

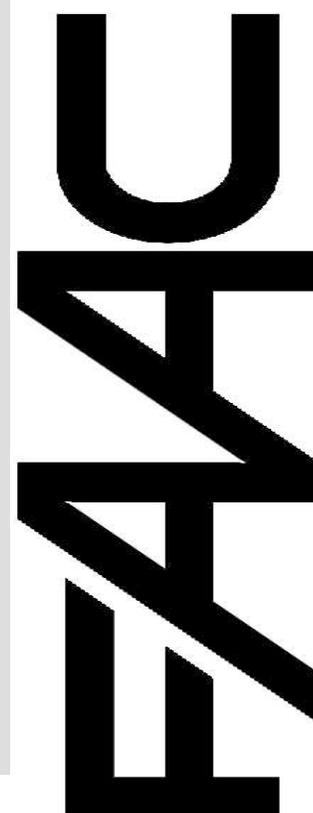
THE 750 OPERATOR AND 455 D CONTROL PANEL: INSTALLATION MANUAL

June, 2004
750 Operator And
455 D Control Panel
Installation Manual

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The 455 D Control Panel Installation Instructions



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IMPORTANT SAFETY INFORMATION

Both the installer and the owner and/or operator of this system need to read and understand this installation manual and the safety instructions supplied with other components of the gate system. This information should be retained by the owner and/or operator of the gate.

WARNING! To reduce the risk of injury or death

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. Never let children operate or play with gate controls. Keep the remote control away from children.
3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release only when the gate is not moving.
6. **KEEP GATES PROPERLY MAINTAINED.** Read the owner's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.
8. **SAVE THESE INSTRUCTIONS.**

When installing the photo-beams supplied with this unit two things need to be considered.

1. Care should be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is in motion.
2. One or more photo-beams shall be located where the risk of entrapment exists, such as the perimeter reachable by the moving gate leaf.

GATE DESIGN

1. A gate is a potential traffic hazard, so it is important that you locate the gate far enough away from the road to eliminate the potential of traffic getting backed up. This distance is affected by the size of the gate, how often it is used, and how fast the gate operates.
2. The operator you choose to install on your gate must be designed for the type and size of your gate and for the frequency with which you use the operator.
3. Your gate must be properly installed and must work freely in both directions before the automatic operator is installed.
4. An automatic operator should be installed on the inside of the property/fence line. Do not install the operator on the public side of the property/fence line.
5. Pedestrians should not use a vehicular gate system. Prevent such inappropriate use by installing separate gates for pedestrians.
6. Exposed, reachable pinch points on a gate are potentially hazardous and must be eliminated or guarded.
7. Outward swinging gates with automatic operators should not open into a public area.
8. The operating controls for an automatic gate must be secured to prevent the unauthorized use of those controls.
9. The controls for an automatic gate should be located far enough from the gate so that a user cannot accidentally touch the gate when operating the controls.
10. An automatic gate operator should not be installed on a gate if people can reach or extend their arms or legs through the gate. Such gates should be guarded or screened to prevent such access.

INSTALLATION

1. If you have any question about the safety of the gate operating system, do not install this operator. Consult the operator manufacturer.
2. The condition of the gate structure itself directly affects the reliability and safety of the gate operator.
3. Only qualified personnel should install this equipment. Failure to meet this requirement could cause severe injury and/or death, for which the manufacturer cannot be held responsible.
4. The installer must provide a main power switch that meets all applicable safety regulations.
5. Clearly indicate on the gate with the 2 warning signs that are included (visible from either side of the gate).
6. It is extremely unsafe to compensate for a damaged gate by increasing hydraulic pressure.
7. Devices such as reversing edges and photobeams must be installed to provide better protection for personal property and pedestrians. Install reversing devices that are appropriate to the gate design and gate application.
8. Before applying electrical power, be sure that the voltage requirements of the equipment correspond to your supply voltage. Refer to the label on your operator system.

USE

1. Use this equipment only in the capacity for which it was designed. Any use other than that stated should be considered improper and therefore dangerous.
2. When using any electrical equipment, observe some fundamental rules:
 - Do not touch the equipment with damp or humid hands or feet.
 - Do not install or operate the equipment with bare feet.
 - Do not allow small children or incapable persons to use the equipment.
3. If a gate system component malfunctions, turn off the main power before making any attempt to repair it.
4. Do not attempt to impede the movement of the gate. You may injure yourself as a result.
5. This equipment may reach high temperatures during operation; therefore, use caution when touching the external housing of the operator.
6. Learn to use the manual release mechanism according to the procedures found in this installation manual.
7. Before carrying out any cleaning or maintenance operations, disconnect the equipment from the electrical supply.
8. To guarantee the efficiency of this equipment, the manufacturer recommends that qualified personnel periodically check and maintain the equipment.

U.L. CLASS AND FAAC OPERATOR

Model	Duty Cycle	Typical Use
Class I: Residential Vehicular Gate Operator		
402 750	Limited duty	<ul style="list-style-type: none"> • Home use • Small apartment building, for example, up to 4 units in a building, with limited public access
422 760		
412 400		
620 640		
885		
Class II: Commercial/General Access Vehicular Gate Operator		
400 640	Continuous duty	<ul style="list-style-type: none"> • Apartment buildings • Very public access
620 885		
Class III: Industrial/Limited Access Vehicular Gate Operator		
400 640	Continuous duty	<ul style="list-style-type: none"> • No public access
620 885		
Class IV: Restricted Access Vehicular Gate Operator		
620 640	Continuous duty	<ul style="list-style-type: none"> • Prison rated security
885		

TECHNICAL DATA

THE 750 OPERATOR

<i>Description</i>	<i>750 Standard</i>	<i>750 Long Leaf</i>
Ambient temperature, deg F (deg C)	-13 to 158 (-25 to 70)	
Maximum duty cycle	30 Cycles/ Hour	
Thermal cut out, deg F (deg C)	212 (100)	
Power voltage required, VAC	115 ±10% or 230, +6 or -10%, 60 Hz	
Absorbed power, W	220	
Motor speed, rpm	1400	
Type of oil	FAAC HD (Aeroshell 41)	

Hydraulic Power Unit:

Height × width × depth, in. (cm)	13 ³ / ₄ × 8 ³ / ₁₆ × 5 ¹ / ₈ (35 × 20.8 × 13)	
Weight, lb (kg)	20 (9)	
Oil quantity, qt (l)	1 (0.9)	
Hydraulic locking:	CBA: Opened CBC: Closed CBAC: Opened and Closed	Not available
Gate weight, lb (kg)	1760 (800)	
Maximum gate length, ft (m)	7 (2.1)	13 (4)

Hydraulic Drive Unit:

Height (not including shaft) × length × width, in. (cm)	4 ⁷ / ₈ × 15 ³ / ₄ × 7 ⁷ / ₈ (12.4 × 40 × 20)	
Weight		
100-deg swing, lb (kg)	18 (8)	
180-deg swing, lb (kg)	20 (9)	
Oil quantity, qt (l)	0.9 (1)	
Maximum angle of rotation		
100-deg swing, deg	118	
180-deg swing, deg	200	
90-deg opening time, sec	12	
Nominal torque, ft-lb (Nm)	338 (460)	

UNPACKING THE OPERATOR

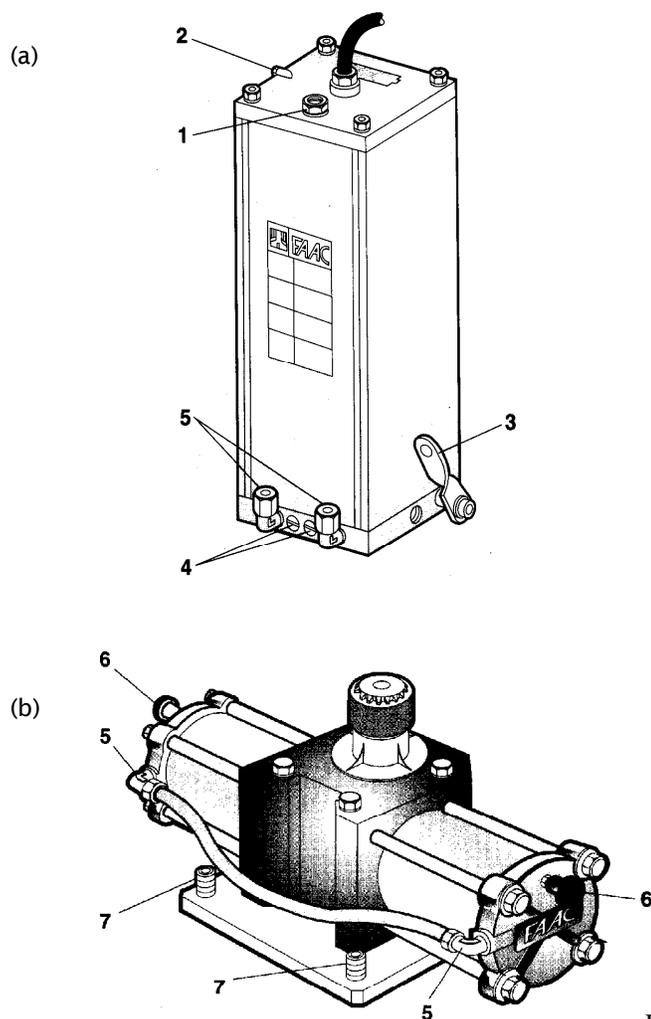
When you receive your 750 Operator, complete the following steps:

Inspect the shipping box for physical damage such as leaking oil or a torn carton. Then inspect the operator after you remove it from the box. Notify the carrier immediately if you note any damage because the carrier must witness the damage before you can file a claim.

As you unpack the boxes, insure that all parts listed below are included:

Power Unit (see figure 1a):

(1) vinyl box with key (the power unit is shipped separately from the box)



Drive Unit (see figure 1b):

(1) Hydraulic drive attached to its base plate with four (4) leveling bolts installed and with the sleeve fitted over the splined shaft.

(2) "Box halves" (right-angled and lipped pieces of galvanized steel that together form the sides of the box around the drive unit)

(1) Top cover protected by peel-off plastic

(1) Package containing two (2) mounting C-brackets, six (6) screws to hold cover on the drive unit, four (4) ring fittings for hydraulic lines, one (1) plastic half-sleeve to fit around drive shaft and match top cover, one 0.3-qt (1/4 liter) container of hydraulic fluid

(1) Plastic collar around splined shaft

1 Oil Plug/Dip Stick

2 Vent Screw

3 Manual Release Lever

4 By-Pass Valve Screw

5 Hydraulic 90-deg Elbow Couplings

6 Bleed Screws

7 Leveling Bolts

Figure 1. Parts of the 750(a) the Power Unit and (b) the Drive Unit (sometimes referred as to the Ram Unit)

THE 750 OPERATOR

GENERAL CHARACTERISTICS

The FAAC 750 Operator is an automatic gate operator for a swinging gate leaf. It can accommodate a gate leaf of up to 1760 lb (800 kg) and up to 13 ft (4 m) in length.

The 750 Operator is a two piece unit consisting of a hydraulic power (or pump) unit and a hydraulic ram (or drive) unit which are connected by the means of two hydraulic hoses.

The 750 Operator can be used to swing the gate leaf inward or outward. Some versions provide hydraulic locking in at least one position, either opened or closed, depending on how it was ordered.

The hydraulic lock is a service device rather than a security device. Additional, external locks are recommended under the following conditions:

- You are installing the Model 750 SB.
- The length of the gate leaf is 7 ft or more.
- The installation requires tight security.
- The site is subject to vandalism.
- The site is subject to strong or very gusty wind.
- You are installing a solid face gate.

For gates with two leaves, two operators are installed, one on each leaf, and both are wired to one control panel. In such two-operator gate installations, one leaf can be programmed to open/ close slightly later than

the other leaf to accommodate overlapping gate designs.

For its protection, the single-phase, bidirectional motor shuts off automatically if its operating temperature reaches 212 deg F (100 deg C). Also for the protection and proper operation of the 750 Operator, each gate leaf on which it is installed must have a fixed positive stop in both the opened and closed positions.

The 750 Operator also includes a key operated Manual Release mechanism and two bypass valves that precisely control the force applied to the gate leaf through the 750 Operator.

The Manual Release mechanism is a lever that disengages (or engages) the hydraulic system of the 750 Operator. When the hydraulic system is disengaged, you can open and close the gate leaf by hand. Such manual operation of the gate is necessary during installation and useful during power failures.

Additional reversing devices (such as inductive loops and photocells) should be installed to provide more complete protection for people and property.

The electronic control panel is a microprocessor-based controller that accepts a wide range of product accessories and reversing devices, thus allowing for flexible gate system design.

INSTALLATION INSTRUCTIONS

Note: The following installation instructions assume you are fully capable of installing a gate operator. This manual does not instruct you in designing a gate, installing a gate, or basic electrical wiring. The installation tasks discussed in this manual are tasks particular to the 750 Operator.

PREPARING THE GATE

Before you install the 750 Operator, you must insure that the gate leaf meets the following criteria.

1. The gate leaf must not exceed the weight and length constraints for 750 Operator that you have.

2. The distance between the gate post and the center of the gate hinge must be at least 2 3/8 in. (6 cm).
3. Make sure the gate leaf has positive stops in both the opening and closing directions (see Figure 3).

Note: If you are installing the 750 Operator with an extension arm, some of the constraints about the gate leaf may not apply to you. See the section "Installing an Extension Arm" for more information on page 14 & 15.

INSTALLING THE 750 OPERATOR

Installing the 750 Operator consists of the following steps:

- Setting the concrete forms
- Installing the power unit
- Installing the drive unit
- Connecting the hydraulic lines
- Synchronizing the hydraulic system
- Installing the gate leaf shoe
- Installing the gate leaf
- Installing the control panel
- Adjusting the hydraulic pressures for the operator
- Checking the motor rotation
- Bleeding the hydraulic system
- Adjusting the bypass valves

SET THE CONCRETE FORMS

You need to lay out the concrete forms according to the dimensions shown in Figures 3 and 4. (Your soil conditions will also determine the size of the cement footing.)

Note: If the vertical distance between the finished grade and the bottom of the gate leaf exceeds 1 1/4 in. (3.3 cm) as shown in Figure 4, you can install a shear-pin assembly as shown in Figure 8 and as discussed in "Installing the Gate Leaf Shoe."

Accurately positioning the foundation plate beneath the gate hinge is critical especially if it supports the drive unit, which supports the gate leaf.

Note: The foundation plate may be supplied by the installer. If so, it must meet the specifications shown in Figure 3.

Note: Insure that the cavity where the drive unit is located is well drained by means of pipes, gravel drainage, or both, whatever is appropriate for your soil conditions.

After the concrete is poured in the form and before it has a chance to set, insert the foundation plate into the cement and position it so that it is flush with the top of the concrete and is level.

Allow the concrete to set a minimum of two full days before you install the drive unit on top of it.

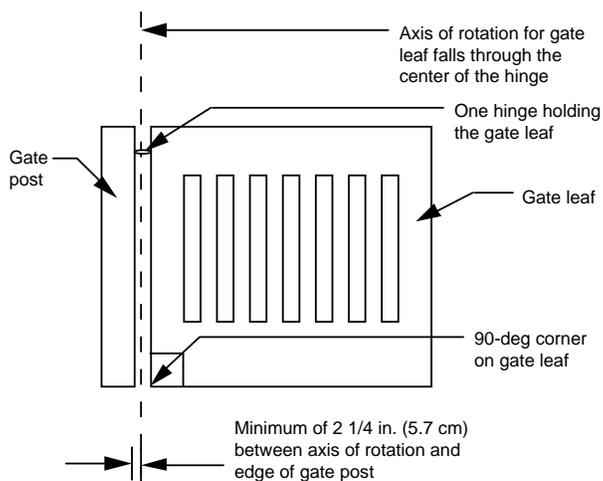


Figure 2. Constraints on the geometry of the gate leaf.

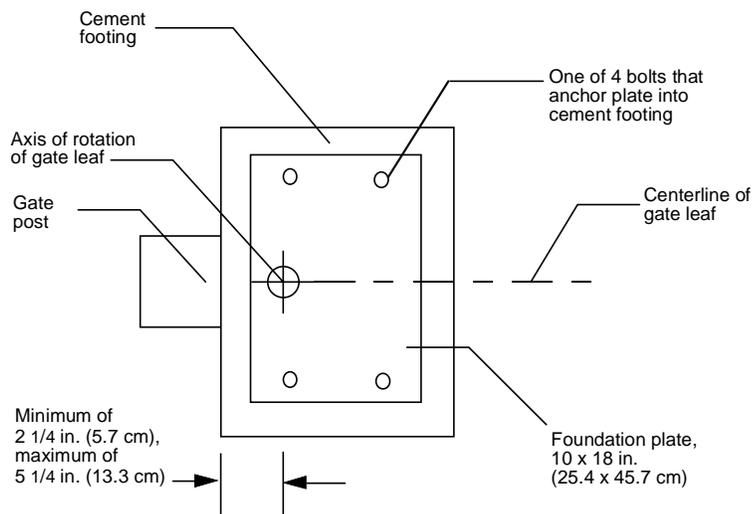


Figure 3. Recommended dimensions for the concrete footing and foundation plate, top view

INSTALL THE POWER UNIT

Figure 5 shows important dimensions and parts of the vinyl power unit box.

There are two constraints to installing the power unit box for the 750 Operator:

1. We recommend that you install the power unit box so that the hydraulic lines between it and the drive unit are no longer than 20 ft (6 m).
2. The power unit itself must be installed so that the vent screw is on the top of the unit as shown in Figure 5.

The power unit box that ships with your operator hinges on the left, but you can reverse the opening direction of the door if necessary for your installation. To reverse the opening direction, open the cover, and then gently pull it off the box. The vinyl hinges can now be placed in the hinge receptacles on the right-hand side. Secure the hinges with the screws provided.

You may surface mount the power unit box to a vertical surface or you may recess it.

To mount the power unit box use the 3/16-in. holes provided (relocating the holes in the box will compromise its integrity).

If you recess the box, keep in mind that hydraulic hoses and electrical wiring need to enter the bottom of the box.

Also, recessing must not interfere with the hinge assembly of the power unit box. You need to keep in mind the following dimensions.

Height: 14 1/4 in. (36.2 cm)

Width: 10 in. (25.5 cm)

Depth: *maximum* of 2 1/2 in. (6.5 cm)

At this time, you also need to remove the vent screw located on the power unit. The vent screw is in the middle of the top, left side of the power unit as shown in Figure 5.

Caution: Failure to remove the vent screw in the power unit may result in erratic operation of the 750 Operator.

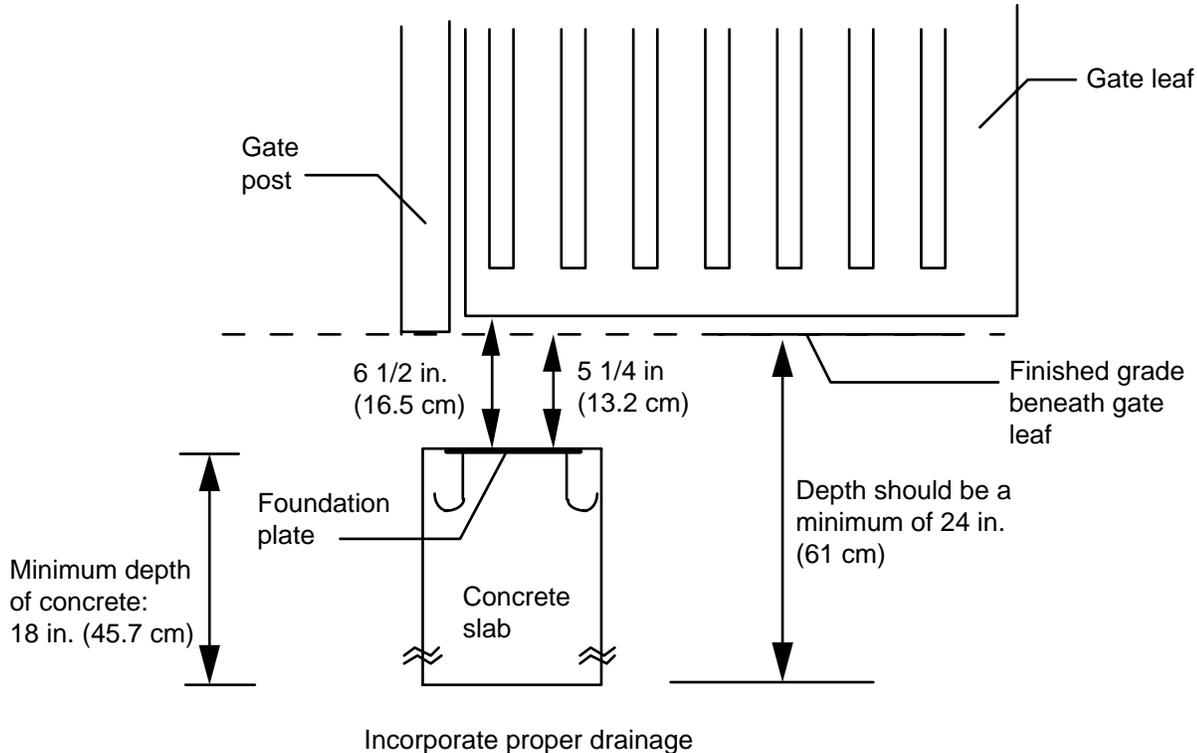


Figure 4. Recommended dimensions for the concrete footing and foundation plate, side view

INSTALL THE DRIVE UNIT

To install the drive unit, first make sure the four leveling bolts on the base of the unit do not protrude from the bottom of the unit. Then place the unit on the foundation plate (see Figure 6).

Position the drive unit according to the following:

The side of the drive unit with the splined shaft should be the side nearest the gate post.

The longitudinal axis of the drive unit is perpendicular to (at right angles to) the fully closed gate leaf.

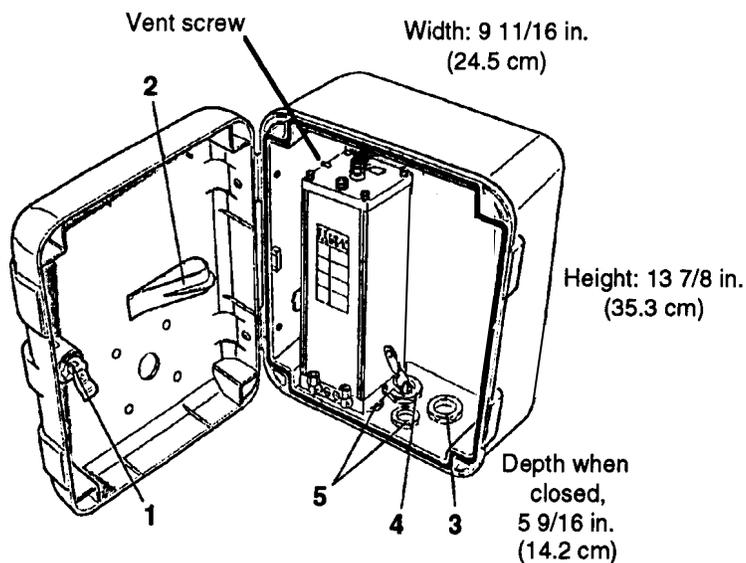
The center of the splined shaft is vertically aligned with the center of the gate hinge axis (use a plumb line).

Caution: NEVER weld the base plate of the drive unit to the foundation plate. Weld only the mounting C brackets to the foundation plate.

When the position of the drive unit meets these conditions, weld the C-shaped mounting brackets to the foundation plate to hold the drive unit in position (see Figure 6).

Next you need to prepare the two L-shaped "box halves" for installation. Note that the lip on each piece should be on top so as to support the top cover. Make the necessary holes for the two hydraulic lines that run from the drive unit to the power unit.

Once you have made your access holes, you can weld the box halves to the foundation plate and to one another so as to enclose the drive unit on four sides. Be sure to protect the drive unit during welding.



- 1 Lock for triangular key
- 2 Clip to hold instruction manual
- 3 1 1/16 in. (3 cm) holes for hydraulic lines
- 4 1 1/16. in (3 cm) knock-outs
- 5 Three knock-outs, each measuring 3/4 in. (2 cm)

Figure 5. Parts of the Power Unit in the vinyl box

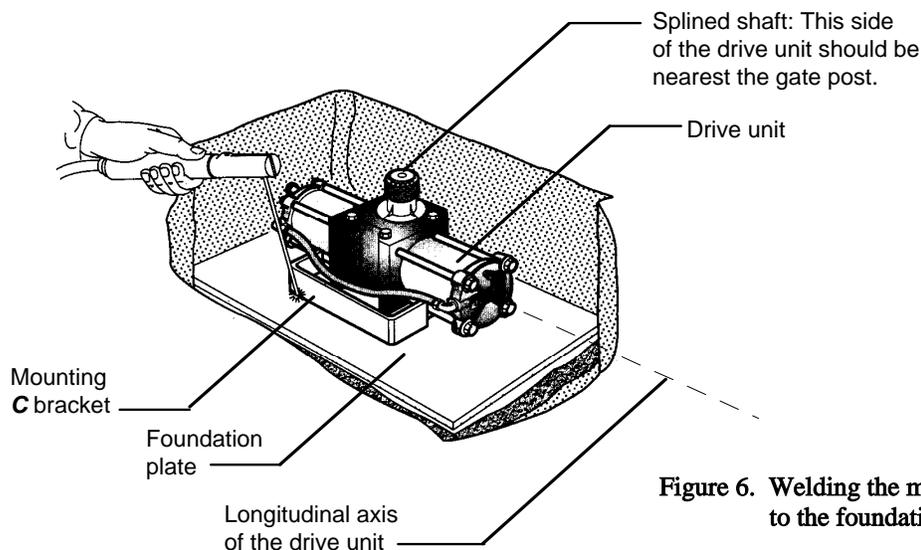


Figure 6. Welding the mounting C-bracket to the foundation plate

CONNECT THE HYDRAULIC LINES

Caution: It is important that the hydraulic lines be kept clean of any debris.

The drive unit and power unit are connected by two hydraulic lines, each with an outside diameter of 5/16 in. (0.8 cm), an inside diameter of 5/32 in. (0.4 cm), and a 2,500 psi (170 bar) rating.

Caution: After removing the nylon piping, do not rotate the splined shaft while you are connecting the hydraulic lines to avoid squirting hydraulic fluid.

Remove the nylon piping connecting the two hydraulic pipe fittings on the drive unit. Clean up any spilled hydraulic fluid.

Be sure the hydraulic lines are free of any debris by flushing them with a jet of compressed air. Then attach one line to each fitting on the drive unit.

Next you attach the other end of the hydraulic lines to the pipe fittings on the power unit (see Figure 7; additional information can be found in the technical drawing on page 21). Attaching the correct line to the correct fitting is important. Make sure that the hose on the end of the drive unit that is on the closing side of the gate/fence line attaches to the hydraulic pipe fitting in the power unit that is nearest the green bypass valve screw. This connection insures that the green valve controls opening pressure.

SYNCHRONIZE THE HYDRAULIC SYSTEM

Next you need to disengage the hydraulic system in order to synchronize it.

Inside the power unit is the Manual Release lever that disengages the hydraulic system (see Figure 1). Make sure the Manual Release lever is turned toward you and down to disengage the hydraulic system.

Now you can synchronize (set) the hydraulic system to the closed position by turning the splined shaft in the closing direction. Turn the shaft as far as it will go. To prevent the piston in the drive unit from bottoming in its cylinder, next turn the splined shaft about 5 deg in the opening direction.

The position of the shaft now corresponds to the fully closed position of the gate leaf. The hydraulic system is now synchronized (set).

Caution: The splined shaft must not be moved from its closed position until the gate leaf shoe that holds the gate leaf has been attached.

INSTALL THE GATE LEAF SHOE

If the vertical distance between the finished grade under the gate and the bottom of the gate leaf is more than 1 1/4 in. (see Figure 4), you need to do one of the following:

- Install a length of appropriately sized pipe between the sleeve that fits around the splined shaft of the operator and the gate leaf shoe.
- Construct a shear-pin assembly to accommodate the extra vertical distance. The assembly is welded to the bottom of the gate leaf shoe on one end and to the sleeve for the splined shaft of the pinion on the other end (see Figures 8 and 9). Such an assembly requires a bottom hinge and also protects the pinion and splined shaft in the event something hits the gate with great force.

Installing the gate leaf shoe involves making the gate leaf shoe, positioning it, and welding it to the splined shaft sleeve. If you are retrofitting the 750 Operator to an existing gate, these tasks require you to remove the gate leaf from its hinges. If you are using a shear-pin assembly, refer to Figures 9 and 10 to determine what you should weld together.

The gate leaf shoe is designed to carry the weight of the gate leaf and transfer the weight to the splined shaft. The shoe surrounds the 90-deg gate-post corner of the gate leaf to carry the gate and to act as a lower hinge. The shoe is made of a U-shaped section and a vertical section (see Figure 9). Later you will weld the bottom of the U-shaped section to the sleeve for the splined shaft (or to the shear-pin assembly, which is welded to the sleeve).

Since the gate leaf shoe holds the gate leaf, both sections must be made of steel at least 1/4 in. (0.6 cm) thick. The U-shaped section of the shoe must be

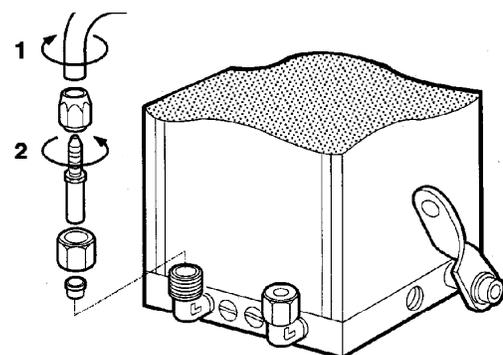


Figure 7. Connect the hydraulic line to the power unit. See the technical drawing on page 21 for more information.

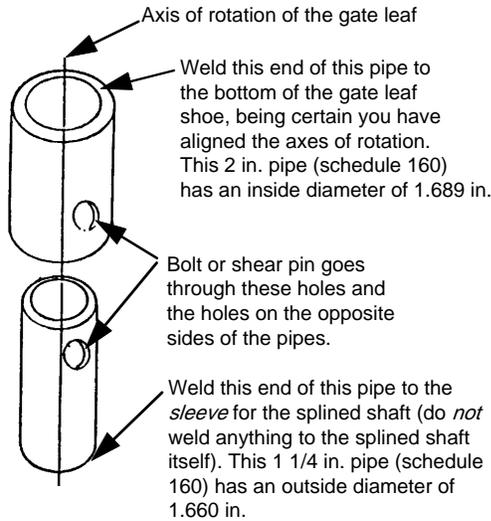


Figure 8. A sample shear-pin assembly

a minimum of 5 3/4 in. (2.1 cm) long and must be as wide as the gate leaf is thick and must fit as tightly as possible to minimize leaf movement within the shoe (see Figure 9).

Construct the U-shaped section of the shoe and verify that it fits around the gate leaf. Position the U-shaped section over the splined shaft so that the leaf's axis of rotation will fall within the minimum dimensions shown in Figure 10.

On the U-shaped section of the shoe, mark the position for the leaf's axis of rotation. Next, drill a pilot hole in the U-shaped section to mark the axis of rotation point and mark the position for the placement of the vertical section of the shoe.

Next you need to position the sleeve for the splined shaft of the pinion (or the shear-pin assembly) on the bottom side of the U-shaped section of the shoe as shown in Figure 9. On the bottom of the U-shaped shoe section, center the sleeve around the pilot hole that marks the axis or rotation. Accurately centering the pilot hole is important.

Caution: NEVER weld the splined shaft to anything.

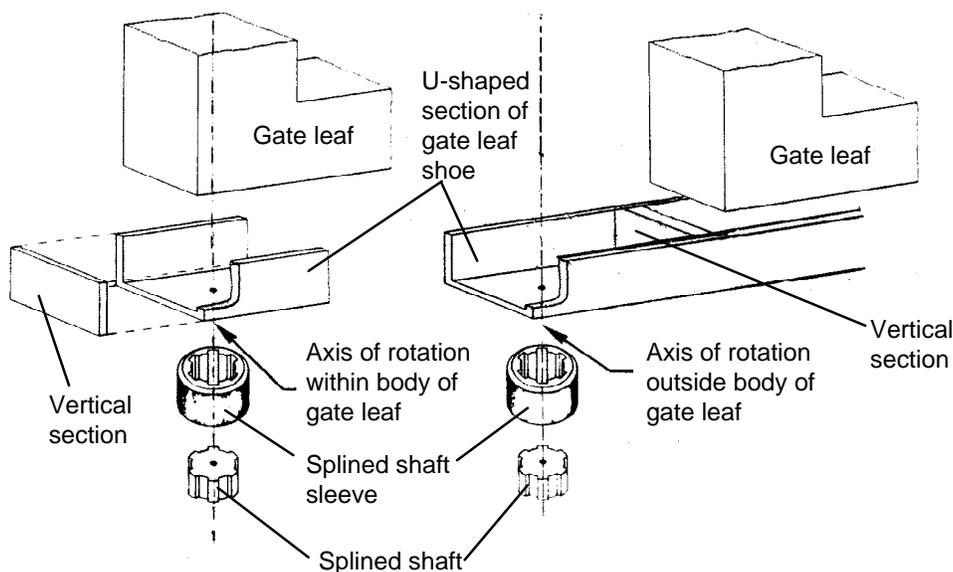
Spot-weld the sleeve into place on the bottom of the shoe's U-shaped section. If you are using the shear-pin assembly, spot weld the sleeve to the bottom of the shear-pin assembly, and spot weld the top of the shear-pin assembly to the bottom of the shoe's U-shaped section.

Next you must test the temporarily welded position of the splined shaft's sleeve. Fit the shaft sleeve over the splined shaft with the U-shaped section aligned in the gate leaf's fully closed position. Verify with a plumb line that the axis of rotation falls through the pilot hole to the center of the splined shaft.

If the axis of rotation alignments are correct, then permanently weld the sleeve for the splined shaft to the bottom of the U-shaped section of the shoe.

Also, you now need to weld the pilot hole closed, and you need to weld the vertical section of the shoe to the U-shaped section of the shoe.

Lubricate the splined shaft with grease and place the finished gate leaf shoe over the shaft in the closed position.



Note: The gate's axis of rotation may fall within or outside the body of the gate leaf.

Figure 9. Parts of the gate leaf shoe

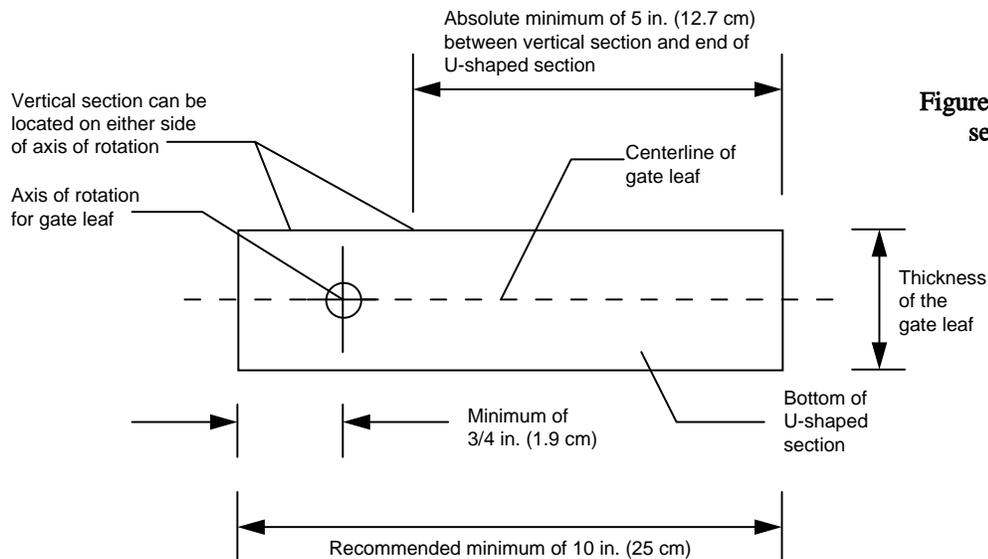


Figure 10. Top view of the U-shaped section of the gate leaf shoe.

INSTALL THE GATE LEAF

If you are not using the telescoping shear-pin assembly, install the gate leaf by placing its 90-deg corner into the gate leaf shoe and then installing the top gate hinge.

Installing the top gate hinge may require the gate leaf to be at a particular height. To raise (or lower) the gate leaf to the proper height, equally adjust the four leveling bolts on the base of the drive unit. The bolts raise (or lower) the splined shaft and thus the gate leaf shoe and gate leaf.

To test the installation of the gate leaf, first make sure that the hydraulic system has been disengaged (the Manual Release lever should point down).

Next, very slowly open and close the gate leaf a few times to see if it moves smoothly and evenly through its entire path. As necessary, adjust the leveling bolts on the base of the drive unit to correct any problems with the gate's travel.

INSTALLING THE 455 D CONTROL PANEL

Installing the control panel consists of the following general steps:

- Connecting the main power to the control panel
- Connecting the activating device
- Connecting the operator to the control panel
- Checking the direction of the motor's rotation
- Connecting other devices to the control panel
- Set operating modes

The installer is responsible for grounding the gate and operator systems, for providing the main power breaker

switch, and for making sure that the entire gate system meets all applicable electrical codes.

For the complete 455 D Control Panel Installation Instructions, see pages 22 - 33 of this manual.

BLEEDING THE HYDRAULIC SYSTEM

For the 750 Operator to work smoothly, it is critical that you bleed the hydraulic system of any air. Before you bleed the system, be sure that you have removed the vent screw on the top, left side of the power unit.

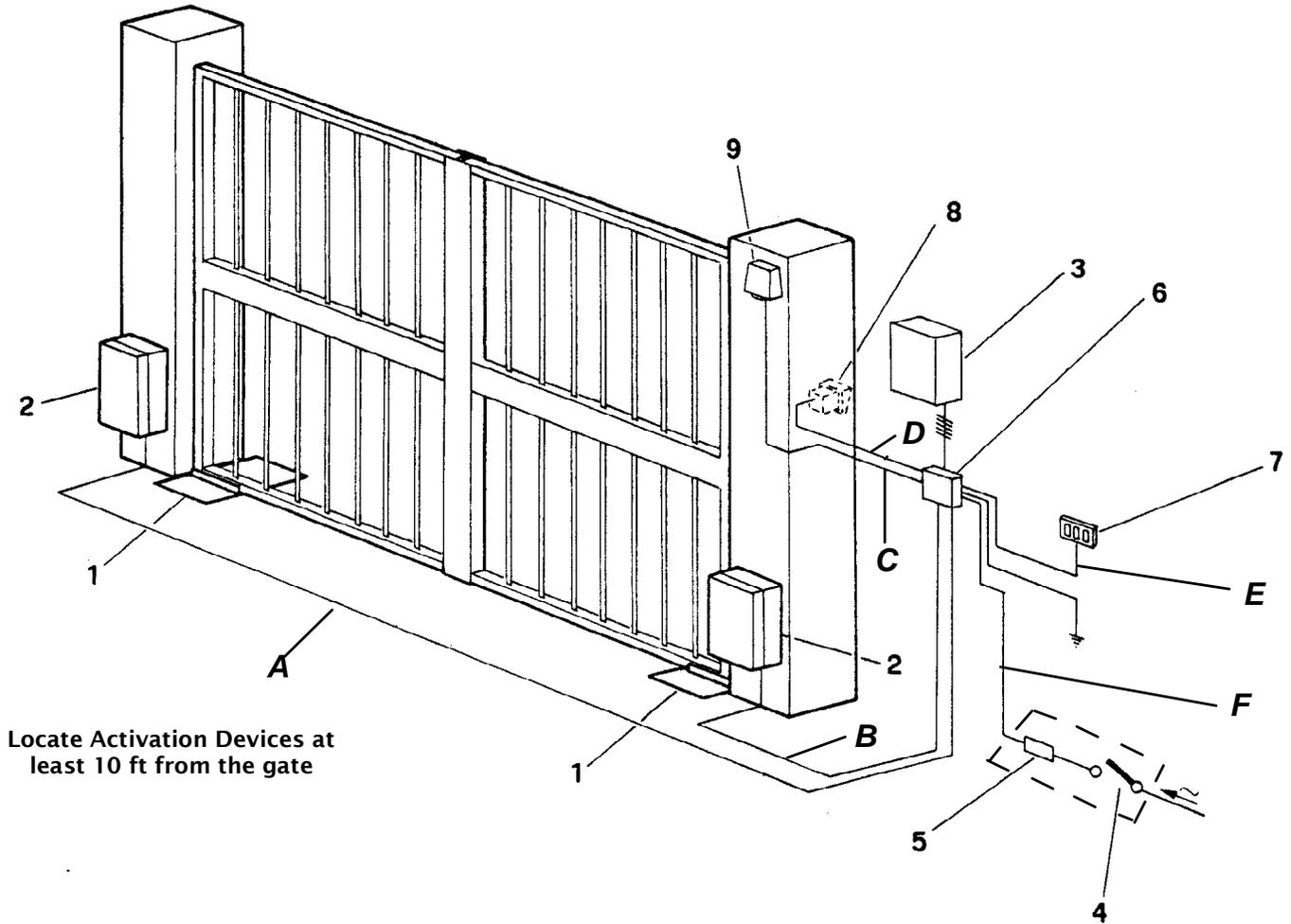
One bleeding operation consists of the following:

- Running the gate leaf through three open-close cycles
- Allowing the gate leaf system to sit idle for 5 minutes
- Releasing the air from each end of the drive unit through the bleed screw holes (see Figure 1)

You need to bleed the hydraulic system before setting the gate up for normal operation.

To run the gate leaf through an open-close cycle, make sure the gate is set up for hydraulic operation (the Manual Release lever is turned up) in the A mode. Activate the gate once to open, pause, and then automatically close. The gate needs to open and close three times.

Then you need to allow the gate to sit idle for a full five minutes. During this time, you can disengage the hydraulic system (turn the Manual Release lever down) and make sure that the top cover is removed from the drive unit to allow you access to the bleed screws on either end of the unit.



Gate System Parts

- 1 750 hydraulic drive unit
- 2 750 hydraulic power unit
- 3 750 Control Panel box
- 4 Main power switch
- 5 Circuit breaker
- 6 Main junction box
- 7 Switch for 750 Operator
- 8 Switch for 750 Operator
- 9 Radio receiver

Wire Gauges for Given Power Source Voltage

	220 VAC	115 VAC
A	4 X 14 AWG	4 X 14 AWG
B	4 X 14 AWG	4 X 14 AWG
C	3 X 18 AWG	3 X 18 AWG
D	5 X 18 AWG	5 X 18 AWG
E	5 X 18 AWG	5 X 18 AWG
F	4 X 14 AWG up to 414 ft (126 m)	3 X 14 AWG up to 130 ft (40 m) or 3 X 10 AWG up to 340 ft (104 m)

Figure 11. Typical layout of gate system with 750 Operators

With the hydraulic system disengaged, open the gate leaf by hand to a half-opened position. Re-engage the hydraulic system.

If you have a CBAC model of the 750 Operator (with hydraulic locking in the fully opened and fully closed positions), then first try to move the gate leaf. If you are unable to make the gate leaf move, then you do not need to bleed the hydraulic system.

If you do need to bleed the hydraulic system, then next open the bleed screw that is on the same side of the drive unit as you are. Open the screw less than a full turn. Next, pull the gate leaf toward you until just oil (and no bubbles) comes out of the drive unit. Then close the bleed screw.

Next, release the air from the other end of the drive unit in the same manner.

Finally, test the automatic operation of the gate. If the gate does not operate smoothly, then repeat the bleeding process again.

INSTALLING AN EXTENSION ARM

Some gate installations do not meet the geometrical constraints shown in Figure 2. In those situations, the 750 Extension Arm option can be used along with the 750 drive unit, power unit, and control panel to install an unobtrusive gate operator.

Using the 750 Extension Arm means that you do not have to permanently remove any leaf hinges, the gate leaf does not need to form a 90-deg angle on the bottom corner nearest the gate post, and the relative location of the rotation axis is not so restricted.

The geometrical constraint for using the 750 Extension Arm is that the center of the splined shaft on the drive unit *must* be within 6 in. (15.25 cm) of the axis of rotation of the gate leaf.

WARNING! The farther away the splined shaft is from the gate's axis of rotation, the greater the risk of danger from pinch points.

Install the drive unit so that the splined shaft is as near as possible to the gate's rotation axis and is directly beneath the center of the fully closed gate leaf.

You need to position the extension collar (see Figures 12 and 13) so that it smoothly slides within the extension U from the fully closed to the fully opened position. Note that the position of the extension collar is affected by the overlap of the extension bar and extension U.

Attach the 750 extension collar to the bottom of the gate leaf with a 7/16 in. (1.1 cm) bolt.

Weld together the extension bar and extension U according to Figure 13.

Caution: Do not weld anything to or on the inside of the sleeve of the splined shaft.

Next, weld the outside of the sleeve for the splined shaft solidly to the inside of the hole in the end of the extension bar.

Follow the rest of the instructions for installing the 750 Operator. With an extension arm, you need not worry about installing a gate leaf shoe nor about installing the gate leaf in the shoe. Instead, you will install one end of the welded extension arm over the splined shaft and the other end around the extension collar.

In addition, you will need to provide a washer beneath the extension collar to keep the extension U from falling off the collar. You also need to shield any pinch points around the extension arm.

Extension Arm With Positive Stops

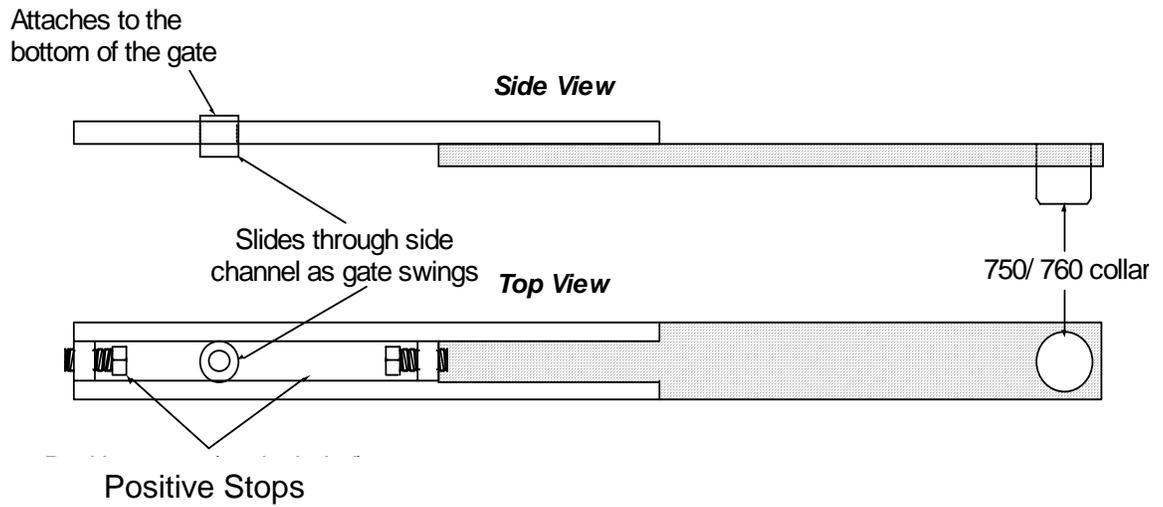


Figure 12. 750 Extension Arms with Built-In Positive Stops (See Page 38 for proper operator location when using the extension arms with built in positive stops)

Extension Arm Without Stops

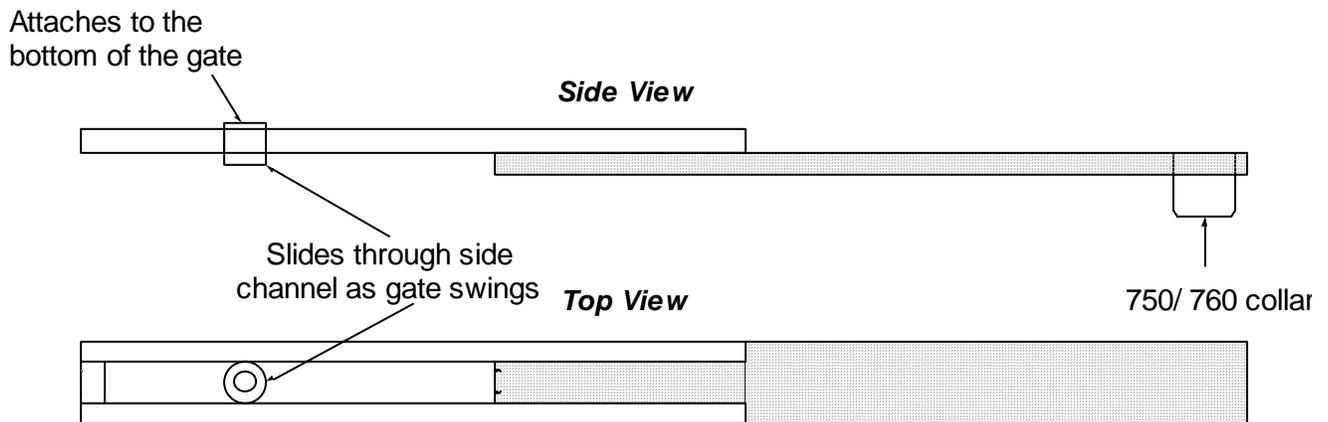
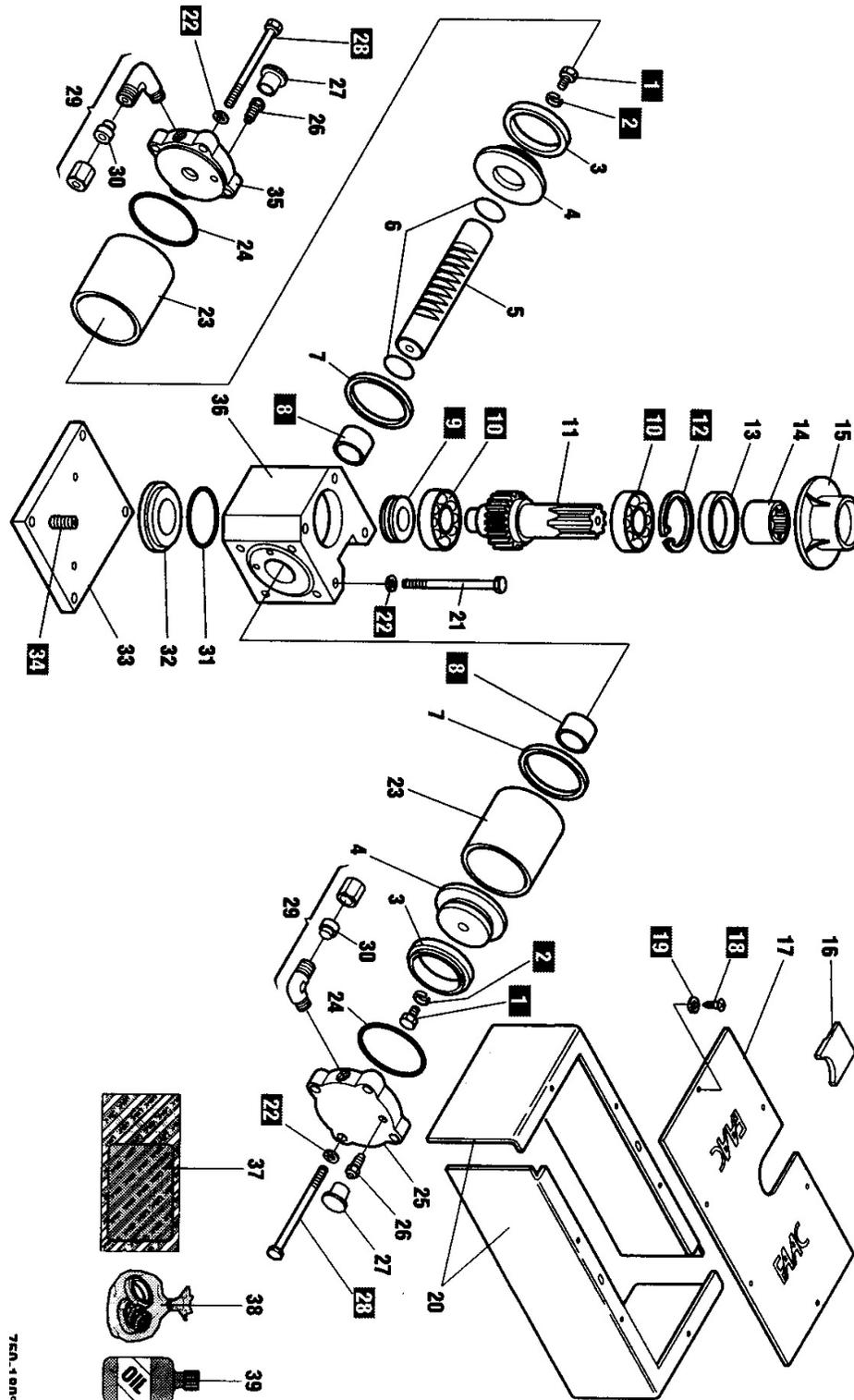


Figure 13. The 750 Extension Arm

750 OPERATOR



750A-1-000

750 PARTS LIST

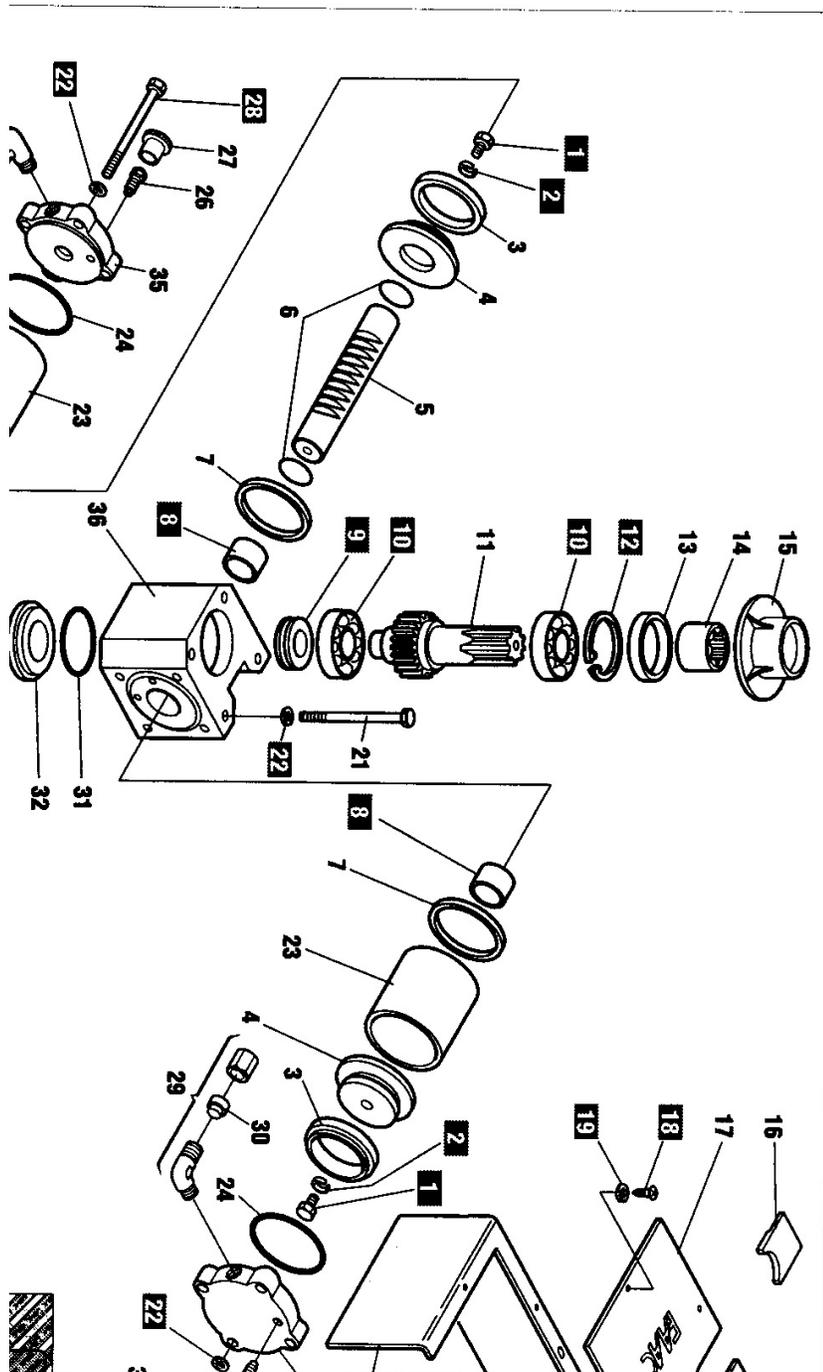
POS	PART NO.	DESCRIPTION	QTY
1	N/A	Bolt (10mm x 25mm)	2
2	N/A	Lock washer	2
3	7091045	Piston Ring	2
4	7350155	Piston	2
5*	7193055	750 Rack (100 degree)	1
6	N/A	O-Ring (26.70mm x 1.78mm)	2
7	7099195	Gasket (Cylinder)	2
8	N/A	Bushing	2
9	2339	Bearing (Thrust)	1
10	2480	Bearing (6006)	2
11	7191525	Pinion	1
12	2550	Snap Ring	1
13	7093035	Seal (Top)	1
14	7309095	Splined Collar	1
15	7039125	Dust Cover	1
16	N/A	Cover Plate	1
17	7270415	Box Lid (750 Half Box)	1
18	N/A	Self-tapping Screw Stainless Steel (3.9mm x 9.5mm)	6
19	N/A	Lock Washer (Stainless Steel)	6
20	7223205	Half Box	2

POS	PART NO.	DESCRIPTION	QTY
21	N/A	Bolt (8mm x 100mm)	4
22	N/A	Lock Washer	12
23**	7366235	Cylinder (100 degree)	2
24	N/A	O-Ring (66.4 mm x 1.78 mm)	2
25	7170275	Flange (Right Side)	1
26	7246025	Zert Fitting (Air Drain)	2
27	7110045	Dust Cover (Zert Fitting)	2
28	N/A	Bolt (8mm x 105mm)	8
29	710101002	Elbow	2
30	7102055	Ferrule Fitting	2
31	N/A	O-Ring (50.52mm x 1.78 mm)	1
32	7200165	Bearing Cup (Bottom)	1
33	7287515	Leveling Plate	1
34	701217	Leveling Bolt (12mm x 35mm)	4
35	7170285	Flange (Left Side)	1
36	7161745	Body	1
37	39050915	Skin Pack	1
38	2171*	Seal Kit (750 Drive Unit)	1
39	6105*	Monolec Oil (1 Qt)	1

* 750 Rack 180 degree Part # 7193065

* * 750 Cylinders 180 degree Part # 7366245

750 CBAC OPERATOR



750 CBAC PARTS LIST

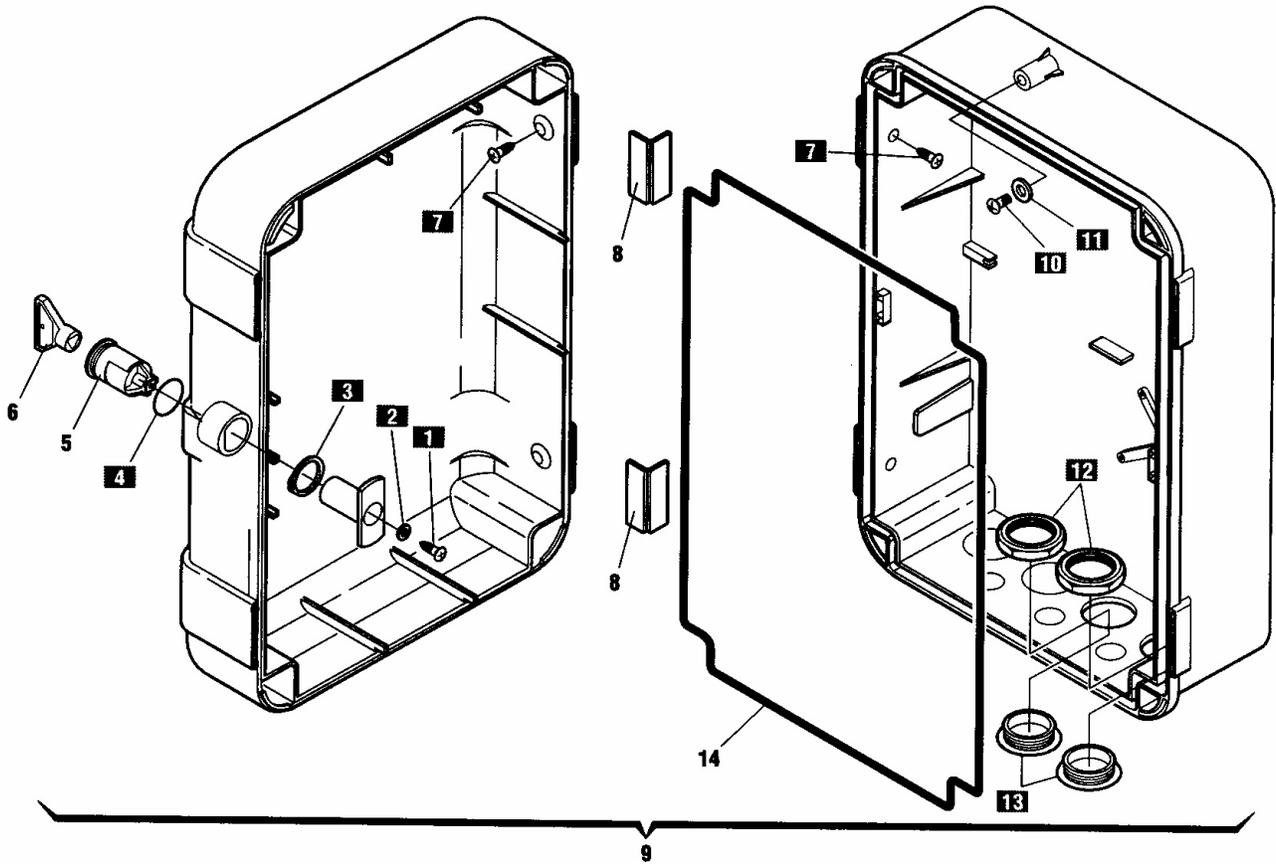
POS	PART NO.	DESCRIPTION	QTY
1	3204385	Lobe Pump (.75 Lt)	1
2*	77000425	115 V 1400 RPM Motor	1
3	7514125	Electric Power Cord	1
4	7099315	Flange Gasket	2
5	7450115	Body (pump housing)	1
6	N/A	Vent Screw Diagram	1
7	7094065	Washer (7mm x 4mm x 1mm)	1
8	2274	Vent Screw (4mm x 6mm)	1
9	7270531	Flange (Upper)	1
10	N/A	Lock Washer	2
11	N/A	Screw (6mm x 10mm)	2
12**	2581	Fiber Washer	1
13**	7039305	Washer (Brass)	1
14**	7109155	Nut (Strain Relief)	1
15**	7109145	Strain Relief	1
16	7112055	Filler Cap (Dip Stick)	1
17	7019145	Tie Rod	4
18	N/A	Star Washer	4
19	2274	Vent Screw (Ground Screw)	1
20	2365	Motor Bolt (4mm x 50mm)	4
21	2366	Lock Washer	4
22	2367	Jam Nut	4
23	N/A	Pin (Pump 4mm x 28mm)	2
24	7090010015	O-Ring (Pump 4.48mm x 1.78mm)	2
25	7090030015	O-Ring (6.75mm x 1.78mm)	1
26	7290155	Manual Release Lever	1
27	N/A	Washer (4mm x 12mm)	1

POS	PART NO.	DESCRIPTION	QTY
28	2274	Allen Bolt (4mm x 6mm)	1
29	4180225	Manual Release	1
30	7090050015	O-Ring (10.82mm x 1.78 mm)	6
31	7049005	Lock Valve Retainer	2
32	4404065	Inlet Valve	2
33	4404085	Lock Valve	2
34	7102055	Ferrule Fitting	2
35	N/A	Nut (12mm x 1 mm)	2
36	4180135	By Pass Cap (Green)	1
37	4180135	By Pass Cap Plug	2
38	4180135	By Pass Spring	2
39	4180145	BY Pass Cap (Red)	1
40	N/A	Self-Tapping Screw (2.9mm x 6.5mm)	2
41	N/A	Screw (5mm x 8mm)	2
42	4180285	Shuttle Piston	1
43	7090440015	O-Ring (7.6mm x 1.78mm)	1
44	499458	Valve Body	1
45	7090150015	O-Ring (9.25mm x 1.78mm)	2
46	7049005	Lock Valve Retainer (Brass)	2
47	390700	Banjo Bolt	2
48	390700	Copper Washer	2
49	7110115	Gas Fittings	2
50	390700	Banjo Bolt Kit	1
51	2170*	Seal Kit	1
52	6105*	Monolec Oil (1 Qt)	1

* All Included in kit # 7109235

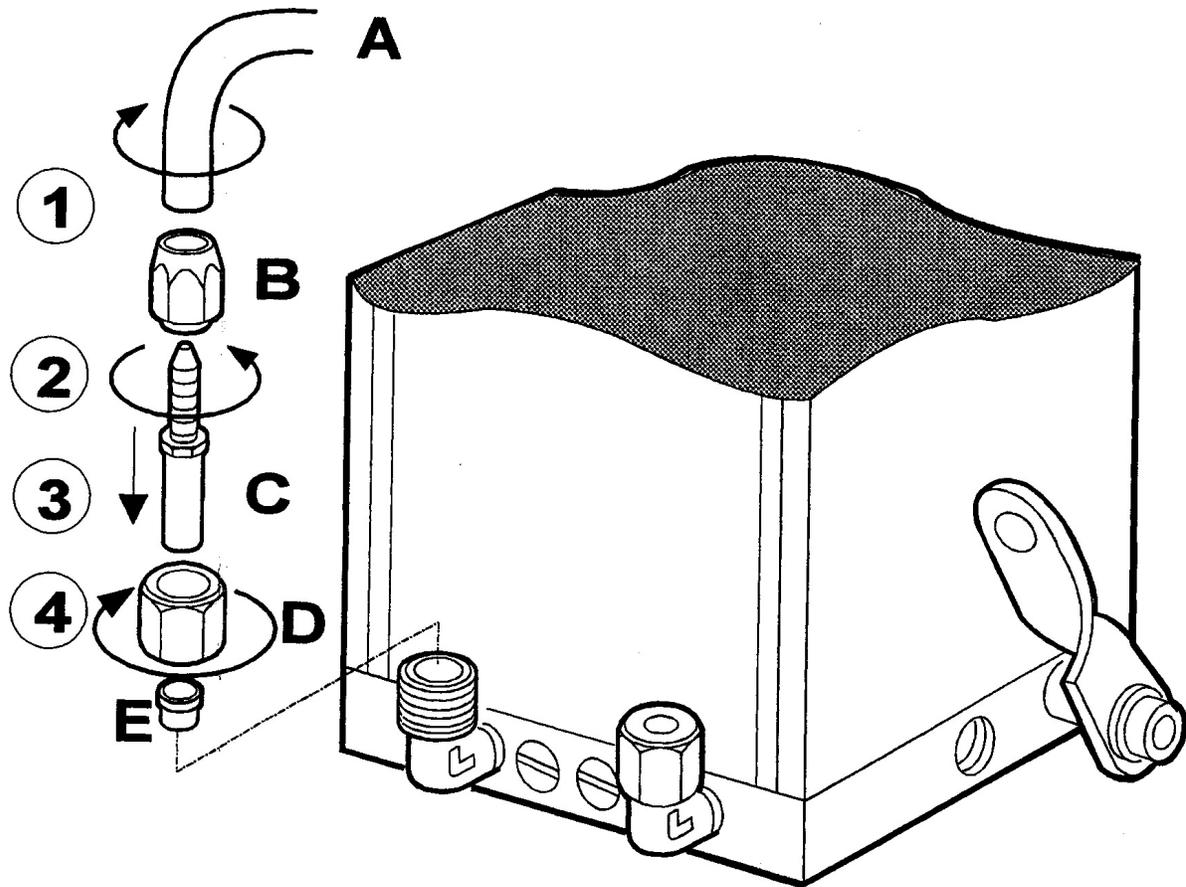
** 220V 1400 RPM Motor Part # 7700205

750 PUMP ENCLOSURE



POS	PART NO.	DESCRIPTION	QTY
1	N/A	Self-tapping screw (3.9mm x 9.5mm)	1
2	N/A	Washer	1
3	N/A	Snap Ring	1
4	N/A	O-Ring (15.6mm x 1.78mm)	1
5	7128035	Lock Body (Enclosure)	1
6	713002	Triangular Release Key	1
7	N/A	Galvanized Self-tapping Screw (2.9mm x 9.5mm)	1
8	7309105	Plastic Hinge	2
9	720309	750 Enclosure	1
10	N/A	Self-tapping Screw (4.8mm x 16.7mm)	1
11	N/A	Washer	1
12	N/A	Nut (Plastic)	2
13	N/A	Plug (Plastic)	2
14	709974	Gasket (Lid)	1

750 FLEX HOSE CONNECTOR KIT



LEGEND	
A	Flexible Hydraulic Hose
B	Flex-hose to Compression Adapter (2-Piece)
C	Flex-hose to Compression Adapter (2-Piece)
D	Compression Nut
E	Ferrule Fitting

PROCEDURE FOR INSTALLING FLEX-HOSE TO COPPER ADAPTER	
Note: The parts are shown in proper installation order.	
1.	Screw item B onto the hydraulic hose A (counter clock-wise) until tight.
2.	Screw item C into item B & A. To get the threads to catch up, you must push C into B & A as you turn it (clock-wise)
3.	Slide item D onto item C.
4.	Slide item E onto item C, with larger end toward item D.
5.	Insert item C into the elbow located on the pump unit.
6.	Tighten item D securely while holding assembled adapter unit fully into elbow.
7.	Once you have tightened item D, item E will be permanently crimped onto item C. So you can remove the hose from the pump and it will remain assembled.

THE 455 D CONTROL PANEL

GENERAL DESCRIPTION

The FAAC 455 D control panel is used to operate the following models.

Swing gate operators:

400	412
402	750
422	760

Barrier gate operators:

610/615

The 455 D programming controls the following:

Operating logic: A, S, E, EP, B, and C logics available.

Reversing device behavior: Choose whether a triggered reversing device during closing immediately reverses gate movement or stops the gate and reverses gate movement when no longer triggered.

Torque or Pressure: Force adjustment for the 412 operator. Adjustable from 0 to 50.

Caution: For all hydraulic operators, the torque **must** be programmed to the maximum (50) setting.

Pause time between opening and closing: adjustable from 0 to 4 minutes.

Opening/Closing time: adjustable from 0 to 2 minutes.

Leaf delay on closing: adjustable from 0 to 4.1 minutes.

The 455 D control panel should be installed in an enclosure that is conveniently located as close as possible to the gate operator. All electrical connections from the control panel to the operator must be made in a weatherproof junction box.

The 455 D control panel requires a single-phase power supply voltage (115 VAC [$\pm 10\%$] or 230 VAC [$+6$ or -10%], 50-60 Hz). The power supply should be protected by a 15 amp dedicated circuit breaker (not provided).

The installer is responsible for grounding the operator system, for providing the main power

breaker switch, and for making sure that the entire gate system meets all applicable electrical codes. The installer should refer to the installation manual for a given operator for more information.

NOTE: An installation is U.L. compliant only when you install the FAAC operators according to the UL325 standards.

INSTALLING THE 455 D CONTROL PANEL

Locate the control panel in the most convenient position possible, considering the movement of the gate.

Installing the control panel consists of the following general steps:

- Connecting the main power to the control panel
- Connecting the activating device
- Connecting the operator to the control panel
- Checking the direction of the motor's rotation
- Connecting other devices to the control panel
- Set operating modes

CONNECT THE MAIN POWER SUPPLY

WARNING! Turn the main power off before you make any electrical connections or before programming.

Wire the main power supply to control panel terminals in block J3 (see Figures 1-CP and 2-CP). The installer is responsible for insuring that a separate, grounded circuit protected by a circuit breaker is between the control panel and the main power supply. All wiring should conform to applicable electrical codes, and all wiring and fittings should be weatherproof and/or suitable for burial.

Connect the ground to the grounding terminal in block J3 and connect the power wires to the terminals labeled N (neutral) and L (line).

NOTE: For a 230V system, a neutral is not needed. Connect one 115V line to the L (Line) and a second 115V line to the N (Neutral).

CONNECT THE OPERATOR(S) TO THE CONTROL PANEL

WARNING! Turn the main power off before you make any electrical connections or before programming.

CAUTION: The operators are grounded only by the grounded circuit the installer provides.

USING A JUNCTION BOX

If an operator is more than 2 ft away from the control panel, you must use a junction box for connection. Use a U. L. Listed cord grip where the operator cord enters the junction box.

Note: If you have a one-leaf gate design, the operator **must** be connected to Motor 1 (terminals 1,2, & 3)

To wire up motor 1, connect the white wire to terminal 1(on the J4 terminal strip), the black wire to 2, and the red wire to 3. Wire each leg of the capacitor (supplied) to terminals 2 & 3.

Note: If you want to delay the closing of one gate leaf in a two-leaf gate design, be sure to connect its operator to Motor 1.

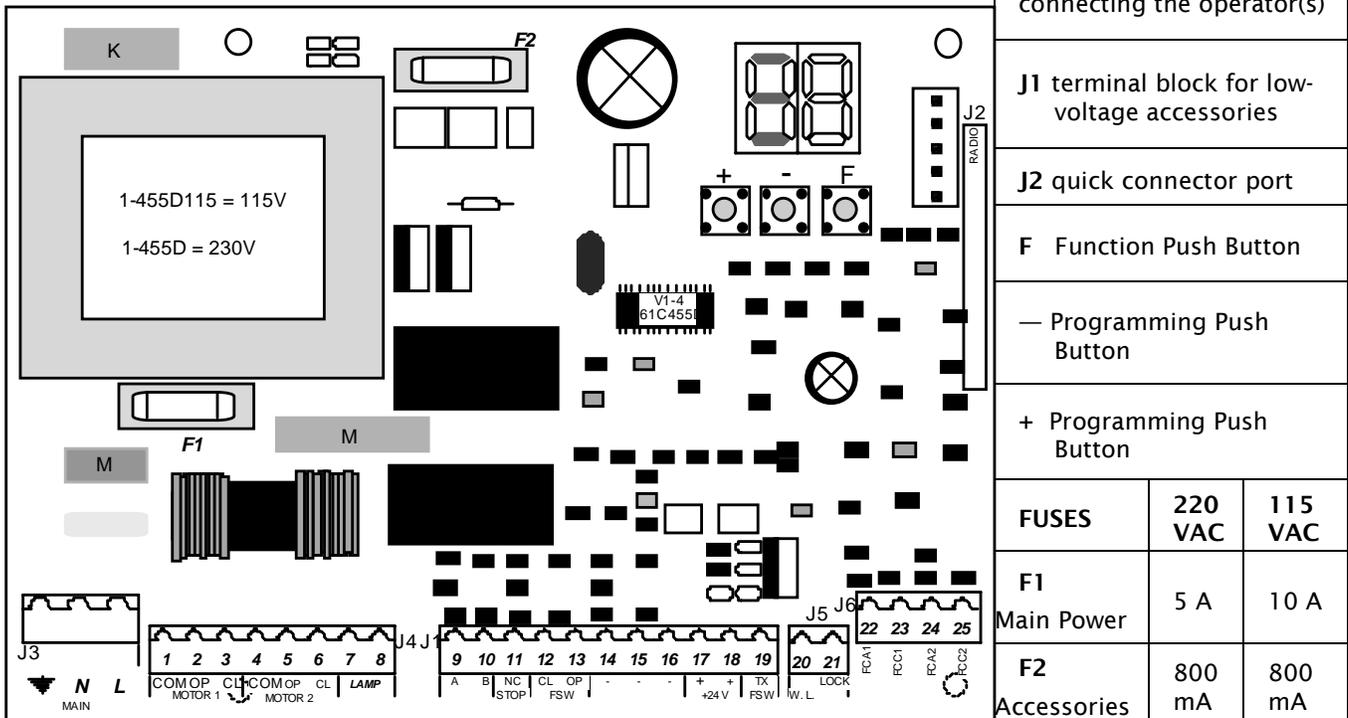
In order to wire motor 2 in a bi-parting system, connect the white wire to terminal 4 (on the J4 terminal strip), the black wire to 5, the red wire to 6. Wire each leg of the capacitor (supplied) to terminals 5 & 6.

CHECK THE MOTOR'S DIRECTION OF ROTATION

After you have connected the main power supply, and the operator(s) to the control panel, you need to check the direction of rotation for each operator motor in your gate design.

Note: To check a motor's direction of rotation, you must have three closed circuits on terminal block J1. Install one circuit between terminals 11 and 16, another circuit between terminals 12 and 19, and another circuit between terminals 13 and 19.

Figure 1-CP. The 455 D Control Panel



J3 terminal block for main power supply		
J4 terminal block for connecting the operator(s)		
J1 terminal block for low-voltage accessories		
J2 quick connector port		
F Function Push Button		
- Programming Push Button		
+ Programming Push Button		
FUSES	220 VAC	115 VAC
F1 Main Power	5 A	10 A
F2 Accessories	800 mA	800 mA

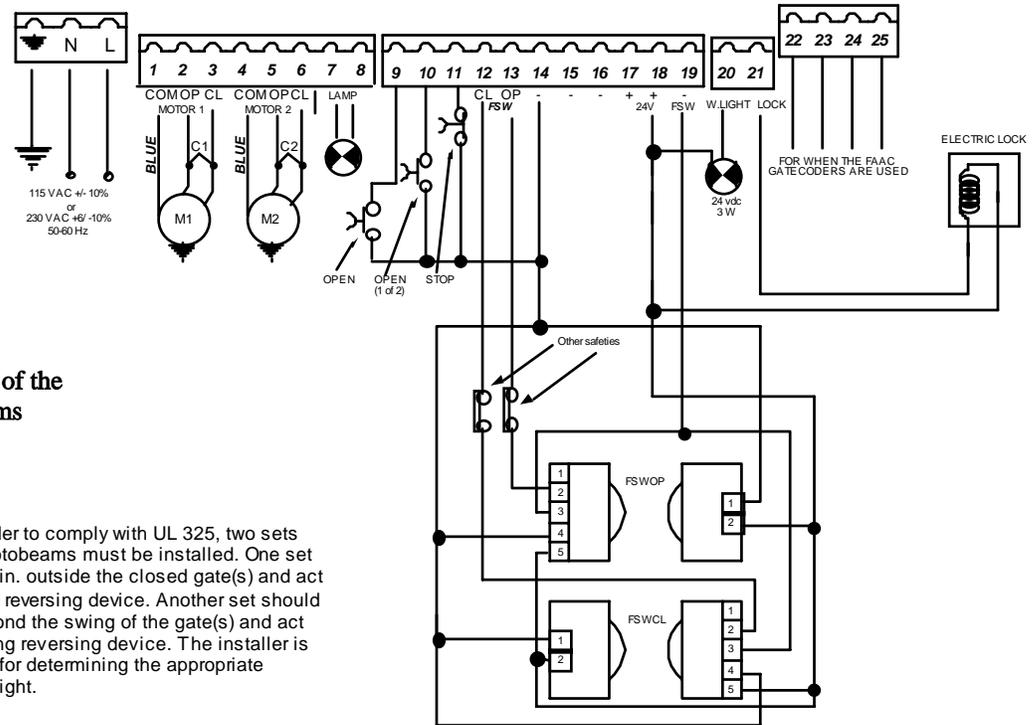


Figure 2-CP.
The terminal strip wiring of the
455 D with photobeams

NOTE: In order to comply with UL 325, two sets of FAAC photobeams must be installed. One set should be 6 in. outside the closed gate(s) and act as a closing reversing device. Another set should be 6 in. beyond the swing of the gate(s) and act as an opening reversing device. The installer is responsible for determining the appropriate mounting height.

You cannot check the motor's direction of rotation without these circuits (jumpers) or the accessories. When properly prepared for testing, the LEDs FSWOP, STOP, and FSWCL should be illuminated (see Figure 4-CP).

WARNING! Running the operator—even for testing purposes—without a connected reversing device is potentially dangerous. Do not place yourself within the path of the moving gate during your test.

Disengage the operator(s) with the Manual Release key (see operator installation manual), and open the gate by hand about halfway.

Next, engage the operator(s) with the Manual Release key so that you can check the rotation of the motor(s).

To activate the operator(s) momentarily short across terminals 9 and 14.

Turn on the main power and send an activating signal to the operator. The gate leaf (or leaves) should open. If a gate leaf closes, then you need to turn off the main power and reverse the connection of the red and black wires on terminal block J4 for the operator controlling that leaf. Then you need to recheck the rotation direction again.

After having completed your test of the motor's direction of rotation, replace any test circuits you installed (between terminals 11 and 16, between 12 and 19, and between 13 and 19) with the proper reversing and stop devices. The instructions for installing such accessories follow.

CONNECT OTHER DEVICES

WARNING! Turn the main power off before you make any electrical connections.

POWER SUPPLY FOR ACCESSORIES: You can access a 24 VDC output for supplying power to accessories through terminals 17 or 18, (+) and 14 or 15 or 16, (-) on terminal block J1. In most cases, this source can be used to power 24 VDC accessories.

NOTE: The 455 D control panel allows a maximum accessory load of 800 mA.

REVERSING DEVICES: Reversing devices include photocells, inductive loops, and so forth. All of the reversing devices should have contacts of the normally closed (N.C.) type. Where you connect a device depends on whether you want the device to operate during opening or during closing.

NOTE: UL **does not** recognize the FAAC system with loop detectors or safety edges. FAAC photobeams must be used to comply with UL 325.

To wire photobeams, refer to Figure 2-CP (see FSWOP for opening photobeams, and FSWCL for closing photobeams). Photobeams must be connected as shown. See Figure 5-CP for the wiring of inductive loops. If using more than one reversing device, they must be wired in series.

(a) To the U. L. Listed gate operator

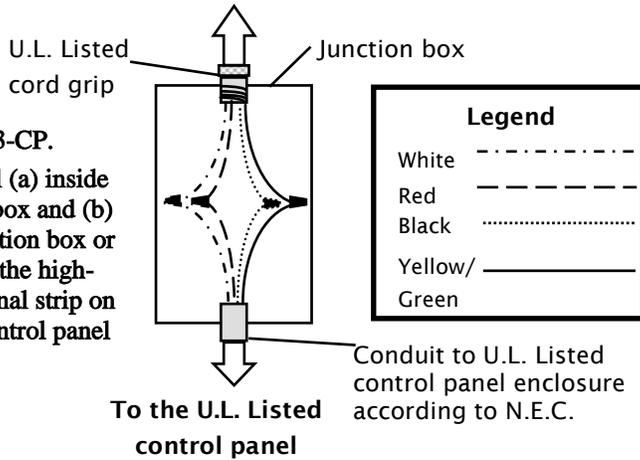
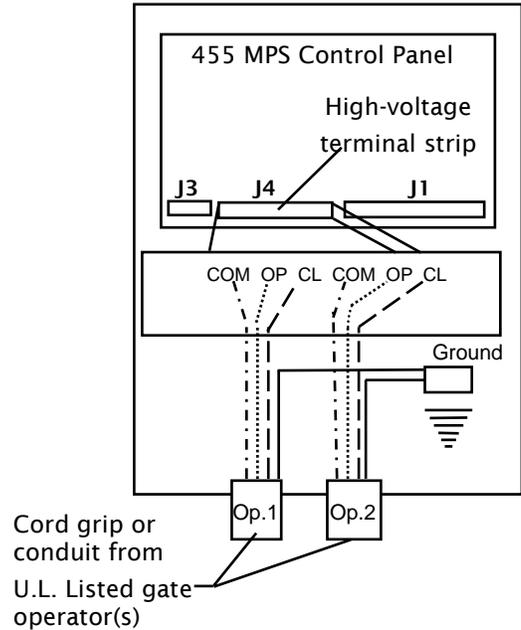


Figure 3-CP.
 Wiring detail (a) inside the junction box and (b) from the junction box or operator to the high-voltage terminal strip on the 455 D control panel

(b) U.L. Listed Control Panel Enclosure



ACTIVATING DEVICES AND RADIO RECEIVER: The activating devices and radio receiver for your gate must have normally open (N.O.) contacts. Connect such devices to terminals 9 and 14.

NOTE: The FAAC radio receiver plugs into the 5 prongs labeled J2 (Quick connect port).

Figure 5-CP shows how to connect a three or four wire receiver.

DECODER CARD: If you are installing the Digicard magnetic card reader, or the Digikey keyboard, use the quick-fit connector J2 for the DS decoder card (see Figure 1-CP).

NOTE: If your using both a receiver and decoder, hard wire the decoder and plug in the receiver.

OPEN/HOLD OPEN DEVICE: To open and hold open the gate, simply maintain a contact across terminals 9 and 14. ("A" Mode only)

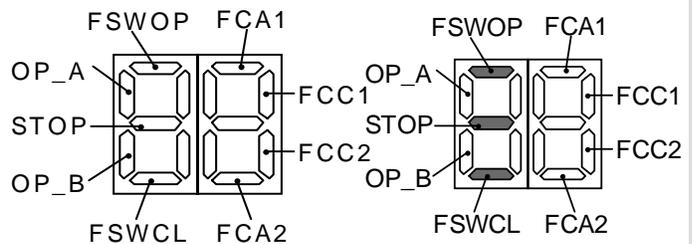
STOP BUTTON: The stop button you install must have normally closed (N.C.) contacts. Multiple stop buttons must be wired in series. Connect your stop device between terminals 11 and 16.

NOTE: The 455 will not operate the motors without a closed circuit between 11 & 16.

The LED Indicators: The nine light emitting diodes (LEDs) on the control panel can be used to check for the proper function of the devices attached to the panel. The LED lights are on whenever the contacts are closed across each of the respective terminals.

OP_A and OP_B (Partial Opening) should illuminate only when an activating signal is sent for 2 and 1 gate leaves, respectively. STOP should be illuminated except when the stop button is pressed. FSWOP and FSWCL should be illuminated except when the reversing

LED	On	Off
OP_A	Command Given	No Command
OP_B	Command Given	No Command
Stop	No Command	Command Given
FSW Open	Opening reversing devices clear	Reversing device triggered
FSW Close	Closing reversing devices clear	Reversing device triggered
FCA1 FCC1	Flashes when gate coder is in use. Operator 1	
FCA 2 FCC 2	Flashes when gate coder is in use. Operator 2	



This display shows the meaning of each LED.

This display shows the normal status of the control panel.

Figure 4-CP. The 455 D display.

devices for opening and closing, safeties are triggered. Use the LEDs and the table in Figure 4-CP to determine if the accessory devices you have installed are operating properly.

Electric Locks: An electric lock can be wired to the 455 D in terminals 18 and 21 (12Vac pulsed provided). If a reversing stroke is needed to allow the electric lock to release, this must be done in advanced programming.

See Figure 5-CP for the connections for a magnetic locking device.

WARNING LIGHT: Connect a warning light to terminals 18 and 20 in the group labeled *W.LIGHT* in terminal block J1 and J5. The terminals provide an output voltage of 24 VDC, maximum power 3 Watts. This output voltage will power most 24 VDC warning lights.

NOTE: The behavior of the warning light varies according to the logic you have set.

LOGICS A, S, E, EP, AND B: The warning light is on steadily during opening and the pause phase. During closing, the light flashes.

LOGIC C: The warning light is on steadily during opening and flashes during closing.

SET OTHER OPERATING CONTROLS

WARNING! Turn the main power off before you make any electrical connections.

You need to program the control panel for your gate's operation. The 455 D Control Panel has on board programming that controls a wide range of functions.

OPERATING LOGICS

NOTE: The 455 D Control Panel provides inputs for opening reversing devices and closing reversing devices. FAAC strongly recommends the use of reversing devices, such as photocells or other non-contact sensors.

- **A (automatic):** The gate opens on command and automatically closes after a pause phase. A second command while opening is ignored; a second command during the pause phase interrupts the pause time; a second command during closing reopens the gate. A maintained open command will hold the gate open.
- **S (security):** The security mode is like A logic except that a second command during opening immediately closes the gate. A maintained open command will not hold the gate open.

- **E (semi-automatic):** This mode requires a command to open and a command to close. A second command during opening stops the gate. A second command during closing reopens the gate.
- **EP (semi-automatic, step by step):** This mode requires a command to open and a command to close. A second command during opening or closing causes the gate to stop. A third command then reverses the previous motion of the gate.
- **B (manned, pulsed):** This mode is designed for guard station use and requires a three-button switch (pulsed) to open, close, and stop the gate.
- **C (manned and constant):** This mode requires constant pressure switches. One to open and one to close. No pressure on a switch stops the gate.

The three programming push buttons allow the programming of the torque (or pressure), the pause time between opening and closing, and the leaf delay on closing.

WARNING! Turn the main power off before you make any electrical connections.

For all FAAC hydraulic operators using the 455 D control panel, the force **must** be set at its maximum setting of 50 in order to supply the correct voltage to the operator.

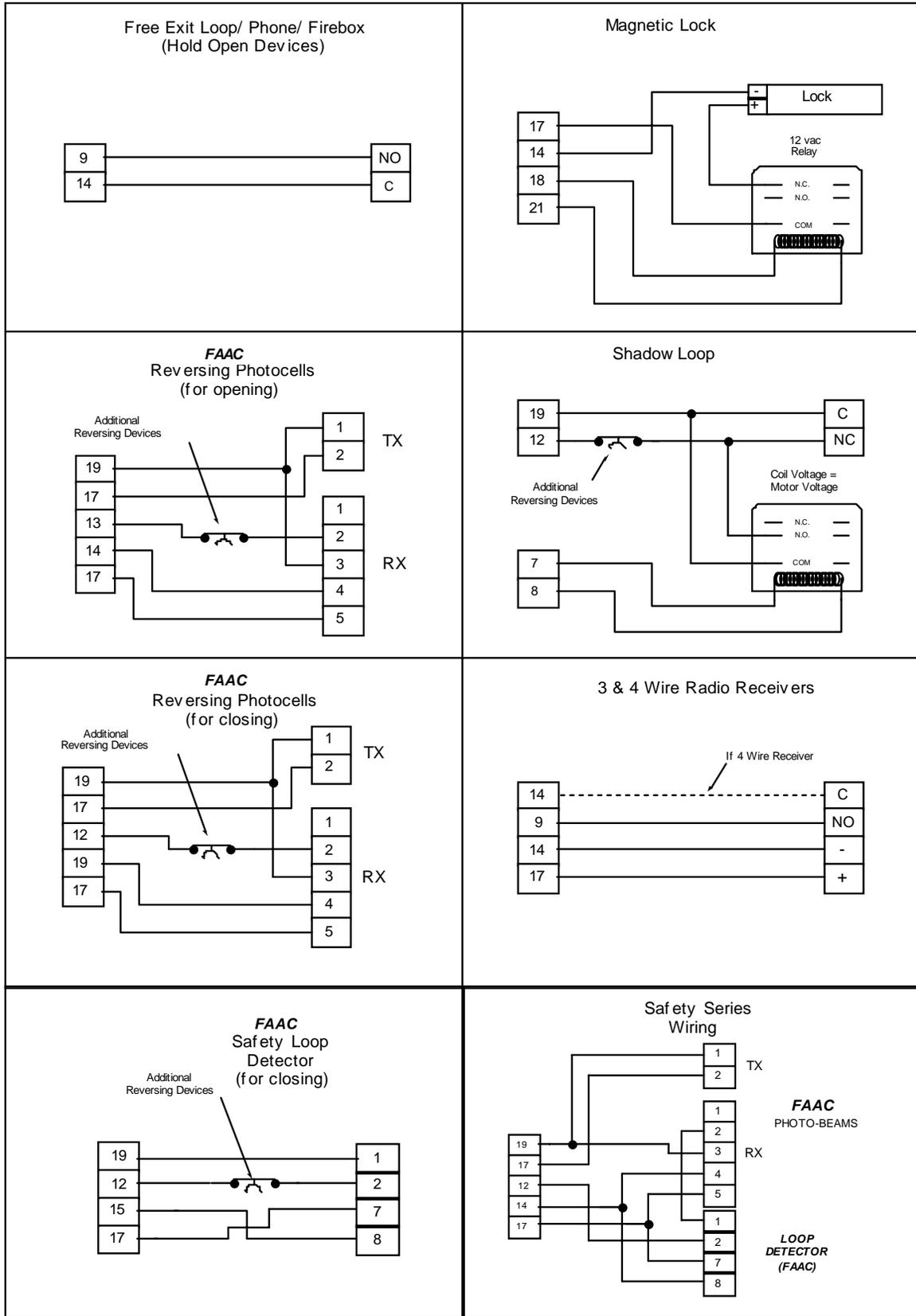
PAUSE TIME: The pause time between opening and closing can be adjusted from 0 seconds to 4 minutes. Time is adjusted in one-second increments from 0—59 seconds. When 60 seconds is reached, time is adjusted in 10 second increments up to 4 minutes. i.e. if display shows 2.5, it means 2 minutes and 50 seconds.

LEAF DELAY: You may choose to delay one leaf on closing for overlapping gate leaves. Be sure the operator on the leaf for delayed closing is connected to Motor 1. On opening, the leaf connected to Motor 2 is delayed 2.5 sec.

NOTE: If an opening leaf delay is desired, it must be enabled in the Advance Programming. However, if enabled, you cannot *adjust* this opening delay of the operator connected to Motor 2.

The closing leaf-delay time is adjustable from 0 to 4 minutes.

NOTE: If the opening/closing time is set at less than the leaf delay time, the delayed leaf closes at the end of the closing time.



NO = Normally Open, NC = Normally Closed, C = Common, TX = Transmitter, RX = Receiver

Figure 5-CP. Common Accessories wired to 455 D Control Panel

PROGRAMMING

To program the automated system, the "Programming Mode" must be accessed.

Programming is split into two parts: BASIC and ADVANCED.

BASIC PROGRAMMING

To access BASIC PROGRAMMING, press the "F" key.

- If you press it (and hold it down), the display shows the name of the first function.
- If you release the key, the display shows the value of the function that can be modified with keys + and - .
- If you press and hold down the "F" key again (and hold it down), the display shows the name of the next function, etc.
- When you reach the last function, press "F" to exit the program, and the display resumes showing the status of the inputs.

The table on the right shows the sequence of functions accessible in BASIC PROGRAMMING.

ADVANCED PROGRAMMING

To access ADVANCED PROGRAMMING, press the "F" key and, as you hold it down, press the "+" key:

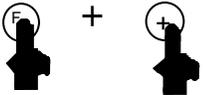
- If you release the "+", the display indicates the name of the first function.
- If you release the "F" key, too, the display shows the value of the function that can be modified with keys "+" and "-".
- If you press the "F" key (and hold it down), the display shows the name of the next function, and if you release it, the value that can be modified with keys "+" and "-".
- When you reach the last function, press the "F" key to exit the program, and the display resumes showing the status of the inputs.

The table on page 27 shows the sequence of functions accessible in ADVANCED PROGRAMMING

PROGRAM BUTTONS		
+	-	F
LEFT	MIDDLE	RIGHT

BASIC PROGRAMMING		
		
Display	Function	Default
LO	OPERATING LOGICS A = Automatic (Timer to Close) E = Semi Automatic S = Security EP = (Semi-Automatic) Step by Step B = Manned, Pulsed C = Manned, constant	E
PA	PAUSE TIME This is the time between open and closing and is adjustable from 0 to 4 min. This is only true in "A" Mode. (see pause time description)	0
F1	FORCE/TORQUE MOTOR 1 This adjusts the force / torque that motor 1 is applying to the gate leaf. Setting is 0 to 50.*	25
F2	FORCE/TORQUE MOTOR 2 This adjusts the force / torque that motor 2 is applying to the gate leaf. Setting is 0 to 50.*	25
cd	CLOSING LEAF DELAY Delays the closing of operator wired into motor one outputs. Adjustable from 0 to 4 minutes (Same as pause time)	0
LL	MOTOR RUN TIME This enables where you choose from "simple" learning or "complete" learning of the motor run time. See page 10 & 11 for complete details. Simple Learning  ≈ 1 s. Complete Learning  > 3 s.	
In	EXIT PROGRAMMING Exit from programming and return to display of inputs status.	

* With Hydraulic operators the Force/Torque must be set to the maximum setting of 50.

ADVANCED PROGRAMMING		
		
Display	Function	Default
60	MAXIMUM TORQUE AT INITIAL THRUST: The motors operate at maximum torque (ignoring the torque setting) at start of movement. Useful for heavy leaves. Y = Enable No = Disabled	no
55	LAST STROKE AT CLOSING: The motors are activated at full speed for 1s to facilitate locking of the electric lock. Y = Enable No = Disabled	no
5	REVERSING STROKE: Before opening, while the gate is closed, the motors thrust to close for 2 s thus facilitating release of the electric lock. Y = Enable No = Disabled	no
00	LEAF 2 OPENING DELAY (2s): Enables delayed start (at opening) of leaf 2, avoiding interference between leaves. Y = Enable No = Disabled	no
FS	FAIL SAFE: If this function is activated, it enables a function test of the photocells before any gate movement. If the test fails (photocells not serviceable), the gate does not start the movement. Y = Enable No = Disabled	no
PF	PRE FLASHING (5s): Activates the flashing lamp for 5s before start of movement. Y = Enable No = Disabled	no
EL	ELECTRIC LOCK ON LEAF 2: For using the electric lock on leaf 2 instead of on leaf 1. Y = Enable No = Disabled	no

Display	Function	Default
50	INDICATOR-LIGHT: If 0 is selected, the output functions as a standard indicator-light (lighted at opening and pause, flashing at closing, and off when gate closed). Different figures correspond to timed activation of the output, which can be used (via a relay) to power a courtesy lamp. Time can be adjusted from 0 to 59s in 1s increments, and from 1.0 to 4.1 min. in 10s steps. 0 = Standard Indicator-Light From 1 to 4.1 = Timed Output	0
Ph	CLOSING PHOTOCELLS REVERSE AT RELEASE: Enable this function if you want the closing photocells to stop the gate movement and reverse it after the beam is cleared. Default setting is immediate reverse. Y = Enable No = Disabled	no
Ad	A.D.M.A.P. FUNCTION: If this function is enabled, the safety devices operate in compliance with French standard NFP 25/362. Y = Enable No = Disabled	no
AS	ASSISTANCE REQUEST (COMBINED WITH NEXT FUNCTION): If activated, at the end of countdown (settable with the next function, i.e. "Cycle programming") it effects 8s of pre-flashing at every Open pulse (job request). Can be useful for setting scheduled maintenance jobs. Y = Enable No = Disabled	no
nc	CYCLE PROGRAMMING: For setting count down of system operation cycles. Settable (in thousands) from 0 to 99 thousand cycles. The displayed value is updated as cycles proceed. This function can be used to check use of the board or to exploit the "Assistance Request" function.	0
in	EXIT PROGRAMMING: Exit from programming and return to display of inputs status.	

LEARNING OF OPERATING TIMES

WARNING: During the learning procedure, the safety devices are disabled! Therefore, any and all traffic must be avoided in the path of the gate leaf(s).

NOTE: Programming must start with the gate(s) in the closed position.

Opening/closing time is established by the learning procedure which varies slightly according to whether you are or are not using Gatecoders.

LEARNING OF NORMAL TIMES

Normal learning (i.e. without Gatecoders) can be done in two different ways:

SIMPLE LEARNING (WITHOUT SLOW DOWN)

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button for 1 second the display begins flashing and the leaves begin the opening movement.

Wait for the leaves to reach the opening positive stop and then supply an OPEN A command after the desired motor run time has been reached (by push-button or radio control) to stop the movement: the leaves stop and the display stops flashing. One more command given will close the gate.

The procedure has ended and the gate is ready to operate.

COMPLETE LEARNING (WITH SLOW DOWN)

NOTES:

- If you do not wish to slow the gate operator(s) down, wait for the gate to reach its positive stop and supply two (2) consecutive open commands (within 1 second).
- If only one gate operator (1) is used, you must go through the entire programming procedure, as if you were programming for two gate operators (2). When the operator has finished opening, supply 5 open commands until the gate operator begins to close, and then resume normal operations.

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button until the gate starts movement: the display will be flashing. The following functions can be commanded by the OPEN A (by push-button wired to terminals 9

and 14, or radio control):

- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (1) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (2) will automatically start to open.
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (2) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (2) will automatically start to close.
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (2) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (1) will automatically start to close.
- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (1) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off.

The display stops flashing and the gate is ready for normal operation.

LEARNING TIMES WITH GATECODER

Learning with the Gatecoder can be done in two different ways:

SIMPLE LEARNING

Close the gates, enter "Basic Programming", select the TIME LEARNING function and press the + push-button for 1 second: the display begins flashing and the leaves begin the opening movement.

The movement stops automatically when the opening positive stop is reached and the display stops flashing.

The procedure has ended and the gate is ready to operate, using default slow down automatically set by the control panel.

COMPLETE LEARNING

NOTES:

- If only one gate operator (1) is used, you must go through the entire programming procedure, as if you were programming a gate operator (2). When the gate operator (1) has finished opening, supply 5 open commands until the gate operator begins to close, and then resume normal operations.

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button until the gate starts movement: the display will be flashing. The following functions can be commanded by the OPEN A command (by radio control or key push-button):

- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start opening gate operator (2).
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start closing gate operator (2).

- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start closing gate operator (1).
- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.

The display stops flashing and the gate is ready for normal operation.

NOTES:

- The open command to slow down the gate should be given before the gate reaches the positive stop to prevent the gate from hitting the stop at full speed. The positive stop could be mistaken for an obstacle and then upon hitting it, the gate(s) would automatically reverse on contact.

AUTOMATED SYSTEM TEST

When you have finished programming, check if the system is operating correctly.

Most important of all, check that the force is adequately adjusted and that the safety devices are operating correctly.

If pressure adjustments on hydraulic operators are not set before programming. It may need to be reprogrammed for desired results.

A (Automatic) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens both leaves and closes them after pause time	Opens single leaf connected to Motor 1 and closes it after pause time	No effect	No effect	No effect	Off
Opening	No effect	No effect	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Interrupts the pause time	Interrupts the pause time	Stops	No effect	Gate remains open until reversing devices no longer triggered	On
Closing	Opens both leaves	Opens leaf	Stops	No effect	Depends on DIP switch 4	Flashes
Stopped	Closes the leaves	Closes the leaf	No effect (opening is inhibited)	No effect	No effect (opening is inhibited)	On

S (Security) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens both leaves and closes them after pause time	Opens single leaf connected to Motor 1 and closes it after pause time	No effect	No effect	No effect	Off
Opening	Closes both leaves	Closes leaf	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves	Closes leaf	Stops	No effect	Gate remains open until reversing devices no longer triggered	On
Closing	Opens both leave	Opens leaf	Stops	No effect	Depends on DIP switch 4	Flashes
Stopped	Closes the leaves	Closes the leaf	No effect (opening is inhibited)	No effect	No effect (opening is inhibited)	On

B (Manned, Pulsed) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens 1 or both leaves	No effect	No effect	No effect	No effect	Off
Opening	No effect	No effect	Stops	No effect	Stops	On
Opened	No effect	Closes 1 or both leaves	No effect	No effect	No effect	On
Closing	No effect	No effect	Stops	Stops	No effect	Flashes
Stopped	Opens 1 or both leaves	Closes 1 or both leaves	No effect	No effect	No effect	On

E (Semi-automatic) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens both leaves	Opens single leaf connected to Motor 1	No effect	No effect	No effect	Off
Opening	Stops	Stops	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves	Closes leaf	Stops	No effect	No effect (opening is inhibited)	On
Closing	Closes both leaves	Closes leaf	Stops	No effect (opening is inhibited)	Depends on DIP switch 4	Flashes
Stopped	Closes the leaves	Closes the leaf	No effect (opening is inhibited)	No effect	No effect (opening is inhibited)	On

EP (Semi-automatic, Step by Step) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens both leaves	Opens single leaf connected to Motor 1	No effect (opening is inhibited)	No effect (opening is inhibited)	No effect (opening is inhibited)	Off
Opening	Stops	Stops	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves	Closes leaf	Stops	No effect	No effect (opening is inhibited)	On
Closing	Stops	Stops	Stops	No effect (opening is inhibited)	Depends on DIP switch 4	Flashes
Stopped	Gate leaves reverse direction	Gate leaf reverses direction	No effect (opening is inhibited)	No effect (opening is inhibited)	No effect (opening is inhibited)	On

C (Manned and Constant) Logic (455 D)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Devices(s)	Warning Light
Closed	Opens 1 or both leaves	No effect	No effect	No effect	No effect	Off
Opening	No effect	No effect	Stops	No effect	Stops	On
Opened	No effect	Closes 1 or both leaves	No effect	No effect	No effect	On
Closing	No effect	No effect	Stops	Stops	No effect	Flashes
Stopped	Opens 1 or both leaves	Closes 1 or both leaves	No effect	No effect	No effect	On

MAINTENANCE

THE 750 OPERATOR

The FAAC recommended maintenance schedule varies according to the frequency of use of the operators, whether lightly used operators (once or twice an hour) or heavily used operators (many cycles per hour).

Check the oil.

To check the oil level correctly, remove the oil filler cap on the top of the power unit. A dip stick is attached to the bottom of the cap for checking the oil level as shown in Figure 14.

Light duty use: check once per year
Heavy duty use: check every 6 mo

Change the oil.

Changing the oil completely in the hydraulic system of the 750 Operator requires removing the power unit and drive unit from their installed positions unless you are able to pump the oil out of both units.

Light duty use: change every 4 yr
Heavy duty use: change every 2 yr

Check the pressure settings.

Light duty use: check once per year
Heavy duty use: check every 6 mo

Check all reversing devices.

Every six months, you should verify that all installed reversing devices work properly.

THE 455 D CONTROL PANEL

Keep the control panel free from spider webs, insects, etc. Otherwise, the control panel requires no maintenance.

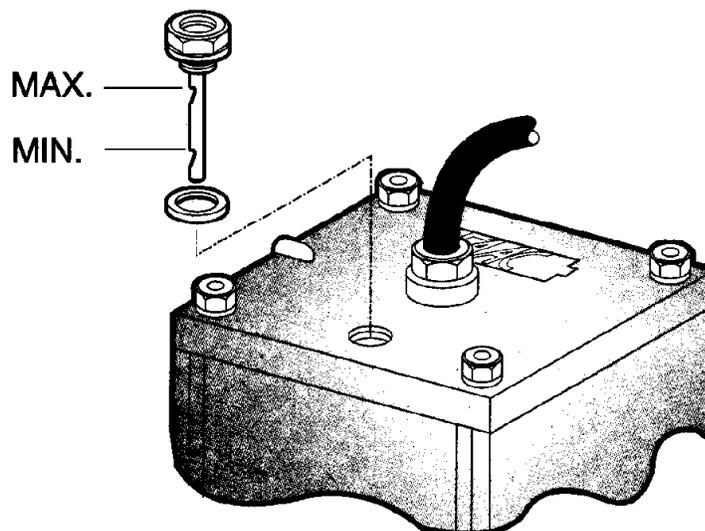


Figure 14. When you check the oil, make sure the oil level falls between the minimum and maximum marks on the oil dip stick

SAFETY IN GATE DESIGN

- A gate is a potential traffic hazard, so it is important that you locate the gate far enough away from the road to eliminate the potential of traffic getting backed up. This distance is affected by the size of the gate, how often it is used, and how fast the gate operates.
- The operator you choose to install on your gate must be designed for the type and size of your gate and for the frequency with which you use the operator.
- Your gate must be properly installed and must work freely in both directions *before* the automatic operator is installed.
- An automatic operator should be installed on the inside of the property/fence line. Do not install the operator on the public side of the property/fence line.
- Outward swinging gates with automatic operators should not open into a public area.
- Pedestrians should not use a vehicular gate system. Prevent such inappropriate use by installing separate gates for pedestrians.
- The operating controls for an automatic gate must be secured to prevent the unauthorized use of those controls.
- The controls for an automatic gate should be located far enough from the gate so that a user cannot accidentally touch the gate when operating the controls.
- Exposed, reachable pinch points on a gate are potentially hazardous and must be eliminated or guarded.
- It is extremely unsafe to compensate for a damaged gate by over tightening a clutch or increasing hydraulic pressure.
- An automatic gate operator should not be installed on a gate if people can reach or extend their arms or legs through the gate. Such gates should be guarded or screened to prevent such access.

TROUBLESHOOTING

WARNING! Before you do any work on the control panel, be sure to turn off the main power.

NOTE: Any control panel specific information in the following applies to the 455 D control panel only.

Problem:

The gate does not respond to an activating signal.

Solution:

Verify that you have correctly wired the operator to the control panel.

Verify that the LED DL3 is on. If it is not illuminated, then check the fuses on your control panel.

If the LED DL3 is not illuminated and your fuses are okay, then the stopping device is being triggered and is preventing the gate from responding to your signal. If you have no stopping device installed, then be sure you have installed a jumper across the appropriate terminals.

Verify that your activating device works properly. Either DL1 or DL2 (depending on your gate design) should illuminate when you signal the gate to close (or open) and LED DL3 should be on. If either DL1 or DL2 does not illuminate when you signal the gate, then the problem may be in your activating device. Short across the appropriate terminals. If the short causes the

gate to close (or open), then the problem is in the activating device. Repair or replace the device.

Problem:

The radio controlled opener does not open the gate.

Solution:

Check the light on the front of the remote transmitter. It should illuminate when you signal the gate. If it does not illuminate and if the batteries are okay, repair or replace the transmitter.

Verify that the wiring for the radio controlled device is correct.

Check the wiring for the antenna and correct it if necessary.

Check DL1 and DL2. One should illuminate when the transmitter button is pressed.

Determine if the fault is in the receiver by temporarily connecting a push button device across the appropriate terminals. If such a push button device opens the gate, repair or replace the receiver.

Problem:

The gate doesn't open (or close) though the motors are running.

Solution:

Make sure that the motor is running in the right direction, and make sure the Manual Release mechanism has fully engaged the hydraulic system.

Problem:

The gate opens but does not close.

Solution:

Make sure you have selected the desired operating mode.

Verify that the reversing devices are working properly. DL4 or DL5 should illuminate when a reversing device is triggered. If either does not illuminate, then one of your reversing devices is preventing the gate from responding to your signal. Check your reversing devices.

If no reversing devices are installed, make sure a circuit is installed between appropriate terminals.

If the motor is running, insure that the bypass valves are correctly adjusted. Increase the bypass pressure in small 1/4 turn increments to see if the hydraulic system needs more pressure.

Problem:

The gate does not fully open (or close).

Solution:

Increase the bypass pressure(s) to see if the hydraulic system needs more pressure.

Check the operator's motor run time selection. You should set a time that is just longer than the rated speed of your model of operator. For example, because the 400 CBAC has a rated opening time of 17 sec, you should select a time that is just longer than the opening time.

TROUBLESHOOTING

WARNING! Before you do any work on the control panel, be sure to turn off the main power.

NOTE: Any control panel specific information in the following applies to the 455 D control panel only.

Check to see that there are no obstructions in the path of the gate or that the hinges are not binding.

Problem:

The operator doesn't work smoothly and the gate jerks as it opens and closes.

Solution:

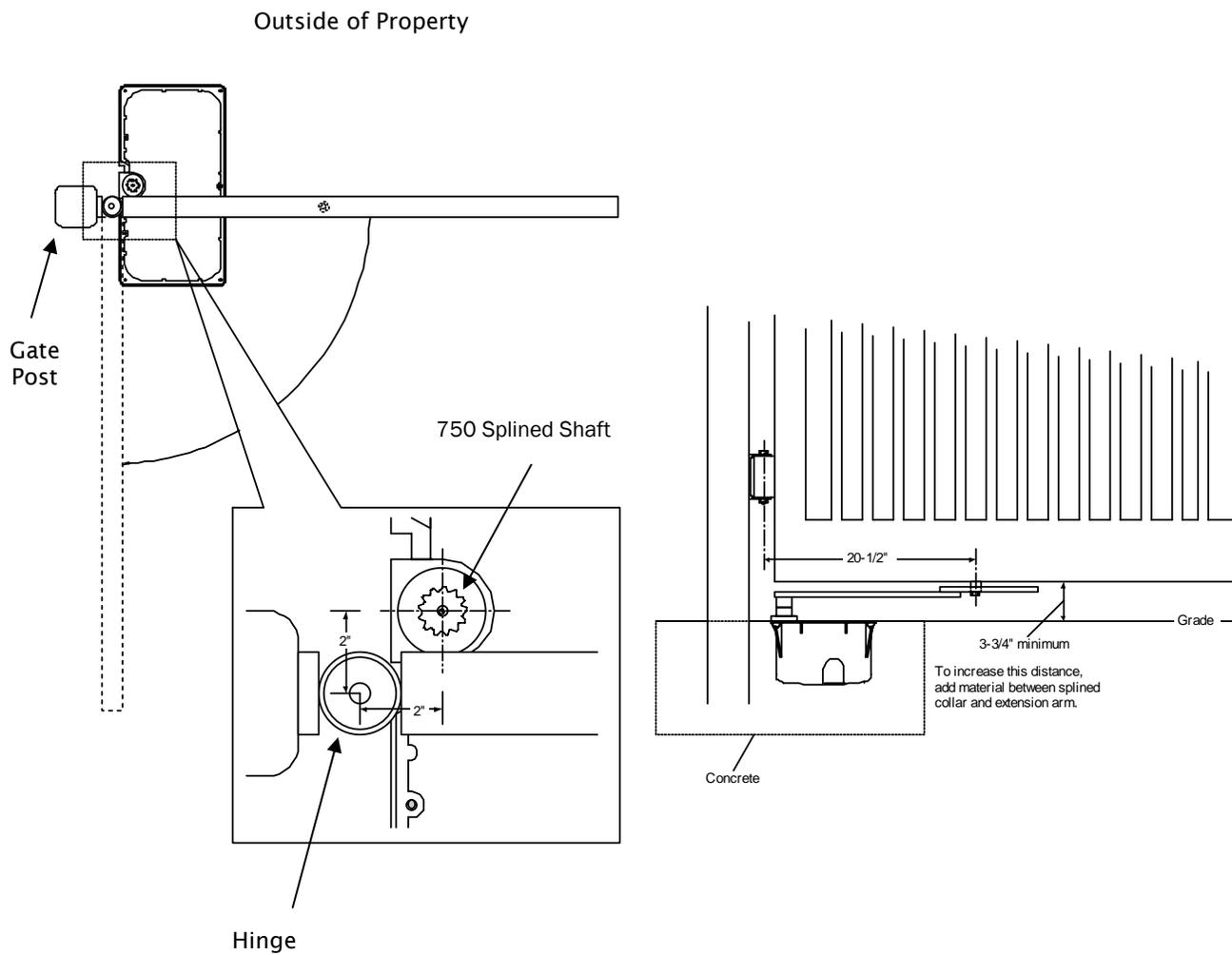
Check the oil level in the operator.

Make sure the Manual Release mechanism has fully engaged the hydraulic operation of the operator.

Bleed the air from the hydraulic system by cycling the gate (opening and then closing) 10 times and pausing for a couple of minutes between cycles.

Make sure that a flexible gate leaf is not the problem. If the gate leaf flexes, then stiffen the gate or use a slower operator.

OPERATOR LOCATION WHEN USING THE EXTENSION ARMS WITH STOPS



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Your Notes

LIMITED WARRANTY

To the original purchaser only: FAAC International, Inc., warrants, for twenty-four (24) months from the date of invoice, the gate operator systems and other related systems and equipment manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., to be free from defects in material and workmanship under normal use and service for which it was intended *provided* it has been properly installed and operated. FAAC International, Inc.'s obligations under this warranty shall be limited to the repair or exchange of any part of parts manufactured by FAAC S.p.A. and distributed by FAAC International, Inc. Defective products must be returned to FAAC International, Inc., freight prepaid by purchaser, within the warranty period. Items returned will be repaired or replaced, at FAAC International, Inc.'s option, upon an examination of the product by FAAC International, Inc., which discloses, to the satisfaction of FAAC International, Inc., that the item is defective. FAAC International, Inc. will return the warranted item freight prepaid. The products manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., are not warranted to meet the specific requirements, if any, of safety codes of any particular state, municipality, or other jurisdiction, and neither FAAC S.p.A. or FAAC International, Inc., assume any risk or liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

Any products and parts not manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., will carry only the warranty, if any, of the manufacturer. This warranty shall not apply to any products or parts thereof which have been repaired or altered, without FAAC International, Inc.'s written consent, outside of FAAC International, Inc.'s workshop, or altered in any way so as, in the judgment of FAAC International, Inc., to affect adversely the stability or reliability of the product(s) or has been subject to misuse, negligence, or accident, or has not been operated in accordance with FAAC International, Inc.'s or FAAC S.p.A.'s instructions or has

been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such product(s). Neither FAAC S.p.A. or FAAC International, Inc., shall be liable for any loss or damage whatsoever resulting, directly or indirectly, from the use or loss of use of the product(s). Without limiting the foregoing, this exclusion from liability embraces a purchaser's expenses for downtime or for making up downtime, damages for which the purchaser may be liable to other persons, damages to property, and injury to or death of any persons. Neither FAAC S.p.A. or FAAC International, Inc., assumes nor authorizes any person to assume for them any other liability in connection with the sale or use of the products of FAAC S.p.A. or FAAC International, Inc. The warranty hereinabove set forth shall not be deemed to cover maintenance parts, including, but not limited to, hydraulic oil, filters, or the like. No agreement to replace or repair shall constitute an admission by FAAC S.p.A. or FAAC International, Inc., of any legal responsibility to effect such replacement, to make such repair, or otherwise. This limited warranty extends only to wholesale customers who buy directly through FAAC International, Inc.'s normal distribution channels. FAAC International, Inc., does not warrant its products to end consumers. Consumers must inquire from their selling dealer as to the nature and extent of that dealer's warranty, if any.

This warranty is expressly in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for use. This warranty shall not apply to products or any part thereof which have been subject to accident, negligence, alteration, abuse, or misuse or if damage was due to improper installation or use of improper power source, or if damage was caused by fire, flood, lightning, electrical power surge, explosion, wind storm, hail, aircraft or vehicles, vandalism, riot or civil commotion, or acts of God.

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