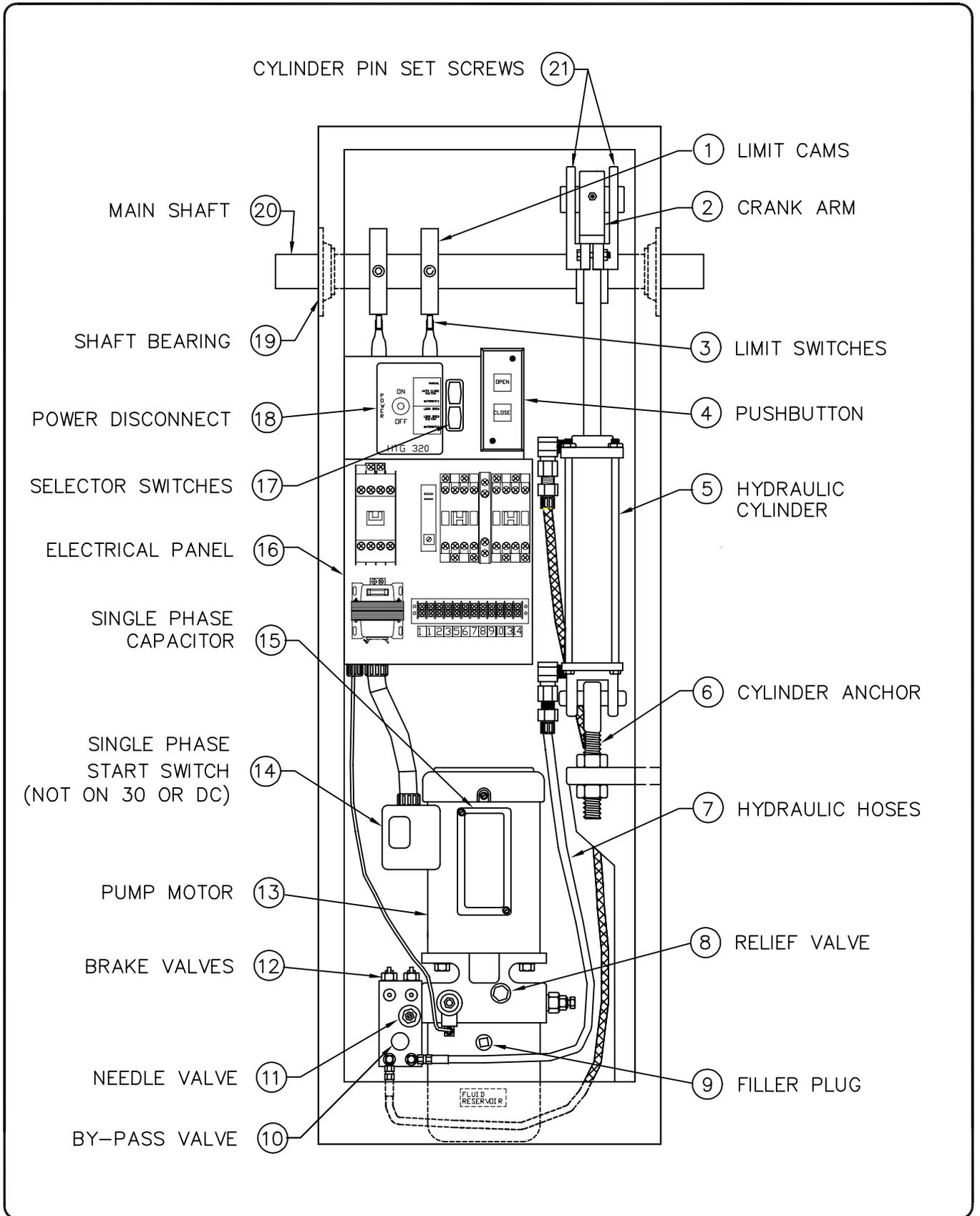


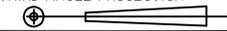
Hy-Security Gate Operators

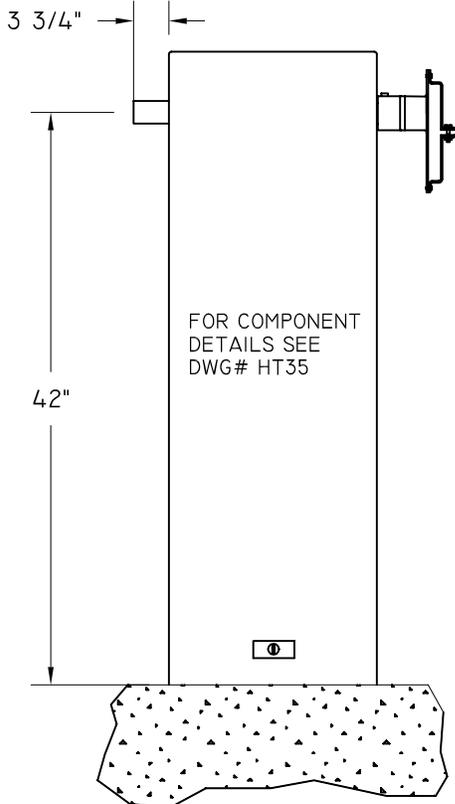
HTG 320 BARRIER ARM GATE OPERATOR HANDBOOK



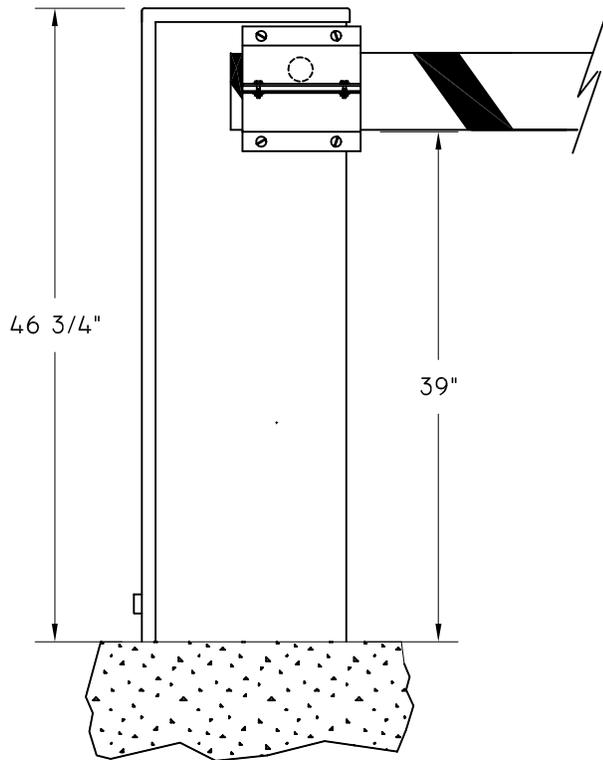
Manufacturers and Designers of Hydraulic Systems



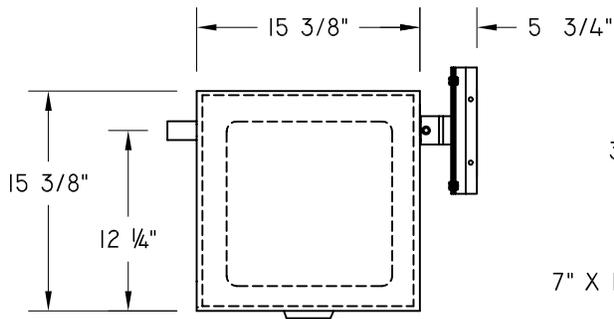
 <p>SEATTLE, WASHINGTON</p>	TITLE	DRAWN	DATE	THIRD ANGLE PROJECTION	REV
	COMPONENTS HTG 320 BARRIER ARM OPERATOR	D. B.	05/12/00		A
		CHECKED	DATE	ERN NUMBER	DATE
		APPROVED	DATE	DRAWING NUMBER:	SHT OF
				HT35	



DOOR SIDE ELEVATION

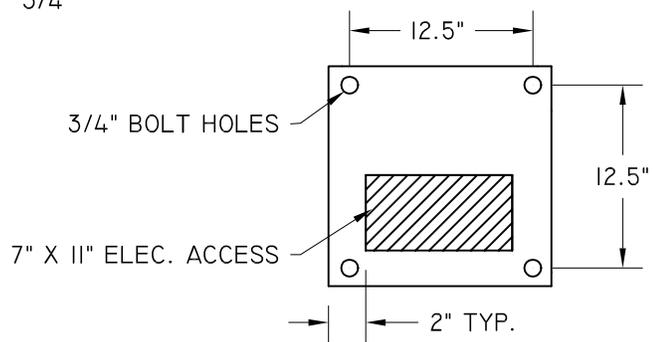


SIDE ELEVATION



PLAN VIEW DOOR SIDE
(COVER IN PLACE)

ROAD SIDE



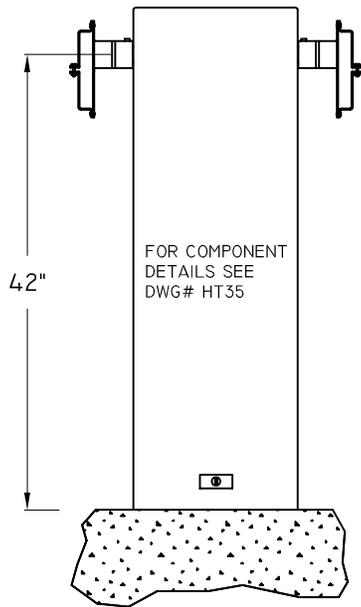
NOTE:
ARM BRACKET CAN ATTATCH
ON LEFT OR RIGHT SIDE.

NOTE:
MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE, IF DEEPER.

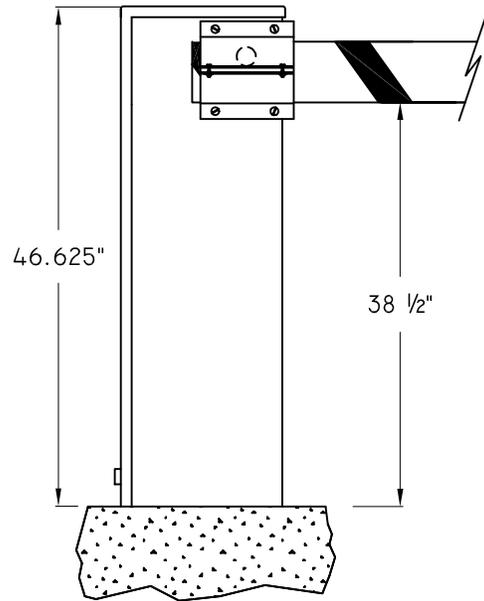


TITLE
**SINGLE WOOD ARM MOUNTING
BRACKET UP TO 14' MAXIMUM**

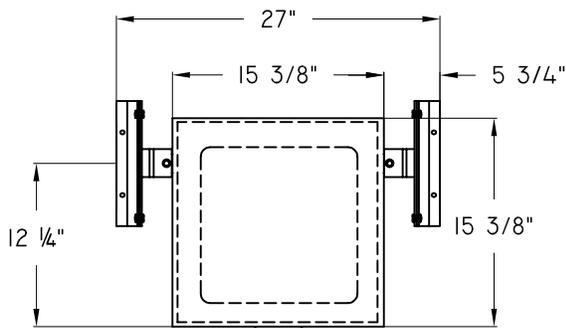
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CHECKED SHOP	DATE MM/YY/DD	PART NUMBER N/A	
APPROVED ENGRNG	DATE MM/YY/DD	DRAWING NUMBER: HTI7	SHT OF



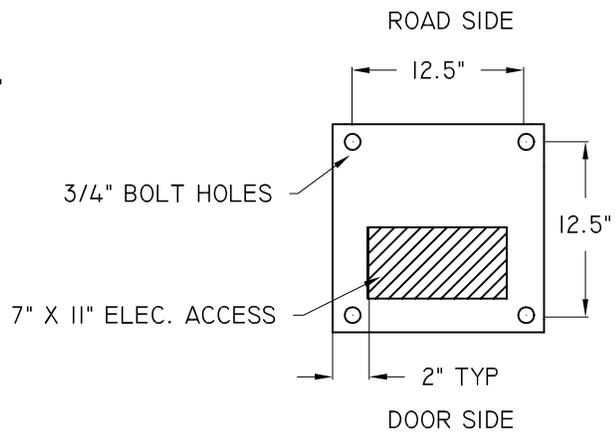
DOOR SIDE ELEVATION



SIDE ELEVATION



PLAN VIEW
DOOR SIDE
(COVER IN PLACE)



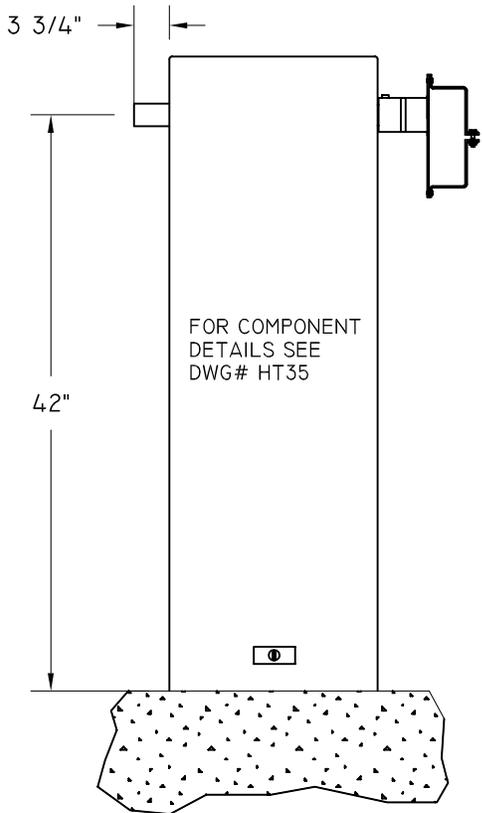
NOTE:
MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE IF IT'S DEEPER.



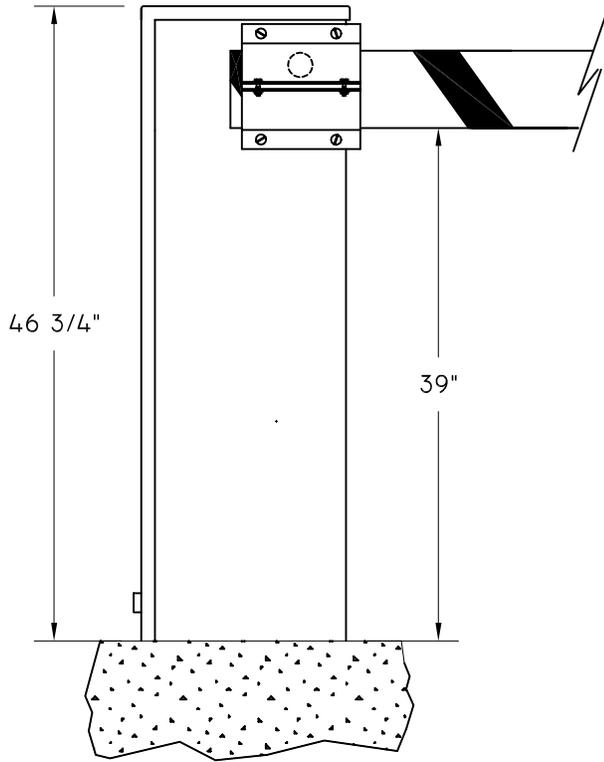
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**TWIN WOOD ARMS 16' AND LESS
NO COUNTERWEIGHTS**

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CHECKED SHOP	DATE MM/YY/DD	PART NUMBER N/A	A
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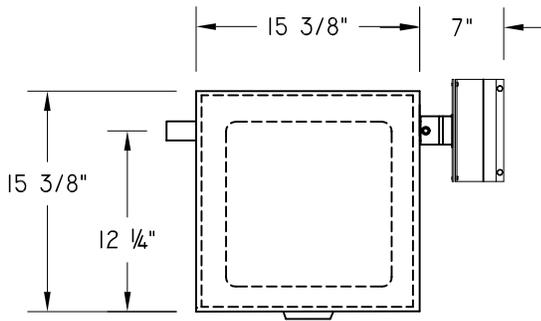
SHT 1 OF 1



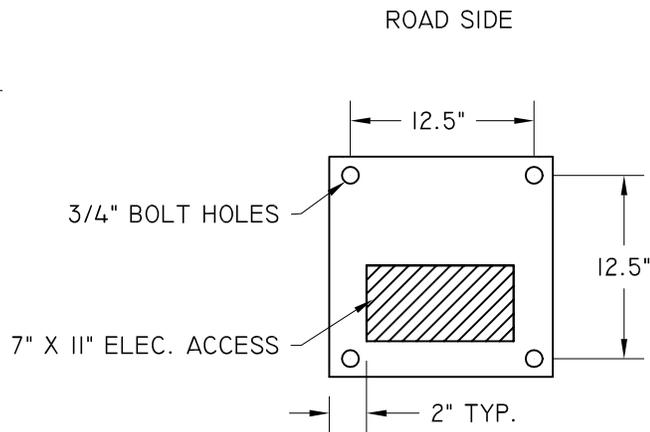
DOOR SIDE ELEVATION



SIDE ELEVATION



PLAN VIEW DOOR SIDE (COVER IN PLACE)



ROAD SIDE

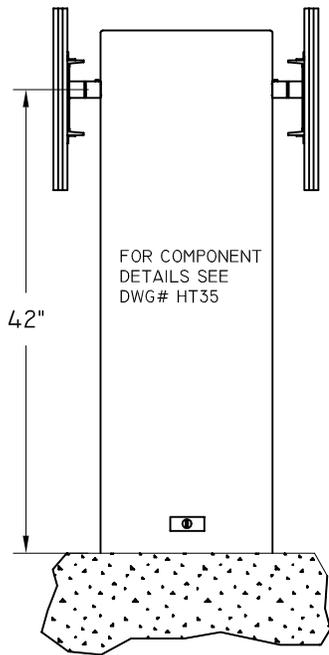
NOTE:
ARM BRACKET CAN ATTATCH ON LEFT OR RIGHT SIDE.

NOTE:
MINIMUM RECOMMENDED SLAB 20" X 20" X 20" OR TO THE FROST LINE, IF DEEPER.

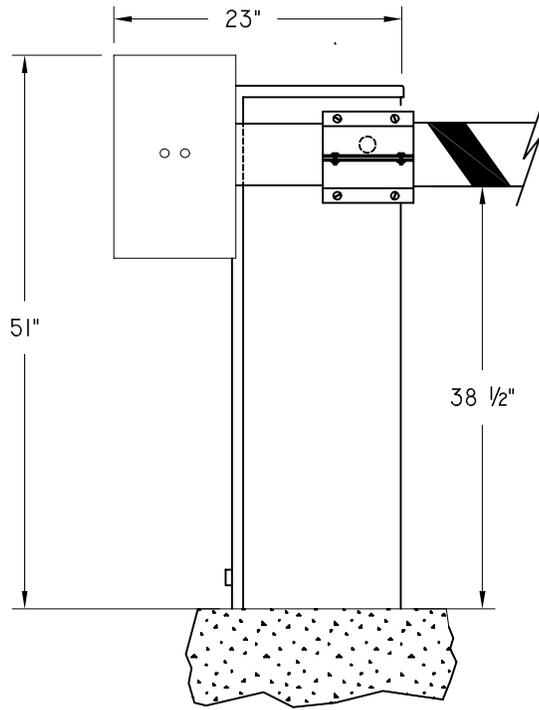


TITLE	DRAWN KERI			DATE 6/15/00	THIRD ANGLE PROJECTION 	REV --
SINGLE ALUMINUM ARM MOUNTING BRACKET 18' MAXIMUM	CHECKED SHOP		DATE MM/YY/DD	PART NUMBER N/A		SHT OF
	APPROVED ENGRNG		DATE MM/YY/DD	DRAWING NUMBER: HT18		

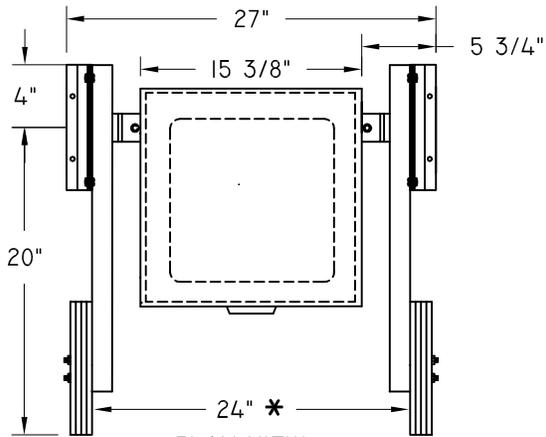
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CHECKED SHOP		DATE MM/YY/DD	PART NUMBER N/A
APPROVED ENGRNG		DATE MM/YY/DD	DRAWING NUMBER: HT18



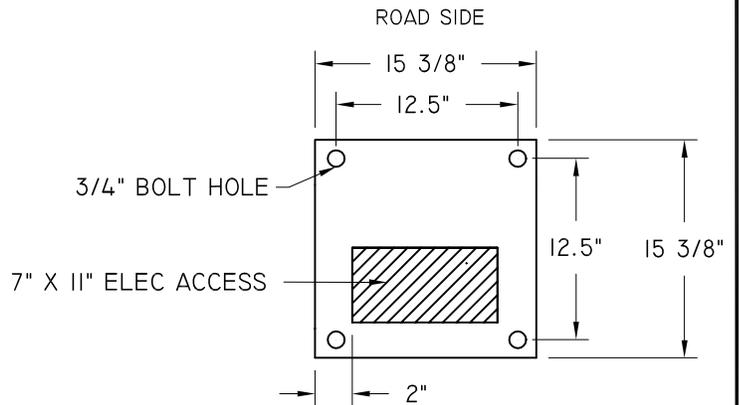
DOOR SIDE ELEVATION



SIDE ELEVATION



PLAN VIEW DOOR SIDE (COVER IN PLACE)



DOOR SIDE

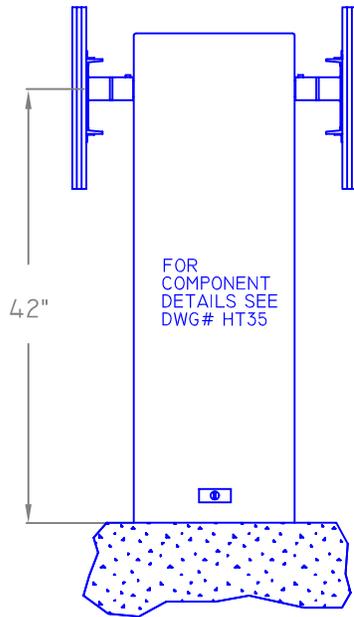
* NOTE:
TOTAL WIDTH IS 24" + 1/2"
FOR EACH COUNTERWEIGHT REQUIRED.

NOTE:
MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE IF IT'S DEEPER.

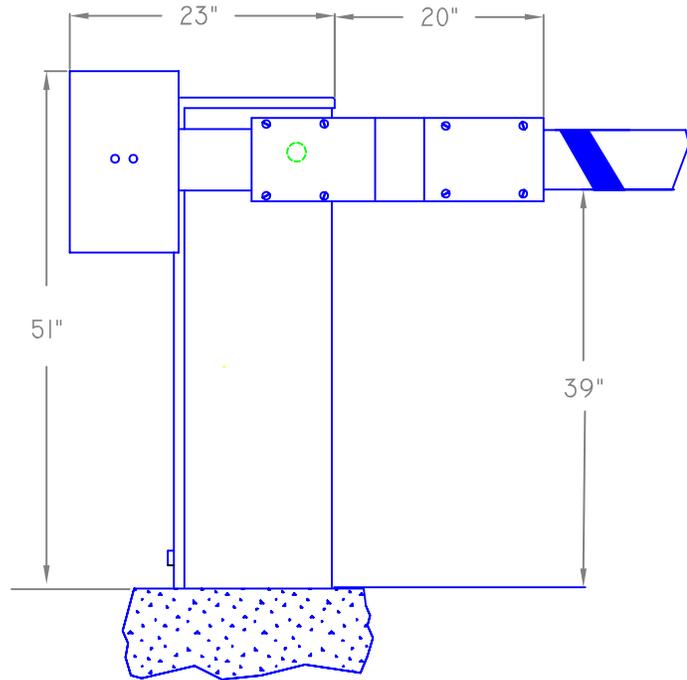


TITLE
**TWIN WOOD ARMS LONGER THAN
16' W/ COUNTERWEIGHTS**

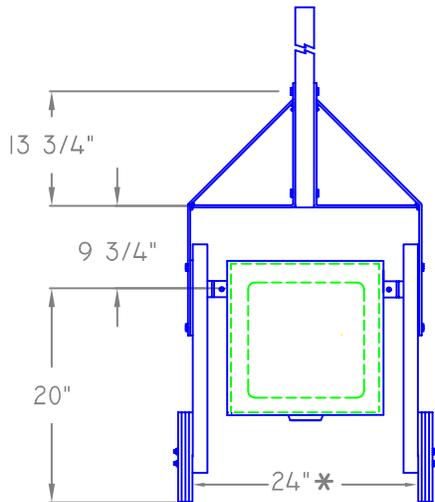
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CHECKED SHOP	DATE MM/YY/DD	PART NUMBER N/A	SHT OF 1 1
APPROVED ENGRNG	DATE MM/YY/DD	DRAWING NUMBER: HT19	



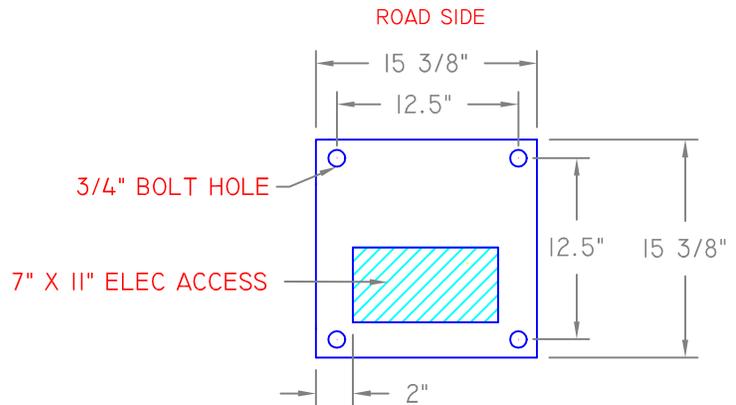
DOOR SIDE ELEVATION



SIDE ELEVATION



PLAN VIEW DOOR SIDE (COVER IN PLACE)



DOOR SIDE

* NOTE:
TOTAL WIDTH IS 24" + 1/2"
FOR EACH COUNTERWEIGHT REQUIRED.

NOTE:
MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE IF IT IS DEEPER.



TITLE
**TUBULAR ALUMINUM/FIBERGLASS ARM
W/COUNTERWEIGHTS 18' - 36'**

DRAWN KERI	DATE 6/12/00	THIRD ANGLE PROJECTION 	REV
CHECKED SHOP	DATE MM/YY/DD	PART NUMBER N/A	---
APPROVED ENGRNG	DATE MM/YY/DD	DRAWING NUMBER: HT22	SHT OF 1 1



Installation Instructions HTG 320 Barrier Arm Operator

Be certain to observe the following requirements

Permanent wiring shall be employed: Use conductors with a rating of at least 75 C. Run conduit directly into the electrical enclosure.

NOTE 1: Proper grounding is required. The grounding connection point is located inside of the electrical enclosure.

NOTE 2: Before servicing the operator be certain to turn off the power by pushing the disconnect switch to the "off" position.

Button station operation: Install the push button control within sight of the gate arm. Be certain the opening is clear before closing gate. Mount a sign, which advises that the area be clear before operation, adjacent to button station.

Automatic operation: Reversing sensor must be used. Be sure to mount safety warning signs, in clear view of everyone, that warns of the automatic operation of the gate. Mount a photo eye below the arm or reversing edge to the leading edge of gate according to its manufacturers specifications. Other devices, such as vehicle detectors may be used to allow for convenient automatic operation of vehicular traffic, however vehicle detectors cannot detect pedestrians.

1. See the barrier arm drawings for the concrete slab size, operator footprint, and other dimensions.
2. Mount the operator to the concrete pad, at all four corners, using 1/2" diameter x 7" anchor bolts minimum.
3. Remove the plastic shipping plug on the pump manifold (left rear corner) and replace it with the supplied black vent cap.
4. Connect appropriate power wiring. Be certain to oversize supply conductors to allow for voltage drop, especially on single phase machines. Follow the wire size schedules (document #E16a,b) for a 3/4 HP motor. Machines that are to operate on voltages above 120 volts, do not need a neutral wire. Connect the power supply conductors to the loose wires, inside the electric control panel, that are labelled to match the primary voltage of the operator. Be certain to also connect a good earth ground.
5. Verify that the tap of the control transformer is connected to match the supplied voltage. It is especially important to distinguish between 208 and 230 volt supplies. The various voltage taps are identified by a label on the transformer, or in the electrical drawings.

6. Test the basic functions of the operator first, before connecting any external control wiring. If your operator is equipped with vehicle detectors, be certain that they are connected to a loop so that they do not cause interference with the function of the machine. Since each vehicle detector connection involves removing a terminal jumper and wiring a N.C. (normally closed) contact; any tripped or unplugged detector will prevent the arm from closing. If the motor turns, but nothing moves, reverse two poles of a three phase power source, and/or verify that the bypass valve is closed. To check the bypass valve and verify that the aluminum knob is not toggled to engage the bypass valve on the hydraulic manifold (see #12 on component drawing HT 35).

7. Bolt arm(s) to operator. Typically a single board is used for arms up to a 14' length. Wood arms that are 14' - 16' are twin arms, bolted together near the tip. Tubular aluminum arms may be single side mounted up to 18' in length. All arms over 18' must be mounted into a yoke adapter. Counterweights must be used for all arms over 18' in length, to assure proper performance. Verify proper balance by following step #2 on the adjustments instruction pages.

8. Test the operator for smooth control of the barrier arm. The arm should stop smoothly at each end of travel. If any adjustments are necessary, follow the HTG 320 adjustments document # HT 45. Also check the reverse delay timer by opening the gate as it is closing. The arm should stop then reverse in a smooth manner. Do not leave the job site without correcting an operator that is stopping hard on its limits or reversing abruptly or damage to the mechanical drive components may occur.

9. Note that there are two switches on the top portion of the control panel, next to the push button control. The lower switch simply opens the arm, and if left in the activated position, the arm is locked full open. Be certain to leave this switch in the automatic position for normal operation. The upper switch creates the automatic close function, when used with a vehicle detector wired for the closing function. For automatic gates employing a closing detector, the auto close function switch is left in the automatic position permanently.

10. After all basic functions are verified, and adjustments made, follow page #E40, titled control circuit options, to connect any accessory or external control wiring. If vehicle detectors are to be used, review the section pertaining to detector loop sizing and layout. Test the operator functions again.



HTG 320 Adjustments

The HTG 320 gate operator is pre-adjusted at the factory to perform correctly with the barrier arm shipped. If the arm length, or weight is changed, it will be necessary to re-adjust the gate operator to perform correctly. To properly adjust all operational aspects of the HTG 320 gate operator, be certain to perform the following adjustments in the sequence listed. The speed of the operator is fixed and is not adjustable.

Be certain to disconnect the power before performing any adjustments!

- 1.** The arm leveling adjustment is accomplished by the adjusting the threaded anchor at the base of the hydraulic cylinder (see #12 on component drawing HT35). The cylinder must be fully extended when the arm is exactly level. By hand, physically pull the arm downward, until the maximum cylinder travel is reached. If the anchor is positioned to hold the cylinder too low, the cylinder will run out of travel before the arm is fully level. If the cylinder is set too high, the arm will sag lower than parallel to the roadway. The cylinder is intended to act as an internal physical stop to prevent the arm from sagging low. Disconnect the cylinder from the anchor, by loosening the Allen set screws on the lower clevis, then removing the lower clevis pin. Loosen the 1" lock nut and screw the anchor as required. Adjust upward to lower arm, or down to raise the arm. Be certain to firmly re-tighten set screws and the locking nut.
- 2.** Before any of the following adjustments can be performed correctly, the operating weight of the arm must be verified to be within the proper range for this machine. NOTE: All arms longer than 16' require counterweight. If this is a new installation using a factory supplied arm, and no additional components have been added, this test is not required because the factory has already provided the correct counterweight for the arm as ordered. To determine the operating weight of the arm, first release the manual bypass valve (see #10 on component drawing HT35), then manually lift the arm from a position ten feet distant from the operator. The arm should appear to weigh thirty pounds, or less, regardless of the length or actual weight of the arm. If the operating weight of the arm is heavier than our maximum specification, the operator is overloaded which adversely affects both automatic and manual operation. The only remedy for an arm that is too heavy is to reduce the length of the arm, or add additional counterweight.
- 3.** For the arm to stop smoothly, when opening or closing, the limit switches must trip approximately five degrees before the arm achieves full travel. If adjustments to the limit switches are necessary, use an Allen wrench to adjust the cam collars on the drive shaft (see #1 on component drawing HT35).
- 4.** When the limit switches trip five degrees early, the speed of the barrier arm is decelerated to prevent instant stops. The rate of deceleration is regulated by the silver colored brake valves, one for each direction of travel. The brake valves are located on the left side of the pump unit (see #12 on component drawing HT35). The brake valve closest to the electric motor controls the close direction. The brake valve on the left controls the open direction. The brake valves do not control the operation of the arm when the manual bypass is pulled. For adjustment of the manual mode, see step #3 on the page describing the emergency opening procedure. If any substantial change is made to the arm, such as addition, or deletion, of signs, lights, or other material, the hydraulic brake valves must be adjusted for the operator to function smoothly. The brake valves allow the gate to smoothly stop, without bouncing, when the limit switches are tripped. Its function is dependent on correct adjustment of the limit switches, described in step two. If adjustment of a brake valve is necessary, loosen the 9/16" lock nut and adjust the brake valve, with an Allen wrench, in one-tenth turn increments (counterclockwise for more rapid stopping). Tighten the 9/16" lock nut on the brake valve when complete.

NOTE: Careful adjustment of the open limit switch and brake valve may be especially important in installations where there is truck traffic and the gate operator is close to the edge of the road. Be aware that the later the open limit switch trips when the gate is opening, the sooner the open circuit will be able to accept a safety reverse when the arm is closing. The best adjustment requires a rapid, but smooth, stop of the arm at the end of the open cycle.



Wire Size Schedules for 1/2-hp through 5-hp motors

Supplying a gate operator with the right electrical service is crucial to the way the performance of the operator the life of its electrical components. If the wire size used is too small, the voltage loss—especially during motor starting—will prevent the motor from attaining its rated horsepower. The percent of horsepower lost is far greater than the percentage of the voltage loss. A voltage loss could also cause the control components to chatter while the motor is starting, substantially reducing their life due to the resultant arcing. There is no way to restore the lost performance resulting from undersized wires, except to replace them; therefore it is much more economical to choose a sufficient wire size at the initial installation.

The tables on the following page are based on copper wire and allow for a 5% voltage drop. The ampere values shown are the service factor ampere rating (maximum full load at continuous duty) of the motor.

Always connect in accordance with the National Electrical Code, article 430, and other local codes that may apply.

The maximum distance shown is from the gate operator to the power source; assuming that source power is from a panel box with adequate capacity to support the addition of this motor load. The values are for one operator, with no other loads applied to the branch circuit. For two operators applied to one circuit, reduce the maximum allowed distance by half.

Use this chart to determine maximum allowable control wiring distance. If the location required exceeds the distances listed on the chart at the right, addition of a long range interface will be necessary.

<i>Pushbutton Control Wiring</i>	
<i>16 ga</i>	<i>125' Maximum</i>
<i>14 ga</i>	<i>200' Maximum</i>
<i>12 ga</i>	<i>300' Maximum</i>
<i>10 ga</i>	<i>500' Maximum</i>

Wire Sizes for Power Wiring, Single Phase Distances are shown in the unshaded boxes

Wire Gauge	115 V, SINGLE PHASE						208 V, SINGLE PHASE						230 V, SINGLE PHASE						
	Amps	10.0	11.06	14.4	27.2	NA	NA	5.5	6.1	7.6	14.2	16.2	NA	5.0	5.8	7.2	13.6	14.8	27.0
	Horse Power	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp
12ga	90	75	60	30				290	260	205	110	100		350	300	245	130	120	65
10ga	140	120	100	50				460	415	330	175	155		560	480	385	205	190	105
8ga	220	190	155	80				725	650	525	280	245		880	760	610	325	300	165
6ga	350	300	245	130				1,150	1,040	835	445	390		1,400	1,120	975	515	475	260
4ga	555	480	385	205				1,825	1,645	1,320	710	620		2,220	1,915	1,550	815	750	410
2ga	890	765	620	330				2,920	2,630	2,110	1,130	1,000		3,550	3,060	2,465	1,305	1,200	660

Wire sizes for Power Wiring, Three Phase Distances are shown in the unshaded boxes

Wire Gauge	208 V, THREE PHASE						230 V, THREE PHASE						460 V, THREE PHASE						
	Amps	2.7	3.1	4.2	6.5	6.7	16	2.4	3.0	3.8	6.2	6.4	15.4	1.2	1.5	1.9	3.1	3.2	7.7
	Horse Power	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp
12ga	590	510	375	245	235	100		730	585	460	280	270	115	2,915	2,350	1,850	1,130	1,100	455
10ga	930	810	600	390	375	160		1,160	930	730	450	435	180	4,640	3,710	2,930	1,800	1,740	725
8ga	1,475	1,285	950	615	595	250		1,835	1,470	1,160	710	690	285	7,340	5,870	4,650	2,840	2,750	1,150
6ga	2,350	2,045	1,510	975	945	400		2,925	2,340	1,845	1,130	1,095	455	11,700	9,350	7,400	4,550	4,400	1,800
4ga	3,720	3,240	2,390	1,545	1,500	630		4,625	3,700	2,920	1,790	1,735	720	18,500	14,800	11,700	7,200	7,000	2,900

Always connect in accordance with the National Electrical Code, article 430, and other local codes that may apply.



Hy-Security Gate Operators

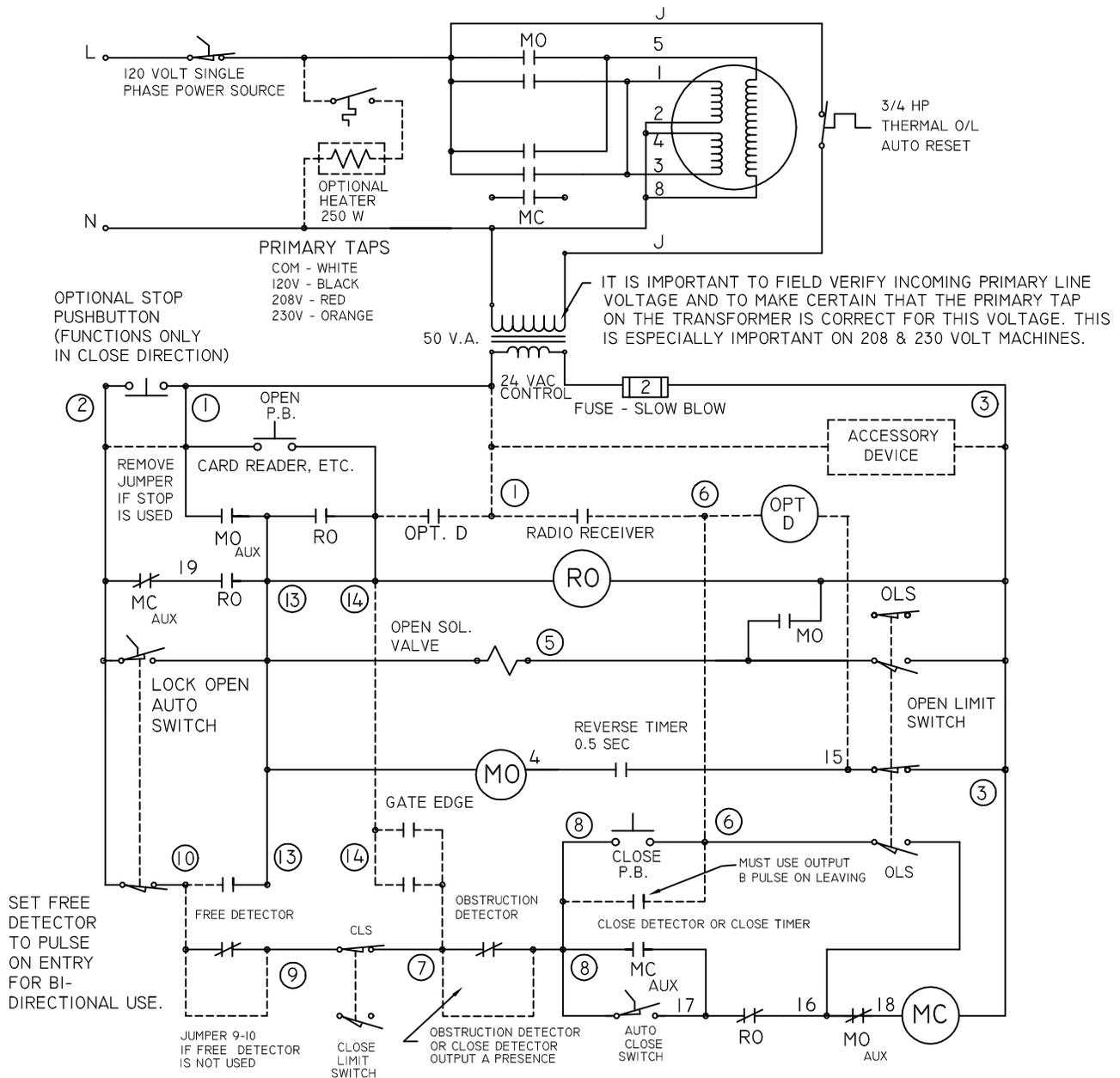
Phone: 1-800-321-9947 • Fax: (206) 286-0614 • Web: www.hy-security.com • 1200 W Nickerson St • Seattle, WA. 98119

Wire Size for Voltage Drop Over Distance

Wire Gauge

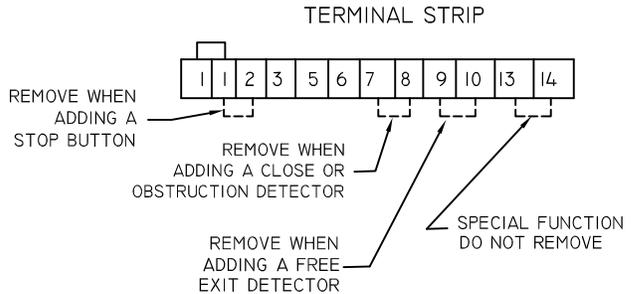
Wire Gauge

E16b



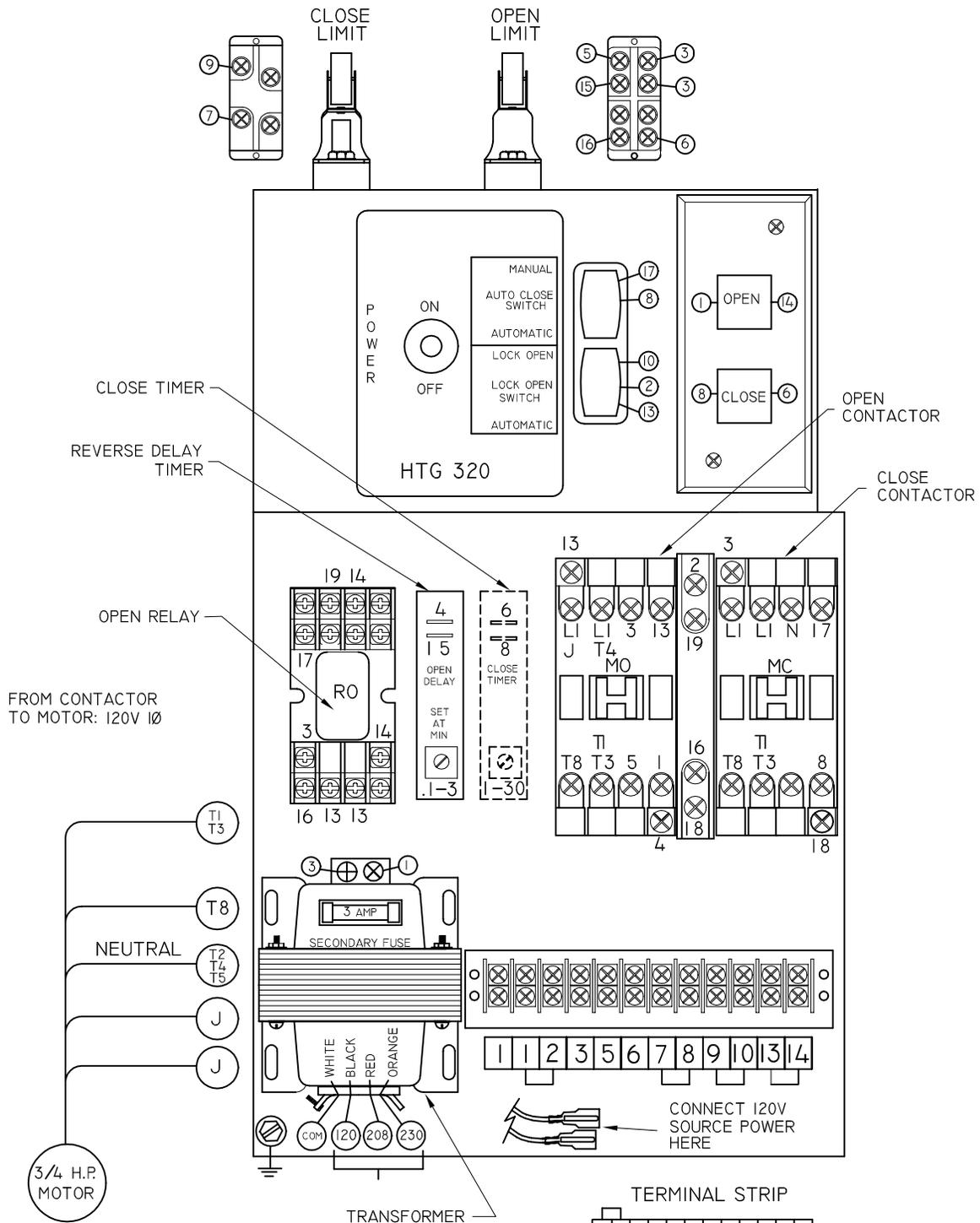
IT IS IMPORTANT TO FIELD VERIFY INCOMING PRIMARY LINE VOLTAGE AND TO MAKE CERTAIN THAT THE PRIMARY TAP ON THE TRANSFORMER IS CORRECT FOR THIS VOLTAGE. THIS IS ESPECIALLY IMPORTANT ON 208 & 230 VOLT MACHINES.

- NOTE:
- LIMIT SWITCHES SHOWN WITH GATE IN TRANSIT AND CONTROLS DE-ENERGIZED.
 - NUMBERS IN CIRCLES INDICATE TERMINAL NUMBERS.
 - ANY TIME A CLOSING DETECTOR IS USED. BE CERTAIN TO ENGAGE THE AUTO CLOSE SWITCH.
 - TO CREATE BI-DIRECTIONAL FUNCTION. ENGAGE THE AUTO CLOSE SWITCH, AND SET THE FREE DETECTOR TO PULSE ON ENTRY.
 - GATE CANNOT CLOSE UNLESS THE LOCK OPEN/AUTO CLOSE SWITCH IS IN AUTO POSITION.



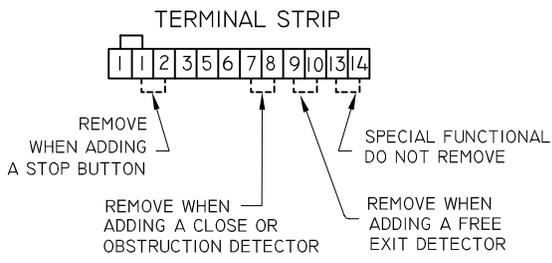
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**HTG 320 CONTROL CIRCUIT
 120V SINGLE PHASE**

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CHECKED -	DATE -	ERN NUMBER -	DATE -
APPROVED -	DATE -	DRAWING NUMBER: E114D	SHT 1 OF 1



FROM CONTACTOR TO MOTOR: 120V 1Ø

INSTALLER NOTE:
 IT IS EXTREMELY IMPORTANT TO FIELD VERIFY THE INCOMING PRIMARY LINE VOLTAGE AND MAKE SURE IT IS CONNECTED TO THE MATCHING PRIMARY TAP ON THE TRANSFORMER. THIS IS ESPECIALLY IMPORTANT ON 208 AND 230 VOLT MACHINES.



TITLE
**HTG 320 COMPONENT DIAGRAM
 120V SINGLE PHASE**

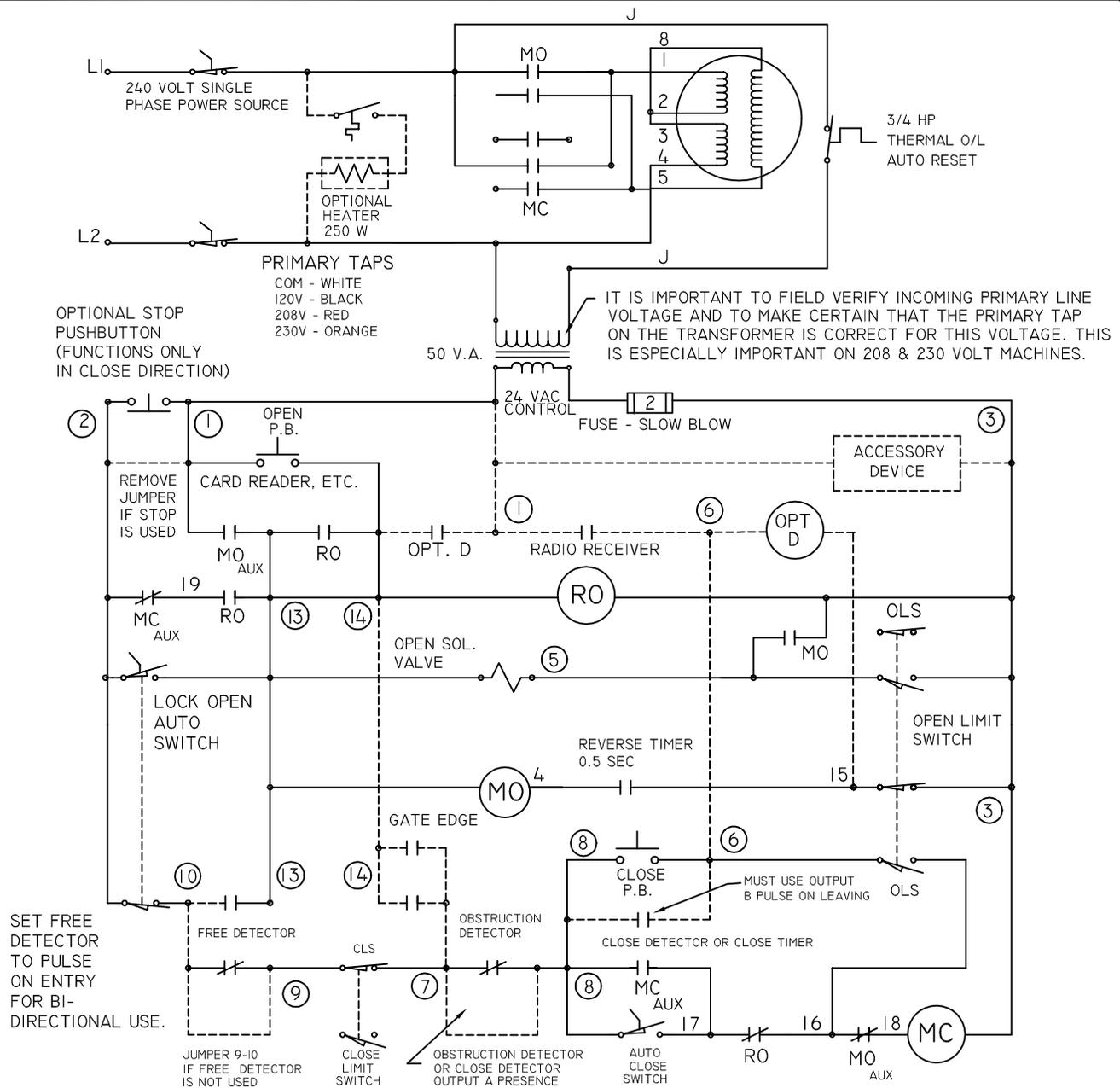
DRAWN D. B.
 CHECKED -
 APPROVED -

DATE 05/18/00
 DATE -
 DATE -

THIRD ANGLE PROJECTION

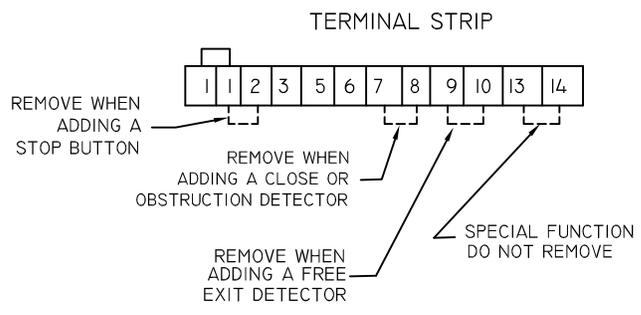
ERN NUMBER -
 DRAWING NUMBER: E117D

REV A
 SHT OF 1 1



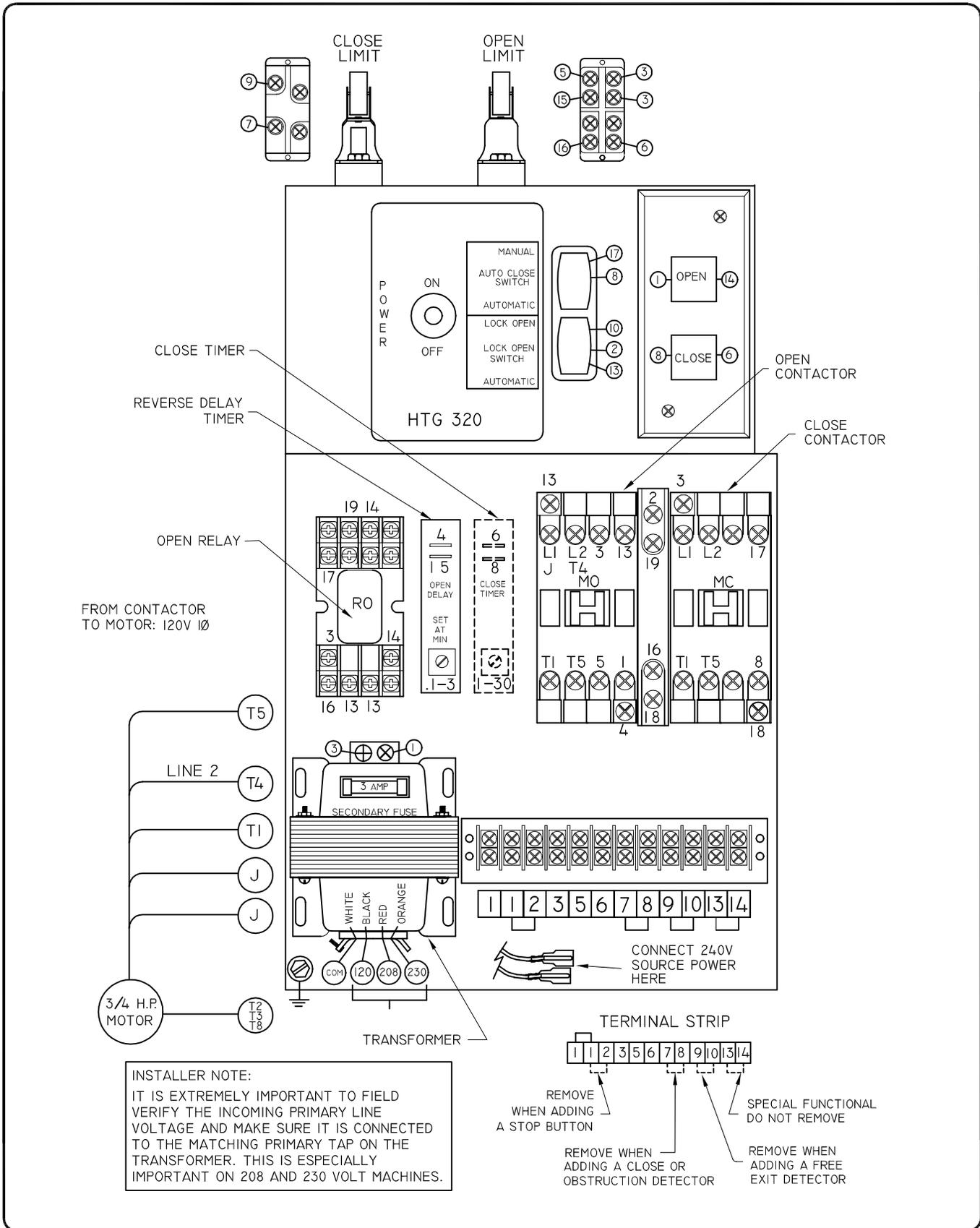
IT IS IMPORTANT TO FIELD VERIFY INCOMING PRIMARY LINE VOLTAGE AND TO MAKE CERTAIN THAT THE PRIMARY TAP ON THE TRANSFORMER IS CORRECT FOR THIS VOLTAGE. THIS IS ESPECIALLY IMPORTANT ON 208 & 230 VOLT MACHINES.

- NOTE:
1. LIMIT SWITCHES SHOWN WITH GATE IN TRANSIT AND CONTROLS DE-ENERGIZED.
 2. NUMBERS IN CIRCLES INDICATE TERMINAL NUMBERS.
 3. ANY TIME A CLOSING DETECTOR IS USED. BE CERTAIN TO ENGAGE THE AUTO CLOSE SWITCH.
 4. TO CREATE BI-DIRECTIONAL FUNCTION. ENGAGE THE AUTO CLOSE SWITCH, AND SET THE FREE DETECTOR TO PULSE ON ENTRY.
 5. GATE CANNOT CLOSE UNLESS THE LOCK OPEN/AUTO CLOSE SWITCH IS IN AUTO POSITION.



TITLE
**HTG 320 CONTROL CIRCUIT
 240V SINGLE PHASE**

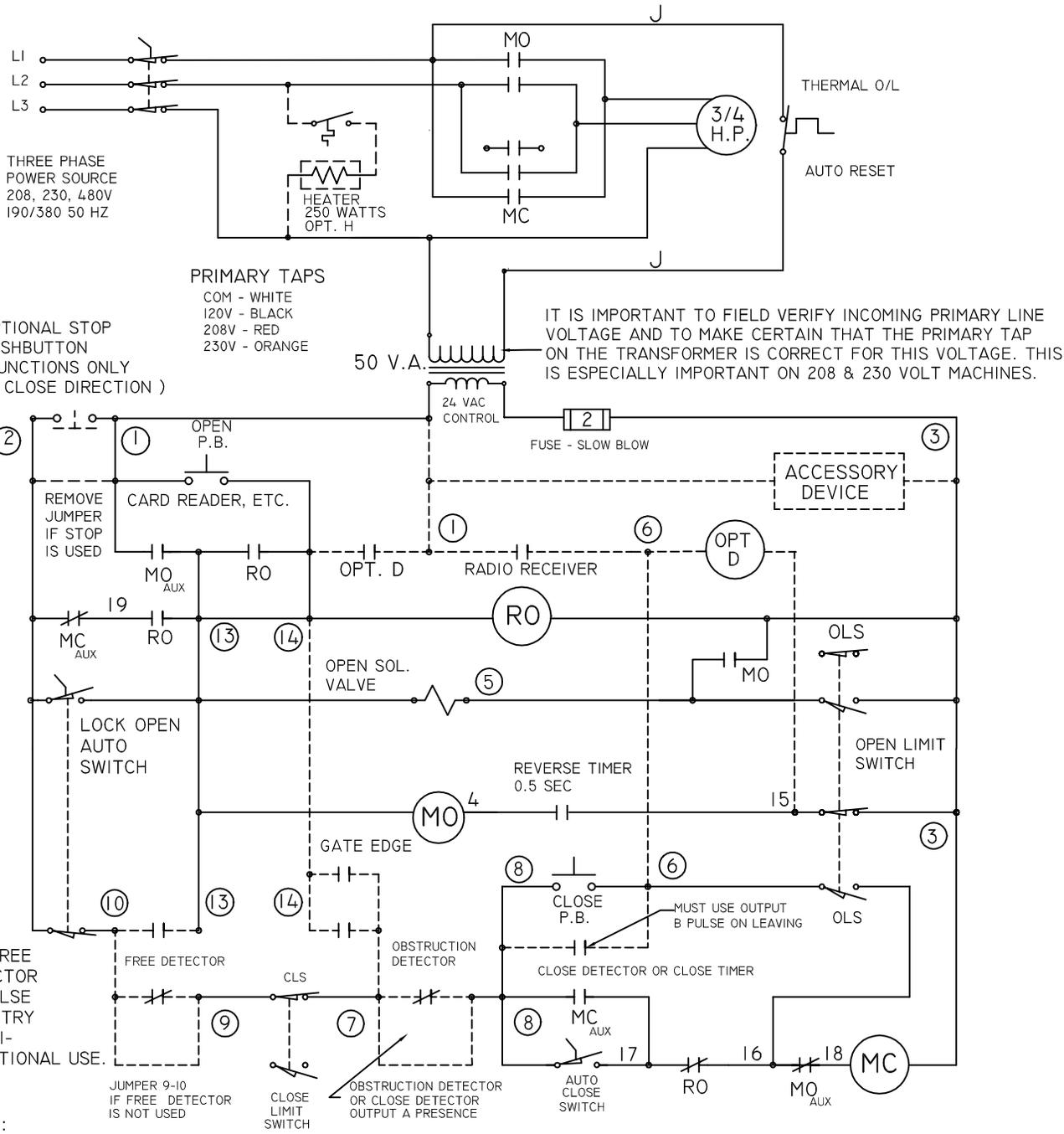
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CHECKED -	DATE -	ERN NUMBER -	DATE -	---
APPROVED -	DATE -	DRAWING NUMBER: E115D		SHT OF 1 1



TITLE

**HTG 320 COMPONENT DIAGRAM
240V SINGLE PHASE**

DRAWN D. B.	DATE 05/18/00	THIRD ANGLE PROJECTION 		REV --
CHECKED -	DATE -	ERN NUMBER -	DATE -	
APPROVED -	DATE -	DRAWING NUMBER: E118D		SHT OF 1 1



OPTIONAL STOP
PUSHBUTTON
(FUNCTIONS ONLY
IN CLOSE DIRECTION)

PRIMARY TAPS
COM - WHITE
120V - BLACK
208V - RED
230V - ORANGE

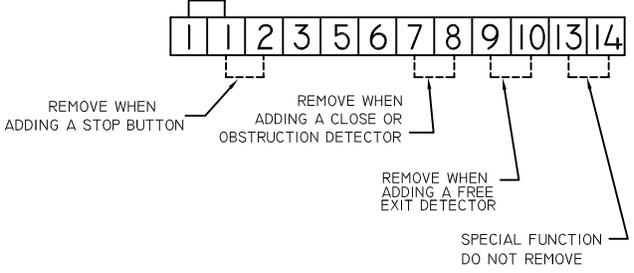
IT IS IMPORTANT TO FIELD VERIFY INCOMING PRIMARY LINE VOLTAGE AND TO MAKE CERTAIN THAT THE PRIMARY TAP ON THE TRANSFORMER IS CORRECT FOR THIS VOLTAGE. THIS IS ESPECIALLY IMPORTANT ON 208 & 230 VOLT MACHINES.

SET FREE DETECTOR TO PULSE ON ENTRY FOR BI-DIRECTIONAL USE.

NOTE:

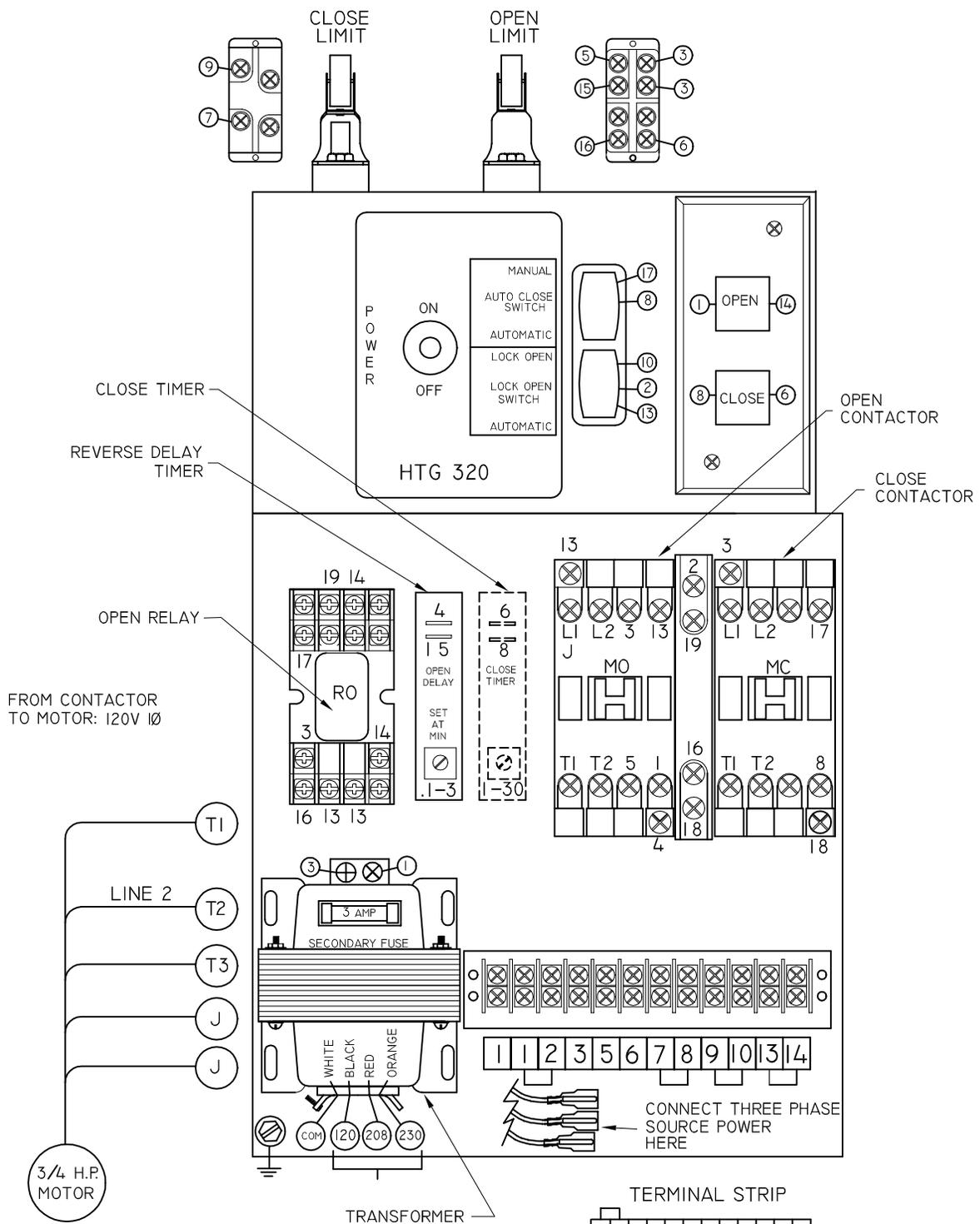
1. LIMIT SWITCHES SHOWN WITH GATE IN TRANSIT AND CONTROLS DE-ENERGIZED.
2. NUMBERS IN CIRCLES INDICATE TERMINAL NUMBERS.
3. ANY TIME A CLOSING DETECTOR IS USED. BE CERTAIN TO ENGAGE THE AUTO CLOSE SWITCH.
4. TO CREATE BI-DIRECTIONAL FUNCTION. ENGAGE THE AUTO CLOSE SWITCH, AND SET THE FREE DETECTOR TO PULSE ON ENTRY.
5. GATE CANNOT CLOSE UNLESS THE LOCK OPEN/ AUTO CLOSE SWITCH IS IN AUTO POSITION.

TERMINAL STRIP



TITLE
**HTG 320 CONTROL CIRCUIT
ALL THREE PHASE**

DRAWN D. B.	DATE 05/18/00	THIRD ANGLE PROJECTION ⊕	REV A
CHECKED -	DATE -	ERN NUMBER -	DATE -
APPROVED -	DATE -	DRAWING NUMBER: E116D	SHT OF 1 1



INSTALLER NOTE:
 IT IS EXTREMELY IMPORTANT TO FIELD VERIFY THE INCOMING PRIMARY LINE VOLTAGE AND MAKE SURE IT IS CONNECTED TO THE MATCHING PRIMARY TAP ON THE TRANSFORMER. THIS IS ESPECIALLY IMPORTANT ON 208 AND 230 VOLT MACHINES.



TITLE
**HTG 320 COMPONENT DIAGRAM
 ALL THREE PHASE**

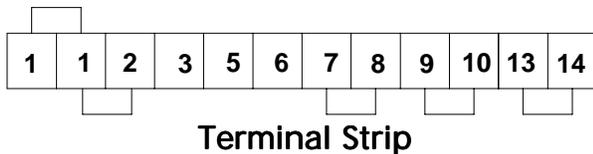
DRAWN D. B.	DATE 05/18/00	THIRD ANGLE PROJECTION 		REV ---
CHECKED -	DATE -	ERN NUMBER -	DATE -	
APPROVED -	DATE -	DRAWING NUMBER: E119D		SHT OF 1 1



HTG 320 Arm Gate Accessory Connection

In General:

1. Connect line power to the loose wires marked to match the primary voltage being used.
2. The Control Circuit is 24 volts.
3. Any time a Closing detector is used, be certain to engage the auto close switch.
4. To allow bidirectional use the free exit detector must be wired and set for pulse on entry. Also engage the Auto close switch.
5. The gate cannot close unless the Lock Open/Auto Close switch is in the 'Auto' position.
6. When using detectors, locate them on a shelf above the door.



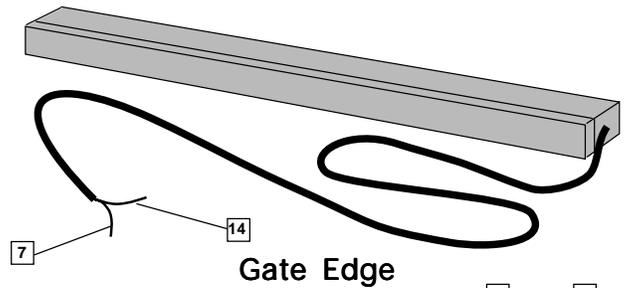
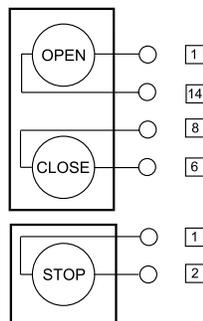
Accessory Jumpers:

The terminal strip is shown jumpered in our standard configuration. When adding a Stop button, remove jumper 1–2. When adding a Closing detector or an Obstruction detector, remove jumper 7–8. When adding a Free Exit detector, remove jumper 9–10. Do not remove jumper 13–14, except with factory instruction.

Pushbuttons:

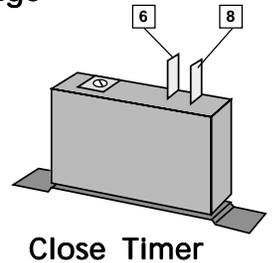
On the pushbutton control station, 'Stop' does not share a common wire with 'Down'. Be certain they are not jumpered.

Note: The stop button only functions when the arm is closing.



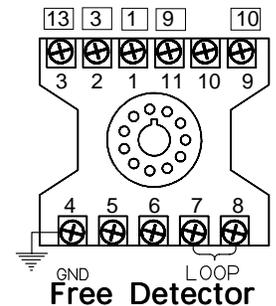
Gate Edge and Close Timer:

As shown, connect the leads of the Gate Edge to terminals 7 & 14. Connect the Close Timer leads to terminals 6 & 8.



Note:

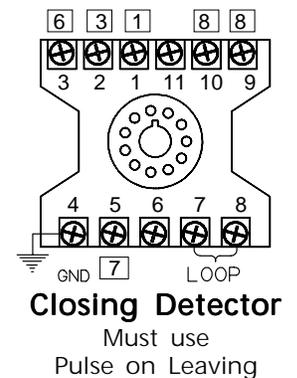
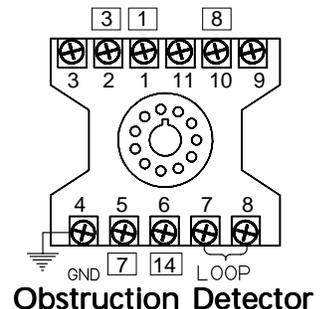
If the free detector is required to hold the gate open, change the detector's mode switch to presence.



About Detectors:

If detectors are used, locate them on a shelf above the door. Shown at right are the three typical detectors; Obstruction, Closing and Free. Use either a Closing detector or an Obstruction detector, but not both. Wire the detectors to the operator terminal strip as noted.

In the case of a Closing detector, a model with two output relays must be used. Output B must be set to pulse on leaving. Always engage the Auto Close switch with a Closing detector. Detectors furnished by Hy-Security will mount into eleven-pin sockets. Other detector types may not fit, and therefore may require wiring harnesses.





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HTG 320 Master/Slave Interconnection

Order part # AEIAX 320 MSLV to receive the master/slave auxillary contacts pre-installed.

Control of two HTG 320 arm gate operators as a master and slave pair is possible with the addition of an auxiliary contact to the close contactor of the master operator. The slave operator must also have the #19 control wire disconnected from its open relay. Be certain to verify modification with the factory if a slave needs to be reconverted to a standard operator. The master and slave operators are then interconnected with four or five wires as follows:

Join #3 Slave to #3 Master

Join #14 Slave to #14 Master

Join #6 Slave to #53 of Aux Contact on the Close Contactor

Join #8 Slave #54 of Aux Contact on the Close Contactor

** See below for 5th wire option*

Be certain that all accessories are connected to the master operator, with the exception of a safety sensing edge, which would connect to each operator separately. Be certain that all terminal jumpers shown on the electrical prints are installed into the slave operator. The auto close switch, in the slave operator, **MUST** be left in the manual position, regardless of the switch position selected in the master operator.

The slave operator will open whenever the master operator is signalled to open, this includes reversing while closing. The slave operator will close when the master is signalled to close, unless the slave operator is not yet fully open. The control circuit of the HTG 320 is not compatible with the use of a stop button when the master and slave interconnection is used.

* If the master/slave system is to operate with a closing detector, an additional relay and a fifth interconnection wire are needed. The added relay coil is energized by the N.O. contact of the closing detector (detector pin #6) and our control power common (terminal strip #3). The installer must connect a wire from the slave operator terminal strip #7 to common input of the added relay, and #8 wire from the slave operator to the N.C. contact of the added relay. Also, be certain to remove the #7 to #8 jumper in the slave operator.

For assistance, contact your local distributor.

Detector Installation Guide

Loop Basics

The vehicle detector passes a small current flow through the “loop” which then becomes an inductive coil. When a vehicle passes over a loop the detector senses the resultant drop in the inductance, and actuates it’s output relay.

Loop Configurations

Configurations differ depending on the application. In parking applications with our HTG320 operator, a loop may be as small as 3’ x 6’. In traffic applications employing one of our sliding gate operators, or swing gate operators, the smallest loop should not be less than six feet square.

Rules to Follow for Security Gate Applications

1. The side of the loop closest to the gate shall be located at least four (4) feet distant from it’s line of travel.
2. The shortest side of the loop shall be between six (6) and eight (8) feet in length. The longest side of the loop shall be between six (6) and twenty (20) feet in length. For applications that need to span a wide area, use several smaller loops. Do not exceed a maximum of 200 square feet of loop area to only one detector.
3. In applications with multiple loops, keep each loop at least six feet apart. This avoids “cross talk”. It is possible to have loops closer together by selecting different frequencies.
4. For greater sensitivity and less chance of false calls caused by the motion of the gate, it is better to use two smaller loops, connected in a series circuit, to one detector instead of one large, single loop.
5. To avoid interference, keep loops at least two (2) inches above any reinforcing steel. Do not route loop wires with, or in close proximity to, any other conductors, including other loop leads, unless shielded lead-in cable is used.
6. Loop and lead-in wire should be one continuous piece. Avoid splices, if possible. If a splice is necessary for any reason, “pot” the splice in epoxy or use heat shrink to ensure that the quality of the splice covering is the same as the original wire jacket.
7. Use only number 12, 14, or 16 gauge stranded wire with a direct burial jacket. Cross linked polyethylene insulation types, such as, XLPE or XHHW, will last much longer and are less prone to damage during installation than conventional insulation types. Preformed loops can be used before road surfacing or under pavers.
8. Twist loose tails of lead-in wires tightly, approximately ten times per foot.

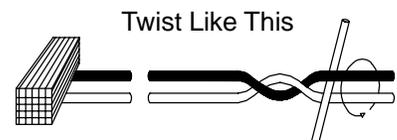
Twist lead-in at least 10 turns per foot



Like This



Not Like This



4/13/00

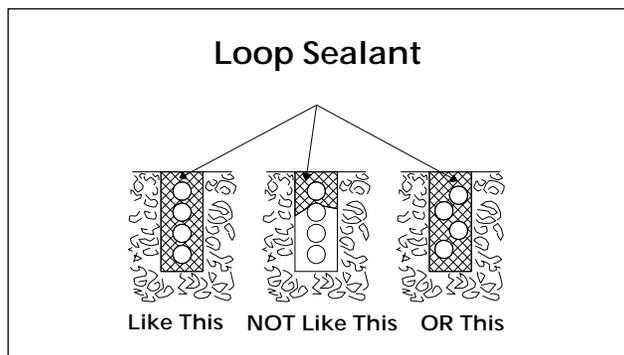
E31a

continued from previous page...

9. Follow this guide for the correct number of turns in the loop;

12 to 20 sq. ft = 5 turns 20 to 60 sq. ft. = 4 turns 60 to 240 sq. ft. = 3 turns

10. This guide is written from a design perspective, but installation workmanship practices are equally important to insure proper operation and long loop life. The best way to insure a quality installation is to employ a professional installer experienced with detector loops. A few important practices are: **A.** The slot in the surface should be cut ¼” wide x 1 ½” deep. **B.** The corners of the cut must be at an angle or core drilled to relieve stress on the wires. **C.** After the wire is installed, the slot must be completely backfilled with a non-hardening sealer. Note that if the loop wires are able to move in the slot after the sealer has set, the detector may give false calls.



Detector Logic

Hy-Security Gate Operators recommends that vehicle detectors be used for free open and obstruction sensing logic only. The exception is in parking applications with our HTG320 operator where detectors may be also used to close the gate. In applications employing our swing , vertical lift, or sliding gate operators, closing logic cannot be used. Because of their slower speeds, closing logic is a poor choice for security gate systems. Since there are several ways that the gate may be left standing open and because there is a loss of safety. Our circuit has not been designed to accomodate “detect to close” logic.

Loop Diagnostics

The following tests cannot guarantee a functioning loop, but failure of either test means that the loop is definitely suspect, even though it may still be functioning at the time.

Test #1:

Resistance of the loop and lead-in wire should not exceed 4.0 Ohms.

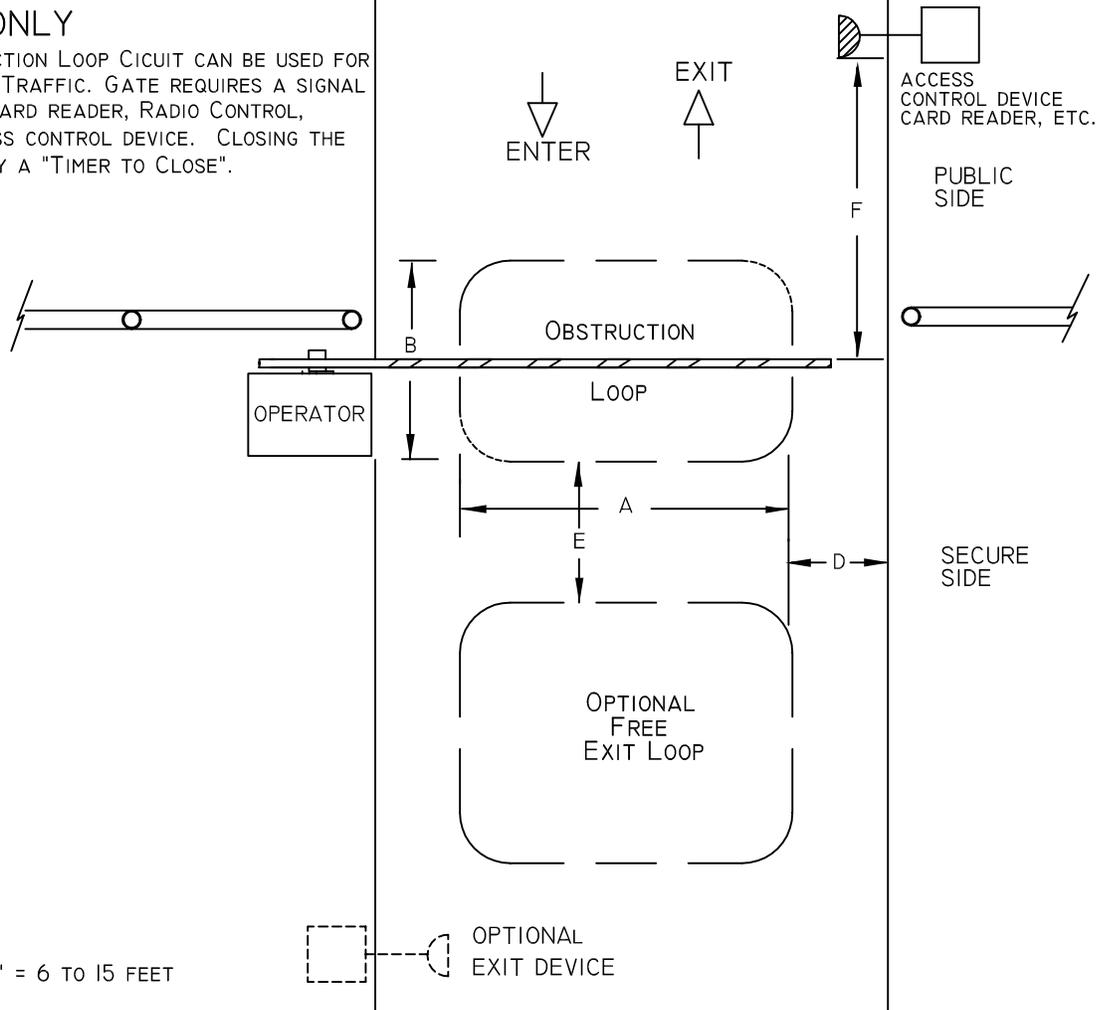
Test #2:

The resistance to earth, as measured with a 500V “Megger”, should be 100 Megohms or more. Loops may function at 10 Megohms or less but will not be reliable (e.g. when the ground is wet from rainfall). Low resistance indicates broken or moisture saturated insulation. This is common if inappropriate wire insulation has been used.

"TIMER TO CLOSE" GATE OPERATION
 OBSTRUCTION LOOP REVERSES GATE
 HTG320 ONLY

HTG320 ONLY

SINGLE OBSTRUCTION LOOP CIRCUIT CAN BE USED FOR BI-DIRECTIONAL TRAFFIC. GATE REQUIRES A SIGNAL TO OPEN FROM CARD READER, RADIO CONTROL, OR OTHER ACCESS CONTROL DEVICE. CLOSING THE GATE IS DONE BY A "TIMER TO CLOSE".



DIMENSION "A" = 6 TO 15 FEET

DIMENSION "B" = 6 TO 8 FEET. IF TAILGATING IS A CONCERN, DIMENSION "B" MAY BE AS SMALL AS 3 FEET BUT SENSITIVITY TO HIGH BED VEHICLES WILL BE SUBSTANTIALLY IMPAIRED.

DIMENSION "C" = DOES NOT APPLY IN THIS DESIGN.

DIMENSION "D" = MAINTAIN 4 FEET BETWEEN LOOP AND EDGE OF ROADWAY. NO VEHICLE CAN PASS THROUGH SUCH A SMALL AREA AND ESCAPE DETECTION.

DIMENSION "E" = 4 FEET MAXIMUM. VEHICLES MUST BE ABLE TO PASS FROM ONE LOOP TO THE NEXT WITHOUT LOSS OF DETECTION.

DIMENSION "F" = 10 TO 12 FEET SUGGESTED.



TITLE
**HTG320/360 BARRIER ARM
 LOOP LAYOUT**

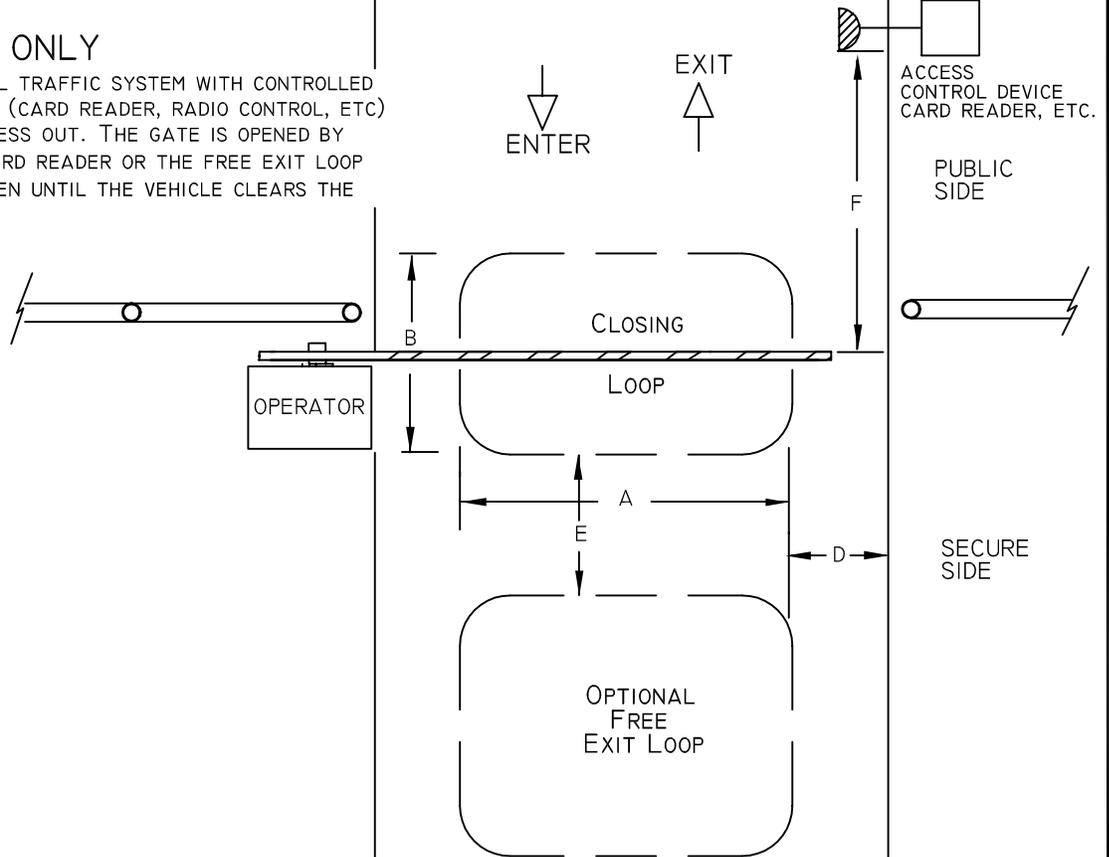
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REV A
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BI - DIRECTIONAL TRAFFIC CONTROL
 MAINTAINED VEHICLE PRESENCE REQUIRED
 HTG 320 ONLY

HTG 320 ONLY

BI-DIRECTIONAL TRAFFIC SYSTEM WITH CONTROLLED ACCESS ENTRY (CARD READER, RADIO CONTROL, ETC) AND FREE ACCESS OUT. THE GATE IS OPENED BY EITHER THE CARD READER OR THE FREE EXIT LOOP AND STAYS OPEN UNTIL THE VEHICLE CLOSING LOOP.



DIMENSION "A" = 6 TO 15 FEET

DIMENSION "B" = 6 TO 8 FEET. IF TAILGATING IS A CONCERN, DIMENSION "B" MAY BE AS SMALL AS 3 FEET BUT SENSITIVITY TO HIGH BED VEHICLES WILL BE SUBSTANTIALLY IMPAIRED.

DIMENSION "C" = DOES NOT APPLY IN THIS DESIGN.

DIMENSION "D" = MAINTAIN 4 FEET BETWEEN LOOP AND EDGE OF ROADWAY. NO VEHICLE CAN PASS THROUGH SUCH A SMALL AREA AND ESCAPE DETECTION.

DIMENSION "E" = 4 FEET MAXIMUM. VEHICLES MUST BE ABLE TO PASS FROM ONE LOOP TO THE NEXT WITHOUT LOSS OF DETECTION.

DIMENSION "F" = 10 TO 12 FEET SUGGESTED.

OPTIONAL EXIT DEVICE



TITLE
**HTG320 BARRIER ARM
 LOOP LAYOUT**

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CHECKED -	DATE -	ERN NUMBER -	DATE -
APPROVED -	DATE -	DRAWING NUMBER E95	

REV A
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HTG 320 Emergency Opening

1. A valve has been factory installed to defeat the hydraulic lock that secures the arm from an unauthorized opening. In the event of a power failure, manual operation is achieved through the following process:
 - A. Toggle the aluminum knob outward on the manual bypass knob, which is located on the valve manifold on the left side of the hydraulic pump (see #12 on component drawing HT35). Lift the arm manually by starting at the tip of the arm and raising it overhead by moving "hand over hand" while walking towards the operator. Be certain to re-close the bypass valve, to prevent the arm from drifting down again.
2. The arm can be manually closed in the same manner, except that once manually started, the arm will fully close itself due to the force of gravity.
3. There is a flow adjustment valve which regulates the speed of manual closing (see #11 on component drawing HT35). Loosen the lock nut and turn clockwise to slow the rate of closing. The correct adjustment allows the arm to close at a moderate speed and stop without excessive bouncing at the full closed position.

HTG 320 Maintenance

1. Mechanical:

The shaft bearings used in the HTG 320 are fully sealed. Very little lubrication is required. Even in heavy use, a single pump of grease once a year is adequate. The crank arm bearing does require lubrication at six month intervals. A grease fitting has been provided at the end of the crank arm, for ease of lubrication.
2. Electric Controls:

BEFORE SERVICING TURN OFF POWER DISCONNECT SWITCH!

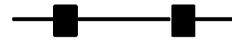
There is no required maintenance involved. If malfunction occurs, read the troubleshooting section (document #HT48) and trace the electrical schematic drawing, or call the factory.
3. Hydraulic System:

See the separate sheet for the Hydraulic System maintenance.

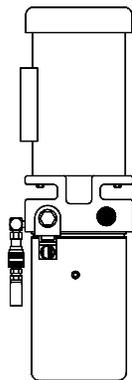


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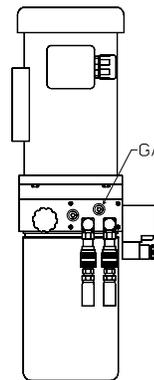
Pressure Relief Valves Adjustment Procedures



RELIEF VALVE

Side View

<u>Model</u>	<u>Factory Setting</u>
111 Series	750 psi
222 SS, E	1000 psi
222 EX	1300 psi
444 Series	1300 psi
HRG Series	1300 psi
HVG Series	2000 psi
HTG 360	1000 psi
HTG 320-6	1000 psi
HTG 320-3	1000 psi
HTG 320-2	700 psi



GAUGE PORT

Front View

The relief valve can be found on the back side (gate side) of the hydraulic power unit. It is the only component located here and has a hex adjusting head and lock nut. To adjust setting, loosen the lock nut screw the threaded bolt CW for increased pressure, turn CCW to decrease pressure.

Pressure relief valves are preset at the factory to utilize maximum available horsepower. The relief valve can be lowered to smooth starting if necessary. This is most easily done by decreasing the pressure until the gate operation slows, and then increasing the pressure just enough to provide normal gate speed.

It must be understood that if you reduce the pressure setting, you will lose horsepower to move the gate if additional resistance (old gate hardware, snow and ice, etc.) is encountered.

Do not attempt to use the relief valve as an entrapment protection device. A photo eye or a gate edge is the best method to protect pedestrians and reserve power to drive the gate.



Hydraulic System Maintenance for HTG 320

FLUID LEVEL: Inspect the oil level semi-annually. Under normal conditions, hydraulic systems do not consume oil. If there is any evidence of leaking, or if the oil level is being checked for maintenance purposes, use the following procedure: with a 5/16" Allen wrench, remove the shiny metal plug near the top of the reservoir. Use a tool, or piece of wire to dip into the reservoir to measure the oil level. Add oil if the level is more than one inch below the filler port. We recommend our *UNIFLOW* hydraulic oil. Part number H 004, as sold in one gallon units by Hy-Security Gate. Automatic transmission fluid may be used, although its performance will be sluggish in freezing weather, unless the operator is well heated. Other hydraulic oils, although technically compatible, tend to be too viscous for proper performance, even in modestly cool weather. *NEVER USE BRAKE FLUID!*

LOOK FOR LEAKS: If the oil level is ever found to be low, check the system thoroughly for leaks. Because all of the hydraulic fittings are SAE straight thread, with "O" ring seals, or JIC flare fittings, any leak should be eliminated by simply tightening the fitting slightly. Rarely, an "O" ring may need to be replaced, if it was damaged. Pipe dope, or teflon tape is not used at any connection point. If oil was found to be leaking from the breather cap, verify that the reservoir is not overflowing, or check the relief valve setting according to our document number G40.

OIL CHANGE: Unlike gasoline engines, hydraulic systems do not foul oil with combustion products; thus oil changes do not need to be frequent. Heat is the main concern. If the unit is subjected to high use, especially those in warm climates, consider changing the oil more frequently. In general, we recommend draining the reservoir and replacing the oil at five or ten year intervals.

To drain the hydraulic oil, leave the arm in the closed position, and disconnect the hydraulic hose where it connects to the top of the hydraulic cylinder. Place the disconnected hose into a waste receptacle and start the gate in the open direction. All of the oil will drain within 15 seconds. Stop the pump immediately, when the flow ceases. Re-connect the loose hose. Refill with new UNIFLOW hydraulic oil available from the factory, or use a substitute, if performance in cold weather is not a question.

DIRECTIONAL VALVE: Our operators employ a two position, single solenoid, directional valve. When 24 volt power is applied, the flow is directed to open the gate. In its normal spring loaded relaxed position the flow is directed to close the gate. The directional valve is totally maintenance free.



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Troubleshooting Guide, HTG 320 Gate Operators

Important Note:

The manual bypass valve is open when the knob is pulled away from the body of the pump manifold. The electric motor will run, but nothing will move, when the valve is in this position.

GATE SPEED: The speed which a hydraulic operator moves a gate is determined by the size of the pump, as expressed in gallons/minute, and the size of the actuator components. Just like a gear box, this speed is not adjustable. Attempting to slow a gate by changing the relief valve setting, or adjusting any other valve will cause a great deal of inefficiency and heat. If the speed of a gate must be changed, contact your Hy-security distributor, or the factory. It is possible that extremely cold weather could affect the speed of the gate, due to the increase in load placed on the system by very thick hydraulic oil and stiff gate hardware. Hy-Security employs a special grade of hydraulic oil that we call UNIFLOW oil. Our hydraulic oil maintains a very linear viscosity over a broad range of temperatures. Because of this special grade of oil and other design considerations, we rate our operators for service in ambient temperatures of -40 degrees to 130 degrees Fahrenheit. If the speed of your operator has been affected by cold weather, verify that it is filled with UNIFLOW oil. In severe conditions, consider adding a heater.

TROUBLESHOOTING:

A. *"When Push Button is activated, the motor does not run."*

(since many devices are capable of holding a gate open; manually close the gate first, before performing these test procedures)

1. Verify that the correct line voltage is applied to the operator.
2. Verify that the control voltage is approximately 24 volts. Measure voltage between terminals #1 and #3. check the transformer primary tap connection, if the voltage is incorrect.
3. Check the fuse on the transformer. Replace if necessary.
4. Verify that control voltage is present between terminals #2 and #3. If not, check for a tripped close vehicle detector. If there is no stop button terminals #1 and #2 should be jumpered.
5. Check the limit switch cams to verify that both limit switches are not tripped.

B. *"Motor is running, but nothing is moving."*

1. Check the manual bypass valve. Close it if found open.
2. If the power is three phase, reverse any two of the three lines.
3. Check the fluid level in the reservoir. See maintenance instructions.
4. Lift the arm manually to verify that it is correctly counter weighted. See the HTG 320 Adjustments document number HT45 for this procedure.

C. *"The arm tries to close when commanded to open."*

1. Verify that the electrical fitting to the hydraulic valve is connected.
2. Check for 24 volts between terminals #5 and #1 when the controls are activated to open the gate.
3. Review information below pertaining to the directional valve.

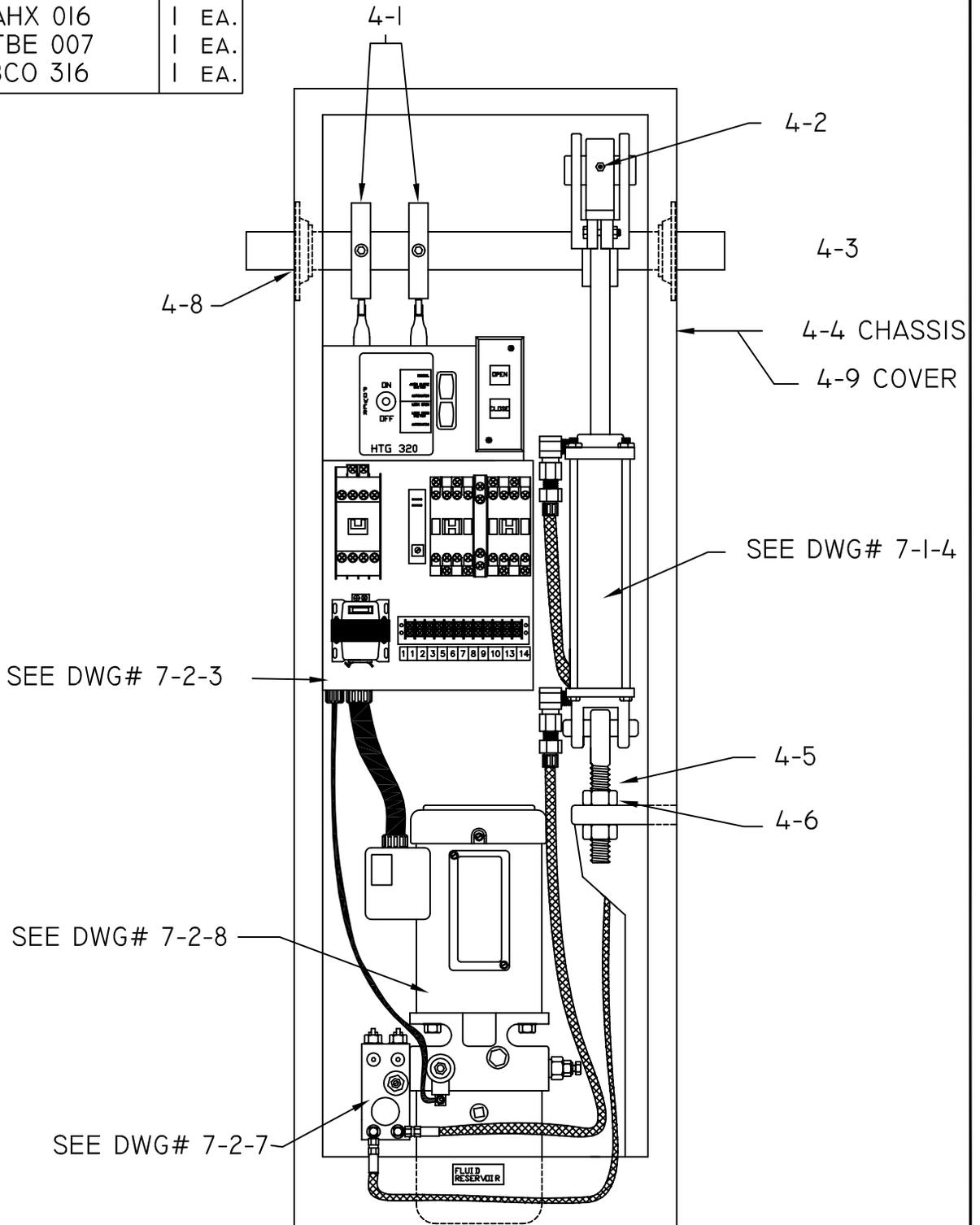
DIRECTIONAL VALVE: Our operators employ a two position, single solenoid directional valve. When 24 volt power is applied, the flow is directed to open the gate. In its normal spring loaded relaxed position the flow is directed to close the gate. If a malfunction should occur, it would most likely cause the gate to only move in the close direction.

To troubleshoot, first verify that 24 volts is being applied to shift the valve when the controls are activated to open the gate. Next, verify that the valve coil is functioning by removing its retaining nut and holding the coil slightly loose to verify that it is magnetized when the controls are activated to open the gate. If the problem persists, exchange the valve and change the hydraulic oil.

D. *"The arm bounces at the end of travel."*

1. See the HTG 320 Adjustments document number HT45 for this procedure.

4-1	MTBLC 316 B	1	EA.
4-2	MPTBE 040	1	EA.
4-3	MTBCS 316	1	EA.
4-4	MTBEN 320 02	1	EA.
4-5	MTBAC 016 096	1	EA.
4-6	MFAHX 016	1	EA.
4-8	MPTBE 007	1	EA.
4-9	RTBCO 316	1	EA.



TITLE
COMPONENTS HTG 320 OPERATOR

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ENGRNG

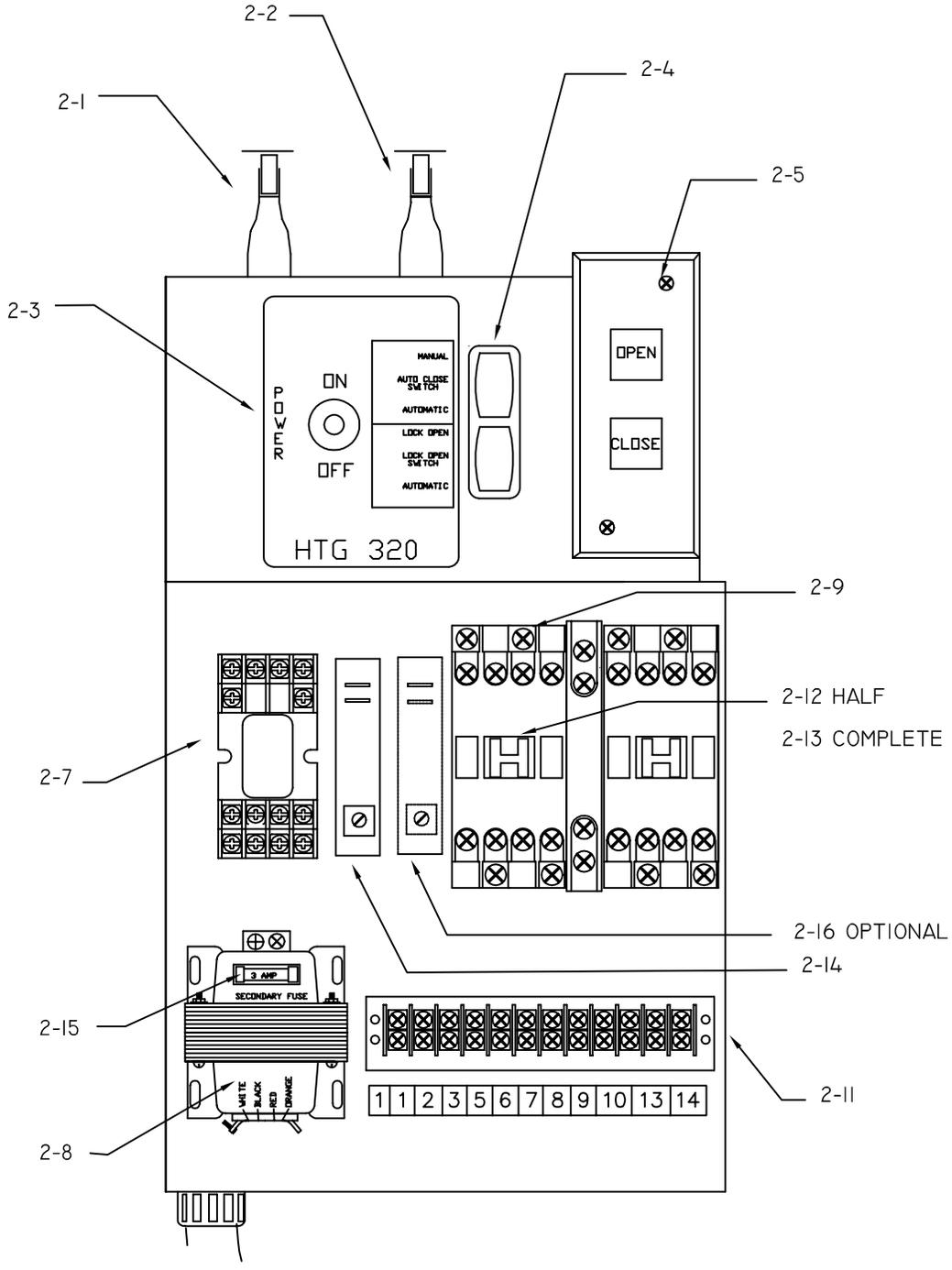
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DATE
MM/YY/DD

THIRD ANGLE PROJECTION
PART NUMBER
N/A
DRAWING NUMBER:
CM7-2-1

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1

ITEM #	QTY	
2-1	ESWLS 241 TB	1 EA.
2-2	ESWLS 241 TBD	1 EA.
2-3	ESWDI 050 3P	1 EA.
2-4	ESWDI 030 RB	1 EA.
2-5	ESWPB 020	1 EA.
2-7	ESWRE 071 14P	1 EA.
2-8	ETRTR 024 050	1 EA.

ITEM #	QTY	
2-9	ESWCO 024 AB	1 EA.
2-11	ECOTS 012	1 EA.
2-12	ESWMC 030 MMTc	1 EA.
2-13	ESWMC 040 MMTc	1 EA.
2-14	EECTI 024 3S	1 EA.
2-15	ESWfu 050 2A	1 EA.
2-16	EECTI 024 30S	1 EA.



TITLE
ELEC. COMPONENTS, HTG 320 OPERATOR

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ENGRNG

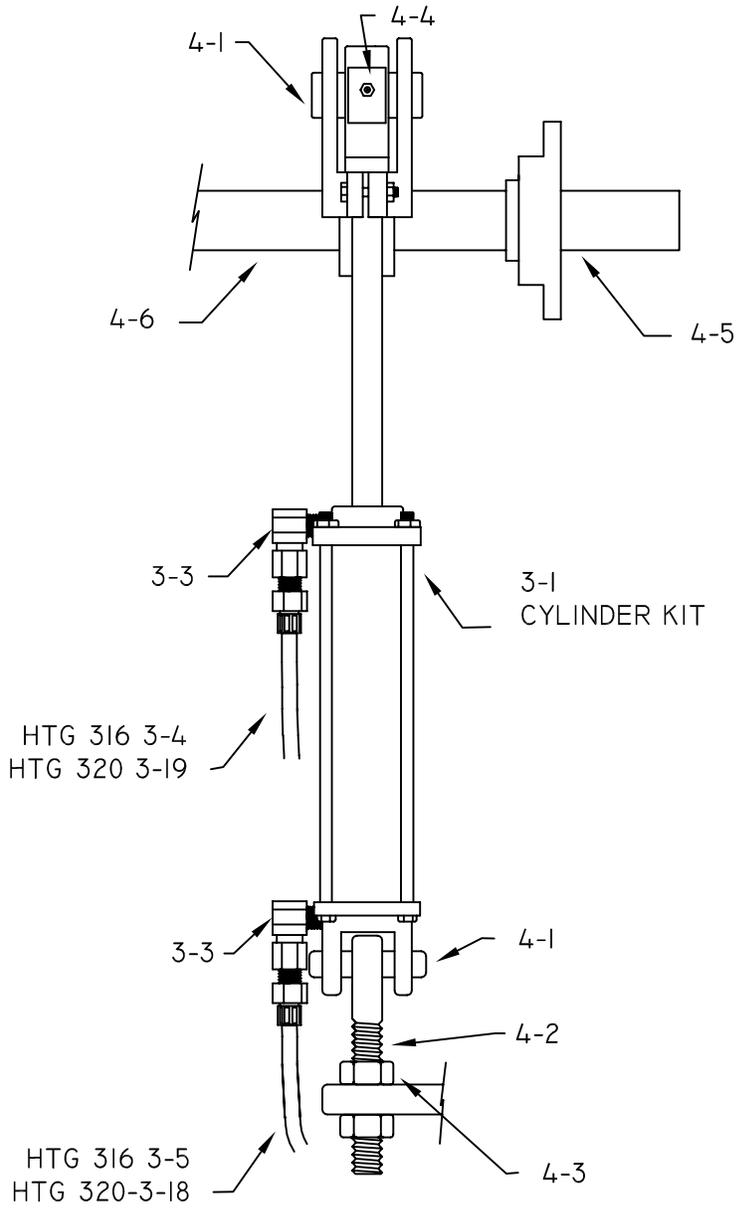
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THIRD ANGLE PROJECTION


PART NUMBER
N/A
 DRAWING NUMBER:
CM7-2-3B

REV
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1 1

ITEM #	QTY	
3-1	H CYCY 206 KIT	1 EA.
3-3	H SFFI 853 04.04	2 EA.
3-4	H SFHO 316 30	1 EA.
3-5	H SFHO 316 4.2	1 EA.
3-18	H SFHO 320 30.5	1 EA.
3-19	H SFHO 320 38.5	1 EA.
4-1	M FAPN 016 064	2 EA.
4-2	M TBAC 016 096	1 EA.
4-3	M FAHX 016	1 EA.
4-4	M PTBE 040	1 EA.
4-5	M PTBE 007	1 EA.
4-6	M TBCS 316	1 EA.

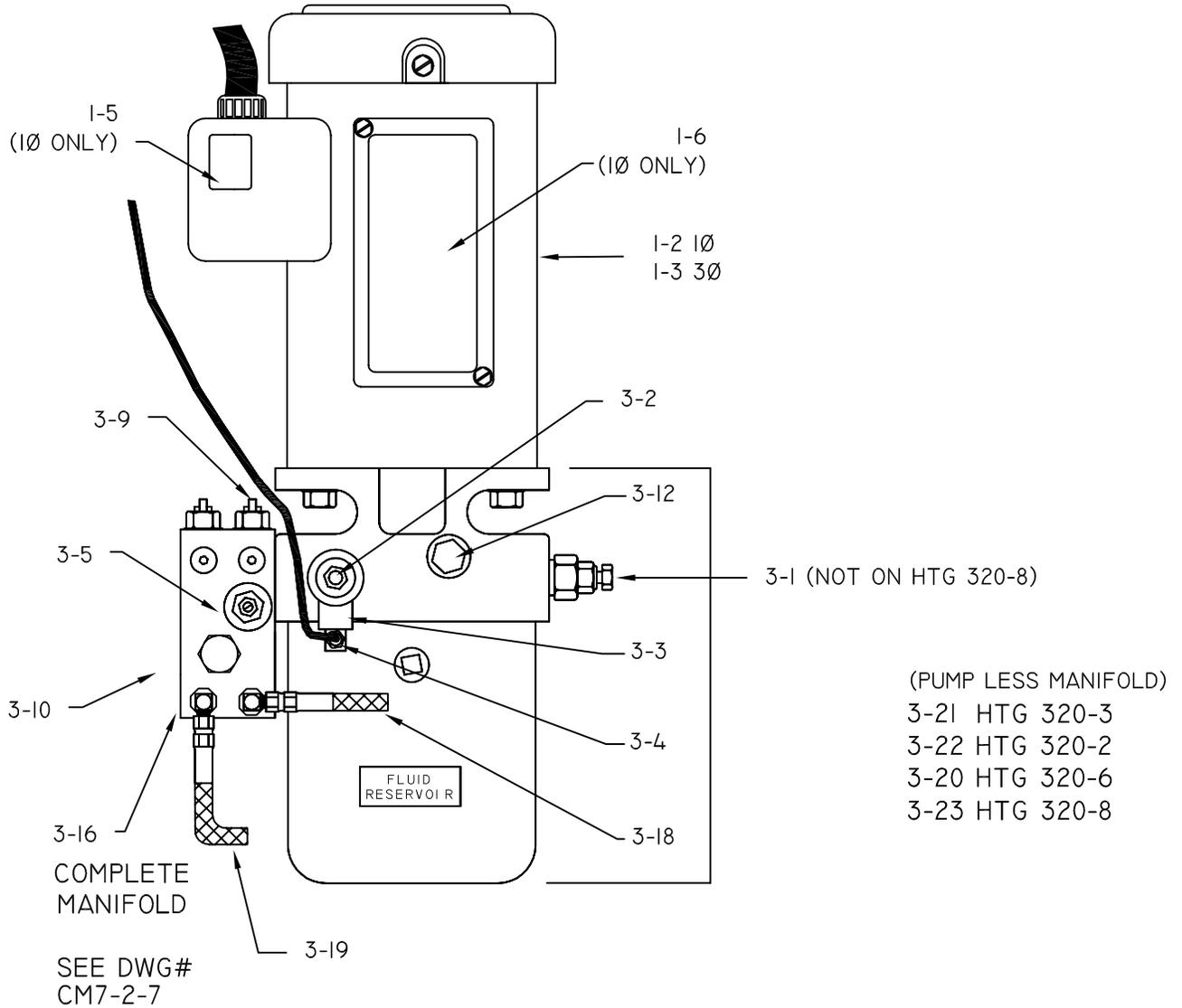


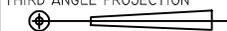
TITLE
COMPONENTS, HTG 320 CYLINDER

DRAWN KERI	DATE 7/7/00	THIRD ANGLE PROJECTION 	REV ---
CHECKED SHOP	DATE MM/YY/DD	PART NUMBER N/A	
APPROVED ENGRNG	DATE MM/YY/DD	DRAWING NUMBER: CM7-1-4	SHT OF 1 1

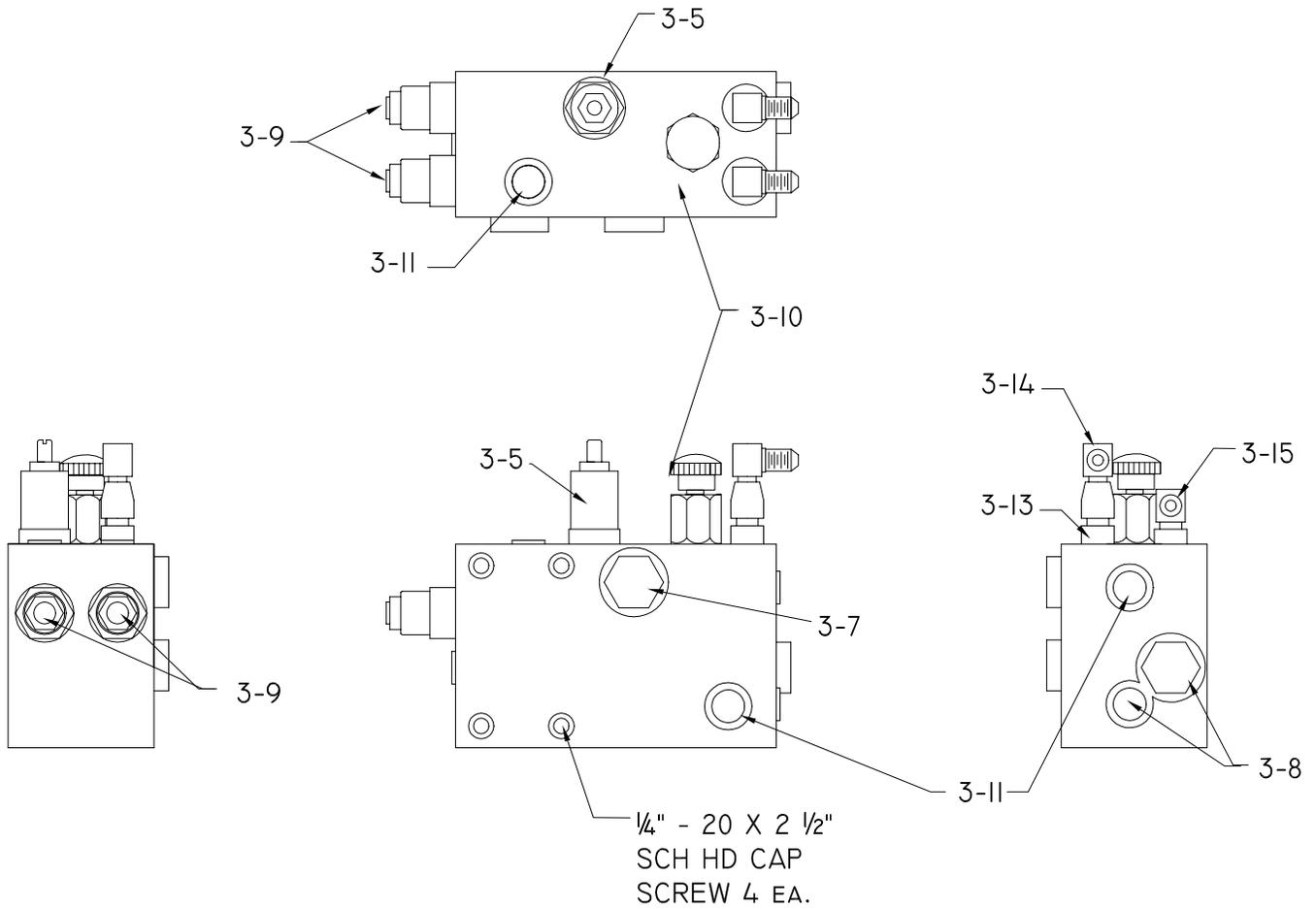
ITEM#	QTY
1-2	EMOB6 215 .75C 1 EA.
1-3	EMOB6 235 .75C 1 EA.
1-5	EMOSS 010 1 EA.
1-6	EMOCP 216 250 1 EA.
3-1	HVARE FBN 1 EA.
3-2	HVADI DEL 2P 1 EA.
3-3	HVASO DEL 024 1 EA.
3-4	ECOPL 001 1 EA.
3-5	HVAFL NVA 1 EA.

ITEM#	QTY
3-9	HVABK CCG LDN 2EA.
3-10	HVABY 000 CRT 1 EA.
3-12	HVACK 003 1 EA.
3-16	HMAMA 320 KIT 1 EA.
3-18	HSFHO 320 30.5 1 EA.
3-19	HSFHO 320 38.5 1 EA.
3-20	HPPPU HI6 .8 1 EA.
3-21	HPPPU HI6 1.6 1 EA.
3-22	HPPPU HI6 2.5 1 EA.
3-23	HPPPU HI6 .8-8 1 EA.



	TITLE	DRAWN	DATE	THIRD ANGLE PROJECTION	REV
	COMPONENTS, HTG 320 PUMP	KERI	12/1/00		---
		CHECKED	DATE	PART NUMBER	
		SHOP	MM/YY/DD	N/A	
APPROVED	DATE	DRAWING NUMBER:	SHT	OF	
ENGRNG	MM/YY/DD	CM7-2-8	1	1	

ITEM #		QTY
3-5	HVAFL NVA	1 EA.
3-7	HVACK CDAD XBN	1 EA.
3-8	HVACK CVB	1 EA.
3-9	HVABK CCG LDN	2 EA.
3-10	HVABY 000 CRT	1 EA.
3-11	HSFFI 714 CS04	5 EA.
3-13	HSFFI 850 0404	1 EA.
3-14	HSFFI 863 0404	1 EA.
3-15	HSFFI 853 0404	1 EA.
3-16	HMAMA 320 KIT	1 EA.



COMPLETE MANIFOLD IS 3-16



TITLE
COMPONENTS, HTG 320 MANIFOLD

DRAWN KERI	DATE 12/1/00
CHECKED SHOP	DATE MM/YY/DD
APPROVED ENGRNG	DATE MM/YY/DD

THIRD ANGLE PROJECTION
PART NUMBER N/A
DRAWING NUMBER: CM7-2-7

REV	---
SHT OF	1 OF 1



Hy-Security Gate Operators

Phone: 1-800-321-9947 • Fax: (206) 286-0614 • Web: www.hy-security.com • 1200 W Nickerson St • Seattle, WA. 98119

LIMITED WARRANTY (Hydraulically Powered Operators)

Hy-Security Gate Operators warrants all of its manufactured products to the end-user to be free of defects in material and workmanship. The model 111LS is warranted for a period of three years from date of shipment. **All other hydraulic operators are warranted for a period of five years from date of shipment.** Drive wheels for slide gate operators are warranted for a period of two years. Batteries in DC operators and individual replacement parts (that are a design component of the gate operator) are warranted for one year from the date of shipment. Even though included as part of a Hy-Security gate operator, accessories carrying another manufacturers name plate, (unless a design component of the gate operator) shall carry only the warranty of the specific manufacturer.

Any modification made to factory products will void the warranty unless the modifications are approved in writing by the factory, in advance of the change. This exclusion does not apply to normal installation of approved accessories and/or safety devices. This warranty shall not apply to equipment which has been improperly installed, subjected to negligence, accident, damage by circumstances beyond Hy-Security Gate Operators' control, or because of improper operation, maintenance, storage or to other than normal use or service.

Labor to install new parts or remove defective parts, travel time, or standby time is specifically excluded from this warranty. Freight (surface or air) and all other incidental costs are NOT covered by this warranty. There are no obligations or liabilities on the part of Hy-Security Gate Operators for consequential damages arising out of, or in connection with, the use or performance of this product. Hy-Security Gate Operators assumes no responsibility for other indirect damages with respect to loss of property, profit or revenue. This Limited Warranty is valid only in the 50 United States, the District of Columbia and the Commonwealth of Puerto Rico. Implied warranties, including those of merchantability and fitness for a particular purpose or application, are limited to one year from date of shipment.

Defective products that are in warranty should be returned to our factory. At our option, we may elect to repair or replace, free of charge, any such parts. An invoice will be sent at the time replacement parts are shipped, and a credit will be issued only after the parts have been returned undamaged and accepted as defective. No warranty credits will be allowed without written permission from the factory, and the return of the defective part, together with a completed Merchandise Return Form (see our Terms of Sale policy for additional details on the return procedure.) Replacement parts shall carry the remainder of the original limited warranty or 90 days, whichever is longer.

This Limited Warranty gives you specific rights. You may have others, which vary from state to state. This Hy-Security Gate Operators' limited warranty is in lieu of all other warranties expressed or implied. This Limited Warranty supersedes all other warranties.