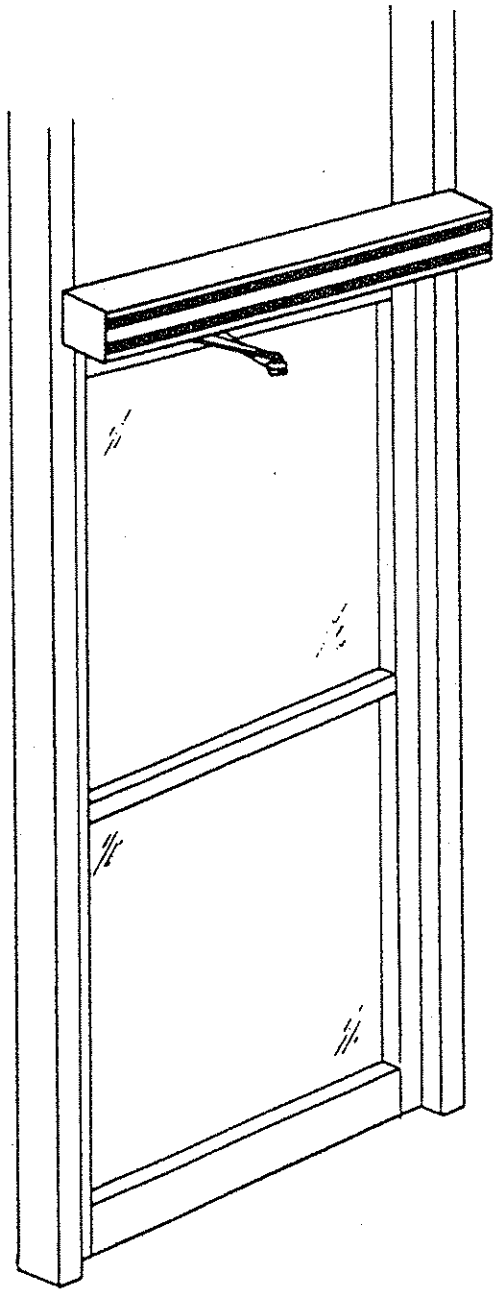
STALLATION-OWNERS MANUAL
18-23-001 REV. A 7-26-90

besam®

ELECTRA™ 150

Swing Door Operator



CONTENTS

INSTALLATION HOUSING AND OPERATOR

1. Determine the required operator housing length, linkage requirement and handling. Refer to installation dwg.
2. With housing assembled, apply the spindle hole locator template 21-24-001. Drill a 1 1/4" diameter hole and prep housing as shown on template.
3. Remove the access cover and remove all aluminum chips. Utilizing the housing as a template, position it according to the appropriate installation drawing and mark 3/4" diameter electrical access and mounting holes on the jambs.

   NOTE: The housing is self-supporting up to a maximum door width of 44". Additional mounting screws are required 12" on center for longer length housings.
4. Check that the mounting surface has the necessary reinforcement. Drill and tap or install rivnuts (see recommended mounting requirements).

MOUNTING MATERIAL	MINIMUM REQUIREMENT
Steel	3/16"* screws
Aluminum	1/4"* screws
Reinforced Concrete	2" screws-up from under-side of header
	2" screws
Wood	2" screws

*Thin-wall profiles must be reinforced with rivnut.

5. Install housing to frame with appropriate fastners. Install main power, switch and impulse wiring. Wiring can enter the housing from the hinge/pivot jamb or strike jamb.

6. The Electra 150 opetrator is secured (see Fig. 1) to the mounting plate (18) as shown. Install the 3 mounting clips (9) to the mounting plate. Install the complete operator (less spindle shaft (11) into the housing and position the operator spindle over the housing spindle hole. Slide mounting clips (9) up into the upper housing groove and secure the 3--1/4" x 20 x 5/8" (7) bolts. Be certain that the spindle center line is still aligned with the required "C" and "D" dimensions.

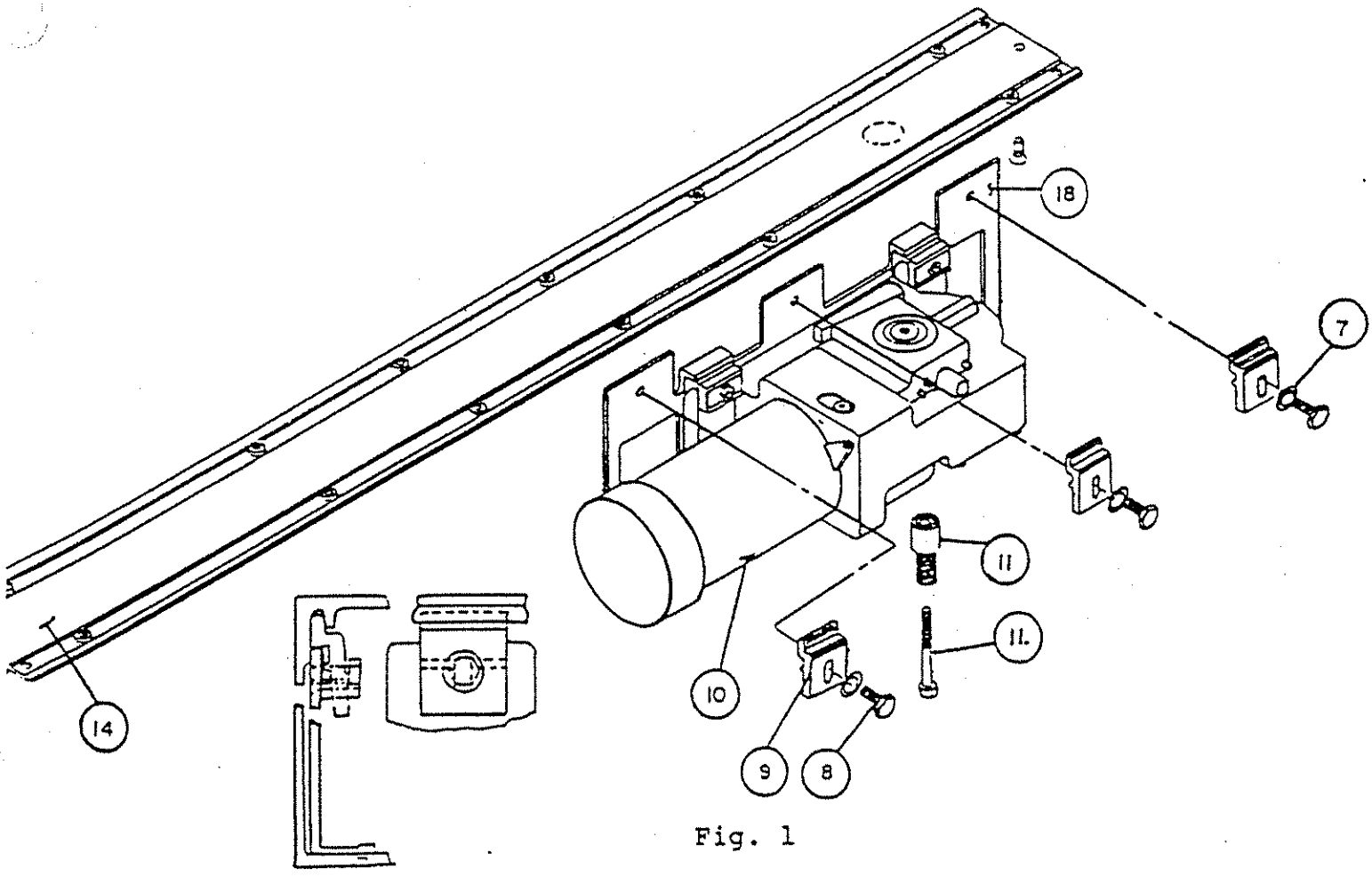
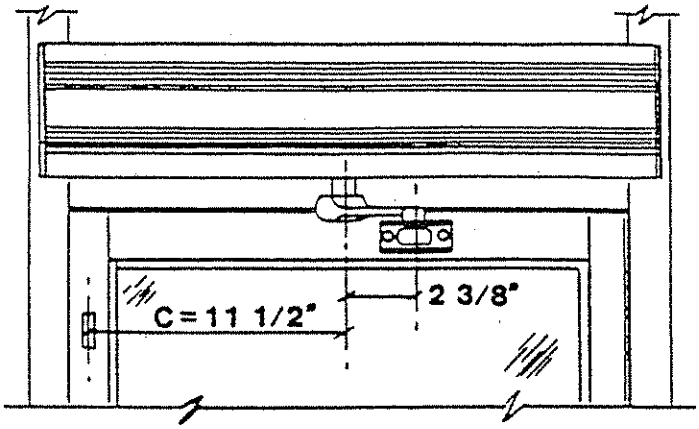


Fig. 1

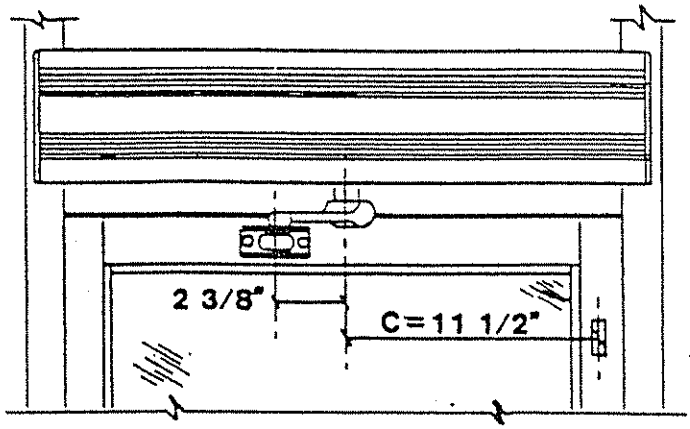
OPERATOR MTG. DETAIL

INSTALLATION STANDARD ARM SYSTEM

RIGHT HAND DOOR



LEFT HAND DOOR



Standard installation implies that the measurement "C" which is the distance between the center line of the hinge/pivot and the center line of the operator spindle is always 11 1/2". Standard installation applies only if the conditions below are fulfilled.

- The reveal (the distance between mounting plate and door may not exceed 6").
- The door weight may not exceed 200 lbs.
- The door width may not exceed 48".
- No special demands on the opening angle of the door (will be approximately 90 degrees).

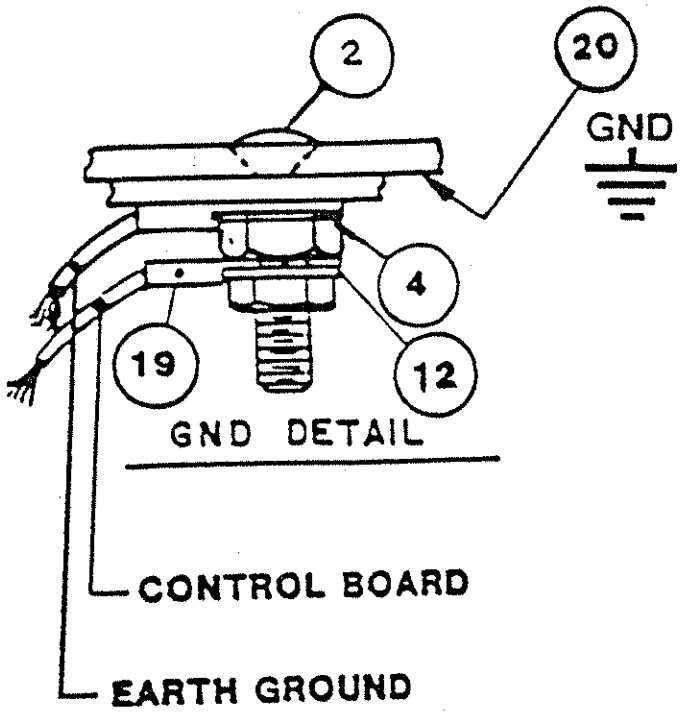
For standard installation with the above conditions fulfilled, an operator with fully acceptable function is obtained.

Wiring

Install the master (slave) printed circuit board(s) into the housing and wire according to installation wiring diagram A-10102. Control(s) are secured to the bottom of housing with self-adhesive tabs.

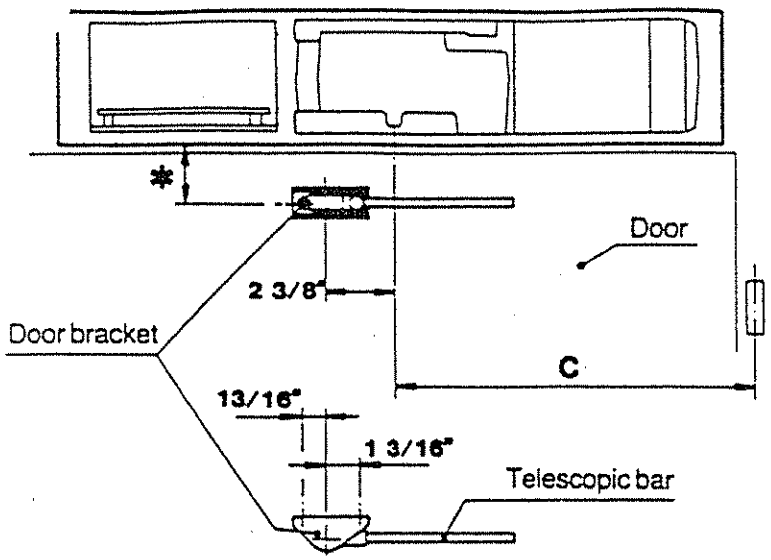
Grounding

A grounding stud (2) is provided with each housing. Remove both nuts (4) and install earth ground next to housing and secure with nut. Next install control board ground (green wire 19) and secure (see Fig. 2) with nut.

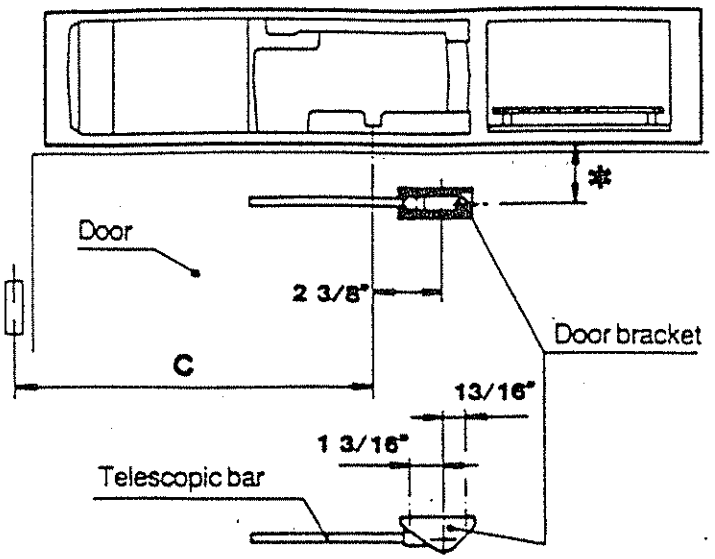


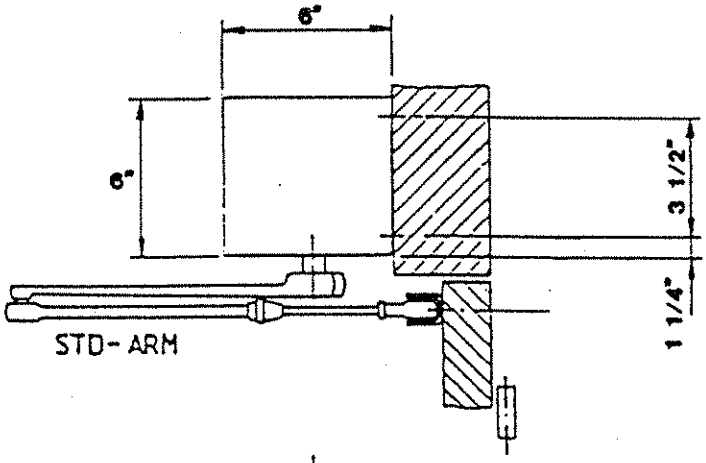
Installation Standard Arm System

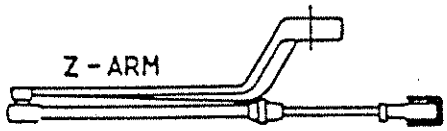
RIGHT HAND DOOR



LEFT HAND DOOR





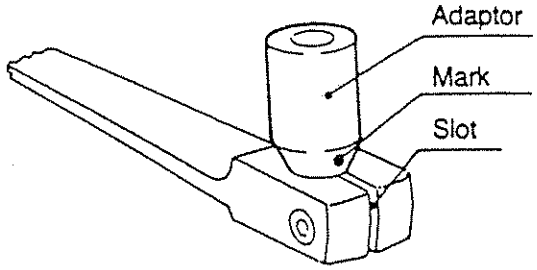


* **SEE INSTALLATION DRAWINGS**

1. Remove the door bracket and the telescopic bar from the arm system. Check that the door has the necessary reinforcement. Close the door and transfer the spindle center line to the door.
2. Establish the door bracket center lines from the appropriate installation drawing.
3. Install the door bracket so that the connecting rod end center line is 2 3/8" from the spindle center line.

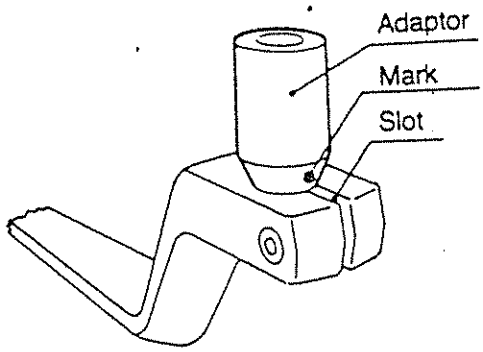
INSTALLATION STANDARD ARM SYSTEM

RIGHT HAND DOOR



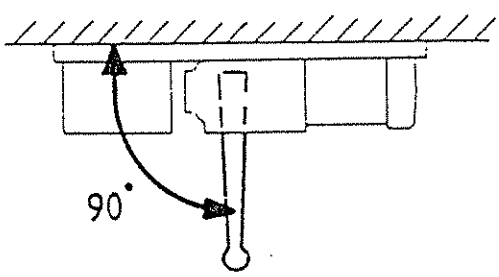
STD - ARM

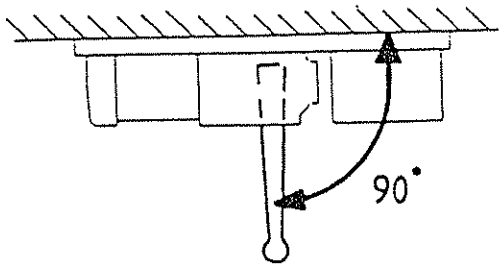
LEFT HAND DOOR



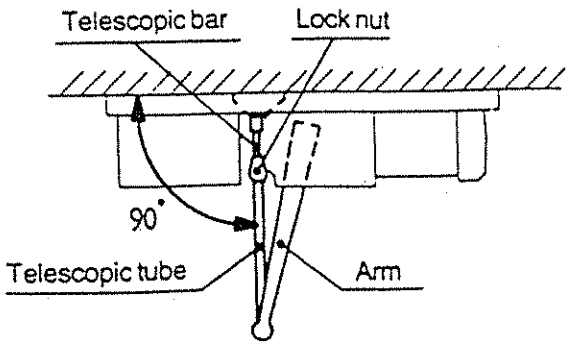
Z - ARM

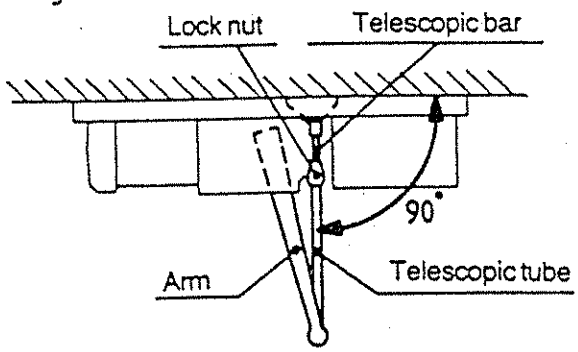
Mount the adaptor on the arm with the mark aligned with the slot in the arm. Tighten the screw properly.





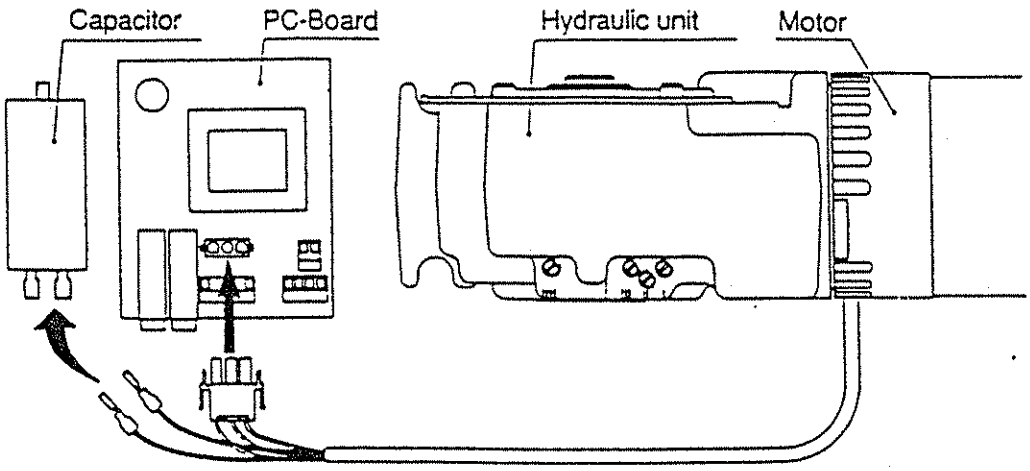
Mount the arm on the shaft of the operator at an angle of 90 degrees to the wall. Ensure that the grooves fit correctly, so they do not get damaged when the arm is tightened.





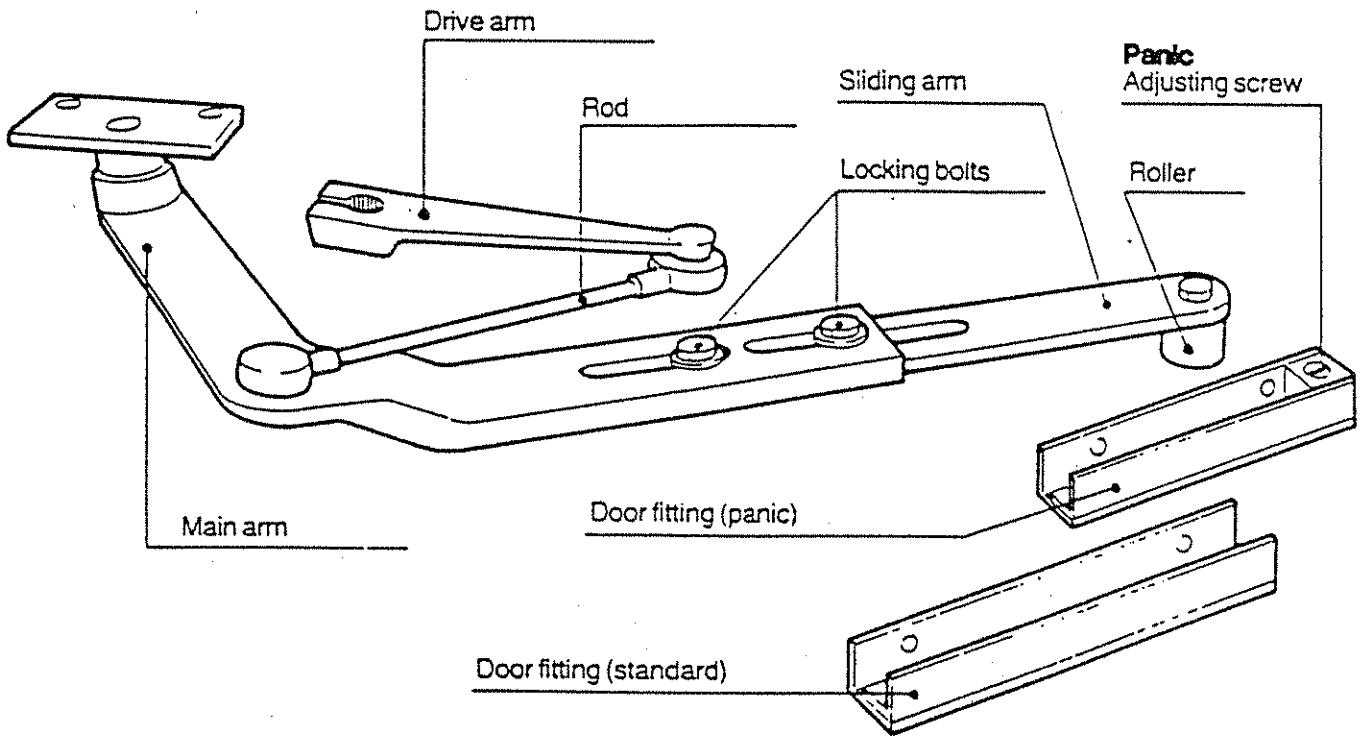
Insert the telescopic bar in the telescopic tube (do not tighten the lock nut). Close the door and keep it closed. Turn the arm until the telescopic bar/telescopic tube are at an angle of 90 degrees to the door. Tighten the telescopic bar by means of the lock nut. Open the door by hand to its maximum extent. Then let it close of its own accord. Check that the opening and closing movements are smooth and free.

INSTALLATION STANDARD ARM SYSTEM



Insert the plug-in connector from the motor to the PC Board. Connect the two flat pin connectors to the capacitor. It makes no difference which connector is connected to which capacitor contact. The cables necessary for connecting main voltage and actuating devices are to be connected to the PC Board. (See connection drawing A-10102).

INSTALLATION PARALLEL ARM SYSTEM



RIGHT HAND SHOWN

Slide-Track is delivered with Sliding Arm, Drive Arm, Rod and Main Arm assembly.

To obtain an adequate installation, the following drawings are to be used.

D-15001 for L.H. (ST-V) hinge hung. For R.H. (ST-H) mirrow image.

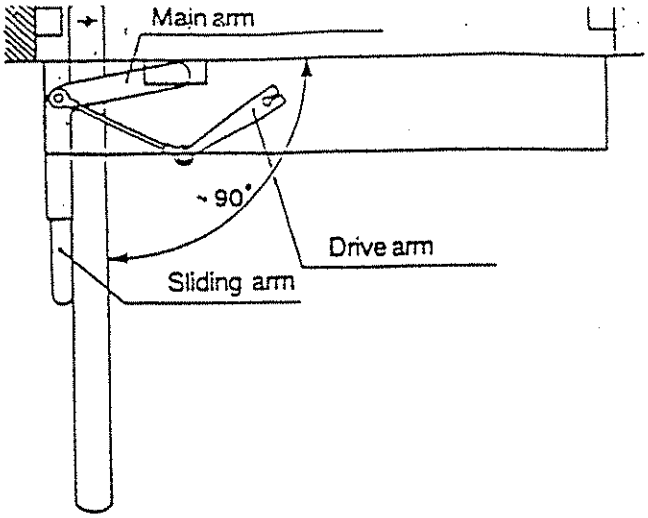
D-15002 for L.H. (ST-V) center pivot. For R.H. (ST-H) mirrow image.

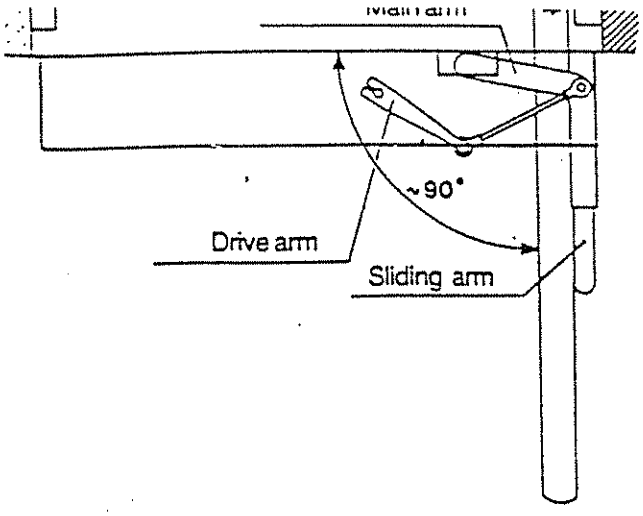
PARALLEL INSTALLATION

For parallel (pull) applications follow installation steps on pages 2, 3 and 4. Also install operator spindle shaft. When preparing the housing with spindle hole locator template 21-24-001, two additional 29/64" holes are required for the linkage support (see installation drawings) bracket.
With the operator housing and operator installed, the Slide Arm System must be attached to the operator housing.

Check that the proper Sliding Arm is mounted on the Main Arm; two sizes for different reveals are available. The shorter arm is always factory installed (see installation drawings) on the Main Arm and covers reveals from 0" to 2 1/16". Release the two locking bolts and slide the arm to the inner position. Mount the Main Arm to the operator housing and secure with the nuts and bolts provided.

Create a constant impulse by installing a jumper wire to the opening impulse terminals (see connection dwg.) on PC Board. The motor will start and the shaft of the operator will turn to its open position. Open the door approximately 90 degrees and let the Main Arm touch the door as shown in Fig. 3. Mount the Drive Arm on the operator shaft with Main Arm positioned as shown. Ensure that the grooves of the Drive Arm and shaft mate correctly so that they are not damaged when arm is secured. Tighten the Main Arm bolt properly.





RIGHT HAND DOOR **LEFT HAND DOOR**

INSTALLATION SLIDE ARM AND TRACK

1. Remove the jumper wire connection. The motor turns off, and the arm system pulls the door towards closed position and stops when the Drive Arm hits the wall. (Install a rubber bumper at this location.)

2. Pull out the Drive Arm from the wall and place a bumper about 3/8" thick between the wall and the Drive Arm.

3. Adjust the Sliding Arm so that it is in contact with the door, and fasten the two locking bolts properly.

4. During the opening and closing movements of the door, the Sliding Arm will move a certain distance on the door. Mark the end positions for this distance. (Note: the end positions do not always occur when the door is fully closed and fully opened).

5. Give constant impulse by means of a jumper wire as before. The arm system now moves away and makes the following installation steps easier.

6. Secure the door track (standard) or breakout (panic). Place the door track symmetrically over the marks on the door with the center of the screw holes 1 5/8" from the top edge of the door. Mark on the door the screw hole locations. Drill, tap and prepare the door for channel attachment with suitable screws.

7. Remove the jumper wire. The arm system returns and stops when the roller on the Sliding Arm hits the door. Attach the door channel together with the arm roller.

8. Push the door to its fully open position. Check that it can open at least 90 degrees and that the roller runs freely in the door channel. Check also that the arm system operates without any problem.

9. If the panic door channel which provides panic breakout is installed, the panic force is to be adjusted to comply with local emergency egress requirements. The adjusting screw is illustrated on page 8. If panic door fitting is installed without requirements on panic breakout, the adjusting screw can be secured tightly.

ADJUSTMENTS

When an opening impulse is given, the door opens electrohydraulically at high speed, slowing down to low speed for the last 25 degrees before maximum opening position is reached. At the end of the time during which the door is held open, which is set by a time delay potentiometer on the PC Board, the door closes by spring action at high speed, slowing down to low speed for the last 10 degrees before closed position is reached. The speeds are factory preset but can be adjusted by means of the four valve screws marked 1, 11, 111 and 1111 (see Fig. 4) on the hydraulic unit. Minimum and maximum speeds are obtained by turning the screws approximately 1 revolution. Oil pressure/opening power is factory preset and should not be changed. However, for extremely heavy doors and high adverse wind pressure, it may be necessary to increase the operating pressure. This pressure increase will, however, create a higher wear factor on the unit. Pressure is increased by turning oil pressure screw clockwise.

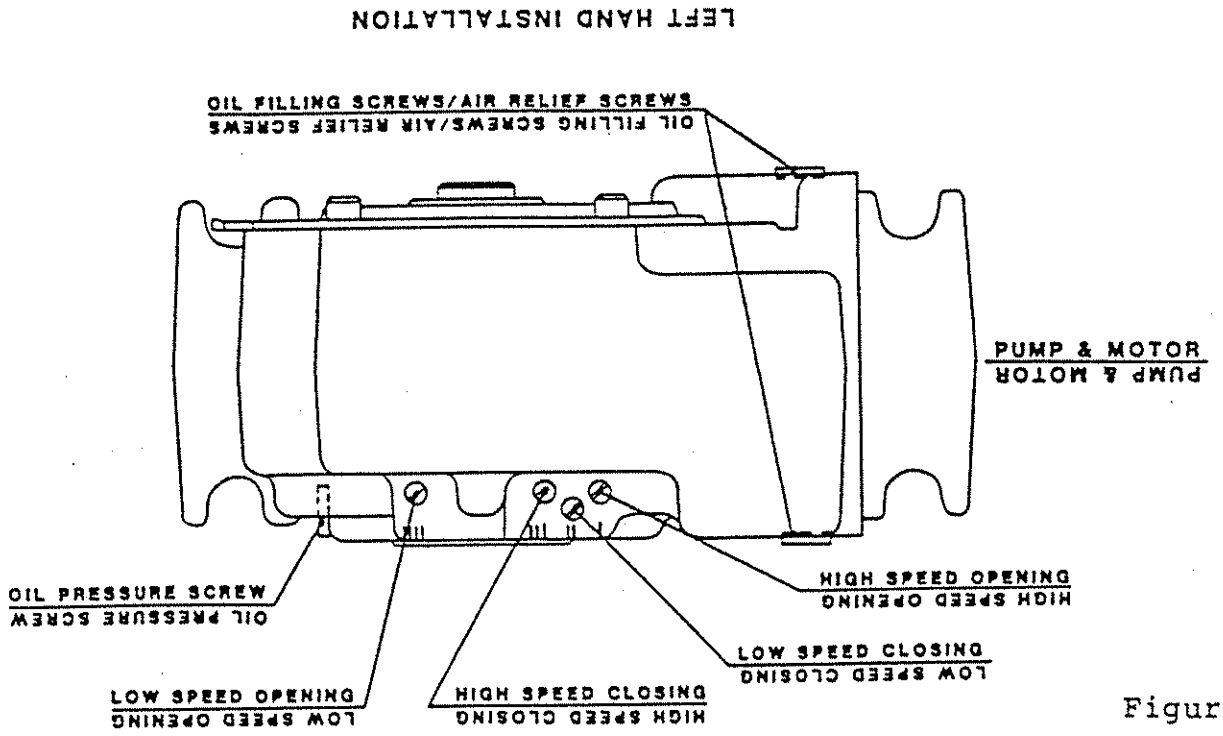
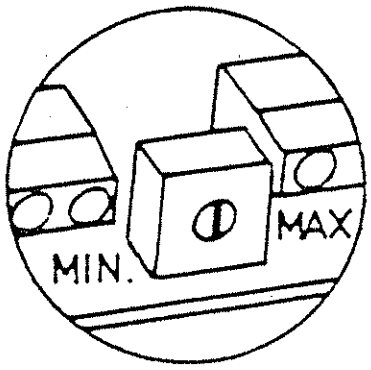


Figure 4

1. Open the upper air relief (see Fig. 4) screw 1-2 turns.
2. Set the time delay potentiometer screw located on P.C. board to about 10-15 seconds.



*3. Actuate an opening impulse and adjust valve screws 1 and 1111 to obtain the desired opening speed and a smooth backcheck (braking) of the door. Clockwise turning decreases the speed.

*4. Actuate an opening impulse and allow door to close while adjusting valve screws 11 and 111 to obtain the desired closing speed and a smooth latch (braking) of the door.

*5. Make a final adjustment of the potentiometer time delay to the desired time for holding the door open.
Fast traffic = short open time.
Slow traffic = long open time.
Open time can be set between 0 and 30 seconds. Clockwise turning increases the open time.

* NOTE: See Safety Requirements for Pedestrian Door Applications.

*SAFETY REQUIREMENTS

Pedestrian Door Applications must comply with the following Entrapment Standards in U.L. 325 and ANSI A156.10 and Low Energy Power Operated Doors (Handicap) Applications ANSI A156.19.

Pedestrian Door Applications High speed opening (to backcheck) - 1.5 seconds or longer.

Closing speed (to latch):

Door Width	In Compliance
30"	2.0 sec.
36"	2.0 sec.
42"	2.5 sec.
48"	3.0 sec.

Latch Area - final 10 degrees of closing in 1.5 seconds or longer.

Low Energy Power Operated Doors

High speed opening (to backcheck) and high speed closing (to latch):

Door Width	In Compliance
30"	3.0 sec.
36"	4.0 sec.
42"	4.5 sec.
48"	5.0 sec.

For door weights above 175 pounds, please refer to ANSI Low Energy Standard. Latch Area - final 10 degrees of closing in 1.5 seconds or longer. Time Delay - if not equipped with a hold open sensing device, the time delay must be adjusted to hold the door fully open for 5 seconds or longer.

NOTE: Please refer to appropriate standards for manual forces, kinetic energy and other safety requirements.

TECHNICAL DATA

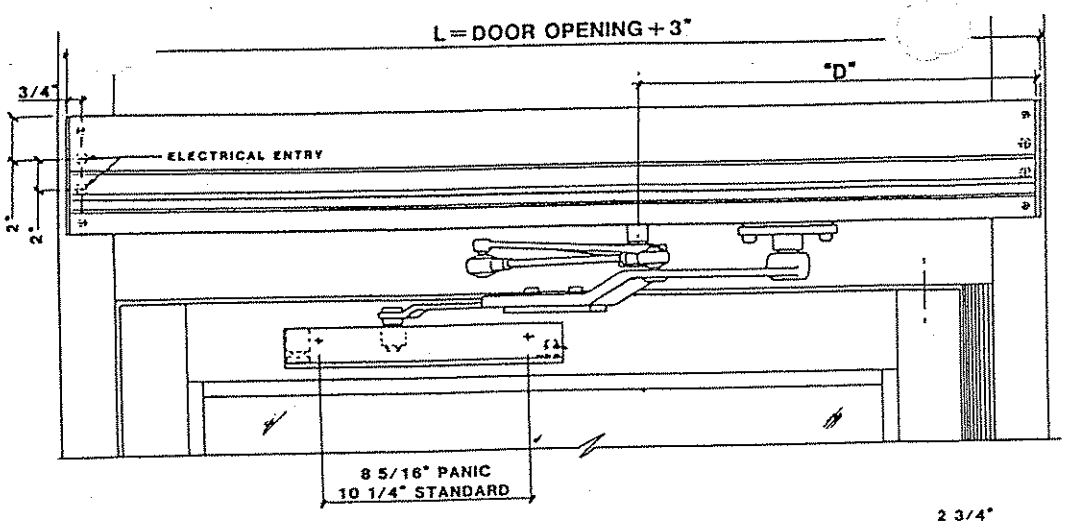
1. Power supply: 110V 60 Hz
2. Power consumption: max. 200W
3. Fuses: see connection drawing.
4. Thermo-Couple: automatic cut out of motor if overheated.
5. Opening time: variable from 1.5 sec.
6. Opening hold time: 0-30 sec.
7. Closing time: variable from 1.5 sec.
8. Dimensions: see installation drawings.
9. Weight (standard) approximately 40 pounds.

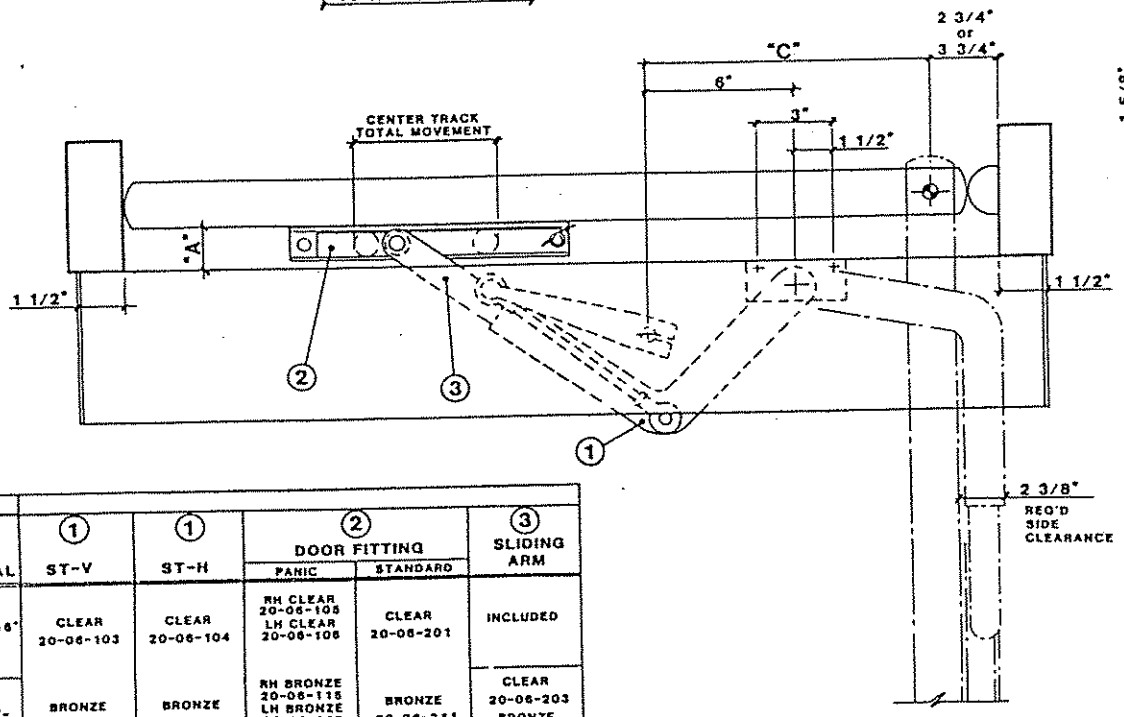
FAULT FINDING PROCEDURES

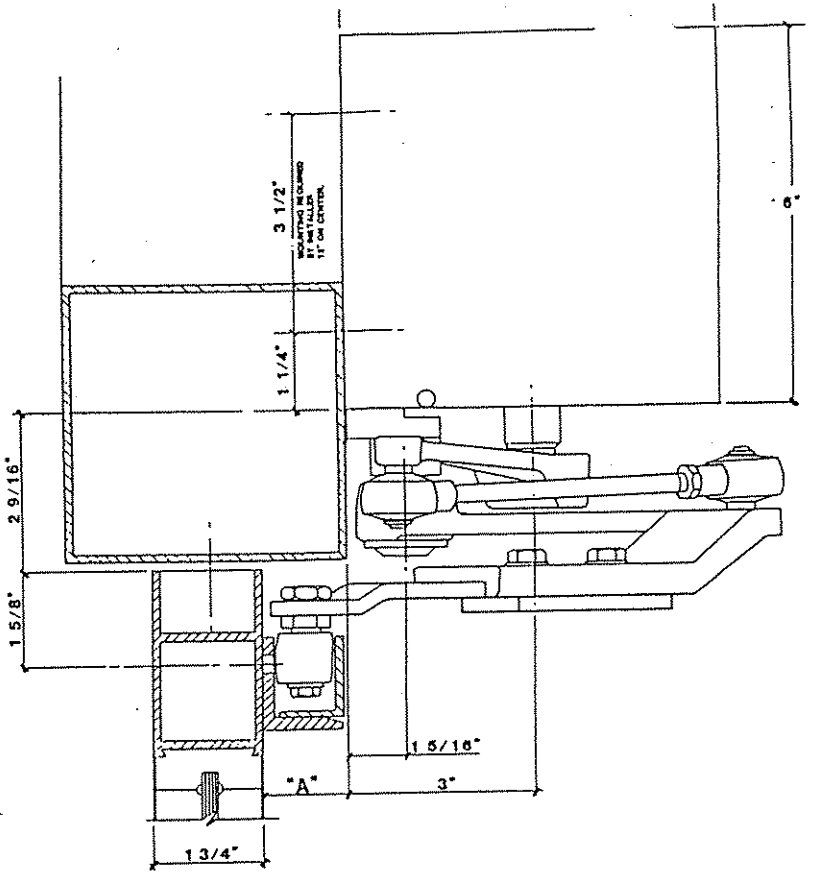
(Also see connection drawing for control unit.)

THE DOOR DOES NOT OPEN - the motor does not start	Control switch is set to off.	Change the setting of the switch.
	Main supply voltage is missing.	Check the voltage between terminals 1 and 2.
	Fuse has blown.	Replace fuse.
	Actuating device not functioning.	Test with jumper wire between opening impulse inputs.

THE DOOR DOES NOT OPEN - the motor does not start	Safety mat or device shorted.	Remove device and retest opening.
	Starting capacitor defective.	Replace and retest.
THE DOOR DOES NOT OPEN - the motor starts	Wrong pre-load angle on the Arm System.	Check and readjust arm pre-load.
	The valve for high speed opening (I) is closed.	Adjust the valve.
	Operator spindle shaft is loose.	Secure properly.
	Fluid level too low.	Check level, correct leak and readjust.
THE DOOR DOES NOT CLOSE - motor runs continuously	Shorted opening/ safety impulse.	Disconnect activating devices.
	Defective PCB.	Replace PCB.







TYPE APPLICATION	"C"	"D"
2 3/4" C.P.	11"	15 1/8"
3 3/4" C.P.	11"	16 1/8"
SPECIAL CONSULT FACTORY		

"A" REVEAL	① ST-V	① ST-H	② DOOR FITTING PANIC	② DOOR FITTING STANDARD	③ SLIDING ARM
0"-2 1/16"	CLEAR 20-06-103	CLEAR 20-06-104	RH CLEAR 20-06-105 LH CLEAR 20-06-106	CLEAR 20-06-201	INCLUDED
2 1/16"-3 5/8"	BRONZE 20-06-109	BRONZE 20-06-110	RH BRONZE 20-06-115 LH BRONZE 20-06-116	BRONZE 20-06-211	CLEAR 20-06-203 BRONZE 20-06-213
NOTE: MAXIMUM REVEAL 3 5/8"					

LEFT HAND SHOWN
(RIGHT HAND MIRROR IMAGE)

REV. A 7-

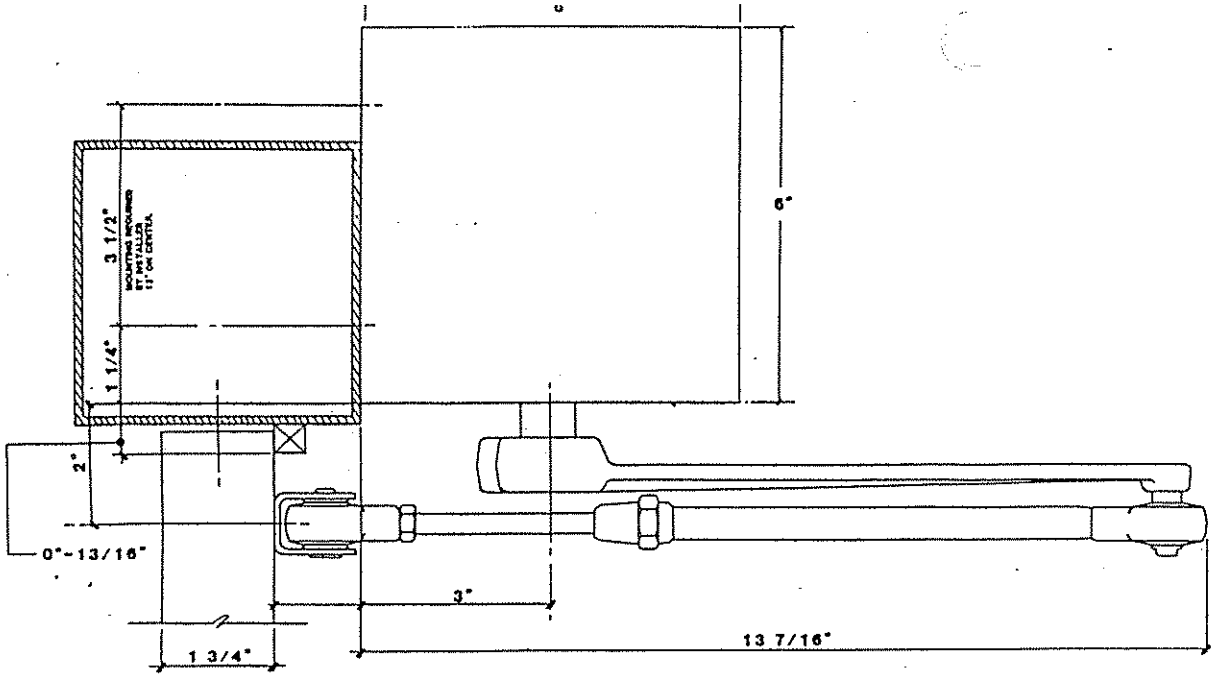
ELECTRA 150 INSTALLATION for CENTER PIVOT DOORS

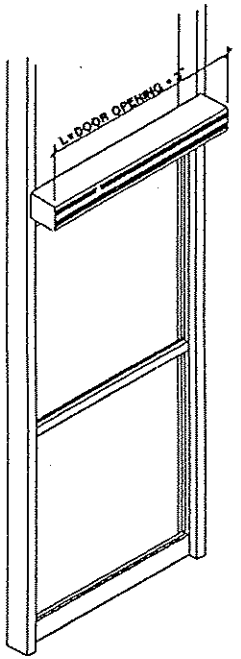
SHEET 2/2

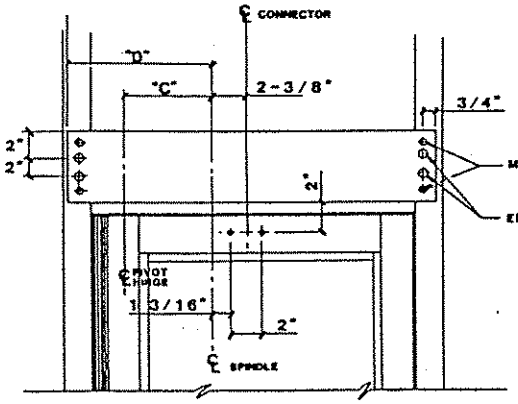
besam

171 TWIN RIVERS DR. EAST WINDSOR, N.J. 08520 609-443-5800

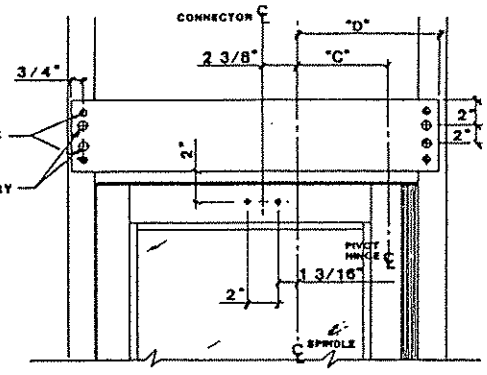
D-15







LEFT HAND MOUNTING



RIGHT HAND MOUNTING

TYPE APPLICATION	"C"	"D"
HINGE HUNG	11 1/2"	12 7/8"
2 3/4" C.P.	11 1/2"	15 5/8"
3 3/4" C.P.	11 1/2"	16 5/8"
SPECIAL: CONSULT FACTORY		

REV. A 7-2

ELECTRA 150 INSTALLATION for REGULAR ARM

DATE 2/20/

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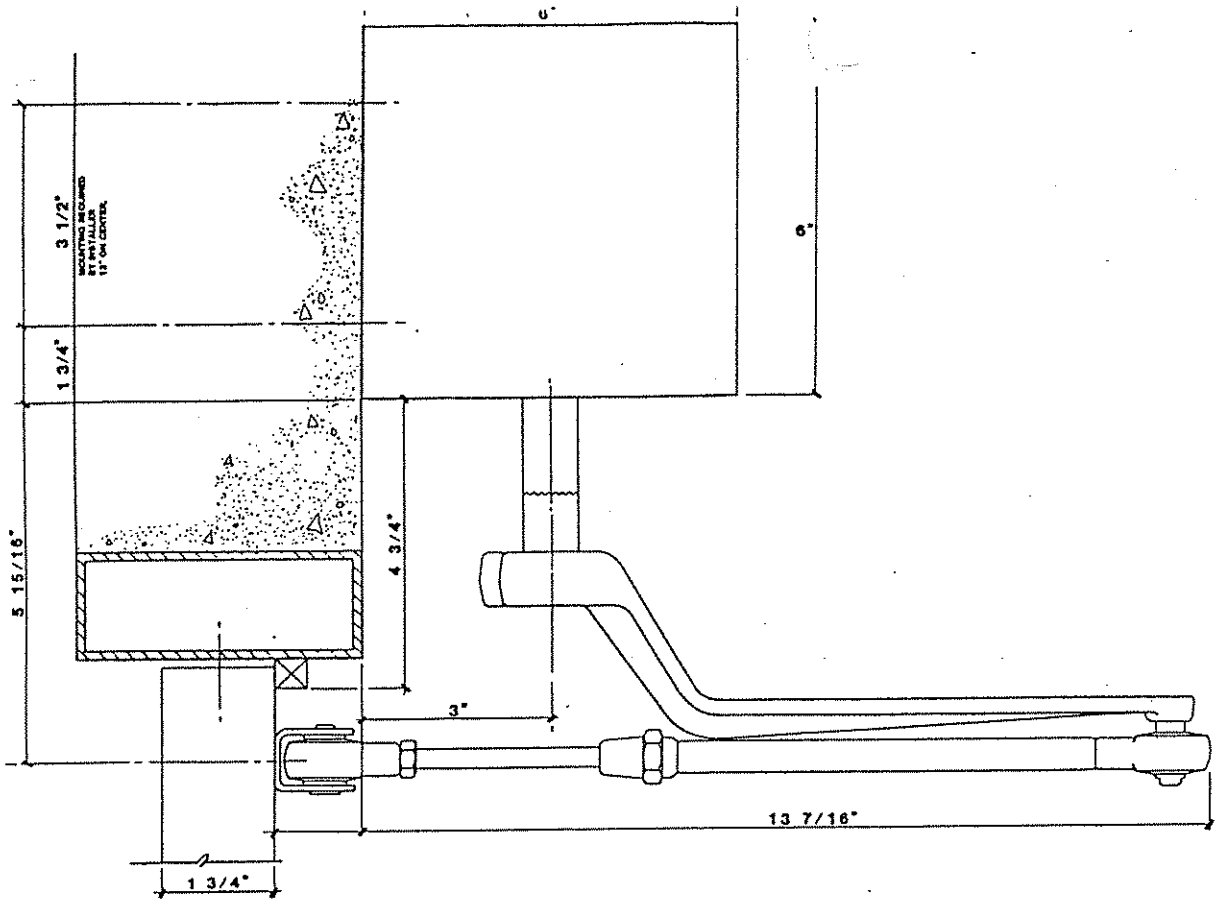
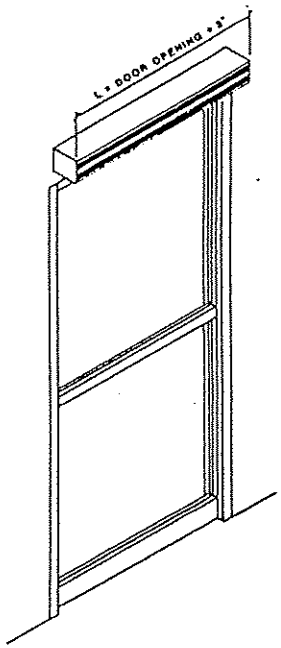
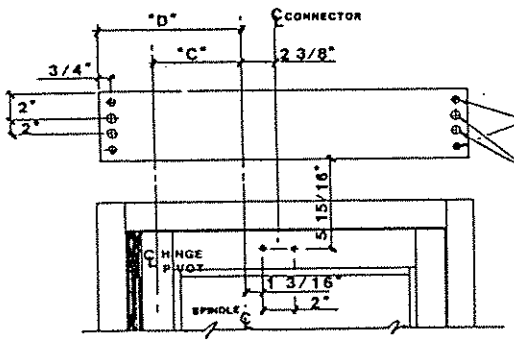
171 TWIN RIVERS DR. EAST WINDSOR, N.J. 08520 609-443-5800

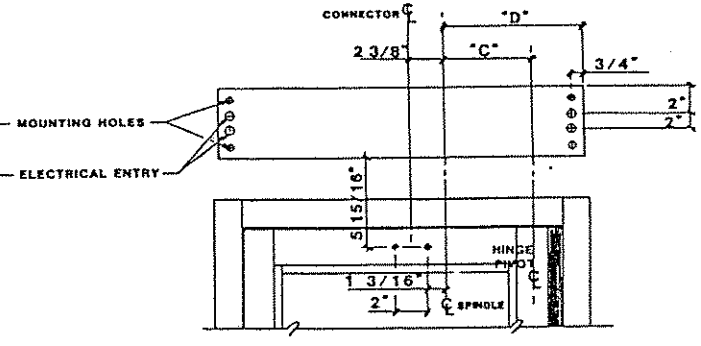
D-150







LEFT HAND MOUNTING



RIGHT HAND MOUNTING

TYPE APPLICATION	"C"	"D"
HINGE HUNG	11 1/2"	13 7/8"
2 3/4" C.P.	11 1/2"	13 5/8"
3 3/4" C.P.	11 1/2"	13 5/8"
SPECIAL: CONSULT FACTORY		

IF REVEAL IS GREATER THAN 3" A SPECIAL TELESCOPIC ROD IS RE
STANDARD APPLICATIONS-MAXIMUM REVEAL IS 6"

FOR SLIMLINE HEADER

REV. A 7

TITLE: ELECTRA 150 INSTALLATION for SHAFT EXTENSION

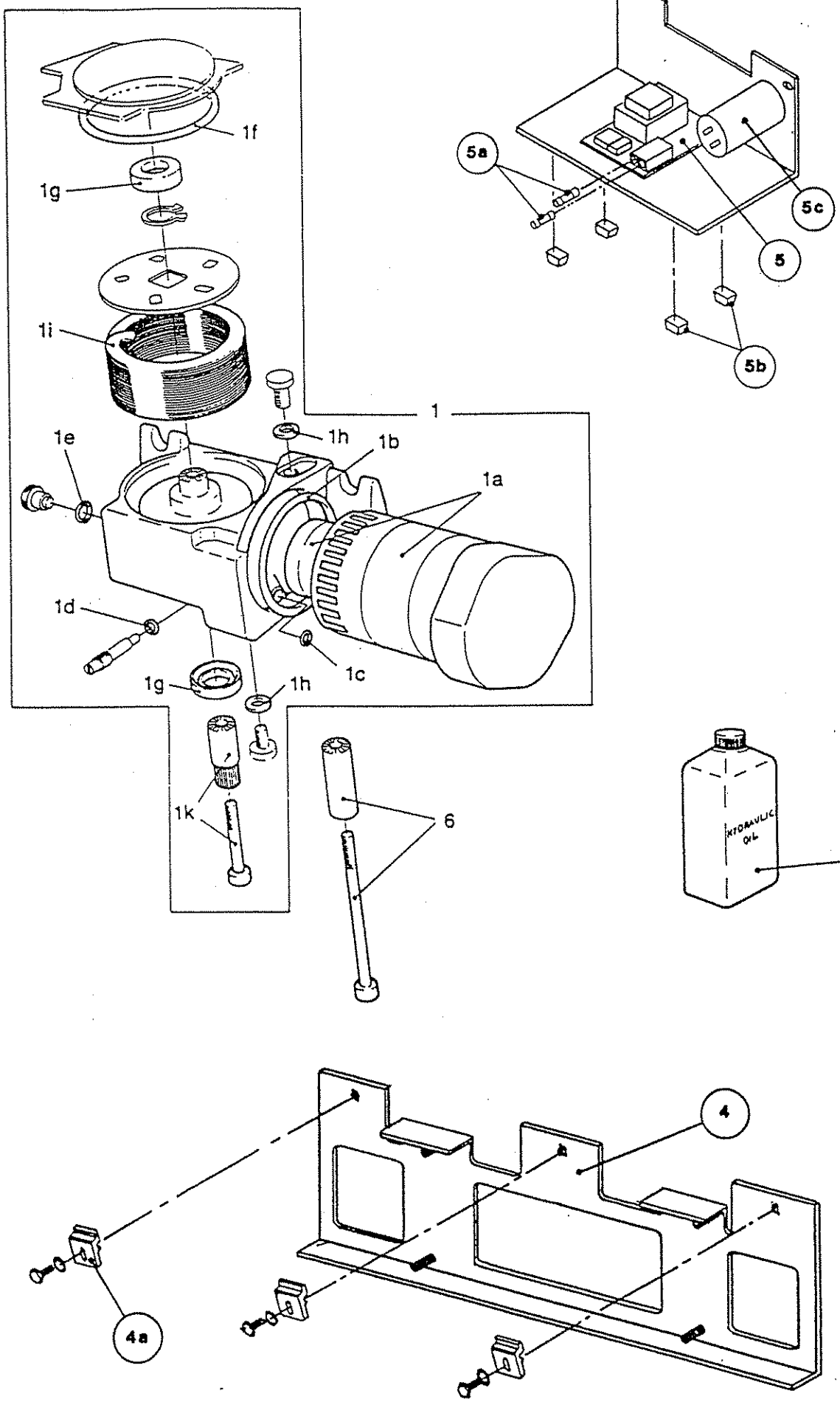
SHT. 2/2

besam

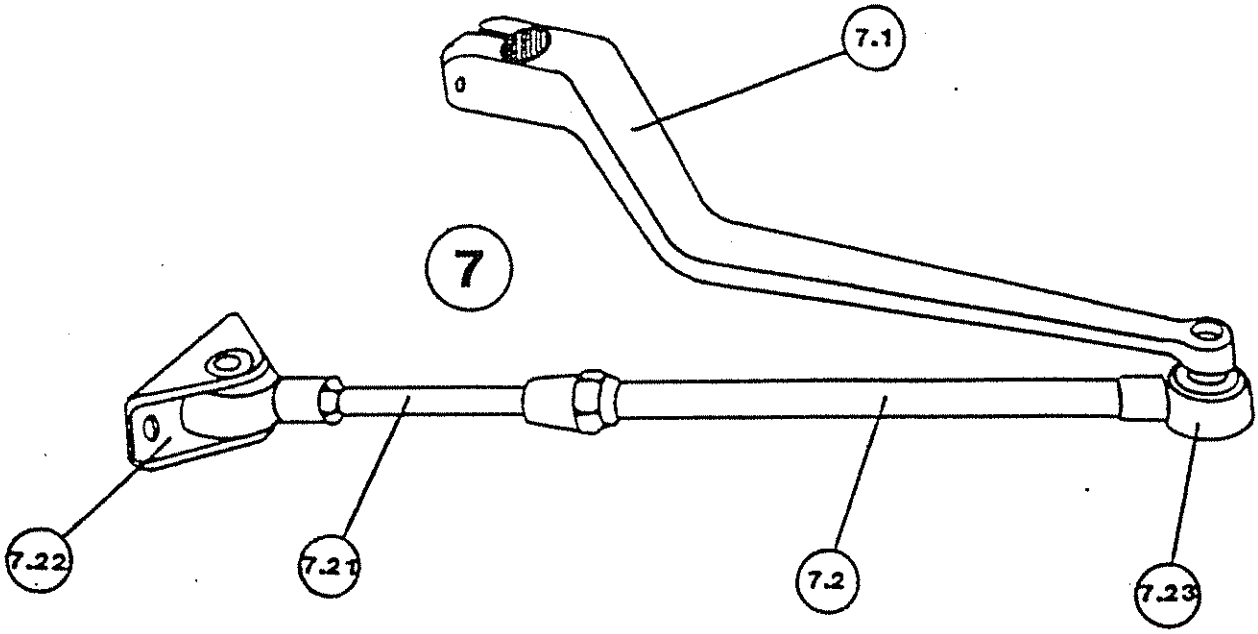
171 TWIN RIVERS DR
EAST WINDSOR, N.J. 08520
609-443-5800

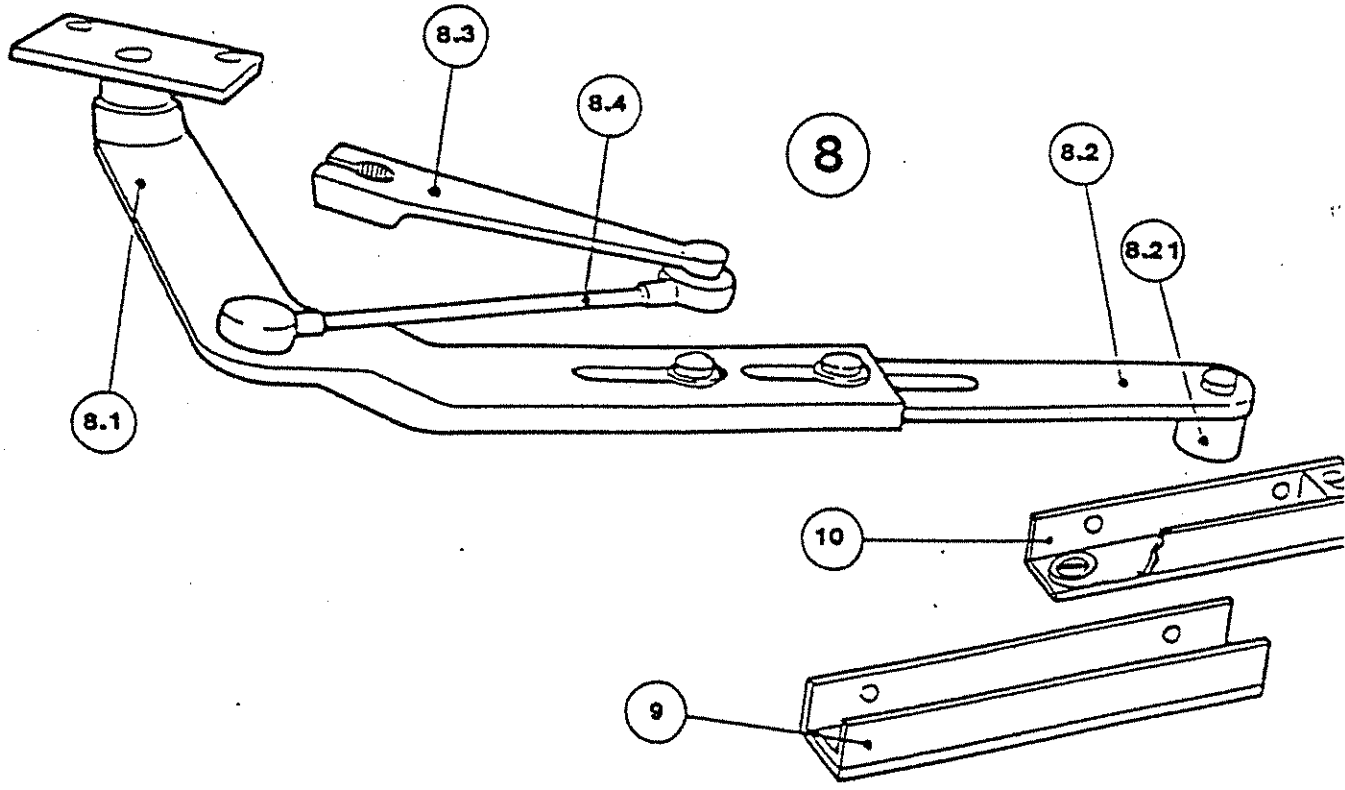
D-15

ELECTRA 150 SPARE PARTS



ELECTRA 150 SPARE PARTS





ITEM	PART DESCRIPTION	PART NUMBER	REMARKS
1	Operator 115 V	21-07-001	Complete
1a	Motor & Pump 115 V	21-07-002	Complete
1b	O Ring Housing	21-20-003	
1c	O Ring Port	21-20-004	
1d	O Ring Valve Set	21-15-050	Set of 4
1e	O Ring Plug	21-20-006	
1f	O Ring Cover	21-20-007	
1g	Radial Oil Seal Set	21-15-031	Set of 2
1h	Copper Washer Set	21-15-030	Set of 2
1i	Torsion Spring	21-03-011	
1k	Spindle Shaft	21-03-010	w/Bolt
2	Operator Housing	Special Order	not shown specify length and finish
3	Hydraulic Oil	20-07-207	Per Gallon
4	Operator Mounting Plate	21-03-005	Complete
4a	Mounting Clip Set	21-15-209	3 Requested
5	Control CSD 110 Master	21-02-002	Shown
	Control CSD 110 Slave	21-02-006	Not Shown
5a	Fuse Set 4 AT	21-15-040	Set of 10
	Fuse Set 1.0	21-02-010	ea.
5b	Bumpons	30-20-231	
5c	Capacitor	20-02-209	
6	Spindle Extension	21-03-200	w/Bolt
7	Arm Sustem		See Next Page

ITEM	PART DESCRIPTION	PART NUMBER	REMARKS
7	Arm Sus. Reg. Installation		
	Arm Sus. Z-Type	20-06-101	Complete- State Color
	Arm Sus. Straight - Type	20-06-102	Complete- State Color
7.1	Arm, Z- Portion Only	20-06-151	State Color
	Arm, Straight - Type	20-06-107	State Color
7.2	Telescopic Bar System	20-06-150	State Color
7.21	Telescopic Bar (Deep Reveal)	20-06-202	In Overlength 2ft.
7.22	Door Attachment	20-06-156	State Color
7.23	Washer Set	20-08-8503	Set of 4
8	Arm Sys. Para. Installation		
	Arm Sus., ST-V-R. HD	20-06-103	Complete - State Color
	Arm Sus., ST-H-L. HD	20-06-104	Complete - State Color
8.1	Main Arm for ST-V	20-06-157	State Color
	Main Arm for ST-H	20-06-155	State Color
8.2	Slide Arm for ST-V & ST-H	20-06-154	State Color
	Slide Arm in Overlength for		
	Reveal more than 1- 9/16"	20-06-203	State Color
8.21	Roller for Slide Arm	20-20-207	
8.3	Drive Arm for ST-V & ST-H	20-06-153	State Color
8.4	Bar for ST-V & ST-H	20-06-152	State Color
9	Slide Track (Butt Hinge)	20-06-201	State Color
10	Slide Track Central Pivot w/ Panic Breakaway		
	Right Hand	20-06-105	State Color
	Left Hand	20-06-106	State Color
11	Spring Tension Tool	21-50-001	Not Shown
12	Door Decal -IN	75-20-101	Not Shown
13	Door Decal -OUT	75-20-100	Not Shown
14	Door Decal - Caution Auto Door	75-20-102	Not Shown
15	Radial Oil Seal Tool	21-15-100	Not Shown