



EQUIPMENT SALES | PARTS | MANUFACTURING

USER'S OPERATION MANUAL

CUSTOMER: _____

S/O#: _____

SERIAL #: _____

MODEL: **JM-CG-D-GV2**

CONTROLLER: **665 LCD JMGV 2_41.TXT**

ELECTRICAL (CONTROL): _____

ELECTRICAL (MOTOR): _____

AIR PSI: **80 PSI**

SPECIAL FEATURES:

JEM International
Phone: 913-441-4788

6873 Martindale
Fax: 913-441-1711

Shawnee, Kansas USA 66218-9354
email: info@jemscales.com

CONTROL WIRE COLOR CODE

RELAY CONTROL WIRES

SCALE HOUSING

CONTROL PANEL

L.....	BLACK
N.....	WHITE
1.....	RED
2.....	BLUE
5.....	ORANGE
7.....	RED/BLACK
GROUND.....	GREEN

SCR / VIBRATOR CONTROL WIRES

CONTROL PANEL J11

SCALE HOUSING

+5V.....	RED.....	A
GND.....	BLACK.....	B
IO2.....	WHITE.....	D
IO1.....	GREEN.....	E

PASSCODE PROTECTION FORMAT
FOR 663 AND 665 PROCESS CONTROLLERS

THE FOLLOWING PARAMETERS WILL NOT BE PROTECTED AND WILL BE AVAILABLE TO THE OPERATOR:

- PRODUCT NUMBER
- FINAL TARGET WEIGHT
- SLOW FILL WEIGHT
- FREE FALL WEIGHT

THE FOLLOWING PARAMETERS WILL BE PROTECTED AND WILL NOT BE AVAILABLE TO THE OPERATOR:

- START FILL DELAY
- AUTO FREE-FALL ON/OFF
- AUTO FREE-FALL START COUNTER
- AUTO FREE-FALL FREQUENCY COUNTER
- AUTO ZERO ON/OFF
- AUTO ZERO START COUNTER
- AUTO ZERO FREQUENCY COUNTER
- TOLERANCE ON/OFF
- +TOLERANCE
- - TOLERANCE
- TOLERANCE CHECK COUNTER
- MASTER CYCLE COUNT

THE FOLLOWING PARAMETERS WILL BE PROTECTED AND WILL NOT BE AVAILABLE TO THE OPERATOR. PARAMETERS THAT WILL BE DISPLAYED, DEPENDS ON THE MODEL OF SCALE PURCHASED:

- FAST FILL BELT SPEED
- SLOW FILL BELT SPEED
- FAST FILL AUGER SPEED
- SLOW FILL AUGER SPEED
- FAST FILL GATE POSITION
- SLOW FILL GATE POSITION
- DISCHARGE DURATION
- CLAMP RELEASE DELAY
- MULTI-DUMP ON/OFF
- MULTI-DUMP CYCLE COUNTER

To access the protected parameters from the MAIN MENU screen, press F5 and key in 4787. The MASTER PASSWORD is 4787 and will always allow access to the PARAMETERS. You can create a four digit user password by typing in "9999" at the password prompt and following the on screen instructions. Use "4787" as the OLD PASSWORD.

SUMMING and LOAD CELL COLOR CODE CHART FOR CM-780 and JM scales with 600 SERIES CONTROLLERS

LOAD CELL

+EXC.....RED
-EXC.....BLACK
+SIG.....GREEN
-SIG.....WHITE
SHLD.....BARE

SUMMING CABLE

+EXC.....RED
+SEN.....BLUE
-EXC.....BLACK
-SEN.....YELLOW
+SIG.....GREEN
-SIG.....WHITE
SHLD.....BARE

600 SERIES CONTROLLER

+EXC.....RED
-EXC.....BLACK
+SIG.....GREEN
-SIG.....WHITE
+SEN.....BLUE
-SEN.....YELLOW
SHD.....BARE

**NOTE: +SEN and -SEN ARE FOR OPTIONAL USE AND SHOULD
ALWAYS BE USED WHEN THE SUMMING CABLE LENGTH IS
GREATER THAN TWENTY-FIVE FEET**

OHMING OF LOAD CELLS

RESISTANCE IN 1K OHMS	LOAD CELL CAPACITY IN POUNDS				
	25#	50#	150#	250#	500#

RED	BLACK	.391	.376	.384	.401	.401
RED	GREEN	.284	.276	.280	.289	.288
RED	WHITE	.284	.276	.280	.289	.288
BLACK	GREEN	.284	.276	.280	.289	.288
BLACK	WHITE	.284	.276	.280	.289	.288
GREEN	WHITE	.351	.351	.351	.351	.351

NOTE: Readings need to be taken with the load cell disconnected from summing box and removed from its working location so that the load cell is free from any stress points. This must be done to provide proper readings.

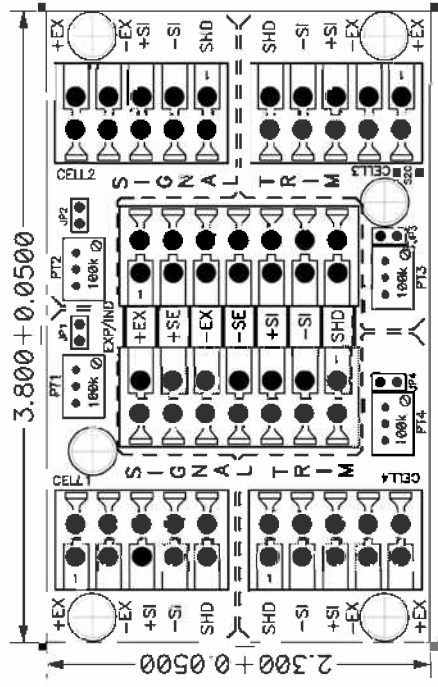
1. Turn power off to controller
2. Disconnect load cells from the summing box.
3. Disconnect the weigh hopper from the load cells by removing the 3/8" cap bolt from the rod-heim joint
4. Have an air gap between the load cell and the rod-heim joint
5. Follow the OHM chart for given capacity of load cell you are checking
6. Set meter to read in 1K
7. All readings must be within 10% of chart
8. The .289 readings can be within the 10% but all four should be the same

FABRICATION NOTES:

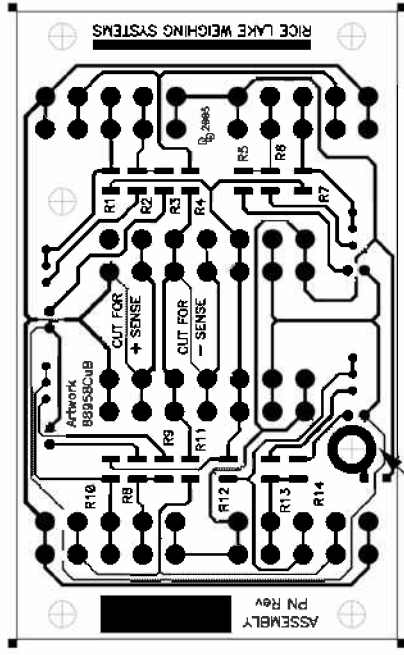
1. BASE MATERIAL SHALL BE LAMINATED EPOXY TYPE G10 OR FR4 0.062 +/- .005 THICK.
- A. MATERIAL MUST MEET UL94V-0 REQUIREMENTS.
2. CONDUCTOR MATERIAL ON BOARD (PLATED THRU) SHALL BE 1 OZ. COPPER MINIMUM.
3. THE TIN LEAD ALLOY PLATING SHALL CONTAIN 40% +/- 5% LEAD AND 60% +/- 5% TIN. ALL SOLDER-PLATED AREAS SHALL BE SUBJECT TO INFRARED OR HOT OIL SOLDER REFLOW PROCESS.
4. MINIMUM PLATING THICKNESS ON TRACE SURFACE AND THROUGH HOLES TO BE .0015 +/- .0005 TIN-LEAD.
5. CONDUCTOR DEFECTS:
 - A. PIN HOLES, NICKS, AND SCRATCHES: CONDUCTOR DEFECTS SUCH AS PIN HOLES AND NICKS WHICH DO NOT REDUCE THE CONDUCTOR WIDTH BY MORE THAN +/- .002.
 - B. PLATING OVERHANG: THE PLATED RESIST MATERIAL OVERHANG REMAINING AFTER THE COPPER FOIL HAS BEEN REMOVED BY ETCHING SHALL NOT EXCEED .005.
 - C. UNDERCUT: THE REDUCTION OF CONDUCTOR CAUSED BY ETCHING UNDER THE EDGE OF PLATING RESIST SHALL NOT EXCEED .001.
 - D. EXCESS CONDUCTOR MATERIAL: ISOLATED SPOTS OF CONDUCTOR MATERIAL NO MORE THAN .010 IN DIAMETER ARE ACCEPTABLE PROVIDING SPACING REQUIREMENTS ARE NOT VIOLATED.
6. WARPAGE: WARPAGE OR TWIST OF PRINTED CIRCUIT BOARD SHALL NOT EXCEED .010 INCH PER INCH.
7. SOLDERABILITY: THE SOLDER COATING SHALL BE ADHERENT AND NON-GRANULAR IN APPEARANCE. THE BASE MATERIAL SHALL NOT SHOW EVIDENCE OF BUSTERING OR DELAMINATION, NOR SHALL CONDUCTORS OR TERMINAL AREAS SHOW EVIDENCE OF SEPARATING FROM THE BASE LAMINATE AFTER DIP SOLDERING.
8. SOLDER MASK: SHALL BE GREEN IN COLOR AND APPLIED TO THE BOTTOM SIDE OF THE BOARD ONLY.
9. A WHITE SILKSCREEN SHALL BE APPLIED TO TOP SIDE OF BOARD TO PROVIDE FOR A LEGEND.
10. ARTWORK SUPPLIED BY RLWS ENGINEERING DEPARTMENT.
11. REFER TO PC BOARD ACCEPTABILITY STANDARDS DOCUMENT: ANSI/IPC-A-600D, CLASS 2.
- WORKMANSHIP PER ANSI/IPC-A-610A CLASS 2
12. LAYER STRUCTURE: BOTTOM SIGNAL LAYER ONLY
13. HOLE SIZES ARE AFTER PLATING WHERE APPLICABLE

ASSEMBLY NOTES:

1. APPLY CONFORMAL COATING PER MANUFACTURER'S INSTRUCTIONS TO BOTTOM SIDE OF BOARD ONLY. MINIMUM ACCEPTABLE THICKNESS IS .0005". PROTECT GROUNDING PAD AROUND MOUNT HOLE FROM COATING.
2. PLACE LABEL IN ASSEMBLY PN Rev FIELD TO INDICATE 88958-B
3. ADD INSTALLATION MANUAL RLWS PN 91989 WHEN PACKAGING FINISHED ASSEMBLY



TOP VIEW



BOTTOM VIEW

THIS IS A FACTORY MUTUAL APPROVED DOCUMENT. ALL CHANGES OR REVISIONS MUST BE AUTHORIZED BY FACTORY MUTUAL RESEARCH CORPORATION AND RICE LAKE WEIGHING SYSTEMS

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RICE LAKE WEIGHING SYSTEMS
 239 West Coleman Street, Rice Lake WI 54808
 Phone: 715-234-9171 FAX: 715-234-6987
 Internet: WWW.RLWS.COM

TOLERANCES UNLESS OTHERWISE SPECIFIED	
Tolerance	Decimal
2 Place	N/A
3 Place	N/A
Drawn DLD	Checked DLD
Approved: DLD	Sheet 2 of 2
Revision B	

REV	REFERENCE	DATE
A	PROTOTYPE for test and evaluation	DLD 3/17/03
B	Change SIP resistor packages to discrete bottom mount surface mount	DLD 7/28/05
ENGINEERING RELEASE		

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JM-600 or JMDT-2 DIGITAL GROSS WEIGH SCALE INSTRUCTION MANUAL

The JM-600 or JMDT-2 scale is a gross weigh bagging scale meaning the product is weighed in the bag. The scale is designed to handle between 7-9 50 lb. bags per minute at plus or minus 3 oz. accuracy or better which is rated at 2 Sigma (95%).

The scale is shipped in separate components (scale housing, spout and programmable controller) and calibrated at the factory. The scale has been separated into three sections for protection during shipping. The three sections are the **scale housing, spout and programmable controller**. The first step is to hang the scale housing from the discharge bin. The inlet opening of the scale is 9" x 7" and the overall height is approximately 26 to 28.5" depending on the type spout. Generally speaking, the top of the scale should be somewhere in the area of 6' 2" from floor, thus making the bottom of the spout 4 ft. from the floor, which is ideal working height. However, if other restrictions such as longer bag sizes or height limitations apply, this 6' 2" dimension can be modified slightly. Once the scale housing is in place, the spout may be attached by using the two 1/4" cap screws. The air lines must be reattached. The programmable controller panel may be installed normally within the operators sight and reach. The programmable controller must be connected to the scale head by simply matching the control wire terminal on the scale head. Refer to the Input/Output chart of the programmable controller (this conduit and wire is not furnished as location of the control panel and other restriction vary on installation).

The load cell cable is then connected to the summing box located on the back of the scale housing. If the cable provided is short of length, you should contact our

service department at 913-441-478: "as you may require a change in this connection. A power supply of 110V-1 phase is required and 100 P.S.I. air pressure at approximately 3 to 4 CFM at maximum speed.

The air is connected into our filter regulator system. We have two regulators. One regulator controls the air pressure to the spout system which is used for clamping the bag in place. This regulator is on the left hand side and is normally set between 50 and 80 lbs. depending on the exact amount of air required to hold your bag. Circumstances that affect this are the weight of the bag and the type of material used in the bag.

For example, a 50 lb. bag would require more air pressure to hold than a 25 lb. bag. The right hand regulator controls the air to the internal radial arm gate of the scale. This has been factory set at approximately 40 lbs. and really should not need to be adjusted any further. It is extremely important that you understand the two regulators and their purposes. If the internal gate is turned up to 80 or 90 lbs. to match the air pressure on the bag clamps, this can cause damage to the housing of the scale.

The air system on the JM-600 or JMDT scale consists of a complete set of valves to provide the air pressure to the air cylinders. These valves are located directly underneath the control cabinet on the right hand side of the scale. The valves are base mounted so that they can be easily removed and cleaned if necessary without having to do rewire.

The air fittings used on the entire scale are swivel type quick disconnect so that the air lines can easily be removed. The valves have speed control adjusts on their

sides. This is so you can adjust the speeds of all air cylinders throughout the scale. These have been set at the factory, however, if you would like the clamps to open faster or close slower, this is a very easy adjustment that can be made with a screwdriver.

In regard to the filter systems on the face of the JM-600 scale, this is for catching water in the air line and should be checked and drained periodically.

The JM-600 scale can be supplied with either a clam shell spout which is our standard, or it can also be supplied with a dust tight spout which is referred to as DT model on your name plate. Either way the system schematic is identical. The operator places the bag on the spout. The spout is then automatically closed with either a wand hand switch or a foot pedal whichever was ordered. When the clamps start to close the start delay timer is engaged as well.

This timer (after timing out) sends impulse to open the internal gravity gate. The gate is held open through the filling cycle and closed after the final weight (less prelim) is reached.

Understanding flow characteristics of your individual product is extremely important. If you will note, the air cylinders can be adjusted so that you have more or less opening size for the slow filling stage of your product. Heavy products such as minerals will require a smaller opening and lighter products such as seed, oats, etc., will require larger openings.

Basically, a 50 lb. bag should have an overall fill time of between 4 and 6 seconds. The dribble mode or second filling should be no less than 1 second.

After you have the basic understanding of the scale functions, please proceed slowly in the following order:

1. Install scale on surge hopper, making sure it is level.
2. Connect electric service required.
3. Provide air into the filter regulator systems.
4. Install spout on scale. Be careful not to stress load cells.
5. Be careful not to weld.
6. Connect all electrical and pneumatic lines by schematic.
7. Turn scale on using F1 or start key on the programmable controller.
8. Set controller per programmable controller instruction manual.
9. Place bag on spout and begin operating scale.

Since the JM series scale is controlled by the programmable controller, it is extremely important that the sequence of events as described is followed. For example, if the scale is overfilling a bag, simply touch the F3 or STOP key and everything will shut down.

The JM-600 is truly a simple scale to understand and use and will provide many years of reliable service.

TROUBLE SHOOTING JM-600 & JMDT (single or two speed)

CLAMPS WON'T CLOSE

1. Power on
2. Air pressure applied
3. Bag clamp valve energized
(Check light on valve)
Check wire connection on valve
and terminal

4. Air line restriction or blockage
5. Binding of air cylinder

CLAMPS CLOSE AND
GATE WILL NOT OPEN

1. Gate valve energized
(2 valves on 2 speed)
Check wire connection on valve and
terminal
2. Air line restriction or blockage
3. Binding of air cylinder

CLAMPS CLOSE AND
GATE WILL NOT OPEN,
THEN RELEASE BAG

1. Check settings on programmable
controller

SCALE FILLS VERY SLOW

1. Check flow restrictor
2. Check cutoff valves
3. Check for restriction in chute area

GRAVITY/VIBRATOR (GROSS WEIGHT-D)

The gravity vibrator is used for free flowing products. The gravity system is air operated and works a radial gate, operated by a single air cylinder. With the unit in fast feed, the cylinder will retract to open the gate and the vibrator will run. The opening of the gate can be controlled by the slide regulator on the front of the housing. When the feeder changes to slow, the gate will close and the vibrator will continue to run until weigh complete is achieved.

Adjustment for slow fill should be made first. The unit should be set to run the entire cycle in slow fill. The adjustment for slow fill using the variable speed adjustment provided for the vibrator. After several bags have been run, all slow fill and weights are correct, then the fast filling adjustment can be made. The fast fill adjustment is made by adjusting the slide regulator on the front of the housing. Screw the handle in to decrease and out to increase. The flow should be set at a flow rate and slowly increased until there is a uniform filling. Each time the fill rate is increased an adjustment may need to be made to the PS-1 valve or time.

Maintenance

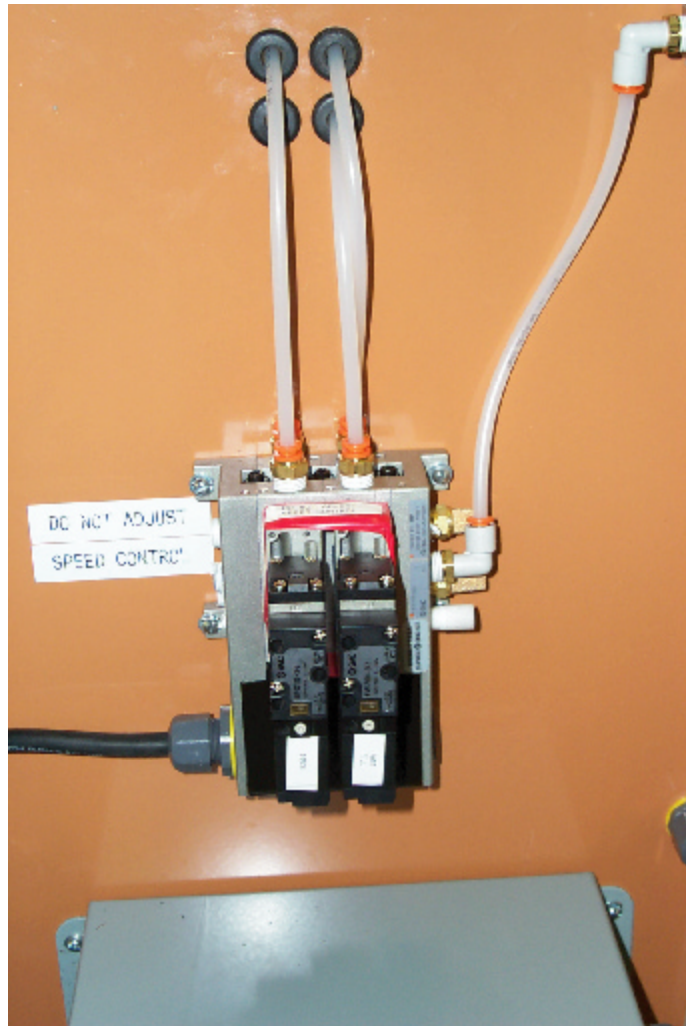
1. Periodically check rubber seals in housing. Adjust as needed and replace when rubber feels brittle.

FLOW CONTROLS

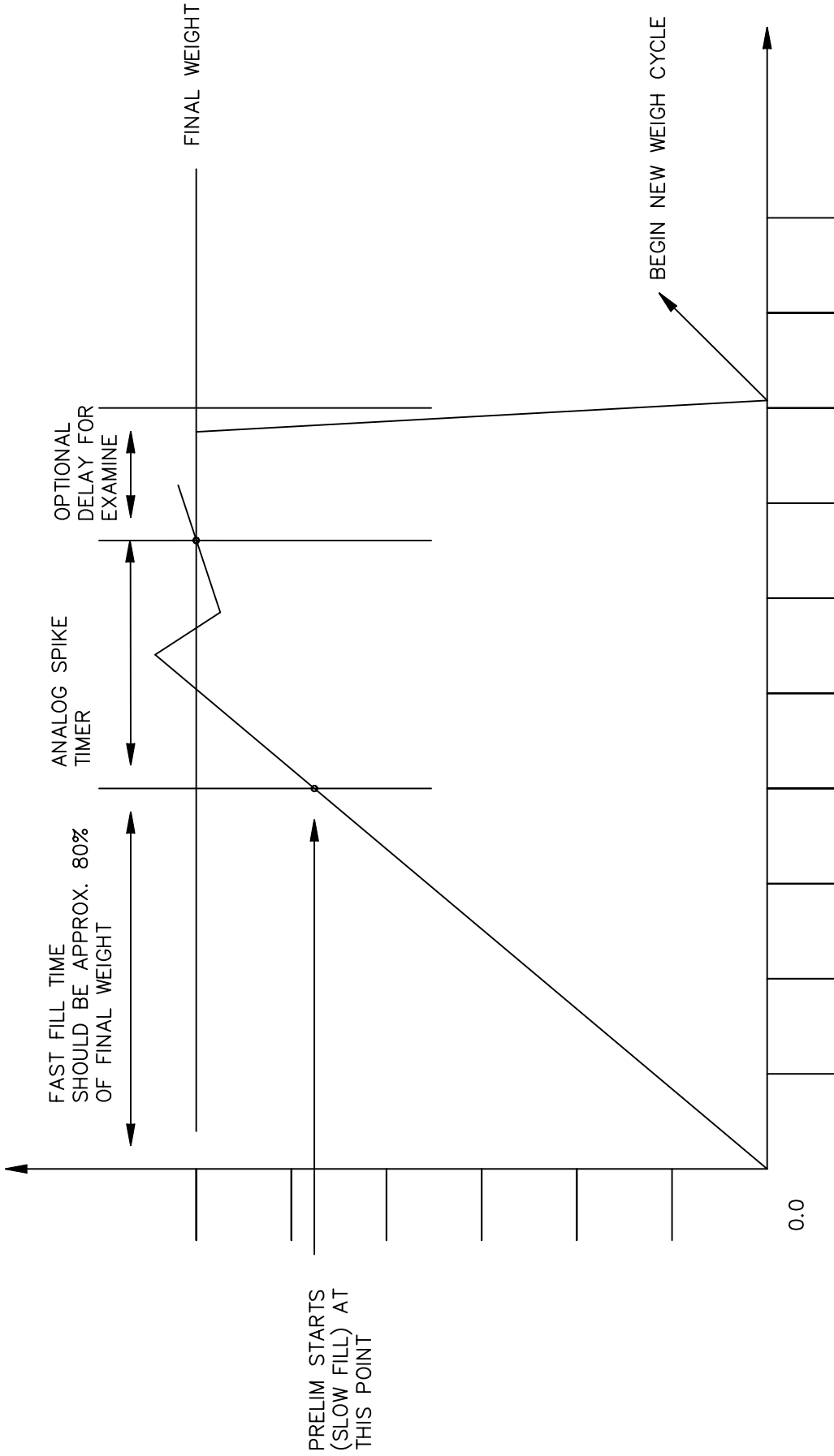
Flow controls are factory set.

DO NOT ADJUST

Faster speeds will cause damage to the equipment and will not increase bagging speeds. Do not remove factory tape.



	Product #		Product #		Product #	
	Scale 1	Scale 2	Scale 1	Scale 2	Scale 1	Scale 2
FINAL TARGET WEIGHT						
PRELIM WEIGHT						
FREE FALL WEIGHT						
FAST FILL BELT/AUGER SPEED						
SLOW FILL BELT/AUGER SPEED						
FAST FILL VIBRATOR SPEED						
SLOW FILL VIBRATOR SPEED						
START FILL DELAY						
DISCHARGE DURATION						
CLAMP RELEASE DELAY						
AUTO FREE-FALL ON/OFF						
AUTO FREE-FALL START COUNTER						
AUTO FREE-FALL FREQUENCY COUNTER						
AUTO ZERO ON/OFF						
AUTO ZERO START COUNTER						
AUTO ZERO FREQUENCY COUNTER						
TOLERANCE ON/OFF						
+TOLERANCE WEIGHT						
-TOLERANCE WEIGHT						
TOLERANCE CHECK COUNTER						
MULTI-DUMP ON/OFF						
MULTI-DUMP CYCLE COUNTER						
TOTAL BAG COUNTER						
MASTER CYCLE COUNTER						
WEIGHT SPIKE DELAY						
FAST FILTER						
SLOW FILTER						
IDLE FILTER						



NOTES -

1. SET FINAL TARGET WEIGH. SET PRELIM. SAME AS FINAL WEIGHT.
SET FREE FALL AT 0.00 .
2. RUN ONE WEIGHMENT, CHECK SPEED OF SLOW FILL, WEIGHT SHOULD INCREASE NOT MORE THAN 5 lbs/sec. ADJUST SLOW SPEED TO THIS.
3. AFTER SCALE HAS GONE WEIGHT COMPLETE RECORD WEIGHT AND ENTER THE OVERAGE INTO THE FREE FALL.
4. THEN BEGIN RUNNING SCALE AND DECREASING PRELIM UNTIL YOU DO NOT GET THE SAME ACCURATE READING.
5. ADJUST DISCHARGE TIME SO THAT LIGHTEST DENSITY PRODUCT JUST ESCAPES HOPPER BEFORE DOORS CLOSE. APPLYS ONLY TO NET WEIGH BAGGERS NOT TO THE JM SERIES SCALES.

REV. 1	
REV. 2	
REV. 3	
REV. 4	
REV. 5	
REV. 6	
REV. 7	

NAME

FOR

FOR PROGRAMMABLE CONTROLLER

TOLERANCE

PART NUMBER

DRAWING NUMBER
XP042A

BER

600 Series
LCD
Programmable Controller
Instruction Manual

VERSION 1-28

JM-600 or JMDT

6873 Martindale Road
Shawnee, Kansas 66218-9354
U.S.A.

Phone: (913) 441-478:
Fax: (913) 441-1711
e-mail: info@lgo.uecrgu.com

CALIBRATION PROCEDURE

FROM THE MAIN MENU PRESS **SETUP KEY** AND THEN PRESS **[F4] KEY**
ID=CALIBRATION WILL APPEAR ON LOWER DISPLAY

CALIBRATION: Pressing ID on the keypad puts controller in the CALIBRATION mode.
(Follow the prompts on the upper display, remembering ENTER=yes / CLR=no)

Sc1 # : When more than one scale is being used (such as a duplex or triplex scale) the Sc1 # must be entered..

New Zero? : Tells the controller what will be established as a ZERO point. **PRESS ENTER**

Units = : Using the **UNITS** key, toggle through the available units until the correct one is selected.

Key in Calibration Weight : Place calibration mass on or in weigh hopper and key in the exact weight of the mass including any other objects used to support or suspend the mass from the weigh hopper. **PRESS ENTER**

Calibration OK? : If upper display is equal to the amount keyed in **PRESS ENTER**.

If upper display is not equal to the amount keyed in press CLR and start at (New Zero ?)

WHEN FINISHED WITH LAST SCALE Sc1 # WILL APPEAR
PRESS CLR KEY TO EXIT. **DUPLEX AND TRIPLEX ONLY !**

If the display reads Code 39 check A/D Cal press CLR key

If the display reads Setup ENTER = CAL press CLR key

If the display reads Setup ENTER = SAVE press the ENTER key

If the display reads Setup ENTER = EXIT press the ENTER key

When the following appears on the lower display you are finished.

MODEL OF SCALE
PROGRAM
SERIAL NUMBER

Keypad Operation

F1: Toggles ON/OFF

F2: Toggles HOLD/RUN

(When HOLD is selected, bag clamp will not automatically release after weigh complete)

F3: Releases bag clamp.

(Key not functional when in the SETUP mode)

F4: Releases an out of tolerance weighing.

(An asterisk will appear to the right of [F4] TOLERANCE ACCEPT when out of tolerance)

SCALE SELECT: Brings controller out of SETUP mode and returns to main menu.

ZERO: This key will zero off any unwanted weight value displayed.

UNITS: Toggles through the available weighing units.

(Pounds/kilograms)

SELECT: Toggles through BAG COUNTER and DATE/TIME.

(Bag Counter counts only weigh complete and in tolerance discharges.

Can be cleared by pressing the CLR key and then the ENTER key)

TARE: Performs an auto-tare. (Normally, only used on a GROSS weighing system to tare off the value of the bag weight)

ENTER/yes: When a change is made in the SETUP mode the new value must be entered.

(Also doubles as a YES command)

CLR/no: When an unwanted value is keyed in, it can be cleared before pressing the ENTER key.

(Also doubles as a NO command)

PRINT: When the PRINT key is pressed three printing options appear on lower display. (OPTIONAL)

[F1] Prints SUBTOTALS of individual Product #'s.

[F2] Prints GRANDTOTALS of all Product #'s.

**NOTE: AUTO FREE-FALL MUST BE TURNED ON AND WILL ONLY
CAPTURE WEIGHMENTS ACCORDING TO THE AUTO FREE-FALL START
AND AUTO FREE-FALL FREQUENCY COUNTERS**

SETUP: Puts controller in the setup mode where a number of changes can be made to the Main Menu and determine how the controller will operate. (SCALE SELECT takes the controller out of the SETUP mode)

F1 will scroll through the Main Menu forwards.

F4 will scroll through the Main Menu backwards.

**NOTE: THE FOLLOWING HAVE CHANGEABLE ENTRY CAPABILITIES AND WILL ONLY
MAKE CHANGES TO THE PRODUCT AND SCALE NUMBER SELECTED !!!**

PRODUCT NUMBER: There are 100 available product numbers and are set at a range between 00-99.

(These numbers are used to setup different products and/or different FINAL TARGET WEIGHT'S for the same product)

FINAL TARGET WEIGHT: Displays the final weight.

PRELIM WEIGHT: Displays how much of final weight will be slow fill.

FREE FALL WEIGHT: Determines the slow fill cut-off to allow for product in suspension.

FAST FILL VIBRATOR SPEED: Speed control for vibrator from 1-100%. (OPTIONAL)

SLOW FILL VIBRATOR SPEED: Speed control for vibrator from 1-100%. (OPTIONAL)

FAST FILL BELT SPEED: Speed control for belt feeder from 1-100%. (OPTIONAL)

SLOW FILL BELT SPEED: Speed control for belt feeder from 1-100%. (OPTIONAL)

FAST FILL AUGER SPEED: Speed control for auger feeder from 1-100%. (OPTIONAL)

SLOW FILL AUGER SPEED: Speed control for auger feeder from 1-100%. (OPTIONAL)

AUTO ZERO: Automatically zeros the weight display after first discharge and is controlled by the AUTO ZERO START and AUTO ZERO FREQUENCY counters.

AUTO FREE-FALL: Automatically adjusts the free fall after first discharge and is controlled by the AUTO FREE-FALL START COUNTER and AUTO FREE-FALL FREQUENCY counters.

TOLERANCE: Will only discharge the weighment if it is within the positive and negative settings for TOLERANCE WEIGHT. (Refer to the F4 key)

+TOLERANCE WEIGHT: Weight that is acceptable above FINAL TARGET WEIGHT.

-TOLERANCE WEIGHT: Weight that is acceptable below FINAL TARGET WEIGHT.

START FILL DELAY (sec.): The amount of time allowed from when the bag switch is made to the beginning of the fill cycle.

CLAMP RELEASE DELAY (sec.): The amount of time, after discharge complete, before the bag is released.

AUTO ZERO START COUNTER: The number of times the controller will ZERO the weight display, after first discharge, when selected scale is set from the OFF to ON setting.

AUTO ZERO FREQUENCY COUNTER: How often the controller will ZERO the weight display after AUTO ZERO START COUNTER is completed.

AUTO FREE-FALL START COUNTER: The number of times the controller will adjust the FREE FALL weight, after first discharge, when selected scale is set from the OFF to ON setting.

AUTO FREE-FALL FREQUENCY COUNTER: How often the controller will adjust the FREE FALL weight after the AUTO FREE-FALL START COUNTER is completed.

TOLERANCE CHECK COUNTER: The number of times the controller will check the weighment to determine whether it is within positive and negative TOLERANCE.

TOTAL BAG COUNT: Total discharges made from selected scale. (Re-settable)

MASTER CYCLE COUNT: Total discharges made from selected product number history. (Non re-settable)

CALIBRATION: Pressing ID on the keypad puts controller in the CALIBRATION mode.
(See CALIBRATION PROCEDURE)

ACCESS TO THE CONTROLLER: Hold the CLR key for 10 seconds while powering-up the controller.
100 SELECT/23640 ID ENTER

Changing TIME:

502 SELECT (Make sure P502 is set for "Enbld". This can be done using the ENTER key)
500 SELECT The new TIME is entered by keying in "HH.MM.SS" (ENTER) Leading zeros need not be entered.

Changing DATE:

502 SELECT (Make sure P502 is set for "Enbld". This can be done using the ENTER key)
501 SELECT The new DATE is entered by keying in "MO.DA.YR" (ENTER) Leading zeros need not be entered.

Changing from U.S.A. to International TIME/DATE:

504 SELECT Change can be made by pressing the ENTER key.

Viewing mv/V output of load cells:

61099 SELECT Specifies the scale number from which to view the information.
61100 SELECT Displays an approximation of the current mv/V output of the connected load cell.

Viewing the voltage of the battery on the database memory board:

60018 SELECT If this voltage falls below 2.5 volts, this message and a warning message display alternately indicating that the battery should be replaced.
The warning message is also displayed during power-up. When the voltage is above 2.0 volts then data in memory will be retained. The voltage on a new battery should be slightly above 3.0 volts. A battery should last several years minimum, possibly over 10 years, depending on conditions.

EXITING THE ACCESS MODE: PRESS THE **ZERO** KEY

If the display reads Code 39 check A/D Cal press CLR key

If the display reads Setup ENTER = CAL press CLR key

If the display reads Setup ENTER = SAVE press the ENTER key

If the display reads Setup ENTER = EXIT press the ENTER key

When the following appears on the lower display you are finished.

MODEL OF SCALE
PROGRAM
SERIAL NUMBER

600 Series Process Controller Set-Up Procedure (gross weigh)

PRODUCT #: - 100 DIFFERENT PRODUCT NUMBERS MAY BE STORED USING CODES 00 - 99. CODES CAN BE SELECTED BY PRESSING THE **SETUP** KEY, TYPE IN THE DESIRED PRODUCT NUMBER, THEN PRESS ENTER.

NOTE: SCALES MUST BE IN THE OFF POSITION TO CHANGE PRODUCT #:

FINAL - ACTUAL WEIGHT OF BAG DESIRED (EXAMPLE 50.00)

PRELIM - SLOW FILL WEIGHT (EXAMPLE 12.00)

FREE FALL - WEIGHT OF PRODUCT IN SUSPENSION (EXAMPLE .90)

SET-UP

1. SELECT PRODUCT #: CODE WHERE VALUES WILL BE STORED.
2. SET FINAL TO DESIRED BAG WEIGHT (EXAMPLE 50.00).
3. FREE FALL .00, AND PRELIM SAME AS FINAL (EXAMPLE 50.00).
4. RUN ONE BAG WITH SCALE IN THE HOLD POSITION TO PREVENT THE CLAMP FROM RELEASING AUTOMATICALLY.
NOTE WEIGHT (EXAMPLE 50.70)
5. ENTER EXCESS INTO FREE FALL (EXAMPLE .70). THE EXCESS WEIGHT IS PRODUCT THAT IS IN THE AIR WHEN THE WEIGHT IS REACHED AND MUST BE COMPENSATED FOR.
6. RUN A SECOND OR THIRD BAG TO BE SURE THAT WEIGHT IS CORRECT. AT THIS POINT WE HAVE RUN ENTIRE BAG IN SLOW FILL TO ACHIEVE THE CORRECT WEIGHT. ONCE THE CORRECT WEIGHT HAS BEEN SET BY ADJUSTING FREE FALL, WE CAN NOW START INCREASING THE SPEED OF FILLING.
7. THE SPEED IS SET USING THE CYCLE LIGHT AND PRELIM WEIGHT. THE CYCLE LIGHT IS USED TO ASSIST THE OPERATOR IN ADJUSTING THE PRELIM WEIGHT AS FOLLOWS. LONG CYCLE LIGHT PRELIM TOO HIGH - VERY SHORT OR NO CYCLE LIGHT PRELIM TOO LOW. DEPENDING ON PRODUCT AND SPEED OF CYLINDERS PRELIM CAN VARY GREATLY FROM PRODUCT TO PRODUCT. NORMALLY PRODUCTS DO NOT CHANGE WITH SIZE (EXAMPLE CODE 00 (50# PELLETS)
FINAL 50.00 - FREE FALL .70 - PRELIM 10.00 CODE 01 (25# PELLETS)
FINAL 25.00 - FREE FALL .70 - PRELIM 10.00)

NOTE: FOR BEST RESULTS SLOW FILLING SHOULD BE APPROXIMATELY 5 LB OR 2.5 KG PER SECOND. MANUALLY ADJUST FLOW RESTRICTOR FOR THIS SPEED. (EXAMPLE 50 LB BAG ALL ENTIRELY IN SLOW FILLING SHOULD FILL IN APPROXIMATELY 10 SECONDS.

LCD CONTRAST ADJUSTMENT FOR THE DISPLAY

The contrast of the LCD changes with temperature. A contrast setting that allows good viewing at a high temperature might make the display impossible to read at a low temperature.

If the display is not visible or hard to read, at power-up you can adjust the contrast as follows:

1. Power down.
2. Hold down the left, down and right arrow keys.
3. Power up.
4. Continue to hold the left, down and right arrow keys until you can see the contrast adjustment menu on the display, then release.
5. Make fine adjustments to the contrast by pressing the up and down arrow keys.
6. Press **[ENTER]** to exit the menu and permanently store the new contrast setting.

GSE Regenerate Program for C Base

Shut the power off to the controller, and then power-up the controller while holding the CLR key until Macro Disbl appears. When Disbl Comm1 appears press ENTER. Then key in 100 SELECT 23640 ID ENTER. This puts the controller in the access mode. The upper display should read P108.01 Scale 1 and the lower display should be blank. At anytime you feel that a mistake has been made, power down the controller and start over from the beginning of this process.

Key in 65002 SELECT and the upper display should read P65002. Deflt -Cal

Press the TARE key two times and the upper display should read P65002. UserC Gen

Press the ENTER key three times and the controller will start loading the program.

When the display shows the Main Menu screen the controller is done loading the program.

***This will set the controllers set-up parameters back to factory defaults, so it is advisable to write down all of the controllers set-up parameter values before performing this procedure.

ERROR CODES and MESSAGES

- CODE 02 Bad Load Cell
Load Cell installed upside down
Green and White Load Cell wires connections reversed
- CODE 03 Bad Load Cell
Load Cell installed upside down
Green and White Load Cell wires connections reversed
- CODE 04 The number to be displayed is greater than 125.00 lb or kg
More than 125 lb or kg of product in the bag on gross weigh
scales or more than 125 lb or kg of product in the weigh
hopper on net weigh scales.
Re-Calibrate scale
- CODE 08 Check all Load Cell and Summing Cable wire connections
and Re-Calibrate
- CODE 26 When the controller is powered-up the main board checks the
data in the database and vise versa, if the information does
not check with each of the components a checksum error
will occur. Try powering down the controller then power-up
again, if this does not work the program will need to be re-
loaded.

FACTORY SET PARAMETERS

WEIGHT SPIKE DELAY	1.1 Second for JM and CM 0.5 Second for 5GV
FAST FILTER	2
SLOW FILTER	3
IDLE FILTER	5

JEM INTERNATIONAL, INC.
PHONE: 913-441-478, FAX: 913-441-1711

JM MAIN SCALE AND HOUSING PARTS LIST				
	PART #	DESCRIPTION	CODE	
1	1425194	Muffler 1/8 NPT		
2	0015480000	Beam clevis		
3	0024257910	Chute seal	R	1
4	0024257911	Chute seal plate MS		
	0024257913	Chute seal plate SS		
	0034053626	Valve plate spacer on models without control box		
5	0098363801	"V" block bearing		
6	0270063801	Pivot		
7	0379823601	Slide bar MS		
	0379823602	Slide Bar SS		
8	0379833601	Slide bar spacer MS		
	0379833602	Slide bar spacer SS		
9	0379943601	Gate stop bar MS		
	0379943602	Gate stop bar SS		
10	0397083501	Shipping clip MS		
	0397083502	Shipping clip SS		
11	0418176601	Regulator Slide handle MS		
	0418176602	Regulator Slide handle SS		
12	0418183501	Regulating slide plate MS		
	0418183502	Regulating slide plate SS		
13	0423943603	Sway Link MS		
	0423943604	Sway Link SS		
14	0423955501	Sway Bracket MS		
	0423955502	Sway Bracket SS		
15	0447973601	Dust skirt bar MS		
	0447973602	Dust Skirt bar SS		
16	0467603501	Restrictor plate MS		
	0467605501	Restrictor plate SS		
17	2795900000	Switch MS	R	1
	0279590001	Switch SS	R	1
18	3600500000	Rod, gate adjust MS		
	3600500001	Rod, gate adjust SS		
19	3700510000	Foot switch		
20	3700560112	Male plug		
21	3770180002	Air cylinder bracket (1 speed) MS		
	3770180003	Air cylinder bracket (1 speed) SS		
22	3770190000	Air cylinder bracket (2 speed) MS		
	3770190001	Air cylinder bracket (2 speed) SS		

	PART #	DESCRIPTION	CODE	Simplex
23	3770330041	Regulator		
24	3770330040	Filter Regulator	R	1
25	3770330039	FR bowl	R	2
26	3770330046	Whole FR assembly		
27	3770340000	Control box MS		
	3770340001	Control box SS		
	3770340005	Valve plate (replaces control box on some models)		
28	3770700000	Housing MS		
	3770720000	Housing SS		
29	3770710000	Feedgate handle MS		
	3770710001	Feedgate handle SS		
30	3770800000	Weight rod MS		
	3770800001	Weight rod SS		
31	3770840000	Prox switch bracket complete MS		
	3770840002	Prox switch bracket complete SS		
32	3770840001	Proximity bracket		
33	3770870000	Valve	R	1
34	3770920000	2 Speed control, terminal strip		
35	3799990000	Bag clamp	R	2
36	3900140000	Rear clevis (2 speed only) MS		
	3900140001	Rear clevis (2 speed only) SS		
37	4425120000	Special washer		
38	4425150000	Wingnut		
39	5418150001	Top chute MS		
	5418150002	Top chute SS		
40	5418220001	Regulating slide MS		
	5418220002	Regulating slide SS		
41	5423910001	Chute gate MS		
	5423910002	Chute gate SS		
42	5448200004	"L" bracket MS		
	5448200006	"L" bracket SS		
43	5448200005	Spring		
44	5448200035	Hex coupling nut MS		
	5448200036	Hex coupling nut SS		
45	5454480002	"H" bracket MS		
	5454480004	"H" bracket SS		
46	5460180001	Beam stop bracket MS		
	5460180002	Beam stop bracket SS		
47	6000420000	Main beam MS		
	6000420003	Main beam SS		
48	6000470001	Dashpot		
49	7052250000	Feed gate bearing		

	PART #	DESCRIPTION	CODE	Simplex
50	7061150000	Rod end bearing (2 speed)		
51	7061400000	Rod end 1/4 RH		
52	7061490000	Rod end bearing (1 speed)		
53	7623140002	Spout bearing MS		
	7623140004	Spout bearing SS		
54	7675400003	Flow decal		
55	7791780000	Dust skirt fabric	R	1
56	7800510000	Proximity switch	R	1
57	7800550150	Load Cell #150, Canadian series		
58	7800550250	Load Cell #250, standard series	R	1
59	7800550604	Summing box		
60	7800552003	Fuse 3 AMP	R	10
61	7800650001	Knob		
62	7800700000	Timer	R	1
63	7800800003	Socket Timer/relay		
64	7800800110	Relay	R	1
65	8282500000	Brass fittings elbow or straight	R	15
66	8282504444	1/4" airline	R	30'
67	8282509999	Vent dust port		
68	8332850000	Gate cylinder (1 speed) MS	R	1
	8332850001	Gate cylinder (1 speed) SS	R	1
69	8333260000	Spout cylinder MS		
	8333260003	Spout cylinder SS		
70	83NC1A200-PS	Seal kit, spout MS	R	1
	83CG5N50SRPS	Seal kit, spout SS	R	1
71	8333260002	Clevis spout		
72	83NQ250GDF145	Gate cylinder (2 speed) MS	R	1
73	83US19149	Gate cylinder (2 speed) SS	R	1
74	9250400000	Weight box cover		
75	9267080000	Weight box		
76	9500150000	Bulb	R	10
77	9500150100F	Selector switch		
78	9500150131F	Red cycle light		
79	9500150134F	Green "on" pilot		
80	9500380000	Terminal block		
81	9500410000	Terminal ground		
82	9500440000	Terminal fuse holder		
	83CQ2B50-PS	Seal kit 2 speed gate cylinder MS or SS	R	2

PART #	DESCRIPTION	CODE	Simplex
	GSE Controller		
13-10-7050	Fuse 600 series main PCB	R	5
24660B-122A0	I/O Module 2 input/2 output R	R	1
24660B-130A0	I/O Module 4 Position SBM. AC	R	1
24660B-102C0	SCR CONTROL 660	R	1
95HBC25DS10	Crydom Relay, DC control SC	R	1

R=RECOMMENDED SPARE PARTS

When ordering parts be sure to advise scale

construction (ex. Mild steel, stainless) and serial number

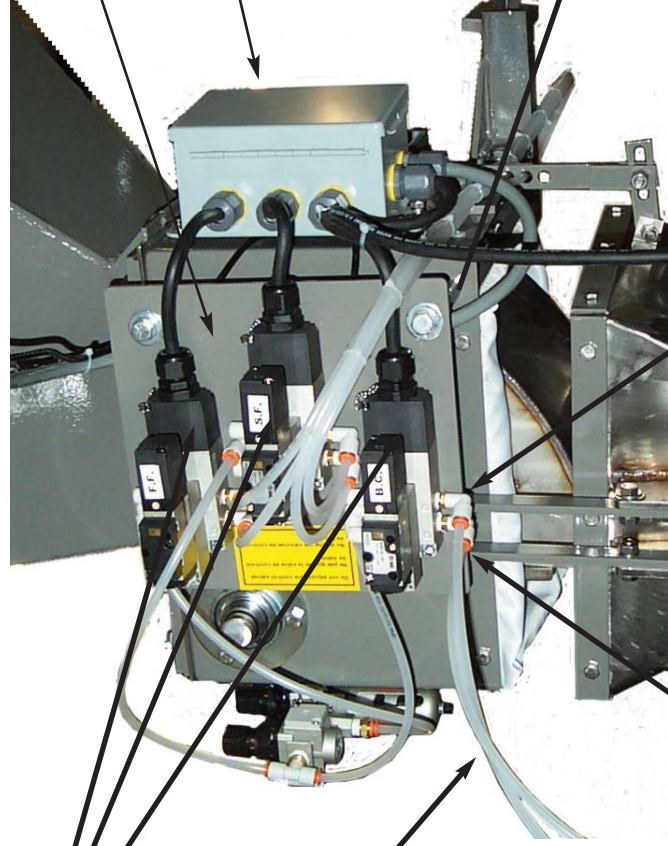
Some part pictures may differ from your scale as we do update parts occasionally

Valves
3770870000
Valve 220
3770870220

Valve Plate
3770340005

Enclosure
17643

Lower spacer
0034053626



1/4" air line
8282504444

Muffler 1/8 NPT
1425194

1/4 x 1/8 NPT
Elbow & straight fittings
8282500000

Enclosure
17643

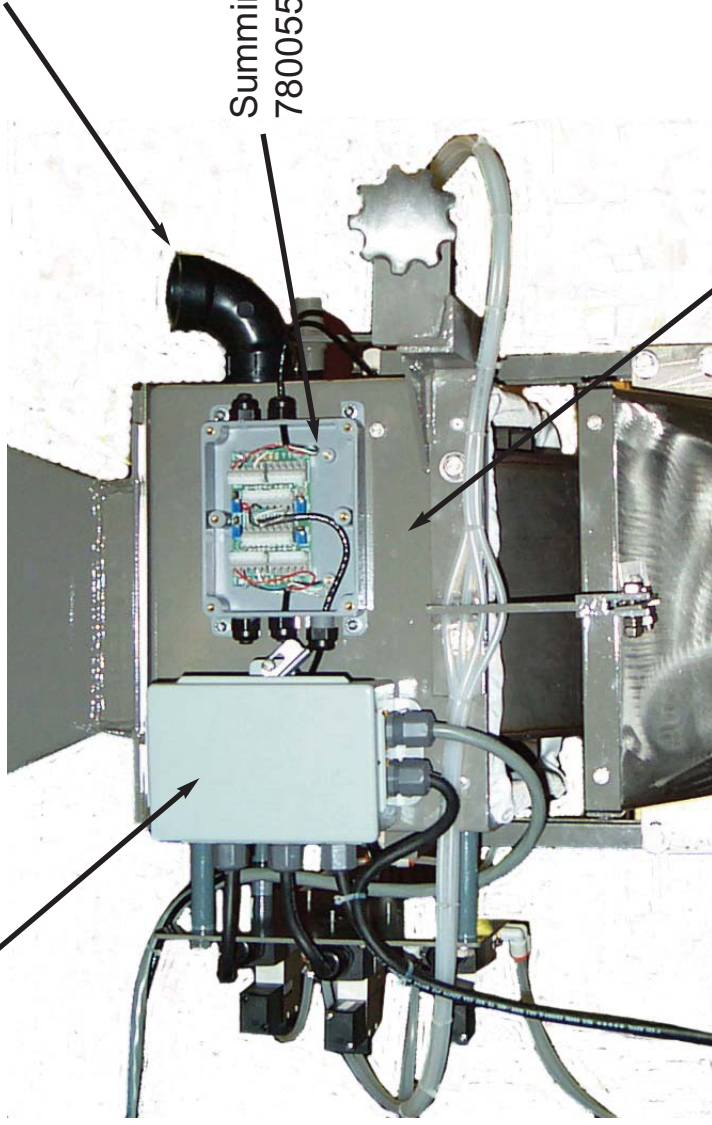
Dust Port
8282509999

Summing Box
7800550604

Scale housing
377070000MS
3770720000SS

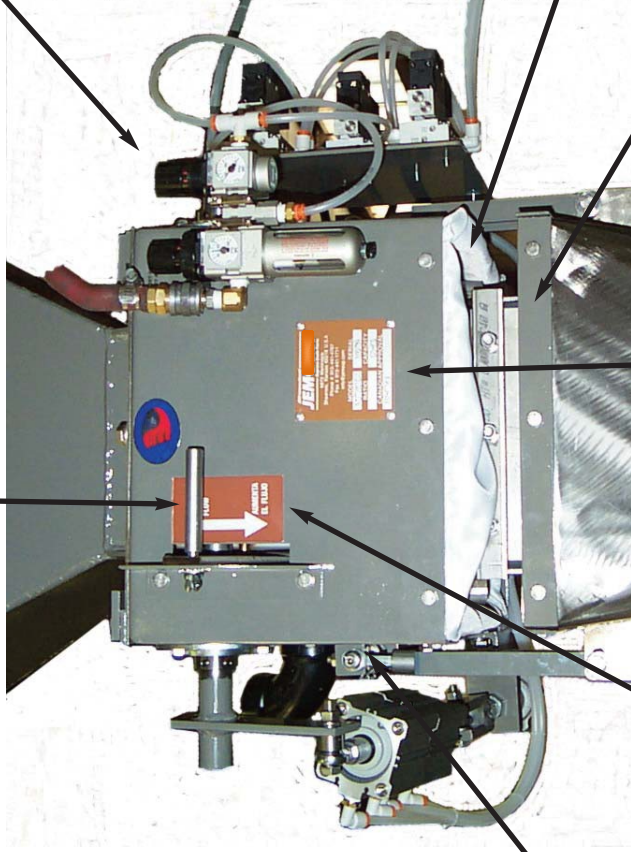
Plate
3770100010

Cylinder
8333287125



Regulator slide handle
0418176601MS
0418176602SS

Filter Regulator Assembly
3770330046
Components
Regulator 3770330041
Filter regulator 3770330040
3/8 x 1/4 elbow fitting
8282500000
3/8 x 1/4 straight fitting



Dust Skirt
7791780000

Dust Skirt bar
0447973601MS
0447973602SS

Name Plate
9300030000

Flow Decal
7675400003

Rod end bearing
7061400000

Feed gate cylinder
Two speed
83NQ250GDF145MS
83US19149SS

Rear Clevis
(2 speed only)
3900140000MS
3900140001SS

Load Cell behind cylinder
7800550250
Canadian
7800550150

2 Speed

Feed gate handle
3770710000MS
3770710001SS

Feed gate bearing
7052250000

Regulator slide
5418220001MS
5418220002SS

Regulating slide
plate
0418183501MS
0418183502SS

H Bracket
5454480002MS
5454480004SS

Load Cell
7800550250
Canadian
7800550150

Single Speed

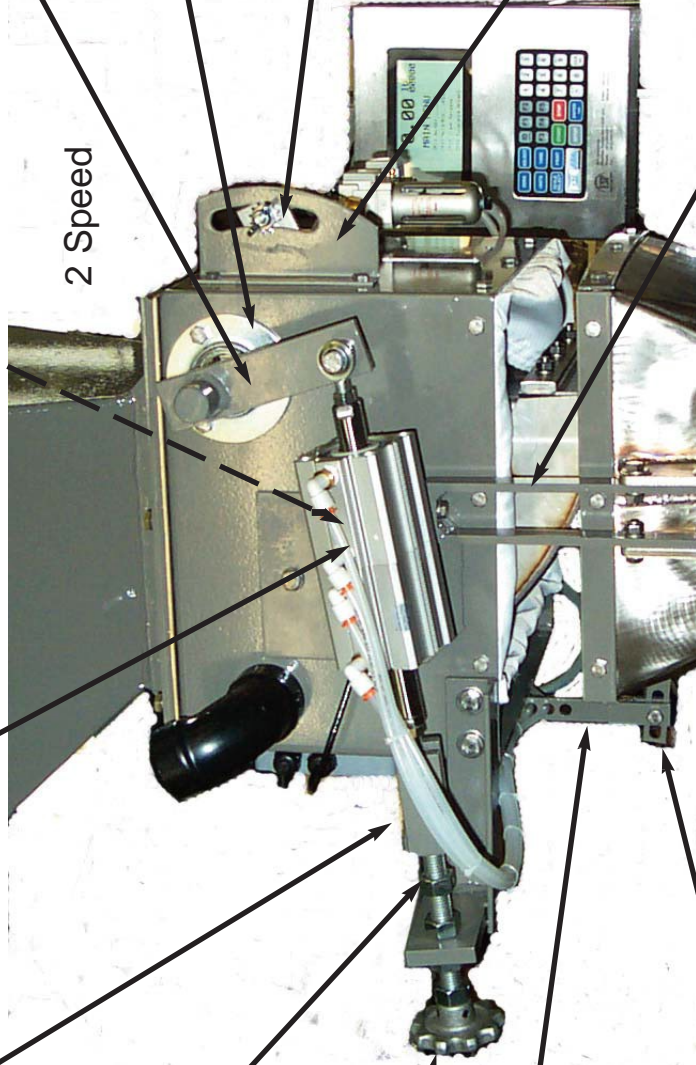
Rod, gate adjust
3600500000MS
3600500001SS

Adjust knob
7800650001

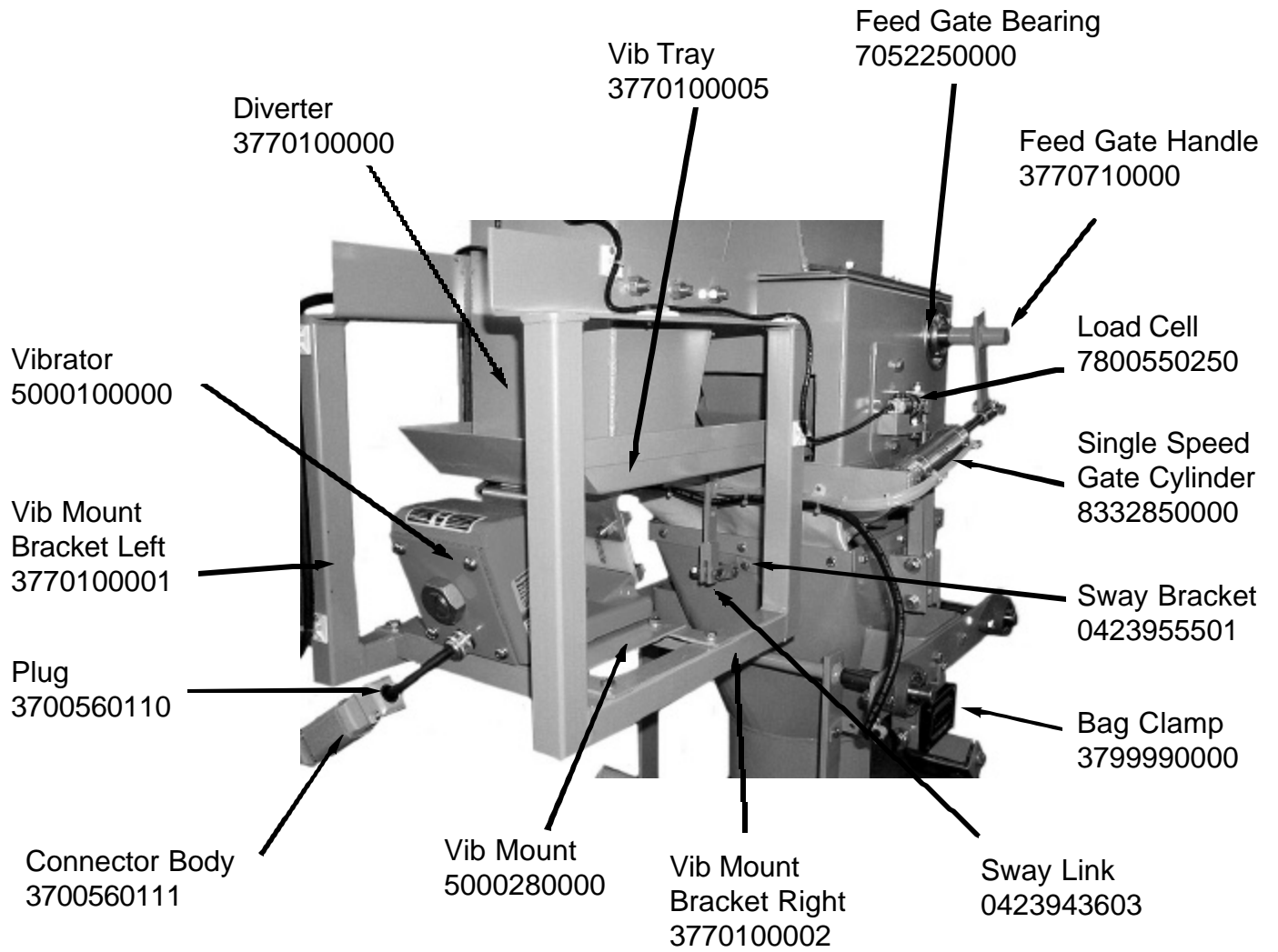
Sway Link
0423943603MS
0423943604SS

Sway Bracket
0423955501MS
0423955502SS

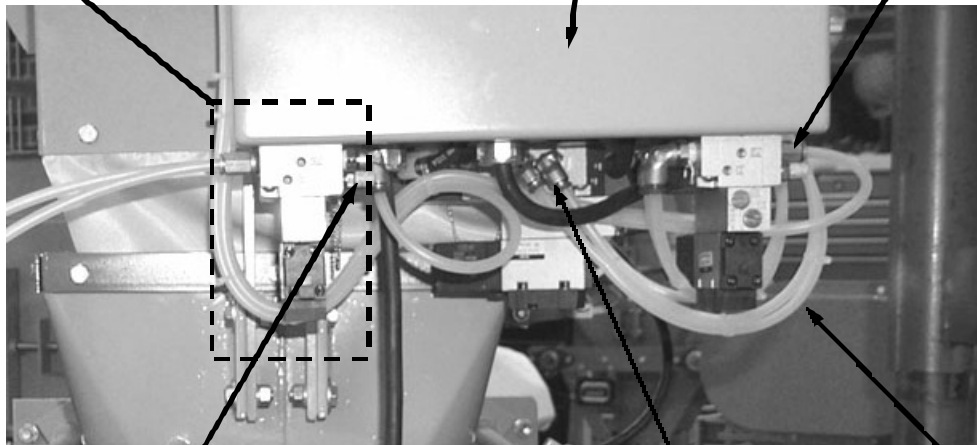
Feed gate cylinder
Single speed
8332850000MS
8332850001SS



GRAVITY VIBRATOR

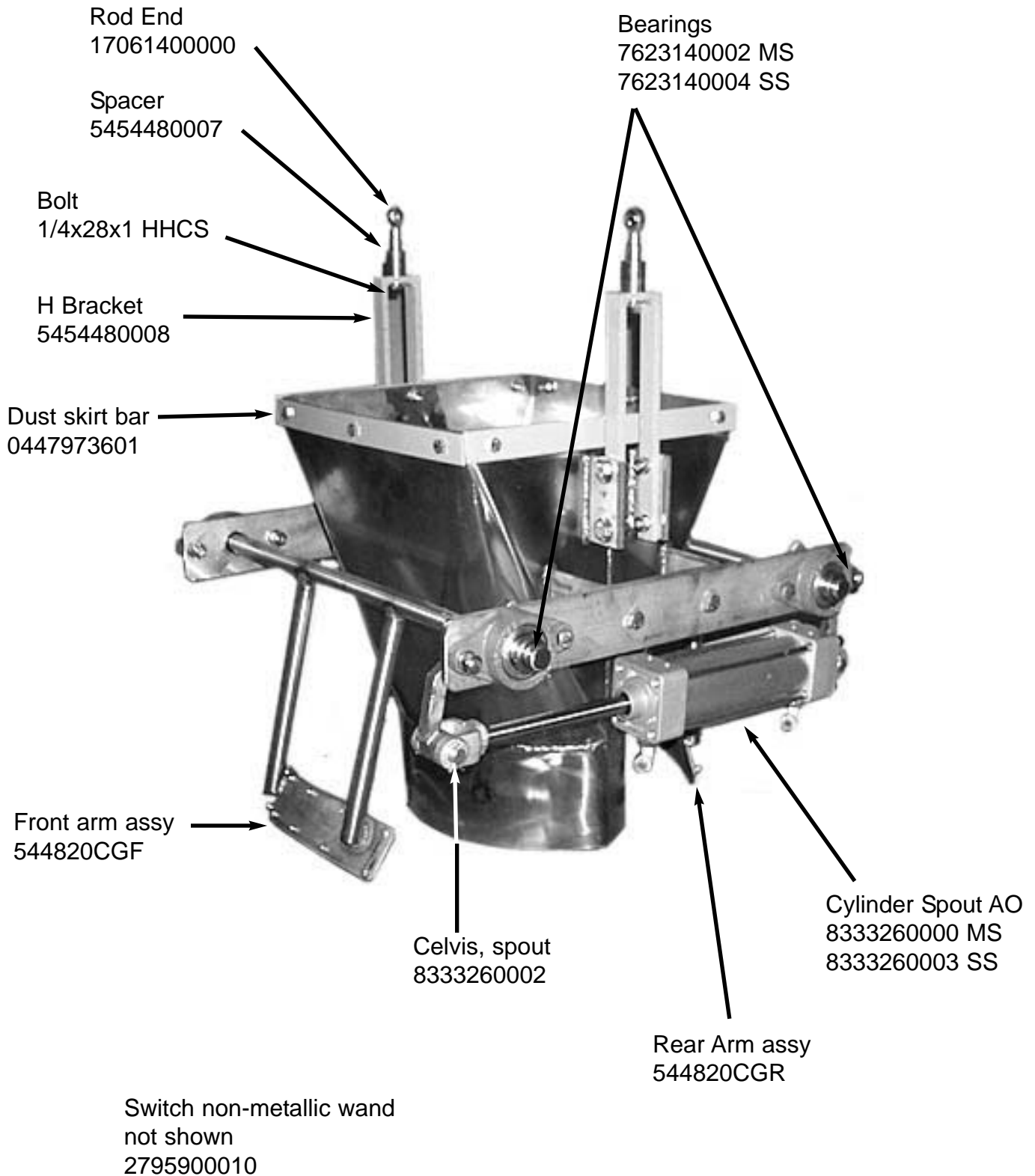


Valve
3770870000
 Control Box
3770340000
 1/4 x 1/8 NPT
Straight fitting



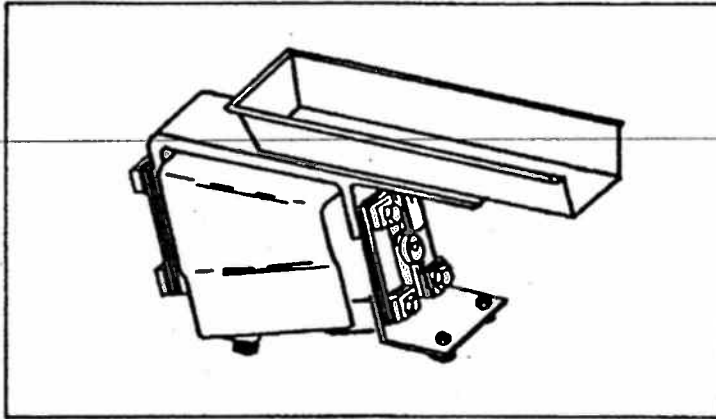
1/8 NPT Muffler
 1/4 x 1/8 NPT Elbow fitting
 1/4" air line
8282504444

CENTER GRIP SPOUT



Service Instructions**Syntron®****Vibrating Feeder****Model: BF Series**

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FMC Technologies Inc. reserves the right to make changes at any time, without notice and without any liability or other obligation on its part, in material, equipment, specifications and model. FMC Technologies also reserves the right to discontinue the manufacture and sale of models, and the parts and components thereof.

The instructions and data herein are vital to the proper installation and operation of this equipment. In order to avoid delays due to faulty installation or operation, please see that these instructions are read by the persons who will install, operate and maintain this equipment.

This manual applies to general instructions for BF Model Feeders. Instructions for spring replacement and magnet replacement, a parts list and operating specifications for specific models are furnished in separate instructions.

NOTE: Supporting information, such as drawings, may be attached to this manual. The information contained therein take precedence over corresponding information printed in this manual.

INTRODUCTION

The "BF" Feeder assembly is an electromagnetic unit, consisting of a dynamically balanced, two-mass vibrating system. This system consists of a trough and trough connecting bracket coupled to an electromagnetic drive by means of leaf springs.

The electromagnetic drive (a coil and core assembly) is located within the base housing. This assembly is connected directly to the rear of drive unit housing. An armature assembly, also included as part of the drive unit, is located opposite the core and coil and is connected directly to the trough mounting bracket.

Leaf springs are located at the front and rear of the drive unit housing. These springs are clamped at the bottom to the drive unit housing, at the top to the trough mounting bracket. The trough, trough connecting bracket and armature become an assembly, joined to the drive unit through the spring assemblies.

THEORY OF OPERATION

Model "BF" Feeder operation produces a vibrating stroke on the surface of the feeder trough. The stroke is obtained by the electromagnet pulling the trough sharply down and back and then allowing it to spring up and forward. Repeated at high speeds (3600 v.p.m. at 60 cycle power supply), this action produces a definite vibrating movement on the trough surface.

The "BF" Feeder requires the use of separate controller which contains a rectifier, used to convert alternating current into rectified current.

Figure 1 illustrates a typical a-c sine wave and a typical r-c sine wave (the type of pulsating current which is required to operate the feeder). The coil is energized only by the portion of the sine wave shown as a solid line of the r-c sine wave. The broken line represents the portion of the sine wave which is blocked by the rectifier. The blocked portion does not reach the feeder coil and during this time the feeder coil is de-energized.

When the coil is energized, the core becomes magnetized and attracts the armature assembly. This pulls the armature, trough mounting bracket and trough down and back towards the core. This pull is against the mid-point of the leaf spring stack, flexing the springs.

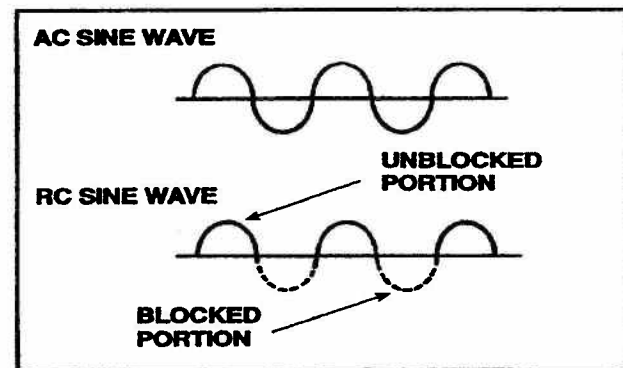


FIGURE 1 – THE RECTIFIED SINE WAVE

The unit is mechanically adjusted to limit the travel of the armature so it does not strike against the face of the core. The space between the armature and core is called the "air gap" and its setting is critical to good feeder operation. Instructions concerning the air gap are on page 6.

The magnetic pull between the armature and core exists during the time and current is passing through the unblocked, or power, half cycle.

Each power half cycle is followed by a half cycle of blocked current flow. During this half cycle, power is not available to the coil and the coil becomes de-energized. With the coil de-energized, the magnetic pull between the core and armature is released and the leaf spring system is permitted to spring back to (and slightly through) its normal position. This pulls the trough, bracket and armature assembly up and forward.

On the next power half cycle, the trough, trough mounting bracket and armature are again pulled down and back. On the next no power half cycle, the trough, trough mounting bracket and armature assembly are again pulled up and forward. Thus, during operation, the trough is continually vibrating along a straight line path.

The following explanation will provide a general description of material flow and how it is achieved by the vibrating stroke of the trough.

Figure 2 illustrates the action of a single particle of the material moving along the trough surface. During a vibration cycle, the trough surface travels between its lowest point (A) to its highest limit (C). The trough travels at its greatest velocity between (A) and (B), although still traveling up and forward, the trough decelerates between (B) and (C). On the upward stroke, the particle of material is in contact with the trough from (A) to (B). At point (B) the velocity of the particle becomes greater than the trough and the particle leaves the trough surface on a free flight trajectory from (B) to (D). The particle lands back on the trough

surface at a position further forward (D). This completes one cycle. Each cycle imparts a forward and upward motion of the material and it lands further along the trough toward the discharge.

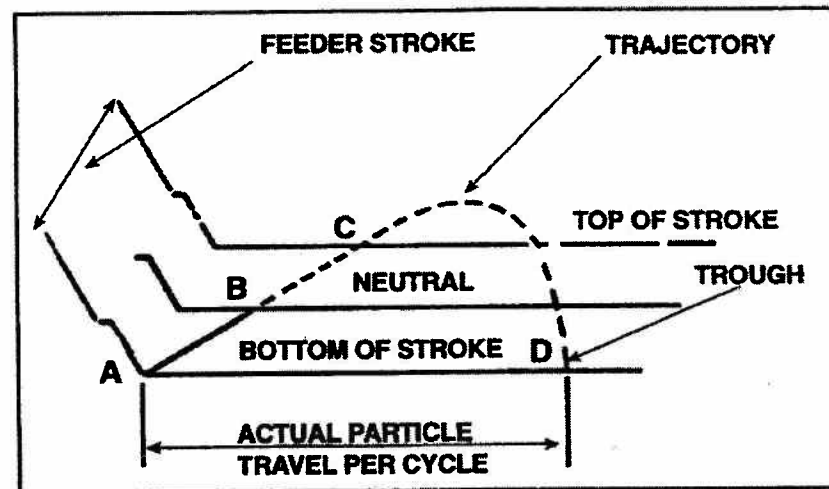


FIGURE 2 - MATERIAL FLOW ON TROUGH

The rate of feed is controlled by the intensity of the magnetic pull which is varied by the controller.

LONG TERM STORAGE

When received, the equipment should be carefully uncrated. If the feeder assembly is shipped mounted on skids, the skids should remain attached to the feeder until installation.

Give the equipment a thorough visual inspection to reveal any damage that may occurred during shipment. If damage is found, contact FMC and the shipping carrier at once.

CAUTION: Do not support the weight of the unit by the trough assembly. This will distort and damage the springs.

When storing the controller, plug all openings in the control box to prevent dirt, rodents and insects from entering. FMC advises placing a corrosion preventive inside control box. Cover the controller and place it in an area protected from extreme heat. Do not drop controller. The force of the impact may damage the components.

INSTALLATION

CAUTION: Do not lift the unit by the trough.

When received, the feeder and controller should be carefully unpacked. All packing bands, paper, etc., must be removed. Check the controller components for protective shipping blocks, tape etc.

Inspect all the equipment received and report any damage which may have occurred during shipment. If damage is found, notify the shipping carrier and FMC's Material Handling Equipment Division.

NOTE: When installing the feeder, consideration must be given to the area of support. Some of the heavier Model "BF" feeders can weigh over 65 pounds and a support must be selected that will safely carry the full weight of the unit under loaded operating conditions.

Most Model "BF" Feeders can be furnished with a choice of mounting feet:


- (1) Standard rubber
- (2) * Rubber foot with 1/4"-20 mounting stud
- (3) * Rubber foot with 1/4"-20 tapped hole
- (4) * Metal enclosed foot with four 1/8" diameter mounting holes (available only with Model BF-T0)


* These mounting feet are designed for bolting the unit directly to the mounting structure.




CAUTION: The feeder must not come in contact with any rigid object or adjacent surface that could hamper its vibrating action, A 1" (25 mm) clearance must be maintained. Any connections (such as dust seals) between the trough and adjacent objects must be flexible, preferably cloth or rubber.

The separate controller assembly should be installed as close to the feeder as possible. Installation on a wall in a clean dry location, free from excessive vibration is recommended.


 **WARNING:** The electrical power supply connection to the FMC supplied controller must be made through a customer supplied safety disconnect switch which must be mounted next to the controller. If possible, install the controller at a location where it will receive adequate ventilation. This will insure prolonged component life.

 **CAUTION:** The conductor between the feeder and controller must be of a size sufficient to carry the current and voltage as stamped on the equipment name plate.

 **WARNING:** Be certain the equipment is properly grounded

With the feeder and controller properly installed and all wiring completed, the equipment is ready for operation.


OPERATION

 **CAUTION:** Unauthorized modification of the feeder or use of unauthorized replacement parts may damage the feeder.

FMC will not assume responsibility for feeder performance as a result of any unauthorized alterations to the equipment. Consult FMC's Material Handling Equipment Operation before modifying your feeder.

 **WARNING:** Before operating feeder make sure controller is closed and secured.

Before starting the equipment, rotate the control knob on the controller to a low counterclockwise position. Turn the switch to its "ON" position and the feeder will begin operating at a low rate of feed. While the feeder is running at this reduced rate, check all external bolts on the feeder assembly for tightness.

 **CAUTION:** When operating normally, the feeder should perform with a smooth even stroke. If a loud "striking" noise occurs, immediately turn off the unit.

Striking is the result of the faces of the core and armature making contact. Striking can result in serious damage to the unit! Refer to the Air Gap section on page 6 for correcting striking condition.

With the feeder operating satisfactorily, load the trough with the material to be conveyed and adjust the control knob to the desired output. Clockwise rotation will increase the feed rate. The material will flow along the trough surface in a smooth controlled rate of feed toward the discharge end of the trough.

MAINTENANCE



WARNING: Before performing any maintenance work, the electrical power supply must be disconnected at the safety disconnect switch.

Some materials, due to their nature, adhere to the trough surfaces. These deposits increase dead weight to the feeder pan, and if permitted to build-up excessively, will alter the natural frequency (tuning) of the feeder. Material build-up on the trough should be removed as a daily practice. Look for material build-up at the rear of the feeder trough, particularly around and under hopper openings. Wet or sticky material build-up can be prevented by using factory installed electrically heated liner plates.

A clean, dry compressed air supply is recommended for general cleaning of these units. Water is not recommended.



WARNING: Never oil the spring assembly. This destroys the clamping effect of the spring pads against one another.

In the event repairs are necessary, take immediate action to avoid possible injury to personnel and damage to the feeder parts from faulty operation. When ordering replacement parts, include all information given on the nameplate.



CAUTION: Any signs of excessive heat or burned components is an indication of trouble. At first notice of an overheating condition, immediately investigate and correct the cause. This could eliminate a potential major component failure. Feeder coils, under normal operating conditions, run warm but never too hot to touch.

TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
Feeder operates too slow	Line voltage below designated rating Unit in contact with rigid object or surface Spring action may be hampered Defective leaf springs Worn or cracked trough	Increase line voltage as designated on the name plate Isolate unit Clean spring assemblies *Replace *Replace
Feeder operates too fast	Line voltage above designated rating. High voltage will cause a "striking" condition.	Reduce line voltage as designated on the nameplate
Unit hums, will not vibrate	Defective SCR within controller (refer to controller instructions)	*Replace

Unit fails to operate	No power to controller	Check for broken or grounded lines
	Defective switch or fuse	*Replace
	Defective SCR within controller (refer to controller instructions)	*Replace
	Feeder coil burned out or grounded	*Replace burned out coil, Repair grounded coil
	Short circuit in wiring	Repair
	Open winding on rheostat	*Replace

* Replace parts only with those supplied or recommended by FMC

SPRING REPLACEMENT

Replacement springs must be of the same size and thickness as those removed. FMC recommends replacing all springs rather than just one.

Before replacing springs, disconnect the feeder from the power supply. Work on one spring assembly at a time (first the rear spring stack). Make a note of the location and arrangement of each spring, spacer and clamp. Remove the bolts which secures the leaf springs to the base, then the bolts which hold the springs to the trough mounting bracket.

Install the new spring assembly in reverse order of that removed. Replace cap screws and torque as specified in the separate instructions pertaining to specific Model "BF" Feeders.

AIR GAP

The air gap is the spacing that exists between the face of the armature and core assemblies. Proper adjustment of this space is extremely important for good feeder operation.

If the air gap is adjusted so the armature and core are too close, the faces of these items will make contact during feeder operation. This is called "striking".

 **CAUTION:** If a loud striking noise occurs, immediately turn the unit off.

When operating normally, the feeder should perform with a smooth even stroke.

If the air gap is adjusted so the armature and core are too far apart, the feeder current may climb to a dangerous level. A high current condition will result in coil burn-out, failure of control components or a reduced material feed.

The air gap is properly set at the factory, re-adjustment should rarely be required. However, if high voltage is applied to the feeder or if the air gap has been altered due to improper handling during shipment or installation, an adjustment may be in order.

Adjustment Procedure for BF-01 and BF-2:

(Refer to the illustration in separate manual.)

Locate the air gap adjusting screw at the front of the feeder base. With the feeder running empty, set the control knob at maximum feed rate (extreme clockwise position).

If armature and core are "striking", rotate cap screw in a CLOCKWISE direction to increase the air gap spacing.

Adjustment Procedure for BF-T0 and BF-T01:


Locate the air gap adjustment screw (slotted core) at the rear of the feeder base. The core is locked in position with the locknut.

With the feeder running empty, set the control knob at maximum feed rate (extreme clockwise position). Loosen the locknut and rotate the core in a CLOCKWISE direction to decrease the air gap or COUNTERCLOCKWISE to increase the air spacing. The limit of movements being established just before the armature and core "strike" under full load condition.

Securely tighten the locknut.

If the feeder lacks power at 100% control setting, or draws excessive current, rotate screw in a COUNTERCLOCKWISE direction to decrease air gap spacing. The limit of movements being established just before armature and core "strike" under full load condition.

NOTE: The air gap adjustment is a very delicate procedure and may require a little time to properly obtain the desired setting. The correct air gap spacing will be obtained when the armature and core faces are as close as possible without "striking" when maximum current is applied to the feeder magnet.

 **CAUTION:** If the air gap adjusting screw is rotated to an extreme position, the tension disc springs may be relieved of any pressure. This will be evident as a "jingling" sound caused by the disc springs vibrating against one another. Adjusting screws should never be rotated to this extreme!

CHECKING FEEDER CURRENT

When checking feeder current with a tong meter, the meter reading must always be multiplied by a value of 1.7. A tong meter does not reveal the same current as designated on the name plate due to the wave form characteristics of the feeder, when operating. Therefore, the 1.7 multiplier must be used.

STROKE GAUGE

Feeder stroke is the distance the trough travels in one complete cycle of vibration. This is measured from the forward upward limit of the vibrating stroke to the downward backward limit of the vibrating stroke.

This stroke can be read from the stroke gauge to the feeder trough. Under vibration, a black "V" will appear on the gauge. The stroke of the unit can be read at the apex of this black "V". The lines should appear solid black. Refer to Figure 3 (page 8).

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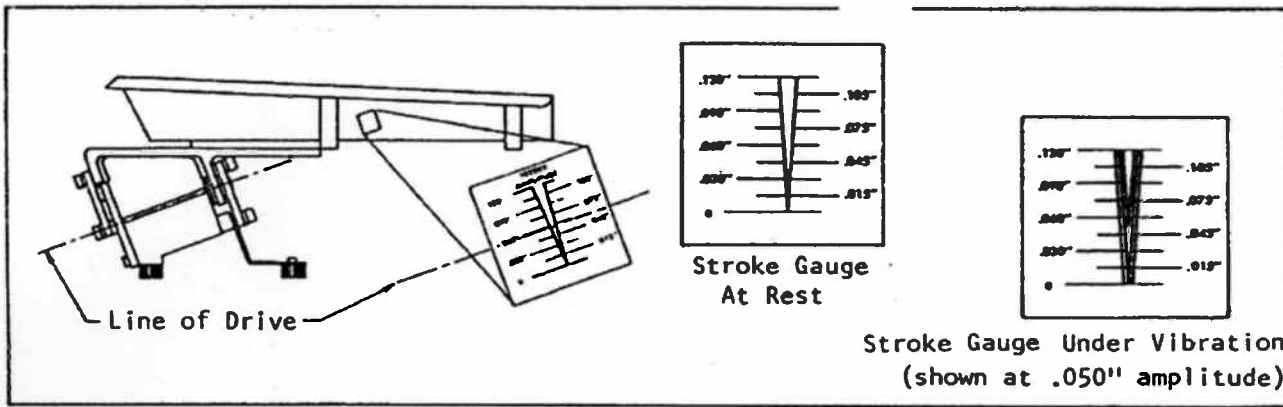
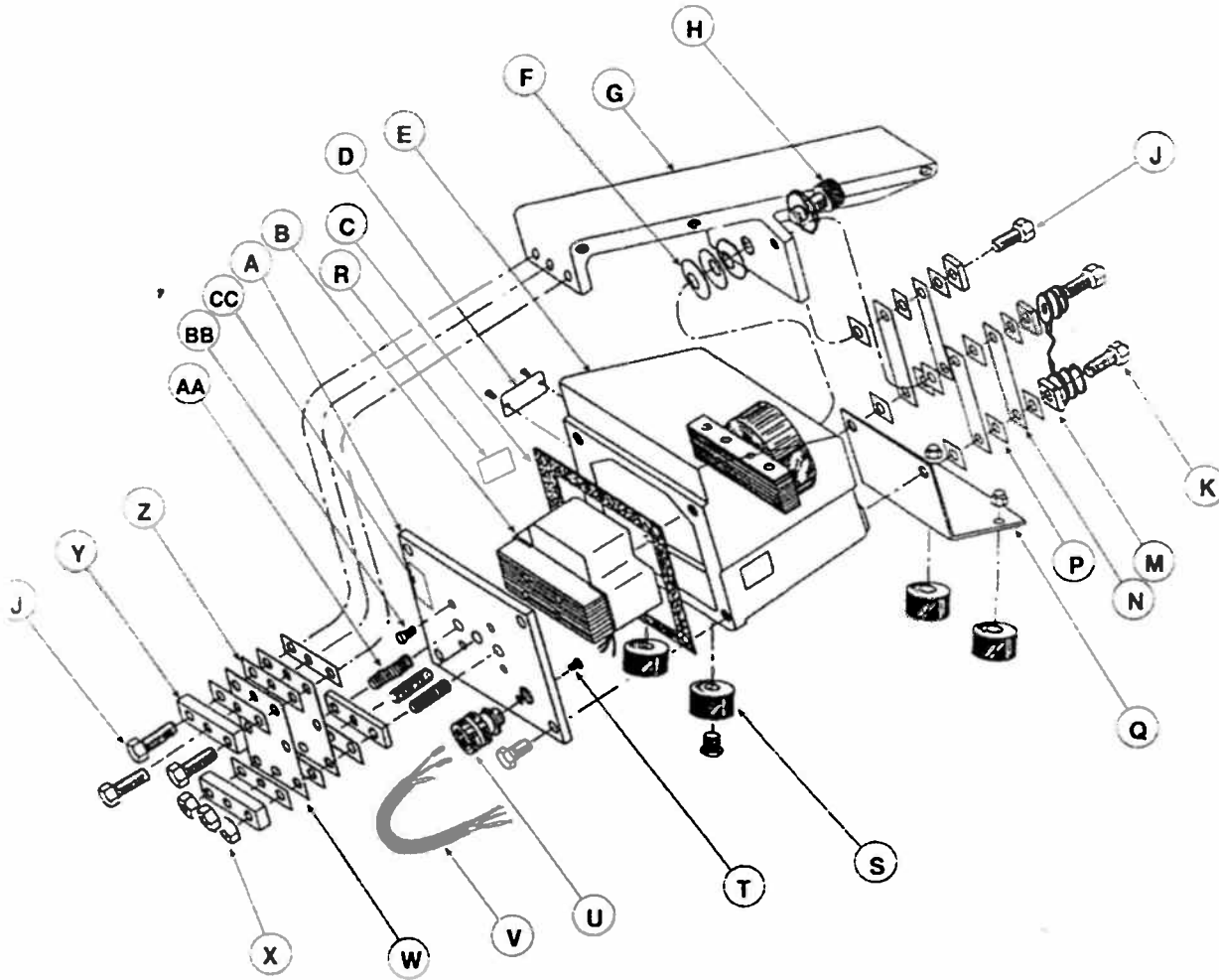


FIGURE 3 - STROKE GAUGE

FEEDER MODEL	OPERATING AMPLITUDE RANGE
BF-T0	.045" - .050"
BF-T01	.045" - .050"
BF-01	.055" - .060"
BF-2	.055" - .060"

TABLE 1 - OPERATING AMPLITUDE

SM0526-091003



PARTS LIST –BF-2-A & BF-2-AS ELECTROMAGNETIC FEEDERS

ITEM	DESCRIPTION	PART NO	QTY
A	Back Plate	B-152538	1
	Cap Screw, Hex Hd., Ni. Pl. (3/8"-16 x 1")	H0310222]	4
	Cap Screw, Hex Hd., S.S. (3/8"-16 x 1")	H0310203]	Only
B	Magnet Assembly (115V/60 Hz)	D-160176-A]	1
	Magnet Assembly (230V/60 Hz)	D-160176-B]	
	Magnet Assembly (460V/60 Hz)	D-160176-C]	
	Magnet Assembly (115V/50 Hz)	D-160176-D]	
	Magnet Assembly (230V/50 Hz)	D-160176-E]	
	Magnet Assembly (460V/50 Hz)	D-160176-F]	
C	Gasket	A-122625	1
D	* Nameplate	A-62245	1
E	Armature & Base Assembly	B-115905	1
F	Disc Spring	0013X125	3
G	Trough Mounting Bracket	C-115873-A	1
H	Air Gap Adjustment Screw	H0404410]	1
	Air Gap Adjustment Screw	H0431202]	Only
I	Plain Washer Ni. Pl. (1/2")	H0117356]	1
	Plain Washer S.S. (1/2")	H0117207]	Only

PARTS LISTS (cont'd)

ITEM	DESCRIPTION	PART NO	QTY
J	Cap Screw, Hex Hd., Ni. Pl. (3/8"-16 x 1 1/2").....	60 Hz H0310622]	7
	Cap screw Hex Hd., S.S. (3/8"-16 x 1 1/2").....	60 Hz H0340926]	Only
K	Cap Screw Hex Hd., Ni. Pl. (3/8"-16 x 1 1/2").....	50 Hz H0310622]	3
	Cap Screw Hex Hd., S.S. (3/8"-16 x 1 1/2").....	50 Hz H0340926]	Only
M	Cap Screw Hex Hd., Ni. Pl. (3/8"-16 x 1 1/4").....	50 Hz H0310322]	4
	Cap Screw Hex Hd., S.S. (3/8"-16 x 1 1/4").....	50 Hz H0340826]	Only
N	Front Spring Clamp, Ni. Pl.	A-115888]	4
	Front Spring Clamp, S.S.	B-224637-001]	Only
P	Front Spring	60 Hz A-115884-C01	8
	Front Spring	60 Hz A-115884-B01]	If
	Front Spring	60 Hz A-115884-A01]	Req'd.
	Front Spring	50 Hz A-115884-C01	4
	Front Spring	50 Hz A-115884-B01]	If
	Front Spring	50 Hz A-195884-A01]	Req'd.
Q	Front Spring Spacer.....	60 Hz A-115887	20
	Front Spring Spacer.....	50 Hz A-115887	12
R	Foot Mounting Bracket.....	A-115875	1
	* Label (Adjustment)	A-195774	1
S	Rubber Foot.....	0207X038]	4
	Rubber Foot (Double Stud).....	0207X035]	Only
T	Rubber Foot (Sandwich Type).....	0207X039]	
	Acorn Nut Chr. Pl. (1/4"-20)	H0101607]	2
U	Acorn Nut S.S. (1/4"-20)	H0110502]	Only
	Lock Washer, Ni. Pl. (1/4").....	H0112858]	2
V	Lock Washer, S.S. (1/4").....	H0112802]	Only
	Mach. Screw, Rd. Hd., Br. (#10-32 x 3/8").....	H0203102	1
W	Lock Washer, Ni. Pl. (#10).....	H0112458]	1
	Lock Washer, S.S. (1/4").....	H0112402]	Only
X	Cable Grip (115/230V Units Only).....	0102X001]	1
	Cable Grip (460V Units Only)	0102X010]	Only
Y	Cable Assembly (115/230V Units Only)	C-160136-C]	1
	Cable Assembly (460V Units Only)	C-160136-M]	Only
Z	Butt Connector (115/230V Units Only)	0202X003]	2
	Butt Connector (460V Units Only)	0202X005]	Only
AA	Rear Spring.....	A-66201-A01	1
	Rear Spring.....	A-66201-B01	2
BB	Rear Spring.....	A-66201-C01	If Req'd.
	Hex Nut, Ni. Pl. (3/8"-16).....	H0103059]	3
CC	Hex Nut, S.S. (3/8"-16)	H0111580]	Only
	Rear Spring Seat & Clamp Bar, Ni. Pl.	A-115885]	3
BB	Rear Spring Seat & Clamp Bar, S.S.	B-224636-001]	Only
	Rear Spring Spacer	A-115886	8
AA	Stud, Ni. Pl.	A-115938]	3
	Stud, S.S.	B-224635-001]	Only
BB	Cap Screw, Fl. Hd., Ni.Pl. (5/16"-18 x 5/8")	H0435511]	4
	Cap Screw, Hex Hd., S.S. (5/16"-18 x 5/8")	H0431311]	Only
CC	Sealant.....	0185X053	As Req'd.
	* Label (Caution).....	A-125694	1

* Do not remove or paint over safety labels or the nameplate. If safety labels need replaced, contact FMC Technologies for an additional supply free of charge.