

APOLLO NEWS REFERENCE

An object, molecule, or spacecraft needs almost seven miles per second to escape from Earth completely. To accomplish this same feat from the surface of the Moon requires only one point five. This means that, pound for pound, it is some twenty-five times easier to escape Selene than Earth. Because of this, and the fact that Luna is eternally exposed to space, our Moon will undoubtedly become a launching platform unequalled in the solar system.

It is on the Moon that a spacecraft-launching system impractical on any other planet can be used. A catapult, a gleaming steel and concrete bow, will stretch across the miles of lonely lunar wilderness. Powered by the sun or man-made

tapping of the atom, this narrow silver arrow will become Man's means of travel to the limits of this system and beyond. Visible from Earth by even simple telescopes, this shining strip of steel will hurl, without resistance from the airless lunar surface, capsules containing medicines, materials, and products developed on the Moon, to Earth. Its power will accelerate and fling into the emptiness, manned craft to journey to the planets, carrying exploration of these captives of the sun to its logical conclusion: the acquisition of these places, too, for Man. Finally, from the timeless lunar landscape, with the almost unlimited capacity of this device anchored to the Moon, the instruments of Man will rise around her curving, silent arc, and fall across the Night which separates the stars. And someday, men will follow.

THE AUTHOR

Richard Hoagland is a former staff lecturer and Curator of Astronomy and Space Science at the Springfield Museum of Science in Massachusetts. He subsequently was Assistant Director of the Gengars Science Center and Planetarium at Children's Museum, Hartford, Conn., and devised several major programs to modernize planetariums in the U. S. His innovations include techniques described as "a major breakthrough in the field of planetarium programming and simulation" in the journal Sky and Telescope. A writer and lecturer, Mr. Hoagland is a consultant on astronomy and space science to museums, planetaria, and the aerospace and broadcasting industries.



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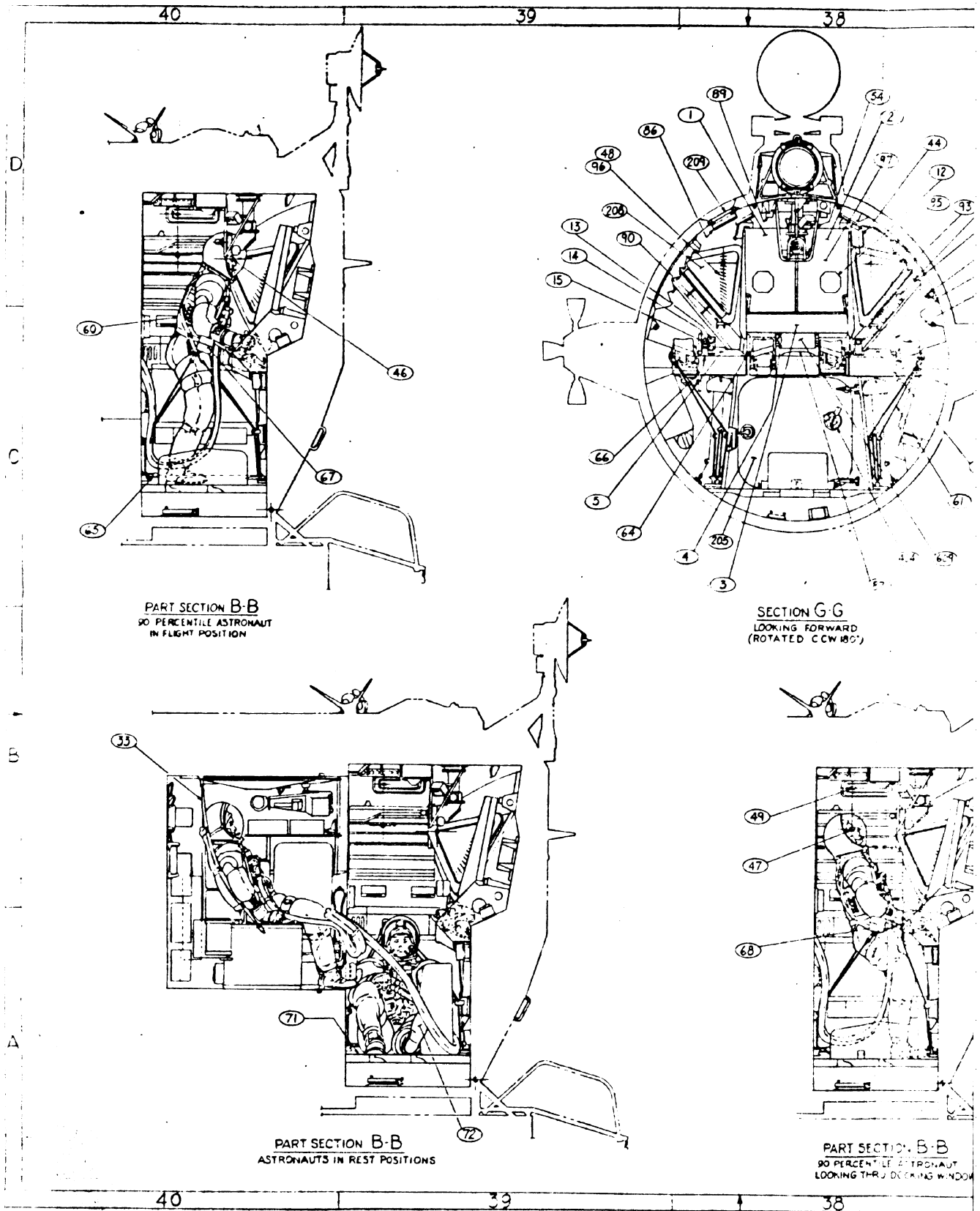
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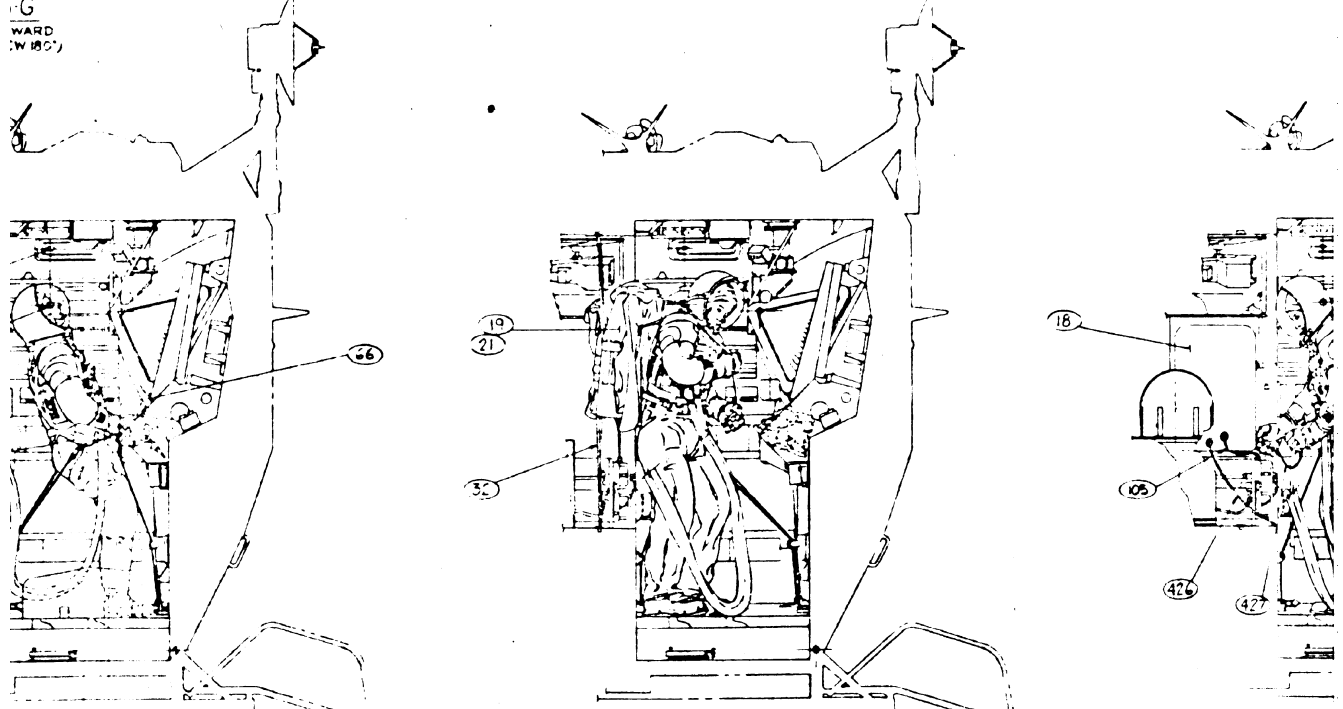
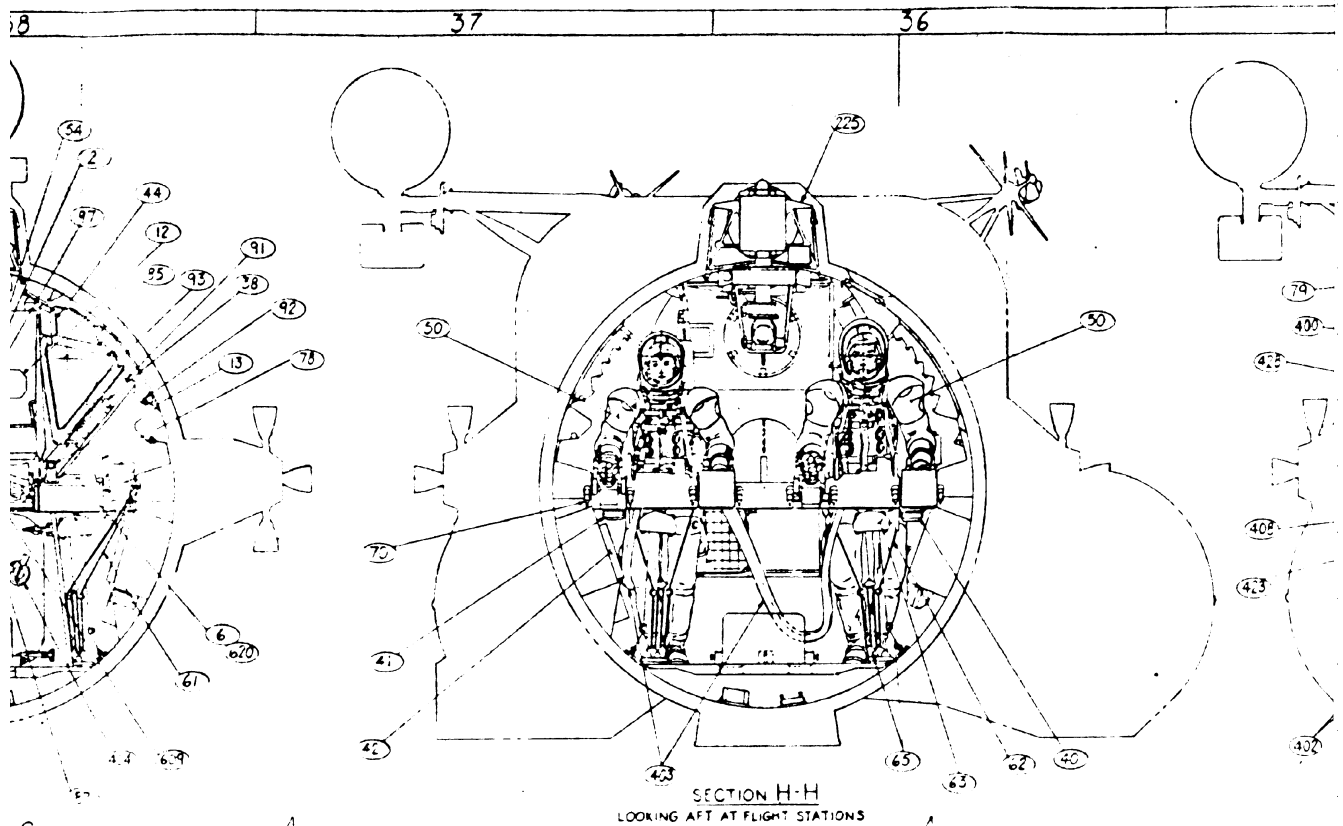
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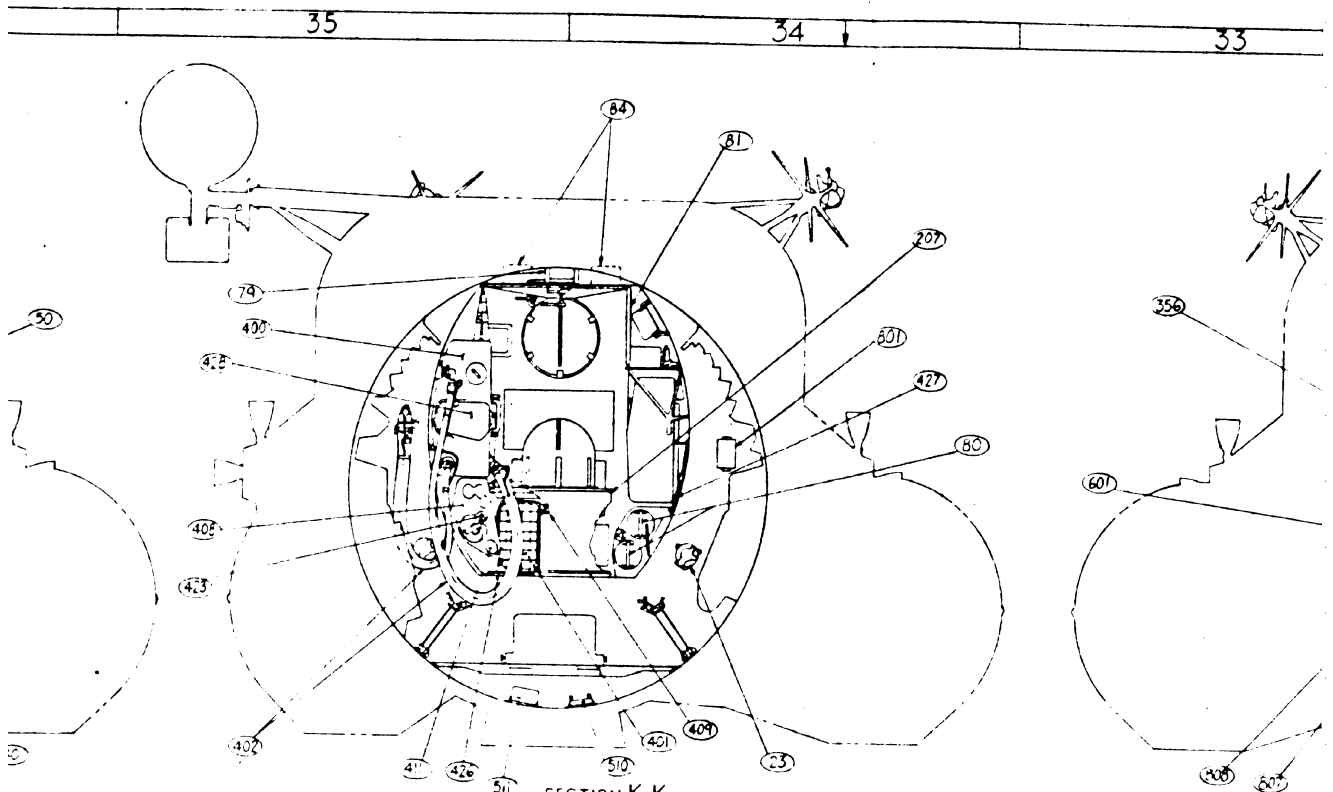
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PART SECTION B-B
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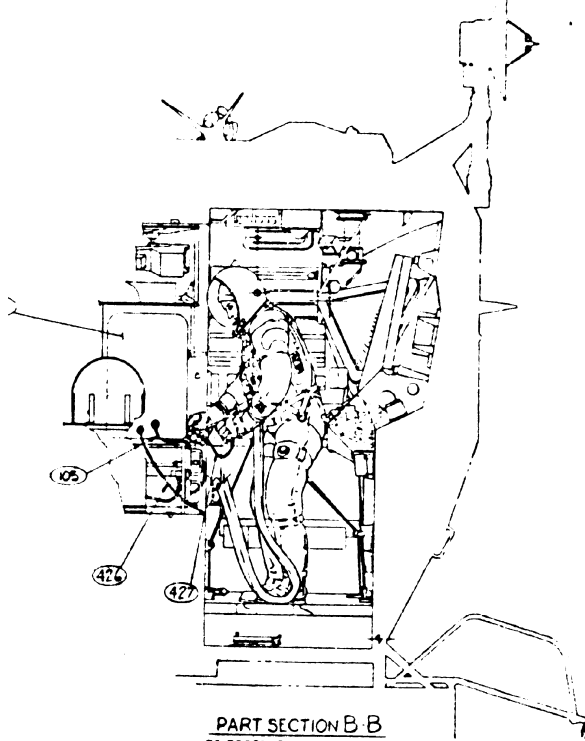
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PART
90 PERCENTILE
AT REG

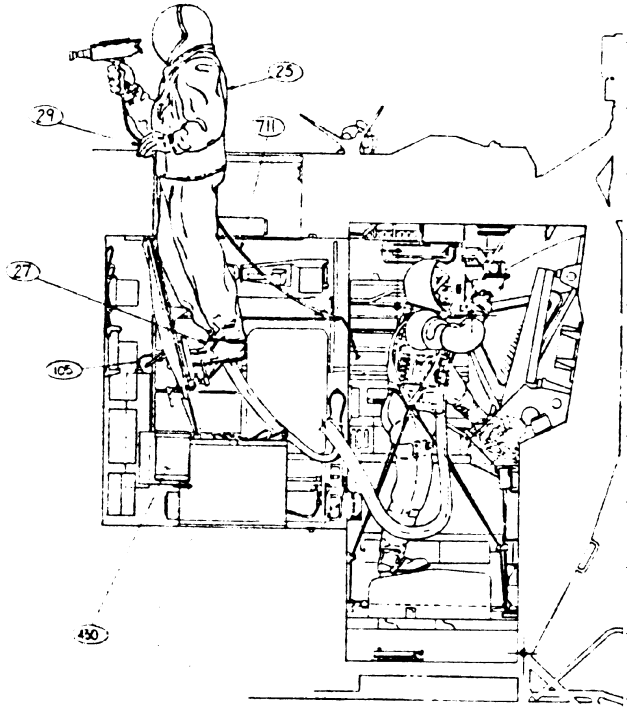
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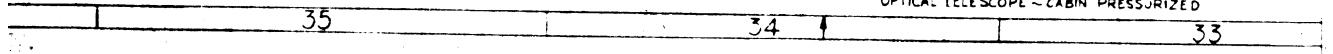
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LOCKING AFT AT 227

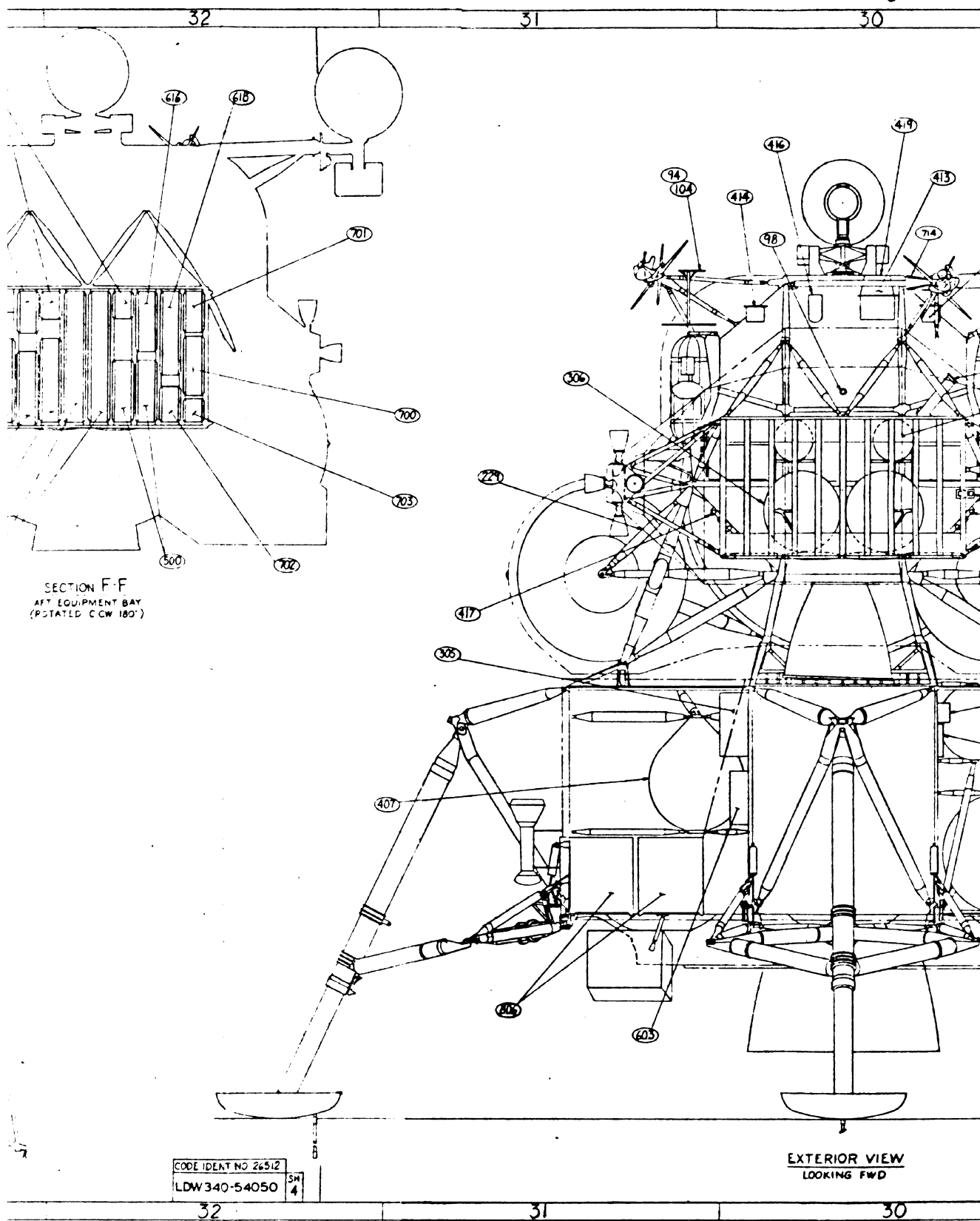


PART SECTION B-B
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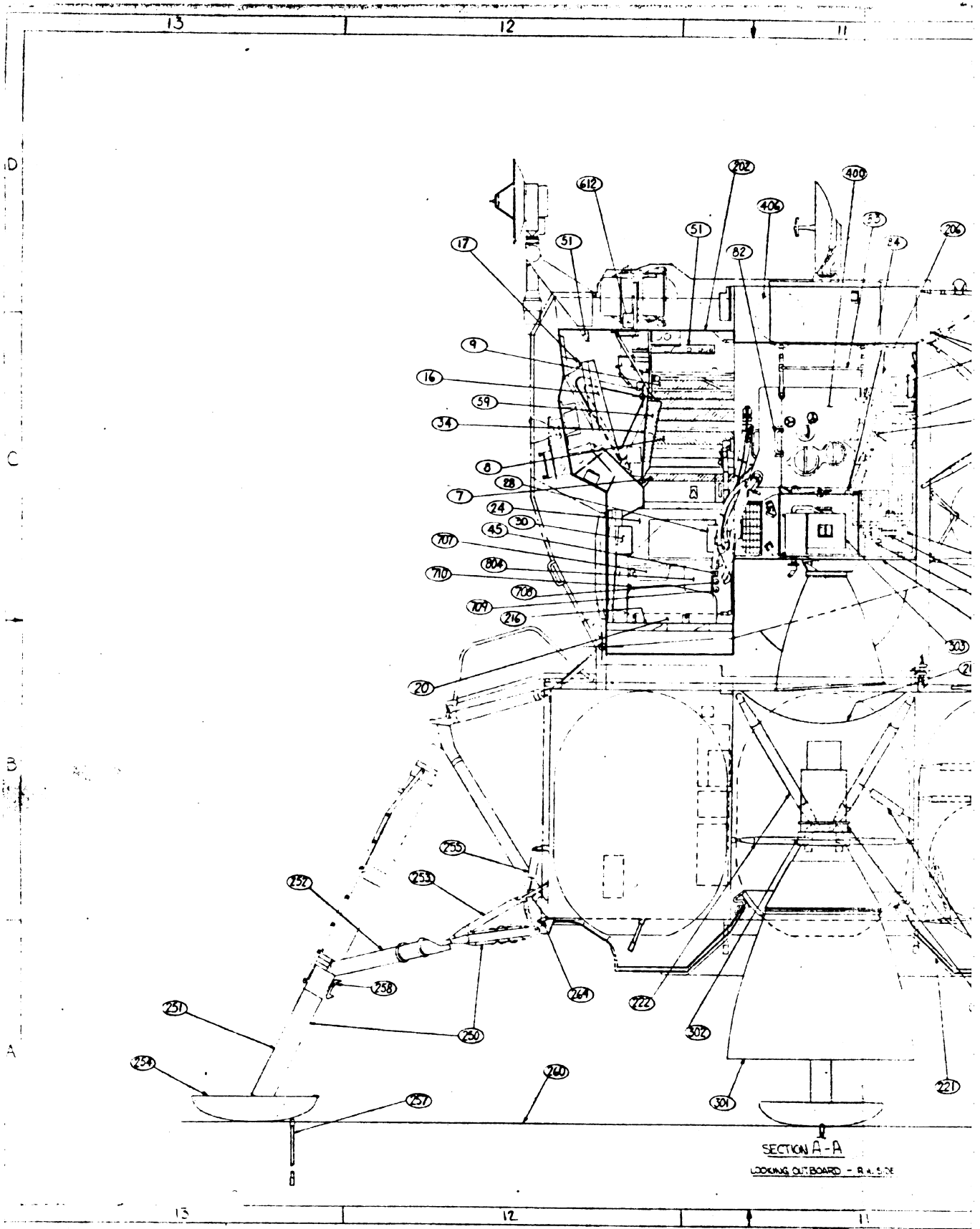


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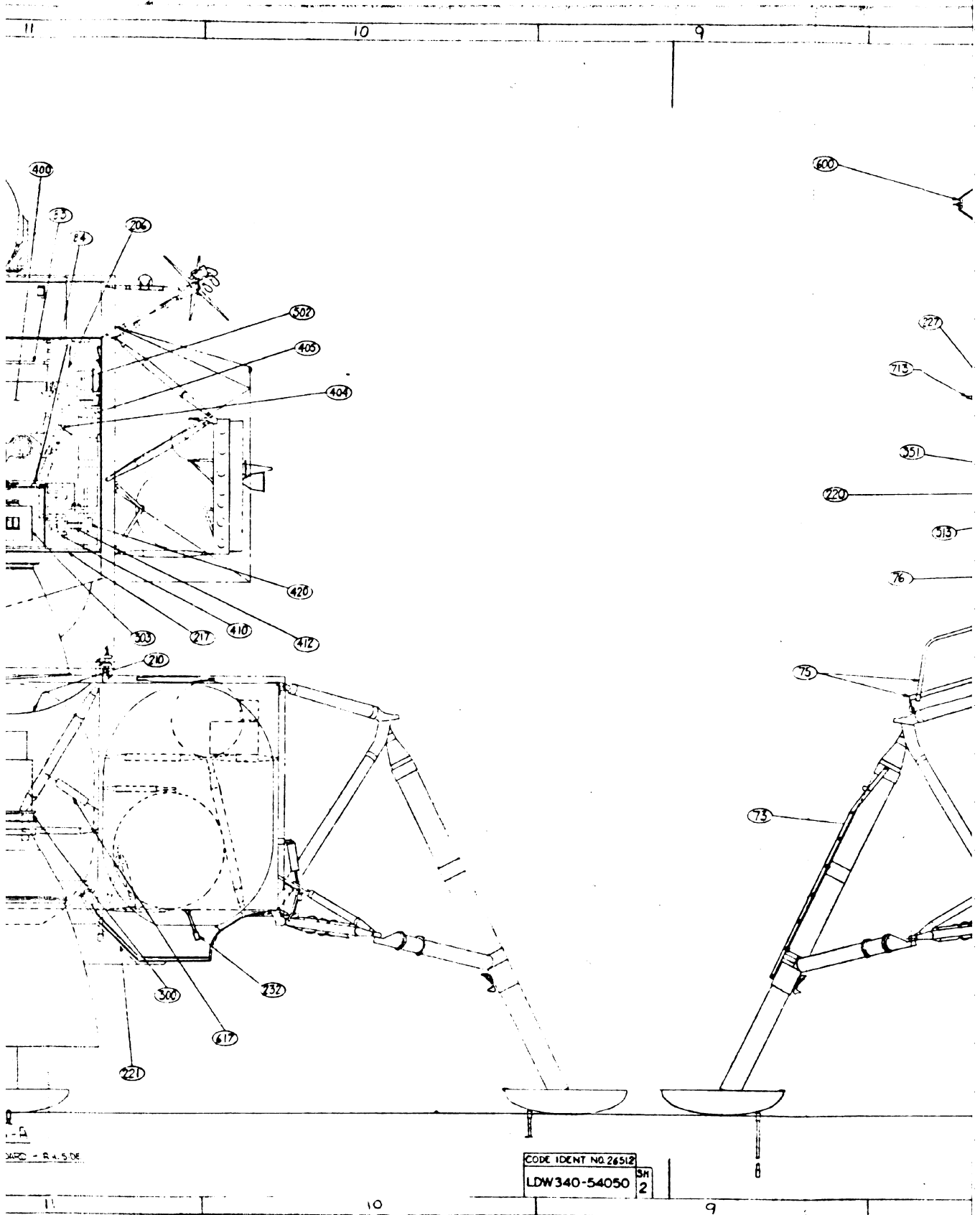


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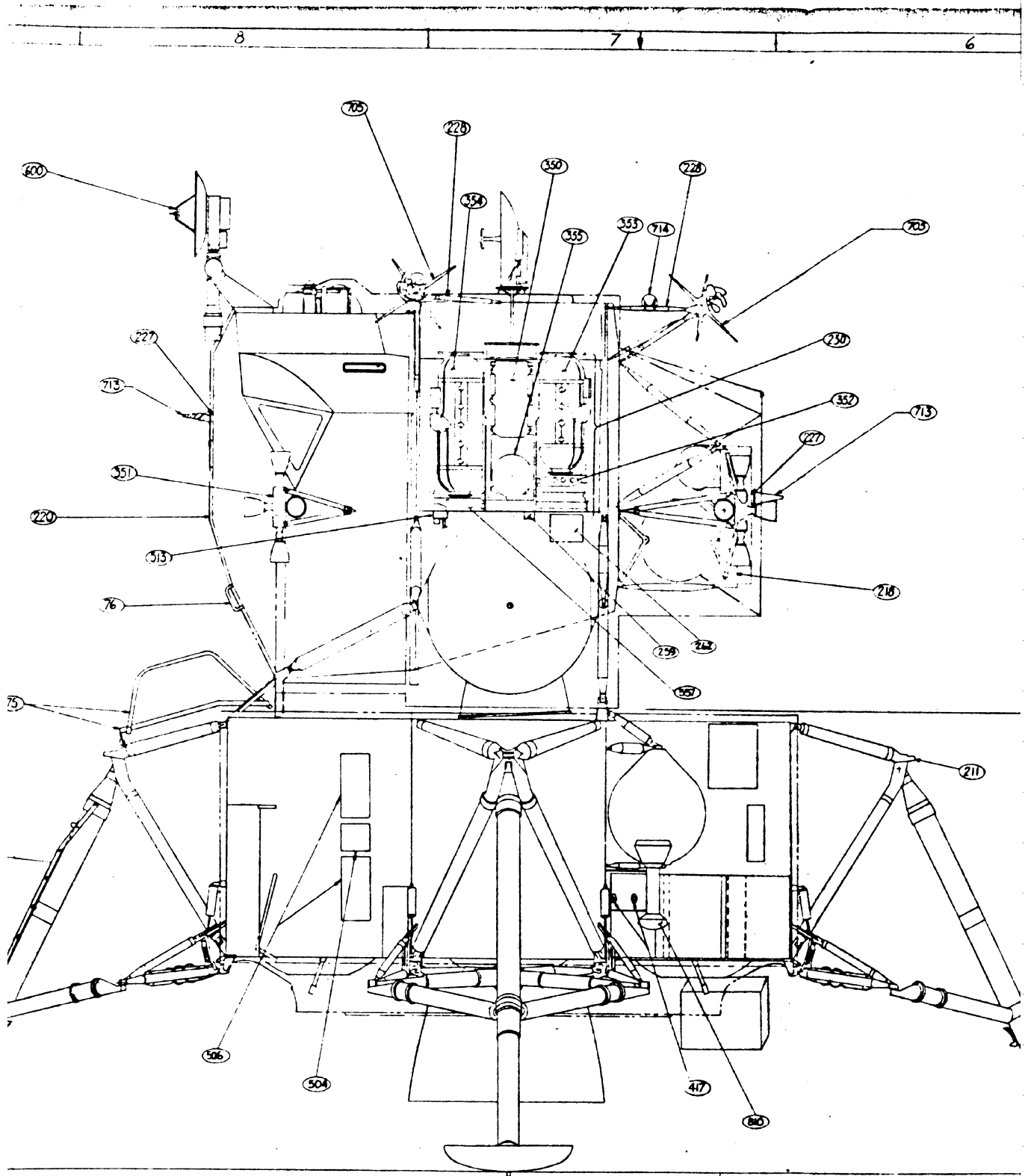


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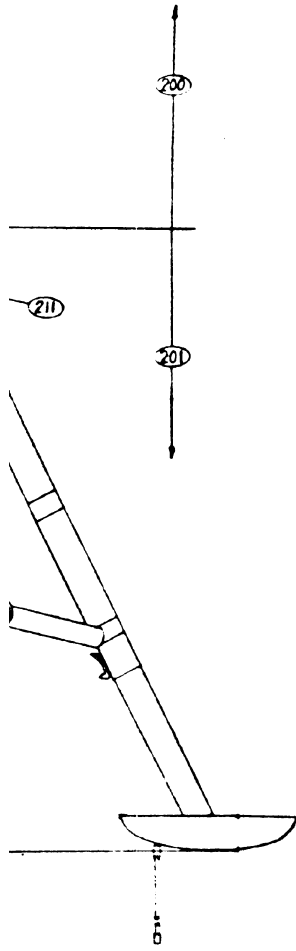
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VIEW E-E
LOOKING INBOARD - LH SIDE

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31	PLSS BATTERY - STOWED (6)	15A	
32	MULTI-PURPOSE WEBBING - INSTALLED AT DOCKING STATION	37A	
33	MULTI-PURPOSE WEBBING - INSTALLED AT REST STATION	40B	
34	MULTI-PURPOSE WEBBING - INSTALLED AS PANEL PROTECTION	12C	
35	E. V. VISORS (STOWED)	21C	
36	PLSS CONDENSATE CONTAINER ASSY	21C	
37	FOOD CONTAINERS (2)	20D	
38	RADIATION SURVEY METER	38D	
39	WATER PROBE	20D	
40	CMOIR CHECK LIST	36C	
41	SYS ENGINEER CHECK LIST	37C	
42	FLIGHT DATA KIT	37C	
43	EXTRAHEMICULAR CREW TRANSFER DEVICE	20D	
44	SEQUENCE CAMERA	38D	
45	INFLIGHT TOOL SET	12C, 20D	
46	DESIGN EYE (SHOWN THUS →)	39C	
47	DOCKING EYE (SHOWN THUS →)	36B	
48	LANDING POINT DESIGNATOR	38D	
49	OVER-HEAD DOCKING RETICLE	36B	
50	PERSONNEL RADIATION DOSIMETER	36D, 37D	
51	ELECTRICAL CONNECTOR SUPPORTS	11D, 12D	
52	FLCA GLOVES UNLISHED (6)	19C	
53	FLCA GLOVES USED (6)	38D	
54	AGT GUARD	38D	
55	PGA URINE DRAIN LINE - STOWED	21B	
56	URINE TRANSFER VALVE	21B	
57	URINE STORAGE	19C	
58	URINE BAG	38D	
59	HARNESSES - STOWED (2)	12C	
60	HARNESSES - DOWNED	35B, 40C	
61	RESTRAINT CORD - STOWED (2)	38C	
62	RESTRAINT CORD - DOWNED	36C	
63	CONSTANT FORCE TAKE UP REEL (2)	36C	
64	TAKE UP REEL LOCKING CONTROL (2)	39C	
65	PULLEY SYSTEM (2)	36C, 40C	
66	OVER-HEAD DOCKING CONNECTION	37B, 39C	
67	ARMRESTS - FLIGHT POSITION (4)	42C	
68	ARMRESTS - DOCKING POSITION (2)	58A	
69	ARMRESTS - STOWED POSITION (4)	19C	
70	ARMREST ATTENUATION CYLINDERS (8)	37C	
71	VEL. CRO FLOOR	40A	
72	VEL. CRO ON BOOTS	39A	
73	FIXED LADDER	9B, 9A	
74	PORTABLE LADDER	9B, 9A	
75	PLATFORM & HANDRAILS	9B	
76	EXTERNAL HANDGRIP (2)	8C	
77	HANDGRIP - COCKPIT FLOOR (3)	19B	
78	HANDGRIPS - FWD CONTROL PANELS (4)	37C	
79	HANDGRIP - COCKPIT CEILING	20D, 35D	
80	HANDGRIP - LICH CANISTER (2)	19C, 34C	
81	HANDGRIP - 22 UPPER	20D, 34D	
82	HANDGRIP - ECS PACKAGE - FWD	11D	
83	HANDGRIP - ECS PACKAGE - UPPER	11D	
84	HANDGRIP/FOOTSTEP - UPPER HATCH (2)	11D, 34D	
85	FWD WINDOW SHADE (2)	19C, 36D	
86	OVER-HEAD WINDOW SHADE	20D, 39C	
87	DEPT PANEL GUARDS	19C, 38C	
88	EQUIPMENT MAIN LINE	19B	
89	MAIN PANEL/CABIN FLOODLIGHTS (2)	19D, 36D	
90	FWD PANEL FLOODLIGHTS (2)	38D	
91	CIRCUIT BREAKER FLOODLIGHTS (2)	38D	
92	SIDE CONSOLE FLOODLIGHTS (8)	37D	
93	E. L. PANEL LIGHTING	36D	
94	DOCKING TARGET R/A DEVICES (6)	31D	
95	LFD R/A	39D	
96	TRACKING LIGHT	19C	
97	SELF-LUMINOUS SWITCH TIPS (12S)	36C	
98	DOCKING LIGHTS - WHITE (2) (FWD + 1 AFT)	17C, 36D	
99	DOCKING LIGHT - YELLOW (1) (FWD)	16C	
100	DOCKING LIGHT - RED (1) (FWD)	15C	
101	DOCKING LIGHT - GREEN (1) (FWD)	16C	
102	GIMBAL ANGLE SEQUENCE TRANSFORMATION ASSY & COLD PLATE	19C	
103	STABILIZATION & CONTROL ASSY (2)	19C	
104	DOCKING TARGET	31D	
105	PLSS CONDENSATE HOSE	34B, 36A	
H. VEHICLE DESIGN INTEGRATION			
200	ASCENT STAGE		
201	DESCENT STAGE		
202	PRESSURE SHELL OUTLINE		12D
203	INTERSTAGE SUPPORTS		15B
204	INTERSTAGE CONNECTION POINTS (4) (SHOWN THUS →)		
205	FORWARD HATCH		
206	UPPER HATCH		11D
207	ENGINE COVER		
208	FORWARD WINDOWS (2)		
209	COMMANDERS OVERHEAD WINDOW		
210	ASCENT ENGINE BLAST DEFLECTOR		11B
211	OUTRIGGER ASSY		
212	PROPELLANT FUEL TANK (A/S)		15C
213	PROPELLANT OXIDIZER TANK (A/S)		17C
214	PROPELLANT OXIDIZER TANK (2-D/S)		27B
215	PROPELLANT FUEL TANK (2-D/S)		25B
216	FLOOR - COCKPIT		
217	FLOOR - EQUIPMENT TUNNEL		
218	ELECTRICAL REPLACEABLE ASSY (ERA) RACK		
219	DOCKING DROGUE		
220	THERMAL SHIELD / SEE NOTE 1)		
221	BASE HEAT SHIELD D/S		
222	DESCENT ENGINE MOUNT		
223	SCIENTIFIC EQUIPMENT BAY		6C
224	RCS THRUSTER CLUSTER MOUNT		
225	NAVIGATION BASE		
226	AFT EQUIPMENT BAY		
227	S-BAND ANTENNA MOUNTS (2)		
228	NAV ANTENNA MOUNTS (2)		
229	PROPELLANT TANK MOUNTS A/S		29C
230	RCS TANK MODULE (2)		
231	PROPELLANT TANK SUPPORTS D/S		
232	SHOCK MOUNT - LANDING GEAR		
233	S/LA LUBRICAL		
III. MECHANICAL DESIGN			
250	LANDING GEAR		
251	PRIMARY STRUT		
252	SECONDARY STRUT		
253	DEPLOYMENT TRUSS		
254	LANDING PAD		
255	DEPLOYMENT & DOWN LOCK MECHANISM		
256	INTERSTAGE UMBILICAL GULLOTINE		
257	LUNAR SURFACE SENSING PROBE		
258	LSSP UNLOCK MECHANISM		
259	PYRO BATTERY (2)		7C
260	GROUND LINE		
261	ELECTRICAL CIRCUIT INTERRUPTERS (2)		
262	EXPLOSIVE DEVICES RELAY BOX (2)		7C
263	INTERSTAGE NUT AND BOLT (4)		
264	LANDING GEAR UNLOCKS (4)		
IV. PROPULSION			
300	DESCENT ENGINE		
301	DESCENT ENGINE SKIRT CONTOUR		
302	DESCENT ENGINE GIMBAL POINTS		
303	ASCENT ENGINE		
304	HELIUM PRESSURIZATION MODULE (A/S-D)		2
305	SUPERCRITICAL HELIUM PRESS. MODULE (D/S)		
306	HELIUM TANK (2) A/S		
307	5 HELIUM STORAGE TANKS (D/S)		
V. REACTION CONTROL			
350	HELIUM PRESSURIZATION MODULE (2)		
351	THRUSTER CLUSTER ASSY (4)		
352	FUEL SERVICE PANEL (2)		
353	RCS FUEL TANK (2)		
354	RCS OXIDIZER TANK (2)		
355	RCS HELIUM TANK (2)		
356	PROPELLANT QUANTITY GAGING SYSTEM CONTROL UNIT		
357	OXIDIZER SERVICE PANEL (2)		
VI. ENVIRONMENTAL CONTROL			
400	SUIT CIRCUIT ASSY		11D, 3
401	CABIN AIR RECIRCULATION ASSY (FAH)		3
402	UMBILICAL HOSES (2) - STOWED		3
403	UMBILICAL HOSES (2) - DOWNED		3
404	CABIN PRESSURE RELIEF AND DUMP VALVE (2)		10C
405	CABIN PRESSURE SWITCHES		
406	WATER TANK (2 A/S)		11D
407	WATER TANK (D/S)		
408	WATER CONTROL MODULE		
409	CABIN TEMPERATURE CONTROL VALVE		
410	COOLANT REGENERATIVE HEAT EXCHANGER		
411	SUIT TEMPERATURE CONTROL VALVE		
412	COOLANT RECIRCULATION ASSY		
413	PRIMARY WATER EVAPORATOR		
414	SECONDARY WATER EVAPORATOR		
415	SECOND PRIMARY WATER EVAPORATOR		
416	COOLANT ACCUMULATOR		
417	WATER SERVICE AND GAS CHARGING PORTS (4 A/S, 2 D/S)		7A
418	GLYCOL FILL PORTS (4 A/S)		
419	STEAM VENT (AFT EQUIPMENT BAY)		
420	FILTER - SECONDARY COOLANT LOOP		
421	GASEOUS OXYGEN TANKS (2) (A/S)		
422	GOK TANK (D/S)		2

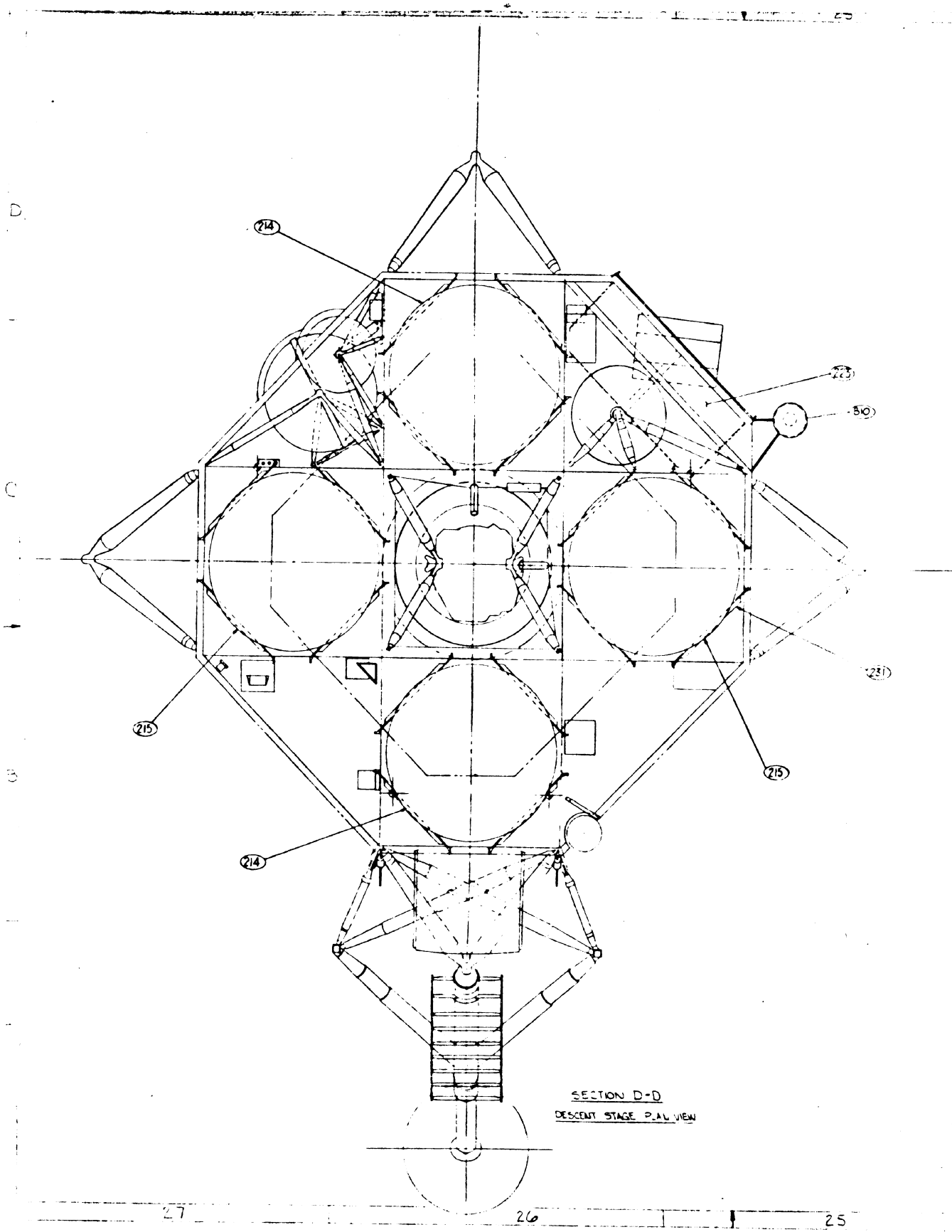


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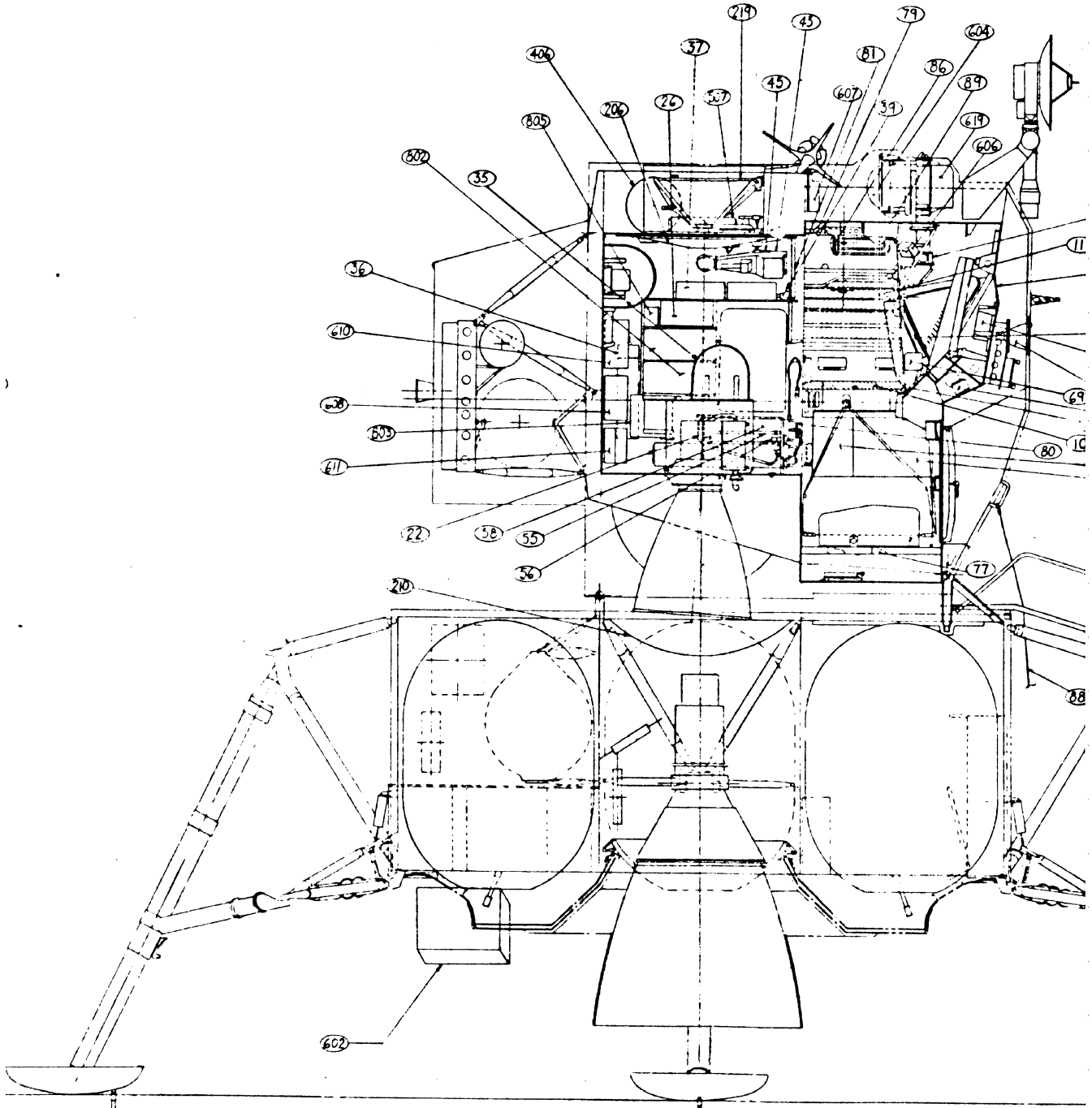
ITEM	NOMENCLATURE	ZONE	NOTES	MANUFACTURING OPERATIONS
			1 THERMAL SHIELDING SHOWN IN PHANTOM LINE FOR REFERENCE ONLY	
423	PLSS WATER FILL VALVE	35C		POST MARKED AND ALL OTHER MARKINGS IN REDUCED DIMENSIONS SEE 1074 BIBLE IF NECESSARY
424	HIGH PRESSURE OXYGEN CONTROL ASSY (D/S)	29B		PLATE AND BRASS COVER SHOWN UNASSEMBLED
425	O ₂ & GLYCOL (1) INTERSTAGE DISCONNECT	29D		JOB TO 1020 2.00 JOB TO 1020 2.00 PHYS. JOB 2.00
426	PLSS WATER REFILL HOSE	35A, 35C		DEPTH MARK FOR LAPPED WELDS IN PH. TUBE 7.7 INP. DIA. BEYOND PERMISSIBLE
427	PLSS OXYGEN REFILL HOSE	34D, 35A		EXTENSION TUBES LENGTH SHOWN UNASSEMBLED 2 IMPERFECT THREADS WELDED
428	OXYGEN CONTROL MODULE (A/S)	35D		DO NOT CARBON PLATE & PAINT WELDS OR SURFACES MARKED WITH DRILLABLE MATERIALS
429	STEAM VENT (FROM CABIN)	29C		MINIMUM GAP OF 2.00 POTENTIALLY USE TO CHANGE OF OFFSETS OF WELDS HYPERSTRETCH SURFACES
430	L/DH CARTRIDGE STORAGE (1)	24C, 34A		MARKETED MARKED MOUNT OF CONCRETE STRONG WELDED
VII ELECTRICAL POWER				
501	INVERTER (2)	32B		WELDS SHOWN IN PHANTOM LINE OF COVER PLATING BRACKET
502	ELECTRICAL CONTROL ASSY (A/S-2)	35D		ALL DIMENSIONS GIVEN TO BE MET AFTER CARBON PLATING FINISHES OF PLAT. AND WELD TO JOB DIA. AND FINISHES TO BE SHOWN IN THREADS AREA OR ALLOWANCES FOR PLATING IN WELDS
503	ECS RELAY BOX	35C		SURFACE DIMENSIONS INCLUDING BLANKED WELDS FOR DIA. DIA. DIA.
504	RELAY JUNCTION BOX	24B		FOR ALL WELDED WELDS
505	ELECTRICAL CONTROL ASSY (D/S-2)	34A, 18B		REMOVE ALL MARKS BEFORE ALL DIMS 105-00
506	BATTERIES (A/S-2)	35C		INSPECT FOR INFORMATION DIMENSIONS DIMENSIONS BEFORE USE INSTRUCTIONS MARKED 0
507	BATTERIES (D/S-4)	34A, 18A		FINISH / FINISH DIMENSIONS TO BE DIMENSIONS
508	CSM/LM ELECTRICAL UMBILICAL CONNECTORS	20A		WELDS OF 1/16 DIA. & 1/8 DIA. ALL DIMTS DIMENSIONS FROM 1 INCH ARE NOT SPECIFIED
509	UMBILICAL INTERSTAGE CONNECTION	18C		TOLERANCE OF LAPPED RELATIONS 0
510	SCIENTIFIC EQUIPMENT POWER OUTLET	17A		
511	LIGHTING CONTROL ASSY & COLD PLATE	34C		
512	ALDOLARY SWITCHING RELAY BOX	29C		
513	FUSE ASSY SENSOR POWER (2) A/S	29C		
514	DEAD FACE RELAY A/S	29C, 23B		
VIII GUIDANCE NAVIGATION & CONTROL				
600	RENDEZVOUS RADAR ANTENNA ASSY	9D		
601	RENDEZVOUS RADAR ELECTRONICS ASSY	35C		
602	LANDING RADAR ANTENNA ASSY	21A		
603	LANDING RADAR ELECTRONICS ASSY	31A		
604	INERTIAL MEASUREMENT UNIT	19D		
605	ALIGNMENT OPTICAL TELESCOPE	19C		
606	ROT CONTROL UNIT	19D		
607	PULSE TORQUE ASSY	20D		
608	COUPLING DISPLAY UNIT & COLD PLATE	21C		
609	DISPLAY & KEYBOARD ASSY	36C		
610	LEM GUIDANCE COMPUTER & COLD PLATE	21C		
611	POWER SERVO/SIGNAL CONDITIONER ASSY AND COLD PLATE	21B		
612	RATE GYRO ASSY & COLD PLATE	12D		
613	ATTITUDE CONTROLLER ASSY (2)	24B		
614	TRANSLATION/THRUST CONTROLLER ASSY (2)	23A		
615	DESCENT ENGINE CONTROL ASSY (DECA)	29B		
616	ATTITUDE & TRANSLATION CONTROL ASSY (ATCA)	32D		
617	GRABAL DRIVE ACTUATOR	10A		
618	ABORT ELECTRONIC ASSY	35C		
619	ABORT SENSOR ASSY & COLD PLATE	19D		
620	DATA ENTRY & DISPLAY ASSY (DEDA)	38C		
IX COMMUNICATIONS				
700	S-BAND TRANSMITTER	31C		
701	S-BAND POWER AMPLIFIER & DRIVER	32D		
702	VHF TRANSMITTER & DRIVER	32C		
703	SIGNAL PROCESSOR ASSY	31C		
704	S-BAND STEERABLE ANTENNA	17D		
705	VHF INFIGHT ANTENNA (2)	6D, 8D		
706	S-BAND ERECTABLE ANTENNA	16A		
707	PORTABLE TV CAMERA	12C		
708	PORTABLE TV CAMERA TELEPHOTO LENS	12C		
709	PORTABLE TV CAMERA LUNAR LENS	12C		
710	PORTABLE TV CAMERA CABLE (STOWED)	12C		
711	PORTABLE TV CAMERA CABLE (IN USE)	34B		
712	S-BAND ANTENNA CABLE	17A		
713	S-BAND INFIGHT ANTENNA (2)	6C, 8C		
714	EVA ANTENNA	7D, 30D		
X INSTRUMENTATION				
800	CAUTION & WARNING ELECTRONIC ASSY (C & WEA)	35D		
801	DATA STORAGE ELECTRONIC ASSY (DSEA) AND COLD PLATE	34D		
802	SPECIMEN RETURN CONTAINERS (2)	21D		
803	STILL CAMERA	21C, 24C		
804	SEQUENCE CAMERA EXTRA FILM STORAGE	12C		
805	FILM AND TAPE STORAGE	21D		
806	SCIENTIFIC EQUIPMENT BOXES (2)	31A		
807	PULSE CODE MODULATION & TIMING EQUIPMENT ASSY (PCMTA)	35C		
808	SIGNAL CONDITIONING & ELECTRONIC REPLACEABLE ASSY NO. 1 (SCERA-1)	35C		
809	SIGNAL CONDITIONING & ELECTRONIC REPLACEABLE ASSY NO. 2 (SCERA-2)	35C		
810	RTG FUEL CASK	2A, 25C		

GENERAL INSTRUMENT ELECTRIC CORP., BETHPHEN, L. I., NEW YORK	
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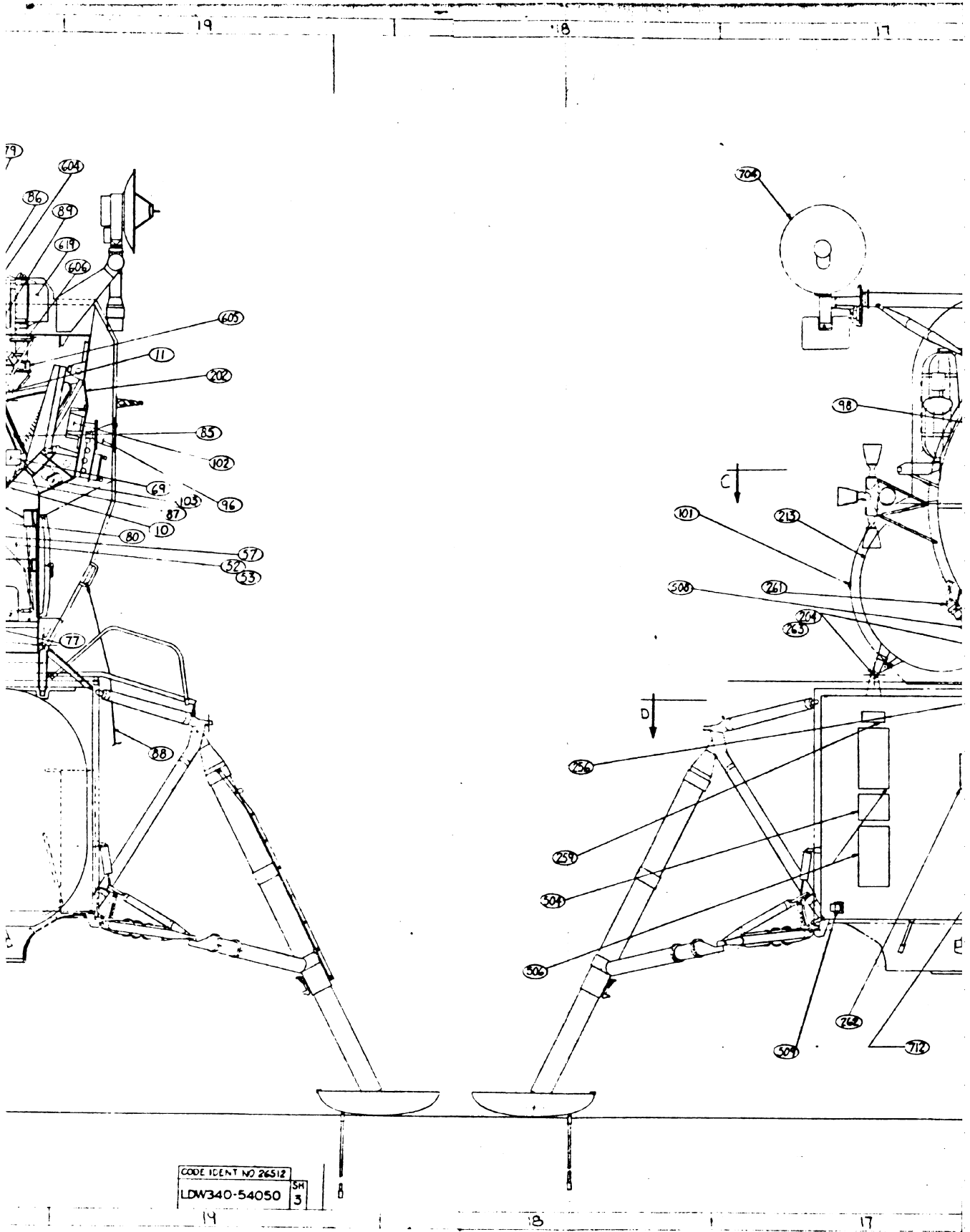


SECTION B-B
LOOKING OUTBOARD - LM SIDE

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