H & J SERIES MOTOR SIZING AND TORQUE CALCULATIONS (Table 5)

MODEL & SIZE	GEAR RATIO	Turns per inch TPI	Rated cap (lbs) P	STATIC TORQUE Ts	UNIT INPUT TORQUE AT RATED CAPACITY T = RUNNING TORQUE (lb-in) at VARIOUS RPM (Theoretical)								NO LOAD TORQUE To
					50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	
H 1/4	5:1	20	500	10.7	6.0	5.6	5.4	5.0	4.6	4.4	4.2	4.0	1.5
	10:1	40		6.7	3.6	3.3	3.2	3.0	2.7	2.5	2.5	2.3	
H 1/2	5:1	20	1,000	24.1	13.7	12.7	12.2	10.9	10.2	9.7	9.4	8.8	2
	10:1	40		15.4	8.2	7.6	7.3	6.7	6.1	5.7	5.5	5.1	
J 3/4	5:1	20	1,500	38	30.0	28.0	27.0	24.7	23.3	22.3	21.6	20.5	1
	5:1	40		28.7	22.0	20.3	19.4	17.3	16.2	15.3	14.7	13.7	2
J1	5:1	20	2,000	53.1	39.2	36.8	35.4	32.3	30.5	29.2	28.3	26.8	3
	10:1	40		33.1	23.2	21.7	20.9	19.2	17.5	16.7	16.1	15.2	
J 2	6:1	24	4,000	113	79.0	73.0	70.0	63.0	58.0	56.0	53.0	50.0	4
	8:1	32		93	64.0	59.0	56.0	50.0	47.0	44.0	42.0	40.0	
	12:1	48		73	49.0	45.0	43.0	39.0	35.0	33.0	31.0	29.0	
J 5	5.33:1	16	10,000	424	294	267	251	231	214	203	194	181	5
	12:1	36		261	168	153	144	126	116	109	104	97	
	24:1	72		191	114	103	96	85	75	68	64	59	
J 10	6:1	18	20,000	906	596	535	498	453	416	390	372	436	7
	12:1	36		584	365	329	308	268	245	229	218	202	
J 20	8:1	16	40,000	1973	1287	1154	1079	982	901	847	809	751	9
	16:1	32		1271	789	710	667	582	530	497	472	438	
J 25	9:1	18	50,000	1938	1526	1364	1273	1155	1057	991	945		10
	18:1	36		1215	935	841	787	685	624	583	554		
J 40	20:1	30	80,000	2557	1917	1698	1573	1377	1243	1156	1094		12

For RPM's not shown use the next slowest RPM. For speeds less than 50 RPM contact factory.

10. Determine Uni-Lift Running Load Proportion Factor: (f)

$$f = \frac{P_3}{(P \times N)}$$

P = Rated Capacity of Uni-lift
P_3 = Max. system running load N= Number of Uni-lifts

11. Determine Unit Running Torque: (T_1) (lb-in)

$$T_1 = (T \times f) + T_o$$

T_0 = No load torque from chart
T = Running torque from chart

12. Find the System Running Torque: (T_2) (lb-in)

$$T_2 = \frac{(T_1 \times N)}{e_1}$$

e_1 = System Arrangement Efficiency, see page 77

13. Find System Power:

$$\text{System HP} = \frac{(T_2 \times RPM)}{(63025 \times e_2)}$$

e_2 = Reducer Efficiency, see page 77
RPM = Uni-Lift input shaft speed

14. Determine System Starting Torque: (T_{s2})

$$T_{s2} = \frac{((T_s \times f) + T_o) \times N}{e_2}$$

T_s = Static torque from chart

15. Determine Motor Starting Torque: (T_{sm}) (lb in)

$$T_{sm} = \frac{T_{s2}}{(R \times e_2)}$$

R = Gear Reducer Ratio

16. Determine Motor Running Torque: (T_{rm})

$$T_{rm} = \frac{T_2}{(R \times e_1)}$$

- Select a motor with a power rating greater than HP requirement in step 13, a starting torque greater than T_{sm} requirement in step 15, and a motor running torque greater than T_{rm} in step 16. See motor chart page 64 for horsepower and torque ratings.
- Select system torque transmission equipment (reducer, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted, see step 12 and system arrangements, page 77.
- Size shafting for system starting torque to be transmitted, see step 16, and Table B page 76.