Coating	225	Castor oil	C3	None	--	255	--	--	--	0	P_b not achieved
	224	Ditto	C4	"	261	223	258	229	B3	16	
	237	"	C4	L11	244	204	243	213	A4	16	
Fluid with coating, C1	238	Ethylene glycol	C1	L17	252	212	250	210	A1	12	
	240	Ditto	C1	L17	248	210	246	209	A1	16	
	241	"	C1	L17	247	211	246	208	B1	16	
	242	Polyethylene glycol	C1	L17	250	212	248	210	B3	18	
	243	Ditto	C1	L17	243	208	242	208	A1	17	
	252	"	C1	L19	240	207	240	211	A4	15	
	253	"	C1	L20	240	207	240	212	A4	15	
	254	"	C1	L21	248	211	248	213	A3	16	
Fluid without coating, C1	274	Polyethylene glycol	None	L22	249	229	249	226	A1	15	Stem seal broke at P_b
	276	Ditto	"	L22	278	224	248	213	B1	1	
	275	"	"	L23	247	230	245	228	B1	13	
	465	Silicate ester	"	L17	255	219	255	219	A1	14	
					Extrusion Ratio 4:1						
Fluids and lubricants	289	Castor oil	None	L17	208	186	208	186	A1	11	
	306(b)	Castor oil	"	L17	204	192	200	190	A1	13	
	303	Polyethylene glycol	"	L22	205	184	208	188	A1	14	
	293	Polyethylene glycol	"	L23	204	189	201	185	B3	15	
	294	Water	"	L17	192	178	205	188	A3	9	
	295	"	"	L17	204	189	212	189	A1	13	
	301	"	"	L17	206	186	212	186	A1	15	
	302(b)	"	"	L17	202	191	204	189	A1	13	

(a) Billet lubricants listed in Table III, coatings in Table IV.

(b) Billet surface finish was obtained by grit blasting followed by vapor blasting.

TABLE X. INVESTIGATION OF EXTRUSION RATIO, STEM SPEED, AND DIE ANGLE FOR 80 F HYDROSTATIC EXTRUSION OF AISI 4340 ROUNDS

Billet diameter - 1-3/4 inches Billet surface finish - 60 to 120 microinches
Fluid - Castor oil Billet lubricant - L17 (20 wt% MoS_2 in Castor Wax)

Trial	Extrusion Ratio	Stem Speed, ipm	Die Angle (Included), degrees	Billet[b] Coating	Extrusion Pressure, 1000 psi				Type of Curve (Fig. 26)	Length of Extrusion, inches	Comment
					Breakthrough		Runout				
					Stem	Fluid	Stem	Fluid			
285	3.3	80	45	None	262	243	--	--	D2	8	
287	3.3	80	45	"	177	167	180	167	A3	12	
312	3.3	80	45	"	171	160	168	157	A1	14	
289	4	20	45	None	208	186	208	186	A1	11	
306[a]	4	20	45	"	204	192	200	120	A1	13	
323[a]	4	80	45	"	206	189	206	188	A1	17	
261	5	20	30	None	273	250	--	--	--	--	P_b not achieved
257	5	20	45	"	255	218	251	215	B1	17	
277	5	20	45	"	240	223	240	216	B1	13	
280	5	20	45	"	248	227	248	220	B1	13	
259	5	20	60	"	256	228	254	223	B1	19	
265	5	20	60	"	259	233	257	231	A1	14	
213	5	20	60	C1	261	219	260	216	B1	19	
214	5	20	60	C1	259	219	258	216	B1	17	
260A	5	20	90	None	296	260	--	--	--	2	P_b not achieved
260B	5	20	90	"	270	240	--	--	--	--	P_b not achieved
262	5	1	45	None	266	244	263	234	D1	6	
288	5	1	45	"	260	229	256.5	217	D2	11	
263	5	6	45	"	255	235	256	229	B1	13	
206	5	6	45	C1	266	224	254	216	B1	15	
207	5	6	45	"	260	218	256	216	B2	15	
208	5	6	45	"	256	218	250	215	B1	16	
328[a]	5	80	45	None	240	220	240	219	A2	4	
339	5	80	45	"	240	219	240	218	A1	5	
340	5	80	45	"	237	217	243	217	A1	14	
246[c]	6	20	45	C1	281	235	280	235	B3	17	
247	6	20	45	None	280	233	278	233	B1	16	
451	6	20	45	"	285	246	--	--	--	--	P_b not achieved
248[d]	6	20	45	C1	279	231	278	231	C1	16	
244	6	20	60	"	284	237	282	234	B1	16	
245	6	20	60	"	284	236	283	233	B1	16	

(a) Billet surface finish was obtained by grit blasting followed by vapor blasting.
(b) C1 = Phosphated coating.
(c) Billet lubricant was L18.
(d) Billet lubricant was L11.