

INTEGRATED UNDERSPEED MONITOR

O.M. 21431

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WARNING

Do not proceed with these instructions* until you have READ the orange cover of this MANUAL and YOU UNDERSTAND its contents.

These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.

***If you are using a Clemco Distributor Maintenance and Part Guide, refer to the orange warnings insert preceding the Index before continuing with the enclosed instructions.**

Electronic files include a Preface containing the same important information as the orange cover.

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Blast Facilities
by Clemco Industries Corp.

1.0 INTRODUCTION

1.1 **Scope:** These instructions cover the installation, adjustments, and replacement parts of the integrated underspeed monitor (proximity switch) used with Clemco bucket elevator recovery systems.

1.2 Safety Alerts

1.2.1 Clemco uses safety alert signal words, based on ANSI Z535.4-1998, to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:



This is the safety alert symbol. It is used to alert the user of this equipment of potential personal injury hazards.

Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

1.3 **General Description:** The illustration in Figure 1 shows the monitor assembly installed on a front feed bucket elevator. The monitor detects the motion of the elevator bottom (idler) pulley. It is designed to shut off the bucket elevator motor in the event the speed of the bottom pulley drops below the monitor's set RPM. This will prevent burn-through, and component damage in the event of an obstruction, jam, or belt slippage, in the bucket elevator.

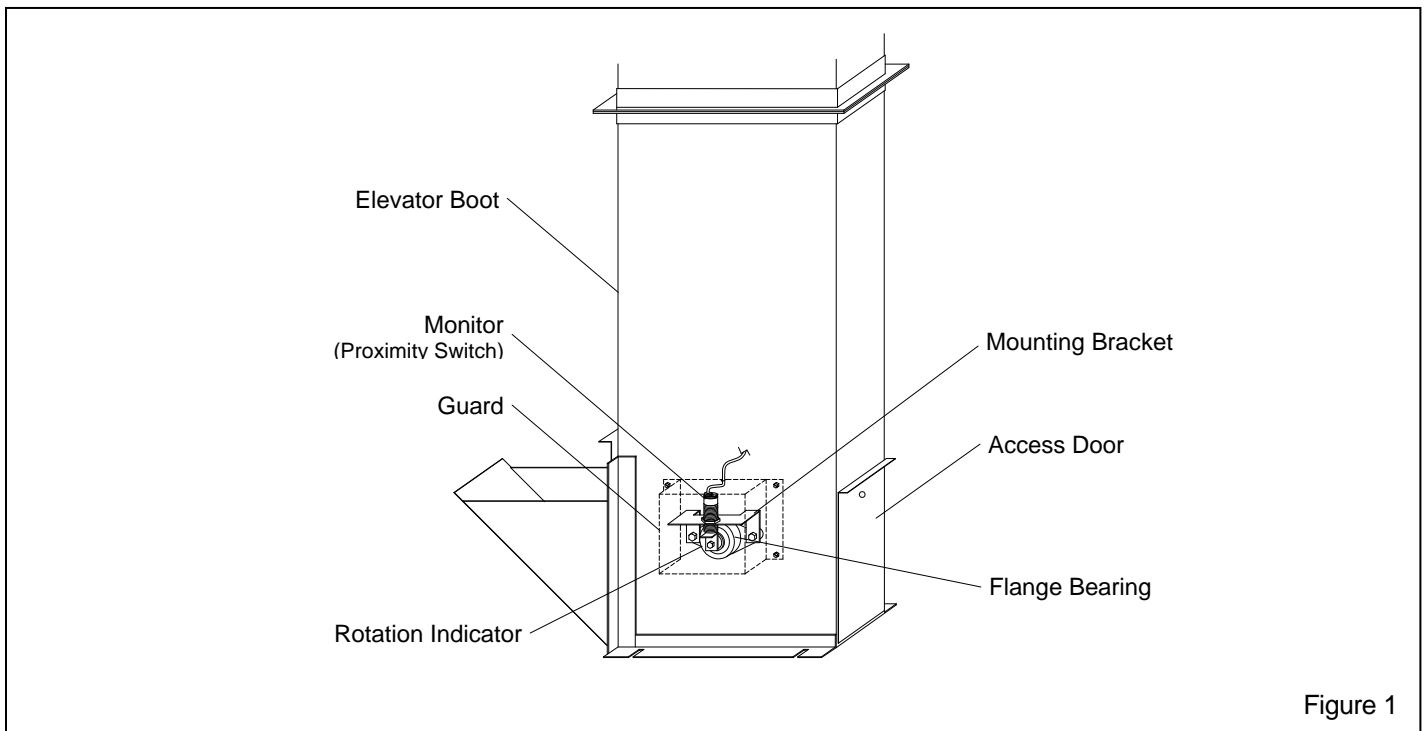


Figure 1

2.0 INSTALLATION
Refer to Figure 2

⚠ WARNING

Lockout and tagout electrical power before beginning the installation. Failure to do so could result in serious injury or death from electrical shock. Failure to lockout and tagout power enables unexpected starting of the elevator, causing severe injury if limbs or objects are caught or pinched in moving parts of the elevator.

2.1 Remove the elevator boot access door to reach the flange bearing mounting screw heads.

2.2 When replacing an old style monitor, remove the old proximity switch, mounting bracket, and rotation indicator from the lower elevator shaft, and the timer from the 8-pin socket located in the electric control panel. The socket will be reused for the new relay.

NOTE: The shaft on new elevators and replacement shafts are pre-drilled and tapped; steps in Paragraphs 2.3 and 2.4 are not required if the shaft is predrilled.

2.3 Drill a 0.257" hole, 1-1/4" deep on the bottom pulley shaft centerline. This step is not required for replacement monitors.

2.4 Tap the hole to a depth of 1" with a 5/16-18 NC thread. This step is not required for replacement monitors.

2.5 Install the rotation indicator using the 5/16 hex head cap screw and lock washer. Tighten hand tight only.

2.6 Use existing fasteners to install the mounting bracket on the flange bearing. Tighten securely.

2.7 Install the monitor onto the bracket as shown.

2.8 Rotate the bottom pulley or rotation indicator tab until the tab is facing the monitor as shown in figure 3.

2.9 Adjust the two nuts on the monitor so the distance between the monitor end and indicator tab is approximately 1/16", or as close as possible without touching, and a maximum gap of 1/8", as shown in Figure 3.

2.10 Tighten the adjusting nuts on the monitor, and the cap screw holding the rotation indicator.

2.11 Recheck the gap; make sure it is approximately 1/16" and that the rotation indicator tab clears the monitor as it moves pass.

2.12 Place the guard over the monitor as shown in Figure 1. If the elevator boot does not have mounting holes, hold the guard in position and match drill the holes.

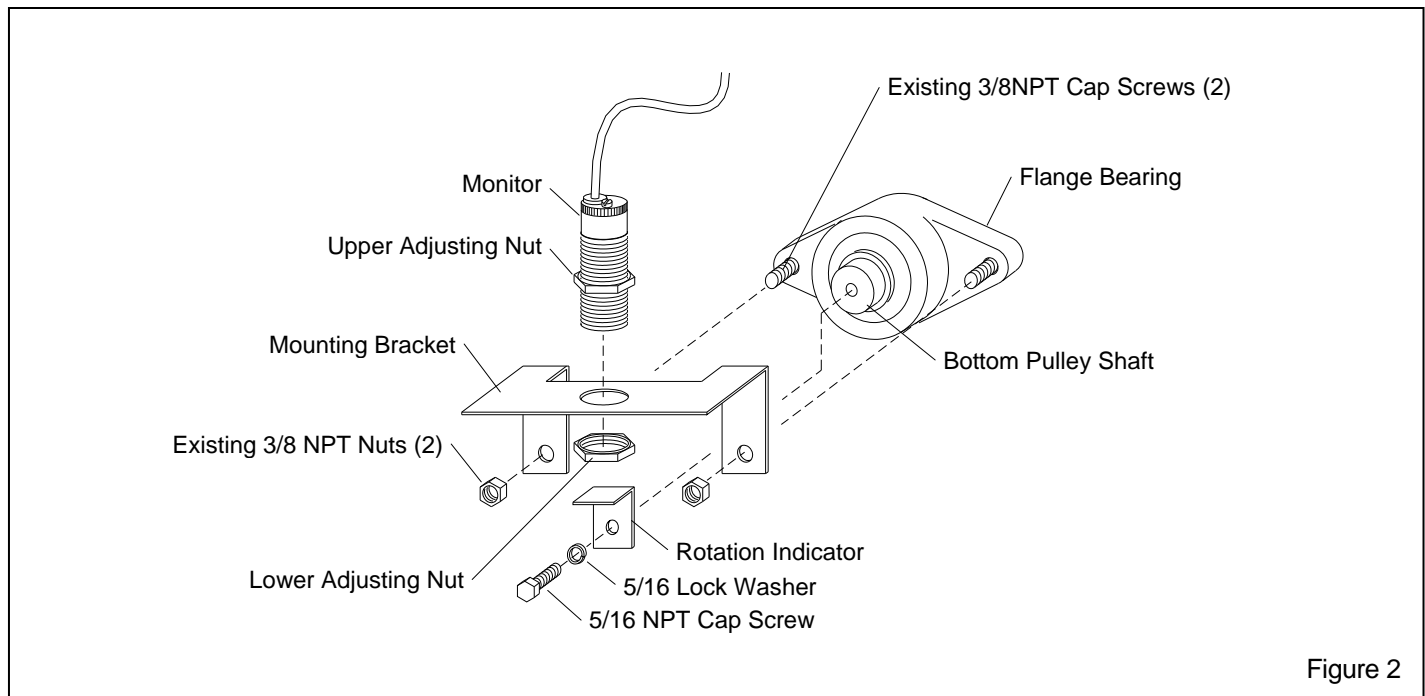


Figure 2

2.13 After the wiring is completed, and adjustments described in section 4.0 are completed, use sheet metal screws to attach the guard. Make sure the monitor lead cord goes through the hole in the top of the guard and that it is not pinched.

2.14 Install the bucket elevator access door.

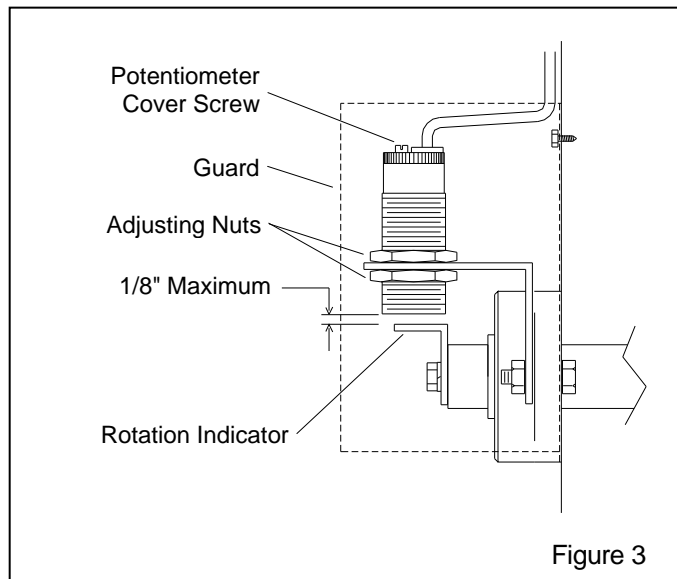


Figure 3

3.0 WIRING

CAUTION

The maximum load rating for the monitor is 0.2 amps. Damage to the monitor will occur if the load rating is exceeded. The monitor must be wired through a relay, not directly to the motor coil.

3.1 Run separate conduit for the monitor lead.

3.2 Wire the monitor to the elevator motor coil relay as shown in the wiring schematic with the job, or as shown in Figure 4 on Page 4. **NOTE: If other recovery components are used in conjunction with the bucket elevator, the monitor should be wired to shut-down the entire system. Doing so will prevent overloading any component if the elevator shuts-down.**

4.0 POTENTIOMETER ADJUSTMENT

4.1 The potentiometer adjusts the time-delay from when the indicator passes the monitor and the elevator shuts-down.

4.2 To gain access to the potentiometer, remove the cover screw located next to the lead cord entry point.

4.3 Using the special screwdriver provided, turn the potentiometer 20 full turns counter-clockwise. If the screwdriver is misplaced, use a small screw driver that is no wider than 3/32".

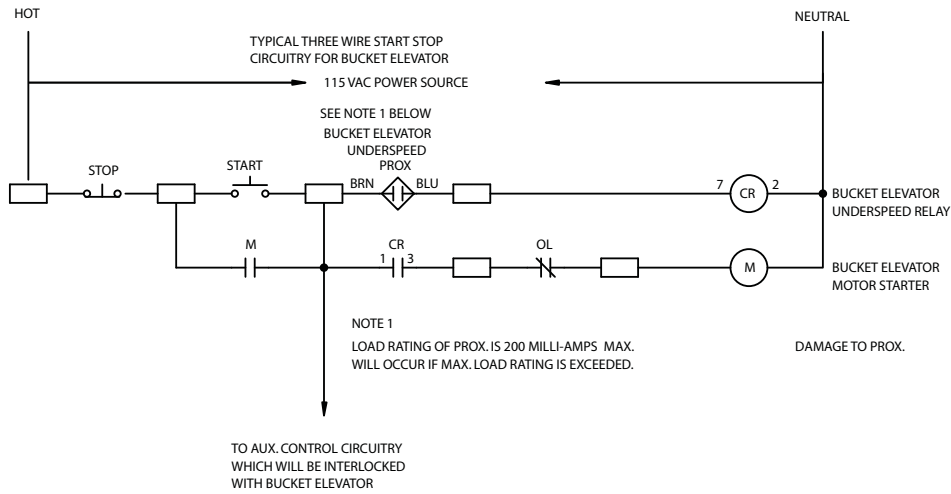
4.4 Start the elevator. Gradually turn the potentiometer clockwise until the elevator shuts down.

4.5 Turn the potentiometer only a few degrees counter-clockwise. Start the elevator and let it run for approximately one minute, and then turn the potentiometer very slowly clockwise until the elevator shuts down. Then, slowly turn the potentiometer from run to shutdown several times to find the trip point. A slipping belt should trip the switch, for that reason the setting should be no higher than needed to keep the elevator running.

4.6 Install the potentiometer cover screw.

5.0 REPLACEMENT PARTS

Item	Description	Stock No.
(-)	Underspeed Monitor Assembly	20217
1.	Monitor ,integrated prox.	21365
2.	Rotation indicator	21369
3.	Mounting bracket.....	21366
4.	Socket, 8 pin.....	12164
5.	Guard.....	21367
6.	Relay, 120 v, dpdt	12046



ITEM	STOCK NO.	DESCRIPTION	QUAN.
CUSTOMER PROVIDED ITEMS			
M		MOTOR STARTER	REF
OL		OVERLOAD FOR MOTOR STARTER	REF
START PB		NORMALLY OPEN FLUSH PUSH BUTTON	REF
STOP PB		NORMALLY CLOSED RED EXTENDED HEAD PB	REF
TERMINALS		TERMINALS PER CUSTOMER APPLICATION	REF

ITEMS PROVIDED WITH BUCKET ELEVATOR			
PROX.	21365	UNDERSPEED PROX	1
RELAY SOC.	12164	8 PIN RELAY SOCKET OCTAL	1
CR	12046	2 POLE DOUBLE THROW 120VAC OCTAL RELAY	1

SYMBOLS	DISCRIPTIONS
 BUCKET ELEVATOR UNDERSPEED PROX	BUCKET ELEVATOR UNDERSPEED PROX. PROVIDED WITH BUCKET ELEVATOR NOTE: UNDERSPEED PROX. MUST ALWAYS BE WIRED ONLY TO RELAY COIL. LOAD RATING OF PROX. IS 200 MILLI-AMPS MAX. WILL OCCUR IF MAX. LOAD RATING IS EXCEEDED. DAMAGE TO PROX.
 STOP	NORMALLY CLOSED RED EXTENDED HEAD PUSH BUTTON PROVIDED BY CUSTOMER.
 START	NORMALLY OPEN GREEN OR BLACK FLUSH HEAD PUSH BUTTON PROVIDED BY CUSTOMER.
	2 POLE DOUBLE THROW OCTAL 8PIN RELAY 120VAC 8 PIN OCTAL RELAY SOCKET PROVIDED ON ELEVATOR
	NORMALLY OPEN CONTACT PART OF CR RELAY
	NORMALLY OPEN CONTACT PART OF M MOTOR STARTER
	COIL TO MOTOR STARTER FOR BUCKET ELEVATOR. PROVIDED BY CUSTOMER.
	MOTOR STARTER OVERLOAD RELAY CONTACT. OVERLOAD RELAY NORMALLY LOACTED ON STARTER. HEATER FOR OVERLOAD SHOULD BE SIZED ACCORDING TO NFPA 70, 1993 NATIONAL ELECTRICAL CODE, ARTICLE 430
	TERMINALS PROVIDED BY CUSTOMERS

Figure 4