

Control Drive Linkage

For exclusive use with pneumatic and electric control drives (see Product Specifications PS11, E81-4, and E81-5 for details) Control Drive Linkage is used as a means of connect on between the control drive and the regulated device.

Selecting Linkage

The following is an example of the procedure for linkage selection and refers to the applications in Figure 3. Figures 1 thru 13 show typical linkage arrangements and applications.

The distance from the center of the control drive shaft to the center of the jack shaft is approximately 70 ft (6.10 m) and from the center of the jack shaft to the center of the damper shaft is 5 ft (1.52 m) with 3 ft (0.91 m) of jack shaft required. The maximum torque required is 750 ft lb (339 Nm). Using a 400 ft lb (542 Nm) to give control drive and assuming a 10 inch (254 mm) radius to one lever ratio throughout, for 90° damper movement the following material would be required:

Shaft collars (Figure 79) are not required in the preceding case because the jack shaft levers are located at the bearings and prevent axial movement of the shaft. The locations of the jack shaft relative to the damper shaft and of the control drive relative to the jack shaft may be adjusted to standard link lengths of 6 ft 9 in (2.06 m) and 72 ft 8 in (6.91 m) respectively, or the links may be cut to suit and rethreaded on the job.

It is impossible to maintain driving and driven levers in the same plane throughout full travel, ball and socket ends may be substituted for the clevises included in the above analysis in the manner illustrated by Figure 4. Page 2.

The use of light linkage suitable for 100 ft lb (136 Nm) torque would call for the following material for layout as in Figure 2, with distance of about 11 ft (3.35 m) from the control drive shaft center to the jack shaft center and other dimensions the same as above.

Quantity	Part	Part Number	Figure
3	Driven Lever	5312865A3	19 (a), page 6
1	Upper Link 22' 8" (6.91 m) long	5313925A6	24 (d), page 10
1	Rod Link 6' 9" (2.06 m) long	5313915A3	24 (a), page 10
1	1 7/16" Diameter Shaft 3' 0" (0.91 m) long	531663A	28, page 12
2	Socket Journal Bearing	19355A1 7/16	26, page 11

Quantity	Part	Part Number	Figure
3	Driven Lever	5313730A2	18 (a), page 6
1	Upper Link 11' 5' 5" (3.49 m) long	5313920A2	23 (e), page 9
1	Upper Link 8' 2" (2.49 m) long	5314716A1	23 (d), page 9
1	1 5/16" Diameter Shaft, 3' 0" (0.91 m) long	5314019C	28, page 12
2	Socket Journal Bearing	19355H 15/16	26, page 11

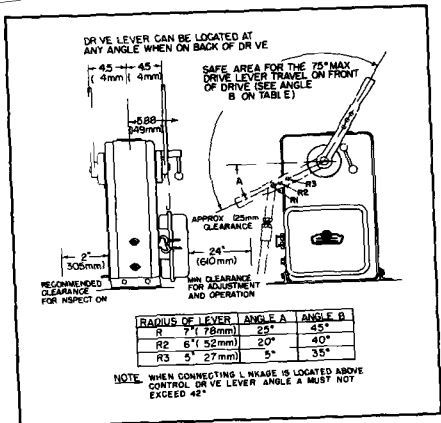


FIGURE 5 Clearance for TYPE AC0-404 Control Drive 75 ft lb (10³ Nm) torque

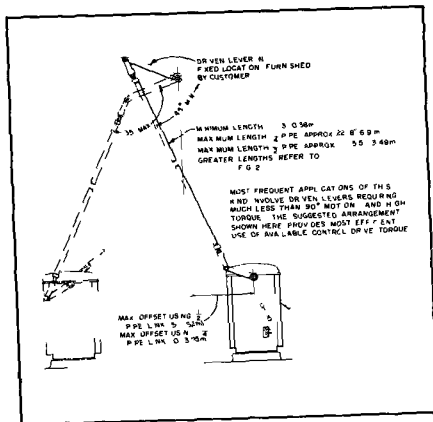


FIGURE 6 Existing lever adaptation

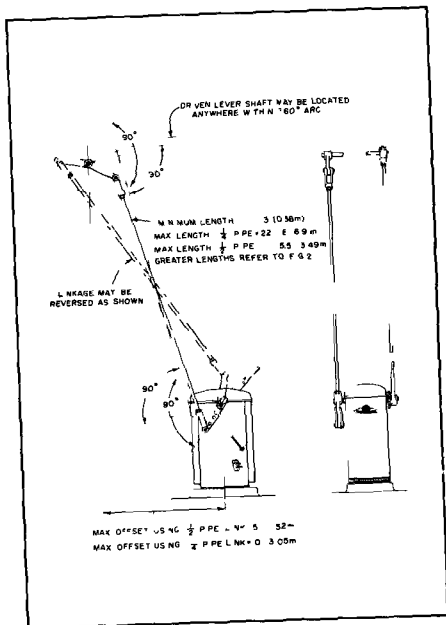


FIGURE 7 Reverse clevis link connection

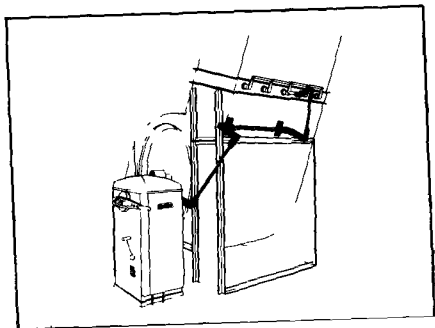


FIGURE 8 Fan damper control

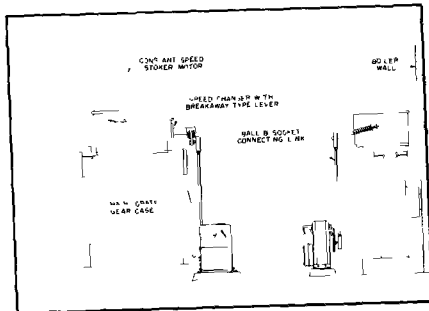


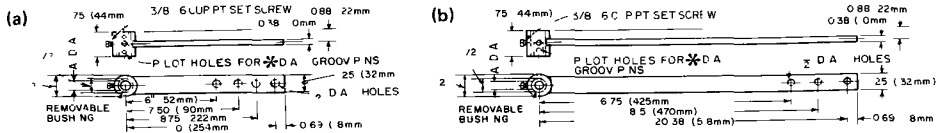
FIGURE 9 Stoker speed control

DRIVE LEVER RADIUS INCHES	DRIVEN LEVER RADIUS INCHES	DRIVEN LEVER TRAVEL (DEGREES) (POSITIONER ADJUSTMENT)	
		MAX	MIN
0.0 (254mm)	0.0(254mm)	90	79
7.75 (97mm)	8.75(222mm)	78	67
7.75 (97mm)	0.0(254mm)	66	57
5.0 (27mm)	7.5 (90mm)	56	5
0.0 (254mm)	6.75(424mm)	50	46
10.0 (254mm)	8.5 (470mm)	45	39
7.75 (97mm)	6.75(424mm)	38	32
7.75 (97mm)	20.38(518mm)	3	26
5.0 (27mm)	6.75(425mm)	25	2
5.0 (27mm)	20.38(518mm)	20	5

The tabu at on istrates how by a choce of drive and driven lever radi and by using part of the contro drive positioner adjustment (to reduce drive lever travel below the max 90), driven lever travels of 15 to 90 may be obtained.

Other combinations are of course feasible. Final adjustment must limit the driven lever travel as required to prevent damage to the driven unit or contro drive stops included on any when specified by purchaser must be set to limit drive travel.

FIGURE 17 Suggested lever combinations for TYPES AC0608, AC0816 Control Drives, 100 ft lb through 4000 ft lb (136 Nm through 5470 Nm) torques

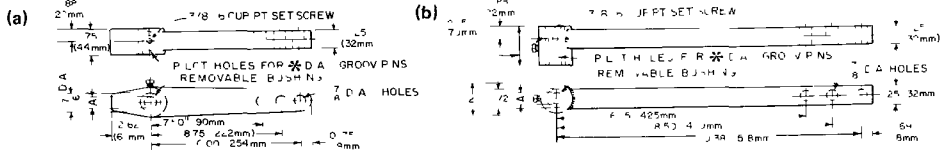


Part No	D men A	*	Max Torque		Weight Lbs	*
			Ft Lb	Nm		
5313730A1*	1/2 †	‡	40	54	2 (0.91 kg)	3/16
	9/16	‡	60	81		
	5/8	‡	85	115		
	11/16	‡	95	129		
	3/4	‡	105	142		
	13/16	‡	110	149		
5313730A2*	7/8	‡	120	163	2 (0.91 kg)	5/16
	15/16 †	‡	265	359		
5313730A3*	1 1/16	‡	275	373	2 (0.91 kg)	5/16
	1 1/8 †	‡	285	387		
5313730A4	1 1/8 †	‡	305	414	2 (0.91 kg)	5/16
	1 7/16	‡	305	414		
5313730A4	1 1/2 †	‡	305	414	2 (0.91 kg)	5/16

Part No	D men A	*	Max Torque		Weight Lbs	*
			Ft Lb	Nm		
5313750A1*	1/2 †	‡	40	54	3.5 (1.59 kg)	3/16
	9/16	‡	60	81		
	5/8	‡	85	115		
	11/16	‡	95	129		
	3/4	‡	105	142		
	13/16	‡	110	149		
5313750A2*	7/8	‡	120	163	3.5 (1.59 kg)	5/16
	15/16 †	‡	265	359		
5313750A3*	1 1/16	‡	285	386	3.5 (1.59 kg)	5/16
	1 1/8 †	‡	305	414		
5313750A4	1 7/16	‡	305	414	3.5 (1.59 kg)	5/16
	1 1/2 †	‡	305	414		

*Removable bushing furnished †Screw machined by factory

FIGURE 18 Light duty drive levers for shaft sizes 1/2 to 1 1/2

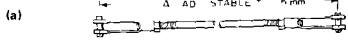
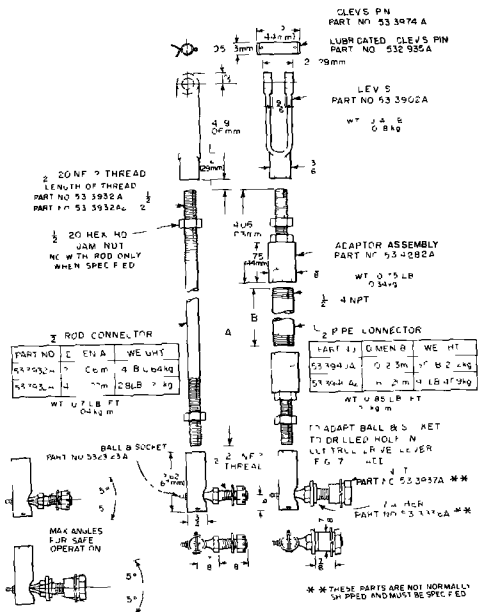


Part No	D men A	*	Max Torque		Weight Lbs
			Ft Lbs	Nm	
5312865K1*	15/16 †	‡	265	359	7.5 (3.40 kg)
	1	‡	325	441	
	1 1/16	‡	390	529	
5312865A2*	1 1/8 †	‡	465	631	7.3 (3.31 kg)
	1 3/16	‡	550	746	
	1 1/4	‡	635	861	
	1 5/16	‡	725	983	
	1 3/8	‡	760	1030	
5312865A3	1 7/16	‡	800	1080	7.0 (3.18 kg)
5312865A4	7/8 †	‡	220	298	7.6 (3.45 kg)

Part No	D men A	*	Max Torque		Weight Lbs
			Ft Lbs	Nm	
5313760E1*	15/16 †	‡	265	359	11.0 (4.99 kg)
	1	‡	325	441	
	1 1/16	‡	390	529	
5313760A2*	1 1/8 †	‡	465	631	11.0 (4.99 kg)
	1 3/16	‡	550	746	
	1 1/4	‡	635	861	
	1 5/16	‡	725	983	
	1 3/8	‡	760	1030	
5313760A3	1 7/16 †	‡	970	1320	11.0 (4.99 kg)

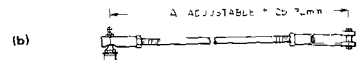
*Removable bushing furnished †Screw machined by factory

FIGURE 19 Medium duty levers for shaft sizes 1 to 1 1/2



Part No	Dimen A	Thrust Lbs	Weight Lbs
5314714A1	2.5 (0.74 m)	450 (204 kg)	2.4 (1.09 kg)
5314714A2	4.5 (1.35 m)	150 (68.1 kg)	3.8 (1.73 kg)

ROD LINK WITH CLEVIS & PINS

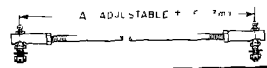


Part No	Dimen A	Thrust Lbs	Weight Lbs
5314008A1	2.4 (0.71 m)	200 (90.8 kg)	2.3 (1.04 kg)
5314008A2	4.4 (1.32 m)	150 (68.1 kg)	3.7 (1.68 kg)

ROD LINK WITH BALL & SOCKET & CLEVIS

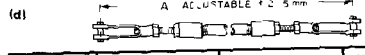


Part No	Dimen A	Thrust Lbs	Weight Lbs
5314007A1	2.3 (0.69 m)	200 (90.8 kg)	2.2 (1.0 kg)
5314007A2	4.3 (1.30 m)	150 (68.1 kg)	3.6 (1.63 kg)



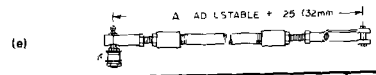
Part No	Dimen A	Thrust Lbs	Weight Lbs
5314715A1	2.3 (0.69 m)	200 (90.8 kg)	2.2 (1.0 kg)
5314715A2	4.3 (1.30 m)	150 (68.1 kg)	3.6 (1.63 kg)

ROD LINK WITH BALL & SOCKET



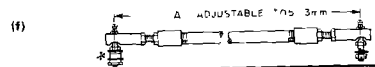
Part No.	Dimen A	Thrust Lbs	Weight Lbs
5314716A1	8.2 (2.49 m)	250 (114 kg)	8.3 (3.77 kg)
5314716A2	11.8 (3.56 m)	125 (56.8 kg)	11.3 (5.13 kg)

PIPE LINK WITH CLEVIS & PINS

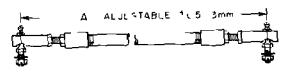


Part No	Dimen A	Thrust Lbs	Weight Lbs
5313920A1	7.115 (2.43 m)	200 (90.8 kg)	8.2 (3.72 kg)
5313920A2	11.5 (3.49 m)	125 (56.8 kg)	11.2 (5.08 kg)

PIPE LINK WITH BALL & SOCKET & CLEVIS



Part No	Dimen A	Thrust Lbs	Weight Lbs
5313930A1	7.9 (2.36 m)	200 (90.8 kg)	8.1 (3.68 kg)
5313930A2	11.3 (3.43 m)	150 (68.1 kg)	11.1 (5.04 kg)

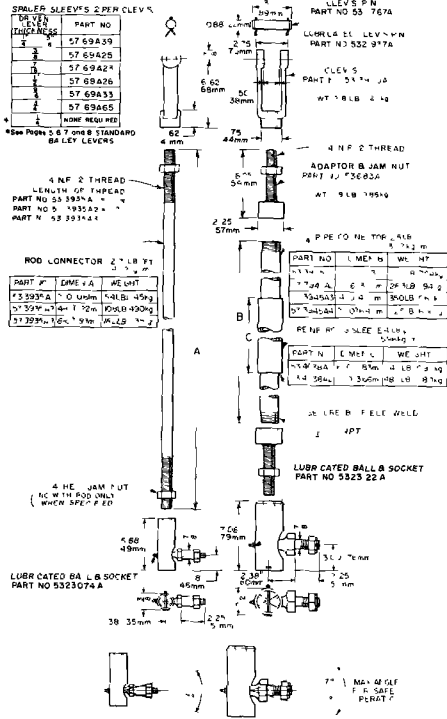


Part No	Dimen A	Thrust Lbs	Weight Lbs
5314717A1	7.9 (2.36 m)	200 (90.8 kg)	8.1 (3.68 kg)
5314717A2	11.3 (3.43 m)	150 (68.1 kg)	11.1 (5.04 kg)

PIPE LINK WITH BALL & SOCKETS

*For light link connection to control drive lever No 5311765A1 this specification ball & socket ends required. Light clevis is not usable here.

FIGURE 23 Light linkage elements and assemblies



(a)

Part No	D men A	Thrust Lbs	Weight Lbs
5313915A1	2.9 (0.84 m)	2700 (1233 kg)	11.1 (5.04 kg)
5313915A2	4.9 (1.45 m)	2150 (976 kg)	16.5 (7.49 kg)
5313915A3	6.9 (2.06 m)	1000 (454 kg)	21.9 (9.94 kg)

ROD LINK WITH CLEVISES AND P NS

(b)

Part No	D men A	Thrust Lbs	Weight Lbs
5313965A1	2.5 (0.74 m)	400 (182 g)	9.0 (4.09 kg)
5313965A2	4.5 (1.35 m)	400 (182 g)	14.4 (6.54 kg)
5313965A3	6.5 (1.96 m)	400 (182 g)	19.8 (8.99 kg)

ROD LINK WITH MEDIUM BALL & SOCKET

(c)

Part No	D men A	Thrust Lbs	Weight Lbs
5314060A1	2.5 (0.74 m)	2750 (1230 kg)	21.4 (9.72 kg)
5314060A2	4.5 (1.35 m)	2150 (976 kg)	26.8 (12.2 kg)
5314060A3	6.5 (1.96 m)	1000 (454 kg)	32.2 (14.6 kg)

ROD LINK WITH HEAVY BALL & SOCKET

(d)

Part No	D men A	Sleeve	Thrust Lbs	Weight Lbs
5313925A1	8-8 (2.64 m)	Om tted	2700 (1230 kg)	27.0 12.3 kg
5313925A2	12-2 (3.71 m)	Om tted	1400 (636 kg)	35.8 16.2 kg
5313925A3	12-2 (3.71 m)	5314038A1	2700 (1230 kg)	59.8 27.2 kg
5313925A4	15-8 (4.78 m)	Om tted	850 (386 kg)	44.5 (20.2 kg)
5313925A5	15-8 (4.78 m)	5314038A1	2700 (1230 kg)	68.5 (31.1 kg)
5313925A6	22-8 (6.91 m)	Om tted	400 (182 kg)	62.0 (28.2 kg)
5313925A7	22-8 (6.91 m)	5314038A2	1500 (681 kg)	110 (49.9 kg)

PIPE LINK WITH CLEVISES & P NS

(e)

Part No	D men A	Sleeve	Thrust Lbs	Weight Lbs
5313966A1	8-4 (2.54 m)	Om tted	400 (182 kg)	24.9 11.3 kg
5313966A2	11-0 (3.61 m)	Om tted	400 (182 kg)	33.7 15.3 kg
5313966A3	15-4 (4.67 m)	Om tted	400 (182 kg)	42.4 (19.2 kg)
5313966A4	22-4 (6.81 m)	Om tted	400 (182 kg)	59.9 27.2 kg

PIPE LINK WITH MEDIUM BALL & SOCKET

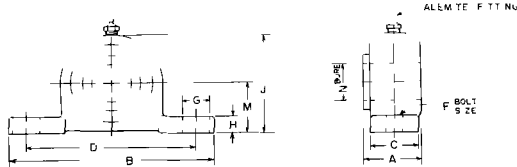
(f)

Part No	D men A	Sleeve	Thrust Lbs	Weight Lbs
5314059A1	8-4 (2.54 m)	Om tted	2700 (1230 kg)	37.3 16.9 kg
5314059A2	11-0 (3.61 m)	Om tted	1400 (636 kg)	46.0 (20.9 kg)
5314059A3	11-0 (3.61 m)	5314038A1	2700 (1230 kg)	70.0 31.6 kg
5314059A4	15-4 (4.67 m)	Om tted	850 (386 kg)	54.8 24.9 kg
5314059A5	15-4 (4.67 m)	5314038A1	2700 (1230 kg)	78.8 35.8 kg
5314059A6	22-4 (6.81 m)	5314038A2	1500 (681 kg)	120 54.5 kg

PIPE LINK WITH HEAVY BALL & SOCKET

FIGURE 74 Mechanical Linkage Components Case Files

G51-5 Control Drive Linkage



Part No	Shaft Size N	A	B	C	D	F Bolts	G	H	J	M	Weight Lbs
5314099D1	1 5/16	1.5 (38 mm)	4.06 (103 mm)	0.75 (19 mm)	3.12 (79 mm)	5/16	0.44 (11 mm)	0.09 (2 mm)	2 (51 mm)	1 (25 mm)	2.0 (0.91 kg)
5314099D2	1 7/16	2.5 (64 mm)	5.75 (146 mm)	1.25 (32 mm)	4.75 (121 mm)	3/8	0.72 (18 mm)	0.16 (4 mm)	3.27 (83 mm)	1.62 (41 mm)	5.0 (2.27 kg)
*5314099D3	1 15/16	4.7 (63 mm)	8 (203 mm)	2.25 (57 mm)	6.25 (159 mm)	1/2	0.75 (19 mm)	0.88 (22 mm)	4.44 (113 mm)	1.9 (56 mm)	9.0 (4.09 kg)
*5314099D4	2 7/16	3.06 (78 mm)	9.5 (241 mm)	2.5 (64 mm)	7.5 (190 mm)	5/8	0.84 (21 mm)	1.1 (29 mm)	7.5 (193 mm)	3.38 (86 mm)	17.0 (7.77 kg)
*5314099D5	2 15/16	4.83 (124 mm)	12.62 (321 mm)	3.5 (89 mm)	10.25 (260 mm)	3/4	1.15 (37 mm)	1.1 (28 mm)	9 (229 mm)	3.75 (95 mm)	27.0 (12.3 kg)

*Ba Bearing

FIGURE 17 Sealed ball bearing



Shaft Torsion Dog per Ft of Length

Part No	D men A	Weight Lb/Ft	Torque n Ft Lb				
			75 (102 Nm)	280 (380 Nm)	400 (542 Nm)	1000 (1360 Nm)	1500 (2030 Nm)
5314019C15/16	1 5/16	2.7 4.02 kg/m					
531663AT 7/8	7/8	5.5 8.9 kg/m					
5314020C1 1/8	1 1/8	11.7 15.9 kg/m					
5314021C 7/8	2 7/8	15 22.4 kg/m					
5314019C2 15/16	2 15/16	22.1 32.9 kg/m					

NOTE: Shaft Torsion should be held to 3% or less of total angular travel

FIGURE 18 Solid shaft and shafting

Part No	D men			Weight Lbs
	A	B	D	
57172A2	15/16	9/16	5/8	0.4 0.18 kg
57 72B8	1 7/16	3/4	2 1/4	0.5 0.23 kg
57172A22	1 15/16	7/8	3	1.7 0.77 kg
57 77A17	2 7/16		3 1/2	1.1 0.50 kg
57172A23	1 15/16	1/8	4 1/4	2.7 1.00 kg

FIGURE 19 Shaft collar

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Bailey Meter Company, Wickliffe Ohio 44092, a subsidiary of Babcock & Wilcox, U.S.A

Bailey Meter Australia Pty Ltd Regent Park N S W Australia
 Bailey do Brasil Sao Paulo, Brazil
 Bailey Meter GMBH Mannheim West Germany

Bailey Meter Company Ltd Pointe Claire Quebec Canada
 Bailey Japan Company Ltd Miyayama cho Japan
 Representatives in Other Principal Cities