SECTION
2000

WORM GEAR ROTARY LIMIT SWITCH SERVICE BULLETIN

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AUTOMATION & PROCESS TECHNOLOGIES

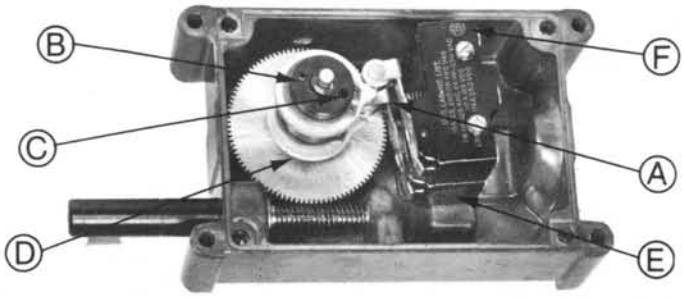


Figure 1 Gemco 2-circuit Rotary Limit Switch illustrating . . .
- Independent adjustable cams A-D
- Switches E-F
- Allen Screws B-C

DESCRIPTION

Gemco's Worm Gear Type Rotary Limit Switches are primarily used on machine tools, handling devices, and rotary operators where motion is expressed in shaft rotation. These switches, operated by independently adjustable cams, control the intermediate or end limits of a linear or rotary motion.

NEMA Type 1 and 12 enclosures are molded from Fibralloy®, a special fiber-glass material that is resistant to acids, alcohols, hydrocarbons, and heat. NEMA Type 4, 7 and 9 enclosures are made of cast aluminum; cast iron or bronze enclosures can be provided upon request.

INSTALLATION

Switch may be mounted in any convenient position.

MAINTENANCE

Powdered metal oil impregnated bearings and bronze gears require no lubrication for life of the switch.

ADJUSTMENT (See Figure 1)

Top cam "A" actuates switch "F"; rear cam "D" actuates switch "E". Both switches "E" and "F" have independently adjustable cams. When the cams rotate, switches "E" and "F" are actuated and the contacts change from normally closed to open position and normally open to closed position.

TO OPERATE 'E' SWITCH

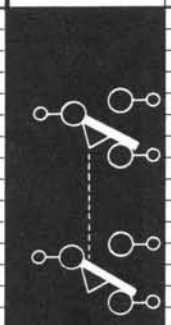
1. Loosen Allen Screw in cavity "C" (Allen Wrench supplied).
2. Rotate shaft to low limit of travel, then manually rotate bottom cam "D" until switch "E" trips.
3. **Retighten Allen Screw in cavity "C".**

TO OPERATE 'F' SWITCH

1. Loosen visible Allen Screw "B".
2. Rotate shaft to high limit of travel, then manually rotate top cam "A" until switch "F" trips.
3. **Retighten visible Allen Screw "B".**

Standard Two Cam S.P.D.T.*			
Contact Symbol	Ratio	Input Shaft Turns*	
		Max. Set	To Reset
	5:1	4 1/2	1/16
	10:1	9 1/4	1/8
	20:1	18	1/8
	30:1	28	1/4
	40:1	37	1/4
	50:1	46	1/4
	60:1	58	1 1/2
	80:1	77	3/4
	100:1	94	3/4
	150:1	135	4
	250:1	230	6
	300:1	265	6 1/2
	500:1	465	15 1/4
	600:1	555	16
	1000:1	920	29
	2000:1	Consult Factory	
	4000:1		
	5333.3:1		

*Switch cap: 125V-15 amps. A.C., 1/2 amp. D.C.
250V-15 amps. A.C., 1/4 amp. D.C.
460V-15 amps. A.C.

Standard Two Cam D.P.D.T.**			
Contact Symbol	Ratio	Input Shaft Turns*	
		Max. Set	To Reset
	5:1	4 3/4	1/8
	10:1	9 1/4	1/4
	20:1	19	1/2
	30:1	28 1/2	1/2
	40:1	37 3/4	3/4
	50:1	46 3/4	3/4
	60:1	58	1 1/2
	80:1	75	1 3/4
	100:1	95	2
	150:1	135	4
	250:1	237	6
	300:1	265	6 1/2
	500:1	460	15 1/4
	600:1	555	16
	1000:1	920	29
	2000:1	Consult Factory	
	4000:1		
	5333.3:1		

**Switch cap: 125 or 250 V.A.C.-10 amps. A.C.
125 V.D.C.-1/2 amp.
250 V.D.C.-1/4 amp.

Standard Three & Four Cam S.P.D.T.***			
Contact Symbol	Ratio	Input Shaft Turns*	
		Max. Set	To Reset
	5:1	4 3/4	1/16
	10:1	9 1/2	1/16
	20:1	19 1/4	1/8
	30:1	28 1/2	1/4
	40:1	38	1/2
	50:1	47	1/2
	60:1	57 1/2	1/2
	80:1	76 3/4	1/2
	100:1	96 1/4	1 1/2
	150:1	135	4
	250:1	234	2
	300:1	265	6 1/2
	500:1	460	7
	600:1	555	16
	1000:1	920	10
	2000:1	Consult Factory	
	4000:1		
	5333.3:1		

***Switch capacities:
Mech. rating - 20 million cycles
Elec. rating - 125 V.A.C. - 10 amps. resistive
250 V.A.C. - 10 amps. resistive
30 V.D.C. - 7 amps. inductive

*Figures are based on a switch using a standard 25° cam; maximum settings between limits.

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WORM GEAR ROTARY LIMIT SWITCH SERVICE BULLETIN

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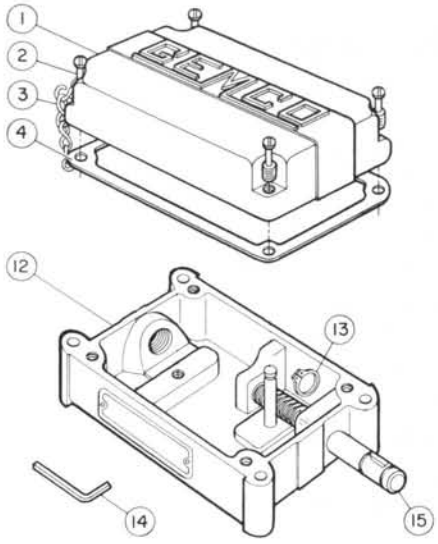

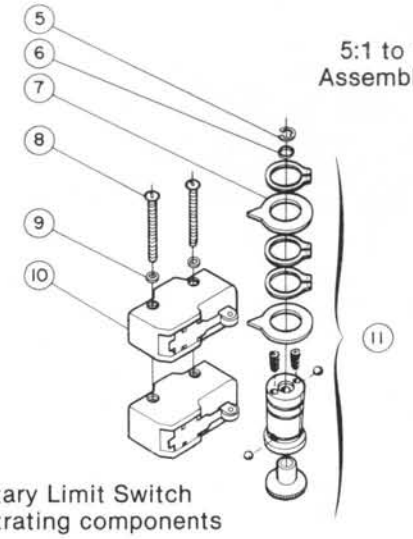

Figure 2 Rotary Limit Switch
'Model B' illustrating components

Worm Gear (WG) Type Parts List

Item Number	Description	NEMA 1 & 12		NEMA 4		NEMA 7	
		Part Number	Quantity Required	Part Number	Quantity Required	Part Number	Quantity Required
1	Cover*	P-50-C	1	A-458-C	1	A-458-C	1
2	Cover Screws	M-58-A	4	1/4-20 x 3/4	4	1/4-20 x 3/4	4
3	Jack Chain (single—included with cover)	No. 14	1				
4	Gasket	S-57-A	1	S-58-A	1		
5	Cam Block "E" Ring	5133-18	1	5133-18	1	5133-8	1
6	Cam Block Spacer	M-730-A	1	M-730-A	1	M-730-A	1
7	Cam (included with gear assembly)	S-55-A	**	S-55-A	**	S-55-A	**
8	Machine Screws (standard round head)	6-32 x 1-5/8	2	6-32 x 1-5/8	2	6-32 x 1-5/8	2
9	Lock Washer (standard)	No. 6	2	No. 6	2	No. 6	2
10	Micro Switch (2 Circuit) (3 and 4 circuit Licon) Double Pole, Double Throw	BZ-2RW22-A2 76-1290/204 DT-2RV212-A7	2 ** **	BZ-2RW22-A2 76-1290/204 DT-2RV212-A7	2 ** **	BZ-2RW22-A2 76-1290/204 DT-2RV212-A7	2 ** **
11	Gear Assembly (5:1 - 100:1 includes cam block, retaining rings, steel balls, set screws, cams and gear). (150:1 - 5333.3:1 Includes cam block, retaining rings, steel balls, gears, base plate and pins).	See Table A See Table B	1 1	See Table A See Table b	1 1	See Table A See Table B	1 1
12	Enclosure bottom (5:1 - 100:1 includes bearings and pin). (150:1 - 5333.3:1 includes bearings).	P-95-C P-95-C	1 1	A-465-C A-470-C	1 1	A-465-C A-470-C	1 1
13	Shaft Retaining ring (Truarc)	5100-37	1	5100-37	1	5100-37	1
14	Allen Wrench	No. 116	1	No. 116	1	No. 116	1
15	Shaft (5:1 - 100:1 includes key). (150:1 - 5333.3:1 includes key)	See Table A See Table B	1 1	See Table A See Table B	1 1	See Table A See Table B	1 1

*For NEMA 1 Cover Assembly, Items 1-4, use Part Number SD-121-C.
**One required per circuit.
For NEMA 4 Cover Assembly, Items 1, 2 and 4, use Part Number SD-122-C.
For NEMA 7 Cover Assembly, Items 1 and 2, use Part Number SD-332-C.
When ordering renewal parts, please specify: O part number O quantity O catalog number of switch.

Table A (See Figure 2)

Ratios	NEMA 1 Enclosure	NEMA 4 or 7 Enclosure	All Enclosures
	Shaft	Shaft	Gear Assembly
5:1	M-748-A	M-745-A	SD-286-B
10:1	M-741-A	M-744-A	SD-287B
20:1	M-747-A	M-746-A	SD-288-B
30:1	M-741-A	M-744-A	SD-290-B
40:1	M-747-A	M-746-A	SD-291-B
50:1	M-741-A	M-744-A	SD-292-B
60:1	M-747-A	M-746-A	SD-293-B
80:1	M-747-A	M-746-A	SD-294-B
100:1	M-747-A	M-746-A	SD-295B

Table B (See Figure 2)

Ratios	NEMA 1 Enclosure	NEMA 4 or 7 Enclosure	All Enclosures
	Shaft	Shaft	Gear Assembly
150:1	M-748-A	M-745-A	SD-296-B
250:1	M-748-A	M-745-A	SD-297-B
300:1	M-741-A	M-744-A	SD-298-B
500:1	M-741-A	M-744-A	SD-299-B
600:1	M-747-A	M-746-A	SD-300-B
1000:1	M-747-A	M-746-A	SD-301-B
2000:1	M-741-A	M-744-A	SD-302-B
4000:1	M-747-A	M-746-A	SD-303-B
5333.3:1	M-654-A	M-795-A	SD-304-B

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SPUR GEAR ROTARY LIMIT SWITCH SERVICE BULLETIN

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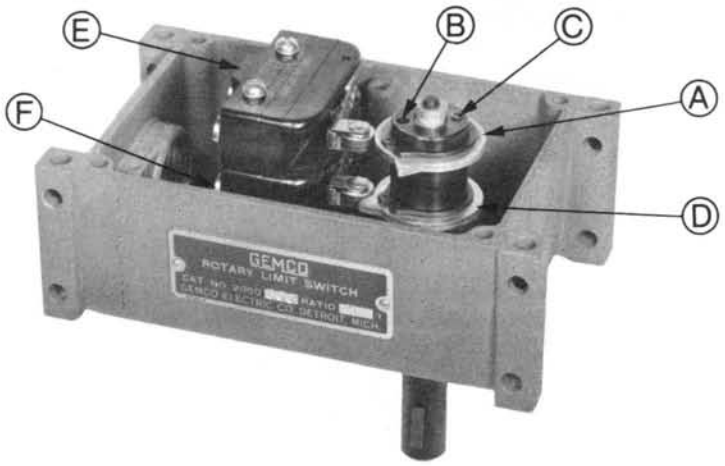


Figure 3 Gemco 2-circuit Spur Gear Type Rotary Limit Switch illustrating . . .
- Independent adjustable cams A-D
- Switches E-F
- Allen Screws B-C

DESCRIPTION

Gemco's Spur Gear Type Rotary Limit Switches are primarily used on control of motor-operated valves, dampers, and material handling systems in applications requiring ratios below 3:1. These switches, operated by independently adjustable cams, control the end and/or intermediate limits of a reciprocating or rotary motion.

NEMA Type 1 and 12 enclosures consist of a die cast housing and a Fibralloy® cover. Fibralloy® is a special fiberglass material that is resistant to acids, alcohols, hydrocarbons and heat.

NEMA Type 4, 7 and 9 enclosures are made of cast aluminum; cast iron or bronze enclosures can be provided upon request.

INSTALLATION

Switch may be mounted in any convenient position.

MAINTENANCE

Powdered metal oil impregnated bearings and bronze gears require no lubrication for life of the switch.

ADJUSTMENT (See Figure 3)

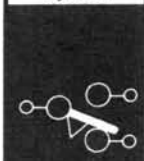
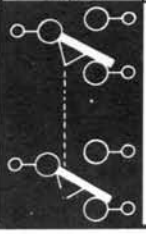
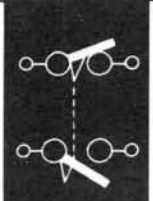
Top cam "A" actuates switch "E"; bottom cam "D" actuates switch "F". Both switches "E" and "F" have independently adjustable cams. When the cams rotate, switches "E" and "F" are actuated and the contacts change from normally closed to open position and normally open to closed position.

To Operate 'F' Switch

1. Loosen Allen Screw in cavity "B" (Allen Wrench supplied.)
2. Rotate shaft to down limit of travel, then manually rotate bottom cam "D" until switch "F" trips.
3. **Retighten Allen Screw in cavity "B".**

To Operate 'E' Switch

1. Loosen visible Allen Screw "C".
2. Rotate shaft to upper limit of travel, then manually rotate top cam "A" until switch "E" trips.
3. **Retighten visible Allen Screw "C".**

Standard Two Cam S.P.D.T.		Standard Two Cam D.P.D.T.		Standard Three & Four Cam S.P.D.T.	
Contact Symbol	Switch Capacities	Contact Symbol	Switch Capacities	Contact Symbol	Switch Capacities
	125V-15 amps. A.C., ½ amp. D.C. 250V-15 amps. A.C., ¼ amp. D.C. 460V-15 amps. A.C.		125 or 250 V.A.C.-10 amps. 125 V.D.C.-½ amp. 250 V.D.C.-¼ amp.		125 V.A.C.-10 amps. resistive 250 V.A.C.-10 amps. resistive 30 V.D.C.- 7 amps. inductive