



FOUR STROKE OUTBOARD PETROL ENGINE HOMOLOGATION FILE

International Homologation File Number: 00549		
Homologation Valid from:	2025	Expiry: 2036 dec 31
Valid for the following classes:	Offshore 3	
Manufacturer:	Mercury Marine	
Engine Model:	Mercury Racing 200R	
Number Manufactured:	200 V6 >1,000	
At the date:	Dec 31, 2023	
Certified by the National Authority of:		
At the date:		
UIM Homologation Group Inspector:	M Lundblad	
At the date:		
UIM Certification Approval:	Union Internationale Motonautique	
At the date:	2026 feb 24	
Running Production Changes		
Change Detail		Page No.
Date Approved for Use		Approved by
Change Detail		Page No.
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PICTURES

Photo of the engine, 45°
from the front at the port side.



Photo of the engine, 45°
from the front at the starboard side.



Photo of complete engine, port side.



Photo of complete engine, starboard side.



PICTURES

Photo of the complete engine,
from the rear.



Picture of the engine, port side without
top cowl.

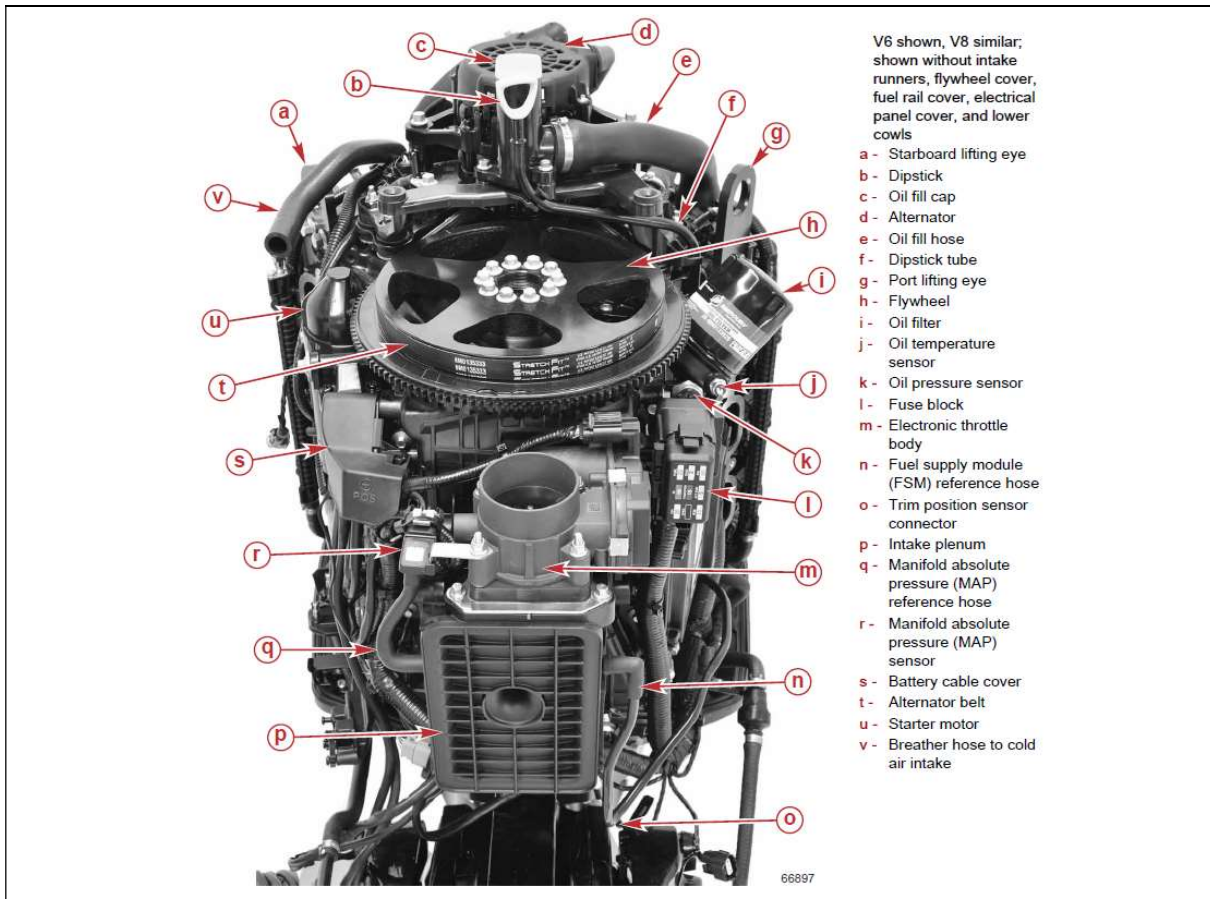


Picture of the engine, starboard side without
top cowl.

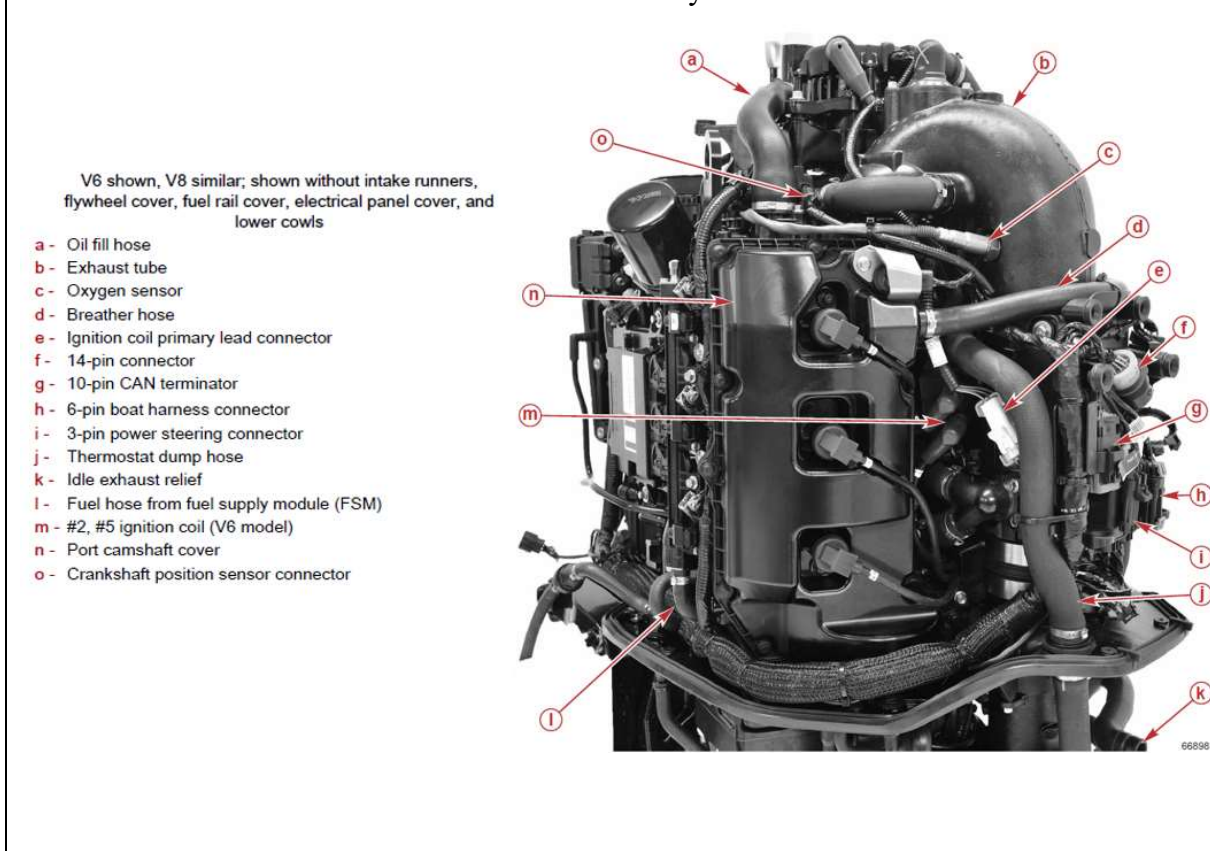


Picture of the front quarter shot of the
engine, port side without top cowl.

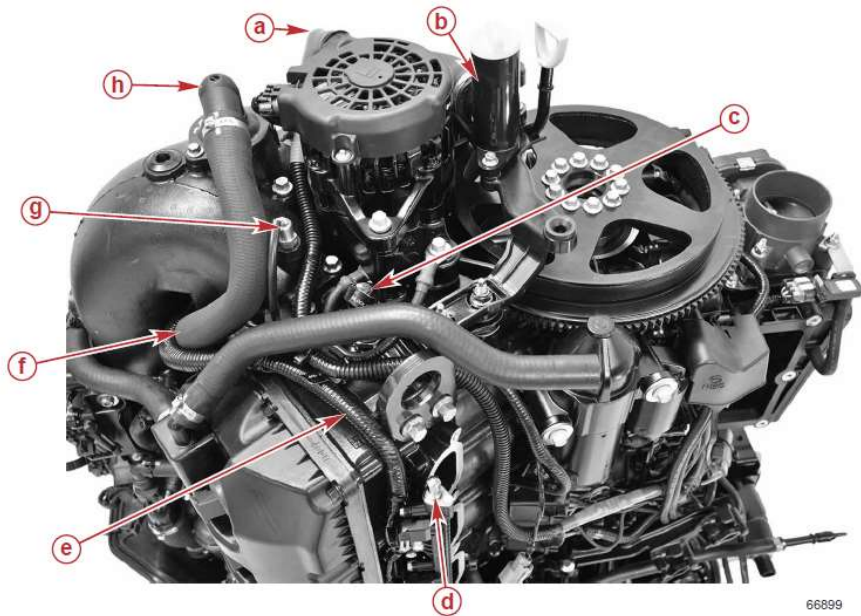




Port aft view of lay out.



Starboard aft top view of lay out.

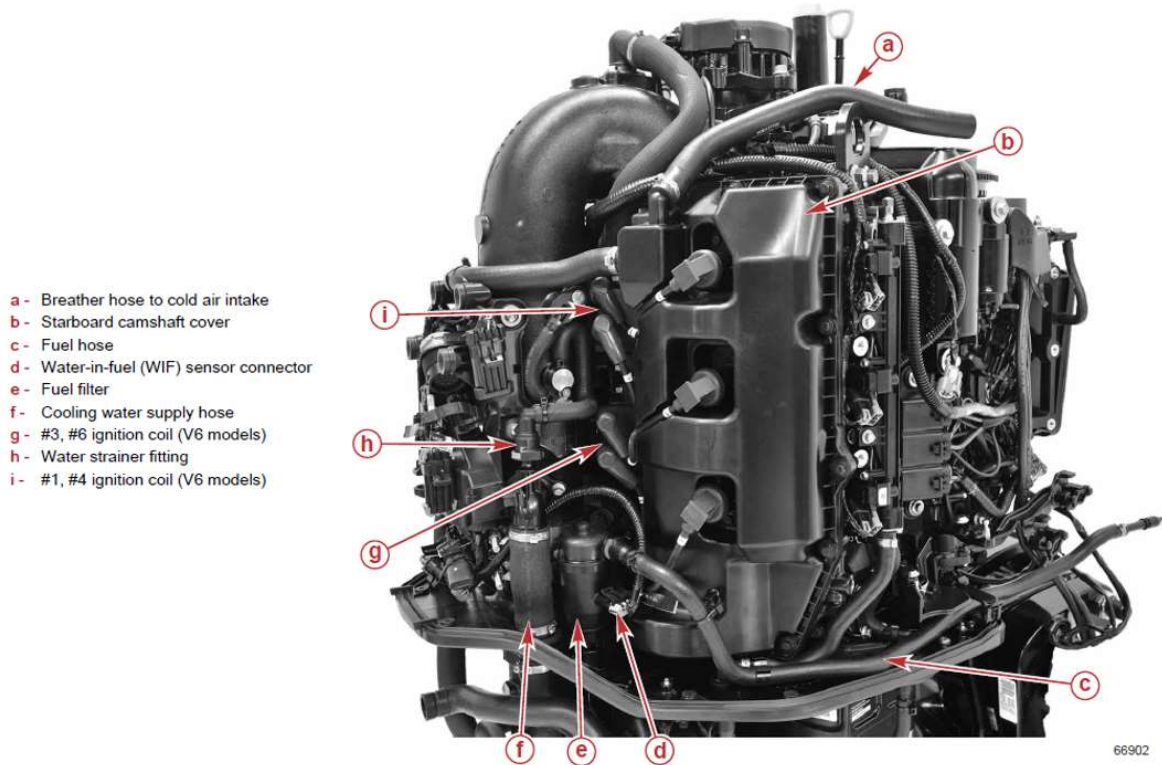


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V6 shown, V8 similar; shown without intake runners, flywheel cover, fuel rail cover, electrical panel cover, and lower cowls

- a - Positive charge lead from the alternator
- b - Oil fill tube
- c - Block water pressure sensor shown; Legris fitting with hose is optional
- d - Schrader valve on starboard fuel rail
- e - Starboard injector harness
- f - Thermostat dump hose
- g - Water temperature sensor
- h - Thermostat housing

Starboard aft view of lay out.

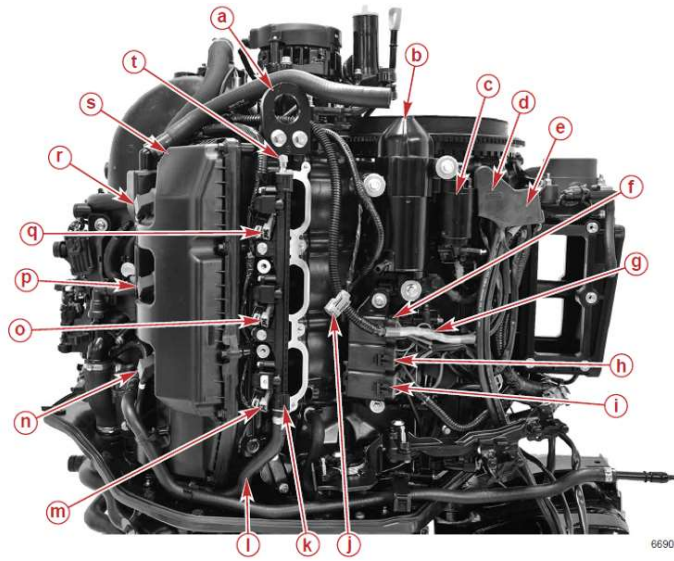


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- a - Breather hose to cold air intake
- b - Starboard camshaft cover
- c - Fuel hose
- d - Water-in-fuel (WIF) sensor connector
- e - Fuel filter
- f - Cooling water supply hose
- g - #3, #6 ignition coil (V6 models)
- h - Water strainer fitting
- i - #1, #4 ignition coil (V6 models)

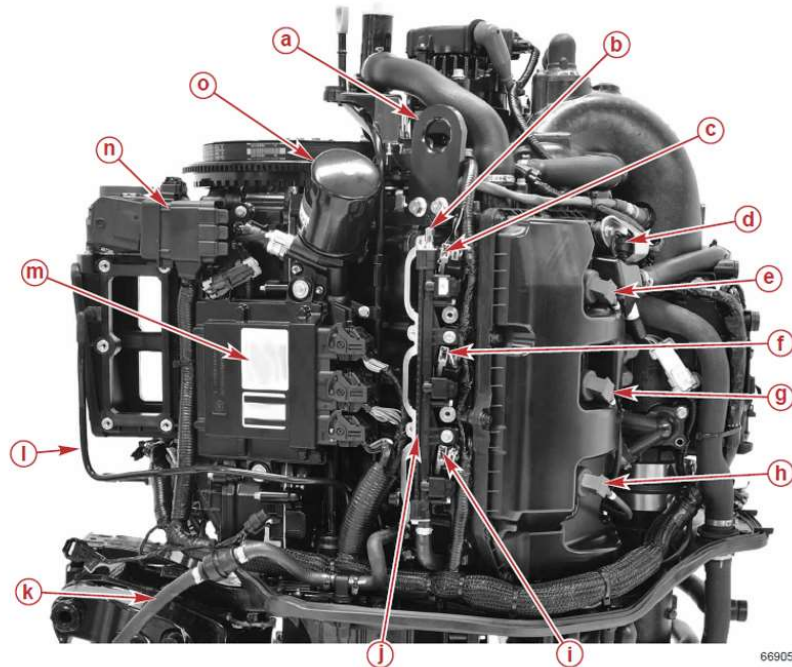
Starboard view.

- a - Starboard lifting eye
- b - Starter motor
- c - Starter solenoid
- d - Negative battery cable connection (under cover)
- e - Positive battery cable connection (under cover)
- f - Trim down relay
- g - 150-amp fusible link
- h - Trim up relay
- i - Main power relay
- j - Manifold air temperature (MAT) sensor connector (sensor is on intake runner)
- k - Starboard fuel rail
- l - Fuel hose from fuel supply module (FSM)
- m - #5 injector
- n - Cylinder #5 high tension lead
- o - #3 injector
- p - Cylinder #3 high tension lead
- q - #1 injector
- r - Cylinder #1 high tension lead
- s - Starboard camshaft cover
- t - Schrader valve



Port view of layout

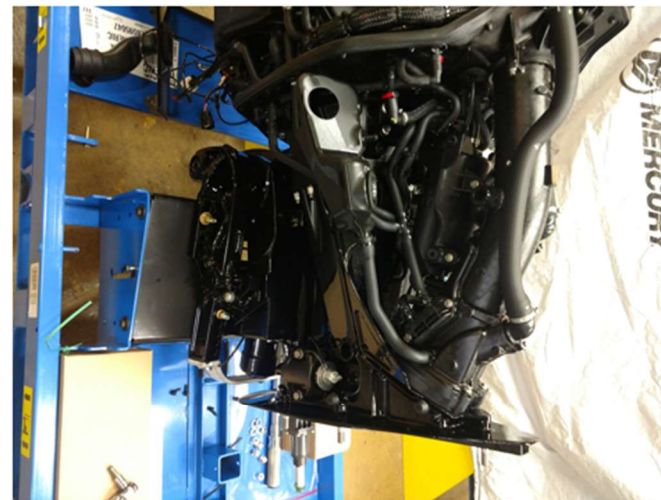
- a - Port lifting eye
- b - Schrader valve
- c - Cylinder #2 injector
- d - Camshaft position sensor
- e - Cylinder #2 high tension lead
- f - #4 injector
- g - Cylinder #4 high tension lead
- h - Cylinder #6 high tension lead
- i - #6 injector
- j - Port fuel rail
- k - Flush hose
- l - Fuel supply module (FSM) reference hose
- m - PCM
- n - Fuse holder
- o - Oil filter



20" Midsection assembly, 45° from the aft, stbd side



20" Midsection assembly, 45° from the aft, port side



20" Transom bracket, 45° from the rear, port side



20" Transom bracket, 45° from the rear, stbd side



Throttle and intake manifold - top



Intake manifold – front



Intake manifold - side



Port intake runners - inside



Port intake runners - outside



Starboard intake runners - inside



Starboard intake runners - outside



Intake manifold throttle adapter



Intake manifold without throttle adapter



Intake manifold port outlet



Throttle body – inlet side



Throttle body – outlet side



Fuel rail on engine (port side)



Fuel injector tip



Engine control unit (ECU) – connector side



ECU on-engine – under port intake runners



Cylinder head (port) from combustion chamber side



Cylinder head (starboard) from combustion chamber side



Combustion chamber

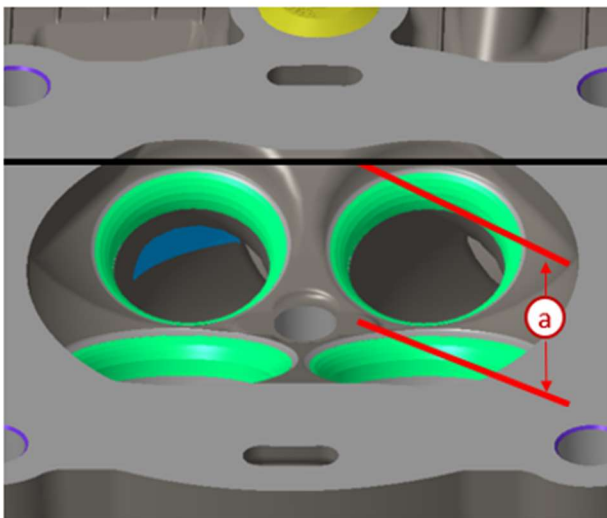


Combustion chamber without valves

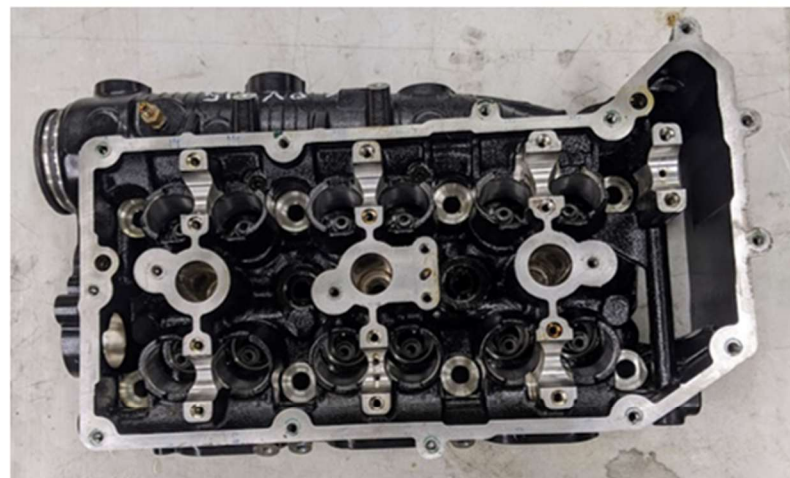


Note: clean-up around port throat is variable due to casting tolerance

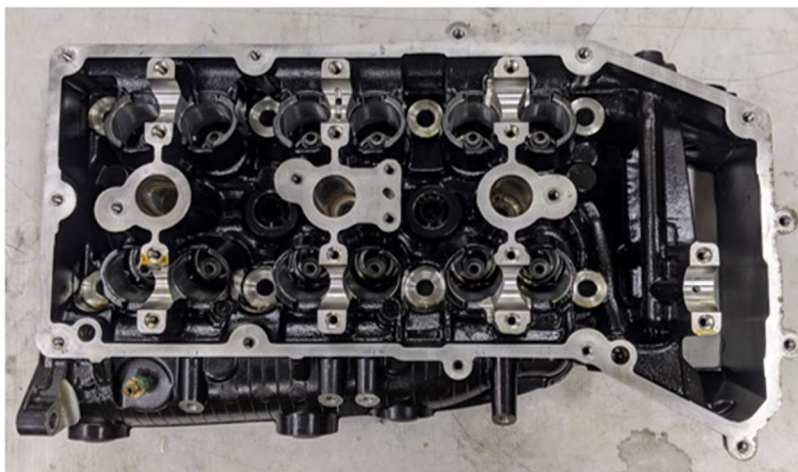
Combustion chamber height a min 14.0 mm



Cylinder head (port) from the valvetrain side



Cylinder head (starboard) from the valvetrain side



Valvetrain – close-up



Cylinder head showing intake port



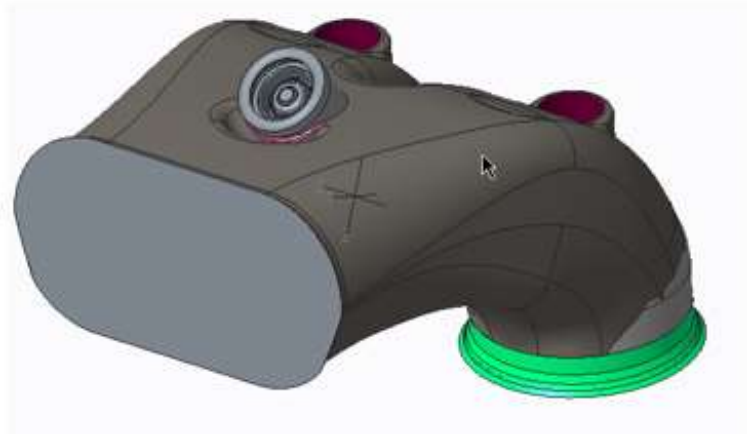
Exhaust outlet – port cylinder head



Exhaust outlet – starboard cylinder head



Intake port core from manifold flange to intake valves,
including valve stems; maximum volume = 152 cc



Intake (left) and exhaust (right) valves



Valve spring with keys and retainer



Intake (left) and exhaust (right) valves



Piston viewed from top



Piston and rod assembly



Piston viewed 45° from wrist pin



Piston viewed from bottom



Connecting rod



Cylinder block from port deck side



Cylinder block from starboard deck side



Crankshaft



Cylinder block from crankshaft side



Exhaust Manifold



Exhaust manifold inlet and outlet



Oil pump without cover



Flywheel bottom (L) and top (R)



MEASUREMENTS

ENGINE FUEL

Type:	Gasoline
Minimum octane required (200R):	91 RON

ENGINE TYPE

Number of cylinders:	6 Cylinders
Cylinder arrangement:	Vee (64°)

ENGINE BLOCK	Tolerance	Measurement	Unit
Bore	+/- 0.10	92.00	mm
Stroke	+/- 0.10	86.00	mm
Capacity per cylinder	max	573.6	cc
Total Capacity	max	3 442	cc
Cylinder block material		XK360.2-T5 Aluminium	
Cylinder liner material		Grey iron	
Distance from crankshaft centreline to cylinder block deck face.	+/- 0.10	210.0	mm
CYLINDER HEAD	Tolerance	Measurement	Unit
Cylinder head material		A356-T6 Aluminium	
Volume of combustion chamber (without volume of spark plug hole)	min	51.9	cc
Compression ratio	max	10.1 nom	
Thickness of cylinder head	+/- 0.20	96.0	mm
Inlet Port:			
Size of port at cylinder head/manifold face	max	30 x 60	mm
Internal diameter of valve seat insert	+/- 0.20	33.1	mm
Surface finish of port		Cast	
Exhaust Port:			
Size of port at cylinder head/manifold face	max	N/A	mm
Internal diameter of valve seat insert	+/- 0.20	26.1	mm
Surface finish of port		Cast	

Inlet Valves:

Diameter of stem	+/- 0.008	5.4725	mm
Diameter of head	+/- 0.1	37.00	mm
Overall length of inlet valve	+/- 0.25	88.49	mm

Exhaust Valves:

Diameter of stem	+/- 0.008	5.464	mm
Diameter of head	+/- 0.1	31.0	
Overall length of exhaust valve	+/- 0.25	87.67	mm

Valve Springs:

Diameter of wire	max	2.925	mm
Inside diameter of coil	min	17.5	mm
Free length	+/- 0.5	46.1	mm
Number of working turns	+/- 0.5	6.1	turns

CAMSHAFT/SHAFTS

Tolerance Measurement Unit

Inlet:

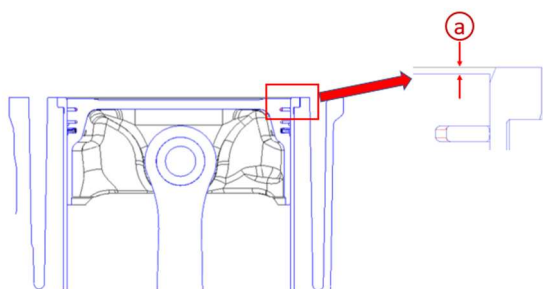
Tappet clearance for checking timing	+/- 0.050	0.175	mm
Total valve lift (at nominal lash)	+/- 0.10	7.89	mm
Total (duration) inlet opening angle (measured at flywheel in degrees at 1,0 mm valve lift at specified valve lash)	+/- 5°	194	degrees
Duration inlet opening angle 3mm under max valve lift (measured at flywheel in degrees)	+/- 2°	122	degrees
Base circle diameter of lobe	+/- 0.02	35.00	mm
Cam shaft lobe height	+/- 0.05	43.07	mm

Exhaust:

Tappet clearance for checking timing	+/- 0.050	0.350	mm
Total valve lift (at nominal lash)	+/- 0.10	8.89	mm
Total (duration) exhaust opening angle (measured at flywheel in degrees at 1,0 mm valve lift at specified valve lash)	+/- 5°	204	degrees
Duration inlet opening angle 3mm under max valve lift (measured at flywheel in degrees)	+/- 2°	120	degrees
Base circle diameter of lobe	+/- 0.02	35.00	mm
Cam shaft lobe height	+/- 0.05	44.24	mm

PISTONS

Material of piston		Aluminium	
Type and thickness of rings	Square	1.20	mm
	Taper Faced Napier	1.00	mm
	Oil Control	2.00	mm
Piston crown height from head deck at top dead center (a)	min	0.30	mm

**CONNECTING ROD**

	Tolerance	Measurement	Unit
Length of rod from big end to small end (centre to centre)	+/- 0.05	140.5	mm

CRANKSHAFT

	Measurement	Unit
Number of main bearing journals	4	
Diameter of main bearing journals	69.984-70.000	mm
Diameter of connecting rod journals	53.984-54.000	mm
Surface finish of crankshaft	Primarily machined, with some as-forged	

TYPE OF BEARINGS

Piston Pin	Floating
Connecting Rod journal	Plain
Main journal	Plain

FUEL INJECTION

	Tolerance	Measurement	Unit
Make		Walbro	
Type of pump, model no.		Gerotor, FGB-29	
Fuel pressure at idle		approx 290-340	kPa
Fuel pressure no running		340-370	kPa
Total number of injectors		6	Injectors
Diameter of throttle bore	max	64.0	mm

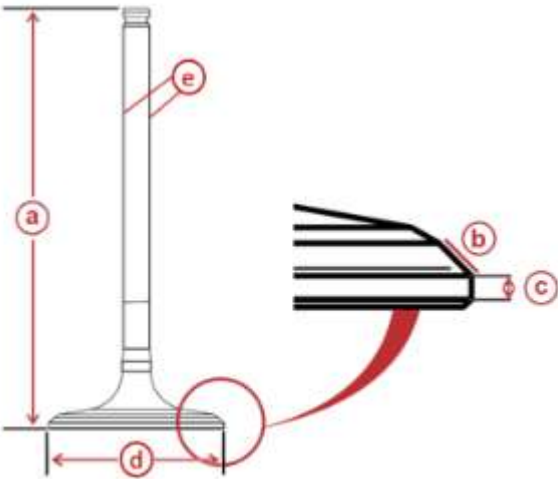
COOLING SYSTEM

Type	Raw water cooled
Method	Thermostat controlled
Pump	Rubber impeller vane pump
Number of impeller blades	6
Thermostat start opening temperature	57-61 °C
Thermostat fully opened	77 °C

VALVE INSPECTION

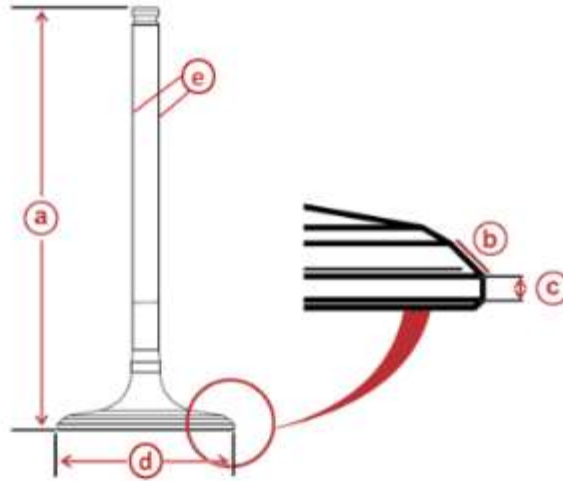
Intake valve

Intake Valve Specifications		
Intake valve	Height (a)	88.49 ± 0.25 mm
	Valve stem diameter (e)	5.4645-5.4805 mm
	Valve face angle	45°
	Outside diameter (d)	37.0 ± 0.1 mm
	Valve margin width (c)	0.875 ± 0.2 mm
	Valve stem service limit runout (measured at valve face)	0.030 mm



Exhaust valve

Exhaust Valve Specifications		
Exhaust valve	Height (a)	87.667 ± 0.25 mm
	Valve stem diameter (e)	5.456-5.472 mm
	Valve face angle	46°
	Outside diameter (d)	31.0 ± 0.1 mm
	Valve margin width (c)	1.331 ± 0.2 mm
	Valve stem service limit runout (measured at valve face)	0.030 mm



SENSOR TESTS

Cylinderblock coolant sensor

Meter Test Leads		Temperature	Reading (nominal)
Red	Black		
Pin A (black/orange)	Pin B (brown/black)	0 °C (32 °F)	32.6 kΩ
		20 °C (68 °F)	12.5 kΩ
		40 °C (104 °F)	5.3 kΩ
		65 °C (150 °F)	2.1 kΩ
		95 °C (203 °F)	786 Ω

Manifold Absolute Pressure Sensor

Manifold Absolute Pressure (MAP) Sensor Readings	
At idle (neutral)	35-48 kPa (5-7 psi)
At wide-open throttle	Within 15% of BARO

Manifold Air Temperature Sensor

Meter Test Leads		Temperature	Reading (nominal)
Red	Black		
Pin A (tan)	Pin B (black/orange)	0 °C (32 °F)	6.5 kΩ
		15 °C (59 °F)	3.2 kΩ
		25 °C (77 °F)	2.1 kΩ
		100 °C (212 °F)	150 Ω

Spark plug

Brand	NGK
Model	LKAR7C-9

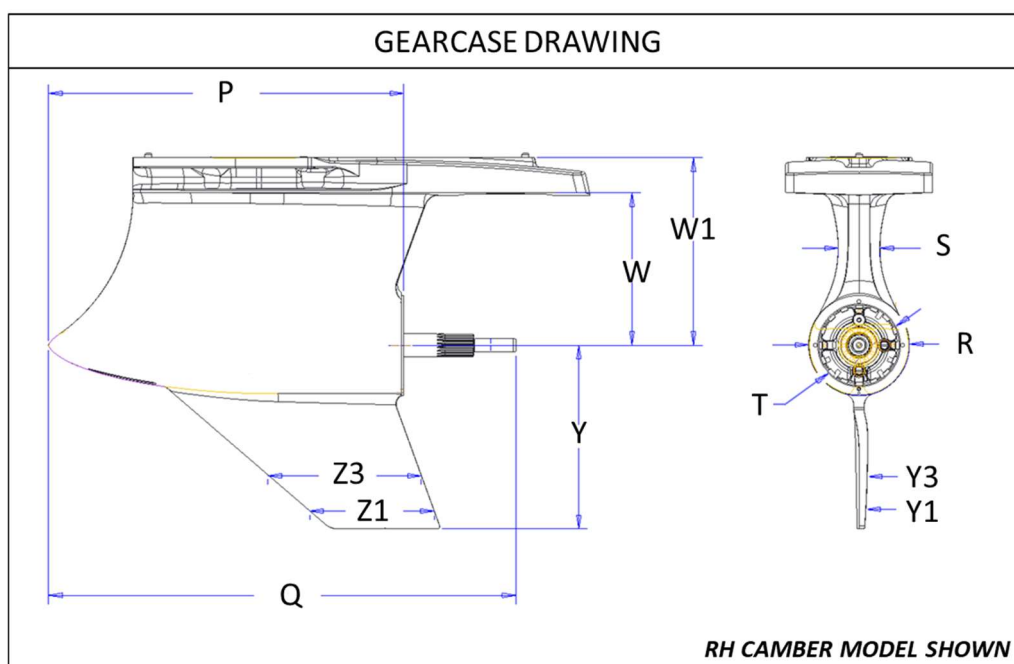
WEIGHTS	Tolerance	Measurement	Unit
Inlet valve (bare)	min	47	g
Exhaust valve (bare)	min	36	g
Valve spring	min	23.5	g
Inlet camshaft (port and stbd)	min	770	g
Exhaust camshaft (port and stbd)	min	1 055	g
Piston (with rings)	min	305	g
Piston Pin	min	66.5	g
Connecting Rod (with bearings and bolts)	min	440	g
Crankshaft	min	16 880	g
Flywheel (bare)	min	5 370	g

UNDERWATER UNIT

Sport Master (Straight or RH cambered skeg)

	Tolerance	Measurement	Unit
Gear Ratio		1.75 (14/29)	
Gear Ratio		1.60 (15/24)	
P Longitudinal length of gearcase torpedo	+/- 5.0	492.0	mm
Q Longitudinal dimension of gearcase including propeller shaft	max	648.0	mm
R Transverse dimension of gearcase	min	140.0	mm
S Thickness of strut	min	57.0	mm
T Diameter of exhaust outlet	max	112.0	mm
Z1 Skeg chord length, 25mm above bottom	+/- 5.0	172.4	mm
Z3 Skeg chord length, 75mm above bottom	+/- 5.0	212.4	mm
W1 Distance from propeller shaft to upper flange	+/- 5.0	259.3	mm
W Distance from propeller shaft to anti-ventilation plate	+/- 5.0	211.0	mm
Y1 Thickness of skeg, 25mm above bottom*	Min	<i>Straight 7.6</i>	mm
Y1 Thickness of skeg, 25mm above bottom*	min	<i>Cambered 9.3</i>	mm
Y3 Thickness of skeg, 75mm above bottom*	min	<i>Straight 10.1</i>	mm
Y3 Thickness of skeg, 75mm above bottom*	min	<i>Cambered 11.4</i>	mm
Y Skeg depth from propeller shaft	+/- 5.0	253.7	mm

**measurement made at skeg trailing edge*

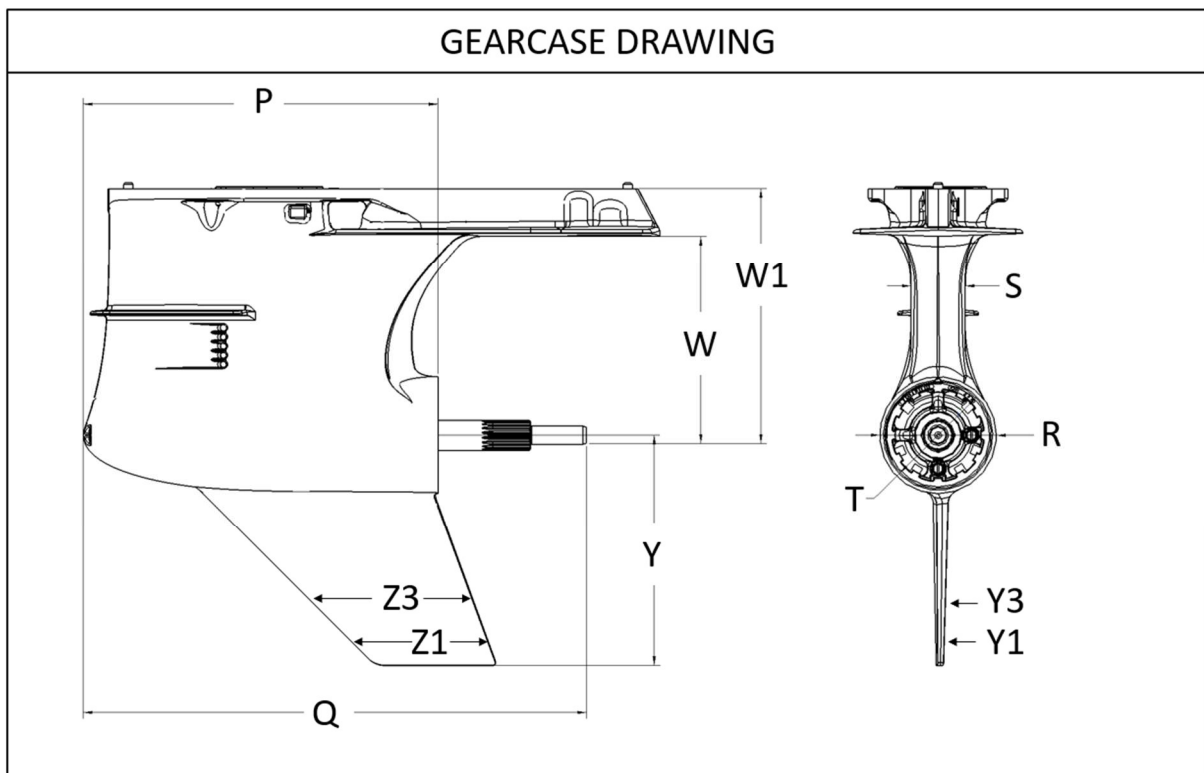


UNDERWATER UNIT

Torque Master

	Tolerance	Measurement	Unit
Gear Ratio		1.75 (12/21)	
P Longitudinal length of gearcase torpedo	+/- 5.0	371.0	mm
Q Longitudinal dimension of gearcase including propeller shaft	max	526.0	mm
R Transverse dimension of gearcase	min	121.9	mm
S Thickness of strut	min	56.6	mm
T Diameter of exhaust outlet	max	112.0	mm
Z1 Skeg chord length, 25mm above bottom	+/- 5.0	143.8	mm
Z3 Skeg chord length, 75mm above bottom	+/- 5.0	175.5	mm
W1 Distance from propeller shaft to upper flange	+/- 5.0	266.0	mm
W Distance from propeller shaft to anti-ventilation plate	+/- 5.0	216.0	mm
Y1 Thickness of skeg, 25mm above bottom*	min	7.1	mm
Y3 Thickness of skeg, 75mm above bottom*	min	8.9	mm
Y Skeg depth from propeller shaft	+/- 5.0	241.0	mm

**measurement made at skeg trailing edge*



FOUR STROKE OUTBOARD**PETROL ENGINE****NOTES**

Inspection of ECM

Model	200R
ECM over speed limiter*	6550 rpm
ECM calibration part number ⁺	8M0240760(DTS) 8M0237451(MECH)

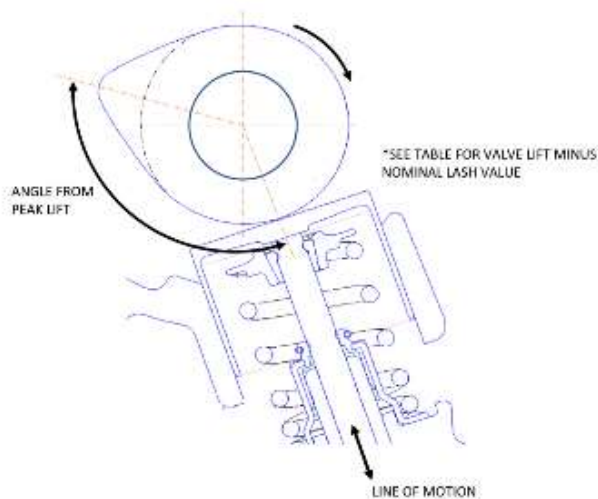
*Note, over speed limiter indicates speed at which one bank of cylinders are cut. At 6,700 rpm all cylinders are cut. Instantaneous spikes over 6,700 rpm are possible if the prop completely exits the water (e.g. wave jump)

+The calibration part number is current as of the publication of this document. Subsequent calibration revisions may be made by Mercury with the approval of UIM COMINTECH.

Cowling

Cowlings may be either Mercury OEM as shipped or may be a lightweight facsimile of the production cowling. External latches may be added or replacing original latches. Mercury decals must appear with contrasting color on any substituted cowling in a manner similar to Mercury OEM cowlings. Rear air inlets must remain, with identical location and cross-sectional area

Attachment 1 - Camlift measurement



Valve Lift Table (in Cam angle) at Nominal Lash			
INTAKE (INT#1 Lobe Index Timing @ Max Lift: 110 degrees in Crank ATDC)		EXHAUST (EXH#1 Lobe Index Timing @ Max Lift: 110 degrees in Crank BTDC)	
Cam Angle	Valve Lift [mm]	Cam Angle	Valve Lift [mm]
-70	0.053		
-68	0.087		
-66	0.121		
-64	0.155	-64	0.007
-62	0.189	-62	0.041
-60	0.223	-60	0.075
-58	0.257	-58	0.121
-56	0.291	-56	0.224
-54	0.336	-54	0.431
-52	0.433	-52	0.759
-50	0.627	-50	1.184
-48	0.932	-48	1.667
-46	1.328	-46	2.170
-44	1.778	-44	2.674
-42	2.246	-42	3.176
-40	2.715	-40	3.673
-38	3.182	-38	4.160
-36	3.639	-36	4.631
-34	4.081	-34	5.082
-32	4.501	-32	5.510
-30	4.899	-30	5.913
-28	5.273	-28	6.292
-26	5.624	-26	6.646
-24	5.950	-24	6.975
-22	6.252	-22	7.278
-20	6.529	-20	7.556
-18	6.781	-18	7.808
-16	7.007	-16	8.033
-14	7.208	-14	8.233

-12	7.384		-12	8.406
-10	7.533		-10	8.553
-8	7.656		-8	8.673
-6	7.754		-6	8.766
-4	7.825		-4	8.833
-2	7.871		-2	8.873
0	7.890		0	8.887
2	7.884		2	8.873
4	7.851		4	8.833
6	7.793		6	8.766
8	7.708		8	8.673
10	7.598		10	8.553
12	7.461		12	8.406
14	7.299		14	8.233
16	7.111		16	8.033
18	6.897		18	7.808
20	6.658		20	7.556
22	6.394		22	7.278
24	6.104		24	6.975
26	5.790		26	6.646
28	5.452		28	6.292
30	5.089		30	5.913
32	4.703		32	5.510
34	4.294		34	5.082
36	3.862		36	4.631
38	3.412		38	4.160
40	2.949		40	3.673
42	2.481		42	3.176
44	2.011		44	2.674
46	1.548		46	2.170
48	1.120		48	1.667
50	0.766		50	1.184
52	0.516		52	0.759
54	0.375		54	0.431
56	0.310		56	0.224
58	0.274		58	0.121
60	0.240		60	0.075
62	0.206		62	0.041
64	0.172		64	0.007
66	0.138			
68	0.104			
70	0.070			
72	0.036			

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