

# Rpt. 4b (Cons) REPORT ON MAIN INTERNAL COMBUSTION RECIPROCATING ENGINE

FOR CONSIDERATION BY THE COMMITTEE OF LLOYD'S REGISTER OF SHIPPING

13 AUG 1965  
Received London

Ship's Name "RAPHAEL"

Port GENOA

Gross tons 31,133

Date of completing rpt. 9/6/1965

Rpt. No.

30070 1

Place of survey, if different from above as above

No. of visits in shops 48

First date 23/11/1962

Last date 8/3/1965

Ship built by ANSALDO S.P.A. CANTIERE NAVALE, GENOA/SESTRI

Yard No. 1598

Yr. Mo.

Engine made by ANSALDO S.A. STAB. MECCANICO (GENOA)

Engine No. 909003

When 1965 2

17.8.65

Fee Lit - 1.391.250 plus Lit. 97.090 (welding) Lit 1.488.340

Expenses

Lit. 7.480 - R.T. (see sum 25. N° 8390 25. 12/16)

Licence name & type of engine ANSALDO FIAT 909S

No. of engines One

2 or 4 stroke cycle two

Single (SA), or opposed piston (OP) SA

No. of cylinders, each engine 9

Diameter of cylinders 900mm.

Stroke(s) 1600mm.

BHP on which fees have been calculated 19.000

Corresponding RPM 122

Corresponding MIP 8.97Kg/sq.cm.

Maximum cylinder pressure 70Kg/sq.cm.

Machinery numeral 3800

## TWO STROKE ENGINES ONLY

Is engine of opposed piston type? no

~~Are the under sides of pistons used as scavenging pumps?~~

No. and type of mechanically driven scavenging pumps or blowers, each engine, and how driven 9 reciprocating type pumps-double action driven by the main engine crossheads

~~Are the under sides of pistons used as scavenging pumps?~~

~~Are relief valves fitted to scavenging manifold?~~

~~Scavenging air pressure at full power~~

~~Is welded construction used for:~~

## TWO & FOUR STROKE ENGINES

Is the engine supercharged? yes

No. of exhaust gas driven supercharge blowers, each engine four

No. and type of mechanically driven charging pumps or blowers, each engine none

Are the under sides of pistons used as supercharge pumps? How driven? no

No. of supercharge air coolers, each engine 1st stage = 2  
2nd stage = 5

Supercharge air pressure at full power 0.94 Kg/cq.cm.

Can engine operate without supercharger? yes

~~Are the under sides of pistons used as scavenging pumps?~~

~~Are relief valves fitted to scavenging manifold?~~

~~Scavenging air pressure at full power~~

~~Is welded construction used for:~~

~~Are tie-bolts fitted?~~

~~Is crankcase separated from under sides of pistons?~~

~~Is engine of crosshead or trunk piston type?~~

~~Is crankcase readily accessible?~~

~~No. and total area of explosion relief devices~~

~~Are flame guards or traps fitted to:~~

~~Can engine be reversed?~~

~~How is engine started?~~

~~Type of governor fitted~~

~~How long has the engine been tested at full power in the shop?~~

Is welded construction used for:

BEDPLATE? yes FRAMES? yes ENTABLATURE? no.

Are tie-bolts fitted? yes

Is crankcase separated from under sides of pistons? yes

Is engine of crosshead or trunk piston type? crosshead type

Is crankcase readily accessible? yes

~~Is the crankcase separated from under sides of pistons?~~

Total internal volume of crankcase 236m3

No. and total area of explosion relief devices 9 - 30300cm2

Are flame guards or traps fitted to: Crankcase relief devices? yes

Starting air pipes at cyl. starting air valves? yes (bursting discs)

Can engine be reversed? yes

~~Is the crankcase readily accessible?~~

How is engine started? by compressed air

Type of governor fitted FIAT-centrifugal type

How long has the engine been tested at full power in the shop? three hours

NOTE: The particulars in this report are to be given as fully and as clearly as possible. Where the answer is "NO" or "NONE" say so. Ticks and other signs of doubtful meaning are not to be used. Wording not applicable to be cancelled.

10m,9/64 (MADE AND PRINTED IN ENGLAND)

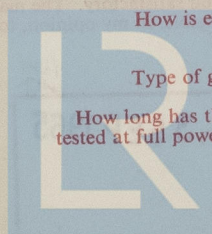
No. of valves each cylinder:	INLET	EXHAUST
	-	-
FUEL	STARTING	RELIEF
	one	one
CYLINDERS		
Cooling medium for: fresh water		
PISTONS		
lub.oil		
FUEL VALVES		
fresh water		

Material of

Cylinder covers

Piston crowns

S.M.Steel



012728-012733-0103



axial  
Is a torsional vibration damper ~~or~~  
~~or~~ fitted? yes

Date of approval of torsional vibration characteristics of engine/flywheel system 11/7/1963

Where positioned Fwd.end of crankshaft

Type FIAT

### CRANKSHAFT

Total weight of balance wts. 5960

Breadth of webs at mid-throw 1330mm.

Radius of gyration

Nos.3&5=939.7mm.  
Nos.6&9=960mm.

Axial thickness of webs 420mm.

No. of main bearings 11

If webs shrunk, radial thickness round eye-holes 312.5mm.

Are main bearings of ball or roller type? no

Nominal shrinkage allowance if dowel pins are not fitted mm.1.65 ÷ 1.75%

Distance between inner edges of bearings in way of cranks 1200mm.

Material of:  
(State whether cast or forged)

Pins } S.M.cast steel

~~Distance between centre lines of side webs of approx. main engine~~

Built, semi-built or solid crankshaft

semi-built

Journals S.M. forged steel

Diameter of:

Journals

700mm.

Minimum approved tensile strength for:

Pins

Webs

55 Kg/sq.mm.

~~SKD crank pins~~

Journals

FLYWHEEL SHAFT. Separate, integral with crank or thrust shaft

integral with thrust shaft

Diameter 2870

Material

S.M.forged steel

Flywheel

~~Diameter~~

Weight 3800Kgs.

Minimum approved tensile strength

55 Kg/sq.mm.

THRUST SHAFT. Separate, integral with crank or flywheel shaft

separate from crankshaft

Material S.M.forged steel

Diameter adjacent to collar

700mm.

Minimum approved tensile strength 55Kg/sq.mm.

MAIN ENGINE DRIVEN PUMPS (each engine. State No. and purpose of each pump and, for bilge pumps, the capacity at normal r.p.m.) also AIR COMPRESSORS (No. and whether they can be declutched)

none

### DECLARATION TO BE SIGNED BY ENGINE BUILDERS

To the best of our knowledge this machinery has been soundly constructed in conformity with the Rules, Regulations and requirements of Lloyd's Register of Shipping, and the foregoing particulars of main engines are correct.

(date)

(signature)

Engine No. 909002

Port and Report No. GEN-No.29569.

A previous similar case was for M.S."GIUSEPPE VERDI"

IDENTIFICATION MARKS of important forgings and castings. (Copies of certificates to be forwarded) G.H.H.-WS

Piston rods (upper part): LLOYD'S WG.N.8043;7464;8045; Crankshaft 336-271  
8067;7522;7470;7462;7451;7521. LLOYD'S DSF -20/10/62

Piston rods (lower parts): LLOYD'S WG.P.21;20;17;330 Thrust/flywheel shaft  
285;284;16;331;19.

Connecting rods: WG.S.247;152;45;1479;149;150;127;152; LLOYD'S GEN.  
505. SS 103  
GM  
28/7/62.

AIR RECEIVERS if supplied with engine. (Copies of certificates to be forwarded)

Port & Cert. No. GEN.M.7670

CRANKSHAFT

THRUST/FLYWHEEL SHAFT

AIR RECEIVERS

Dates of approval of plans

27/8/1962

27/8/1962

14/8/1962

The machinery reported above has been built under Special Survey in accordance with the Rules, approved plans and Secretary's letters, examined running on the test bed and found satisfactory. The materials and workmanship are good, the spare gear required by the Rules has been supplied and the machinery is eligible, in my opinion, to be fitted in a classed ship.

Date of Committee

FRIDAY - 3 SEP 1965

Minute

See Rpt.1.

(P. RUGGIERO) & (W. GIUNTI)  
Surveyor to Lloyd's Register of Shipping

Foundation

NOTE.—Where existing machinery is submitted for classification, the circumstances are to be explained as fully as possible, and the recommendation should be suitably amended.