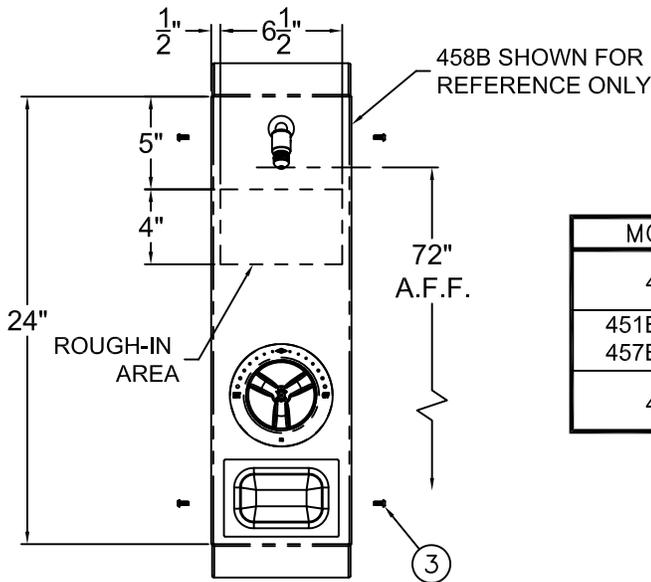
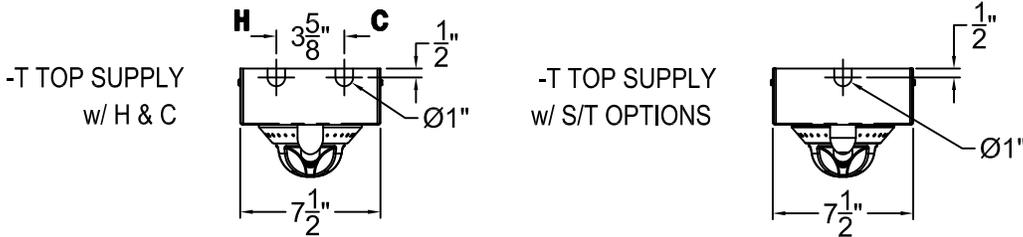
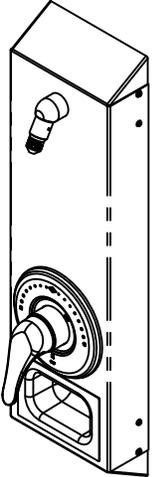


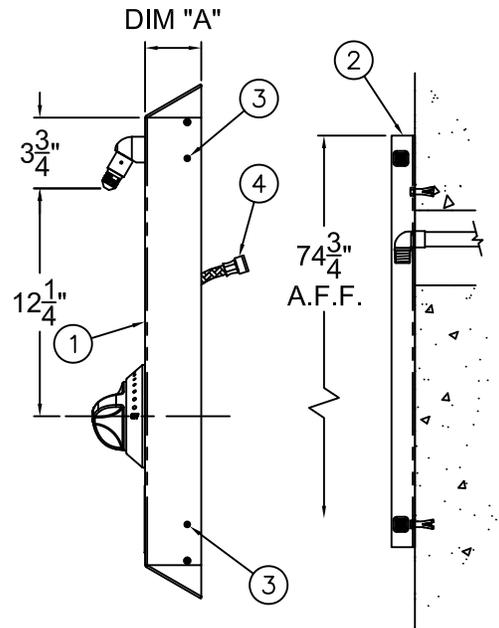


REFERENCE DRAWINGS			
SHOWER HEAD	9970-122-001	FLO-CLOZ	9975-000-001
TINNERMAN NUTS	9951-007-001	METER-MATIC	9975-020-003
PANEL SCREWS	9951-005-001	T/P VALVE ADJUST	9900-007-001
T/P VALVES PRIOR TO JUNE 2014	9975-006-001	T/P VALVE(SHOWN)	9975-005-002

-W WALL SUPPLY OPTION. SHOWN w/ OPTIONAL -LV R LEVER HANDLE



MODELS	DIM "A"
450B	4-1/2"
451B, 455B 457B & 458B	3"
456B	4"



WARNING:

PRIOR TO COMPLETING INSTALLATION SUPPLY LINES MUST BE FLUSHED OF ALL FOREIGN MATERIAL SUCH AS PIPE DOPE, CHIPS, SOLDER, ETC. VALVE MUST BE DRAINED PRIOR TO BEING SUBJECTED TO FREEZING TEMPERATURES.

INSTALLATION INSTRUCTIONS:

- A- DISASSEMBLE SHOWER HOUSING ASSEMBLY ① FROM WALL MOUNTING FRAME ② BY REMOVING VANDAL RESISTANT SCREWS ③ FROM THE HOUSING.
- B- INSTALL MOUNTING FRAME ② AT DESIRED HEIGHT AND ANCHOR FRAME TO WALL USING HARDWARE BY OTHERS.
- C- PROVIDE SUPPLY ROUGH-INS IN THE AREA INDICATED. THOROUGHLY FLUSH SUPPLY LINES.

- D- MAKE UP SUPPLY CONNECTIONS TO 1/2" NPS HOSE END INLETS ④ WHILE SUPPORTING HOUSING OFF THE FLOOR. NOTE: SUPPLY INLET CONNECTION WILL ACCOMMODATE A 1/2" NPT MALE ADAPTER.
- E- ASSEMBLE THE SHOWER HOUSING ① TO THE MOUNTING FRAME ② USING SCREWS PROVIDED.

NOTE:

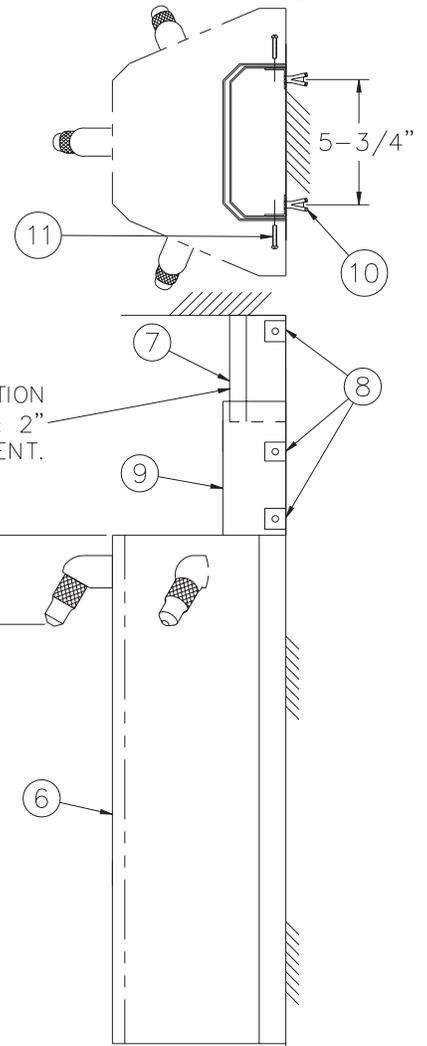
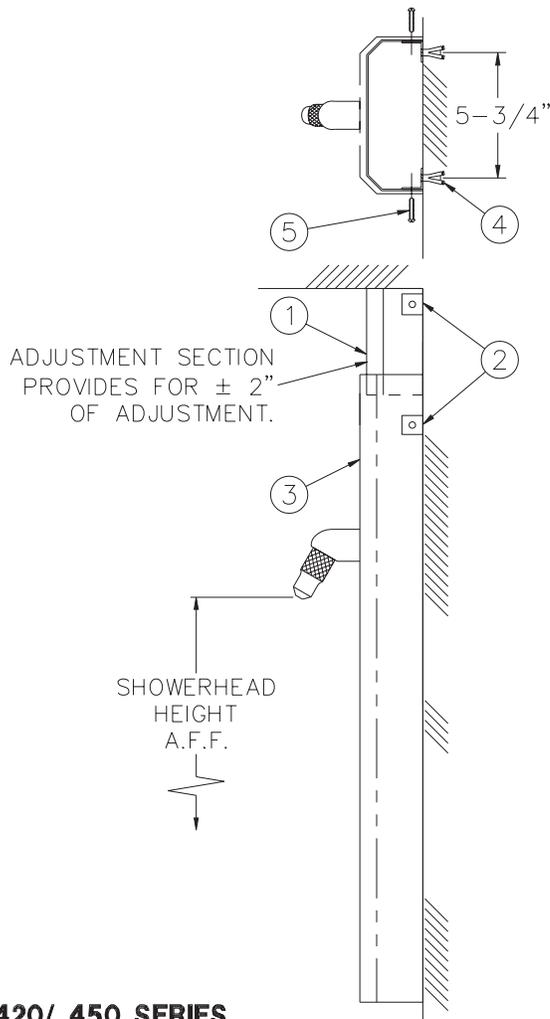
MAXIMUM RECOMENDED WORKING PRESSURE IS 100PSI, 130° F INLET TEMPERATURE & 105° F MAXIMUM OUTLET TEMPERATURE.

<p>ACORN ENGINEERING COMPANY P.O. BOX 3527 Industry, CA 91744 15125 Proctor Ave Industry, CA 91746 (626) 336-4561 FAX (626) 961-2200</p>	<p>TITLE APEX SURFACE MOUNTED SHOWER, 450B SERIES</p>		
	<p>MANUFACTURE DATE</p> <p>OCTOBER 2010</p> <p>TO PRESENT</p>	<p>DATE ISSUED</p> <p>10/25/10</p> <p>DATE REVISED</p> <p>06/01/14 D</p>	<p>DRAWING NUMBER</p> <p>9900-005-003</p>



IMPORTANT!

WALL ANCHORS AND ANCHORING HARDWARE ARE BY OTHERS.



420/ 450 SERIES

INSTALLATION INSTRUCTIONS (420/450 SERIES)

AFTER COMPLETION OF TOP SUPPLY ROUGH-INS:

- A- POSITION ADJUSTMENT SECTION ① UP TO CEILING. USING ADJUSTMENT SECTION AS A TEMPLATE, MARK POSITION FOR L-CLIPS ②.
- B- FOLLOWING THE APPROPRIATE FIXTURE INSTALLATION INSTRUCTIONS, USE EXTENDED HOUSING ③ AS A TEMPLATE TO MARK POSITIONS FOR L-CLIPS ②.
- C- INSTALL WALL ANCHORS ④ (BY OTHERS) FOR L-CLIPS. POSITION L-CLIPS ② WITH CAGE NUT FACING OUTWARD FOR ATTACHMENT OF HOUSING AND FASTEN TO WALL (WALL FASTENERS BY OTHERS).
- D- ASSEMBLE ADJUSTMENT SECTION ① TO L-CLIPS USING #10-32 SCREWS ⑤ PROVIDED.
- E- COMPLETE FIXTURE INSTALLATION WITH HOUSING ② OVER ADJUSTMENT SECTION ①.

NOTE: FOR 420 SERIES SHOWERS (NOT SHOWN), CEILING ADJUSTMENT SECTION ASSEMBLES OVER HOUSING.

460/ 470 SERIES

INSTALLATION INSTRUCTIONS (460/470 SERIES)

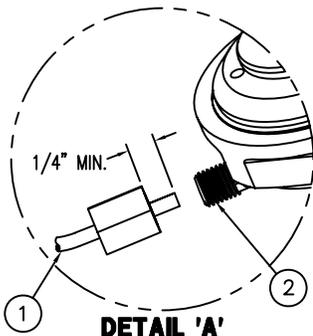
AFTER COMPLETION OF TOP SUPPLY ROUGH-INS:

- A- MOUNT HOUSING ⑥ TO WALL PER APPROPRIATE FIXTURE INSTALLATION INSTRUCTIONS.
- B- POSITION ADJUSTMENT SECTION ⑦ UP TO CEILING. USING ADJUSTMENT SECTION AS A TEMPLATE, MARK POSITION FOR L-CLIPS ⑧.
- C- POSITION SUPPLY COVER ⑨ AND USE AS A TEMPLATE TO MARK POSITION FOR L-CLIPS ⑧.
- D- INSTALL WALL ANCHORS ⑩ (BY OTHERS) FOR L-CLIPS. POSITION L-CLIPS ⑧ WITH CAGE NUT FACING OUTWARD FOR ATTACHMENT OF HOUSING AND FASTEN TO WALL (WALL FASTENERS BY OTHERS).
- E- ASSEMBLE ADJUSTMENT SECTION ⑦ TO L-CLIPS USING #10-32 SCREWS ⑪ PROVIDED.
- F- ASSEMBLE SUPPLY COVER ⑨ TO L-CLIPS USING #10-32 SCREWS ⑪ PROVIDED.

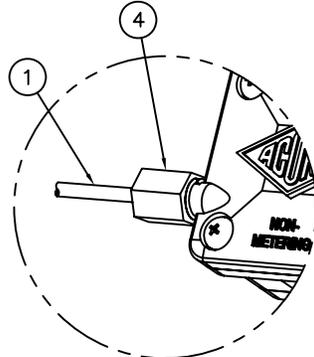
<p>ACORN ENGINEERING COMPANY P.O. BOX 3527 INDUSTRY, CA. 91744 (626) 336-4561 FAX (626) 961-2200</p>	<p>TITLE APEX OPTION -SC SUPPLY COVER for MODEL #420, #450, #460 & #470</p>	
	<p>MANUFACTURE DATE</p> <p>JULY 1969</p> <p>TO PRESENT</p>	<p>DATE ISSUED</p> <p>10/05/92</p> <p>DATE REVISED</p> <p>06/22/04</p>



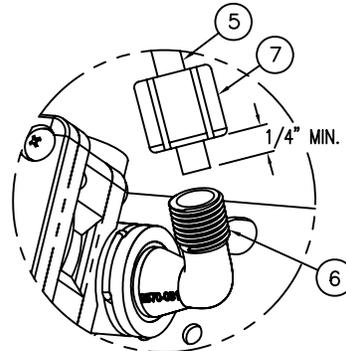
SIDE OUTLET SHOWN



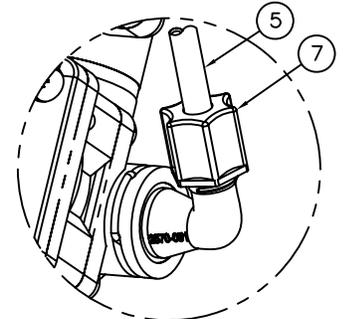
DETAIL 'A'



DETAIL 'B'



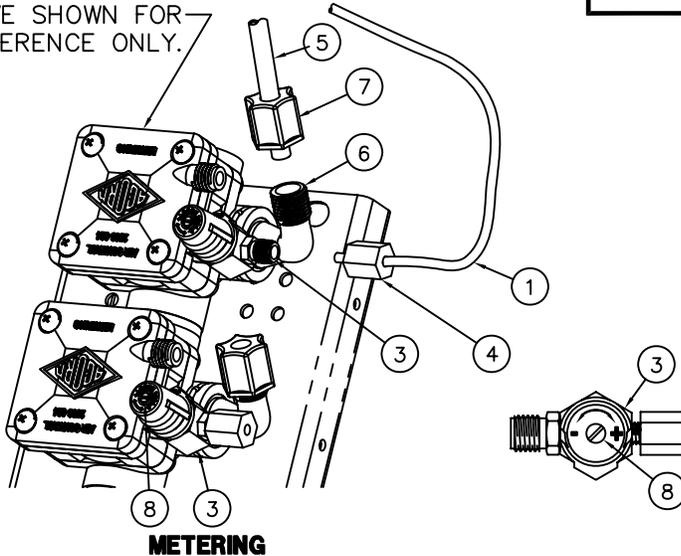
DETAIL 'C'



DETAIL 'D'

NOTE: PENAL-WARE & ECO-RAIN SHOWER FIXTURES USE 1/4" O.D. RISER TUBING WHILE OTHER SHOWER-WARE FIXTURES USE 3/8" O.D. TUBING.

AIR-CONTROL 03M-MA2 VALVE SHOWN FOR REFERENCE ONLY.



METERING

REFERENCE DRAWINGS	
REPAIR PARTS	DRAWING
VALVE BODY	9955-006-003
CHECKSTOP	9956-040-003
PUSHBUTTON/ESCUTCHEON	9957-300-001
METERING SERVOMOTOR	9955-000-003

NOTE:

- ALL TUBING SHOULD BE CUT SQUARE AND BE FREE OF BURRS OR DEFORMITIES TO ENSURE A WATER TIGHT CONNECTION.
- EXTEND TUBING AT LEAST 1/4" BEYOND FERRULE NUT AND INSERT TUBING INTO CONNECTION OPENING BEFORE TIGHTENING.
- TUBING SHOULD BE FREE OF KINKS TO ENSURE PROPER OPERATION.
- MAXIMUM RECOMMENDED WORKING WATER PRESSURE IS 100 PSI; TEMPERATURE IS 130° F; OUTLET TEMPERATURE IS RECOMMENDED AT A MAXIMUM OF 105° F.

WARNING:

PRIOR TO MAKING INSTALLATION, SUPPLY LINES MUST BE FLUSHED OF ALL FOREIGN MATERIAL SUCH AS PIPE DOPE, CHIPS, SOLDER, ETC. VALVE MUST BE DRAINED PRIOR TO BEING SUBJECTED TO FREEZING TEMPERATURES. MAXIMUM RECOMMENDED OUTLET WATER TEMPERATURE IS 105° F.

TIMING IS ADJUSTABLE FROM 5 TO 60 SECONDS AND IS ACCOMPLISHED BY ROTATING TIMING SCREW (8). TURNING THE TIMING SCREW CLOCKWISE INCREASES METERING TIME WHILE TURNING THE SCREW COUNTERCLOCKWISE DECREASES METERING TIME.

INSTALLATION INSTRUCTIONS:

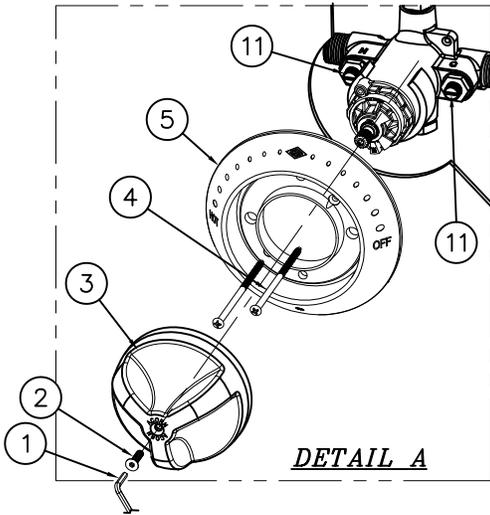
- A- MOUNT FIXTURE IN ACCORDANCE TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- B- ASSEMBLE PUSHBUTTONS AND OR SHOWER NOZZLES TO FIXTURE IF REQUIRED.
- C- CONNECT 1/8" O.D. POLYETHYLENE AIR LINE (1) TO PUSHBUTTON (2) AND VALVE TIMER ASSEMBLY (3). SEE DETAILS 'A' & 'B'. HAND TIGHTEN FERRULE NUT (4) PROVIDED.

- D- CONNECT SHOWER RISER (5) TO VALVE ASSEMBLY ELBOW (6). SEE DETAIL 'C' AND 'D'. HAND TIGHTEN FERRULE NUT (7) PROVIDED.
- E- AFTER THOROUGHLY FLUSHING SUPPLY LINES, MAKE UP CONNECTIONS TO VALVE ASSEMBLY INLET(S) 1/2" NPT OR 1/2" NPS FLEX HOSE AS REQUIRED.

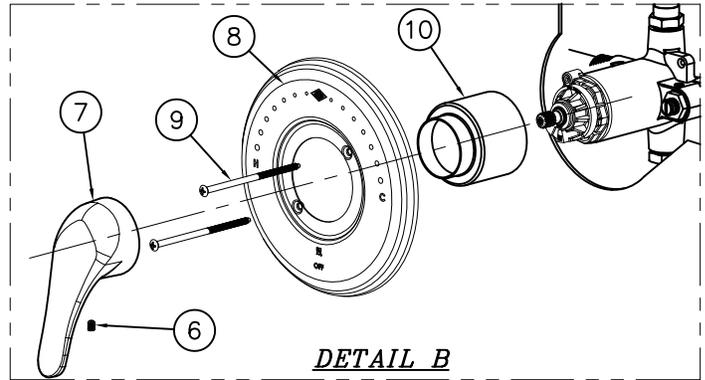
<p>ACORN ENGINEERING COMPANY P.O. BOX 3527 INDUSTRY, CA. 91744 (626) 336-4561 FAX (626) 961-2200</p>	<p>TITLE HAND OPERATED, AIR-CONTROL VALVE SHOWER CONNECTIONS</p>		
	<p>MANUFACTURE DATE</p> <p>OCTOBER 2010</p> <p>TO PRESENT</p>	<p>DATE ISSUED</p> <p>10/28/10</p>	<p>DRAWING NUMBER</p> <p>9900-006-003</p>
	<p>DATE REVISED</p>		



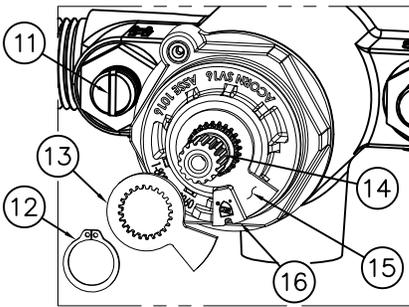
REFERENCE DRAWINGS	
ASSEMBLIES	NUMBER
T/P VALVE	9975-005-002



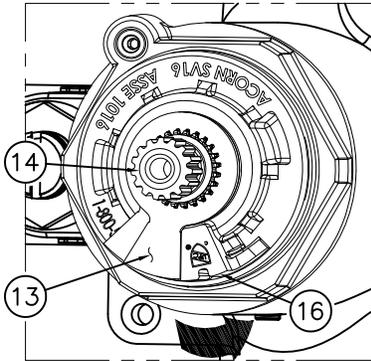
DETAIL A



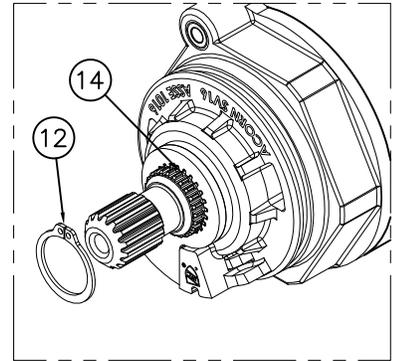
DETAIL B



DETAIL C



DETAIL D



DETAIL E

INSTRUCTIONS:

A-REMOVE TRI-LEVER HANDLE TRIM: SEE DETAIL A

a- USING CENTER REJECT ALLEN WRENCH (1) REMOVE HANDLE SCREW (2) AND REMOVE HANDLE (3).

b- REMOVE ESCUTCHEON (4) BY REMOVING SCREWS (5).

FOR OPTIONAL -LVR LEVER HANDLE TRIM: SEE DETAIL B

a- REMOVE SET SCREW (6) AND HANDLE (7).

b- REMOVE ESCUTCHEON (8) BY REMOVING SCREWS (9).

c- PULL OFF VALVE SLEEVE (10).

TEMPERATURE ADJUSTMENT:

B-ENSURE MAIN WATER SUPPLY IS ON.

C-ENSURE CHECK STOPS (11) ARE OPEN.

D-ENSURE VALVE IS IN THE OFF POSTION.

E-USING SNAP RING PLIERS REMOVE RETAINING RING (12) AND THE FIRST TEMPERATURE LIMIT WASHER (13) ONLY FROM VALVE STEM (14). SEE DETAIL C.

NOTE: IF SECOND TEMPERATURE LIMIT WASHER (15) COMES OFF, RESETTING OF THE OFF STOP MAY BE REQUIRED, KEY AS CLOSE AS POSSIBLE ON THE COUNTER-CLOCKWISE SIDE OF BONNET STOP (16). USING HANDLE (3) OR (7) SLIGHTLY OPEN AND CLOSE VALVE TO ENSURE WATER WILL SHUT OFF. DETAIL C.

TEMPERATURE ADJUSTMENT: CONTINUED:

F- USING HANDLE (3) OR (7) TURN VALVE STEM (14) COUNTER-CLOCKWISE TO INCREASE HOT, CHECKING OUTLET TEMPERATURE UNTIL DESIRED TEMPERATURE IS REACHED (RECOMMENDED 105° TO 110°). SLIDE FIRST TEMPERATURE LIMIT WASHER (9) OVER VALVE STEM (13) AND ENSURE SIDE OF WASHER RESTS AS CLOSE AS POSSIBLE TO CLOCKWISE SIDE OF BONNET LIMIT STOP (16). DETAIL D.

G- WITH VALVE IN THE "ON" POSTION AND WATER RUNNING, USING SNAP RING PLIERS INSTALL RETAINING RING (12). ENSURE RETAINING RING (12) IS INSERTED PROPERLY INTO GROOVE ON VALVE STEM (14). DETAIL E.

H- REINSTALL TRIM IN REVERSE ORDER.

<p>ACORN ENGINEERING COMPANY P.O. BOX 3527 Industry, CA 91744 15125 Proctor Ave Industry, CA 91746 (626) 336-4561 FAX (626) 961-2200</p>	<p>TITLE -8 T/P TEMP/PRESS BALANCING MIXING VALVE - TEMPERATURE ADJUSTMENT</p>		
	<p>MANUFACTURE DATE</p> <p>APRIL 2014</p> <p>PRESENT</p>	<p>DATE ISSUED</p> <p>05/01/14</p>	<p>DRAWING NUMBER</p> <p>9900-007-001</p>
		<p>DATE REVISED</p> <p>09/01/16 B</p>	