ⁹ / ₃₂	1302	30 ¹ / ₈	765	22 ⁵ / ₈	575	896	406		
PJ3M	3	25.5	30	33.75	—	52 ⁵ / ₈	1337	38 ⁵ / ₈	982	26½	673	1180	535		
PJ4M	4	34	40	45	—	59¼	1505	38 ⁵ / ₈	982	26½	673	1380	626		

Water Cooled



	Number of cylinders	BHP				PRINCIPAL DIMENSIONS						NETT WEIGHT			
		1500		1800		CV 2000	PS 3000	length		height		width		lbs	kg
								in	mm	in	mm	in	mm		
AV1M	1	5	6	6.5	—	40½	1029	30½	775	21 ⁹ / ₁₆	548	600	272		
AV2M	2	10	12	13	—	47 ¹ / ₈	1197	30½	775	21 ⁷ / ₈	556	781	354		
PH1WM	1	6.25	7.5	8.2	—	40½	1029	30½	775	21 ⁹ / ₁₆	548	600	272		
PH2WM	2	12.5	15	16.4	—	47 ¹ / ₈	1197	30½	775	21 ⁷ / ₈	556	781	354		
PJ1WM	1	8.5	10	11.25	—	40 ²³ / ₃₂	1038	30 ⁹ / ₁₆	776	21 ⁵ / ₈	549	700	318		
PJ2WM	2	17	20	22.5	—	51 ⁹ / ₃₂	1302	30 ⁹ / ₁₆	776	24 ³ / ₁₆	614	896	406		
PJ3WM	3	25.5	30	33.75	—	53 ⁷ / ₃₂	1352	36	914	29	737	1200	544		
PJ4WM	4	34	40	45	—	59 ²⁷ / ₃₂	1520	36	914	29	737	1400	635		

N.B. The approximate dimensions and weights quoted are for engines with reverse and reduction gear.



PETTER MARINE

One & two cylinders water cooled marine diesel engines

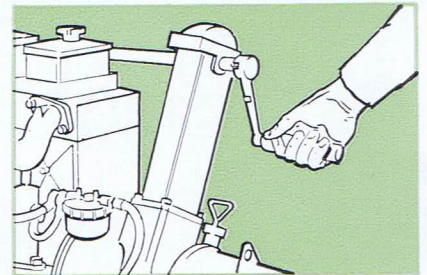
Type PHWM 6.25-16.4bhp (continuous rating)



PHWM range one & two cylinders 6.25 & 16.4 bhp

Water cooled marine diesels (continuous rating)

The Petter PHWM water cooled marine propulsion diesel engines range from 6.25 to 16.4 bhp and are widely used in a variety of craft. The engines are of a compact and robust design, providing economy, long life and easy maintenance. Direct fuel injection ensures easy starting, a feature of all Petter diesels. The units have the general approval of the British Ministry of Transport, Lloyds Register of Shipping, Bureau Veritas, Det Norske Veritas, American Bureau of Shipping and various other classification societies. Users of Petter engines are assured of outstanding spares and after sales service from our qualified Agents established in practically every country of the world, ready to help with every requirement. Marine auxiliary sets are also available, providing electrical, pumping and compressor services.



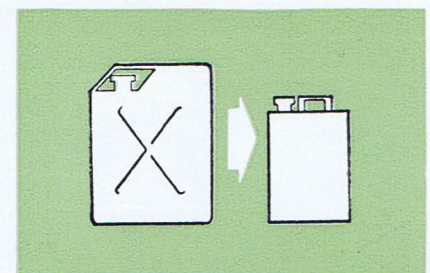
Handstarting on all models



Rugged reliability



World wide after sales service



Outstanding fuel economy

Specification

TYPE:

Cold starting, vertical, water cooled, overhead valve, totally enclosed, compression ignition, four stroke cycle engine of the direct injection type.

GENERAL DATA:

Bore 87.3mm (3.4375in) Stroke 110mm (4.33in)

bmp (Continuous Rating 'A') at 2000

rev/min 80.8 lb/in² (5.68 kg/cm²)

Cubic capacity 659 cm³ (40.2 in³) PH1WM,

1318 cm³ (80.4 in³) PH2WM

Compression ratio 16.5 : 1

Lubricating oil consumption at rated load 0.0055 pints/bhph (2.72 g/CVh)

ENGINE RATINGS:

For engines operating under standard conditions of:

Temperature: 29.4°C (85°F) maximum.

Altitude: Up to 500ft (150m) above sea level.

Relative

Humidity: 60% maximum.

Continuous

Rating 'A': The continuous power permitted at rated speed British Standard rating (B.S. 649:1958).

German DIN 6270 'A' rating. U.S. Commercial Standard CS. 102E-42.

Derating should be made in accordance with B.S. 649:1958.

GUARANTEE:

All PETTER engines are capable of giving their performance and our guarantee covers all ratings specified.

GOVERNING:

Speed control is by means of a hand quadrant control unit coupled to a totally enclosed centrifugal governor. The control unit permits a variation of engine speed from 500-600 rev/min to a maximum of 1500, 1800 or 2000 rev/min

SPEED RANGE:

Engines running at 1500 rev/min (B.S. rating) are not suitable for running at 1800

and 2000 rev/min (B.S. rating) as those at the latter speeds are fitted with a flywheel of higher grade material.

INSTALLATION:

The engines are fitted with steel bearers as standard and these permit easy mounting by $\frac{1}{2}$ in diameter bolts to the engine seatings in the craft. The maximum angles of installation are 10° (PH1WM) or 8° (PH2WM) including the amounts required for bow lift at full speed. When installing the engine it is essential to ensure that an absolutely unrestricted supply of fresh air reaches the air cleaner at all times.

PISTON:

The aluminium alloy piston has a hemispherical bowl in the crown and is fitted with three compression rings, one oil scraper ring and a fully floating gudgeon pin. The top compression ring is chromium plated ensuring long life with little cylinder bore wear.

CRANKSHAFT:

Of forged steel with all bearing surfaces induction hardened and ground to take replaceable steel backed, thin wall precision type bearings. The bearing material is aluminium tin.

CYLINDER HEAD:

Cast iron with specially shaped inlet passages to achieve a high degree of turbulence.

CYLINDER BLOCK:

Cast iron with ample water spaces. The centrifugally cast iron liner is easily removable.

CRANKCASE:

A robust tunnel bored iron casting with integral sump. Machined side faces provide rigid mounting for the engine and gearbox bearers.

LUBRICATING OIL SYSTEM:

Pressure feed by gear type pump to main, large end, valve rocker shaft bearings and reversing gear. The cylinders, small ends and camshaft are splash lubricated. The

reduction gear has independent oil bath lubrication.

FUEL SYSTEM:

On all one-cylinder engines and PH2WMR, fuel is gravity fed from an engine mounted fuel tank through a replaceable paper element filter. The system for the PH2WRMR and RM engines is similar, except that no tank is fitted to the engine. The fuel injection pumps are operated by rocker gear from the camshaft.

COOLING:

An accessible engine-mounted rotary pump circulates cooling water, the temperature of which is thermostatically controlled.

EXHAUST SYSTEM:

Exhaust manifolds are tapped 1in BSP on one-cylinder engines. On two-cylinder engines they are tapped 1 $\frac{1}{2}$ in BSP and discharge aft.

STARTING:

By hand. A detachable pawl type starting handle is supplied for starting on the crankshaft at the forward end. Raised hand starting is available at an extra cost although this cannot be fitted on engines embodying a mounted fuel tank.

STANDARD EQUIPMENT:

Fuel filter, air cleaner with replaceable paper element, quadrant speed control, driving half coupling, sump drain pump, engine bearers, starting handle, set of tools, set of joints and gaskets for decarbonising engine. Operator's handbook.

OPTIONAL EXTRAS:

Stern gear (alternative lengths available), propellers, plummer block, mating half coupling, electric starting, fuel feed pump, raised hand starting, acoustic exhaust silencer, water cooled exhaust silencer, exhaust and water piping and skin fittings, water cooled manifold, water temperature thermometer, heat exchanger, oil pressure gauge, separate fuel tanks, reverse rotation.



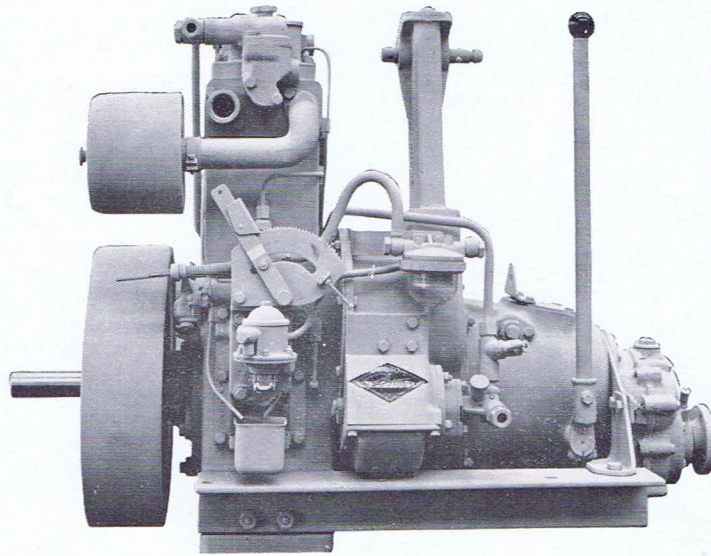
PH1WRMR PH1WRM & PH1WMR

ONE-CYLINDER UNITS 6.25-8.2 bhp (continuous rating)

PH1WRMR: These units are fitted with a Reverse and 2:1 Reduction Gear, providing propeller drive at half engine speed. The unit is for use with a right-handed propeller, but reverse rotation units are available.

PH1WRM: These units are similar to the PHWRMR types, but have no Reduction Gear. Thus with a standard rotation engine, drive is provided for a left-handed propeller at engine speed. Reverse rotation units are available.

PH1WMR: These units have no Reverse Gear and are fitted with Petter clutch and 2:1 Reduction Gear, providing propeller drive at half engine speed. Thus with a standard rotation unit, drive is provided at half engine speed for a right-handed reversible pitch propeller. Reverse rotation units are available.



The illustrations below show the standard direction of rotation and the alternative starting arrangements.

bhp continuous Rating 'A'	6.25	7.5	8.2
Engine Speed rev/min	1500	1800	2000
Prop Speed rev/min	RMR	750	900
	MR	1500	1800
Fuel Consumption. Full load and full speed, engine will run on		min	min
	1 Gal Fuel	185	155
	1 Litre Fuel	41	34

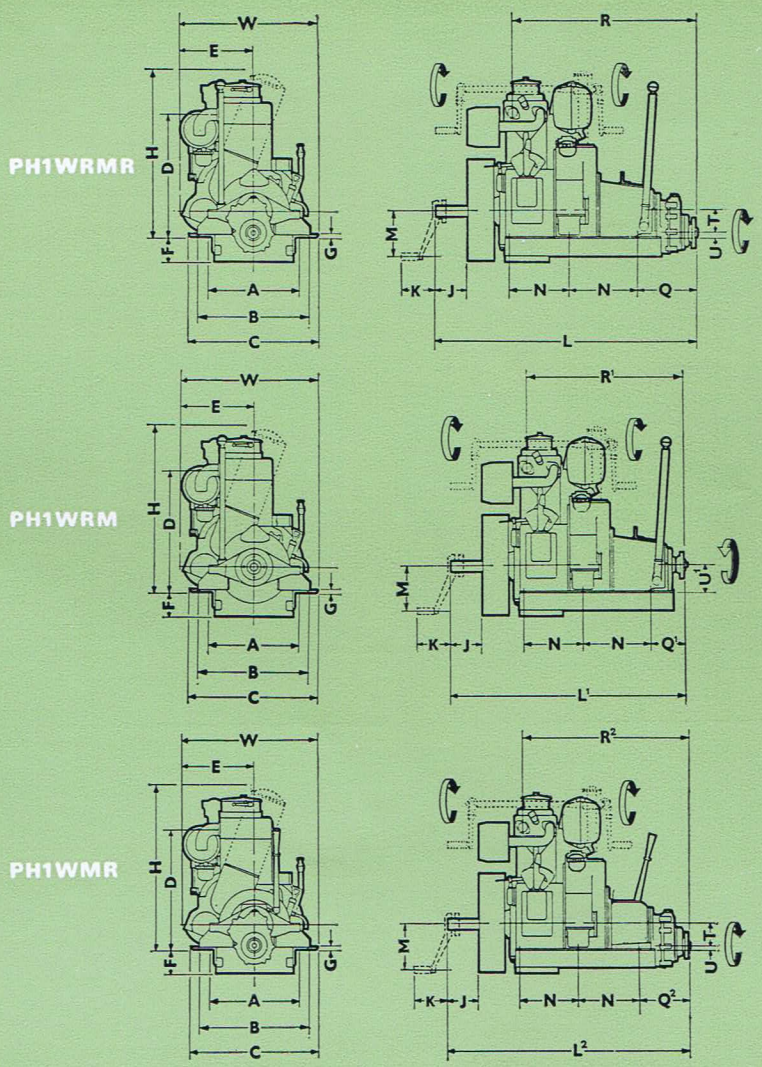
	A	B	C	D	E
in	14	17 ⁵ / ₈	20 ¹ / ₈	19 ¹ / ₂	11 ¹ / ₂
mm	356	448	511	495	292

	F	G	H	J	K
in	3 ⁷ / ₈	5 ⁷ / ₁₆	26 ⁵ / ₈	4 ² / ₁₆	6 ³ / ₈
mm	98	8	676	116	162

	L	L ¹	L ²	M	N
in	40 ¹ / ₂	36 ⁷ / ₈	38 ⁵ / ₈	7 ¹ / ₂	9
mm	1029	937	987	184	229

	Q	Q ¹	Q ²	R	R ¹
in	11 ¹ / ₂	7 ⁷ / ₃₂	9 ¹ / ₃₂	28 ⁹ / ₁₆	24 ¹ / ₈
mm	280	188	239	725	633

	R ²	T	U	U ¹	W
in	26 ¹ / ₈	3 ⁵ / ₁₆	1 ³ / ₈	4 ¹ / ₈	21 ⁷ / ₈
mm	684	84	21	105	556



Note: 'A', Represents minimum width between bearers.

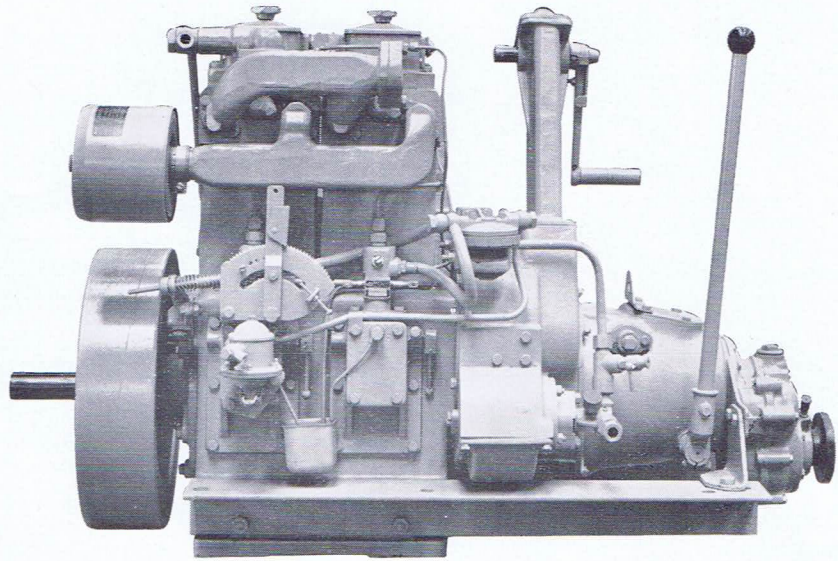
PH2WRMR PH2WRM & PH2WMR

TWO-CYLINDER UNITS 12.5-16.4 bhp (continuous rating)

PH2WRMR: These units are fitted with a Reverse and 2:1 Reduction Gear, providing propeller drive at half engine speed. The unit is for use with a right-handed propeller, but reverse rotation units are available.

PH2WRM: These units are similar to the PHWRMR types, but have no Reduction Gear. Thus with a standard rotation engine, drive is provided for a left-handed propeller at engine speed. Reverse rotation units are available.

PH2WMR: These units have no Reverse Gear and are fitted with a Petter clutch and 2:1 Reduction Gear, providing propeller drive at half engine speed. Thus, with a standard rotation unit, drive is provided at half engine speed for a right-handed reversible pitch propeller. Reverse rotation units are available.



The illustrations below show the standard direction of rotation and the alternative starting arrangements.

bhp continuous Rating 'A'		12.5	15	16.4
Engine Speed rev/min		1500	1800	2000
Prop Speed rev/min	RMR MR	750	900	1000
	RM	1500	1800	2000
Fuel Consumption. Full load and full speed, engine will run on		min	min	min
1 Gal. Fuel		100	85	70
1 Litre Fuel		22	18	16

	A	B	C	D	E
in	14	17 ⁵ / ₈	20 ¹ / ₂	21 ³ / ₄	11 ¹ / ₂
mm	356	448	511	552	300

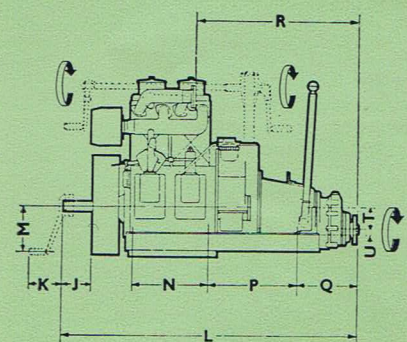
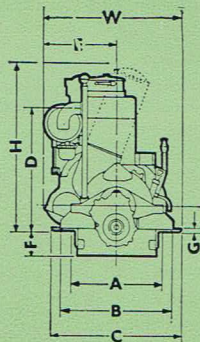
	F	G	H	J	K	L
in	3 ⁷ / ₈	1 ⁵ / ₈	26 ⁵ / ₈	4 ⁹ / ₁₆	6 ³ / ₈	47 ¹ / ₈
mm	98	8	676	116	162	1197

	L ¹	L ²	M	N	P
in	43 ¹ / ₂	45 ¹ / ₂	7 ¹ / ₄	12	15
mm	1105	1156	184	305	381

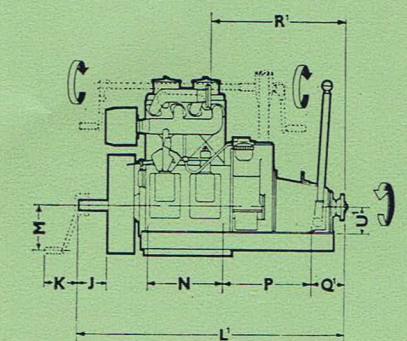
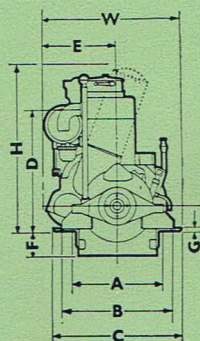
	Q	Q ¹	Q ²	R	R ¹
in	8 ³ / ₂	5 ¹ / ₂	10 ¹ / ₂	25 ³ / ₈	21 ³ / ₈
mm	220	128	255	644	552

	R ²	T	U	U ¹	W
in	23 ³ / ₂	3 ⁵ / ₁₆	1 ³ / ₈	4 ¹ / ₂	21 ⁷ / ₈
mm	603	84	21	105	556

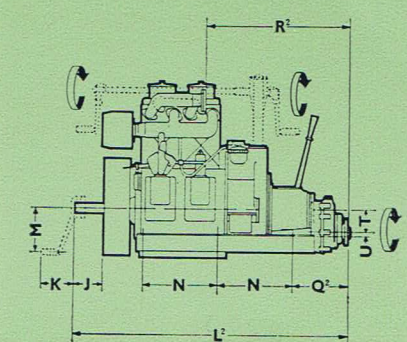
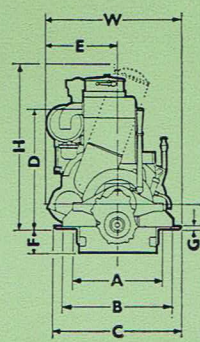
PH2WRMR



PH2WRM



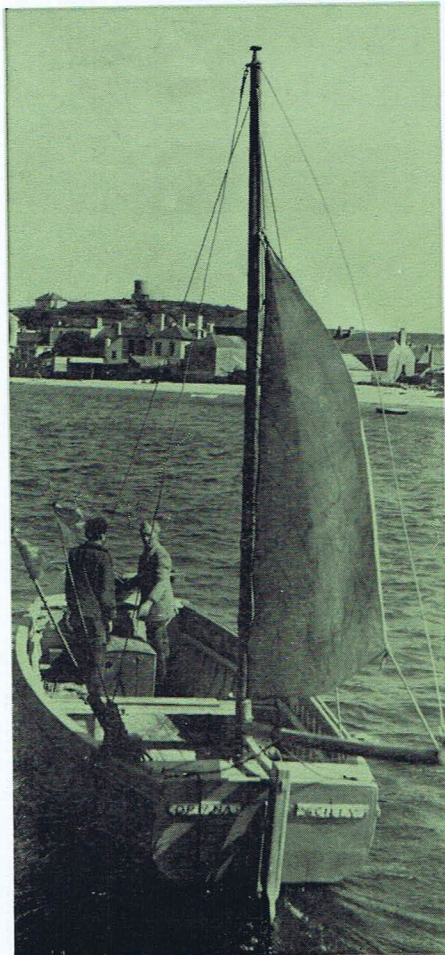
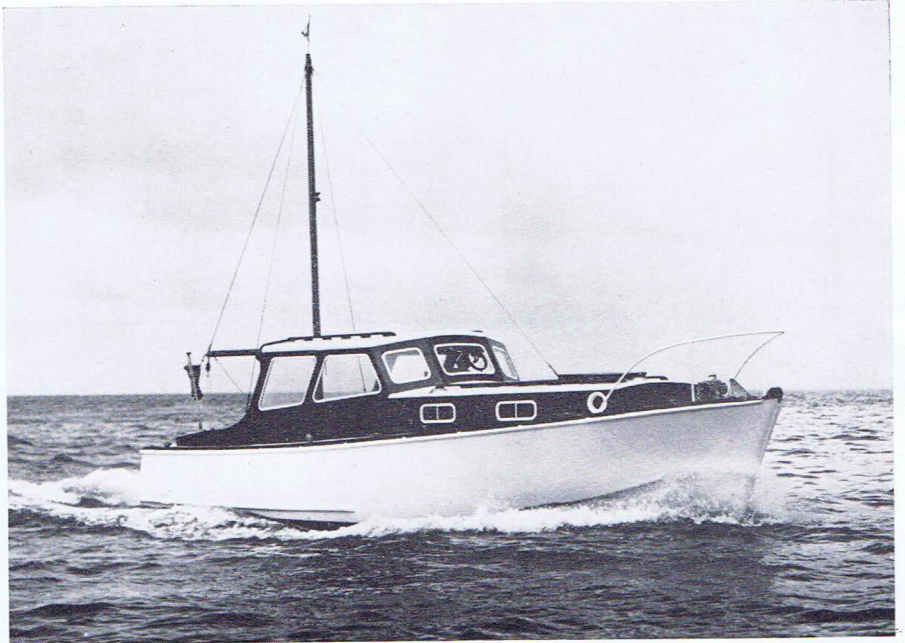
PH2WMR

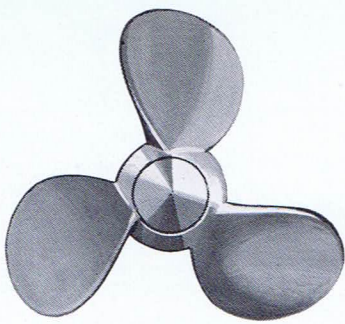


Note: 'A', Represents minimum width between bearers.



Petter Marine





PROPELLER & STERNGEAR DETAILS

Standard propeller sizes

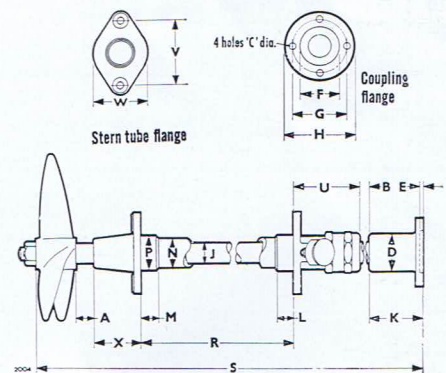
PHWRMR	750 rev/min		900 rev/min		1000 rev/min	
	No. of cyls.					
Pitch	in	14½	15	14½	13½	13 12
	mm	368	381	368	343	330 305
Dia.	in	15½	18	15½	17	14 16½
	mm	394	457	394	432	356 419

PHWRM	1500 rev/min		1800 rev/min		2000 rev/min	
	No. of cyls.					
Pitch	in	8½	9½	7	8	7 7½
	mm	216	241	178	203	178 191
Dia.	in	10½	12½	10	11½	9½ 11
	mm	267	318	254	292	241 279

PHWMR	750 rev/min		900 rev/min		1000 rev/min	
	No. of cyls.					
Pitch	in	14½	15	14½	13½	13 12
	mm	368	381	368	343	330 305
Dia.	in	15½	18	15½	17	14 16½
	mm	394	457	394	432	356 419

Standard sterngear

Standard sterngear is available as an extra and includes a cast three-blade bronze propeller, a brass sterntube and bronze tailshaft with a steel coupling all of adequate size to transmit the power of the engine. Propellers listed are for average hulls and are not necessarily the most suitable for any particular installation. If optimum engine performance is not obtainable, reference should be made to our nearest agent, who is in possession of details of over-pitch propellers which we can make available. Alternatively, our Technical Department will be pleased to recommend an alternative propeller on receipt of hull drawings, which should contain particulars of displacement and draught. The above sterngear is suitable for average conditions. In waters heavily laden with abrasive matter, recommendations can be made for alternative designs.



Note: 'A' should not be less than 1in. 'B' should not be less than 3in. 'C' in table below, is diameter of coupling bolt holes. For non-standard shafts 'S' must be greater than 'R' by 18⅛in or more. Propeller shaft taper is 1 in 12 on diameter.

All Types		C	D	E	F	G	H
	in		1⅓/32	2⅓/16	3/16	2·3638 2·3622	3·1496
mm		10	56	5	60·04 60·00	80	103
in	J	K	L	M	N	P	
	1¼	¾	1	1	1¾	2⅝	
mm	32	83	25	25	44	54	
in	R	S	U	V	W	X	
	24	72	4⅛	3⅞	3¼	2⅞	
mm	610	1829	105	98	83	73	

Approximate Shipping Specification-

with standard equipment



PH1WRMR & PH2WRMR

	Weight (Bare Engine)	Weight (Gross)	Packing Case Size	Cubic Capacity	Ocean Tons (40 ft ³ =1 ton)	Ocean Tonnes (35 ft ³ =1 tonne)
One Cylinder Engine	600 lb	729 lb	45×25×34 in	22.13 ft ³	0.55	0.63
	272 kg	331 kg	1143×635×864 mm	0.63 m ³		
Two Cylinder Engine	781 lb	1176 lb	53×30×39 in	35.9 ft ³	0.90	1.03
	354 kg	533 kg	1346×762×991 mm	1.02 m ³		

PH1WRM & PH2WRM

	Weight (Bare Engine)	Weight (Gross)	Packing Case Size	Cubic Capacity	Ocean Tons (40 ft ³ =1 ton)	Ocean Tonnes (35 ft ³ =1 tonne)
One Cylinder Engine	580 lb	709 lb	45×25×34 in	22.13 ft ³	0.55	0.63
	263 kg	322 kg	1143×635×864 mm	0.63 m ³		
Two Cylinder Engine	761 lb	1156 lb	53×30×39 in	35.9 ft ³	0.90	1.03
	346 kg	524 kg	1346×762×991 mm	1.02 m ³		

PH1WMR & PH2WMR

	Weight (Bare Engine)	Weight (Gross)	Packing Case Size	Cubic Capacity	Ocean Tons (40 ft ³ =1 ton)	Ocean Tonnes (35 ft ³ =1 tonne)
One Cylinder Engine	518 lb	647 lb	45×25×34 in	22.13 ft ³	0.55	0.63
	235 kg	293 kg	1143×635×864 mm	0.63 m ³		
Two Cylinder Engine	701 lb	1096 lb	53×30×39 in	35.9 ft ³	0.90	1.03
	318 kg	497 kg	1346×762×991 mm	1.02 m ³		

Sterngear Shipping Specification details on request

Illustrations, weights and measurements are approximate and we reserve the right to make modifications which may be considered necessary. In compiling this leaflet every care has been taken, but the specification, and details must not be regarded as binding.

PETTERS LIMITED



Hamble, Southampton, England
 Telephone: Hamble 2061
 Telex: 47626
 Telegrams: Petter Hamble Telex