FIRE PUMP

NAFFCO
PASSION TO PROTECT

INSTALLATION,

OPERATION &

MAINTENANCE

I N S T R U C T I O N S

HORIZONTAL END SUCTION FIRE PUMP - NE SERIES

CONTENTS

CONTENTS

1. SAFETY

1.1. General Safety Instructions

DO NOT OPERATE THIS PUMP AT ANY PRESSURE, FLOW RATE, OR LIQUID TEMPERATURE OTHER THAN THOSE WHICH SHOWN ON THE NAME PLATE. DO NOT PUMP ANY LIQUID OTHER THAN WATER. IGNORING THIS WARNING CAN RESULT IN PUMP FAILURE AND SERIOUS PERSONAL INJURY OR DEATH.

If the safety labels are missed or damaged, contact NAFFCO and get label and replace.

While starting pump set make sure pump set coupling guard fixed in the pump set.

Only proper tools of correct size shall be used for maintenance and service.

Do not wear loose clothing that could catch on moving parts.

Pump room should be kept clean from oil, waste cloth, water and easily explosive materials.

Pump room should not be treated a like store room.

Fire pump should be monitored during running to ensure that it was started due to an actual demand and water tank should be monitored to avoid dry run condition.

1.2. Electric Hazards

Check proper earth connection of the electric, diesel, jockey controllers and electric motors.

Make sure safety labels and operation labels are stuck in the controllers if damaged please get from NAFFCO and replace.

Use only qualified personnel for installation and maintenance.

Electric motor cables terminals should be properly terminate and covered with terminal cover.

Inspect cable and connector if any damage replace immediately.

Do not keep tools on top of battery, this could result short circuit.

1.3. Mechanical Hazards

Wear eye protection during welding, grinding, drilling etc. Wear ear protection while operating diesel engine. Always wear safety shoes and safety gloves.

Monitor water leakage of pump gland packing. If excessive leak adjust the packing, do not place hands or finger into this area.

During maintenance disconnect battery negative terminal connector.

Do not refuel the engine when its running, fuel fumes are highly flammable.

Diesel engine exhaust pipe line should be insulated from temperature and it should be kept separate from discharge line.

2. INTRODUCTION

This manual provides general instruction for the installation, operation, maintenance, dismantling and assembling of horizontal end suction fire pump manufactured by NAFFCO, U.A.E. Each centrifugal fire pump is tested in our fac-

tory to ascertain that its performance conforms to the design requirement of the project. Certified copies of all test reports shall be submitted to the engineer for approval, and our QC engineer shall check all the equipment against shipping paper.

NAFFCO centrifugal fire pumps will give trouble-free and satisfactory service for a long time if they are properly installed and maintained periodically. Follow the instructions in this manual carefully. Do not run the pumps under operating instructions which differ from those specified by us.

3. IDENTIFICATION

Every pump unit is coming with separate name plate. This name plate is having serial number, model, flow rate and head.

It is important that the serial number should be quoted while claiming for spares or service. This will identify the unit exactly and ensure that correct advice and parts are selected. If it is known that any update or modification to the pump has been carried out since original supply then this information is also crucial (Refer fig. no. 1).

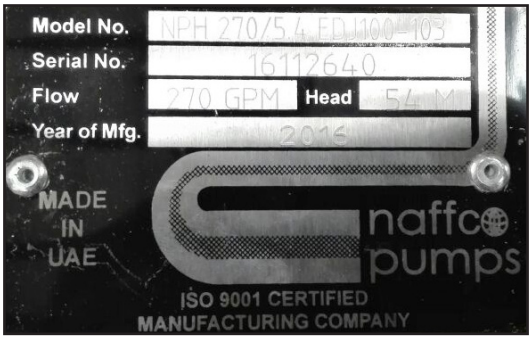


Fig. No. 01

4. HANDLING

Pump set shifting and lifting shall be done using forklift (refer fig no. 02). When lifting the pump set it should be very careful not to broke the fire pump set. The pump set mounting holes should match properly with the foundation bolts without any damage.

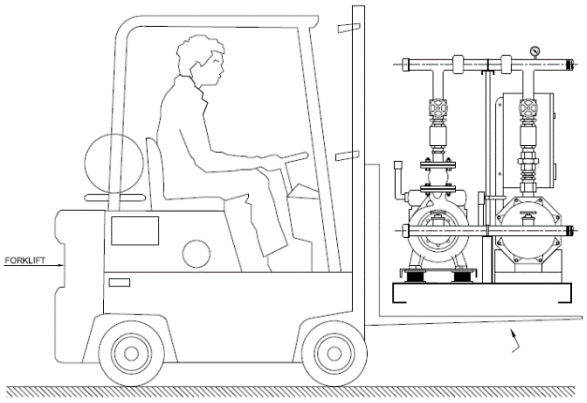


Fig. No. 02

5. INSTALLATION

Fire water pump sets and control systems should be installed in accordance with this installation manual and GA drawing. Failure to install the supplied NAFFCO fire pump set fully in accordance with this instruction manual void the equipment warranty. Proper ventilation and drainage system shall be provided for fire pump room.

5.1. FOUNDATION

We recommend that you install the pump on a concrete foundation which is heavy enough to provide permanent and rigid support to the entire pump. The foundation must be capable of absorbing any vibration, normal strain or shock. As a rule of thumb, the weight of the concrete foundation should be 2.5 times the total weight of the pump. The concrete foundation must have an absolutely level and even surface. Place the pump on the foundation and fasten it. The base frame must be supported on the whole area. Make sure the concrete foundation has set before mounting the pump set. The surface of the foundation must be completely horizontal and perfectly flat. The foundation should be 200 mm larger than the base frame on all four sides. See Fig.03 for foundation details.

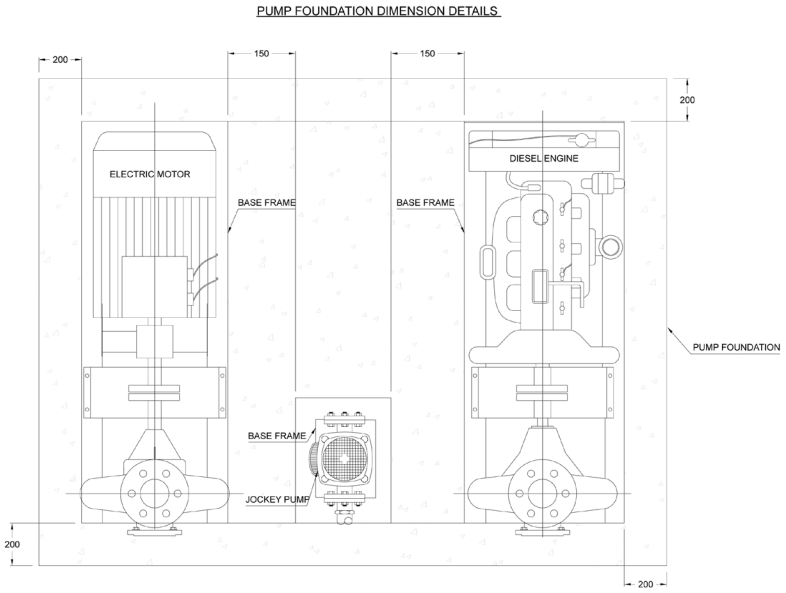


Fig. No. 03

5.2. GROUTING

Base plates have to be grouted with non-shrinking mortar up to the upper edge of the frame after having been fixed in position. See Fig.04 for details.

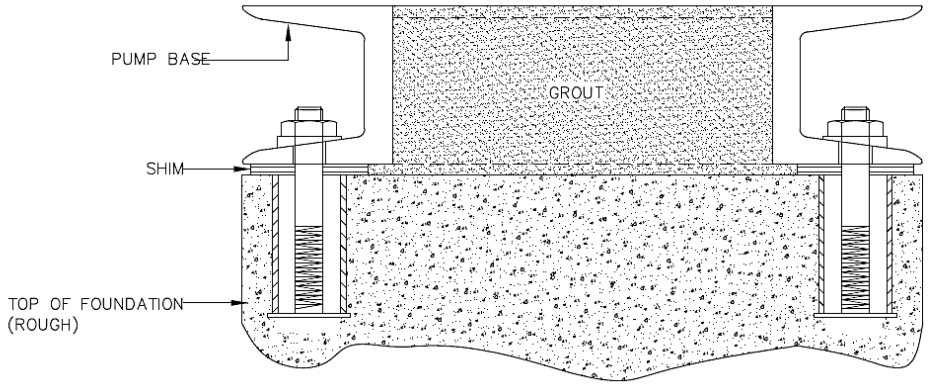


Fig. No. 04

5.3. Mounting and base frame levelling

Position the pumps set on the foundation and align using a precision spirit level (on the base frame) Fig05. Always fit shims to left and right of the foundation bolts, between the base frame and the foundation. All shims must be perfectly flush and uniformly tighten up securing means.

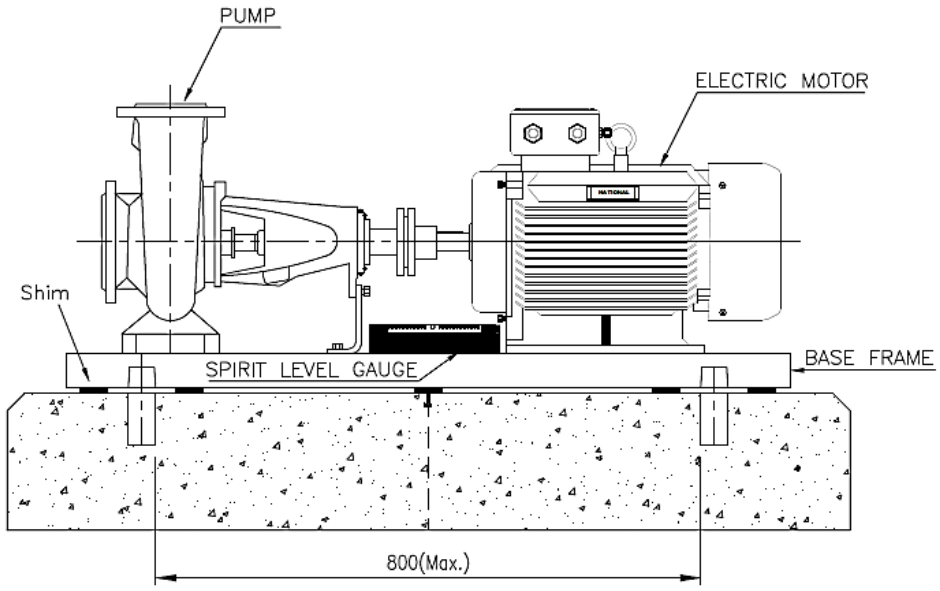


Fig. No. 05

5.4. Aligning Pump and Driver

a) Radial Alignment:

The radial alignment is of the driver and the pump coupling is done using a straight gauge as give below. Maximum allowable misalignment is 0.92 mm or as per coupling manufacturers recommendation.

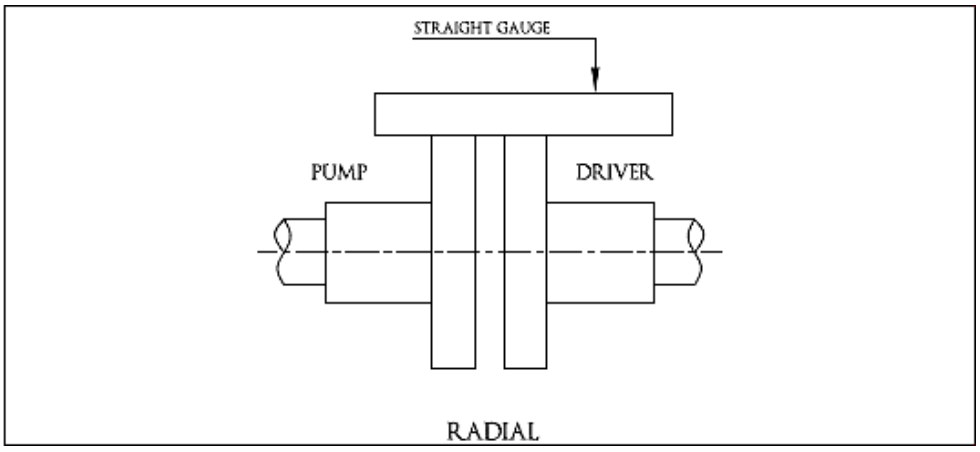


Fig. No. 06

a) Axial Alignment:

Measure the coupling outer face with caliper in 4 sides (360°). Adjust the driver in the direction required. Maximum allowable misalignment is 0.92 mm or as per coupling manufacturer's recommendation.

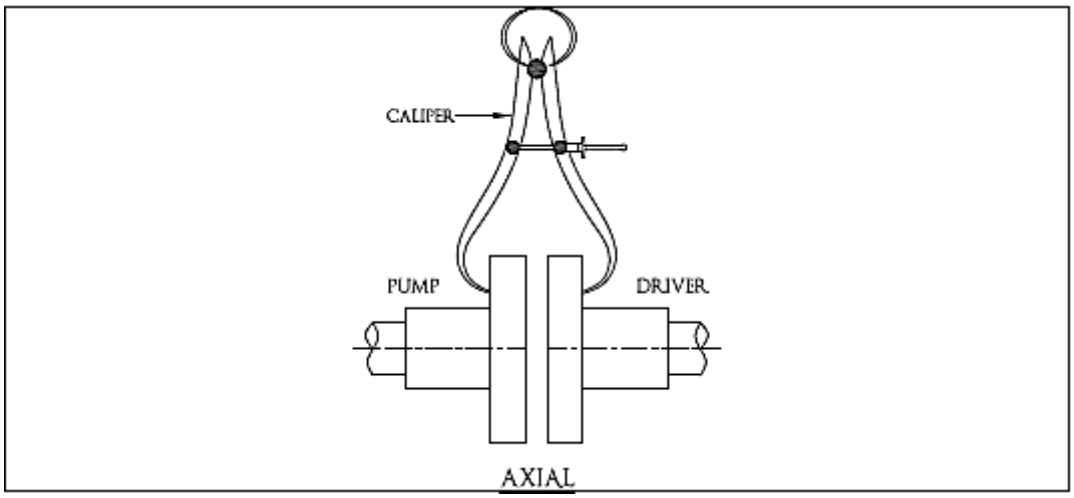


Fig. No. 07

5.5. PARTS REQUIRED FOR INSTALLATION

This section explains in detail about the parts required and the installation procedure for fitting the suction (suction manifold shall be installed by the installer at field with gate valve suction the suction manifold piping and fitting will not be standard part of fire pump set supplied by NAFFCO) and delivery manifolds on to the pump set.

5.5.1 PARTS EXPLANATION

5.5.1.1 GATE VALVES

Gate valves are used in both suction and delivery piping .Gate valves (GV) are specifically used in isolation applications in various piping systems. And they operate in the fully opened or fully closed positions.
Gate valves are multi-purpose bi-directional shutoff valves. The shutoff action is achieved by moving the wedge in vertically up/down direction in the valve body, because of their ability to cut through liquids. They are used in both suction and discharge piping of the fire pump set.

5.5.1.2 FLEXIBLE COUPLING

Flexible Coupling prevents stresses due to expansion and contraction on the threaded spot, isolate against the transfer of noise and vibration, and compensate for misalignment.

The welding and threading which done on the pipe may danger of buckling or pulling apart and resulting misalignment damages are eliminated.

The flexible coupling reduces objectionable noise and vibration in piping systems connected to the fire pumps. The transmission of noise and vibration tends to reduce the efficiency of the pumps.

5.5.1.3 NON RETURN VALVE

A non-return valve or one-way valve is a valve fixed on the discharge line that normally allows fluid to flow through it in only one direction. Check valves have an inlet and outlet. It also eliminates the water hammering effect and sufficient pressure will be hold inside the pump.

5.5.1.4 BALL VALVE

A ball valve is fixed on the suction manifold to opening the valve there by flow from the tank. A ball valve is a valve with a spherical disc, the part of the valve which controls the flow through it. The sphere has a hole, or port, through the middle so that when the port is in line with both ends of the valve, flow will occur. When the valve is closed, the hole is perpendicular to the ends of the valve, and flow is blocked. The handle or lever will be in line with the port position letting you see the valve's position. Once the pump is primed the ball valve should be in closed condition.

5.5.1.5 SUCTION MANIFOLD

Suction manifolds are used to evenly distribute fire water to two or more pumps in the fire pump package, greatly simplifying the fire pump-set system. The suction manifold piping is of MS type and is provided with two inlet/outlets that can be used bi-directionally depending on the site requirements; it also has provisions to connect to the electrical pump set, diesel pump set, jockey pump set and a ball valve which is used as a priming valve.

5.5.1.6 DISCHARGE MANIFOLD

Discharge manifold is used to combine multiple pump outputs into one high volume feed .The discharge manifold piping is of MS type and is provided with two inlets that can be used in either direction depending on the site requirements, it also has provisions to connect to the electrical pump set, diesel pump set, jockey pump set.

5.5.1.7 REDUCER/INCREASER

A reducer/increaser allows for a change in pipe size to meet hydraulic flow requirements of the system, or to adapt to existing piping of a different size. Reducers/Increasers are usually eccentric reducers/increasers in the suction side and concentric reducer/increaser in the discharge side are used when required to maintain the same top- or bottom-of-pipe level.

- Ensure the bolt grouting or chemical anchors are allowed to dry thoroughly before connecting any pipe work.

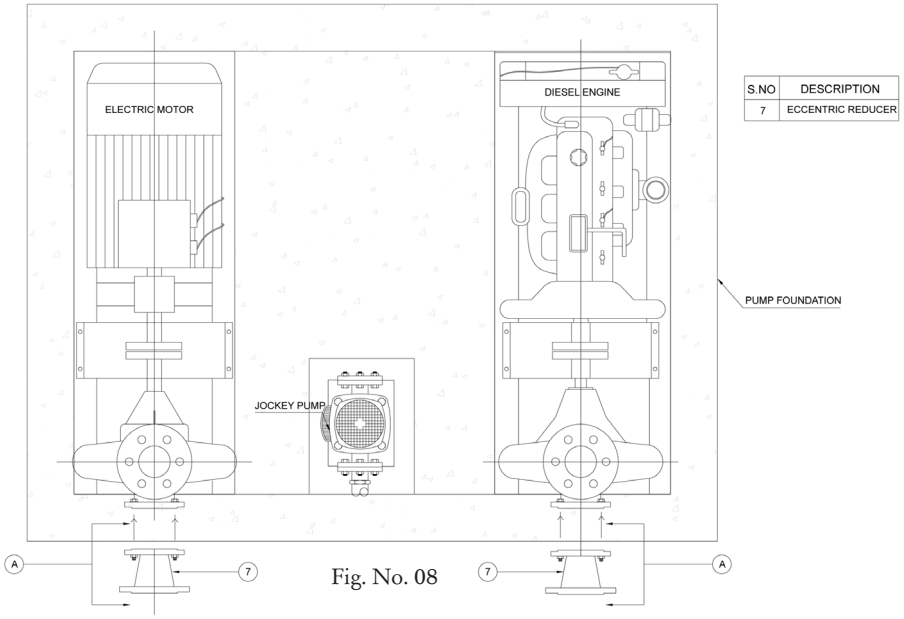
- The suction piping should be supported independently and close to the pump so that no strain is transmitted to the pump when the flange bolts are tightened; use pipe hangers or other supports at intervals necessary to provide supports closest to the pump.

- The suction pipe from fire water tank should be as short and direct as possible without more bends, and should be flushed before connecting to the pump. Horizontal Suction lines must have a gradual rise to the pump.

5.5.2 INSTALLATION INSTRUCTIONS OF SUCTION PIPING

- Connect the eccentric reducer to the suction flange of both electrical and diesel pump and tighten it using a nut and bolt assembly as shown in the figure below
- Only clear water shall be used for firefighting purpose

A - ECCENTRIC REDUCER TO SUCTION FLANGE ASSEMBLY

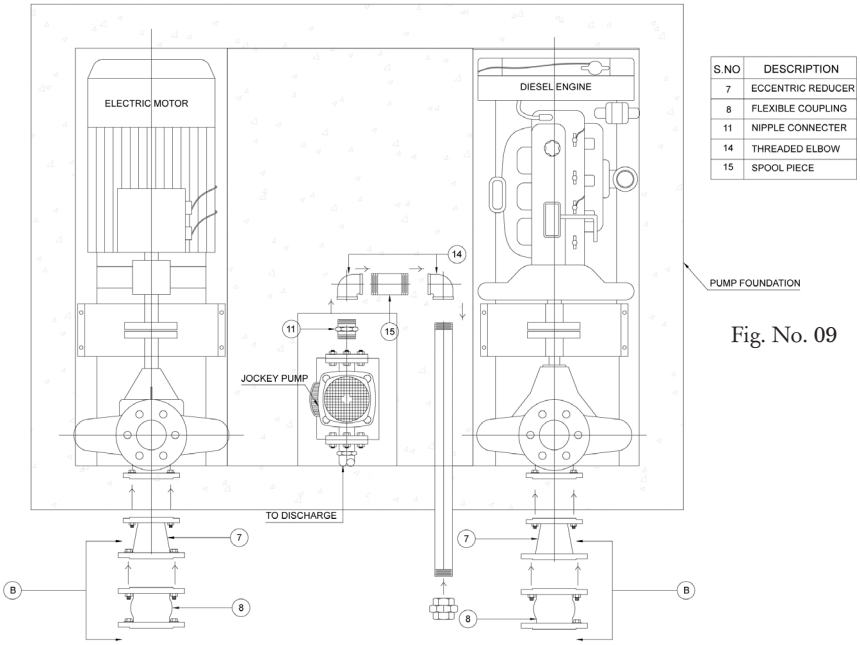


S.NO	DESCRIPTION
7	ECCENTRIC REDUCER

Fig. No. 08

- Connect the gate valve to the flexible coupling and tighten it using a nut and bolt assembly as shown in the figure below. Connect a threaded union to the suction piping of the jockey pump. Care has to be taken that necessary supports are to be provided on the suction side.

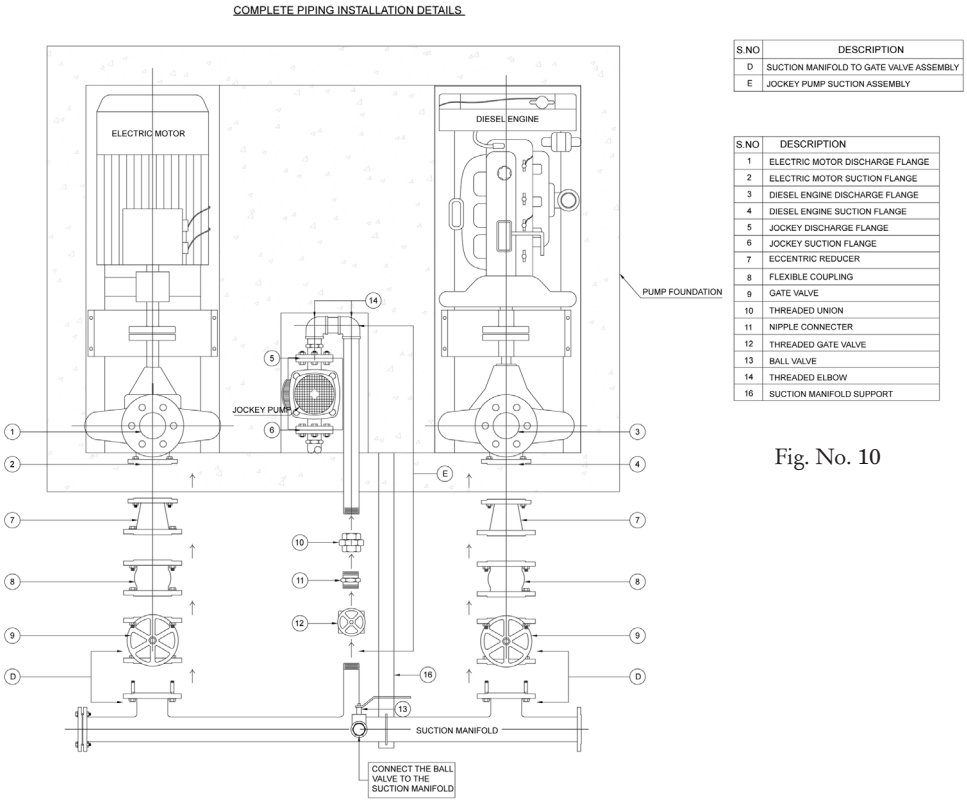
B - FLEXIBLE COUPLING TO ECCENTRIC REDUCER ASSEMBLY



S.NO	DESCRIPTION
7	ECCENTRIC REDUCER
8	FLEXIBLE COUPLING
11	NIPPLE CONNECTER
14	THREADED ELBOW
15	SPOOL PIECE

Fig. No. 09

• Connect the suction manifold to gate valves and union respectively as shown in the figure below and connect the ball valve to suction manifold for priming. Connect a Nipple connector and threaded gate valve to the suction piping of the jockey pump. Care has to be taken that necessary supports are to be provided on the suction side.



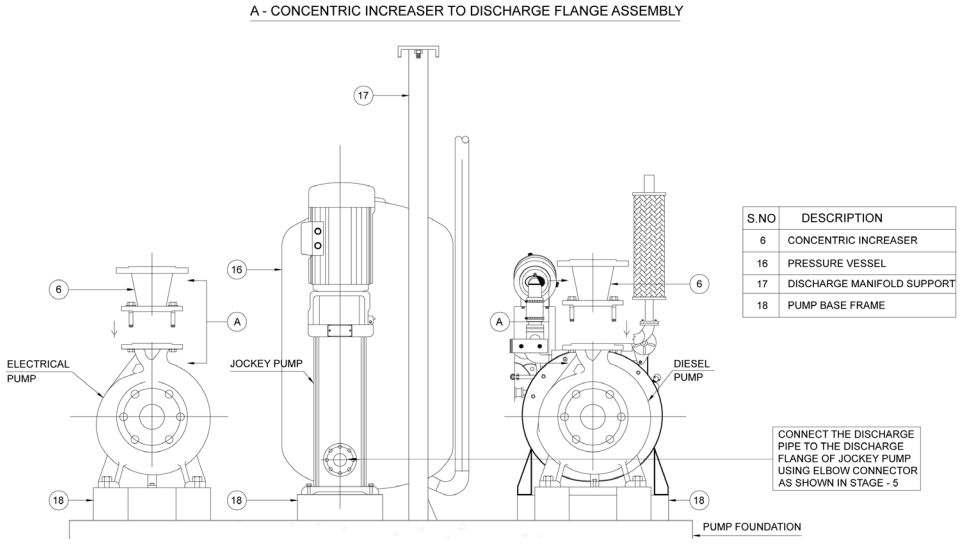
S.NO	DESCRIPTION
D	SUCTION MANIFOLD TO GATE VALVE ASSEMBLY
E	JOCKEY PUMP SUCTION ASSEMBLY

S.NO	DESCRIPTION
1	ELECTRIC MOTOR DISCHARGE FLANGE
2	ELECTRIC MOTOR SUCTION FLANGE
3	DIESEL ENGINE DISCHARGE FLANGE
4	DIESEL ENGINE SUCTION FLANGE
5	JOCKEY DISCHARGE FLANGE
6	JOCKEY SUCTION FLANGE
7	ECCENTRIC REDUCER
8	FLEXIBLE COUPLING
9	GATE VALVE
10	THREADED UNION
11	NIPPLE CONNECTER
12	THREADED GATE VALVE
13	BALL VALVE
14	THREADED ELBOW
16	SUCTION MANIFOLD SUPPORT

Fig. No. 10

5.5.3 INSTALLATION INSTRUCTIONS OF DISCHARGE PIPING

• Connect the concentric increaser to the discharge flange of both electrical and diesel pump and tighten it using a nut and bolt assembly as shown in the figure below



S.NO	DESCRIPTION
6	CONCENTRIC INCREASER
16	PRESSURE VESSEL
17	DISCHARGE MANIFOLD SUPPORT
18	PUMP BASE FRAME

Fig. No. 11

• Connect the flexible coupling to concentric increaser and tighten it using a nut and bolt assembly as shown in the figure below. Assemble the discharge piping of the pressure vessel as shown in the figure below.

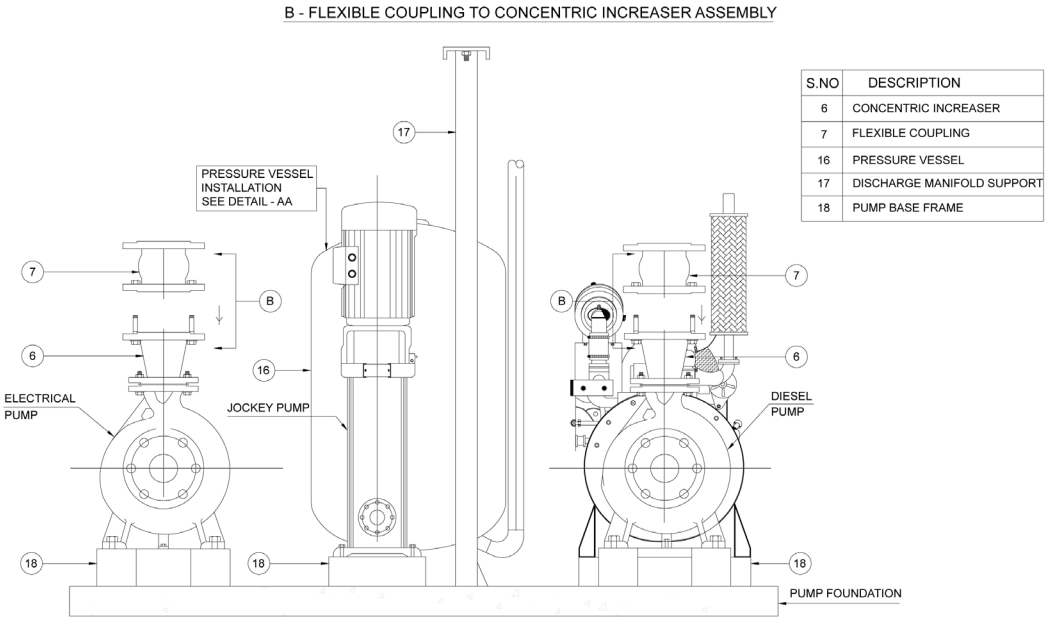


Fig. No. 12

• Connect the non-return valve to the flexible coupling and tighten it using a nut and bolt assembly as shown in the figure below

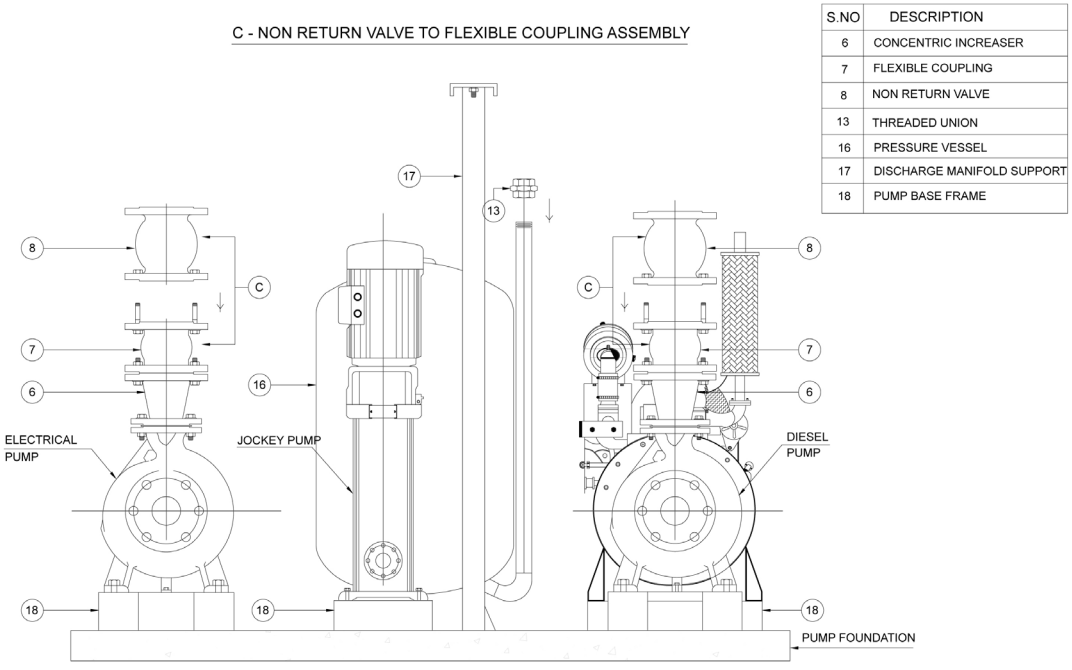


Fig. No. 13

- Connect the gate valve and pool piece to the non-return valve and tighten it using a nut and bolt assembly as shown in the figure below

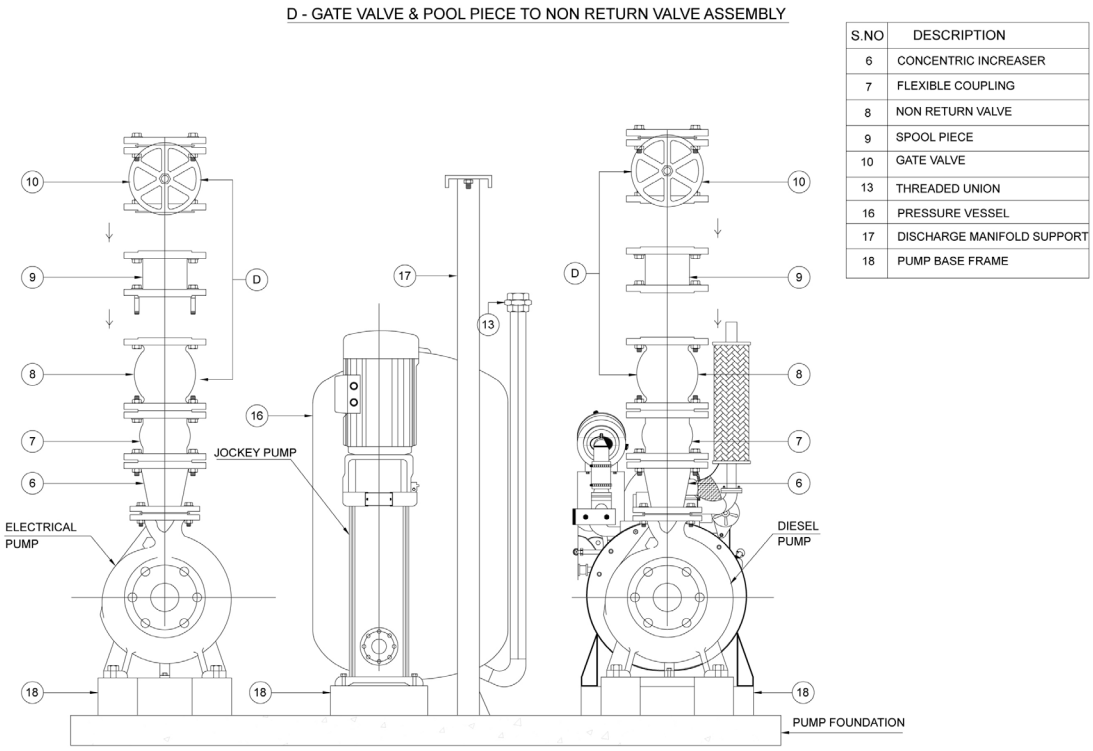
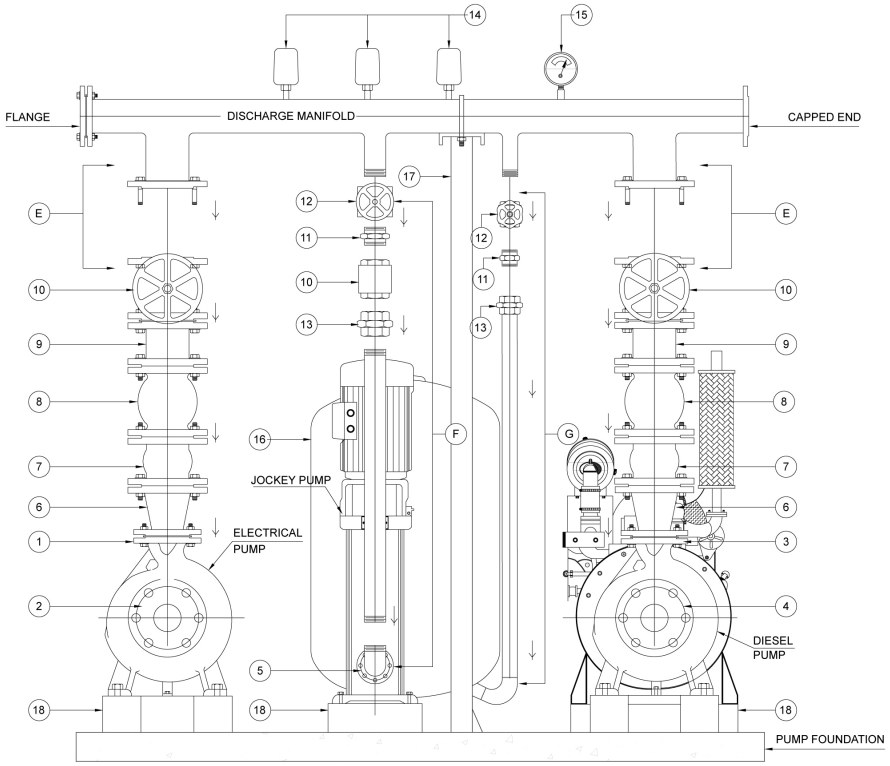


Fig. No. 14

- Connect the discharge manifold to gate valves and union respectively as shown in the figure below.

- Connect the discharge piping assembly of the jockey pump to the discharge manifold as shown in the picture below.

- Fix the pressure gauge to read the discharge pressure and fix the pressure switches for main, stand-by and jockey pump respectively on the discharge manifold and connect the electrical wiring of the pressure switch to the respective control panel.



S.NO	DESCRIPTION
E	DISCHARGE MANIFOLD TO GATE VALVE ASSEMBLY
F	JOCKEY PUMP DISCHARGE ASSEMBLY
G	PRESSURE VESSEL ASSEMBLY

S.NO	DESCRIPTION
1	ELECTRIC MOTOR DISCHARGE FLANGE
2	ELECTRIC MOTOR SUCTION FLANGE
3	DIESEL ENGINE DISCHARGE FLANGE
4	DIESEL ENGINE SUCTION FLANGE
5	JOCKEY DISCHARGE FLANGE
6	CONCENTRIC INCREASER
7	FLEXIBLE COUPLING
8	NON RETURN VALVE
9	SPOOL PIECE
10	GATE VALVE
11	NIPPLE CONNECTER
12	THREADED GATE VALVE
13	THREADED UNION
14	PRESSURE SWITCHES
15	PRESSURE GAUGE
16	PRESSURE VESSEL
17	DISCHARGE MANIFOLD SUPPORT
18	PUMP BASE FRAME

Fig. No. 15

- Fix the suction manifold to the fire water tank through elbow pipe.

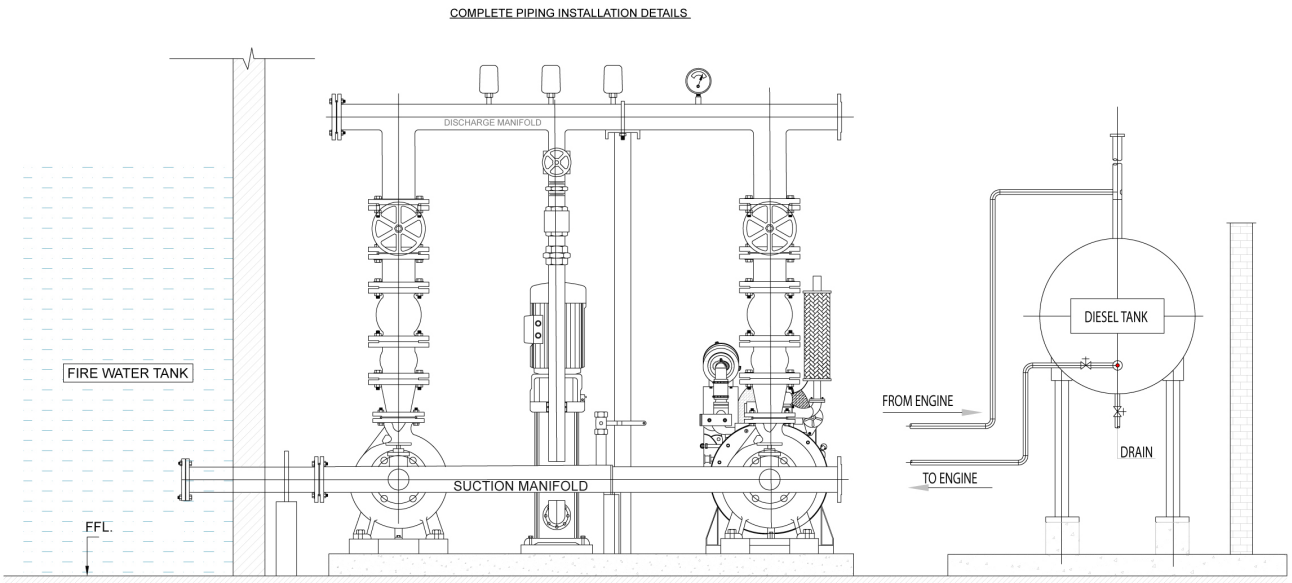


Fig. No. 16

6. Supporting Norms

Within warranty period the natural defect made by drivers, pump & supporting parts and controller inner parts will claimed according to company norms. The physical defect like man made error (Wrong handling) and voltage level (Proper input) were not come under warranty. Monthly commission report should be provide during claim warranty it's used to support to checked periodic inspection and maintenance of Battery charge level, Cooling Oil, Fuel, Input voltage through wiring, Cooling water, Controller input and electronic unit and switch's, Periodic cleaning of water and fuel tanks, Pump distribution all valves and piping, Basement and other bolt tightened.

Note

- The original setting given by the manufacturer. There may any modification done will not claimed in the warranty.

- Do not operate motor if any abnormal sound or smoke found. If it's necessary get help or guidance from manufacturer/ company approved service center.

- Storing of fire pump and equipment's and drivers more than 6 months it require special attention. In this period they should be stored in indoors at dry environment with its initial package and recommended protective cover with air circulation and also inspect for any external damage and periodic condition like standing water, part missing and dirt build etc. This condition must corrected.

- Especially 6 months to one year storage engine should take special attention.

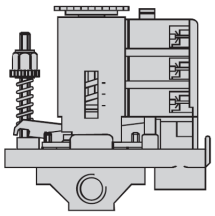
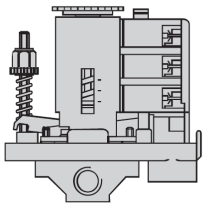
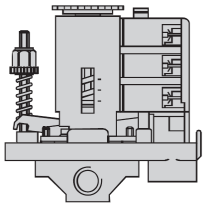
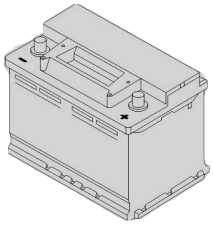
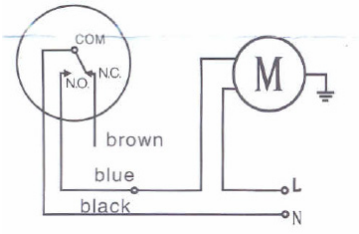
    a. Drain engine oil and change oil filter (Drain oil and replace coolant with protection plug this must repeat for every 6 month).
    b. Refill engine crankcase with engine preservative oil and change fuel filter.
    c. Install the coolant plugs in normal mix percentage of 50% cooled and 50% water.
    d. Remove the protection from intake and exhaust openings.
    e. Disconnect the coupling or drive shaft from pump and run the engine at slow speed for 1-2 minutes. not exceeding normal operating temperature.

7. CONTROL PANEL WIRING

The electrical wiring from the pressure switches and other contactors are connected to their respective control panel as shown below.

NOTE : The mentioned connections instructions o the next table is just for reference , actual wiring and installation instructions are enclosed along with the controller.

8. CONNECTIONS TO THE TERMINAL BOX

SL. NO.	INSTRUMENT	CONNECTION TO TERMINAL BOX
1		Connect the pressure switch for main pump contactors to terminal 13 and 14 as shown in the figure • Adjust screw-nut 1 for rising pressure. • Adjust screw-nut 2 for falling pressure.
2		Connect the pressure switch for jockey pump contactors to terminal 13 and 15 as shown in the figure • Adjust screw-nut 1 for rising pressure. • Adjust screw-nut 2 for falling pressure.
3		Connect the pressure switch for diesel pump contactors to terminal 46 and 47 as shown in the figure. • Adjust screw-nut 1 for rising pressure • Adjust screw-nut 2 for falling pressure
4		Connect the battery terminals to terminals 40 and 41 respectively as shown in figure
5		Connect the stopper solenoid to terminal 49 as shown in the figure
6		Connect the float switch terminal L and N to control panel terminals 43 and 44

9. SEQUENCE OF OPERATION

The following sequence of operation is explained considering the below mentioned pump set as an example , the pressure switches have to set according to the delivered pump set duty points and not the duty points mentioned in this example.

For Example:

FIRE PUMP SET DUTY POINT: 750 GPM @ 10 BAR

JOCKEY PUMP

- The Controller is actuated, either by drop in system pressure ("AUTO" mode) or by placing the HAND OFF-AUTO Switch in the "HAND" position.
- The Jockey Pump maintains the pressure in the system from _9 bar to _10 bar.
  1. In the "AUTO" mode, the Pump will start when the pressure drops to _9 bar & will continue to run & cut-off until the pressure reach the normal level _10 bar.
  2. In the "HAND" mode, the pump will continue to run until the HAND-OFF-AUTO selector switch is moved from the "HAND" position.

ELECTRICAL MOTOR DRIVEN FIRE-PUMP

- The Controller is actuated, either Automatically or Manually, but must be Shut-down Manually.
  1. In the "AUTO" mode, the Pump will start when the pre-set pressure of _8 bar at the Pressure Switch was reached and will continue to run until Shut-down manually.
  2. In an Emergency, the Pump can be started manually by the "START" pushbutton.

- A "STOP" pushbutton is provided for Manual Stopping of the motor.

DIESEL ENGINE DRIVEN FIRE-PUMP

- In the Automatic Starting – Placing the Main Switch in the "AUTO" position puts the Controller in the Automode.

- When system pressure continue to drop and Electric Fire Pump fails to Start, the Diesel Fire Pump will start when the pre-set value of _7 bar at the Pressure Switch was reached and will continue to run until Shutdown manually.

- In the Manual Starting – The Controller has a main MANUAL-OFF-AUTO Selector switch. For Manual operation, place the switch in the "MANUAL" position and push either (or both) CRANK pushbuttons, release when the engine starts.

- The engine will continue to run until the switch is moved to the "OFF" position.

10. Check List for Fire Pump Set after installation

SL. NO	DESCRIPTION	
1	Check the foundation height and clearance it should be 200mm larger than base frame on all side.	Checked ☐
2	Suction piping & Discharge piping should be in proper size. Not less than suction nozzle size.	Checked ☐
3	Isolation valve (OS&Y) in suction piping & discharge piping should be in proper location	Checked ☐
4	In suction and discharge piping eccentric reducer and increaser installed correctly.	Checked ☐
5	Check whether the discharge pressure gauge is installed	Checked ☐
6	Check whether the non-return valve are fitted in correct position	Checked ☐
7	All isolation valves supervised in the open position	Checked ☐
8	Diesel pump pressure relief valve without isolation	Checked ☐
9	In diesel engine, two storage batteries provided with charger	Checked ☐
10	Cooling system from heat exchanger or cooling water supply pipe line from pump discharge is installed	Checked ☐
11	Cooling line return line one size higher than inlet and this return water should be visible to monitor	Checked ☐
12	Diesel tank located above ground (outlet of diesel tank should be above or same level of diesel engine inlet)	Checked ☐

SL. NO	DESCRIPTION	
13	Water supply to the fire pump adequate to meet fire pump requirements	Checked ☐
14	Alignment of coupling must be checked	Checked ☐
15	Check the lubrication of pumps and drivers if stored long time	Checked ☐
16	Ensure the voltage, frequency and no of phase power supply are matching with the name plate	Checked ☐
17	Check the circuit wiring connections, terminals and proper earthing	Checked ☐
18	Check the diesel level in the tank should be more than 2⅔ liter	Checked ☐
19	Check the tolerance and rotate pump shaft manually to confirm the free rotation	Checked ☐
20	Stick reflective tape on the pump shaft for checking speed	Checked ☐
21	Make sure exhaust muffler were connected	Checked ☐
22	Ensure sufficient water in tank	Checked ☐
23	Check the RPM whether working as per manufacturer standard	Checked ☐
24	Check Stud bolt connected in both flexible coupling	Checked ☐
25	Check the rotation of the shaft and pump in clockwise	Checked ☐
26	Check whether gasket is properly inserted in-between coupling area	Checked ☐
27	Ensure the air is released by screw in jockey pump before starting	Checked ☐

11. Faults and Remedies

MOTOR		
FAULT	CAUSES	REMEDY
Motor not rotate when system is turned on.	No Voltage to motor and debris lodge.	Ensure that motor is connected to power supply and that supply switch is installed properly connected for the supply voltage and Hz. And also ensure that no debris is lodged in motor.
Over load	Abnormal symptoms on the bearing sliding surface (wear, adhesion of foreign matter).	Replace bearing, shaft sleeve, thrust washer, etc.
	Contact of rotor and stator	Check rotor and stator surfaces and abnormal symptoms such as swelling and also inspection the bearing
	Locked rotor	Check the pump coupling and output alignment
Abnormal symptoms in motor.	Decrease in insulation resistance due to moisture absorption in stator	Measure insulation resistance and winding resistance.
	Unbalance of resistance between the winding at stator or lack of phase	Dry by blowing N_2 gas into the stator or if insulation resistance and winding resistance cannot be corrected replace the stator
	Attachment of metal surface on the stator or rotor	Check the motor section. Clean attached excessive metal
Thermostat operates frequently	Motor over load	Check operating flow rate Check liquid specific gravity and viscosity

MOTOR		
FAULT	CAUSES	REMEDY
Motor over heating	Low voltage or frequency or amp draw	Ensure that connected to power supply switch is installed properly
	Flow too low or bearing failure	Check the flow of water tank via suction head

ENGINE		
FAULT	CAUSES	REMEDY
Trouble to Start up the engine	Fuel pipe line clogged or fuel tank had much lower fuel	The inlet and outlet pipe be air pressurized to clean clogged material and fuel must be higher than three-quarters in fuel tank
	Starter motor damage or motor time timer setting error and low Battery	The timer setting in controller may cause the damage the motor or not able to start the engine The differ of power supply fault as given input in the medium of battery
	Fuel filter or fuel pump clogged with the dust	Remove and clean fuel filter. Replace fuel filter.
Low RPM	Internal combustion problem	Fuel to air ratio out should in proper as by adjusting or set air band and fuel pressure to specs
	Ignition transformer not providing spark to fuel.	Replace the ignition transformer, clean and adjust electrodes.

ENGINE		
FAULT	CAUSES	REMEDY
Burner fires and abnormal smoke	Fuel clogged	Clean fuel tank in site which adequate of dust particle clogged and damage inner parts and use pure fuel as supply
	Random low pressurized engine oil	Engine oil should checked periodically and if necessary be replaced at the time
High Vibration	Not steady in the base of the engine	Grouting of the basement with fixed bolt and other parts fixed around the engine should tighten with proper tool without damaging other part
Bearing run under hot	Improper alignment and oil	Realign engine and drive, Check oil for applicability and level/ quantity
	Bearing cooling not working	Check cooling oil line
Engine over heating	Cooling line or radiator not working	Check the cooling line over the engine if necessary replace line and proper water be check and pour for circulation
	Gasket and piston ring worn out	Check the gasket whether the damage cause serious problem and also piston ring be replaced

JOCKEY PUMP		
FAULT	CAUSES	REMEDY
Pump not starts	Pump improperly primed	Before starting the jockey pump air should be released by screw mounted on that use proper tool.

12. POLICY OF WARRANTY

NAFFCO's obligation and liability under this warranty being limited to replacing or repairing any part providing defective under normal use and service, and reasonable cost of repair and replacement of said part or parts, within one year from the date of Testing & commissioning, at NAFFCO's facilities.

This warranty certificate must be presented to obtain services pursuant to the warranties set forth herein.

This warranty does not covered by NAFFCO when repaired on not authorized workshops.

This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchant or fitness for a particular purpose. The obligations and liabilities at NAFFCO under this warranty shall not include any transportation, any other charges, liability for direct, indirect or consequential damages and delay resulting from the defect or any other obligations or liability on the part of NAFFCO. NAFFCO neither assumes nor authorize any other person to assume for it any other liability in connection with such equipment. Any improper use or application of the product or the substitution of any parts not approved by the NAFFCO shall avoid this warranty. Failure to provide regular maintenance in accordance with safety regulations shall likewise void this warranty. This warranty covers only the products mentioned below.

This warranty neither cover batteries, parts damaged by decomposition from chemical reaction, wear and tear caused by abrasive materials, nor damages resulting from misuse, accident, negligence or from improper installation, operation maintenance, modification or adjustment.

This warranty will be considered void in case of following conditions:

1) Failure to provide regular maintenance in accordance with safety regulations, failure to produce the detailed maintenance report from the date of testing

2) Evidence of quantities of sand, mud and construction debris in the installation. Sand and mud are abrasives and will damage shaft and bearings construction debris may lock impeller and cause the motor to burn out.

3) Use of this equipment for temporary de-watering purpose on construction jobs and other than fire pump application for safety system.

4) Careless handling, accidental damage, fault or improper installation or wiring. Failure to provide detailed documents showing that the installation and wiring is done exactly as per NAFFCO's recommendation.

5) Pumping liquids in excess of 150F unless specifically designed for this service. Failure to provide water temperature logs proving that water temperature was maintained at this level.

6) Pumping equipment is not serviced as per our IOM manual. Failure to provide the detail service reports confirming that servicing was done as per our IOM manual.

7) Failure to follow the instruction provide in the installation. Operation and maintenance manuals of this equipment and associated equipment and accessories. Failure to provide photographic evidence of step by step installation, operation and maintenance showing that it was done as per our instructions.

8) The change in setting/alignment had done without manufacturer report warranty will void NAFFCO is not liable for any warranty on starting equipment, electrical apparatus and other material are not manufactured by NAFFCO; since the same is usually covered by the warranties of the respective manufacturers thereof.

Service Policy:

The field service must be obtained from the authorized representative of NAFFCO and field visit charges may be applicable.

This warranty is void in case of full payment of the above mentioned project is not received.

NAFFCO makes no warranty as to starting equipment, electrical apparatus or other material not of its manufacture, since the same are usually covered by warranties of the respective manufacturers.

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Project Name	:.....
Location	:.....
Fire Pump Set Duty Point	:.....
Electric Fire Pump Sl. No(s).	:.....
Diesel Fire Pump Sl. No(s).	:.....
Commissioned By	:.....
Date of Commissioning	:.....
Signature of Commissioning Engineer	:.....

NAFFCO
PASSION TO PROTECT

NAFFCO
Email: info@naffco.com
www.naffco.com

In line with NAFFCO policy for continuous product development, NAFFCO has the right to change specifications without prior notice.

NE-IOM/2018/V.01

FOR ANY ASSISTANCE, PLEASE CONTACT
800-NAFFCO
800 6233326
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