
Application

Cranes

Products Used

2006

Problem

OEMs and users of large cranes need to make sure that they control the end limits of the hoist travel. This prevents damage to the hook and cable drum assembly as well as the motor.

Solution

We installed a 2006 Rotary Cam Limit Switch off of the cable drum to monitor the hoist travel and set the upper and lower limits to prevent overtravel.

Benefits

- Safety
- Prevents accidental overtravel
- Prevents damage to motor and drive mechanism

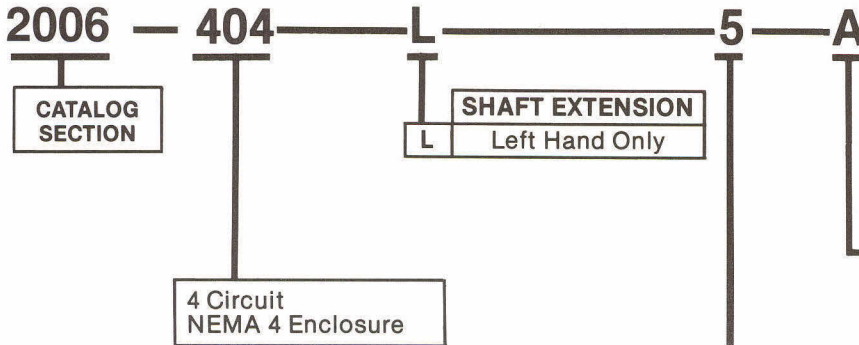
Conclusion

A simple mechanical Rotary Cam Limit Switch can save hundreds or thousands of dollars and prevent hours of downtime due to overtravel.



Type K Rotary Limit Switches

FOUR (4) CIRCUIT ROTARY LIMIT SWITCH CATALOG NUMBERING SYSTEM



CROSS REFERENCE 4 CIRCUIT ROTARY LIMIT SWITCHES	
CUTLER HAMMER PART NO.	GEMCO PART NO.
10316H-158-1	2006-404-L-120-A
10316H-159-1	2006-404-L-60-A
10316H-160-1	2006-404-L-40-A
10316H-173-1	2006-404-L-1080-A
10316H-175-1	2006-404-L-357-A
10316H-1026-1	2006-404-L-10-A
10316H-1027-1	2006-404-L-20-A
10316H-4568-1	2006-404-L-5-A
10316H-4569-1	2006-404-L-30-A
10316H-4571-1	2006-404-L-80-A
10316H-4600-1	2006-404-L-270-A

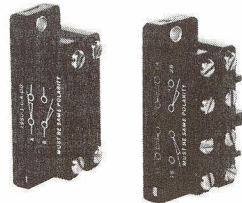
SWITCH TYPE	
A	All S.P.D.T.
B	1-D.P.D.T., Balance S.P.D.T.
C	2-D.P.D.T., Balance S.P.D.T.
D	3-D.P.D.T., Balance S.P.D.T.
E	4-D.P.D.T.,
R	Quick Reset

All Switches have Isolated Contacts
 S.P.D.T. 1 NO—1 NC Contacts
 D.P.D.T. 2 NO—2 NC Contacts

RATIO	
5	5:1
10	10:1
20	20:1
30	30:1
40	40:1
60	60:1
80	80:1
120	120:1
270	270:1
357	357:1
1080	1080:1

SPARE SNAP SWITCHES

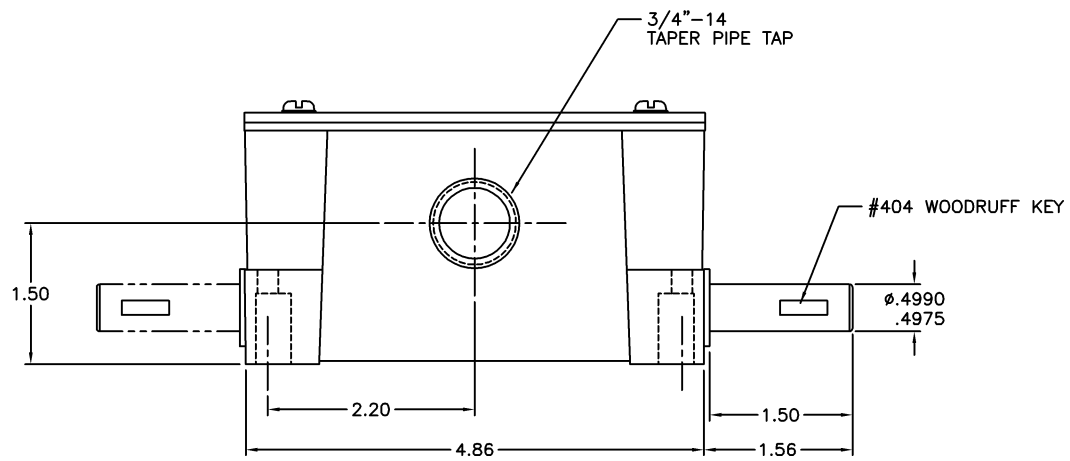
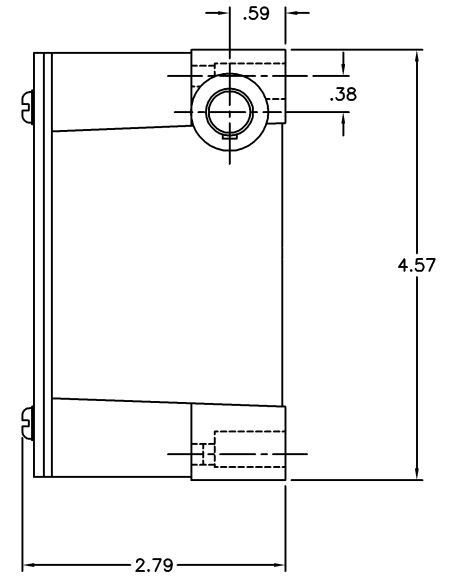
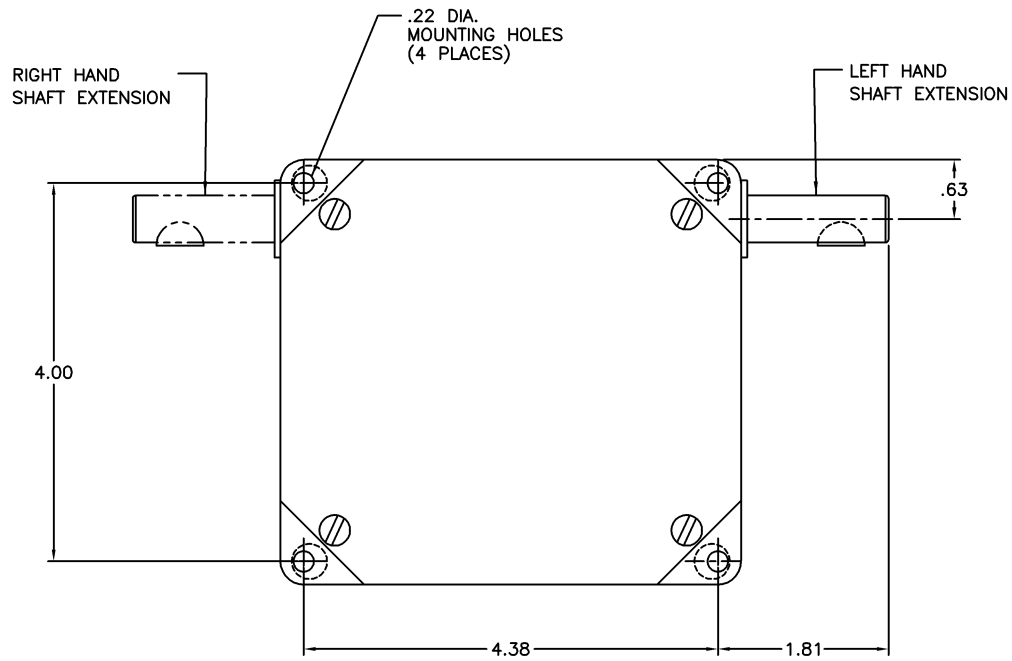
CUTLER HAMMER PART NUMBER	GEMCO PART NUMBER	
SPDT 10316H89A	1950-1-B-A-DO	
DPDT 10316H2000	1950-4-B-A-DO	
Quick Reset	1950-1408	



ELECTRICAL CONTACT RATINGS

Switch Type	Contacts	Volts	AC						Volts	DC	
			Inductive Pilot Duty 35% Power Factor				Con- tinuous Carrying Amperes	Resistive 75% Power Factor Make, Break and Continuous Carrying Amperes		Inductive Pilot Duty and Resistive	
			Make		Break					Make and Break Amperes	Con- tinuous Carrying Amps.
			Amps.	VA	Amps.	VA	Double Throw				
1950-1-B-A-DO	SPDT	110	40	.....	15	.....	15	15	115	0.25	15
		220	20	.....	10	.....	15	15	230	0.1	15
		440	10	.....	6	.....	15	15	600	.....	15
		600	8	.....	5	.....	15	15			
1950-4-B-A-DO	DPDT	115	30	3450	3	345	10	10	115	0.2	10
		230	15	3450	1.5	345	10	10	230	0.1	10
		440	7.5	3450	0.75	345	10	10	600	.....	10
		575	6	3450	0.6	345	10	10			

NOTE: The maximum period for which the switch contacts are opened or closed during one revolution (360°) of the cam block assembly is 25° or 335°. Multiply the Rotary Limit Switch gear ratio times 25° or 335° to obtain the input shaft rotation which will yield 25° or 335° of cam block rotation.



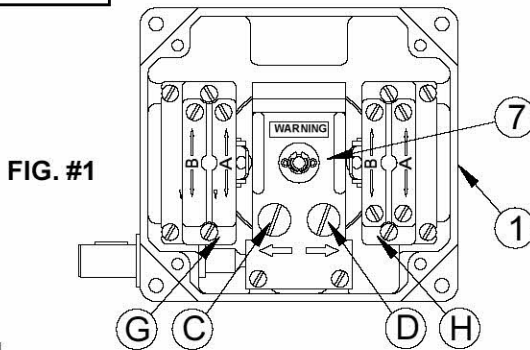
FINISH: PAINT PER FSN0004

ROTARY LIMIT SWITCH
2006 SERIES NEMA 4
2 CIRCUIT UNIT

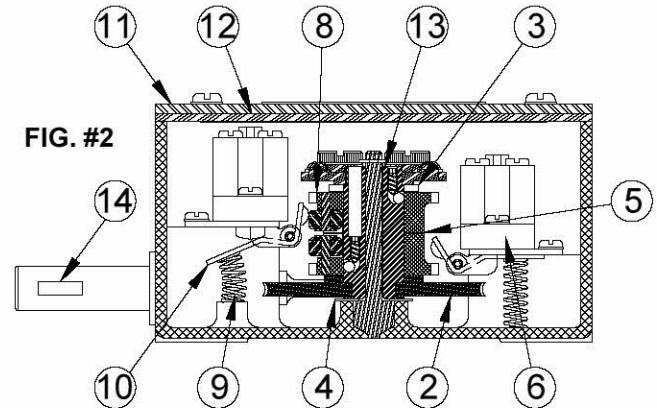
888 629-3592 Ex

WARNING:
 LOOSEN CAM SET SCREW
 BEFORE ADJUSTING OR
 DAMAGE OF CAMS WILL
 OCCUR

Contact positions shown are when
 cams ARE NOT actuating levers.



Nominal Input Shaft to Cam Ratio	Turns of Input Shaft			
	Maximum	Minimum	Over Travel	To Reset
5:1	4	1/8	1/8	1/16
10:1	8-1/2	1/4	1/4	1/8
20:1	17	1/2	1/2	1/4
30:1	26	1	3/4	3/8
40:1	35	1	1	1/2
60:1	53	2	2	3/4
80:1	72	2-1/2	2-1/2	1
120:1	108	3	3	1-1/2



DESCRIPTION

This rotary limit switch is designed to control the limits of travel of rotating reversing equipment.

The limit switch input shaft is connected to a worm gear. Adjustable self lubricating nylon roller-cams are concentrically mounted to the worm gear. These adjustable cams actuate the precision limit switches by utilizing a lever assembly.

INSTALLATION

This limit switch may be mounted in any convenient position. When installed, this limit switch will provide long life with a minimum amount of service maintenance.

The following recommendations will prove helpful:

1. Install the limit switch so that the shaft load will not exceed (5) five pounds.
2. A flexible coupling is recommended for all installations other than gear drive application.
3. Coupling should be employed in a manner that results in a minimum of thrust loading on the shaft. If switches are mounted with the shaft up or down, some additional thrust loading resulting from the weight of the shaft plus a very light coupling is permissible.
4. Whenever possible, a separate support bearing for the drive sprocket should be used.
5. Permissible speed of the input shaft is 2000 R.P.M.

LUBRICATION

This limit switch was lubricated at the factory and should not require lubrication for the life of the switch.

ADJUSTMENT

Refer to figure #1. The electrical switch units "G", "H", are shown with the contact positions assumed when the cams ARE NOT actuating the switch units.

When the cam rotates and actuates the switch, the "B" (closed) contact opens and the "A" (open) contact closes. Each precision switch has (1) one independent adjustable cam.

TO ADJUST SWITCH "G"

1. Loosen Red Set Screw
2. Turn "C" to Trip "G"
3. Tighten Red Set Screw

TO ADJUST SWITCH "H"

1. Loosen Blue Set Screw
2. Turn "D" to Trip "H"
3. Tighten Blue Set Screw

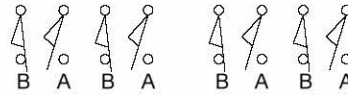
RENEWAL PARTS

When ordering renewal parts give this form No. PF-046, Item No., Description, Part No., Quantity, and the Complete Unit Number stamped on the label. Reference FIG. #1 and FIG. #2

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Case & Shaft Assembly		1
	5:1 Ratio	PSD-0091300-DN	
	10:1 Ratio	PSD-0091400-DN	
	20:1 Ratio	PSD-0091500-DN	
	30:1 Ratio	PSD-0091600-DN	
	40:1 Ratio	PSD-0091700-DN	
	60:1 Ratio	PSD-0091800-DN	
2	Cam Block & Worm Gear Assy.		1
	5:1 Ratio	PSD-0090500-DN	
	10:1 Ratio	PSD-0090600-DN	
	20:1 Ratio	PSD-0090700-DN	
	30:1 Ratio	PSD-0090800-DN	
	40:1 Ratio	PSD-0090900-DN	
	60:1 Ratio	PSD-0091000-DN	
3	Shim Cam Block (.080 Thick)	PS-0003300-A	1
	10:1 Ratio	PS-0000800-A	
	20:1 Ratio	PSD-0090700-DN	
	30:1 Ratio	PSD-0090800-DN	
	40:1 Ratio	PSD-0090900-DN	
	60:1 Ratio	PSD-0091000-DN	
	80:1 Ratio	PSD-0091100-DN	
4	Shim Cam Block (.020 Thick)	PS-0000800-A	1
	20:1 Ratio	PSD-0090700-DN	
	30:1 Ratio	PSD-0090800-DN	
5	Shim Cam Block (.016 Thick)	PS-0003200-A	2
	Limit Switch Standard SPDT	1950-1-B-A-DO	
6	Optional DPDT	1950-4-B-A-DO	...
	Optional SMSB	1950-1408	
7	Adjusting Bracket Assembly	PSD-0024600-B	1
8	Gear and Roller Assembly	PSD-0090400-A	2
9	Spring Compression	PM-0018000-A	2
10	Lever Assembly	PSD-0024400-A	2
11	Cover	PC-0069100-A	1
12	Cover Gasket	PS-0000900-A	1
13	Spacer Center Post	M-0073000-A	1
14	Woodruff Key (#404)	04-564019-DN	1

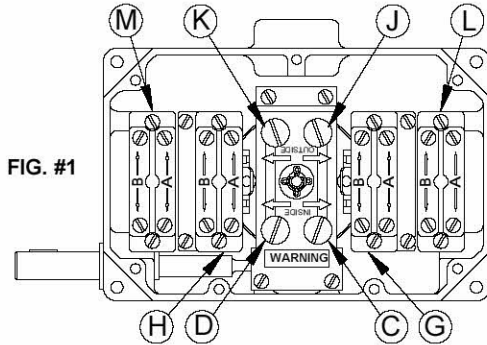
WARNING:
LOOSEN CAM SET SCREW
BEFORE ADJUSTING OR
DAMAGE OF CAMS WILL
OCCUR

Contact positions shown are when
cams ARE NOT actuating levers.
600 VOLT MAX.



DESCRIPTION

This rotary limit switch is designed to control the limits of travel of rotating reversing equipment. The limit switch input shaft is connected to a worm gear. Adjustable self lubricating nylon roller-cams are concentrically mounted to the worm gear. These adjustable cams actuate the precision limit switches by utilizing a lever assembly.



INSTALLATION

This limit switch may be mounted in any convenient position. When installed, this limit switch will provide long life with a minimum amount of service maintenance.

The following recommendations will prove helpful:

1. Install the limit switch so that the shaft load will not exceed (5) five pounds.
2. A flexible coupling is recommended for all installations other than gear drive application.
3. Coupling should be employed in a manner that results in a minimum of thrust loading on the shaft. If switches are mounted with the shaft up or down, some additional thrust loading resulting from the weight of the shaft plus a very light coupling is permissible.
4. Whenever possible, a separate support bearing for the drive sprocket should be used.
5. Permissible speed of the input shaft is 2000 R.P.M.

LUBRICATION

This limit switch was lubricated at the factory and should not require lubrication for the life of the switch.

ADJUSTMENT

Refer to figure #1. The electrical switch units "G", "H", "L" an "M" are shown with the contact positions assumed when the cams ARE NOT actuating the switch units.

When the cam rotates and actuates the switch, the "B" (closed) contact opens and the "A" (open) contact closes. Each precision switch has (1) one independent adjustable cam.

TO ADJUST SWITCH "M"

1. Loosen Red Set Screw
2. Turn "K" to Trip "M"
3. Tighten Red Set Screw

TO ADJUST SWITCH "L"

1. Loosen Blue Set Screw
2. Turn "J" to Trip "L"
3. Tighten Blue Set Screw

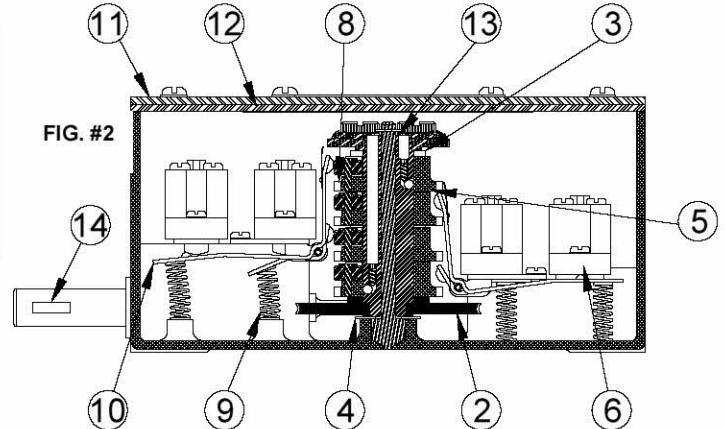
TO ADJUST SWITCH "H"

1. Loosen Green Set Screw
2. Turn "D" to Trip "H"
3. Tighten Green Set Screw

TO ADJUST SWITCH "G"

1. Loosen Yellow Set Screw
2. Turn "C" to Trip "G"
3. Tighten Yellow Set Screw

Nominal Input Shaft to Cam Ratio	Turns of Input Shaft			
	Maximum	Minimum	Over Travel	To Reset
5:1	4	1/8	1/8	1/16
10:1	8-1/2	1/4	1/4	1/8
20:1	17	1/2	1/2	1/4
30:1	26	1	3/4	3/8
40:1	35	1	1	1/2
60:1	53	2	2	3/4
80:1	72	2-1/2	2-1/2	1
120:1	108	3	3	1-1/2



RENEWAL PARTS

When ordering renewal parts give this form No. PF-046, Item No., Description, Part No., Quantity, and the Complete Unit Number stamped on the label. Reference FIG. #1 and FIG. #2

ITEM	DESCRIPTION	PART NUMBER	QTY		
1	Case & Shaft Assembly		1		
	5:1 Ratio	PSD-0092400-DN			
	10:1 Ratio	PSD-0092500-DN			
	20:1 Ratio	PSD-0092600-DN			
	30:1 Ratio	PSD-0092700-DN			
	40:1 Ratio	PSD-0092800-DN			
	60:1 Ratio	PSD-0092900-DN			
	80:1 Ratio	PSD-0093000-DN			
2	Cam Block & Worm Gear Assy.		1		
	5:1 Ratio	PSD-0093500-DN			
	10:1 Ratio	PSD-0093600-DN			
	20:1 Ratio	PSD-0093700-DN			
	30:1 Ratio	PSD-0093800-DN			
	40:1 Ratio	PSD-0093900-DN			
	60:1 Ratio	PSD-0094000-DN			
	80:1 Ratio	PSD-0094100-DN			
3	Shim Cam Block (.080 Thick)	PS-0003300-A	1		
	Shim Cam Block (.020 Thick)	PS-0000800-A			
	Shim Cam Block (.016 Thick)	PS-0003200-A			
	Limit Switch Standard SPDT	1950-1-B-A-DO		4	
		Optional DPDT			1950-4-B-A-DO
	Optional SMSB	1950-1408		...	
	7	Adjusting Bracket Assembly		PSD-0024700-B	1
	8	Gear and Roller Assembly		PSD-0090400-A	4
	9	Spring Compression		PM-0018000-A	4
	10	Lever Assembly		PSD-0024500-A	2
	11	Cover		PC-0069200-A	1
	12	Cover Gasket		PS-0001000-A	1
	13	Spacer Center Post		M-0073000-A	1
	14	Woodruff Key (#404)		04-564019-DN	1