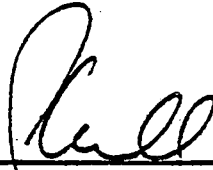
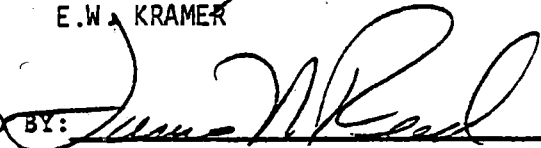


EPRI JUSTIFICATION REPORT

REPORT NUMBER 1125

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MASONEILAN DIVISION OF MCGRAW EDISON

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Doc 3269A  
11-13-81

## JUSTIFICATION REPORT

### 1. Introduction

This report has been prepared for the Electric Power Research Institute, EPRI, by Masoneilan Division of McGraw Edison at their request. This report will be integrated with EPRI's Valve Selection/Justification Report.

The information released in this report is not considered proprietary, therefore there is no restriction placed on its use within the confines of the EPRI/PWR Safety and Relief Valve Test Program Report.

The valves in the United States subject to this test program were sold only to Westinghouse and were to be installed at Westinghouse project sites. Masoneilan has not been provided information to where specific valve serial numbers have been sent. This information should be available through Westinghouse. All valves used on Power Operated Relief Valve, PORV, applications in the United States were Masoneilan Model No. 38-20721 or 38-20771. All valves are 2" size.

Identification of the sites in the United States at which Masoneilan PORV's are located are as follows:

<u>UTILITY</u>	<u>PLANT</u>	<u>MODEL NO.</u>
Duquesne Light	- Beaver Valley 1	38-20721
Indiana & Michigan Electric	- Donald Cook 1 & 2	38-20721
Pacific Gas & Electric	- Diablo Canyon 1 & 2	38-20771
Tennessee Valley Authority	- Sequoyah 1	38-20721
Virginia Electric & Power	- North Anna 1 & 2	38-20771
Wisconsin Public Service	- Kewaunee	38-20721

### 2. Description of Basic Model

The model numbers 38-20771 and 38-20721 valves are top guided single seat globe valves with pneumatic actuators. The valve plug is lifted off the seat by pneumatically loading the actuator. Positive closure is provided by the spring return or failure mode of the actuator. The valve plug is top guided in the valve bonnet. Adequate guiding area has been provided in the bonnet to prevent instability of the plug. The seat ring retainer provides easy and quick access to the seat ring and seat ring gasket for removal and maintenance.

The model numbers 38-20771 and 38-20721 are the only models installed in the U.S. The only difference is the valve plug used in model number 38-20771 uses a linear control contour and in model number 38-20721 has equal percentage contour. Critical dimensions that affect the valves shut-off, flow capacity, stability, and speed remain unchanged. This difference affects only the flow characteristics of modulating valves thus has no significant impact to the EPRI test.

The flow is from under the valve body bridge i.e., the flow forces the valve plug open. The actuator selected has sufficient spring thrust to overcome these flow and pressure forces. Reference drawing numbers A8425 and A8529.

3. Selected Test Valve

The valve selected for test was secured from the Tennessee Valley Authority from the Sequoyah Site. This valve is essentially the same as those at other sites.

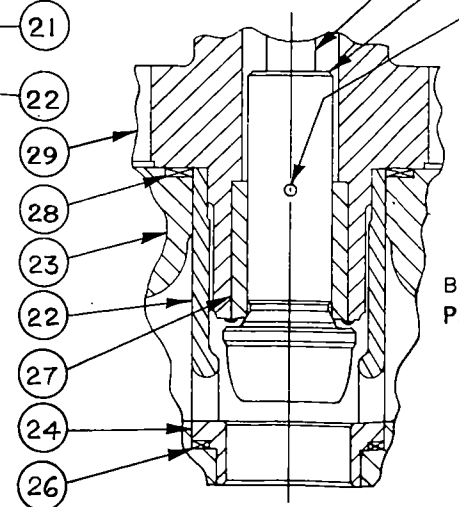
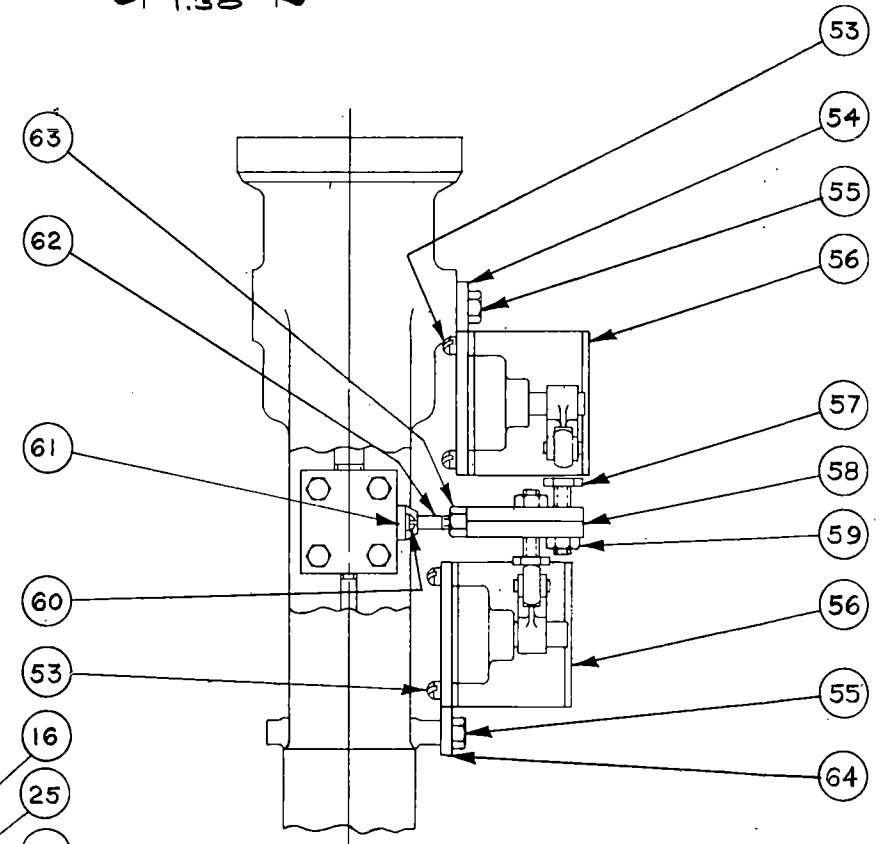
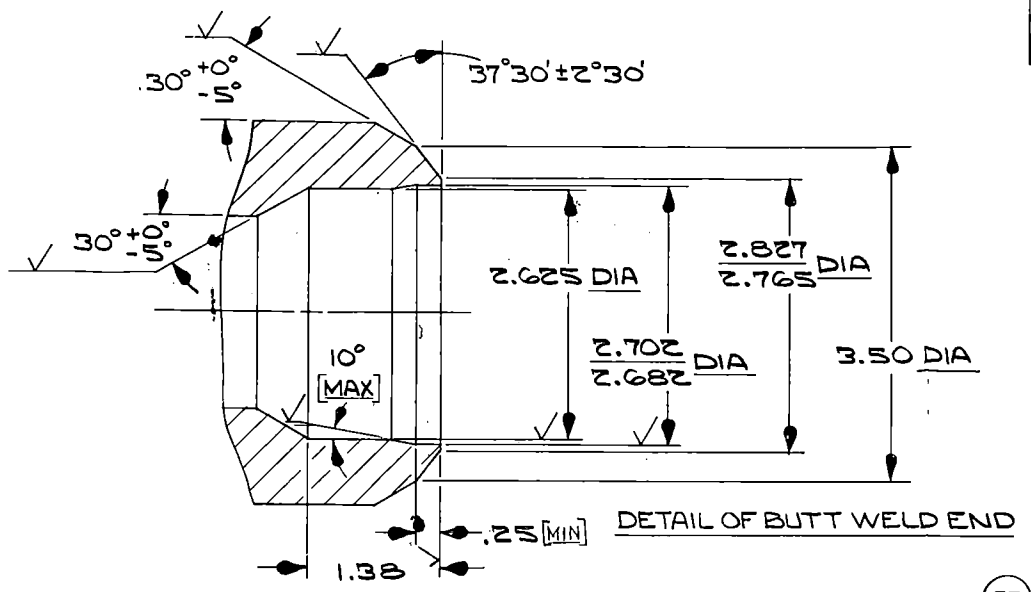
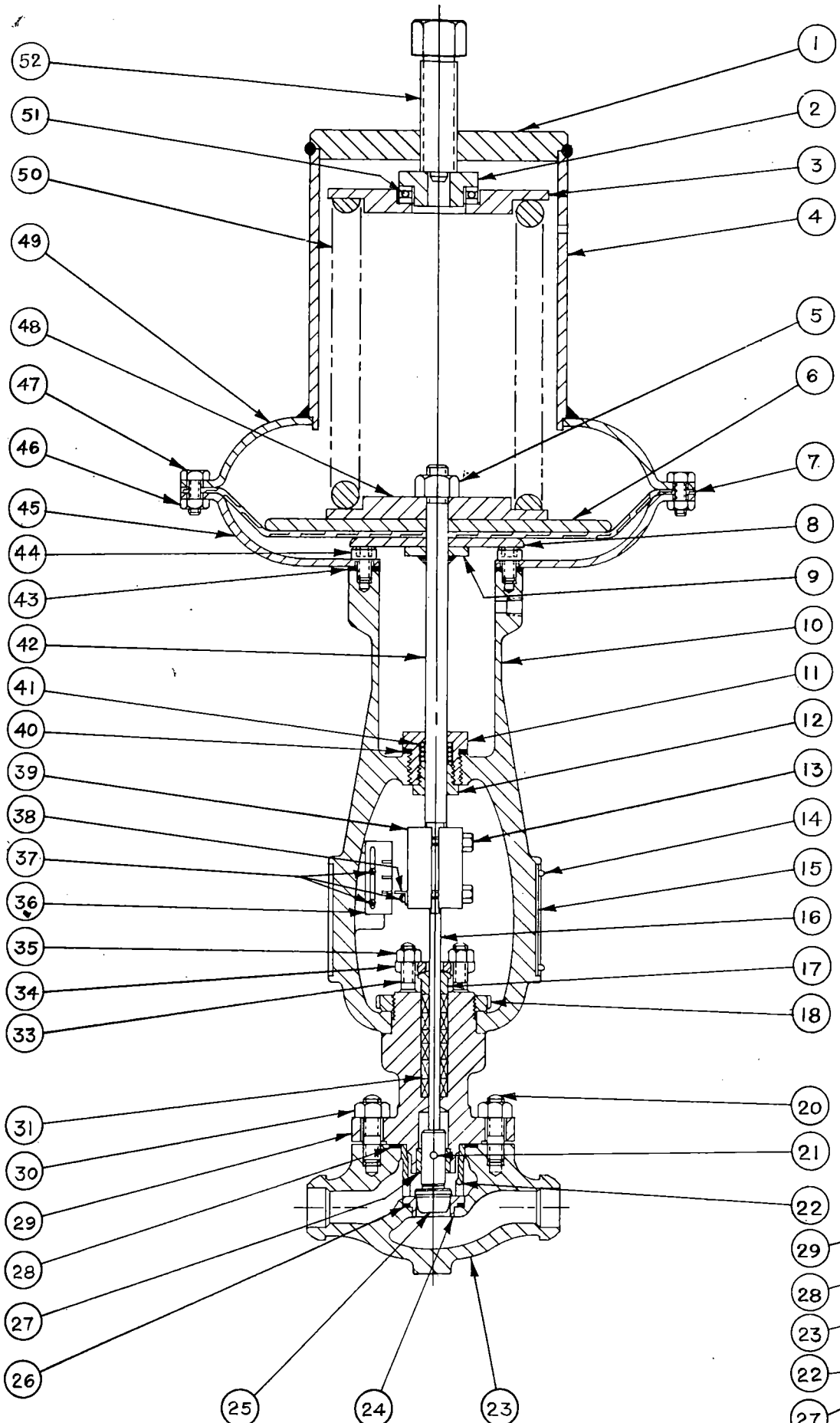
4. Design Variations Between PWR Plant Valves and Selected Test Valves

As stated in the previous paragraphs there are no significant design variations that would affect the EPRI test results or valve performance between the test valve and others in the field.

5. Conclusion

In summary the valve selected by EPRI is representative to those currently in use in the PORV applications in the United States.

REVISIONS				
SYM.	DESCRIPTION	DISP.	DATE	APPROVED
	1. REWORK 2. SCRAP 3. USE AS IS 4. RECORD CHANGE			
B	REQ. NO. 3654	4	11-27-70	<i>[Signature]</i>
C	REQ. NO. 3731	4	2-3-71	<i>[Signature]</i>



REFERENCE:  
CERTIFIED DRAWING NO. CPI-18-55-C  
WITHOUT AIRSET  
CERTIFIED DRAWING NO. CPI-18-71-C  
WITH AIRSET

VALVE SIZE	TAG NO.	PARTS LIST
2"	3 1A58 RGP	A 8529-D
2"	3 1A58 RGP	A 8476-D

UNLESS OTHERWISE SPECIFIED		DRAWN	E.A.B.	5-29-69
DIMENSIONS ARE IN INCHES AND MILLIMETERS AND ARE AFTER PLATING		CHECKED	<i>[Signature]</i>	6-3-69
DIMENSIONING SYSTEM		CH. DR.	<i>[Signature]</i>	6-3-69
INCHES (MM)		ENGR.		
TOLERANCES ON:		NEXT ASSEMBLY PARTS LIST SEE TABLE		
INCHES		PART NO.		
ANGLES		MATERIAL		
MILLIMETERS		FORGING NO.		
FINISH		F.N.O.		
MACHINED SURFACES, REF. USAS B46.1-1962		SCALE NONE W.D. NO.		

WORTHINGTON CONTROLS COMPANY NORWOOD, MASSACHUSETTS MONTEBELLO, CALIFORNIA		
CONTROL VALVE 20,000 SERIES-ANSI BUTT WELD ENDS QUICK CHANGE TRIM NO. 18 REV. ACTUATOR WITH 20" SPRINGS MOUNTING FOR SWITCHES		
SIZE	CODE/IDENT. NO.	REV.
D	38683 A8425	C

PC. NO.	PART NO.	NAME	NO. REQ.	MATERIAL	SIZE
1	010224-008-105	SPRING BARREL CAP	1	ASTM A283 GR D	
2	010191-002-117	BALL RACE	1	USS MACH 5	
3	010186-058-105	UPPER SPRING BUTTON	1	ASTM A283 GR D	
4	010220-033-002	SPRING BARREL	1	SAE 1020	
5	971512-020-110	NUT	1	ASTM A307	1" - 14UNC
6	010285-012-002	DIAPHRAGM PLATE	1	SAE 1020	
7	010275-025-686	DIAPHRAGM	1	NEOPRENE & RAYON FABRIC	
8	010217-024-105	STOP PLATE	1	ASTM A283 GR D	
9	010217-004-002	DIAPHRAGM WASHER	1	SAE 1020	
10	010700-006-100	YOKE	1	ASTM A216 GR WCB	
11	010213-006-317	PACKING BOX	1	WAKEFIELD ALLOY 41	
12	010209-013-410	PACKING BOX GLAND	1	ASTM B16	
13	971159-008-110	CAP SCREW	4	ASTM A307	1/2 - 13UNC X 1.75
14	971335-002-250	DRIVE SCREW	2	GENERAL AUSTENITIC ST.ST.	
15	983750-001-153	SERIAL PLATE	1	ASTM A167 TY 304	
16	011156-134-780	PLUG STEM	1	HAYNES ALLOY 25	
17	010102-009-780	PACKING BOX GLAND	1	ASTM A276 TY 316	
18	010106-001-026	DRIVE NUT	1	SAE 1117	
20	007905-008-066	BODY STUD	8	ASTM A193 GR B7	7/8 - 9UNC X 3.38
21	971342-027-780	PIN	1	HAYNES ALLOY 25	
22	013902-009-780	SEAT RING RETAINER	1	ASTM A461 GR 630	CONDITION H-900
23	013454-658-780	BODY	1	ASTM A351 GR CF 8M	
24	010234-608-780	SEAT RING	1	ASTM A276 TY 316 & NO.6 STELLITE	
25	013434-107-780	PLUG	1	ASTM A276 TY 316 & NO.6 STELLITE	
26	009191-431-801	SEAT RING GASKET	1	304 ST.ST. WITH ASBESTOS	2.75 O.D. X 2.38 I.D. X .125
27*	010110-237-780	BUSHING	1	NO. 6 STELLITE	
28	009191-170-801	BODY GASKET	1	304 ST.ST. WITH ASBESTOS	3.38 O.D. X 2.94 I.D. X .125
29*	013044-618-780	BONNET	1	ASTM A351 GR CF 8M	
30	971511-068-010	NUT	8	ASTM A194 GR 2H	7/8" - 9UNC
31	005675-503-779	PACKING	10	ASBESTOS & GRAPHITE	
33*	971490-003-177	PACKING BOX STUD	2	ASTM A193 GR B8	1/2 - 13UNC X 2.00
34	010105-001-780	PACKING BOX FLANGE	1	ASTM A235 CL C	
35	971520-005-158	PACKING BOX NUT	2	ASTM A194 GR 8 (TUFFTRIDED)	1/2 - 13UNC
36	983676-003-600	INDICATOR PLATE	1	ALUMINUM	
37	971305-015-250	MACHINE SCREW	3	GEN. AUSTENITIC ST.ST.	
38	010408-221-153	POINTER	1	ASTM A167 TY 304	
39	010408-384-117	SPLIT CLAMP	1	USS MACH	
40	001904-604-426	PACKING BOX GASKET	1	ASTM B152 TYP ETP	2.50 O.D. X 2.12 I.D. X .020
41	971919-007-916	STRING PACKING	1	ASBESTOS & GRAPHITE	.19 DIA X 16.00
42	010175-143-152	ACTUATOR STEM	1	ASTM A582 TY 303	
43	001904-628-800	YOKE GASKET	1	ASBESTOS FIBER	7.12 O.D. X 5.62 I.D. X .031
44	971161-003-110	CAP SCREW	12	ASTM A307	3/8 - 16UNC X .75
45	010310-004-105	LOWER DIAPHRAGM CASE	1	ASTM A283 GR D	
46	971511-012-110	NUT	40	ASTM A307	3/8 - 16UNC
47	971004-017-110	DIAPHRAGM CASE CAP SCREW	40	ASTM A307	3/8 - 16UNC X 1.25
48	010186-059-105	LOWER SPRING BUTTON	1	ASTM A283 GR D	
49	010309-082-105	UPPER DIAPHRAGM CASE	1	ASTM A283 GR D	
50	000049-001-130	SPRING	1	ASTM A229	
51	971700-027-250	BALL & RETAINER	1	GEN. AUSTENITIC ST.ST.	
52	010199-019-021	ADJUSTING SCREW	1	ASTM A108 GR B 1113	8 - 32UNC X .56
53	971264-008-110	MACHINE SCREW	8	ASTM A307	
54	008149-311-105	UPPER MOUNTING BRACKET	1	ASTM A283 GR D	
55	971002-007-110	CAP SCREW	4	ASTM A307	5/16 - 18UNC X .62
56	971961-005-888	SWITCH	2	PURCHASED ASSEMBLY	
57	009790-041-207	TAKE OFF BUTTON	2	ASTM A193 GR B6	
58	009790-003-207	ADAPTER	1	ASTM A193 GR B6	1/4 - 28UNF
59	971514-001-110	LOCK NUT	2	ASTM A307	12 - 24UNC X .81
60	971268-012-110	MACHINE SCREW	1	ASTM A307	
61	051425-010-026	STEM CONNECTOR	1	SAE 1117	
62	051332-018-152	CLAMP ROD	1	ASTM A582 TY 303	
63	971513-006-110	LOCK NUT	1	ASTM A307	5/16 - 18UNC
64	008149-295-105	LOWER MOUNTING BRACKET	1	ASTM A283 GR D	

- \* CONTAINED IN ASSEMBLY 013044-623-999
- ▲ CONTAINED IN ASSEMBLY 010309-083-999
- CONTAINED IN ASSEMBLY 010175-142-999
- RECOMMENDED SPARE PARTS

- REMACINE YOKE PER 010405-008-A
- NOTES :
1. VALVE STROKE = 1.50 INCHES
  2. MAXIMUM TEMPERATURE = 650 ° F
  3. AIR PRESSURE IN THE DIAPHRAGM CHAMBER MUST NOT EXCEED 55 PSIG TO PREVENT COMPONENT DAMAGE
  4. REQUIRED AIR PRESSURE INPUT TO BEGIN LIFT OF PLUG FROM MAIN SEAT = 29 PSIG
  5. MAXIMUM AIR TO OPERATE VALVE 55 PSIG
  6. VALVE C<sub>v</sub> = 46
  7. REQUIRED AIR PRESSURE INPUT FOR SHUT OFF OF BACKSEAT = 55 PSIG.

REVISIONS			
SYM.	DESCRIPTION	DISP.	DATE
1	REWORK		
2	SCRAP		
3	USE AS IS		
4	RECORD CHANGE		
B	REQ NO. 3597	4	9-17-70

ASSEMBLY DWG  
A8425-D

UNLESS OTHERWISE SPECIFIED		DRAWN	RDB-CEG 9-4-70	MASONELAN INTERNATIONAL, INC. NORWOOD, MASSACHUSETTS, U.S.A.	
DIMENSIONS ARE IN INCHES AND MILLIMETERS AND ARE AFTER PLATING		CHECKED	R. Quary 1-4-70	CONTROL VALVE	
DIMENSIONING SYSTEM + INCHES (MM)		CH. DR.	C. French 9-4-70	2" 20000 SERIES-1500LB ANSI RATING	
TOLERANCES ON:		ENGR.		3" BUTT WELD ENDS PER WAPD DWG NO. 500B822	
INCHES		NEXT ASSEMBLY		FULL AREA- LINEAR BACKSEAT	
ANGLES		PARTS LIST		QUICK CHANGE TRIM-18 RACT W/RO SPRINGS	
MILLIMETERS		PART NO.		D 2400 X SWITCHES	
FILLET RADII		PATTERN NO.		SIZE	CODE IDENT. NO.
BREAK SHARP EDGES AND REMOVE ALL BURRS		MATERIAL		D	38683
MACHINED SURFACES		FORGING NO.		A 8529	
REF. USAS B46.1-1962		FINISH		SCALE	REV.
		F. NO.			B
				W. NO.	H 20693-4

B8 - MUESCO CONTROLS, INC.