

SAFEGARD SERVICE KIT # 7334-2

THIS SERVICE KIT CONTAINS NORMAL REPLACEMENT PARTS FOR SAFEGARD CONTROL. THOSE PARTS INCLUDED WITH KIT INDICATED BY (S) (SEE EXPLODED VIEW). ALL OTHER PARTS MUST BE ORDERED SEPARATELY IF REPLACEMENT IS REQUIRED.

REVISION NOTE - REPLACEMENT INTEGRAL VALVE KIT (INCLUDED IN #7334-2 SERVICE KIT INCORPORATES A NEW, HIGHER PRESSURE VALVE. THIS OBSOLETE SPRING & PAD ASSEMBLY ON OLDER SAFEGARD MODELS, DIAPHRAGM (#4506-3) IS USED ONLY ON VERSIONS INCORPORATING BODY AND END PLATE ASSEMBLY.

SPRING SELECTION - EACH OF THE THREE SPRINGS LISTED CORRESPONDS TO A SPECIFIC PRESSURE RANGE (GIVEN AS INCHES OF WATER COLUMN). THE SECOND FROM THE LAST DIGIT IN THE CONTROL MODEL NO. SPECIFIES RANGE AND RESPECTIVE SPRING THAT IS USED.

MODEL NO. 760-**-**-*

2	WHITE (COLOR IDENTIFICATION) SPRING P.N. 2021-21-1 RANGE: 25 - 650 IN. OF WATER
3	WHITE (COLOR IDENTIFICATION) SPRING P.N. 2021-21-1 RANGE: 25 - 650 IN. OF WATER
4	RED (COLOR IDENTIFICATION) SPRING P.N. 2021-21-2 RANGE: 650 - 1750 IN. OF WATER

NOTE: FURTHER DISASSEMBLY (REMOVAL OF ADJUSTMENT SCREW AND SCREW CAP SHOWN IN EXPLODED VIEW) IS NORMALLY NOT REQUIRED UNLESS REPLACEMENT IS WARRANTED.

6 USING THE VALVE WRENCH SUPPLIED IN THE SAFEGARD SERVICE KIT, UNTHREAD AND REMOVE THE INTEGRAL VALVE (#3257-10).

5 REMOVE DIAPHRAGM ASSEMBLY (#4508-5), ADJUSTMENT SPRING (#2021-21-*) AND SPRING RETAINER (#4578) FROM THE SPRING HOUSING.

4 SEPARATE THE SPRING HOUSING FROM BODY.

3 (UNITS HAVING SEPARATE BODY AND END PLATE ASSY.) - IF SPACER IS PRESENT, REMOVE AND DISCARD.

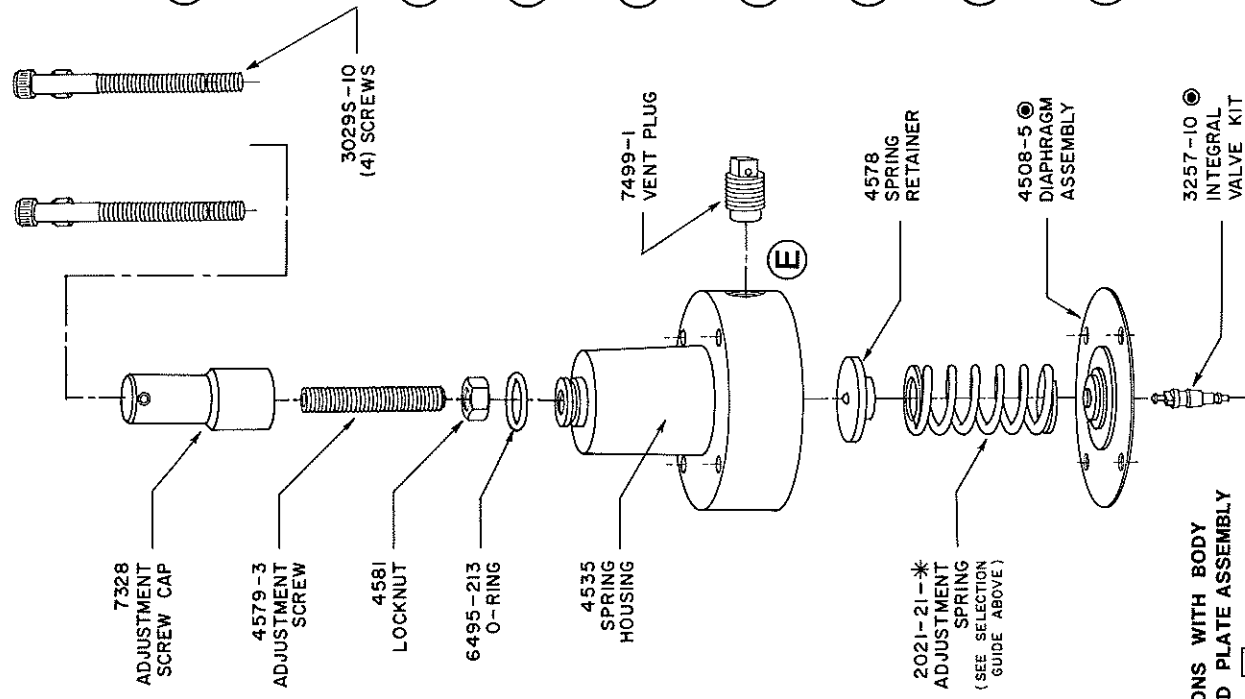
2 (UNITS HAVING SEPARATE BODY AND END PLATE ASSY.) - SEPARATE THE END PLATE FROM BODY. - REMOVE LARGE O-RING (#6495-407) AND DIAPHRAGM (#4506-3).

NOTE: SPRING AND PAD, IF PRESENT, SHOULD BE REMOVED AND DISCARDED. REFER TO "SAFEGARD SERVICE KIT #7334-2" DISCUSSION.

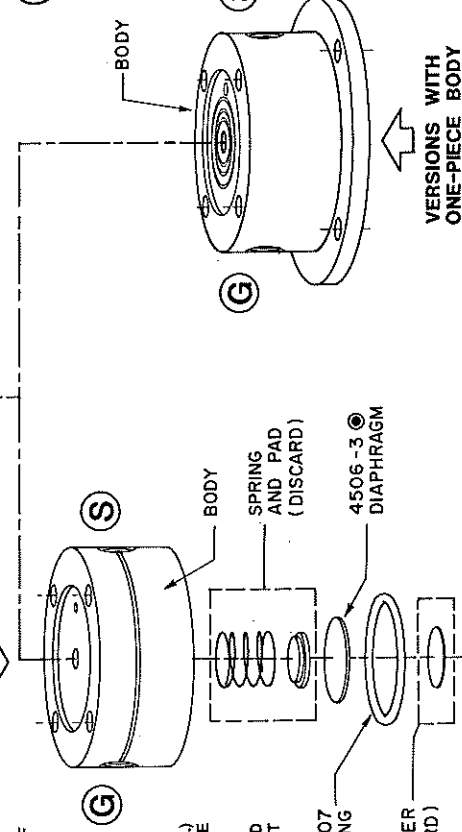
1 REMOVE THE 4 SOCKET-HEAD CAP SCREWS.

NOTE - SOME VERSIONS OF THE SAFEGARD CONTROL USE ASSEMBLY SCREWS INSTALLED FROM THE UNDERSIDE OF THE END PLATE. NEWER VERSIONS USE ASSEMBLY SCREWS INSTALLED FROM TOP OF SPRING HOUSING. REFER TO ILLUSTRATION.

DISASSEMBLY



VERSIONS WITH BODY AND END PLATE ASSEMBLY



VERSIONS WITH ONE-PIECE BODY

ASSEMBLY



- 1 SUBASSEMBLY - INSTALL INTEGRAL VALVE FROM REPLACEMENT VALVE KIT (#3257-10) INTO BODY. USE DEPTH GAUGE PROVIDED TO CHECK INSTALLATION (SEPARATE INSTRUCTIONS PROVIDED).
- 2 INSERT SPRING RETAINER (#4578) INTO HOUSING SO THAT RAISED STEP FACES UP TO CONTACT ADJUSTMENT SPRING.
- 3 POSITION ADJUSTMENT SPRING (#2021-21-*) IN HOUSING SO THAT IT IS SEATED ON THE SPRING RETAINER.
- 4 PLACE DIAPHRAGM ASSEMBLY (#4508-5) OVER SPRING IN HOUSING. STEPS IN CENTER OF DIAPHRAGM SHOULD SEAT INSIDE OF THE SPRING.
- 5 INSTALL BODY (WITH VALVE SIDE DOWN) OVER DIAPHRAGM ASSEMBLY AND SPRING HOUSING.
- 6 (UNITS HAVING SEPARATE BODY AND END PLATE ASSY.) - INSERT DIAPHRAGM (#4506-3) INTO CENTER POCKET IN BODY.
- 7 (UNITS HAVING SEPARATE BODY AND END PLATE ASSY.) - POSITION LARGE O-RING (#6495-407) IN GROOVE ON END PLATE. INSTALL END PLATE WITH O-RING OVER BODY.
- 8 INSTALL THE 4 SOCKET-HEAD CAP SCREWS TO SECURE THE ASSEMBLED UNIT.

NOTE: UNITS HAVING ONE-PIECE BODY USE SCREWS (#3029S-10) INSTALLED FROM HOUSING. ALL OTHER VERSIONS USE SCREWS (#3029S-14) INSTALLED FROM UNDERSIDE.

9 PROCEED AROUND THE BOLT CIRCLE AND TIGHTEN SCREWS, ALTERNATING BETWEEN EVERY OTHER ONE TO ENSURE EVEN COMPRESSION.

NOTE

AFTER ANY SERVICE OR DISASSEMBLY OF THE SAFEGARD CONTROL, THE PRESSURE SETTING SHOULD BE CHECKED. THIS WILL ENSURE THAT SAFEGARD WILL OPERATE AS DESIRED, ESPECIALLY IF THE ADJUSTMENT SCREW WAS DISTURBED.

REQUIRED TOOLS

1/8" AND 5/32" ALLEN SOCKET WRENCHES

SERVICE INSTRUCTIONS -- PRELIMINARY

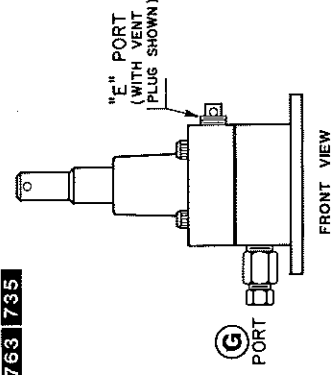
THE SAFEGARD OVERPRESSURE CONTROL IS A PRECISION-ENGINEERED COMPONENT OF A KING-GAGE TANK LEVEL INDICATING SYSTEM. CARE SHOULD BE EXERCISED DURING SERVICE AND ASSEMBLY PROCEDURE THAT ALL INTERNAL PARTS ARE PROPERLY INSTALLED. FOLLOW INSTRUCTIONS COMPLETELY. IT IS RECOMMENDED THAT A CLEAN AND DRY WORK STATION BE AVAILABLE FOR SERVICING THE UNIT.

DO NOT USE WIRE BRUSH OR ABRASIVE MATERIALS TO CLEAN INTERNAL SURFACES. DO NOT REAM, OR IN ANY WAY MODIFY INTERNAL PASSAGES.

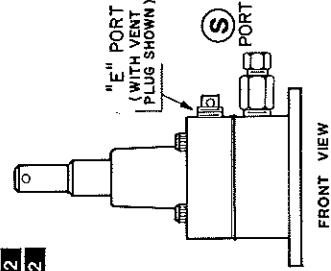
NOTE - "ALIGNING MARKS" ARE PROVIDED FOR PROPER ORIENTATION OF BODY SECTIONS DURING ASSEMBLY (SEE FIGURE BELOW).

TUBING CONNECTIONS OF VARIOUS SAFEGARD MODELS

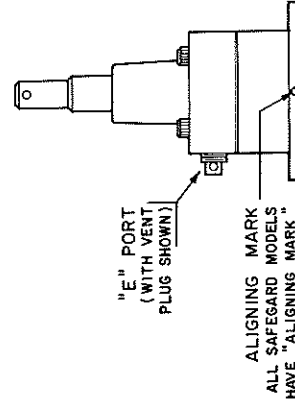
MODELS
763 735



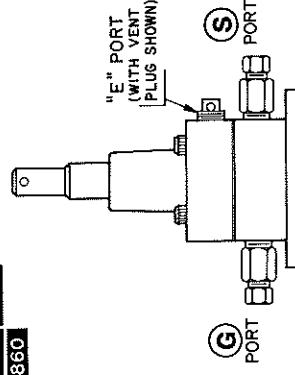
MODELS
761 762
781 782
861



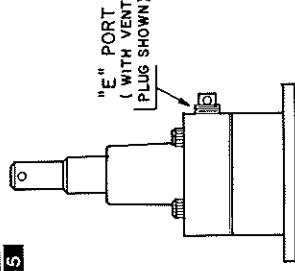
REAR VIEW (TYPICAL)



MODELS
760 780
860



MODELS
736 737
764 765



SERVICE DRAWING ASSEMBLY AND DISASSEMBLY INSTRUCTIONS SAFEGARD OVERPRESSURE CONTROL FOR SAFEGARD, RATIOGARD & DYNAGARD CONTROLS

NOT APPLICABLE TO SAFEGARD CONTROL MODEL NO. 4530

B	6/6/88	REVISED SPRING RANGE
A	4/25/83	RELEASED

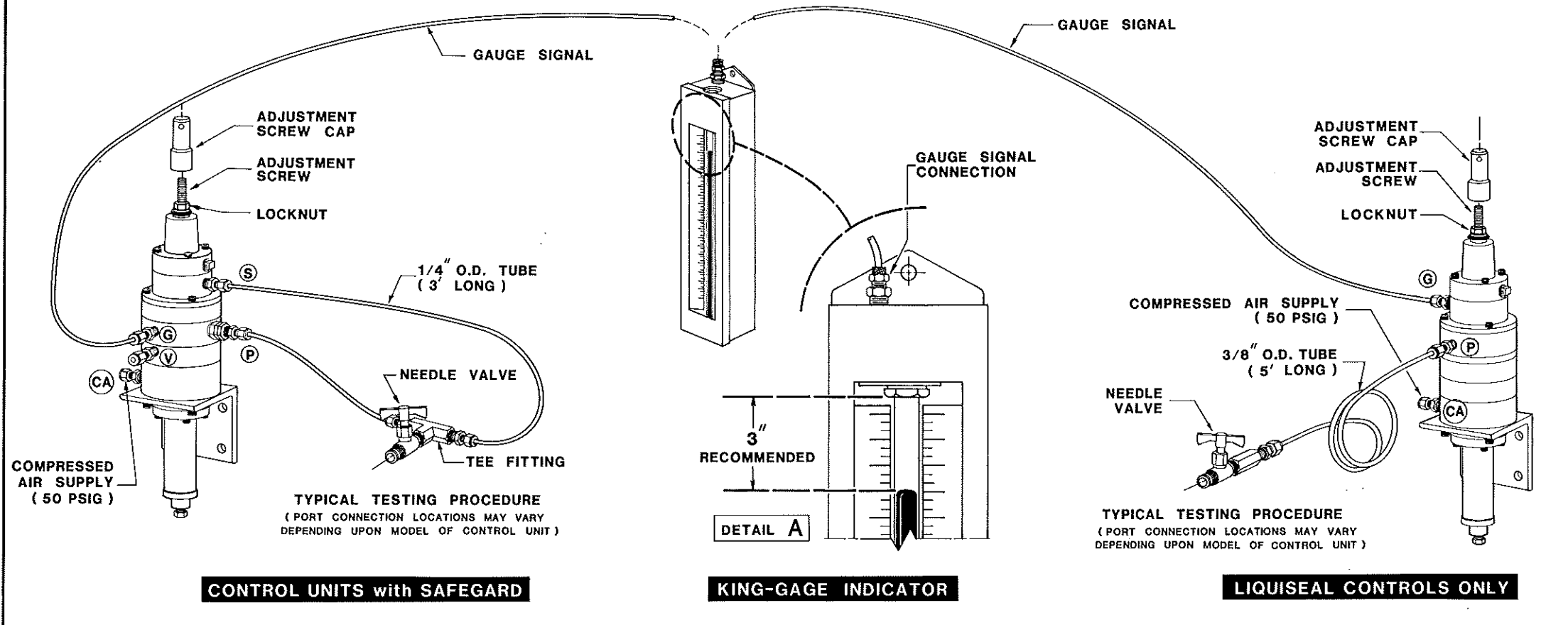


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REV. B



PRELIMINARY SERVICE INSTRUCTIONS

THE SAFEGARD OVERPRESSURE CONTROL IS DESIGNED TO PREVENT THE APPLICATION OF PRESSURE BEYOND THE RANGE OF AN INDICATOR. THE SAFEGARD SETTING (WHICH REGULATES THE AMOUNT OF APPLIED PRESSURE) IS ADJUSTABLE TO ACCOMMODATE VARIOUS INDICATOR RANGES.

FOLLOWING ANY SERVICE THAT INVOLVES DISASSEMBLY OF THE SAFEGARD CONTROL, OR SHOULD THE CONTROL BE RECEIVED NOT "FACTORY PRESET", THE ADJUSTMENT PROCEDURE OUTLINED HERE SHOULD BE PERFORMED. THIS WILL ENSURE PROPER PERFORMANCE OF THE SAFEGARD CONTROL AS PART OF THE TOTAL GAUGING SYSTEM.

EQUIPMENT REQUIRED

- 1/8" ALLEN SOCKET WRENCH (HEX KEY)
- 7/16" WRENCH (OR CRESCENT-TYPE WRENCH)
- REGULATING (NEEDLE) VALVE
- 3' (MINIMUM) OF 1/4" O.D. POLYFLO TUBING -- SENSOR CONTROL OR PURGE CONTROL UNITS
- 5' (MINIMUM) OF 3/8" O.D. POLYFLO TUBING -- LIQUEISAL CONTROLS ONLY
- 35 TO 50 PSIG COMPRESSED AIR SUPPLY TO "CA" PORT OF CONTROL UNIT

INDICATOR MUST BE VISIBLE

THE INDICATOR MUST BE VISIBLE TO THE PERSON ADJUSTING THE PRESSURE SETTING -- OR AN OBSERVER MUST BE PLACED AT THE INDICATOR TO RELAY THE GAUGE READINGS.

EXCESS PRESSURE (BEYOND THE RANGE OF THE INDICATOR) CAN DISPLACE THE INDICATING LIQUID FROM THE GLASS TUBE. IF PRESSURE IS ALLOWED TO INCREASE TOO RAPIDLY, INDICATING LIQUID MAY SPRAY OUT FROM THE TOP OF THE INDICATOR.

CAREFUL OBSERVATION WILL PREVENT THIS SITUATION FROM OCCURRING WHEN ADJUSTING THE SAFEGARD CONTROL.

THE FOLLOWING PROCEDURE ASSUMES USE OF A KING-GAGE INDICATOR (COLUMN-TYPE). TUBING CONNECTIONS BETWEEN "G" PORT OF CONTROL UNIT AND INDICATOR ARE ASSUMED TO BE COMPLETED.

IMPORTANT! -- ON THOSE SYSTEMS EMPLOYING A DOWNPIPE IN THE TANK, EXERCISE CAUTION IF REMOVING THE CONTROL UNIT FROM SERVICE. IF TANK IS FULL (OR DOWNPIPE ENTERS THROUGH TANK WALL) WHEN COMPRESSED AIR PURGE IS DISCONNECTED, TANK PRODUCT MAY POSSIBLY SIPHON OUT OF TANK THROUGH DOWNPIPE.

PRESSURE SETTING ADJUSTMENTS

- 1 DISCONNECT EXISTING TUBES FROM "P" PORT AND "S" PORT (IF APPLICABLE) OF CONTROL UNIT. REPLACE WITH 1/4" OR 3/8" O.D. POLYFLO TUBING...
 SENSOR CONTROLS OR PURGE CONTROLS -- 3 FEET (MINIMUM) OF 1/4" O.D. TUBING.
 LIQUEISAL CONTROLS -- 5 FEET (MINIMUM) OF 3/8" O.D. TUBING.
- 2 INSTALL A NEEDLE (REGULATING) VALVE WITH APPROPRIATE "TEE" FITTING INTO THE LENGTH OF TUBING (SEE ILLUSTRATION). OPEN VALVE COMPLETELY TO "FLOW" POSITION. CONNECT THE LOOSE END OF THE TUBE TO THE "S" PORT OF THE CONTROL UNIT.
 LIQUEISAL CONTROLS -- PLACE THE NEEDLE VALVE AT THE OPEN END OF THE 5 FT. LENGTH OF TUBING. VALVE SHOULD BE OPEN TO THE FLOW POSITION.
- 3 COMPRESSED AIR SUPPLY (50 PSIG MAXIMUM) SHOULD BE CONNECTED TO THE "CA" PORT AT THE CONTROL UNIT.
 NOTE: ABOVE SPECIFICATION IS FOR THE PURPOSES OF ADJUSTMENT ONLY. OPERATING PRESSURES WHILE IN ACTUAL SERVICE MAY BE HIGHER.
- 4 REMOVE ADJUSTMENT SCREW CAP, LOOSEN LOCKNUT AND UNTHREAD ADJUSTMENT SCREW TO THE POINT WHERE IT TURNS FREELY -- NO RESISTANCE IS FELT FROM THE SPRING INSIDE OF THE HOUSING (SAFEGARD IS CLOSED).
- 5 AT THIS POINT (WITH VALVE OPEN) THERE SHOULD BE NO READING ON THE INDICATOR. INDICATING LIQUID SHOULD BE AT THE LOWEST MARK ON THE SCALE.
 NOTE: IF THERE IS ANY READING ON THE INDICATOR (LIQUID ABOVE THE LOWEST MARK ON INDICATOR SCALE), DISCONNECT TUBING AT THE "G" PORT OF THE CONTROL UNIT. ALLOW LIQUID TO FALL, THEN RECONNECT AT "G" PORT.
 IF READING REMAINS, IT IS POSSIBLE THAT INDICATOR CONTAINS TOO MUCH INDICATING LIQUID, OR SCALE IS NOT PROPERLY ADJUSTED. (REFER TO INDICATOR SERVICE MANUAL.)
- 6 SLOWLY CLOSE NEEDLE VALVE AND WATCH INDICATOR FOR ANY CHANGE IN LEVEL OF THE INDICATING LIQUID. (SINCE THE SAFEGARD IS CLOSED, THERE SHOULD BE NO READING UNLESS THE INTEGRAL VALVE ASSEMBLY IS LEAKING.)
 NOTE: THIS PROCEDURE ASSUMES THE ADJUSTMENT SCREW HAS BEEN SUFFICIENTLY UNTHREADED. BEFORE DISASSEMBLING SAFEGARD TO REPLACE INTEGRAL VALVE, REPEAT STEPS 4-6. MAKE CERTAIN ADJUSTMENT SCREW IS ALMOST COMPLETELY UNTHREADED. IF FAILURE IS STILL APPARENT, REPLACE INTEGRAL VALVE.

- 7 OPEN NEEDLE VALVE COMPLETELY AND ALLOW PRESSURE TO VENT.
- 8 TURN ADJUSTMENT SCREW IN (CLOCKWISE) WITH HEX KEY UNTIL RESISTANCE FROM ADJUSTMENT SPRING IS FELT. THEN, TURN SCREW IN (CLOCKWISE) AN ADDITIONAL 1-2 TURNS. (DETAIL A)
- 9 OBSERVE THE INDICATOR WHILE SLOWLY CLOSING THE NEEDLE VALVE. CAREFULLY "THROTTLE" THE VALVE SO THAT THE INDICATING LIQUID RISES VERY SLOWLY (THIS SIMULATES TANK FILLING OPERATION).
- 10 NOTE THE LEVEL AT WHICH THE LIQUID STOPS RISING, OR OPEN NEEDLE VALVE IF LIQUID RISES ABOVE THE 3" RECOMMENDED LIMIT (SEE DETAIL B). **IMPORTANT!** --OPEN NEEDLE VALVE COMPLETELY AND WAIT FOR LIQUID TO FALL BEFORE MAKING ANY ADJUSTMENT TO THE SAFEGARD.
- 11 IF LIQUID STOPS BEFORE REACHING THE UPPER END OF THE INDICATOR...
 OPEN NEEDLE VALVE, ALLOW LIQUID TO FALL COMPLETELY AND THEN TURN ADJUSTMENT SCREW IN (CLOCKWISE) 1/2 TO ONE FULL TURN. REPEAT STEPS 9 & 10.
 IF LIQUID RISES TO TOP OF INDICATOR BEYOND 3" RECOMMENDED LIMIT...
 OPEN NEEDLE VALVE, ALLOW LIQUID TO FALL COMPLETELY AND THEN TURN ADJUSTMENT SCREW OUT (COUNTERCLOCKWISE) 1/2 TO ONE FULL TURN. REPEAT STEPS 9 & 10.
- 12 WHEN LIQUID STOPS AT DESIRED LEVEL... SECURE LOCKNUT AND REPEAT STEPS 9 & 10 TO TEST SETTING. REPLACE ADJUSTMENT SCREW CAP WHEN FINISHED.
- 13 DISCONNECT TUBING AND NEEDLE VALVE FROM CONTROL UNIT PORTS. RECONNECT PURGE ("P") AND SIGNAL LINES ("S"), IF APPLICABLE, FROM THE TANK SENSOR.

IMPORTANT

SHOULD THE INDICATOR SHOW A READING (DURING THE COURSE OF THIS PROCEDURE) WITH THE NEEDLE VALVE OPEN, A "LOCKED" PRESSURE CONDITION MAY HAVE OCCURRED.
 THIS IS CAUSED BY IMPROPERLY TURNING THE ADJUSTMENT SCREW OUT (COUNTERCLOCKWISE) WHILE PRESSURE IS APPLIED TO THE INDICATOR. THIS CAN BE CORRECTED BY OPENING THE NEEDLE VALVE AND TURNING IN THE ADJUSTMENT SCREW UNTIL THE INDICATING LIQUID FALLS.

**SERVICE DRAWING
ASSEMBLY AND DISASSEMBLY INSTRUCTIONS**

**SAFEGARD OVERPRESSURE CONTROL
FOR SAFEGARD, RATIOGARD & DYNAGARD CONTROLS**

NOT APPLICABLE TO SAFEGARD CONTROL MODEL NO. 4530

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A	4/25/83	RELEASED		
		Ann Arbor, Michigan U.S.A. PH: 734-662-5691 FAX: 734-662-6652 www.king-gage.com	K-2000-2-100 PAGE 2 OF 2 REV. B	