

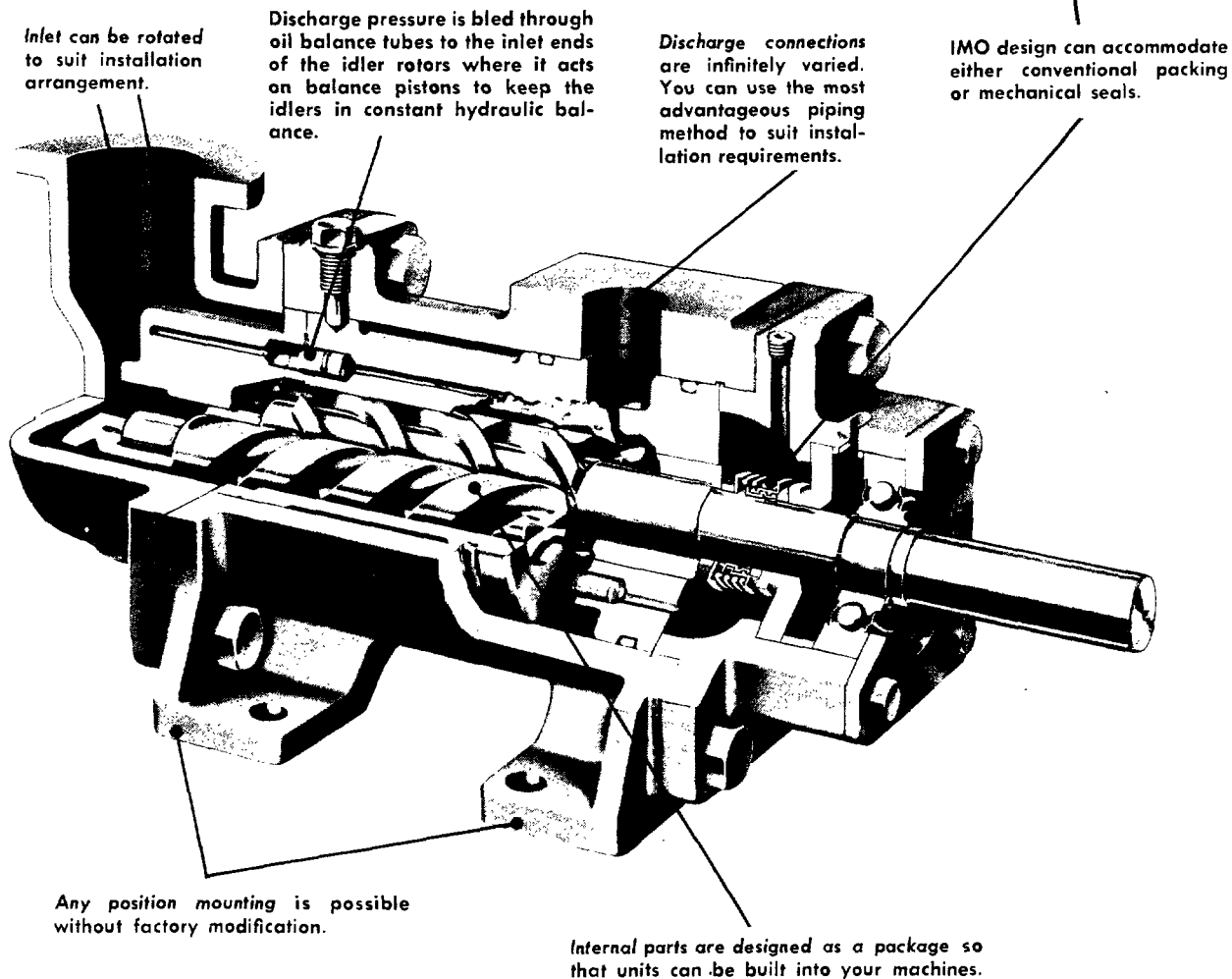
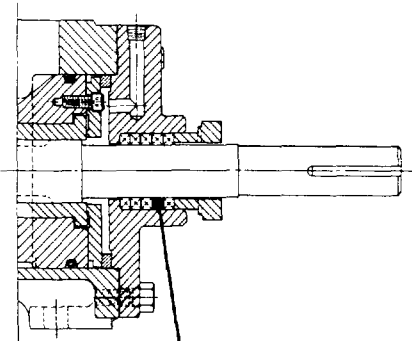
DE LAVAL PUMP

SERIES A3D
ROTOR SIZES
218 AND UP

PLAINTIFF'S EXHIBIT

IMO-143

The De Laval IMO is a constant-displacement, rotary, screw type pump. Fluid is propelled axially in a constant, uniform flow through the action of just three moving parts—a power rotor and two idler rotors. The smooth intermeshing of these rotors propel the fluid axially in a steady flow without churning, pocketing or pulsation. There are no timing gears, cams, valves, sliding vanes, or reciprocating parts to wear or become noisy. Quiet, compact IMO pumps are excellent for direct-connected, high-speed operation.



DE LAVAL
TURBINE INC.

POWER AUXILIARIES DIVISION

TRENTON, NEW JERSEY 08602 ■ TELEPHONE: 809-587-5000

CABLE ADDRESS: TURBINCO - TRENTON

STANDARD SPECIFICATIONS

Heavy duty casing

Casing is high tensile, close grained cast iron, every case is hydrostatically tested.

Inlet opening—adjustable position

125 lb. ASA flange opening may be rotated to suit piping arrangement.

Outlet opening—designed for flexibility

Pump is complete with an adaptor to which the purchaser may weld his discharge pipe or any desired flange configuration or outlet fitting. The adaptor should, of course, be removed from the pump case before welding.

Accurately manufactured rotor housings

Rotor housing or sleeve is cast iron. Special fixtures are used during manufacture to insure concentricity of rotor bores with respect to the casing and also insure interchangeability.

Rotors

Power rotor is heat treated chromium-molybdenum steel; nitrided and ground during manufacture.

Idler rotors are cast iron, induction hardened and ground.

Complete hydraulic balance

All pumps are provided with complete hydraulic balance features for normal pressure ranges of service. Unusual service conditions, such as high suction pressures, can be met with minor factory alterations.

All position mounting

Pumps may be mounted in any position—horizontally, vertically or inclined—without special modifications.

Bedplate

Sturdy steel channel construction utilized.

Coupling

Selections are conservatively made in accordance with coupling manufacturer's published horsepower ratings.

TWO SEALING METHODS AVAILABLE

A3DB model

Equipped with mechanical seal. Also ball bearing for overhung loads.

Mechanical seal

A bellows type shaft seal has been adopted after extensive testing to prove its adaptability. The bellows member is Buna N synthetic rubber. The carbon and cast iron mating faces are lapped to insure perfect sealing and long trouble-free service.

Ball bearing

The cartridge type, pre-packed dust resistant

ball bearing is designed to take any normal overhung load from V-belt or chain drive.

A3DF model

Equipped with conventional packing box.

Shaft packing

Conventional shaft packing consists of alternate rows of die-formed hard and soft packing rings. Soft rings are square plaited asbestos, hard rings are square flexible metallic.

Packing Box Pressure Control

The mechanical seal or shaft packing is subject to low fluid pressure through a pressure breakdown labyrinth from pump discharge.

The fluid is relieved from the seal chamber through an internal relief line connected to the suction chamber of the unit.

The fluid is relieved from the packing chamber through an external line containing a valve which sets the packing chamber pressure to lubricate the packing and prevent air from being drawn in around the shaft on suction lift applications.

DE LAVAL PUMP

TYPES A3DB & A3DH

(106 - 400 ROTOR SIZES)

INSTRUCTIONS AND PARTS LIST

INSTALLATION

MOUNTING - The pump can be mounted in any position. It can be driven by either direct drive or belt drive. To change the position of the inlet head, remove bolts (004), turn head in increments of 90° until desired suction position is obtained, then tighten bolts holding head to case. Be sure that the gasket is not crimped during rotation of the inlet head.

ALIGNMENT - Initial alignment established when pump and driver are factory mounted must be maintained. Place bedplate on smooth, rigid foundation. Disconnect coupling, then level unit on foundation using shims or blocks near foundation bolts to avoid springing unit when bolts are tightened. Coupling alignment should be within .003" - .005" FIR. When correct alignment is established, grout bedplate to foundation. Leveling shims or blocks may be grouted in place. Coupling alignment should be rechecked as piping is installed. As a final check, see that pump shaft turns freely by hand.

PIPING - Piping should start at and run away from pump with allowances made for contraction and expansion strains caused by temperature changes. Support piping independently of pump.

Make suction pipe short and direct. Use pipe at least one size larger than suction opening of pump. Do not force connecting unions or flanges in place. Avoid piping pockets or loops. All joints must be air tight.

Whenever possible, have liquid flow to pump. When liquid does not flow to inlet, install a foot valve in suction line as far from the pump as possible.

SUCTION STRAINER - Protect pump by installing a suction strainer. Net area of strainer should be at least three to four times net area of suction line.

RELIEF VALVE - Discharge line is to be provided with a relief valve set 5 to 10 percent above maximum working pressure.

If a discharge strainer is installed, its net area should be at least 2-1/2 times the net area of the discharge line.

PRIMING AND VENT CONNECTIONS - Always provide a priming connection on the suction side and a vent for purging on the discharge side of the pump.

RETURN LINES - Always submerge relief valve discharge and other return lines in tank or reservoir. This avoids foaming liquid or picking-up air. If relief lines can not be returned to tank, connect them to pump suction line as far from pump inlet as possible. Locate tank returns as far away from tank suction pipe opening as possible. Provide sufficient reservoir on suction side of pump to avoid overheating the liquid in closed systems.

MAINTENANCE

GENERAL - It is generally convenient to remove the smaller pumps (rotor size 106 to 187) from their baseplates for bench disassembly. Close off suction and discharge lines to pump. Disconnect piping and uncouple pump from its driver. Drain pump case to keep spillage to a minimum during disassembly. Rotor sizes 106 to 187 may be drained by tipping the pump over on its side so the fluid can drain out of both inlet and outlet openings. Rotate power rotor shaft a few times to remove fluid trapped in rotors. Rotor sizes 218 to 400 may be drained by removing pipe plug located in base of inlet head and allowing fluid to flow out. Rotate power rotor shaft by hand in a counter-clockwise direction to allow fluid trapped in rotors and discharge end of pump to be drained off. Replace pipe plug.

The DB series pumps are equipped with a Type 21, John Crane, rubber (Buna N) bellows, mechanical seal, Buna N "O" rings, and Type SZZ, MRC ball bearing. The DH series pumps are equipped with a Type 9, John Crane Teflon mechanical seal, Viton "O" rings, and Type SZZ-S10, MRC high temperature ball bearing.

DISASSEMBLY OF PUMP

Step 1 - Remove cap screws or bolts (004) and pull off inlet head (002). Remove gasket (009) and pull out thrust cage (029). Note: Oil balance tube (026) with "O" rings (027) may or may not come out with the thrust cage when the cage is pulled out. If balance tube is still in the rotor housing (024), pull it out of the housing and set it aside.

Step 2 - Remove both idler balance piston housings (023). Grasp end of each idler rotor (021) and pull it towards you. Each will unscrew itself from the rotor housing.

Step 3 - From discharge end of pump, remove bolts (047). Grasp coupling hub and pull power rotor assembly out of pump case. Set assembly aside and go on to Step 5, unless it is necessary to service either the mechanical seal (025) or the ball bearing (049), then, proceed with Step 4.

Step 4 - Remove coupling hub, coupling key (031), bearing retainer (043), and outer retaining ring (042) from power rotor shaft. Remove ball bearing (049) by pressing it off the shaft. If a press is not available, a gear or wheel puller with grips small enough to fit into the slots of the bearing spacer (048) should be used. Avoid gripping outer rim of stationary seal member, the rim forms a sealing area in the discharge chamber, and marring it can destroy its sealing effectiveness. Remove bearing spacer (048), inner retaining ring (042), and stationary seal member of mechanical seal (025). Remove rotating seal member and sleeve (038) (furnished only on rotor sizes 218 to 400). Note: Set screws on rotating member of Type 9 seal must be loosened to remove the member from the shaft.

Step 5 - Remove cap screws or bolts (004) and pull off inboard end cover (046). Insert fingers or hand into bore of balance piston housing (022) and pull housing with "O" ring (028) out of the pump case. Note: Oil balance tube (026) with "O" rings (027) may not come out with the housing. If it did not, reach into the pump case and pull balance tube out of rotor housing (024).

Step 6 - It is generally not necessary to remove rotor housing (024) from the pump case; however, if it is necessary to do so, proceed in the following manner. Remove rotor housing stop pin (006) and Dyna-Seal (007). Reach into pump case from discharge end and push rotor housing out of pump case through the suction end. This completes disassembly of the pump.

REASSEMBLY OF PUMP

Inspect and clean all parts before starting reassembly. New gaskets (.015" plant fibre, cut to suit) and new "O" rings should be installed whenever the pump is rebuilt. SAE-30 oil or equal should be used to assist pump reassembly. DO NOT USE GREASE.

Step 1 - Put "O" ring (028) in its groove on rotor housing (024). Apply a light coat of oil to bore in pump case (001) and to rotor housing. Insert rotor housing into pump case from suction end of pump making sure housing is positioned as indicated on assembly drawing. Align housing so that rotor housing stop pin (006) will seat properly. Install Dyna-seal (007) with rotor housing stop pin (006).

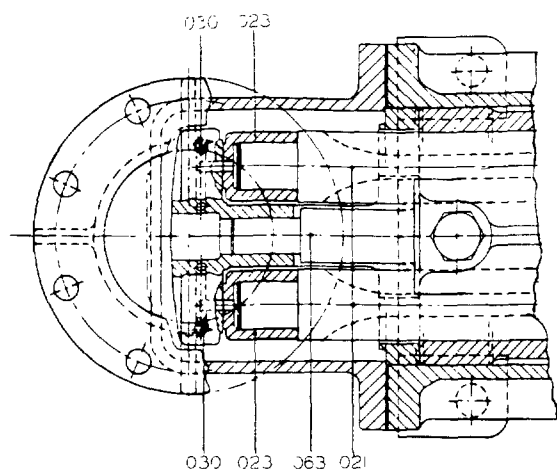
Step 2 - Put "O" rings (027) on balance piston tube (026) and apply a light coat of oil to tube. Put "O" ring (028) on balance piston housing (022) and apply a light coat of oil to housing. Insert oil balance tube (026) into balance piston housing and insert housing into pump case as shown on assembly drawing. Be sure balance piston tube is lined up with its mating bore in rotor housing (024).

Step 3 - Place gasket (009) on inboard end cover (046) and bolt end cover to pump case as shown on assembly drawing. Secure with cap screws or bolts (004). Proceed with Step 5 if seal or bearing did not require servicing.

Step 4 - Before installing a new seal, inspect the power rotor shaft for burrs - giving particular attention to the retaining ring groove areas - and remove, if present.

The seal is a precision product equipped with lapped sealing faces. Care should be taken not to scratch or mar the lapped faces during installation.

To install a Type 9 seal, coat power rotor shaft with oil from balance piston (020) to coupling end. Install sleeve (038) (furnished only on rotor sizes 218 to 400). Coat I. D. of rotating seal member with oil and install on shaft. Note that retaining clips are present on this part of the seal. After the rotating member has been installed on the shaft, remove the clips to set the seal. Install stationary seal member, bearing spacer (048), and inner retaining ring (042). Press ball bearing (049) into position and install outer retaining ring (042).



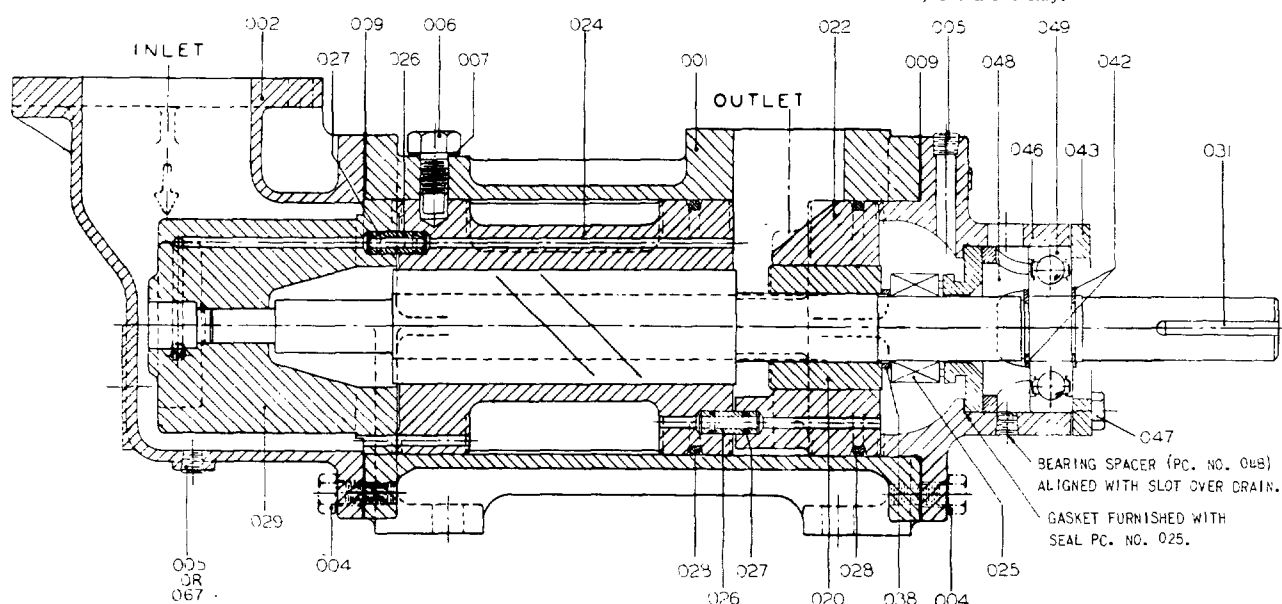
PARTS LIST

IDP No.	DESCRIPTION	IDP No.	DESCRIPTION
001	Pump Case	026	Oil Balance Tube
002	Inlet Head	027	"O" Ring
004	Cap Screws (106 to 187)	028	"O" Ring
005	Hex Head Bolts (218 to 400)	029	Thrust Cage
006	Soc. Head Pipe Plug	030	Plug
006	Rotor Housing Stop Pin	031 *	Coupling Key
007	Dyna-Seal	038 °	Sleeve
009	Gasket	042	Retaining Ring
020 *	Balance Piston	043	Bearing Retainer
021	Idler Rotor	046	End Cover, Inboard
022	Balance Piston Housing	047	Hex Bolt
023	Idler Balance Piston Housing	048	Bearing Spacer
024	Rotor Housing	049	Ball Bearing
025	Mechanical Seal	063 *	Power Rotor
		067 *	Soc. Hd. Pipe Plug

* Parts not serviced separately - make up the power rotor sub-assembly.

° Furnished on rotor sizes 218 to 400 only.

* 067 Furnished on rotor sizes 218, 250 & 275 only.



SECTIONAL ASSEMBLY

To install a Type 21 mechanical seal, obtain a piece of light weight flexible shim stock and wrap it around the power rotor shaft so that it covers both retaining ring grooves and extends approximately 1/4" beyond shoulder on shaft ext to inner retaining ring groove. Coat shaft shim stock and I. D. of rotating seal member with oil. Install sleeve (038) (furnished only on rotor sizes 218 to 400). Install rotating seal member. Note: As the rotating member passes over the shim stock, twist it in the same direction as the direction of wrap of the shim stock. Remove shim stock from shaft. Install stationary seal member, bearing spacer (048) and inner retaining ring (042). Press ball bearing (049) into place and install outer retaining ring (042).

Inspect the seal to be sure that it is properly seated. The drive lugs on the rear of the retainer should be fully engaged in their mating grooves on the drive ring. The lip on the rear of rubber bellows should extend equally upward around the driving band for the seal to be seated properly.

Step 5 - Insert gasket furnished with new mechanical seal into inboard end cover (046) as shown on assembly drawing. Insert power rotor assembly into pump case from discharge end. Put bearing retainer (043) into place and fasten to end cover with bolts (047).

Step 6 - From suction end of pump, coat idler rotors (021) with oil and insert into rotor housing (024). Place idler balance piston housings (023) on protruding ends of idler rotors. Put "O" rings (027) on oil balance tube (026) and coat tube with oil. Insert tube into its bore in thrust cage (029), and insert thrust cage into pump case. Be sure oil balance tube (026) goes into its mating bore in rotor housing.

Step 7 - Install gasket (009) and inlet head (002) to pump case with cap screws or bolts (004). This completes reassembly of the pump. Reinstall the pump as described in "Installation" procedures.

OPERATION

STARTING UP - If possible, test system with liquid pressure on lines before starting pump for the first time. Flush all lines, especially the suction line, free from dirt, weld beads, thread turnings, pipe scale, etc., before starting pump. Such trash will damage the pump and any regulating or control equipment installed in the system. Make sure the driver is rotating in the direction shown by arrow on inboard end cover.

Prime pump before start up. Pump priming should include filling the pump case, plus as much of the suction line as possible with liquid. Plug, Part (005), discharge end should be removed and this space filled with oil to lubricate the sealing faces of the mechanical seal. Replace plug.

Vent discharge side of pump before start up. New systems are filled with air. If this trapped air is not removed, unit may fail to pump, or operation may be erratic and noisy. Venting is essential when the suction line is long or the pump discharges against a system pressure when starting.

Open suction and discharge valves, start driver (see driver instructions for details).

LOSS OF SUCTION - If the pump does not discharge after being started, shut it down at once. Prime the pump and start it again. If pump does not pick-up liquid right away, look for a leak in the suction piping. Sometimes this trouble can be traced to excessive suction lift caused by an obstruction, throttled or closed valve, clogged or leaking strainers, or other causes. Connecting a gage at several points along the suction line while the pump is operating will help spot the trouble.

SHUTTING DOWN - Stop driver, close the suction and discharge valves. This is especially important if the pump is to be shut down for a long time. Leakage through the foot valve (if the main supply is below pump level) could drain the oil from the pump and require repriming as though you were starting up initially.

ROUTINE CARE - If installation precautions are observed carefully, the pump should operate satisfactorily with little attention other than periodic check on capacity, suction and discharge pressures.

NOISY OPERATION - Should the pump develop noise after satisfactory operation, look for excessive suction lift due to cold or dirty liquid, gas or air in liquid, coupling misalignment, or excessive wear of rotors and housings in the instance of an old pump.

REPAIR AND REPLACEMENT ORDERS

Best service is obtained when the following instructions are observed carefully:

Give serial number of the pump for which parts are desired. Serial number is on nameplate.

Specify plainly the part names and numbers and the quantity desired.

Refer to Publication number A3D-6.

Give complete shipping directions.

When returning parts to the factory, tag each part with all information necessary for complete identification. Do not return parts without prior approval.

DE LAVAL TURBINE INC.

TRENTON, NEW JERSEY 08602, U. S. A.

DE LAVAL TURBINE INC.

TRENTON, NEW JERSEY 08602 ■ TELEPHONE: 609-587-5000
CABLE ADDRESS TURBINCO - TRENTON

QUOTATION NO. 29DA-43-HW

Please address reply to:
Gifford-Hill Building, Suite 400
2949 Stemmons Freeway
Dallas, Texas 75247
Phone: 214-637-4130

February 23, 1968

Peerless Boiler and Engineering
2015 E. Park Place
Oklahoma City, Oklahoma

Attention: Mr. Malcolm Murphy

Subject: Boiler Feed Pump

Dear Mr. Murphy:

I am pleased to offer De Laval's quote on a boiler feed pump to meet the following specifications:

Pump Model	De Laval IMO Pump ABDB-106 ^{6 118}
Maximum Suction Lift Available	20" HG
Discharge Pressure	150 PSI
Viscosity Minimum	35 SSU
Pump RPM	3500
HP Required	2.1 ^{1 1/2 HP} _{7.3 GPM}
Capacity	12 GPM _{9.3 GPM}

The weight of the pump is 45#. Shipment can be made in four (4) weeks from receipt of order.

Also included is: One (1) 3 HP, 208 volt, 3 phase, 60 cycle electric motor, frame size 182T, explosion proof; One (1) Lovejoy coupling L-090; One (1) bedplate. Price includes mounting of above components on bedplate.

Your price for the above package, F.O.B. Trenton, New Jersey is \$342.00. Terms are net 30 days.

If customer desires a coupling guard installed, there would be an addition of \$24.00.

40-108

DE LAVAL TURBINE INC. (hereinafter referred to as "De Laval") proposes to furnish the Purchaser the apparatus, machinery, or materials (hereinafter termed "Machinery"), subject to the following conditions:

1. DELIVERY: Unless otherwise specified, De Laval will furnish the machinery f.o.b. cars, its factory. Delivery to the transporting carrier shall constitute delivery to the Purchaser and shall constitute transfer of title to the Purchaser, except as limited in paragraph 2, below.

If shipment or any other act or condition affecting payment for machinery shall be delayed on account of Purchaser, payment shall become due when Purchaser is notified that the machinery is ready for shipment, and machinery shall thereafter be held at Purchaser's risk and expense.

If partial shipments are made at the instance of the Purchaser, proportionate payments shall become due and payable on the partial shipments.

The specified shipment, or erection if specified, is subject to any delay on the part of the Purchaser in supplying De Laval with necessary data, or approved drawings as may be required, or any changes therein at the Purchaser's instance, and to delays caused by fires, floods, strikes, accidents, civil or military authority, delay by suppliers of material and any other cause beyond De Laval's reasonable control. If changes in specifications are made at the instance of the Purchaser, shipment will be extended a reasonable time, according to such delay, and De Laval shall be compensated for extra costs and expense.

2. TITLE: Without relieving the Purchaser from obligation to make payment as provided for and without reference to the form of invoice that may be used by De Laval, it is agreed that the title to the machinery furnished shall remain in De Laval for security purposes only until the purchase price (including any extensions of payment whether evidenced by note or otherwise) shall have been fully paid in cash, and the machinery shall remain the personal property of De Laval, whatever may be the mode of its attachment to realty or other property, until fully paid for in cash; and the Purchaser agrees to perform all acts which may be necessary to perfect and assure retention of title in De Laval. In case of failure by the Purchaser to make any payment when due, it is expressly understood that it shall be optional with De Laval to take exclusive possession of the machinery wherever found and remove same without legal process, and that any payments which may have been made on account of same shall be retained by De Laval as liquidated damages, without prejudice to its right of recovery of further damage it may suffer from any cause.

3. WARRANTY: De Laval warrants the machinery, so far as of its own manufacture, to be free from defects of material and workmanship, and should any part of it be found, under specified service conditions within one year after date of notification of completion at De Laval's plant or shipment, whichever is the earlier, to have been defective, De Laval will repair or replace said part f.o.b. its factory, provided the original part is returned to its factory transportation prepaid and De Laval's inspection may establish the claim. De Laval shall in no event be held liable for damage or delay caused by defective material or workmanship, and no allowance will be made for repairs or alterations unless made with its written approval. Equipment and accessories not of our manufacture, are warranted only to the extent of the warranty of the original manufacturer. De Laval shall not be liable for damage of any kind resulting from erosive or corrosive action of any gases or liquids handled by the machinery.

De Laval assumes no responsibility for damages due to deterioration during periods of storage by the Purchaser prior to installation and operation. If provided for in the proposal or for an extra charge, De Laval will, if notified prior to shipment that the machinery is to be stored, apply preservatives to minimize the deterioration.

4. INSURANCE: Fire and extended coverage insurance in an amount sufficient to protect De Laval's interest in the machinery is to be taken out from and maintained with an insurer satisfactory to De Laval by and at the cost of the Purchaser from the time of receipt until the machinery may have been fully paid for in cash. The Purchaser shall assume all losses resulting from any cause that may not be covered by insurance.

5. TAXES: The Purchaser shall pay to De Laval in addition to the purchase price, the amount of any excise, sales, privilege, use, or any other tax, local, state, or federal, which is payable by De Laval because of the occurrence of an order or sale or delivery of the machinery covered hereby.

6. INSTALLATION: The machinery shall be installed by and at the expense of the Purchaser unless otherwise expressly stipulated. Upon request, De Laval will provide a competent superintendent to supervise the setting up and/or starting of the machinery. The Purchaser shall pay De Laval for the service of said superintendent at the rate stipulated plus traveling and all proper expenses of said man. The superintendent shall be considered an employee of De Laval, but De Laval shall not be liable for injury to persons or damage to property occurring in the course, or as a result of the superintendent's presence upon the premises of the Purchaser.

De Laval accepts no responsibility for material and equipment or for the acts of men furnished by the Purchaser, nor has it any responsibility for the performance of machinery not set up or started under the supervision of its superintendent unless deficient performance is caused by defects of design, material or workmanship.

7. SPECIFICATIONS: Any specifications hereto attached are a standard form covering machinery of De Laval of substantially identical type and character and there may be immaterial variations therefrom in the details of design and construction of any particular machine. De Laval reserves the right to make such changes in details of design, construction, arrangement or equipment of the machinery to be furnished as shall, in its judgment, constitute an improvement over such former practice as may be shown or described in the specifications. De Laval does not supply detailed or shop working drawings of its machinery.

8. PATENTS: De Laval shall indemnify the Purchaser for any liability the Purchaser may incur because of claims of infringement of United States apparatus patents by machinery or parts manufactured by De Laval. The Purchaser shall indemnify De Laval for any liability De Laval may incur because of claims of infringement of United States process patents in the use of the machinery and parts furnished hereunder.

9. CANCELLATION: Should the order resulting from this quotation be terminated for any just cause, the Purchaser shall pay De Laval for all costs and expenses incurred and commitments made in connection with the performance of the order, plus a reasonable profit thereon.

10. EMERGENCIES: For contracts or orders with a price of \$200,000 or more and/or for development contracts of a special nature, where De Laval's performance or completion of such contracts or orders is delayed or suspended directly or indirectly as the result of war, national emergency, federal or state statute or government rules or regulations, priority controls, defense efforts, or any like cause (as distinguished from the normal delays in manufacturing caused by factors beyond the control of the manufacturer, such as strikes, fires, traffic embargoes, etc.), the purchase price and the shipping schedule contained in such contract or order shall be renegotiated upon the termination of the cause for delay or suspension of performance consistent with prices and shipments offered by De Laval for the product covered by such contract or order at the time of the renegotiation. If an agreement cannot be reached as to the revised price and shipment terms, either De Laval or the Purchaser may terminate such contract or order by written notice and the Purchaser shall pay within thirty (30) days after the giving of such notice of termination all costs incurred by De Laval in connection with such contract or order and a reasonable profit.

11. LIMITS OF LIABILITY: In no circumstances shall De Laval be liable for special or consequential damages. The complete liability of De Laval, whether express or implied is limited to that stated in these conditions of sale.

12. ATOMIC ENERGY USE: The Purchaser represents that the equipment being supplied hereunder is to be used for a purpose other than in, or in any way related to, the creation, handling, or use of atomic energy or any activity associated therewith; and De Laval shall not be responsible to the Purchaser or any third party should the equipment be used otherwise than as represented, in which event the Purchaser shall indemnify and hold De Laval free and harmless of any and all costs and damages.

13. GENERAL: The provisions hereof supersede and entirely replace any other conditions of sale, and are binding and enforceable in writing and signed by a duly authorized officer of De Laval.

**DE LAVAL
TURBINE INC.**

TRENTON, NEW JERSEY 08602 ■ TELEPHONE 609-587-5000
CABLE ADDRESS: TURBINCO - TRENTON

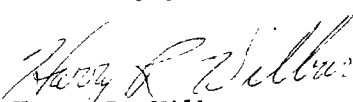
QUOTATION NO. 29DA-43-HW

Please address reply to:
Gifford-Hill Building, Suite 400
2949 Stemmons Freeway
Dallas, Texas 75247
Phone: 214-637-4130

Peerless Boiler and Engineering
Attention: Mr. Malcolm Murphy
February 23, 1968
Page 2

Thank you for the opportunity to quote on this requirement. I am enclosing descriptive literature on the De Laval IMO pump. Please call on us if you need additional information.

Sincerely yours,


Harry R. Wilbur
Sales Engineer

HRW:dh
Enclosure

the fact that the β phase is not stable at room temperature, the β phase is not observed in the DSC thermogram. The β phase is observed in the DSC thermogram only when the sample is cooled from the melt at a rate of 10 K/min or faster. The β phase is observed in the DSC thermogram only when the sample is cooled from the melt at a rate of 10 K/min or faster.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 200 million to 400 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.