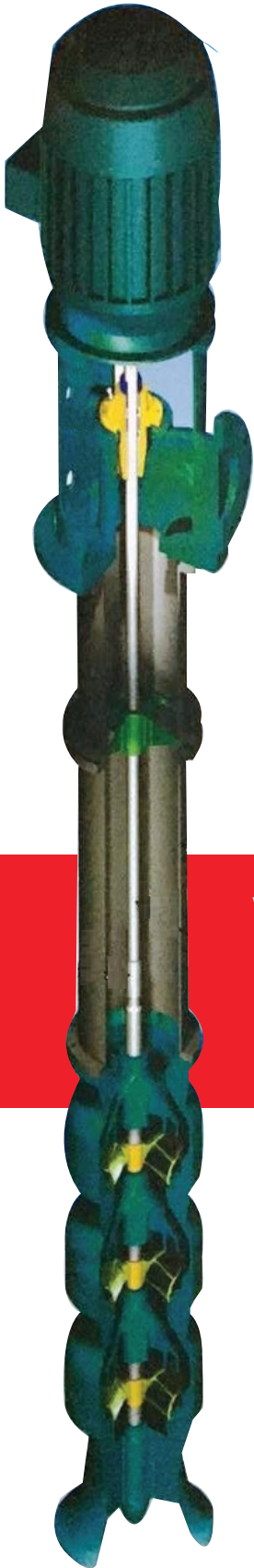




Serving since 1968



# VERTICAL TURBINE PUMPS

(Oil and Water Lubricated)



MANUFACTURING EXCELLENCE  
SINCE 1968

# INTRODUCTION

Chandra Pumps Pvt. Ltd., a leading name in manufacturing of “CHANDRA” make Vertical Turbine Pumps. Chandra Pumps offers high quality products and services to clients in all over India. Established in 1968, today “CHANDRA” is serving in the vital fields of national interest.

Chandra Pumps have wide application in the field of agriculture and drinking water supply etc. Economical and low maintenance operation make these pumps ideal for irrigation purposes. These pumps are adaptable for municipal use to meet thousands of primary water wells. These pumps also have varied type of demand and needs for supply of water to all Industrial Units small, medium, large or giant Industrial companies. Central Government is giving priority to provide fresh drinking water for all rural and urban areas. State Governments are giving priority to agricultural and irrigation sectors.

Chandra Pumps incorporate a great combination of young talents and experienced professionals in field of Engineering in order to achieve the 100 % quality assured product. Engineers and Marketing professionals do analysis in their respective fields and actively participate in Research and Development to provide the company a continuous push towards its Vision. A Process based Approach, step wise regular Quality Checks, Testing as per Indian Standards, Final Inspection of Finished Goods under the supervision of Quality Engineer, Engineering Head and Inspecting Officer from Govt. Dept.. make Chandra product , a benchmark of trust. Team in Chandra Pumps possesses vast experience of Designing, Developing, Manufacturing, Installing and Running over 6000 pumps all across India, exploring their experience of more than 49 years in Pump Manufacturing Industry .

Chandra Pumps Meerut facility is equipped with two High Tech Testing Laboratories to test the performance of the Finished Good to meet the required specifications and parameters using Digital Panels with Latest Technological Procedures and Standard Methods under well qualified and experienced Technical Team.

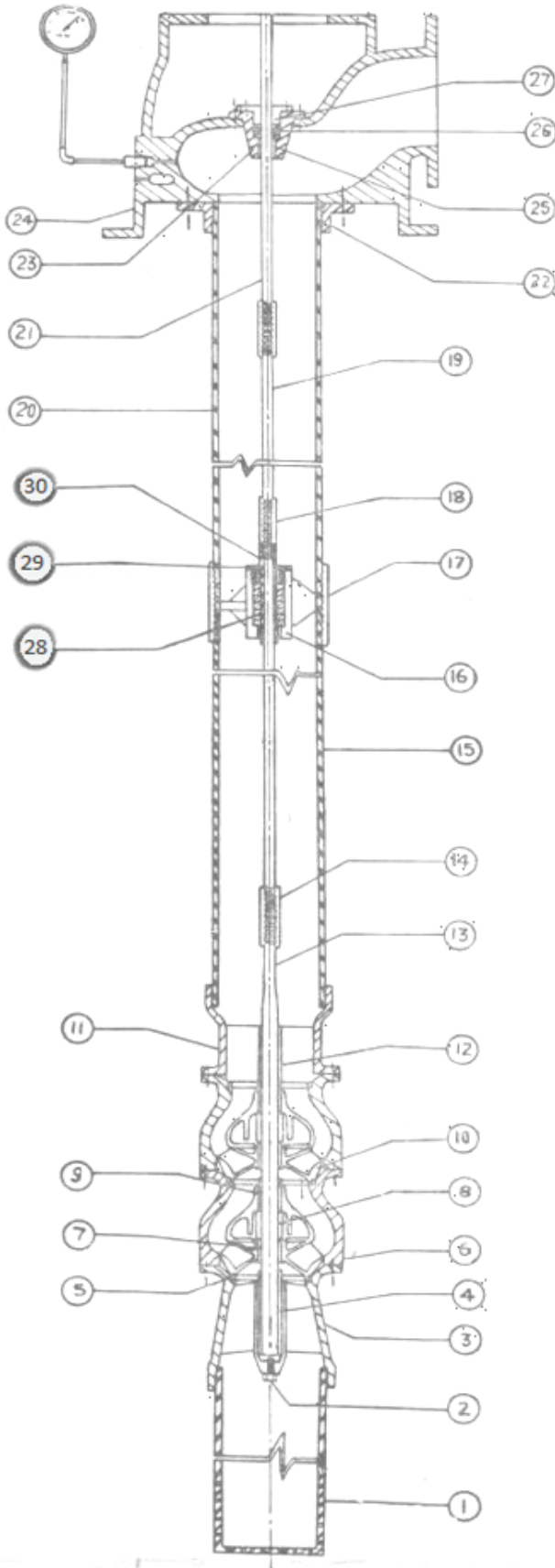
# APPLICATIONS

- Water Supply
- Lift Irrigation
- Fire Fighting
- Flood Control
- Raw Water Intake
- Drainage Pump Station
- Industrial Utilities
- Circulating Water
- Drinking Water Scheme
- Cooling Tower
- Dewatering



# CROSS SECTION OF VERTICAL TURBINE PUMP

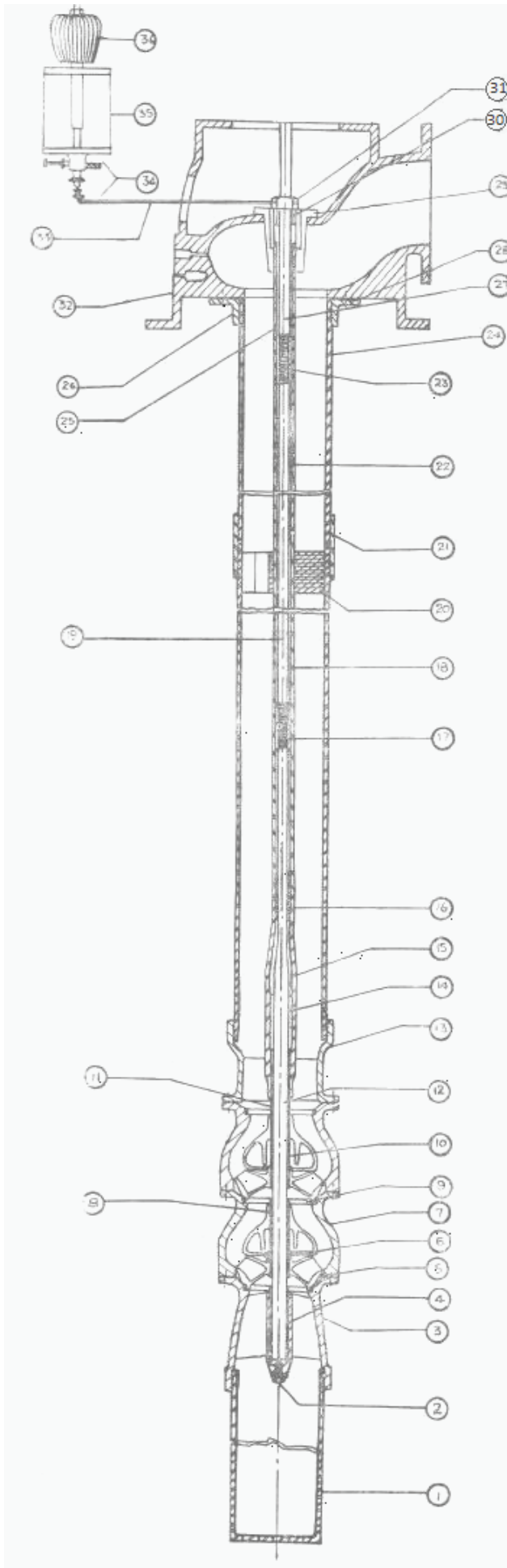
(Water - Lubricated)



Part No.	Name of Part
1	Strainer
2	Suction Bowl Plug
3	Suction Bowl
4	Suction Bowl Bush
5	Impeller Seal Ring
6	Intermediate Bowl
7	Impeller Lock Collect / Key
8	Intermediate Bowl Bush
9	Intermediate Shaft Pump Sleeve
10	Impeller
11	Discharge Bowl
12	Discharge Bowl Bearing
13	Pump Shaft
14	Pump Shaft Coupling
15	Column Pipe
16	Bearing Retainer
17	Column Joint (Flanged / Socket)
18	Shaft Coupling
19	Line Shaft
20	Top Column Pipe
21	Top Shaft
22	Top Column Flange
23	Stuffing Box
24	Surface Discharge Head
25	Stuffing Box Bush
26	Stuffing Box Pkg.
27	Stuffing Box Gland
28	Rubber Bearing
29	Check Nut
30	Shaft Sleeve

Water Lubricated Turbine Pump

(Oil - Lubricated)



Part No.	Name of Part
1	Strainer
2	Suction Bowl Plug
3	Suction Bowl
4	Suction Bowl Bush
5	Impeller
6	Impeller Lock Collect
7	Intermediate Bowl
8	Intermediate Bowl Bush Bronze
9	Neck Ring
10	Intermediate Bowl Bush Rubber
11	Discharge Bowl Bush
12	Pump Shaft
13	Discharge Bowl
14	Discharge Bowl Screw Bearing
15	Tubing Adopter
16	Tubing Adopter Bearing
17	Pump Shaft Coupling
18	Shaft Tube
19	Line Shaft
20	Shaft Tube Stabilizer
21	Column Joint (Flanged / Socket)
22	Line Shaft Bearing
23	Shaft Coupling
24	Column Pipe
25	Top Tube
26	Top Column Flange
27	Top Shaft
28	Top Column Flange Gasket
29	Tube Tension Plate
30	Tube Tension Nut Bush
31	Tube Tension Nut
32	Surface Discharge Head
33	Connecting Oil Line Assembly
34	Valve And Body Assembly
35	Lubricator
36	Magnetic Coil Assembly

# DESCRIPTION

Pumps are of single or multistage, consisting of bowl assembly, column assembly and driving unit assembly. Variety of models are available to operate at 50Hz and 60 Hz.

## **Bowl**

A diffuser with vanes cast integrally.

## **Impeller**

Impellers are of Francis (BHR), Mixed flow (BHQ, BHM, BHK), Semi-axial (BHMa) and Axial (BHA) type; enclosed or semi-open depending upon model. In case of condensate extraction pumps, first stage impeller can have double suction optionally.

## **Suction bell/Impeller guide piece**

Designed for smooth inflow of water with minimum losses.

## **Shaft**

The shaft is of high tensile strength steel.

## **Column pipe**

Either cast or fabricated, it houses line shaft bearings and directs water from bowl assembly to discharge head/elbow.

## **Bearings**

### **Transmission bearings :**

Cutless bearings are of natural / synthetic rubber / Elastomeric with outer shell of brass or suitable material. Lubrication by self/external clear water. Oil lubrication with bronze bearing is also available upon request.

### **Thrust bearing :**

Michell Tilting Pad Type or Antifriction type for taking hydraulic axial thrust and weight of rotor assembly. Lubrication with oil or grease.

Thrust bearing arrangement is available either independently in pump and drive or combined thrust arrangement in drive.

## **Discharge head/Discharge tee**

To direct flow from column pipe to discharge pipe located above or below ground level with single floor or two-floor arrangement as per requirement.

## **Non-reverse ratchet**

To prevent reverse rotation of pump due to back flow of the water in case of its tripping, available on request

## **Motor stool**

Rigid construction to ensure vibration-free operation of pumpset.

## **Coupling**

For pump and prime mover flexible or rigid as per requirement.

For line shaft threaded barrel or muff type as per requirement.

## **Direction of rotation**

Clockwise when viewed from driving end.

## **Drive**

Electric motor with vertical hollow/solid shaft is a standard arrangement.

Diesel engine/steam turbine with a right angle gear unit upon request.

## **High efficiency and low submergence**

Hydraulic design is being updated with our continuous R & D efforts to meet requirements of high efficiency and low submergence, taking care of other parameters, such as high reliability and optimum system design.

## RANGE

Casing Size	150 mm to 600 mm
Capacity	200 LPM to 30,000 LPM
Head	upto 225 mts

For higher capacities refer to us.

## MATERIAL OF CONSTRUCTION

Part description	Material of Construction
Casing / Bowl	Cast Iron / Ni. Cl./Cast Steel / Stainless Steel / Duplex SS / Super Duplex SS/ Ni.-Resist / ----
Impeller	Cast Iron / Bronze / Cast Steel / Stainless Steel / Duplex SS / Super Duplex SS/ Ni.-Resist ----
Intermediate Shaft Bearing	Bronze / Cutless Rubber / Thordon / Ferroform / Green Tweed / ----
Strainer	GI / SS
Pump/ Line/ Top Shaft	Carbon Steel / Stainless Steel / Duplex SS / Super Duplex SS ----
Wearing Ring	Cast Iron / Bronze / Cast Steel / Stainless Steel / Duplex SS / Super Duplex SS/ Ni.-Resist ----
Shaft Sleeve	Carbon Steel / Stainless Steel / Duplex SS / Super Duplex SS / ----

Note : NiCl indicates Cl with 1.5% Nickel. Other materials are also available.

CI : Cast Iron , CS : Cast Steel , SS : Stainless Steel , Br : Bronze

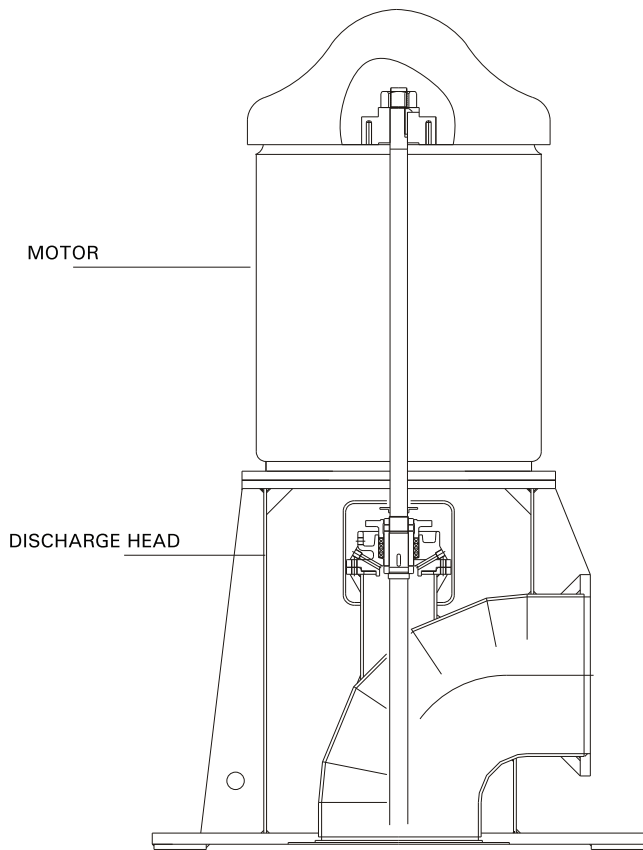
# MATERIALS

## MATERIAL STANDARDS - GENERAL INFORMATION

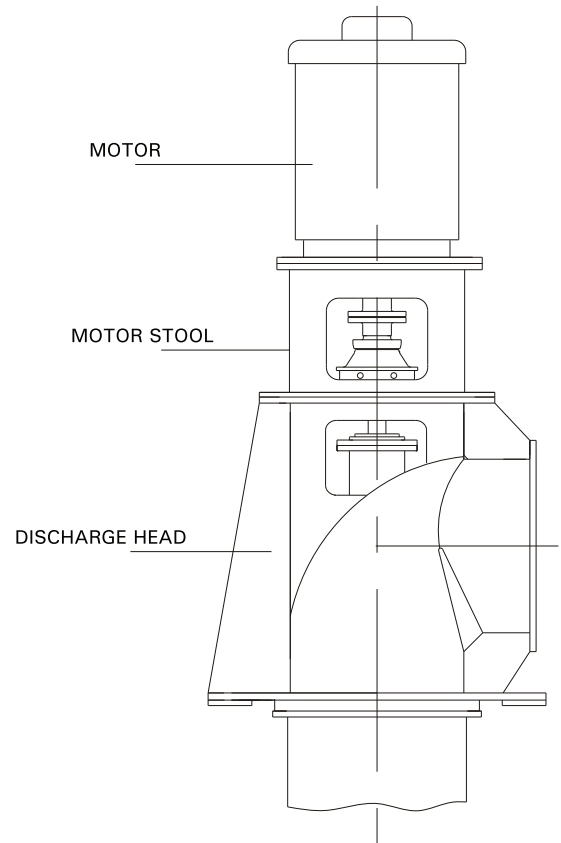
Material Type	Indian Standard (IS)	American Standard (ASTM)	DIN	British
Cast Iron	IS 210, Gr. FG 260	ASTM A48, CL. 35 or 40	1691 GG 25	BS EN 1561-GJL 250
Cast Iron with Ni.	Normally gives 1.5% Ni. ----- Other percentage can give if desired -----			
Bronze	IS 318, Gr. LTB 2	ASTM B62, B145 Alloy4A ASTM B584 – C83600	CuSn5ZnPb	BS EN 1982-CC491K BS1400 LG2-C
Phosphor Bronze	IS 28, Gr. 1			
Aluminum Bronze	IS 305, Gr. AB1	ASTM B 148 (9A)	UNS No. C95200	
Carbon Steel (Castings)	IS 1030, Gr. 230-450W	ASTM A216, Gr. WCB		
Stainless Steel (Castings)	IS 3444, Gr. 10	ASTM A743, Gr. CA15	1.4106(X12Cr14)	
	IS 3444, Gr. 24	ASTM A743, Gr. CA6NM	1.4313(X3CrNiMo13-4)	425 C 11
	IS 3444, Gr. 1	ASTM A743, Gr. CF8		
	IS 3444, Gr. 1	ASTM A351, Gr. CF8	1.4308	EN 10213-41.4308
	IS 3444, Gr. 4	ASTM A743, Gr. CF8M		
	IS 3444, Gr. 4	ASTM A351, Gr. CF8M	1.4408	EN 10213-41.4408
	IS 3444, Gr. 15	ASTM A 743, Gr. CF3		
	IS 3444, Gr. 15	ASTM A 351, Gr. CF3	1.4309	EN 10213-41.4309
	IS 3444, Gr. 16	ASTM A743, Gr. CF3M		
	IS 3444, Gr. 16	ASTM A351, Gr. CF3M	1.4409	EN 10213-41.4409
Duplex SS & Super Duplex. Casting)		ASTM A890, Gr. 1B UNS No. J93372 CD4MCuN		
		ASTM A890, Gr. 1C UNS No. J93373 CD3MCuN		
		ASTM A890, Gr. 2A UNS No. J93345 CE8MN		
		ASTM A890, Gr. 3A UNS No. J93371 CD6MN		
		ASTM A890, Gr. 4A UNS No. J92205 CD3MN		
		ASTM A890, Gr. 5A UNS No. J93404 CE3MN		
Carbon Steel (Bars)	IS 1570(P-III), Gr. 40C8	ASTM A107, Gr. 1040		BS 970(En-8)/08 0M40
	IS 1570(P-III), Gr. 55C8	AISI 1055	CK55	BS 970(En-9)/07 0M55
Stainless Steel (Bars)	IS 1570(P-V), Gr.X12 Cr12	ASTM A276, Type 410	1.4006 (X10Cr13)	410 S21
	IS 1570(P-V), Gr.X15 Cr16Ni2	ASTM A276, Type 431	1.4057 (X20CrNi17)	
		ASTM A276, Type 304	1.4301 (X5CrNi18 10)	304 S15
	IS 1570(P-V), Gr.X04 Cr17Ni12Mo2	ASTM A276, Type 316	1.4401 (X5CrNiMo17122)	316 S31
	IS 1570(P-V),Gr.X02 Cr17Ni12Mo2	ASTM A276, Type 316L	1.4404 (X2CrNiMo17122)	316 S11
Duplex SS (Bars)		ASTM A276, UNS S31803	1.4462 (X2CrNiMoN22 5)	
		ASTM A276, UNS S32760	1.4501(X3CrNiMoN25 7)	
Steel (Plates)	IS: 2062 (Fe 410 WA)	ASTM A283, Gr. D	1700 Gr ST 4-2 Fab. Steel 4-4	

# MOTOR ARRANGEMENT

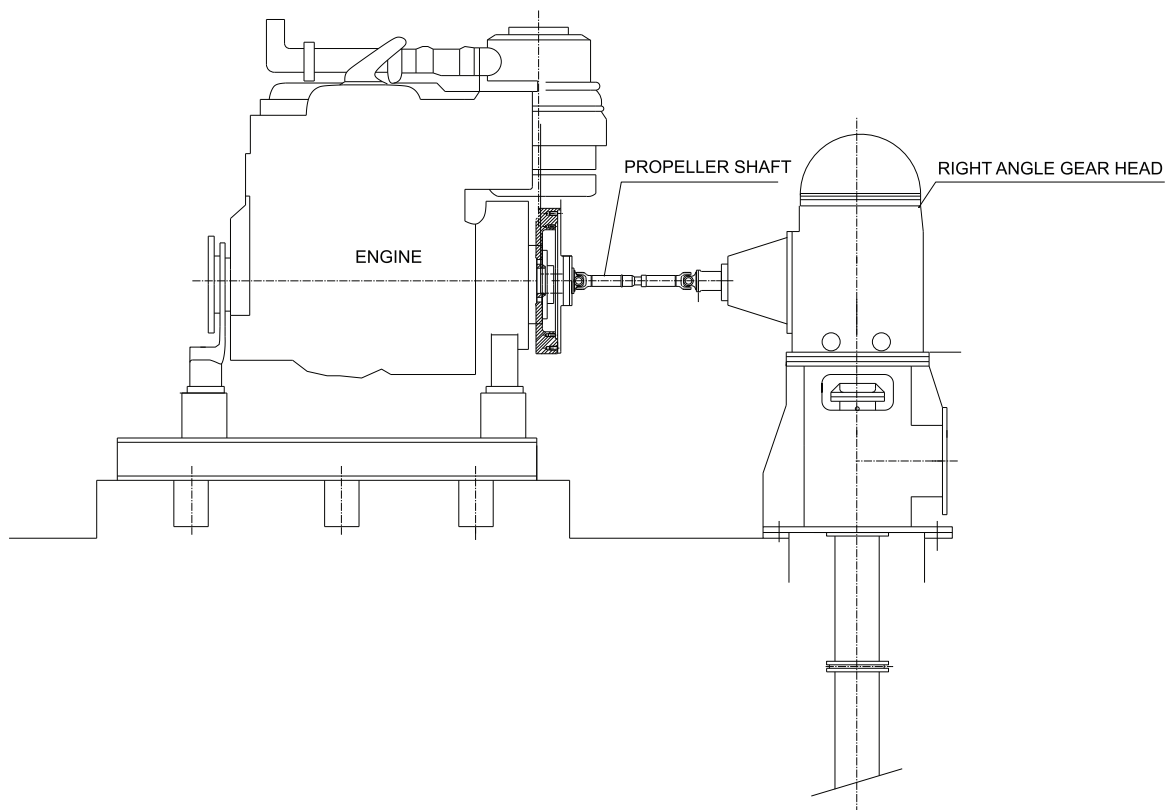
(Hollow Shaft)



(Solid Shaft)



(Engine Driven Pump)





# REFERENCES

## Government / Semi Government

- U.P. JAL NIGAM – (Meerut, Ghaziabad, Jhansi, Mahoba, Kanpur, Bareilly, Lucknow, Agra, Gorakhpur, Allahabad, Varanasi, Banda).
- Bhakra Beas Management Board
- Uttaranchal Pey Jal Nigam – (Haridwar, Kotdwar, Haldwani, Almora)
- MES – (Agra, Delhi, Ambala, Pathankot, Jammu, Meerut, Sri Nagar, Mathura, Bathinda, Kanpur, Bareilly, Shahjanpur, Udham Singh Nagar)
- Ordnance Factory – (Muradnagar, Hazratpur, Shahjahanpur, Bhandara)
- U.P. Irrigation Dept.
- Hindustan Aeronautics Ltd.
- Plantation Corporation of India.
- Bharat Electronics Ltd.
- Punjab Water Supply & Sewage Board.

## Public / Private Companies

- Modi Xerox Ltd.
- DSM Sugar, Daurala Sugar Works.
- Modi Xerox Ltd.
- Lords Distillery.
- ITC Ltd.
- Bajaj Hindustan Ltd.
- Venus Sugar Ltd.
- Venus Cement Ltd.
- Ajudhia Distillery Shah Wallace Distillery.
- Jindal Polyester Ltd.
- Mansarovar Bottling Co. Ltd. (Coke).
- Mawana sugar Works.
- Mansurpur Sugar Mills.



- Uttar Pradesh State Electricity Board.
- NTPC.
- Haryana State Minor Irrigation Tubewell Corp.
- Controller Of Stores – Haryana, Punjab.
- Thermal Power Station – Faridabad  
Jal Sansthan – (Agra, Jhansi).
- Jind Co-op Sugar Mills.
- Railways.
- Western Coalfields Ltd.
- Municipal Corporation Shahdol (M.P.).
- Minor Corporation, Patna (Bihar).
- Public Health Division – (Quilon, Mavelikara, Kottayam, Shahdol, Trivandrum)

- Titawi Sugar Complex.
- Modi Sugar Mills.
- Modi Rubber Ltd.
- Modi Vanaspati Co. Ltd.
- Upper Ganges Sugar & Industries Ltd.
- Seohara
- Oudh Sugar Mills Ltd.
- K.M. Sugar Works Ltd.
- Shamli Distillery & Chemical Works.
- Daurala Organics Ltd.
- Star Paper Mills Ltd.
- Synthetic & Chemical Ltd.
- Bharat Starch & Chemical Ltd.
- Rauzagaon Sugar.
- Dhampur Sugar Mills Ltd.
- Bazpur Distillery
- Simbhaoli Sugar Mills Ltd.



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