

POWER OFF

Remove all power from master switch before providing service or repairs.

I. Mounting

Mounting brackets are incorporated at the base of the master switch on Nema 1 enclosures for floor type mounting; (4 .344" diameter holes are provided.) A 1-1/4" conduit opening is located at the base of the switch. For open type or desk mounting, use the four counter-sunk .219" diameter holes located on the Intermediate Plate (1).

IIA. Handle Arrangement

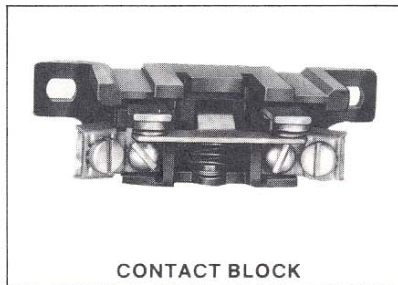
Handle arrangement can be changed from STANDARD RIGHT HAND MASTER to LEFT HAND MASTER by the following method:

- 1) Remove four mounting screws (27) and take off cover (28).
- 2) Remove one stop screw (61) on gear box (3).
- 3) Remove four gear box mounting screws (4).
- 4) Turn Handle 90°.
- 5) Remove one spring pin (63) inside gear housing on operating shaft. Drive the gear spring pin (63) 5/8" deep into the gear hub to clear operating shaft.
- 6) Pull out handle and shaft, (while holding gear), from gear housing.
- 7) Reposition gear, (spring pin up), for standard left hand arrangement. Insert handle and shaft. Align hole in shaft and gear, and drive spring pin into shaft, (1/16" below gear hub diameter).
- 8) Install Spring pin (63) into hole in operating shaft.
- 9) Apply loctite to threads on stop screw (61). Install stop screws into gear housing.

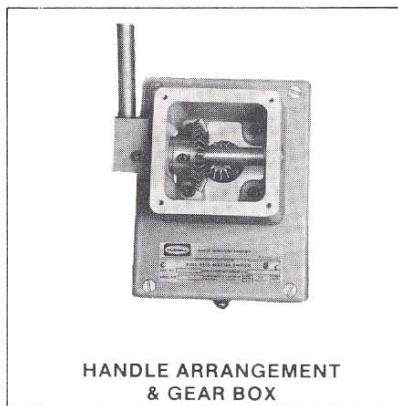
NOTE "A"

Handle should be in the up-right position and the switch in the off-point position. This insures proper cam to handle orientation.

- 10) Reinstall gear box assembly on master switch to new position.



CONTACT BLOCK



HANDLE ARRANGEMENT & GEAR BOX

Tighten four mounting screws (4).

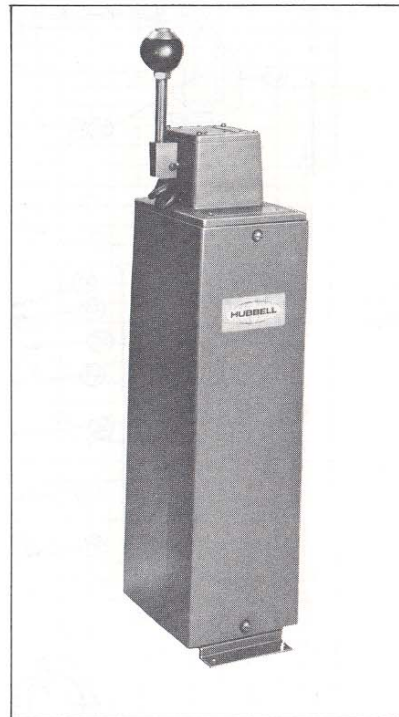
- 11) Install cover (28) and tighten four mounting screws (27).

IIB. Auxiliary Pushbutton Handle Arrangement

The Master Switch handle can be changed from standard right hand to left hand operation only! For 90° rotation, turn Master Switch enclosure 90°.

The Master Switch must be removed from the enclosure or desk. Follow Part IV instructions for changing cams, (1 thru 6), and continue:

- 1) Disconnect switch wires from terminal block (12), cut off "push-on" terminals from wires. (Follow IIA HANDLE ARRANGEMENT instructions 1 thru 9).
- 2) Feed handle cable through intermediate plate (1) and hole in main frame (10); (See Note "A").
- 3) Align cable and gear box (3) on master switch and tighten four mounting screws (4).



- 4) Install cover (28) and tighten four mounting screws (27).

- 5) Install new "crimp-on" terminals on handle wires and connect terminals to block (12).

- 6) Install Master Switch into enclosure or desk, and follow Part IV instructions 1 thru 6 in reverse order to assemble Master Switch.

III. Gear Box Assembly

NOTE "B"

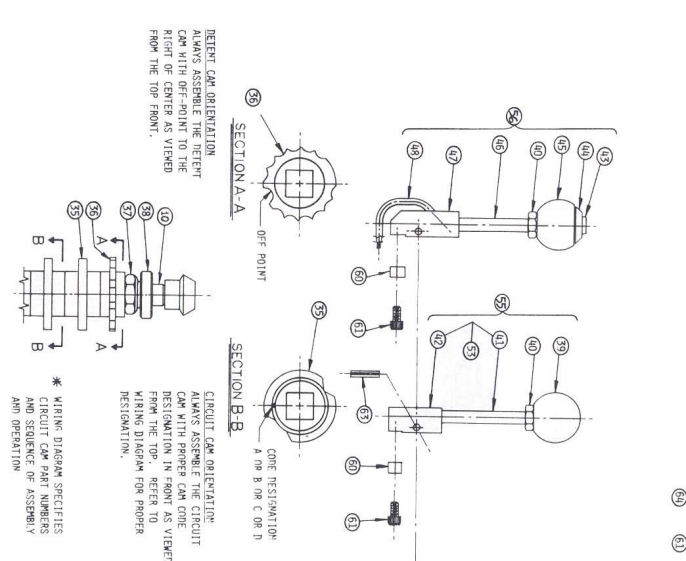
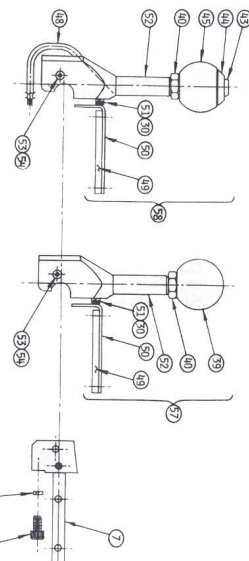
The gear box (3) can be repositioned from standard right hand to left hand operation when contact sequence is identical for forward and reverse. This can be accomplished by rotating the gear box only, and interchanging electrical connections 1F and 1R on contact blocks (14).

CAUTION: Remove all power from Master Switch before interchanging electrical connections.

The gear box assembly can be repositioned to one of the alternate 90° locations by the following method:

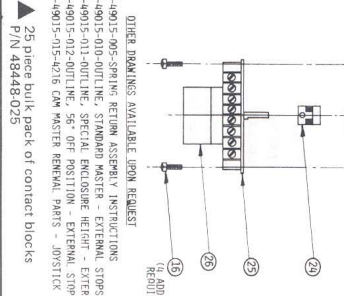
CAUTION: Be sure that the switch is in off-point position prior to repositioning the gear box assembly. The detent follower must be engaged with the off-

(Continued on last page)



UPPER PORTION MAIN SHAFT ASSEMBLY (TYPICAL)

Table with columns: ITEM, PART NO., DESCRIPTION, STANDARD SPEED POINTS (1-5), SPECIAL SPEED POINTS (6-12), and additional numerical data.



RETURN CAM ORIENTATION: ALWAYS ASSEMBLE THE RETURN CAM WITH THE SPRING ON THE BACK SIDE OF THE CAM. REFER TO WIRING DIAGRAM FOR PAPER RESIGNATION.

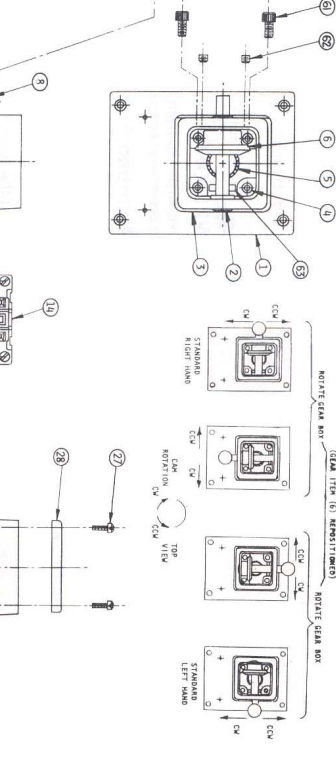
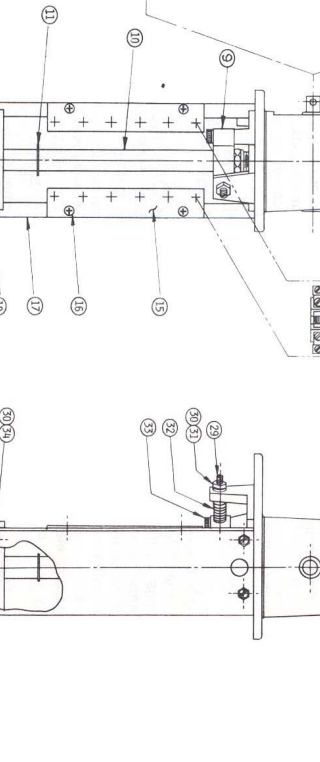
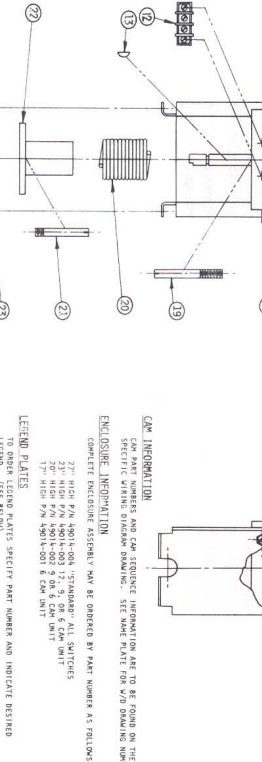


Table with columns: ITEM, PART NO., DESCRIPTION, and various numerical data.

OTHER DRAWINGS AVAILABLE UPON REQUEST: C-49015-010-SPRING, RETURN ASSEMBLY INSTRUCTIONS; C-49015-011-OUTLINE, STANDARD MASTER - EXTENSION; C-49015-012-OUTLINE, SPECIAL ENCLOSURE HEIGHT - EXTERNAL STOPS; D-49015-015-0218 CAM MASTER RENTAL PARTS - JUSTICE PIN 48484023

Table with columns: ITEM, PART NO., DESCRIPTION, and various numerical data.

Items 19-22 not sold separately, available in kits 48018-201, 48018-202, 48018-203 or 48018-204. See following page for more information.

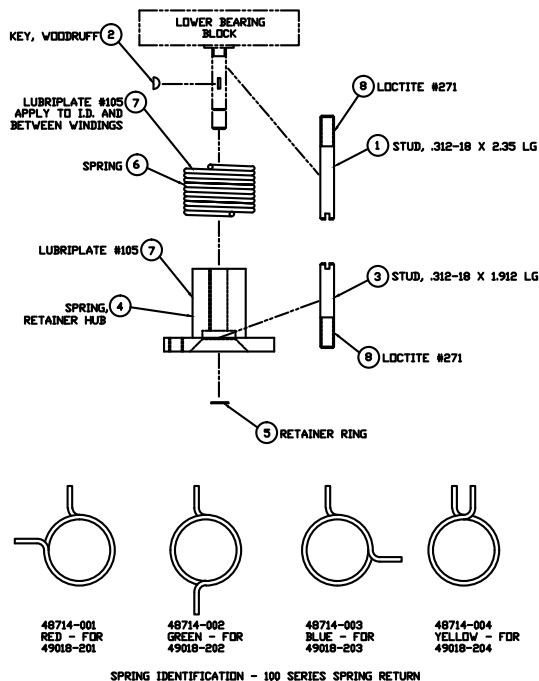
Pub 105-1 Installation Instructions for 200 Series Spring Return

FIRST USE THE SELECTION GUIDE BELOW TO DETERMINE THE CORRECT SPRING RETURN UNIT FOR YOUR SWITCH. SPRING RETURN UNITS DIFFER ONLY BY THE SPRING USED. EACH SPRING MAY BE IDENTIFIED BY THE COLOR CODE OR BY THE IDENTIFICATION CHART.

YOU MUST KNOW THE CAM AND CONTACT GROUP PART NUMBER TO BE ABLE TO DETERMINE THE CORRECT SPRING RETURN UNIT.

THE BASE CAM & CONTACT GROUP PART NUMBER MAY BE FOUND AT THE TOP OF ONE OF THE FOUR COLUMNS IN THE SPRING RETURN UNIT SELECTION GUIDE ----- FOLLOW DOWN THE SUFFIX COLUMN TO YOUR CAM & CONTACT GROUP SUFFIX NUMBER. READ ACROSS TO THE BASE PART NUMBER COLUMN AND READ YOUR CORRECT SPRING RETURN UNIT AT THE INTERSECTION OF THE TWO COLUMNS.

ie. 1 CAM & CONTACT GROUP P/N 49011-007 USES SPRING RETURN UNIT P/N 49018-202 AND BY USING THE ITEM 6 IDENTIFICATION CHART YOU SEE THAT THE GREEN SPRING P/N 48714-002 IS THE CORRECT SPRING.



SEE SHEET A-49015-006 AND 49015-007 FOR SPRING RETURN UNIT SELECTION GUIDE

ALL DIMENSIONS IN INCHES 1=4

PERCAUTIONARY NOTE :

BE SURE THAT THE BOSS ON THE MAIN SHAFT EXTENDS DOWN BEYOND THE SURFACE OF THE LOWER BEARING BLOCK APPROX. 1/16". IF THE BOSS ON THE MAIN SHAFT EXTENDS DOWN BELOW THE BEARING BLOCK 1/4", AS IT DID ON SOME 'EARLY UNITS' SHIPPED EARLY 1980 AND PRIOR, THE 100 SERIES SPRING RETURN UNIT WILL NOT FIT AND SPRING RETURN P/N 49018-000 MUST BE ORDERED. HOWEVER, IF YOUR SWITCH REQUIRES SPRING RETURN UNIT P/N 49018-203 OR P/N 49018-204, THE 49018-000 SPRING RETURN UNIT WILL NOT OPERATE PROPERLY. IN THIS CASE A NEW MAIN SHAFT MUST BE INSTALLED AND 100 SERIES SPRING RETURN UNIT MAY THEN BE USED.

1. APPLY ITEM 8 (LOCTITE #271) TO ITEM 1 (STUD) AND THREAD INTO LOWER BEARING BLOCK - TIGHTEN.
2. SLIDE ITEM 4 (HUB) ONTO SHAFT AS FAR AS IT WILL GO. ROTATE HUB A FULL 360°, THERE MUST BE NO INTERFERENCE BETWEEN STUD AND HUB. IF ANY INTERFERENCE OCCURS BETWEEN THE STUD AND THE HUB, THE END OF THE STUD MUST BE FILED UNTIL NO INTERFERENCE OCCURS.
3. APPLY ITEM 8 (LOCTITE #271) TO ITEM 3 (STUD) AND THREAD INTO SPRING RETURN HUB - TIGHTEN.
4. SLIDE HUB ONTO SHAFT AS FAR AS IT WILL GO. ROTATE HUB A FULL 360°, THERE MUST BE NO INTERFERENCE BETWEEN THE STUD AND THE LOWER BEARING BLOCK. IF ANY INTERFERENCE OCCURS BETWEEN THE STUD AND THE LOWER BEARING BLOCK THE END OF THE STUD MUST BE FILED UNTIL NO INTERFERENCE OCCURS.
5. INSTALL ITEM 2 (WOODRUFF KEY) IN SHAFT AND TAP IN PLACE WITH A PLASTIC OR RAWHIDE MALLET IF NECESSARY. DO NOT USE A STEEL HAMMER ON KEY.
6. SLIDE HUB ON SHAFT OVER THE WOODRUFF KEY TO BE SURE THAT THERE IS NO INTERFERENCE. REMOVE HUB.
7. APPLY GENEROUS AMOUNT OF ITEM 7 (LUBRIPLATE #105) TO THE INSIDE AND BETWEEN WINDINGS OF THE ITEM 6 (SPRING). A TUBE OF LUBRIPLATE #105 IS PROVIDED FOR THIS PURPOSE.
8. SLIDE THE SPRING OVER THE HUB. WITH THE SPRING IN THE LEFT HAND AND THE HUB IN THE RIGHT HAND, ROTATE THE HUB CLOCKWISE UNTIL THE SPRING TAB NEAREST THE HUB FLANGE ENGAGES WITH THE STUD ON THE HUB.
9. SLIDE THE HUB AND SPRING ONTO THE SHAFT UP TO THE WOODRUFF KEY. ROTATE THE HUB AND SPRING CLOCKWISE UNTIL THE SPRING TAB NEAREST THE LOWER BEARING BLOCK ENGAGES WITH THE STUD ON THE BEARING BLOCK AND CONTINUE TO ROTATE CLOCKWISE UNTIL THE HUB KEYWAY ALIGNS ITSELF WITH THE WOODRUFF KEY ON THE SHAFT. PUSH THE HUB AND SPRING ONTO THE SHAFT AS FAR AS IT WILL GO.
10. INSTALL ITEM 5 (RETAINING RING) USING A TRUARC 0200 PLIER OR EQUIVALENT TOOL.
11. USING THE MASTER SWITCH HANDLE OPERATE THE MASTER THRU ALL SPEED POINTS IN BOTH DIRECTIONS. BE SURE THAT NO INTERFERENCE OCCURS BETWEEN THE SPRING TABS AND THE SIDE OF THE MAIN FRAME. IF INTERFERENCE DOES OCCUR THE SPRING MUST BE REMOVED FROM THE SWITCH AND THE EXCESSIVE MATERIAL MUST BE REMOVED FROM THE END OF THE SPRING TABS. CAUTION - DO NOT REMOVE MORE MATERIAL THAN NECESSARY TO PROVIDE CLEARANCE.

* Part Numbers are for reference only and not available as individual items.

49018-201	49018-202	49018-203	49018-204
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ITEM	DESCRIPTION	* PART NO.	DWG. NO.	QTY			
1	STUD, .312-18 X 2.350 LG	48631-001	T163 (71)	1	1	1	1
2	KEY, WOODRUFF #303	57458-008	A-57458	1	1	1	1
3	STUD, .312-18 X 1.912 LG	48630-001	T163 (70)	1	1	1	1
4	SPRING, RETAINER HUB	48498-002	A-48498-002	1	1	1	1
5	RETAINER RING .375 EXT	57429-019	A-57429	1	1	1	1
6	SPRING, RED	48714-001	B-48714	1			
	SPRING, GREEN	48714-002	B-48714		1		
	SPRING, BLUE	48714-003	B-48714			1	
	SPRING, YELLOW	48714-004	B-48714				1
7	LUBRIPLATE #105 3/8 OZ CAPSULE	47239-048	C-47239	1	1	1	1
8	LOCTITE #271 0.5 ML CAPSULE	47239-008	C-47239	1	1	1	1



(Continued from front page)

point on the detent cam to insure proper cam-to-handle orientation.

- 1) Remove cover (28) by removing four screws (27).
- 2) Remove four socket head screws (4), lift gear box assembly, and rotate in 90° increments to one of the alternate positions.

(SEE NOTE "B")

- 3) Set housing down in new position and re-install four socket head cap screws (4).

CAUTION: Be sure that handle is in the up-right position and the switch is in the off-point position to insure proper cam-to-handle orientation.

IV. Changing Cams

- 1) Remove all power to Master Switch.
- 2) Remove Circuit Blocks and Switch Mounting Plates (14) and (15) by removing required number of screws (16). IT IS NOT NECESSARY TO DISTURB EXISTING WIRING.
- 3) Customer wiring must be disconnected from terminal block (12) if switch is equipped with auxiliary pushbutton handle.
- 4) Disconnect customer wiring if switch is equipped with potentiometer module (25).
- 5) Remove four screws securing intermediate plate (1).
- 6) Remove Master Switch from enclosure or desk mounting.
- 7) If Switch is equipped with potentiometer module (25), it must

be removed prior to main shaft (10) removal. It is not necessary to remove the potentiometer coupling (24) from the main shaft (10).

- 8) Remove detent cam compression spring (32).
- 9) Remove four screws (34) and lockwashers (30) which secures lower bearing block (18).
- 10) Remove the main shaft assembly from the main frame (17).
- 11) Remove pinion (5) off top of main shaft (10).
- 12) Remove upper bearing (38).
- 13) Remove locknut (37) that secures detent cam (36) and circuit cams (35).

CAUTION: Observe the orientation and order of assembly of detent cam (36) and circuit cams (35).

- 14) Refer to cam coding on wiring diagram for proper cam orientation.
- 15) Re-assemble the Master Switch. The handle should be in an up-right position with the main shaft in the off point position to insure proper cam-to-handle orientation.

V. Adjusting Potentiometer Assembly (25)

(For Stepless Application)

- 1) Remove all power to Master Switch.
- 2) Remove wires #2 & 4 on Potentiometer Assembly (25) Terminal Board.

- 3) Remove 4 flat head screws from Intermediate Plate (1).
- 4) Lift and tilt the Master Switch so the bottom of switch (Potentiometer Assembly) clears the Housing. Support the tilted switch.
- 5) Attach Ohm Meter leads to Potentiometer Assembly Terminals #2 & 4.
- 6) Move handle from STOP to STOP in opposite directions.
Record the Ohmic Value. Loosen two locking screws, (do not remove), on bottom of Circuit Board. Rotate handle on switch to stop position and rotate potentiometer until ohmic value is equal in both directions. Secure two locking screws. Check Ohmic Value again in both directions.
- 7) Re-assemble Master in reverse order.

VI. Lubrication

Your Euclid Type 4216 Mill Master Switch is equipped with double sealed and lubricated ball bearings on the main shaft and oilite bronze sleeve bearings impregnated with oil on the operator shaft. While the sealed ball bearings do not require lubrication maintenance, the oilite bearings may be lubricated periodically with an SAE30 non-detergent oil.

The pinion-bevel gear combination should be inspected on a regular basis, and lubricated with an NLGI #1 grease such as Lubriplate #107 or equivalent.

Electrical Ratings									
Electrical Contacts are rated in accordance with NEMA Standard ICS-2-125 (B600 and N600 Table Rating)									
AC	Maximum Continuous Amperes	Maximum Make and Break Current — Amperes							
		120V		240V		480V		600V	
		Make	Break	Make	Break	Make	Break	Make	Break
B600	5	30	3	15	1.5	7.5	.75	6	.6
DC	Maximum Continuous Amperes	Maximum Make and Break Current — Amperes							
		125V		250V		301V to 600V			
		Make	Break	Make	Break	Make	Break	Make	Break
N600	10	2.2	2.2	1.5	1.5	0.4		0.4	



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