

SHIP NO. 220.

(M.V. "NAGARA MARU")

LIST OF SPARE GEARS.

(ENGINE PART.)

THE YOKOHAMA DOCK CO., LTD.,

YOKOHAMA,

1934.

Draw.No. 771-8.



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Design Dept.  
13/6/1934.

SHIP NO. 220.

LIST OF SPARE GEARS.

( ENGINE PART )

MAIN ENGINE.

(a) Crank Shaft.

1 set of coupling bolts and nuts with split pins.

(b) Main Bearings.

1 set of main bearing brasses for working cylinder (2 halves)

1 set of main bearing bolts and nuts for one bearing.

(c) Working Cylinder, &c.

1 upper cylinder cover with valves ready for fitting.

1 upper inner cylinder cover.

1 lower cylinder cover with valves, stuffing box and gland ready for fitting.

1 lower inner cylinder cover with gland.

1 complete cylinder liner.

1 set of studs and nuts for one top cylinder cover.

1 set of studs and nuts for one bottom cylinder cover.

(d) Valves on Cylinder Cover, &c.

7 sets of fuel valve with cage and spring ready for fitting for top.

7 sets of fuel valve with cage and spring ready for fitting for bottom.

7 fuel valve needles with nozzles and nozzle guides for top cylinder.



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Trade

14 fuel valve needles with nozzles and nozzle guide for bottom cylinder.

7 complete sets of safety valves for top & bottom cylinder.

7 complete sets of indicator valves for top cylinder.

7 complete sets of indicator valves for bottom cylinder.

3 complete sets of starting air valves for one cylinder ready for fitting.

7 sets of stuffing box packing rings for crank chamber top.

7 sets of stuffing box packing rings for one piston rod.

7 sets of fuel oil pipes with union nuts between fuel pump and fuel valve for one cylinder.

(e) Connecting Rods and Crossheads.

1 set of crosshead guide shoes for one cylinder.

1 crank pin bearing for connecting rod with bolts and nuts.

2 crosshead bearings with bolts and nuts.

3 sets - 6 dipping pipes for piston cooling.

(f) Working Pistons.

1 main pistons complete with rings and piston rod ready for fitting.

2 piston crown tops.

2 bottom pistons.

7 sets of piston rings for one piston.

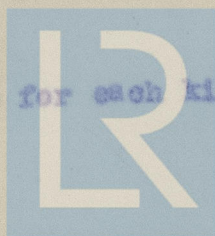
1 set of protecting tubes and return pipe.

4 sets of complete telescopic pipes.

(g) Valve Gears.

3 starting air valve cams.

1 set of cam profile gauges for each kind.



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1 set of cam shaft driving wheels.

3 rollers each for the levers of starting air valves.

1 pair of cam shaft bearing brasses with bolts and nuts.

(h) Fuel Oil Pumps.

1 set of fuel oil pump complete for top cylinder.

1 set of fuel oil pump complete for bottom cylinder.

7 fuel pump piston and guides for top cylinder.

7 fuel pump piston and guides for bottom cylinder.

7 fuel pump suction valves ready for fitting.

7 valve cones with springs for the above.

7 fuel pump delivery and non-return valves ready for fitting.

7 valves cones with springs for the above.

7 Spill valves with guides and springs.

7 fuel cams with screws and packing pieces.

7 cam rollers with pins and bushes.

1 set of fuel pump actuating gears with bushes, roller and pin.

7 springs of each size above.

(i) Governor.

1 pair of brass and gear wheel for governor shaft.

2 springs of each size.

(j) Main Thrust Bearing.

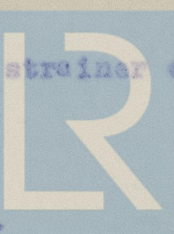
1 set of thrust pad rings.

(k) Miscellaneous.

1 each kind of springs excluding those specified above.

1 each kind of pressure gauges.

2 sets of suction and delivery strainer element of fuel oil pump.





2 sets of filter elements excluding those specified above.

1 lubricator for each kind.

6 glasses for lubricator.

6 delivery pipes of mechanical lubricator with union nuts.

1 set of other packing material for one engine.

1 set of ball bearing of each kind.

1 each kind of grease cups.

Assorted number of bolts and nuts excluding those specified above.

#### SHAFTING AND SCREW PROPELLER.

1 propeller shaft.

1 set of coupling bolts and nuts of intermediate shaft.

2 propeller blades.

#### DIESEL GENERATORS.

(a) Crank shaft

1 set of coupling bolts and nuts for one coupling.

(b) Main Bearing.

1 set of main bearing brasses with studs and nuts.

(c) Cylinders, &c.

1 cylinder liner.

1 cylinder cover with studs and nuts.

1 set of cover fixing studs and nuts.

(d) Valves on Cylinder Cover.

6 complete fuel valves ready for fittings.

12 fuel nozzles.

6 complete exhaust valves with cages, valves, seats and springs ready for fitting.



6 exhaust valves and seats.  
6 exhaust valve springs.  
6 complete air suction valves with cages, valves and springs ready for fitting.  
6 air suction valves.  
6 air suction valve springs.  
6 complete starting air valves with cages, valves and springs ready for fitting.  
6 starting valves.  
6 starting valve spring.  
6 complete safety valves with valve boxes ready for fitting,  
6 safety valve springs.  
6 lengths of fuel pipes with union nuts.

(e) Connecting Rods.

2 sets of connecting rod top end brasses for one cylinder.  
2 sets of connecting rod bottom end brasses with bolts & nuts for one cylinder.

(f) Working Pistons.

2 main pistons with packing rings and gudgeon pins.  
6 sets of piston packing rings ( including oil scraper rings) for one piston.

(g) Valve Gear.

6 fuel cams.  
3 exhaust valve cams.  
2 exhaust cam rollers with pins and bushes.  
2 pins and bushes for exhaust valve lever.  
2 air suction valve cams.



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2 air suction cam rollers with pins and bushes.

2 pins and bushes for air suction valve lever.

2 starting valve cams.

2 starting cam rollers with pins and bushes.

2 pins and bushes for starting valve lever.

2 sets of cam profile gauge for each kind.

(h) Fuel Oil Pumps.

6 sets of plungers with guides and springs.

6 spill valves with guides and springs.

6 suction valves.

6 delivery valves.

6 spill valves.

6 non-return valves.

2 driving levers with rollers and lever pins.

6 springs of each kind.

1 complete set of driving mechanism with rollers and pins.

(i) Governor

2 springs.

(j) Lubricating Oil Pump.

2 sets of gear wheels with bushes.

2 sets of gearing bushes for driving gear wheel pump.

(k) Manoeuvring Air Compressor.

2 sets of piston rings for each stage.

1 complete change of suction valves and delivery valves for each stage of one cylinder.

2 sets of valve ~~xxx~~ rings and springs of suction valve and delivery valve.

1 pair of bearing brasses with bolts and nuts.



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1 pair of crank pin brasses with bolts and nuts.  
1 set of gudgeon pin brasses.  
1 set of relief valve and springs.  
2 sets of drain valve complete.  
1 set of screws and nuts for cylinder cover and piston.  
10% intercooler tubes for one compressor.  
1 set of lining material for friction clutch.  
1 set of sliding block for clutch lever.  
(1) Miscellaneous.  
2 sets of delivery filter elements of fuel oil for each kind.  
2 each kind of other strainer elements.  
1 spring of each kind excluding those specified above.  
1 set of ball bearing for each kind.  
1 pressure gauge for each kind.  
1 complete set of cut joints for one Diesel generator and compressor.  
2 complete sets of union nuts and nipples of each kind and size.  
Assorted number of bolts and nuts excluding those specified above.

EMERGENCY AIR COMPRESSOR.

1 suction valve for each stage.  
1 delivery valve for each stage.



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AUXILIARY DIESEL GENERATOR.

(a) Crank Shaft.

1 set of coupling bolts and nuts.

(b) Main Bearing.

1 set of main bearing brasses with studs and nuts.

(c) Cylinder &c.

1 cylinder cover with studs and nuts.

(d) Valves on Cylinder Cover.

2 complete fuel valves with cages, needle valves, springs and nozzles ready for fitting.

2 fuel nozzles.

2 fuel valve springs.

2 complete exhaust valves with cages, valve seats and spring ready for fitting.

2 exhaust valve springs.

1 complete air suction valve, valve and springs ready for fitting.

1 air suction valve spring.

1 starting air valve with cage, valve and spring ready for fitting.

1 starting valve spring.

1 safety valve with valve box ready for fitting.

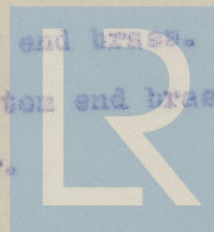
1 safety valve spring.

2 lengths of fuel pipes with union nuts.

(e) Connecting Rods.

1 set of connecting rod top end brass.

1 set of connecting rod bottom end brasses with bolts and nuts for one cylinder.



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(f) Working Piston.

- 1 piston with packing rings.
- 2 sets of piston packing rings (including oil scraper rings) for one piston.

(g) Valve gear.

- 1 fuel cam.
- 1 exhaust valve cam.
- 1 exhaust cam roller with pin and bush.
- 1 air suction valve cam.
- 1 air suction cam roller with pin and bush.
- 1 starting valve cam.
- 1 starting cam roller with pin and bush.

(h) Fuel Oil Pumps.

- 1 fuel oil pump complete.

(i) Governor.

- 2 springs.

(j) Cooling water pump.

- 1 set of suction and delivery valve.

(k) Lubricating Oil Pump.

- 1 suction valve with spring.
- 1 delivery valve with spring.

(l) Miscellaneous.

- 1 set of delivery filter elements of fuel oil for each kind.
- 1 each kind of other strainer element.
- 1 spring of each kind excluding those specified above.
- 1 set of each kind of ball bearings.
- 1 pressure gauge for each kind.



1 complete set of cut joints.

(a) Turbo-blower.

1 impeller with shaft.

1 set of bearing brasses.

1 set of coupling bolts with nut complete with rubber ring  
for one coupling.

COOLING WATER PUMPS FOR MAIN ENGINE.

COOLING WATER PUMP FOR AUXILIARY GENERATOR.

Following spare gears to be supplied for each kind of pumps.

1 set of impeller with shaft and key.

1 set of bearing brasses for each kind and size.

1 set of flexible coupling rubbers.

1 spring for each kind.

FUEL OIL TRANSFER PUMPS.

FUEL OIL SERVICE PUMPS.

LUBRICATING OIL PUMPS.

Following spare gears to be supplied for each kind of pumps.

1 set of wheels with shaft and keys for each kind.

1 set of bearing brasses for each kind.

1 set of stuffing box packing for each kind.

1 set of flexible coupling rubber for each kind.

1 spring for each kind.

FIRE AND GENERAL SERVICE PUMP.

BILGE AND BALLAST PUMP.

FRESH WATER PUMP.

HOT SALT WATER PUMP.

Following spare gears to be supplied for each pump.

1 set of impeller with shaft and key for each kind.



- 1 set of bearing brasses of each kind.
- 1 set of thrust bearings of each kind.
- 1 set of flexible coupling rubber of each kind.
- 1 set of each kind of ball bearing.
- 1 set of air pump of each kind.
- 1 spring of each kind.

#### BILGE AND SANITARY PUMP.

#### CARGO OIL PUMP.

Following spare gears to be supplied for each pump.

- 2 sets of bucket packing rings for one cylinder.
- 1 set of bearing bushes of each kind and size with bolts and nuts.
- 2 sets of suction valves and delivery valves with seats, and spindles or studs complete for one cylinder.
- 1 set of relief valve springs for one cylinder.
- 1 spring of each kind excluding those specified above.

#### PURIFIER.

- 4 sets upper ball bearings for vertical spindle.
- 24 springs for ditto.
- 2 sets middle and lower bearing bushes or ball bearings for vertical spindle.
- 4 sets Tread wheels and spindle of lower bearing for vertical spindle.
- 4 cone metals and screw for bowl support.
- 20 bowl joint rings.
- 8 Disc joint rings.
- 8 Brake faces.
- 2 sets Worm and worm wheel.



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- 2 sets Vertical and horizontal spindle.
- 2 sets ball bearing for worm wheel shaft.
- 2 sets friction block for electric drive.
- 2 sets friction block lining for do.
- 2 sets pump lubricator.
- 2 complete set of cut-joints.
- 12 driving belts.

#### EXHAUST GAS BOILER.

- $\frac{1}{30}$  of total number of thimbles.
- 1 set of feed check valves, seats and spindles.
- 6 gauge glasses.
- 2 safety valve springs.
- 1 set of manhole and mud-hole door packings.
- 1 each spindle for blow-off valve, steam valve, main stop valve, auxiliary stop valve.
- $\frac{1}{2}$  number of fire bricks.

#### AUXILIARIES OF EXHAUST GAS BOILER.

- 2 spare burners.
- 12 spare burner tips ( assorted )
- 1 lighting up burner.
- 1 set of steam piston packing rings for one feed pump.
- 1 set of bucket packing rings for do.
- 1 set of suction and delivery valves with seats and springs for do.
- 1 set of slide valve spindle complete for do.
- 1 complete change of filter element for hot well tank.
- 2 filter elements excluding those specified above.



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FRESH WATER RECOOLER.

536 Ferrules.

268 Tubes.

2680 packings.

CONDENSER.

18 ferrules.

3 tubes.

50 packings.

LUBRICATING OIL COOLER.

60 tubes.

GENERAL SPARE..

- 1 stop valve spindle and seat of each size and kind for  
air reservoirs and air bottles and air distributing valve  
box.
- 1 complete relief valve of each size and kind for air  
reservoir.
- 1 set of working parts of reducing valves of each kind for  
air and steam.
- 1 set of H.P. air pressure gauge master valve spindle.
- $\frac{1}{2}$  set of flat gauge glasses for oil tanks complete with  
packing pieces.
- 1 glasses for each size of sight glass.
- 1 round glass tube for each oil tank.
- 1 strainer element of each kind excluding those specified  
above.



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- 1 set of brasses for engine room ventilating fan.
- 1 set of drain valve and spindle for compressed air reservoirs and bottles.
- 1 belt leather and connection pieces for each size.
- 1 length of delivery pipe of air compressors to air reservoirs.

#### MAIN DYNAMO.

#### AUXILIARY DYNAMO.

Following spare gears to be supplied for each dynamo.

- 1 armature in zinc case for main dynamo only.
- 2 field coils of each size and kind.
- 3 sets of carbon brushes for one dynamo.
- 1 line of brush holder and springs.
- 1 set of bearing bushes of each size and kind.
- 1 set of resistance for regulator.

#### MOTORS.

(The following spares to be supplied for each kind of motor unless otherwise specified).

- 1 field coil.
- 1 set of carbon brushes for each motor.
- 1 set of brush holder spring for each motor.
- 1 set of bearing bushes.
- 2 magnet coil for control gear.
- 1 set of sparking contact and finger with spring for do.
- 1 set of springs assorted for do.
- 1 pilot lamp for each control gear.
- 1 element of resistance for regulator.



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- 1 armature for main engine turning motor.
- 1 armature for lubr. oil shifting pump motor.
- 1 armature for bilge and sanitary pump motor.
- 1 armature for fresh water pump motor.
- 1 armature for hot sea water pump motor (this is to be supplied only when hot sea water pump motor is not similar to fresh water pump motor).
- 1 armature for engine room ventilating fan motor.
- 1 armature for work shop machine motor.
- 1 armature for fire and general service pump motor.
- 1 armature for bilge and ballast pump motor ( this is to be supplied only when bilge and ballast pump motor is not similar to fire and general service pump motor).
- 1 armature for cargo oil pump motor.
- 1 armature for lubricating oil purifier motor.
- 1 armature for fuel oil purifier motor (this is to be supplied only when fuel oil purifier motor is not similar to lubricating oil purifier motor).

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