



INSTALLATION, OPERATION & MAINTENANCE INSTRUCTION

CUSTOMER: ENGINEERED SYSTEMS

CUSTOMER P.O. ES-14795

PUMP SERIAL NUMBER: 0802APN01338-1

PUMP SIZE: 20AFV-H VERTICAL PUMP

FOR PARTS AND SERVICE CONTACT:

FLOWSERVE
4050 AIR PARK DRIVE
ORLAND, CA 95963
PHONE # 530-865-0516
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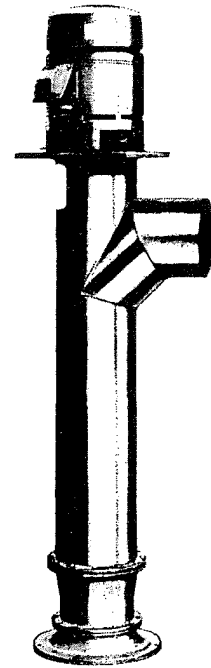
TYPE "D" VERTICAL PROPELLER PUMPS

III. DESCRIPTION

The Byron Jackson Type "D" Vertical Propeller Pump is a self-contained high capacity pump used to lift water from sumps, canals or reservoirs. It is designed to be supported over the water on a wood, steel or concrete structure.

The pump is composed of three major subassemblies:

1. The pumping element commonly called the bowl assembly.
2. The discharge assembly, including the column and discharge elbow.
3. The driving unit, which may be either an electric motor or right angle gear.



IV. INSTALLATION

Where the length of the unit permits, the unit will be shipped from the factory fully assembled. The driver may be installed, or shipped separately, again depending on the size.

Use a cable sling passed through the opening below the motor mounting flange and looped around the pump. Do not use lifting eyes attached to motors to raise the pump as they are designed to lift only the motor. In raising the pump to the vertical position, use care not to damage the suction bell by dragging it on the ground. Lower the pump into position and shim the base so that the pump hangs vertically. A machinist's level placed on the motor support flange will indicate the correct position.

Install lubricator and piping. Check the tightness of the tension nut (#479) to be sure it did not work loose in shipping. It tightens with a left hand (CCW) thread and should be as tight as one man can pull on an 18" pipe wrench with one hand.

See Section IX for mounting drivers. The motor half coupling on solid shaft drivers will usually be installed at the factory. Before connecting the shaft coupling to the pump momentarily energize the motor and check for proper rotation, which is counter-clockwise when viewed from above.

Fill the lubricator with a good grade of lubricating oil (SAE #10) and with the motor and solenoid energized, open the drip feed to allow perhaps a pint of oil to run into the bearings. This will lubricate the pump prior to startup. On the 16" and 20" pumps the bottom bearing below the impeller is grease-packed at the factory with a waterproof graphite grease. It does not require replacement except when bearings are replaced. The DH pumps, driven with a solid shaft driver, will have the three piece adjustable coupling. See Section VII for adjustment. Set impeller lift at .020 to .030 clearance. The type DL pump, driven with a solid shaft driver will have a two-piece coupling which requires no adjustment.

The pump is now ready to start. When the motor is energized, adjust the lubricator drip feed to approximately 15 drops per minute for the new pump, which should be continued approximately 24 hours. Then the oil may be reduced to 5 drops per minute.

V. DISMANTLING

The general construction of the pump is illustrated on the sectional drawing. Dismantling is not advised until one is familiar with the construction of his particular pump.

1. Detach oil tank, remove the coupling bolts, and remove motor. Remove the pump from the sump and lay it down on the floor supported on blocks.
2. Remove the adjusting plate (532) and the pump half coupling (530). On Type DL pumps, knock out the coupling pin with a punch. Slightly heat the coupling half and pry off. Disconnect oil line (684) and remove tension nut (479), packing ring (480) and gasket (744).
3. Disconnect the discharge elbow (465) and remove it. If the pump is fitted with one or more sections of column, the inner column should be carefully supported during disassembly to avoid strain due to its own weight.
4. Remove the upper section of inner column (405) unscrewing to the right (left hand threads). The upper column bearing (393) may be removed if replacement is required. Disconnect the upper column shaft (402) unscrewing it also to the right.
5. If the pump is fitted with additional lengths of column, they are removed in a similar manner until the pumping element is reached.

NOTE: For ten foot lengths of outer column, there is a plain bearing (396) between two five foot lengths of inner column.

6. To dismantle the pumping element, remove the shaft coupling (401), then remove the flange bolts and separate the stator case (83) from the suction bell (86). The pump shaft (167) with the impeller (176) may then be removed. The 8" and 12" DL have one piece cases so that the shaft and impeller are removed from the bottom.
7. To remove the impeller from the shaft, knock out the pin with a punch. Remove all burrs from the shaft and press the impellers off. A little heat from a torch may be required.
8. Inspect all bearings and shafts, replacing those that are worn. Remove wear ring (205) and bottom bearing only if replacement is necessary.

VI. ASSEMBLY

Reassembly of the parts is in the same manner as disassembly, but in reverse order. Make sure all parts are clean and in good repair. Replacement of gaskets is recommended. Care should be exercised to use the same material and thickness as originally furnished.

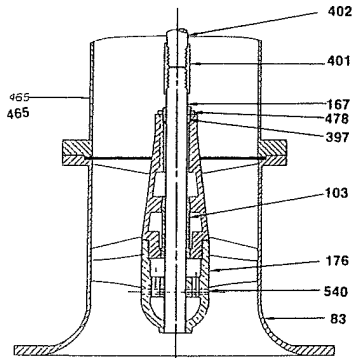
Lubricate the bottom bearing on the 16" and 20" pumps as follows. After the impeller is secured to the shaft, place a quantity of a good waterproof graphite grease in the bottom of the bearing housing. Push the shaft into the bearing until the grease appears being forced out. Remove the plug from the bottom of the bearing housing and force the shaft the remaining distance to the bottom to remove surplus grease. Replace the plug. Without removing the shaft from the bearing, install the stator case.

In connecting the lengths of column shaft, the shaft ends should meet in the center of the coupling. Tighten the joint using a pipe wrench on each shaft, held so the handles are together to avoid bending the shaft.

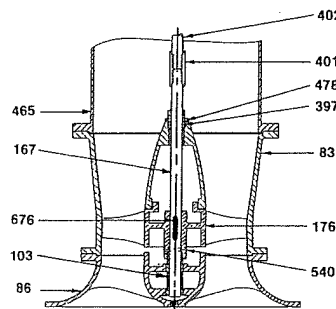
TYPE D VERTICAL PROPELLER PUMP

Sectional Drawings Type DL & DH Water Lube

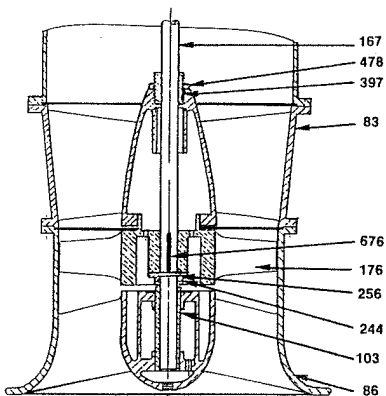
SEE NOTE (2)



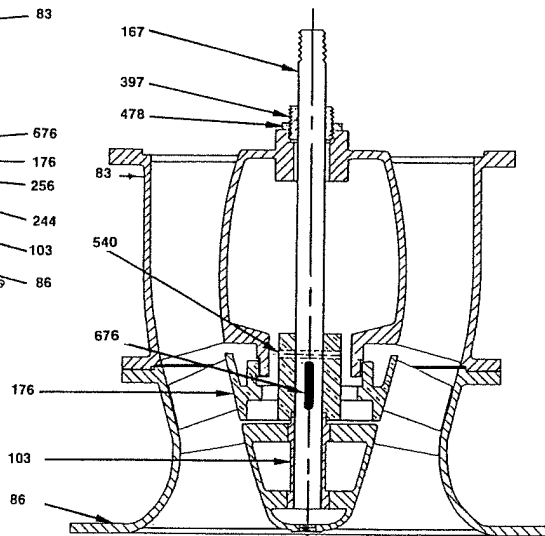
**8" — 12" DL
Water Lube**



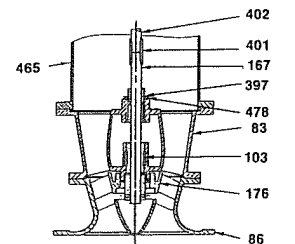
**16" — 20" DL (1)
Water Lube**



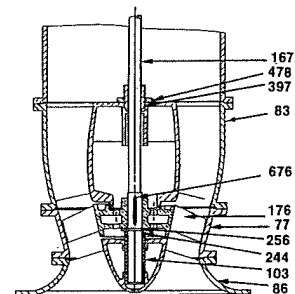
**24" DL
Water Lube**



**16" — 20" DH (1)
Water Lube**



**8" — 12" DH
Water Lube**



**24" DH
Water Lube**

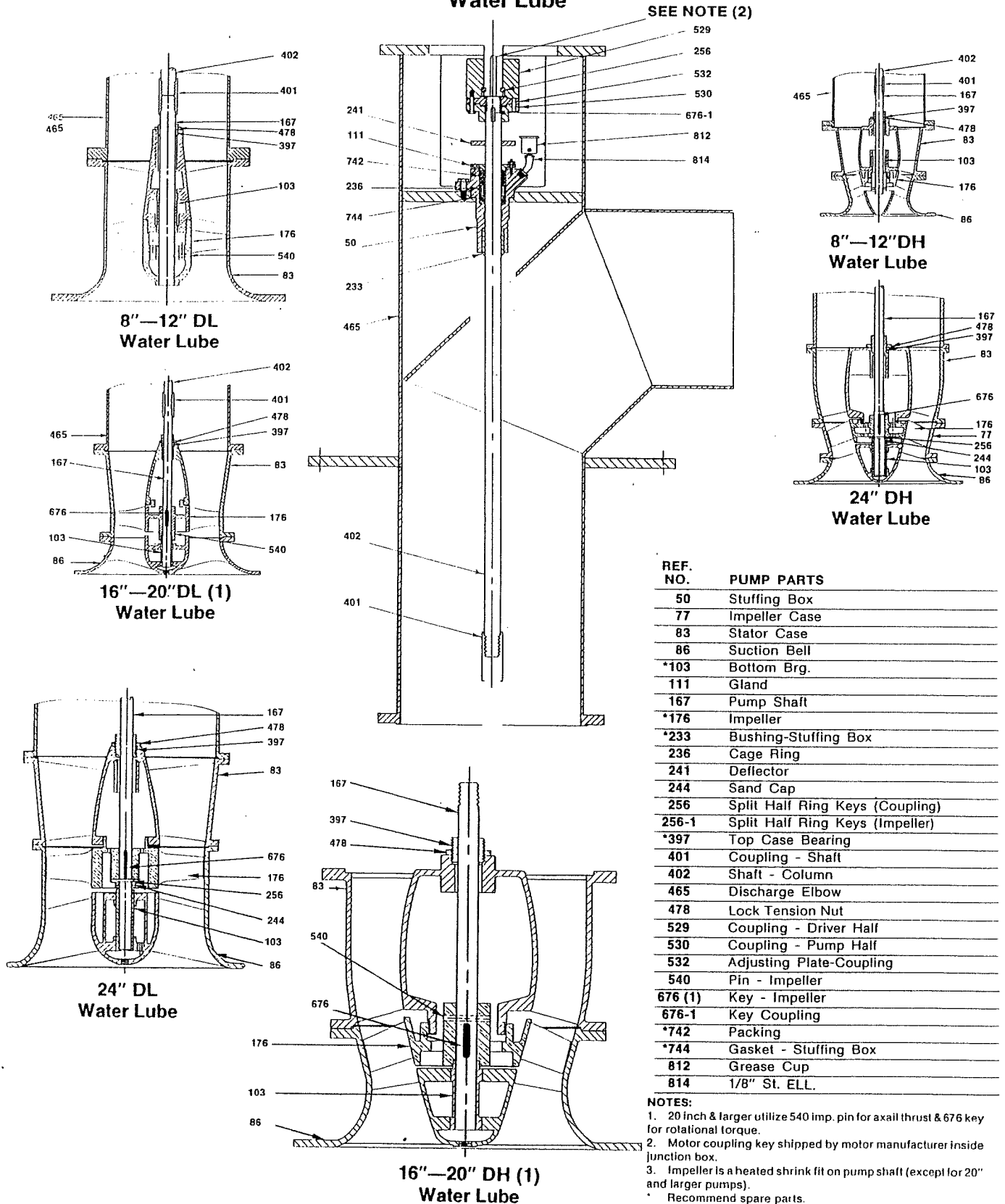
REF. NO.	PUMP PARTS
50	Stuffing Box
77	Impeller Case
83	Stator Case
86	Suction Bell
*103	Bottom Brg.
111	Gland
167	Pump Shaft
*176	Impeller
*233	Bushing-Stuffing Box
236	Cage Ring
241	Deflector
244	Sand Cap
256	Split Half Ring Keys (Coupling)
256-1	Split Half Ring Keys (Impeller)
*397	Top Case Bearing
401	Coupling - Shaft
402	Shaft - Column
465	Discharge Elbow
478	Lock Tension Nut
529	Coupling - Driver Half
530	Coupling - Pump Half
532	Adjusting Plate-Coupling
540	Pin - Impeller
676 (1)	Key - Impeller
676-1	Key Coupling
*742	Packing
*744	Gasket - Stuffing Box
812	Grease Cup
814	1/8" St. ELL.

NOTES:

- 20 inch & larger utilize 540 imp. pin for axial thrust & 676 key for rotational torque.
 - Motor coupling key shipped by motor manufacturer inside junction box.
 - Impeller is a heated shrink fit on pump shaft (except for 20" and larger pumps).
- * Recommend spare parts.
.. Optional construction available at extra cost.

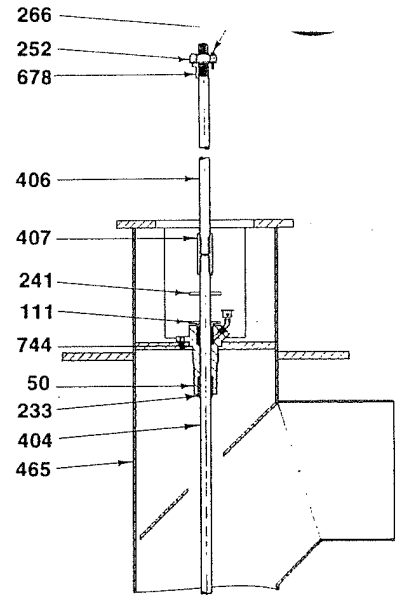
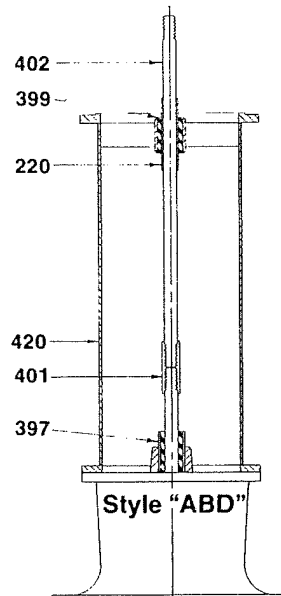
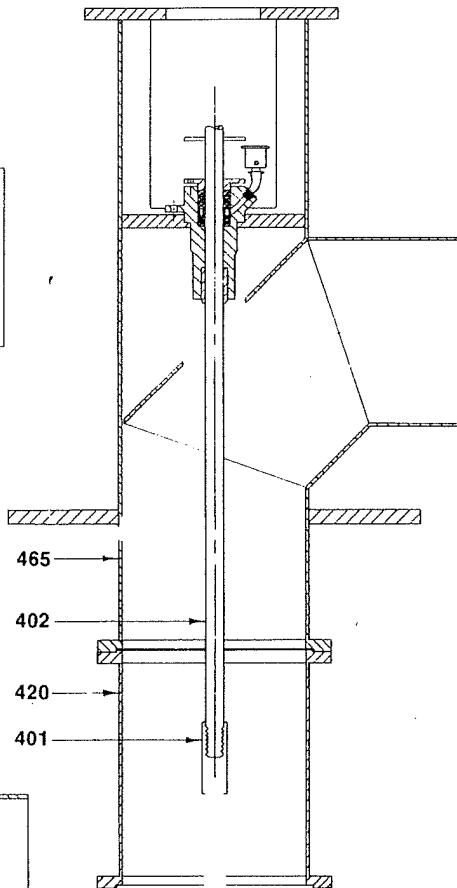
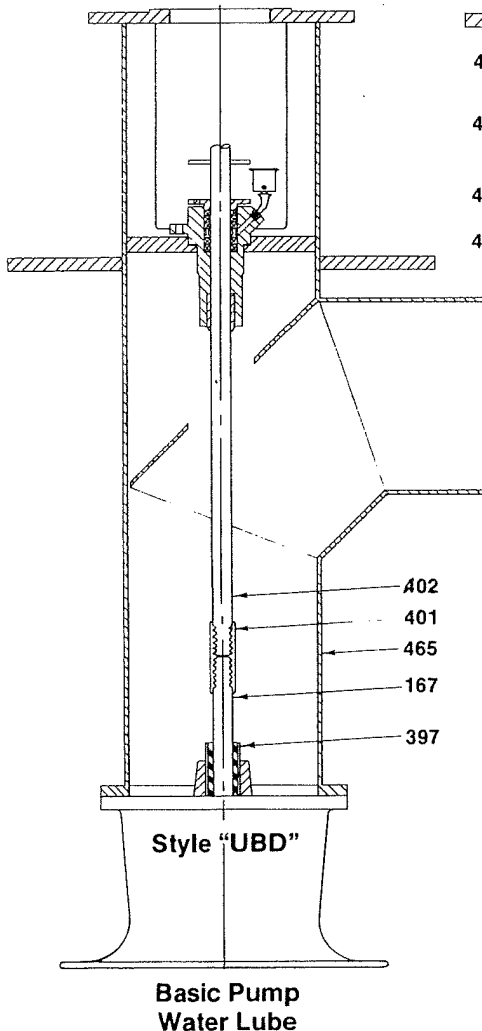
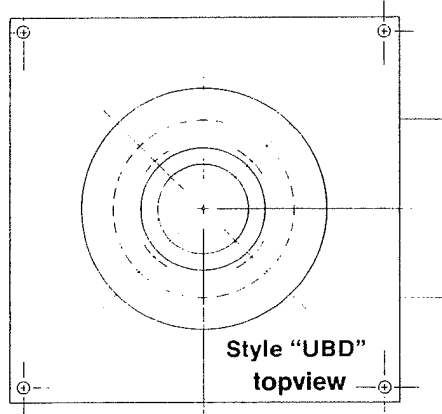
TYPE D VERTICAL PROPELLER PUMP

Sectional Drawings Type DL & DH Water Lube

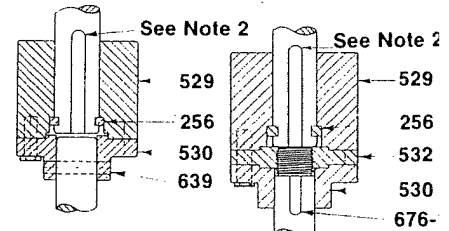


TYPE D VERTICAL PROPELLER PUMPS

Pump Sectional Drawings Type DL & DH Water Lube



Used With VHS Motors Water Lube



Two Piece Coupling DL Units Only

Three Piece Coupling DH Units Only

REF. NO.	PUMP PARTS
50	Stuffingbox
111	Gland
220	Sleeve-Shaft
*233	Bushing—Stuffing Box
241	Deflector
252	Nut-Head Shaft (VHS Motor)
256	Split Half Ring Keys - Coupling
266	Lock Screw-Head Shaft Nut (VHS Motor)
*399	Bearing - Shaft
401	Coupling - Shaft
402	Shaft - Column
404	Head Shaft (VHS Motor)
406 (4)	Motor Shaft (VHS Motor)
407 (4)	Coupling-Motor Shaft (VHS Motor)
420	Column - Outer
465	Discharge Elbow
529	Coupling - Drive Half
530	Coupling - Pump Half
532	Adjusting Plate-Coupling
676	Key - Coupling
678	Gib Key (VHS Motor)
*744	Gasket - Stuffing Box

NOTES: (4) Used with two piece head shaft only
*Recommended spare parts
(2) Motor Coupling key shipped by motor manufacturer inside junction box.

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FLOWSERVE PUMP DIVISION - HASTINGS
CUSTOMER BILL OF MATERIAL

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JOB:PN01338-000

Lev	Item	Description	Qty Per Pump	Material
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		***** BOM PROCESSOR: BASMITH DATE: 02/25/08 REVISION: A *****		
		***** IMPELLER TRIM ***** 1 (17 DEG) FULL DIA IMPELLER POLISHED *****		
		***** TEST AND INSPECTION ***** NO SPECIAL REQUIREMENT *****		
		***** FINAL ASSEMBLY INFORMATION ***** OUTLINE DRAWING #: GPN01338A BASE TO BELL LENGTH: 243.00 END FLOAT: .63 SHAFT STICK-UP ABOVE BOWL/COLUMN: 12.500 HEAD SHAFT TO MOTOR MTG FLANGE: 5.00 ASSEMBLE COMPLETE UNIT. *****		
		***** PAINT SPECIFICATIONS ***** SANDBLAST & COAT WITH 10-12MILS CARBOLINE 891-0794. - (1) BOWL - COAT OD - (2) 24" COLUMNS - COAT OD - (1) DISCH ELBOW - COAT OD ABOVE & BELOW BASE PLATE SANDBLAST & COAT WITH 8MIL MDFT TENEMEC 90-97 - (1) 48"OD FOUNDATION PLATE UNDERSIDE & SIDE EDGES *****		
		***** NAMEPLATE DATA ***** SIZE: 20AFV-H TYPE: AFV SERIAL NO.: 0802APN01338-1 HEAD: 15 FEET TDH GPM: 14000 RPM: 880 RAISE IMPELLER: .125 DOWN DRIVER DATA: EXSITING MOTOR MAKE: USEM FRAME SIZE: 447TP		