	Technical Standards and Safety Authority INSPECTION PROCEDURE	July 4, 2012
	Procedure for Testing of Elevator Hydraulic Jack Replacements	Rev. 0

This inspection procedure is to be used only where

A) a hydraulic jack or cylinder is replaced with **no change** :

- in jack arrangement or
- nominal plunger diameter and
- no change to the car speed.

Verification of speeds and testing with 100% rated load [A17.1/CSA B44 2010 8.10.3.2.3(d) and (cc)] is not required.

- ✓ A relief valve test shall be carried out by engaging the plunger stop ring and the no load speeds shall be confirmed.

Where the Working Pressure is not marked on a tag on the machine,

- ✓ measure the actual on site no-load working pressure.
- ✓ Calculate the full load working pressures using hydraulic chart below.
- ✓ Calculate 150% of full load working pressure to determine the maximum allowable relief pressure.

When possible, use the pressure figures from the pressure data tag on the driving machine.

With the plunger on the stop ring, verify,

- ✓ the actual relief pressure is less than or equal to the maximum allowable relief pressure marked on the tag or as calculated by the chart.

This will verify the integrity of the hydraulic system including the new components.

Top and bottom car runby and clearances do not have to conform to current code if no changes are made to these clearances.

B) Where a hydraulic jack or cylinder is replaced **with changes**

- in jack arrangement or
- nominal plunger diameter or
- to the car speed

Use full load tests to verify

- ✓ speeds and
- ✓ pressure

required as per A17.1/CSA B44 2010 8.10.3.2.3(d) and (cc).

Note: Chart for Calculating Hydraulic Plunger Diameter vs. Pressure as shown below on page 2.

HYDRAULIC PLUNGER DIAMETER vs. PRESSURE

PRESSURE in Pounds per square inch (psi)

Rated Load in Lbs	PLUNGER CIRCUMFERENCE IN INCHES																		
	6.3	7.8	8.6	9.4	11	12	13	14	16	17	19	20	22	24	25	27	30	33	40
	PLUNGER DIAMETER IN INCHES																		
	2	2.5	2.8	3	3.5	3.7	4	4.5	5	5.4	6	6.5	7	7.5	8	8.5	9.5	11	13
1000	317	207	170	142	104	90	80	64	51	43	36	30	26	23	20	18	14	11	8
1500	475	310	255	213	156	135	121	96	76	65	53	45	39	34	30	26	21	17	12
2000	633	413	340	284	208	180	161	128	102	87	71	60	52	46	40	35	28	23	16
2500	792	516	425	356	260	226	201	160	127	109	89	75	65	57	50	44	35	28	20
3000	950	620	510	427	312	271	241	192	153	130	107	91	78	68	60	53	42	34	24
3500		723	595	498	363	316	281	224	178	152	124	106	91	80	70	62	50	40	28
4000		826	680	569	415	361	322	256	204	174	142	121	104	91	80	71	57	45	32
4500		929	765	640	467	406	362	289	229	196	160	136	117	102	90	79	64	51	36
5000			850	711	519	451	402	321	255	217	178	151	130	114	100	88	71	57	40
5500			929	782	571	496	442	353	280	239	196	166	143	125	110	97	78	62	44
6000				853	623	541	483	385	306	261	213	181	156	137	120	106	85	68	48
6500				924	675	587	523	417	331	283	231	196	169	148	130	115	92	74	52
7000				995	727	632	563	449	357	304	249	211	182	159	140	123	99	79	56
7500					779	677	603	481	382	326	267	226	195	171	150	132	106	85	60
8000					831	722	643	513	408	348	284	242	208	182	160	141	113	91	64
9000					935	812	724	577	459	391	320	272	234	205	180	159	127	102	72
10000						902	804	641	510	435	356	302	260	228	199	176	142	113	80
12000							965	769	612	522	427	362	312	273	239	212	170	136	96
15000								962	765	652	533	453	389	341	299	264	212	170	120
18000									918	783	640	544	467	410	359	317	255	204	144
20000										870	711	604	519	455	399	353	283	227	160
25000											889	755	649	569	499	441	354	283	200
30000												906	779	683	598	529	425	340	240
35000													909	796	698	617	495	397	280

For each additional 100 lbs. of rated load for the applicable plunger diameter, add the incremental psi amount to the amount chosen from the table above. For example: 530 lbs. Rated load and a 6.5" diameter plunger - **Calculation: 3 x 3.0 (from below) +151 (from above) = 160 psi.**

Add per 100 lbs	31.7	20.7	20.7	17.0	14.2	10.4	8.0	6.4	5.1	4.3	3.6	3.0	2.6	2.3	2.0	1.8	1.4	1.1	0.8

Add the empty car up pressure to the calculated chart pressure to get the full load working pressure.

Relief valve setting: Pressure not to raise more than 50% above the maximum working pressure.

For multiple cylinders: Divide the calculated result by the number of cylinders, then add to the empty car up pressure to get full load working pressure

For (1:2) roping: Calculate as above. Then multiply the results by 2 to obtain working pressure.
(For 1:3 multiply by 3; for 1:4 multiply by 4; etc.)

NOTE: When possible, use the pressure figures from the pressure data tag on the unit.