PUMP MOTOR AND PUMP (FIGURE 5-2)

The pump motor is a three-phase induction motor. The rotation speed of this type of motor depends upon the line frequency and is nearly 3440 RPM, for all loads. The inter-meshing screw type pump produces a smooth flow of oil, which is nearly constant for a fired pump speed, regardless of output pressure. The pump is protected from over pressure by a relief valve in the hydraulic valve assembly. The motor is protected for overheating by an overload heater relay which drops power to the motor starter contractors.

UNIT VALVE OPERATING SEQUENCE

The Unit Valve is a series of solenoid-controlled valve: pressure relief valve, manual lowering valve and two check valves combined in one assembly and utilized to direct the flow of oil to and from the car jack the solenoid-controlled valves functionally provide four valves, but physically consist for two piston (UP and DOWN) valves, with two solenoid-actuated hydraulic control circuits to each valve. When and up call is registered and the pump starts, the up solenoid (U) and the up stop solenoid (US), are simultaneously energized, the pump output flows temporarily through the up valve and back to the tank, before directing the flow to the jack, for a smooth start.

SELECTIVE-COLLECTIVE OPERATION

A. - CAR AT REST-SOLENOID COILS DE-ENERFIZED

The car at rests is held by a hydraulic fluid system locked is place by a check valve, down valve, solenoid pilot valve and a manual lowering valve.

B. - UP DIRECTION

When an up call is registered and the pump starts, the up solenoid (U) and the up stop solenoid (US) are simultaneously energized, closing ball checks 1 and 2, the pump output flows through the up valve and back to the reservoir.

Hydraulic fluid from the pump travels through the up control fluid strainer to the by-pass sizing adjustment, then to the control side of the up piston. The control side of the up pistons larger in area than the area of the up piston Exposed to the pressure; therefore, the up piston begins to move rapidly forward, retracting the opening in the up valve, raising the pump pressure. When the pump pressure reaches a point slightly below the pressure on the Ram side of the check, the fluid coming through the by-pass sizing Adjustment is shut off.
Then fluid from the up acceleration adjustment (UA), which also comes from the control fluid strainer, causes a continuing Movement of the up valve.

Fluid begins from the up control fluid strainer trough a ball check to the down piston holding it firmly in position. This allows the guide and has the down checks assembly to act independently as a check valve. As the pump pressure increases above that on ram side of the check valve, the check valve is opened, allow fluid to flow to the ram cylinder, causing movement of the ram in the up direction. The elevator then Accelerates to full speed as the up piston closes the valve.

Upon reaching a predetermined distance below the floor to which the car is traveling (6 inches for each 25 feet per minute of car speed), the up solenoid (U) is de-energized, allowing fluid from the control side of the up piston to flow through the up transition adjustment (UT), then to the up leveling speed regulator the orifice of which is held open by mechanical linkage attached to the check valve. The control fluid then returns to the reservoir and the up piston moves toward the open position. As the up piston moves, opening the up valve, hydraulic fluid begins flowing to the reservoir, reducing the pump pressure. As the pump pressure is reduced, the check valve begins closing, also, partially closing the orifice in the up leveling speed regulator linked mechanically to the check valve.

When the flow trough the orifice in the up leveling speed regulator (LS) equals in quantity, the flow through the maximum up acceleration orifice (UA) and the up leveling adjustment (UL) the car will be in leveling speed. Upon reaching a point slightly before the floor (usually 3/8 of an inch to 1/4 of an inch), the up stop solenoid (US) is de-energized. This allows fluid to flow through the up stop adjustment (US), causing the up piston to fully open, permitting the total pump output to flow to the reservoir, causing the car to stop. After the car comes to a complete stop, the pump motor is then electrically timed out and stops. If during up movement, the car has been overloaded or hits an obstruction, the fluid on the control side of the u piston is evacuated to the reservoir through the relief valve, causing the up piston to cycle open and by-pass the entire pump output.

DOWN DIRECTION

When a down call is registered, the down leveling solenoid (DL) and the down valve solenoid (D) are simultaneously energized, allowing fluid from the control side of the down piston and fluid from control adjustments, (Down Stop DS and Down Transition=DT) to flow through the down acceleration adjustment (DA) and back to the reservoir. This reduces the pressure on the control side of the down piston. The pressure acting on the area of the down piston exposed to the ram pressure then causes the down piston to open the down valve. The down valve will remain in the open piston as long as the flow of the control fluid passing through the down acceleration adjustment (DA) exceeds the flow through the down transition (DT) and the down stop adjustment (DS) the maximum door speed is controlled by a mechanical stop limit the down piston travel (Adjustment D).

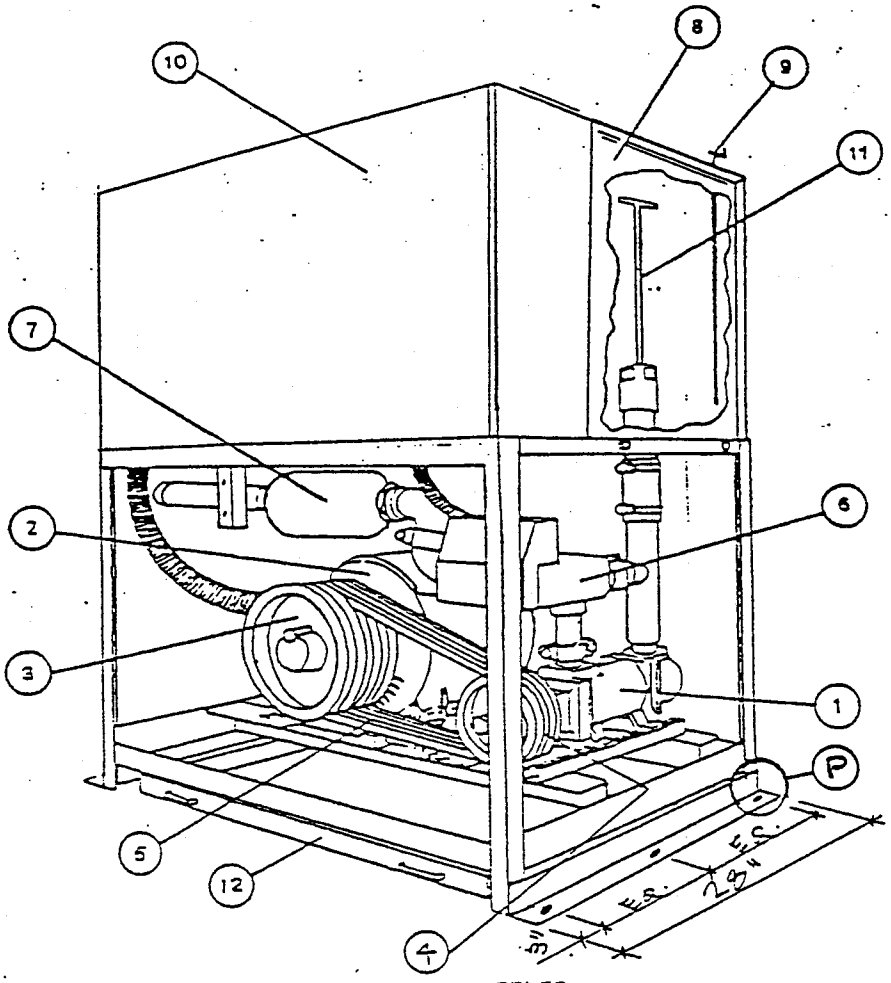
Upon reaching a predetermined distance above the floor to which the car is traveling (6 inches for each 25 feet per minute of car speed) the down solenoid (D) is de-energized, the fluid input to the

Control side of the down piston from the ram continues, as the control side of the piston is larger in area than the area to ram pressure.

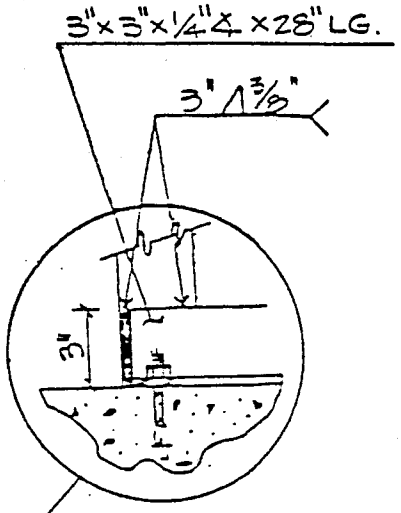
This causes the down piston to start closing. A control rod follows the movement of the piston, uncovering control porting and allowing fluid to flow through the down level adjustment (DL), which when equal in quantity to the flow through the down level adjustment (DT), stops the motion of the piston, placing the down valve in the leveling position. The rate of movement of the down piston from the open position to leveling position is controlled by the down transition adjustment (DT), upon reaching a point slightly before floor level, the down leveling solenoid (DL) is de-energized, causing the fluid coming through the down transition (DT) and the down stop (DS) adjusters to be diverted to the control side of the down piston, moving the down piston to the fully closed position of the down valve.

The final closing rate of the down valve is controlled by the down stop adjustment (DS). Opening the down stop adjustment (DS) will cause the car to stop more firmly, as control fluid is sent to the control side of the down piston at a more rapid rate.

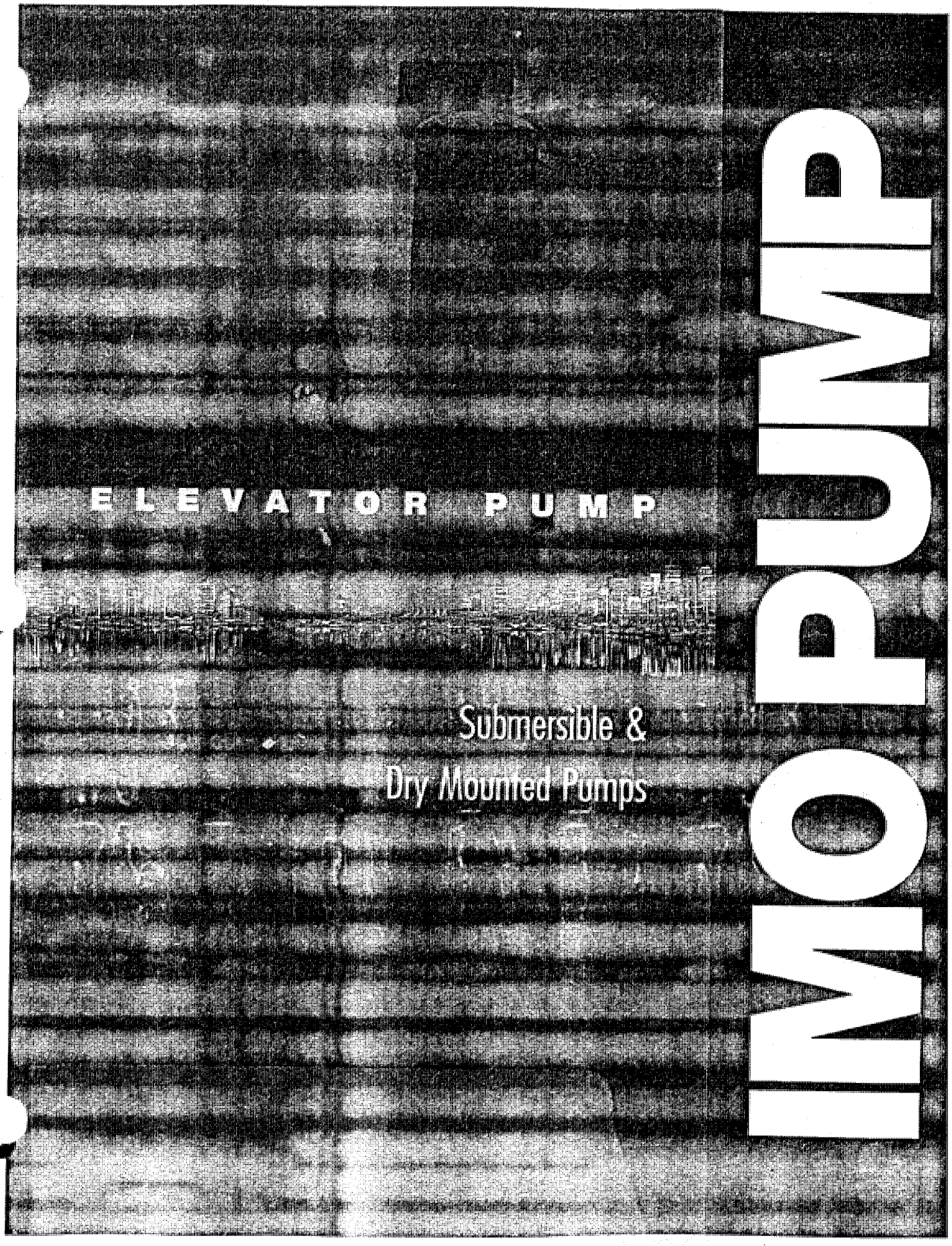
IN NO CASE SHOULD THE SLOWDOWN DISTANCE EXCEED THE 6 INCHES FOR EACH 25 FEET PER MINUTE CAR SPEED. THIS RULE APPLIES TO BOTH UP AND DOWN ADJUSTMENT SEQUENCE.



1. HYDRAULIC PUMP
2. DRIVE MOTOR
3. MOTOR SHEAVE
4. PUMP SHEAVE
5. DRIVE BELTS
6. CONTROL VALVE
7. MUFFLER
8. OIL TANK
9. DIP STICK
10. CONTROLLER
11. MANUAL SHUT OFF VALVE
12. DRIP PAN



(P) ATTACHMENT TYPICAL (6) PLCS. W/ 5/8" ϕ PHILIPS REDHEAD WEDGE ANCHORS W/ 2 3/4" EMBED.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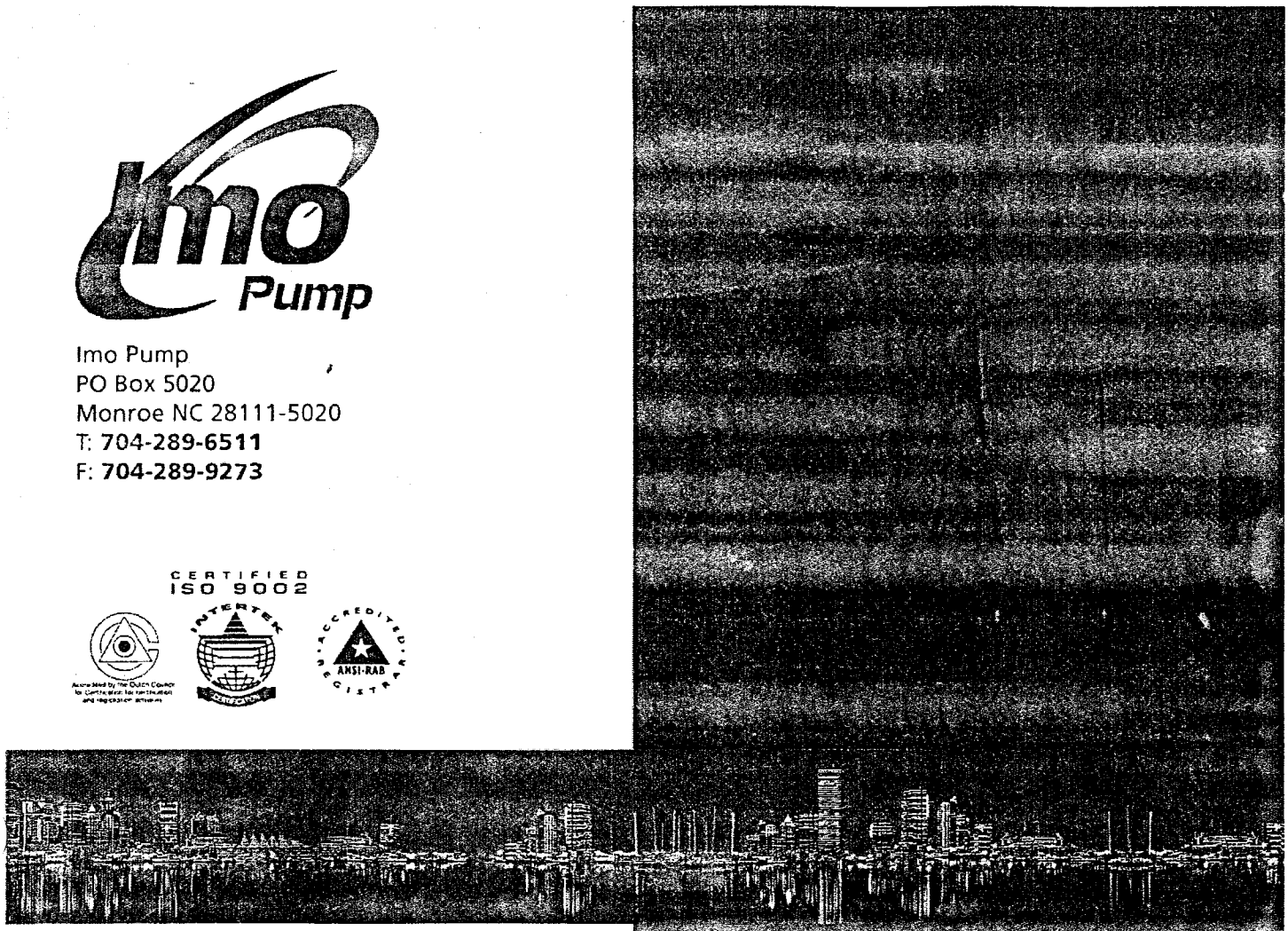

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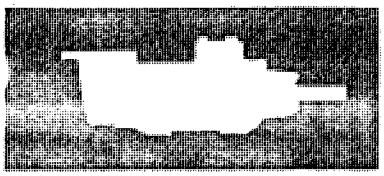

Dry Mounted Elevator Pumps

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SPECIFICATIONS AND FEATURES

Rotor Housing	Iron
Power Rotor	Hardened and Ground Alloy Steel
Idler Rotors	Hardened and Ground Pearlitic Iron
Operating Pressure	To 500 psig – Belt Drive (See Performance Charts) To 600 psig – Direct Drive (Contact Factory for Details)
Viscosity	100 SSU minimum at maximum temperature*
Temperature	0 - 160°F
Drive	Direct or Belt
Rotation	Clockwise, facing pump shaft
Mounting	Any Attitude
Shaft Seal	John Crane type 21 mechanical seal with Buna N bellows, carbon rotating face and stationary seat
Bearing	Cartridge-type, permanently grease-packed, single row radial deep groove ball bearing
O-Rings	Buna N
Gaskets	Cellulose Fiber
Filtration	60-100 Mesh suction strainer recommended

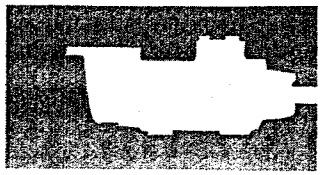
* Lower viscosities may be permissible with review and approval by Imo Pump.

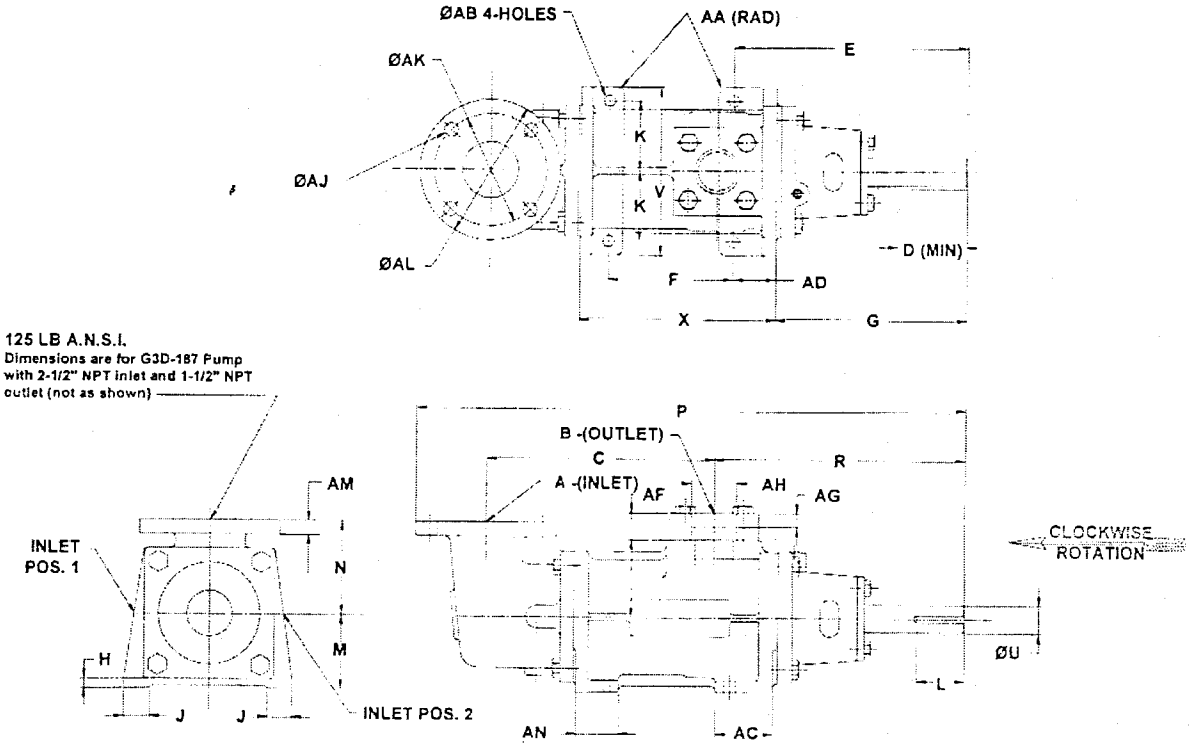
DETERMINING SHAFT SPEED (RPM) FROM FLOW RATE

Pump Type	Flow Rate (GPM) @ 100 SSU and 200 PSI										Pump Type
	15	20	25	30	35	40	50	75	100	125	
3D-137	2083	2581	3079	3578	4076						3D-137
3D-156		1839	2179	2518	2858	3197	3876				3D-156
3D-187				1580	1776	1973	2366	3348			3D-187
3D-218							1581	2200	2818	3437	3D-218
3D-250								1523	1938	2352	3D-250
3D-275										1793	3D-275
3D-312											3D-312
3D-350											3D-350

Pump Type	Flow Rate (GPM) @ 100 SSU and 200 PSI										Pump Type
	150	175	200	225	250	275	300	325	350	375	
3D-137											3D-137
3D-156											3D-156
3D-187											3D-187
3D-218											3D-218
3D-250	2767	3181									3D-250
3D-275	2104	2415	2727								3D-275
3D-312		1700	1914	2127	2340	2553					3D-312
3D-350				1530	1681	1832	1983	2134	2285	2436	3D-350

Drawings And Dimensions - Dry Mounted Pumps 187-350





Pump Type	A	B	C	D		E	F	G	H	J	K	L	M	N	P	R	Key
				Mech. Seal	Packing												
G3D-187	2-1/2	1-1/2	8.94	3.38	3.38	8.75	4.88	6.88	.50	3.75	3.13	3.31	3.50	3.25	20.31	9.13	1/4-1/4
G3D-218	3	2	12.13	4.94	4.38	12.38	6.63	10.13	.63	4.50	3.75	4.81	4.00	5.00	29.19	13.31	3/8-3/8
G3D-250	4	2-1/2	14.00	4.94	4.38	12.50	8.00	10.13	.75	5.00	4.25	4.81	4.75	6.00	32.25	13.75	3/8-3/8
G3D-275	3	3	15.38	4.38	4.38	12.06	8.94	9.69	.75	2.63	4.50	4.25	5.13	6.00	32.69	13.56	1/2-1/2
G3D-312	4	3	17.50	4.25	4.38	12.00	10.19	9.38	.75	2.63	5.25	4.25	5.50	6.25	35.25	13.25	1/2-1/2
G3D-350	5	4	19.81	4.25	4.38	12.13	12.00	9.50	.75	2.88	5.75	5.25	6.25	7.00	38.56	13.75	1/2-1/2

Pump Type	U	V	X	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	WT./lbs.
G3D-187	1.1250 1.1245	7.50	8.31	.38	.63	2.38	1.88	3.63	2.25	.66	–	–	–	–	–	–	82
G3D-218	1.5000	9.00	10.38	.38	.63	3.00	2.25	4.13	1.53	.88	2.406	4 @ 3/4	6.00	7.50	.75	2.25	154
G3D-250	1.5000	10.00	11.94	.38	.63	3.13	2.38	4.25	2.00	.81	2.906	8 @ 3/4	7.50	9.00	.94	2.38	202
G3D-275	1.8750	11.00	13.69	.38	.63	3.25	2.38	5.00	2.25	.94	3.535	4 @ 3/4	6.00	7.50	.75	3.25	246
G3D-312	2.0000	12.00	15.44	.38	.63	3.38	2.63	5.25	2.25	.94	3.535	8 @ 3/4	7.50	9.00	.94	3.38	281
G3D-350	2.0000	13.00	17.31	.38	.63	3.38	2.63	6.25	2.69	1.13	4.545	8 @ 7/8	8.50	10.00	.94	3.38	410

For –137 and –156 Pump Dimensions, Contact Factory or Local Sales Office.

NOTES: *1.* Dimensions are for cast iron cased pumps. *2.* All "U" dimensions are subject to standard NEMA tolerance. *3.* Dimension "AH" is weld socket (weld by customer). Removable socket weld flange is included with pump. *4.* Top inlet position is standard.

Performance Curves - Dry Mounted Hydraulic Pumps

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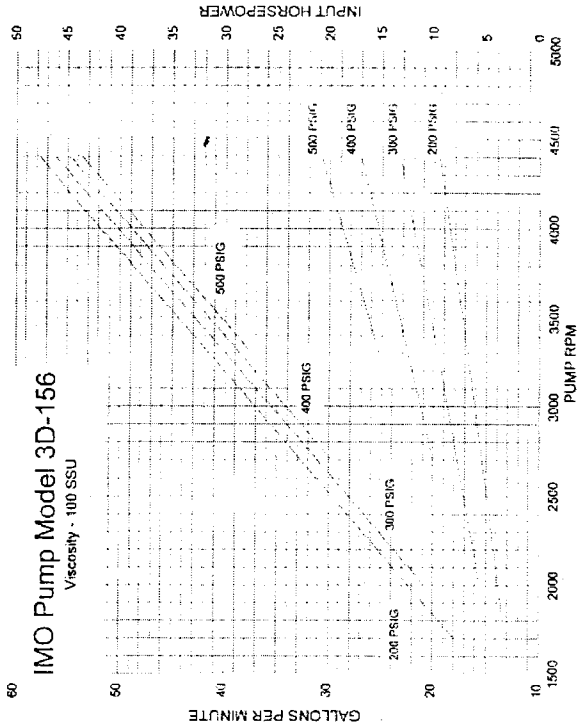
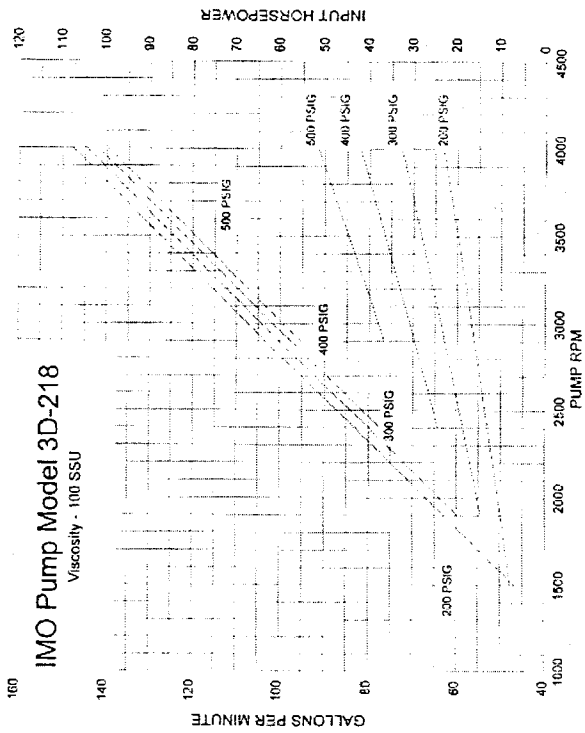
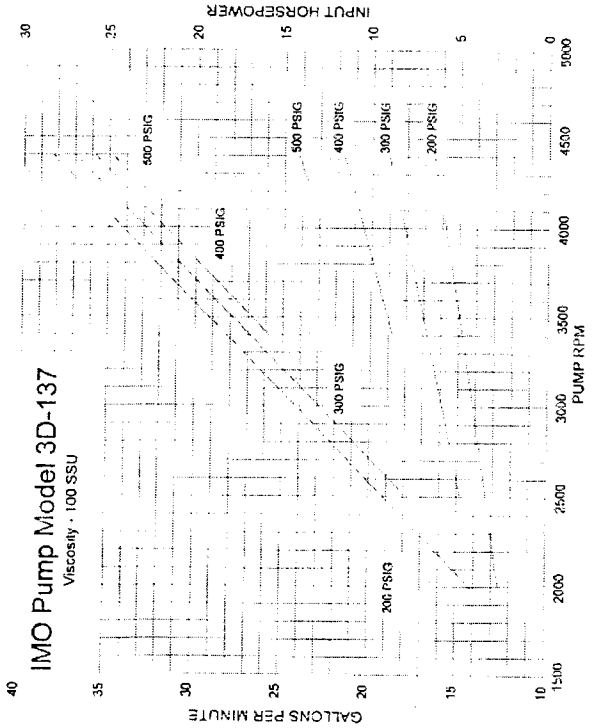
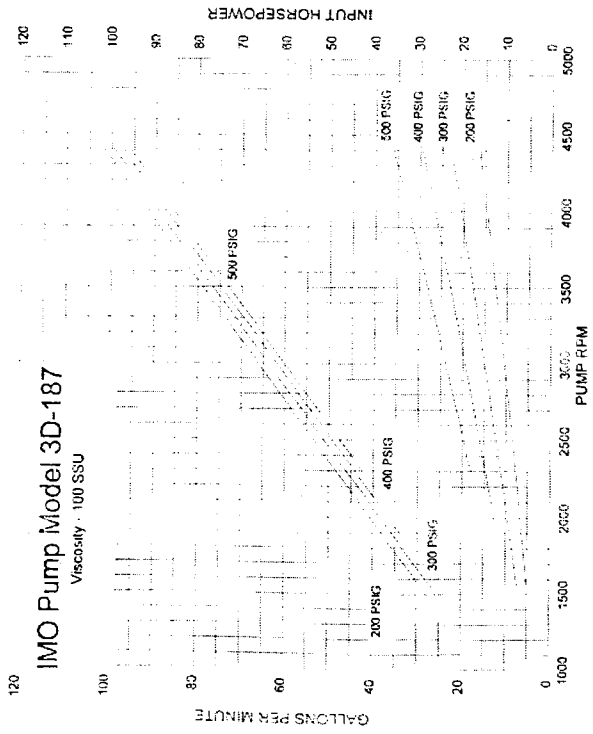
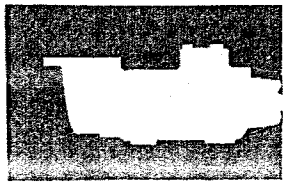


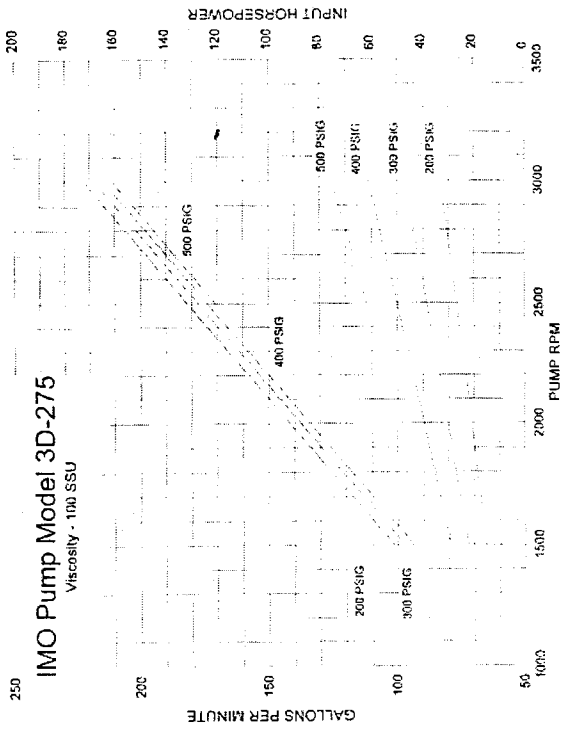


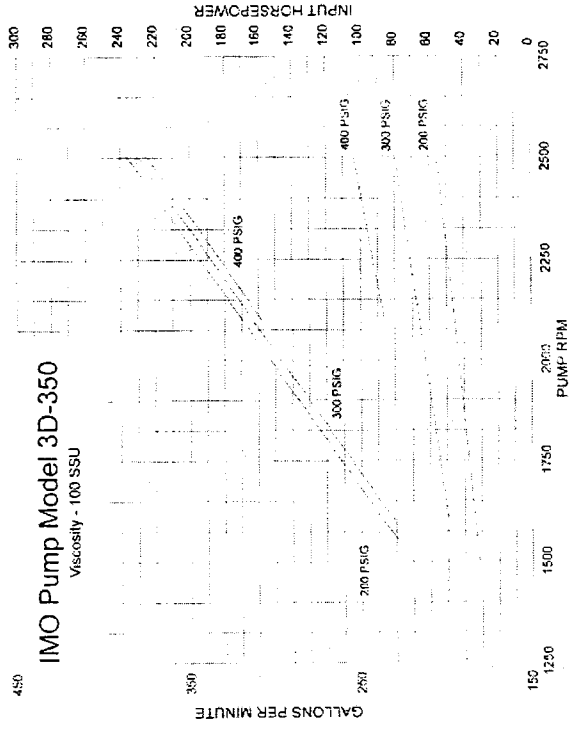


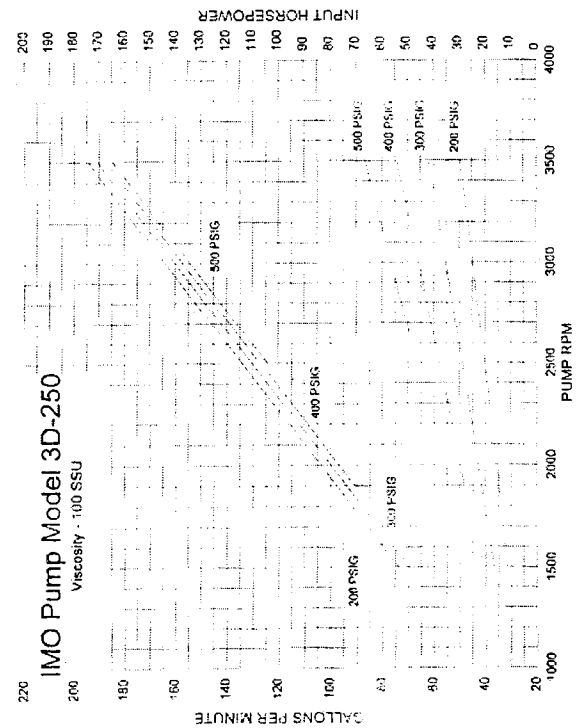


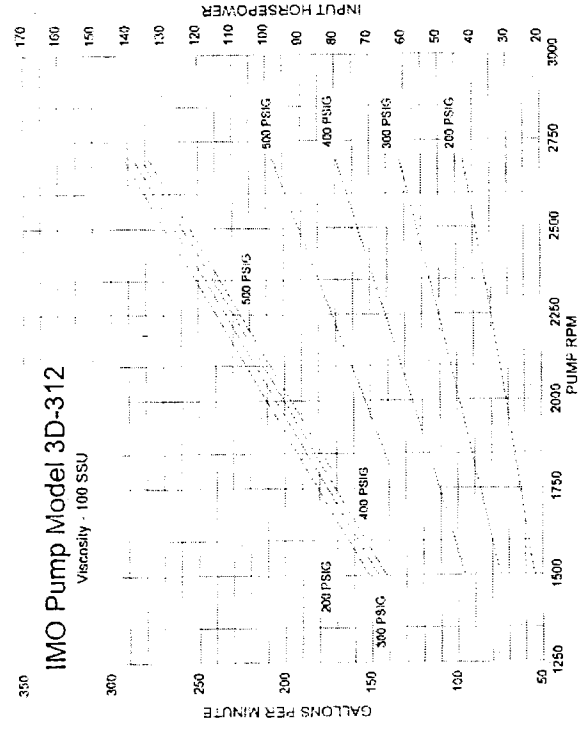
Performance Curves - Dry Mounted Hydraulic Pumps

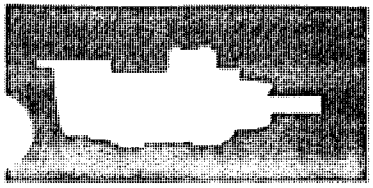












Dry Mounted Hydraulic Elevator Systems

INSTALLATION GUIDELINES

To assure trouble free operations, please follow these guidelines:

Mounting

Mount pump and motor as integral units on common rigid baseplate to avoid shifting and misalignment. Isolation pads (bracket to frame) will help reduce vibration. Check motor/pump rotation to avoid pump damage.

Belt Drive

Sheaves must be balanced and shaft bores must be concentric with belt grooves. Please sheave close to bearing retainer. Avoid sheave misalignment by using straight-edge to ensure alignment.

Adjust belt tension to manufacturer's recommendations.

Suction Conditions

Size piping adequately and avoid multiple fittings. Install 60-100 mesh strainer on suction line to protect pump. Assure adequate surface to avoid excessive pressure drop when dirty.

Do not exceed pump suction capability to avoid cavitation which causes noise, vibration and pump damage.

Lowest oil level of reservoir must cover inlet-line to prevent vortexing. Place return lines below lowest oil level. Keep reservoir and piping clean at all times. Clean system before each start-up. Vent reservoir through filter/breather to exclude dirt.

Temperature

Avoid exceeding oil temperature specifications. (Normal oil temperature range is 60°F to 135°F for most installations). Install tank heaters as required. Run by pass lines from hydraulic block or valve to reservoir, not to pump suction.

Start-up

Fill pump with oil before start-up. Open suction and discharge valves, bleed system air and start pump under low pressure. Check system for air leaks, especially suction piping. Set pressure valve at lowest pressure consistent with satisfactory elevator operation.

SERVICE HINTS

If operation of the pump is noisy, check the following points:

1. Air entrained in oil, or leaks in suction line
2. Vortexing or low oil level in reservoir
3. Restrictions in suction line or clogged strainer
4. Incorrect alignment of pump and motor
5. Excessive belt tension or slip
6. Motor, pump, bracket or other component loose
7. Unmatched belt set, or unbalanced sheave
8. Pump suction capability exceeded – oil too cold or pump speed excessive
9. Worn pump
10. Damaged or unbalanced motor

Check the points below if there is no oil flow or pressure is too low:

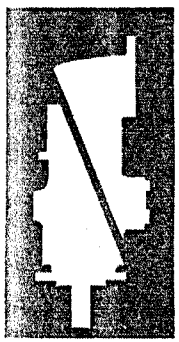
1. Restricted pump suction
2. Control valve damaged or malfunctioning
3. Excessively cold and viscous oil
4. Low oil in reservoir
5. Incorrect motor rotation
6. Belts slipping
7. Worn or damaged pump

DETERMINING FLOW RATE (GPM) FROM CAR SPEED (FT/MIN)

Elevator Performance

Car Speed	Plunger Diameter																Car Speed
	2.75	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	
1	0.31	0.37	0.50	0.65	0.83	1.02	1.23	1.47	1.72	2.00	2.29	2.61	2.95	3.30	3.68	4.08	1
10	3.08	3.67	4.99	6.52	8.25	10.19	12.33	14.67	17.22	19.97	22.93	26.09	29.45	33.02	36.79	40.76	10
20	6.17	7.34	9.99	13.04	16.51	20.38	24.66	29.35	34.44	39.95	45.86	52.18	58.90	66.03	73.58	81.52	20
30	9.25	11.01	14.98	19.57	24.76	30.57	36.99	44.02	51.67	59.92	68.79	78.26	88.35	99.05	110.36	122.29	30
40	12.33	14.67	19.97	26.09	33.02	40.76	49.32	58.70	68.89	79.89	91.71	104.35	117.80	132.07	147.15	163.05	40
50	15.41	18.34	24.97	32.61	41.27	50.95	61.65	73.37	86.11	99.87	114.64	130.44	147.25	165.09	183.94	203.81	50
60	18.50	22.01	29.96	39.13	49.53	61.14	73.98	88.05	103.33	119.84	137.57	156.53	176.70	198.10	220.73	244.57	60
70	21.58	25.68	34.95	45.65	57.78	71.33	86.31	102.72	120.55	139.81	160.50	182.61	206.15	231.12	257.51	285.34	70
80	24.66	29.35	39.95	52.18	66.03	81.52	98.64	117.40	137.78	159.79	183.43	208.70	235.61	264.14	294.30	326.10	80
90	27.74	33.02	44.94	58.70	74.29	91.71	110.97	132.07	155.00	179.76	206.36	234.79	265.06	297.16	331.09	366.86	90
100	30.83	36.69	49.93	65.22	82.54	101.91	123.31	146.74	172.22	199.73	229.29	260.88	294.51	330.17	367.88	407.62	100
110	33.91	40.35	54.93	71.74	90.80	112.10	135.64	161.42	189.44	219.71	252.22	286.97	323.96	363.19	404.67	448.38	110
120	36.99	44.02	59.92	78.26	99.05	122.29	147.97	176.09	206.66	239.68	275.14	313.05	353.41	396.21	441.45	489.15	120
130	40.07	47.69	64.91	84.79	107.31	132.48	160.30	190.77	223.89	259.65	298.07	339.14	382.86	429.23	478.24	529.91	130
140	43.16	51.36	69.91	91.31	115.56	142.67	172.63	205.44	241.11	279.63	321.00	365.23	412.31	462.24	515.03	570.67	140
150	46.24	55.03	74.90	97.83	123.82	152.86	184.96	220.12	258.33	299.60	343.93	391.32	441.76	495.26	551.82	611.43	150
160	49.32	58.70	79.89	104.35	132.07	163.05	197.29	234.79	275.55	319.58	366.86	417.40	471.21	528.28	588.61	652.19	160
170	52.40	62.37	84.89	110.87	140.32	173.24	209.62	249.46	292.77	339.55	389.79	443.49	500.66	561.30	625.39	692.96	170
180	55.49	66.03	89.88	117.40	148.58	183.43	221.95	264.14	310.00	359.52	412.72	469.58	530.11	594.31	662.18	733.72	180
190	58.57	69.70	94.87	123.92	156.83	193.62	234.28	278.81	327.22	379.50	435.65	495.67	559.56	627.33	698.97	774.48	190
200	61.65	73.37	99.87	130.44	165.09	203.81	246.61	293.49	344.44	399.47	458.57	521.76	589.01	660.35	735.76	815.24	200
210	64.74	77.04	104.86	136.96	173.34	214.00	258.94	308.16	361.66	419.44	481.50	547.84	618.46	693.36	772.54	856.01	210
220	67.82	80.71	109.85	143.48	181.60	224.19	271.27	322.84	378.88	439.42	504.43	573.93	647.91	726.38	809.33	896.77	220
230	70.90	84.38	114.85	150.00	189.85	234.38	283.60	337.51	396.11	459.39	527.36	600.02	677.37	759.40	846.12	937.53	230
240	73.98	88.05	119.84	156.53	198.10	244.57	295.93	352.19	413.33	479.36	550.29	626.11	706.82	792.42	882.91	978.29	240
250	77.07	91.71	124.83	163.05	206.36	254.76	308.26	366.86	430.55	499.34	573.22	652.19	736.27	825.43	919.70	1019.10	250

Req. GPM = Total Area x .0519 x Car Speed Req.
Car Speed = GPM/Total Area x 19.27
Note: Check with cylinder manufacturer for actual cylinder size/displacement



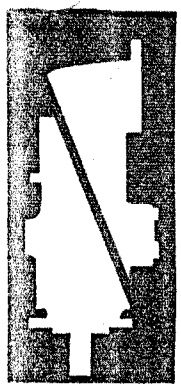


CHART FOR DETERMINING PSI FROM GROSS LOADS**

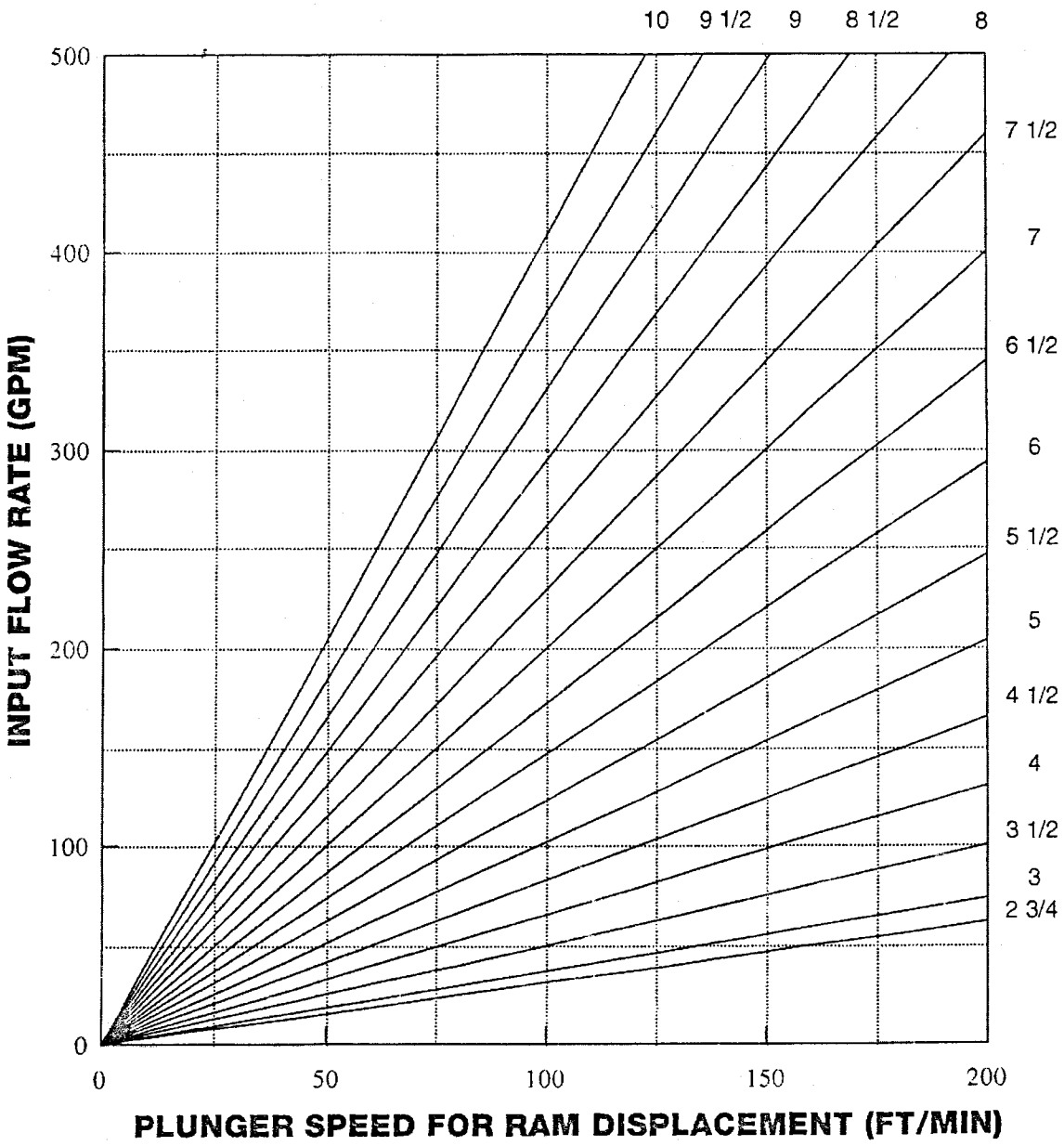
Elevator Performance

Net* Load	Plunger Diameter															
	2.75	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
1000	168	141	104	80	63	51	42	35	30	26	23	20	18	16	14	13
1500	253	212	156	119	94	76	63	53	45	39	34	30	26	24	21	19
2000	337	283	208	159	126	102	84	71	60	52	45	40	35	31	28	25
2500	421	354	260	199	157	127	105	88	75	65	57	50	44	39	35	32
3000	505	424	312	239	189	153	126	106	90	78	68	60	53	47	42	38
3500	589	495	364	279	220	178	147	124	105	91	79	70	62	55	49	45
4000	673	566	416	318	252	204	168	141	121	104	91	80	70	63	56	51
4500	758	637	468	358	283	229	189	159	136	117	102	90	79	71	63	57
5000	842	707	520	398	314	255	210	177	151	130	113	99	88	79	71	64
5500	926	778	572	438	346	280	231	195	166	143	124	109	97	86	78	70
6000	1010	849	624	477	377	306	253	212	181	156	136	119	106	94	85	76
6500		920	676	517	409	331	274	230	196	169	147	129	115	102	92	83
7000			728	557	440	357	295	248	211	182	158	139	123	110	99	89
7500			780	597	472	382	316	265	226	195	170	149	132	118	106	95
8000				637	503	407	337	283	241	208	181	159	141	126	113	102
8500				676	534	433	358	301	256	221	192	169	150	134	120	108
9000				716	566	458	379	318	271	234	204	179	159	141	127	115
9500				756	597	484	400	336	286	247	215	189	167	149	134	121
10000				796	629	509	421	354	301	260	226	199	176	157	141	127
12000					755	611	505	424	362	312	272	239	211	189	169	153
14000						713	589	495	422	364	317	279	247	220	198	178
16000						815	673	566	482	416	362	318	282	252	226	204
18000							758	637	542	468	407	358	317	283	254	229
20000								707	603	520	453	398	352	314	282	255
25000								884	753	650	566	497	441	393	353	318
30000								1061	904	780	679	597	529	472	423	382
35000									1055	909	792	696	617	550	494	446
40000										1039	905	796	705	629	564	509
50000												995	881	786	705	637
ADD PER 100 LBS	16.8	14.1	10.4	8.0	6.3	5.1	4.2	3.5	3.0	2.6	2.3	2.0	1.8	1.6	1.4	1.3

* Net Load includes – platform, sling, enclosure, plunger weight, and friction loss

** For maximum PSI add CAPACITY to above figures

EFFECT OF FLOW RATE ON PLUNGER SPEED



Dry Hydraulic Pump Motors

Electrical Characteristics
80 Starts/Hour

- Class F Insulation
- Class B Temp Rise (40 deg. C Amb.)
- 80 Starts/Hour
- 1800 SRPM
- Ball Bearing Design
- Enclosure: ODP
- Foot Mounted
- Motors are suitable for Wye-Delta starting if reduced starting current is desired
- Conforms to UL and CSA standards

H.P.	VOLTS	FRAME	RPM	F.L. AMPS	L.R. AMPS	P.F.	EFF	NEMA CODE
20	200 * 230/460 575	254T	1760	60 52/26 21	261 224/112 87	79.0	91	E
25	200 * 230/460 575	256T	1755	73 63/32 26	331 290/145 113	82.0	90	E
30	200 230/460 575	284T	1760	83 72/36 29	419 351/175 140	86.0	91	E
40	200 230/460 575	286T	1760	109 94/47 38	495 424/212 170	86.0	92	D
50	200 230/460 575	324T	1765	133 116/58 46	667 562/281 232	88.0	92	D
60	200 230/460 575	326T	1765	160 140/70 57	833 724/362 290	88.0	92	E
75	230/460 575	364T	1765	174/87 69	800/400 311	87.0	93	D
100	230/460 575	365T	1765	230/115 92	1004/502 421	88.0	93	C
125	230/460 575	404T	1765	288/144 116	1330/665 579	87.0	94	D

Data given for information, subject to change without notice

* Note: Across the Line Start Only

EMI Electro-Mech. Industries
28W039 Commercial Ave. Barrington, IL 60010
Phone (847) 381-9550 Fax (847) 381-5997

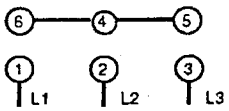
SPEC.: 3400-B
DATE: JUNE 99

MANUFACTURED BY:

Dry Hydraulic Pump Motors

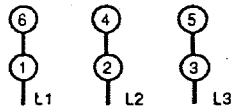
CONNECTION DIAGRAM 6-LEAD

WYE START



LINE L1	1
LINE L2	2
LINE L3	3
CONNECTTOGETHER	6-5-4

DELTA RUN

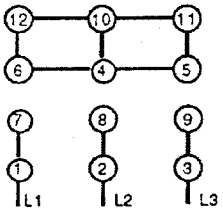


LINE L1	1-6
LINE L2	2-4
LINE L3	3-5
CONNECTTOGETHER	

CONNECTION DIAGRAM 12-LEAD

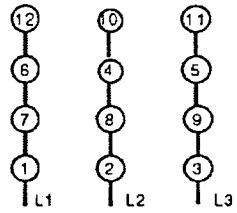
A - LOW VOLTAGE

WYE START, LOW VOLTAGE



LINE L1	1-7
LINE L2	2-8
LINE L3	3-9
CONNECTTOGETHER	6-4-5-12-10-11

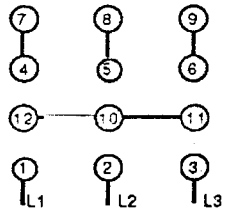
DELTA RUN, LOW VOLTAGE



LINE L1	1-6-7-12
LINE L2	2-4-8-10
LINE L3	3-5-9-11
CONNECTTOGETHER	-

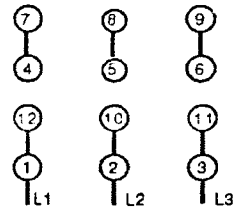
B - HIGH VOLTAGE

WYE START, HIGH VOLTAGE



LINE L1	1
LINE L2	2
LINE L3	3
CONNECTTOGETHER	10-11-12
	4-7
	5-8
	6-9

DELTA RUN, HIGH VOLTAGE



LINE L1	1-12
LINE L2	2-10
LINE L3	3-11
CONNECTTOGETHER	4-7
	5-8
	6-9

EMI Electro-Mech. Industries
28W039 Commercial Ave. Barrington, IL 60010
Phone (847) 381-9550 Fax (847) 381-5997

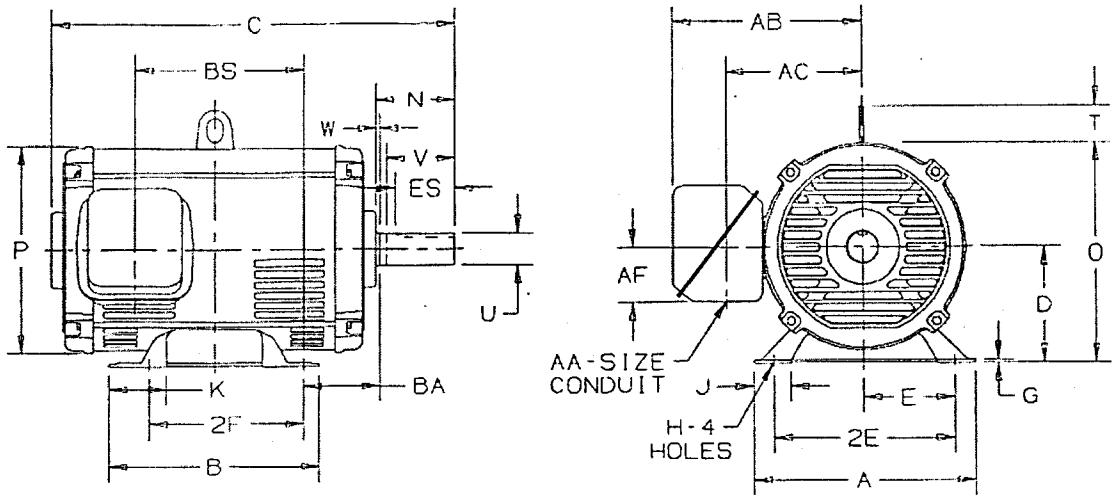
SPEC.: 3410-A
DATE: MAY 99

MANUFACTURED BY:

MOTORS

Dry Hydraulic Pump Motors

Motor Dimensions 254T-326T



FRAME	MOTOR											
	A	B	C	D	E	2F	G	H	J	O	T	P
254T	11.25	11.75	23.2	6.25	5	8.25	0.19	0.53	1.38	11.75	2.06	11.1
256T						10						
284T	13.5	12.94	24.88	7	5.5	9.5	0.19	0.53	2.31	13.19	2.22	12.44
286T						11						
324T	15	14	27.5	8	6.25	10.5	0.25	0.69	2.31	15.13	2.19	14.19
326T						12						

FRAME	MOTOR						SHAFT					
	AB	AC	AF	BA	BS	AA	N	KEY	U	V	W	ES
254T	9.75	7.44	1.81	4.25	9.19	1.25	4.44	0.38	1.625	3.75	0.44	2.91
256T												
284T	11.75	8.44	3.25	4.75	10.38	2	4.88	0.5	1.875	4.38	0.25	3.63
286T												
324T	12.69	9.31	3.25	5.25	11.5	2	5.75	0.5	2.125	5	0.5	3.91
326T												

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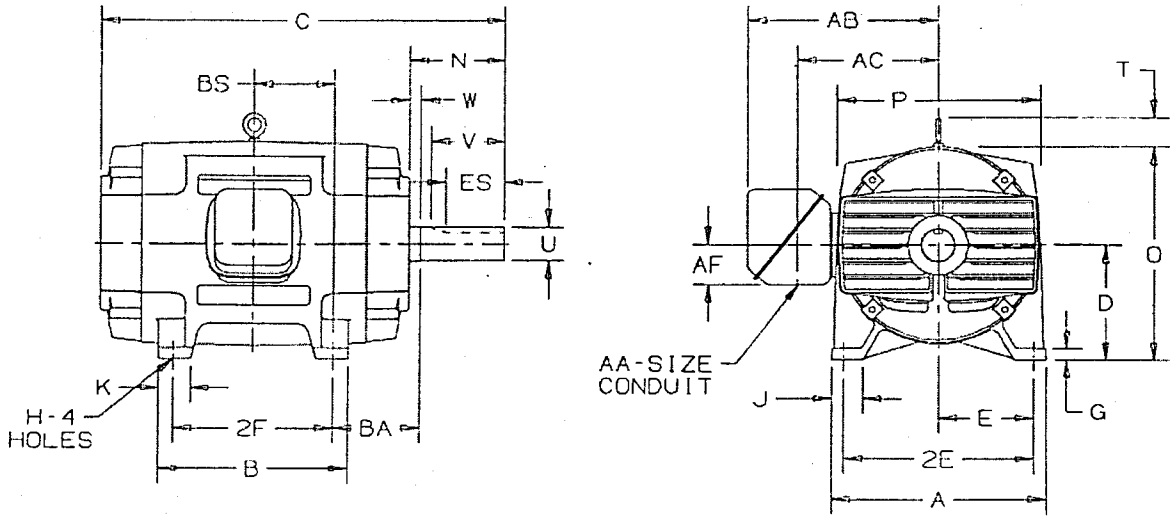
26W039 Commercial Ave. Barrington, IL 60010
Phone (847) 381-9550 Fax (847) 381-5997

SPEC.: 3420-B
DATE: June 99

MANUFACTURED BY:

Dry Hydraulic Pump Motors

Motor Dimensions 364T-404T



FRAME	MOTOR											
	A	B	C	D	E	2F	G	H	J	O	T	P
364T	17.63	13.75	28.69	9	7	11.25	1	0.66	3.44	17.75	2.47	17.63
365T	17.63	14.75	29.69	9	7	12.25	1	0.66	3.44	17.75	2.47	17.63
404T	18	14.75	32.56	10	8	12.25	1	0.81	2.63	18.81	2.47	17.63

FRAME	MOTOR						SHAFT					
	AB	AC	AF	BA	BS	AA	N	KEY	U	V	W	ES
364T	16.19	11.94	3.38	5.88	5.63	3	6.13	0.63	2.375	5.63	0.25	4.31
365T	16.19	11.94	3.38	5.88	6.13	3	6.13	0.63	2.375	5.63	0.25	4.31
404T	16.19	11.94	3.38	6.63	6.13	3	7.5	0.75	2.875	7	0.25	5.75

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28W039 Commercial Ave. Barrington, IL 60010
Phone (847) 381-9550 Fax (847) 381-5997

SPEC.: 3421-B
DATE: June 99

MANUFACTURED BY: