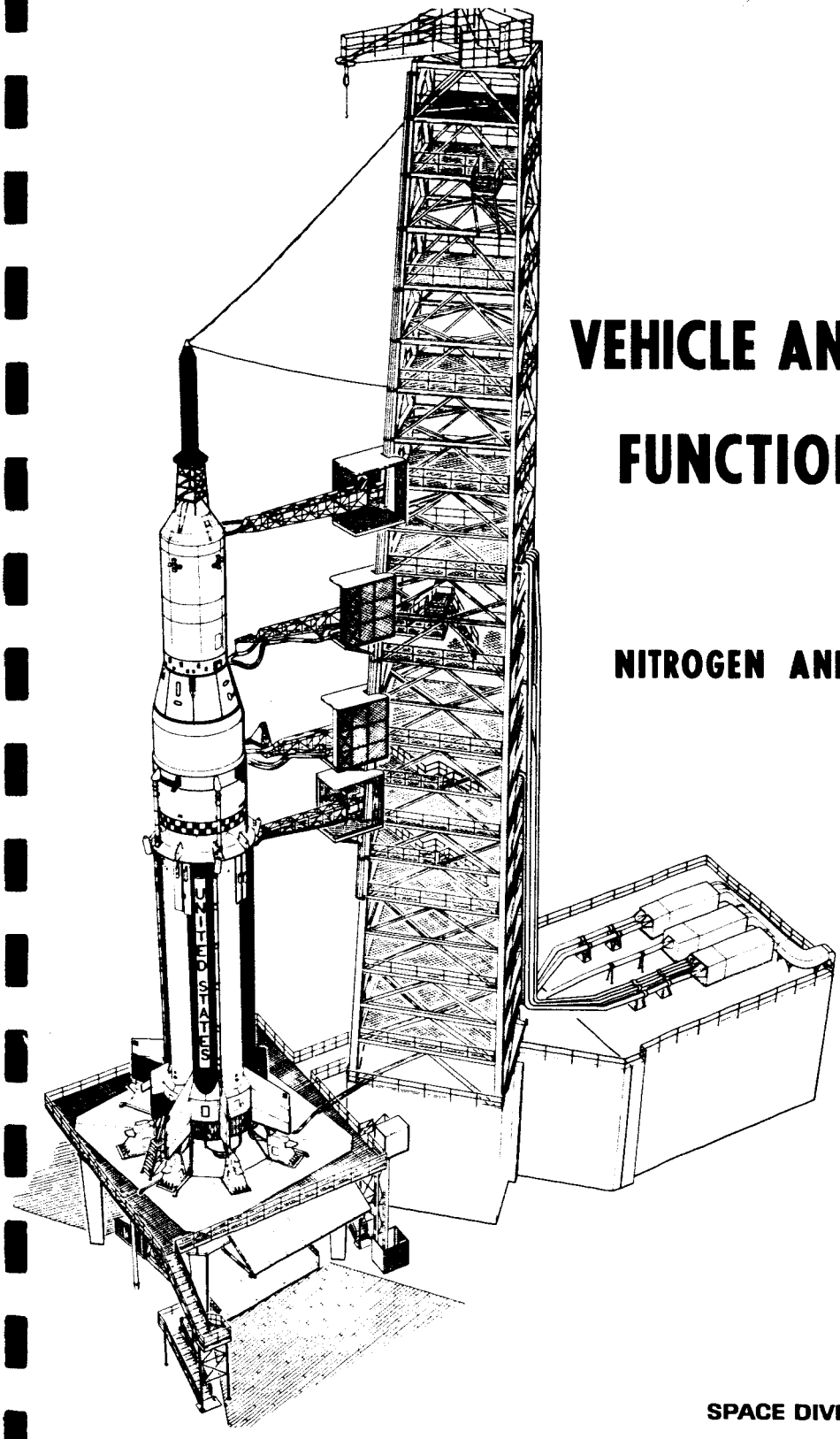
N65-18118
(ACCESSION NUMBER) (THRU)
54 1
(PAGES) (CODE)
CR 57071 11
(NASA CR OR TMX OR AD NUMBER) (CATEGORY)
FACILITY FORM 602

HEC-D042
VOLUME IV



SA-9

VEHICLE AND LAUNCH COMPLEX FUNCTIONAL DESCRIPTION

NITROGEN AND HELIUM STORAGE FACILITY

GPO PRICE $ _____

OTS PRICE(S) $ _____

Hard copy (HC) 3.00

Microfiche (MF) .50

SPACE DIVISION CHRYSLER CORPORATION

HUNTSVILLE OPERATIONS

HEC-D042
VOLUME IV

SA-9

VEHICLE AND LAUNCH COMPLEX
FUNCTIONAL DESCRIPTION

NITROGEN AND HELIUM STORAGE FACILITY

MARCH 1964

ENGINEERING COMMUNICATIONS DEPARTMENT

SPACE DIVISION CHRYSLER CORPORATION

HUNTSVILLE OPERATIONS

FOREWORD

This volume has been prepared for the Functional Integration Section, Systems Integration and Operations Branch, Vehicle Systems Division, Propulsion and Vehicle Engineering Laboratory, by Engineering Communications Department, Chrysler Corporation Space Division, under contract number NAS8-4016.

The following series, of which this volume is a part, functionally describes the mechanical and electromechanical systems of Saturn I SA-9 space vehicle and Launch Complex 37:

Volume I.	RP-1 Fuel System
Volume II.	LOX System
Volume III.	LH_2 System
Volume IV.	Nitrogen and Helium Storage Facility
Volume V.	Pneumatic Distribution System
Volume VI.	Environmental Control System
Volume VII.	Launch Pad Accessories
Volume VIII.	H-1 Engine and Hydraulic System
Volume IX.	RL10A-3 Engine and Hydraulic System
Volume X.	Separation and Flight Termination Systems
Volume XI.	Supplement: Legend and Composite Schematic

Each volume contains mechanical schematics and a list of applicable finding numbers.

Volume IV describes those components that are active during launch operations: it specifically excludes maintenance and checkout procedures. It is intended for use by NASA and prime contractor management and administrative personnel. Only information available by December 5, 1963, has been included.

TABLE OF CONTENTS

	Page
1. NITROGEN STORAGE FACILITY	1
1.1. LN_2 Storage Tank Annular Space Pressurization	1
1.2. LN_2 Storage Tank Filling Operation	2
1.3. LN_2 Storage Tank Pressurization	2
1.4. GN_2 Transfer to the Environmental Control System	3
1.5. LN_2 Converter and Vaporizer Operation	3
1.6. High Pressure Gas Storage Battery Operation	5
1.7. GN_2 Transfer to the Pneumatic Control Distributor and LOX, RP-1, and LH_2 Control Panels	6
2. HELIUM STORAGE FACILITY	6
2.1. Helium Compressor Operation	7
2.2. High Pressure Gas Storage Battery Operation	9
LIST OF FINDING NUMBERS	11
MECHANICAL SCHEMATICS	47
DISTRIBUTION	53

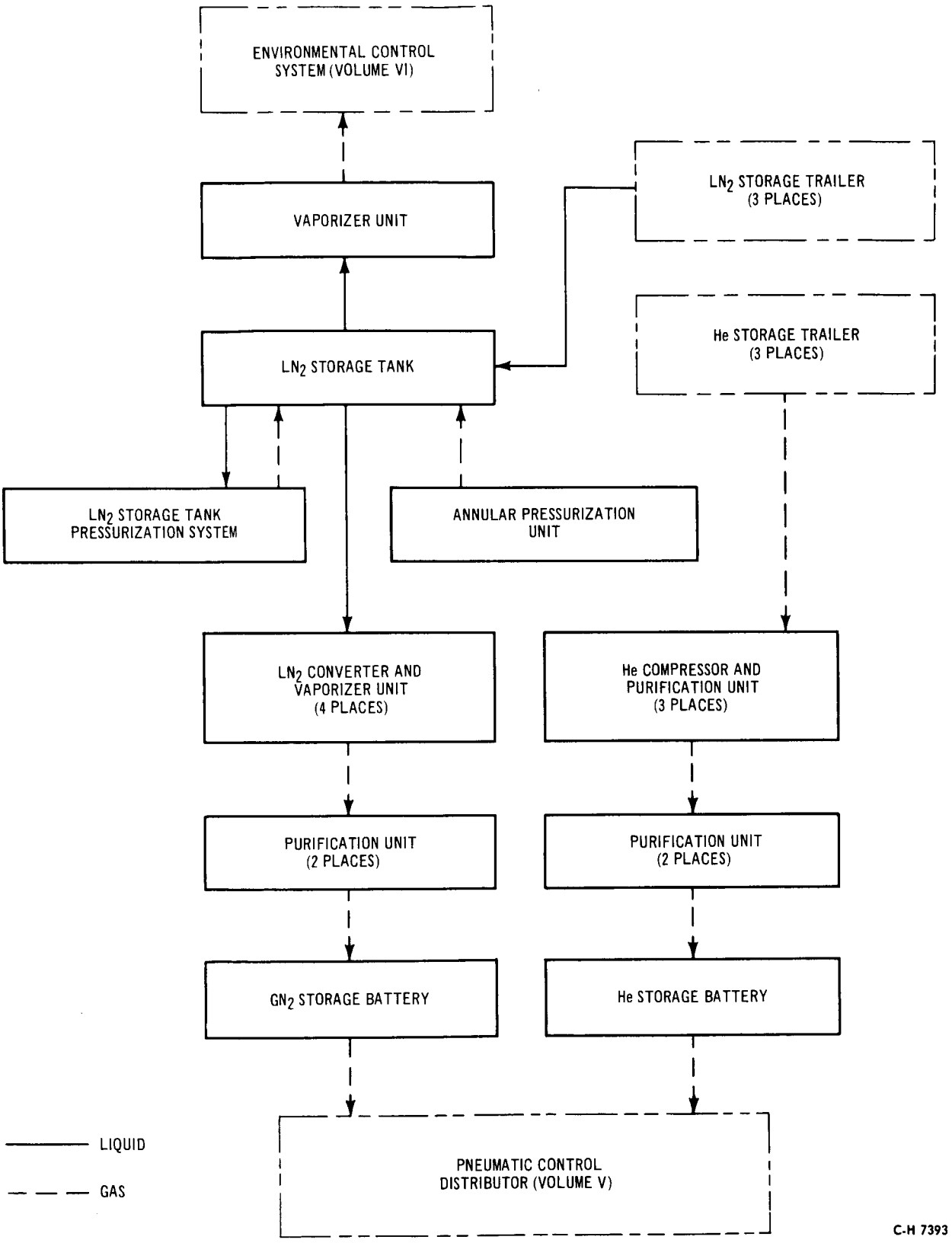


FIGURE 1. NITROGEN AND HELIUM STORAGE FACILITY

The nitrogen and helium storage facility is the source of all gaseous nitrogen and gaseous helium used throughout the launch complex and vehicle systems. A liquid nitrogen (LN_2) storage tank supplies the pneumatic control distributor and the LOX, RP-1, and LH_2 control panels by means of four LN_2 converter and vaporizer units, a gaseous nitrogen (GN_2) purification system, and a GN_2 storage facility. The same LN_2 storage tank supplies GN_2 to the environmental control system through two LN_2 vaporizers. A helium supply trailer supplies gaseous helium to the pneumatic control distributor through three helium compressors, a helium purification system, and a helium storage facility. The basic flow is shown on figure 1.

1. NITROGEN STORAGE FACILITY

The major operations associated with the nitrogen storage facility are LN_2 storage tank annular space pressurization, LN_2 storage tank filling operation, LN_2 storage tank pressurization, GN_2 transfer to the environmental control system, LN_2 converter and vaporizer operation, high pressure gas storage battery operation, and GN_2 transfer to the pneumatic control distributor and LOX, RP-1, and LH_2 control panels.

GN_2 pressure regulation is basically provided by two pneumatic regulators. A manually adjusted back pressure regulator, located on a line connecting the purification unit and the GN_2 storage facility, begins to open when back pressure from the purification unit reaches 3500 psig; it becomes fully open when downstream pressure to the GN_2 storage facility equals the 3500-psig back pressure. Line pressure then builds up to a nominal operating pressure of 6000 psig. Another manually adjusted pressure regulator reduces discharge pressure (6000 psig) from the GN_2 storage facility to the LOX, RP-1, and LH_2 pneumatic control panels to 3500 psig.

A majority of the individual components and subsystems are adequately described by the GN_2 system schematics, in the list of finding numbers, and in the nitrogen storage facility operations section--all included in this document. The following description pertains to only the more complex components or subsystems.

1.1. LN_2 Storage Tank Annular Space Pressurization (figure 2)

Proper environment for LN_2 storage is maintained by a GN_2 pressurization system, which pressurizes the perlite insulated annular space between the inner and outer spheres of the LN_2 storage tank.

Shut-Off Valves A1173-1 and A1173-2 permit GN_2 at 2200 psig to flow from GN_2 Storage Tanks A1174-1 and A1174-2, past Pressure Monitor Gage

A1171 and Manual Vent Valve A1215, to Pressure Regulator A1423 that reduces the pressure to 50 psig. The GN_2 flows to Pressure Regulator A1170, which further reduces the pressure to 1.5 psig, past Pressure Monitor Gage A1169, through Check Valve A1168, past Manual Vent Valve A1167, and through Manual Shut-Off Valve A1166 into the annular space of the LN_2 storage tank where the GN_2 is monitored by Pressure Gage A1156. Relief Valve A1151 and Burst Disc A1152 protect the annular space against overpressurization.

1.2. LN_2 Storage Tank Filling Operation (figure 2)

LN_2 flows (or is pumped) from three supply trailers through Coupling-Halves A1197-1, A1197-2, and A1197-3; past Manual Drain Valves A1196-1, A1196-2, and A1196-3; through Fill Valves A1195-1, A1195-2, and A1195-3; past Relief Valve A1194; and through Strainer A1193 and Fill and Drain Valve A1162. Maximum fill rate is 700 gpm from each trailer in operation. As the tank is filled, increasing pressure in the ullage area is relieved to atmosphere by Manual Vent Valve A1187, Manual Bypass Valve A1186, and Check Valve A1184. Overpressure protection for the storage tank is provided by 105-psig Relief Valve A1154 and 125-psig Burst Disc A1153.

When the required level within the storage tank has been reached, LN_2 discharges from Full Trycock Valve A1155 and the pumping operation ceases. LN_2 drained from the tank fill line passes through Check Valve A1198 before exhausting to the disposal area.

Liquid Level Gage A1159 monitors the storage tank level and Pressure Gage A1158 monitors the tank ullage pressure.

1.3. LN_2 Storage Tank Pressurization (figure 2)

LN_2 Storage Tank A1150 is pressurized by drawing off and vaporizing part of its liquid and returning the gas to the ullage portion of the tank. Pneumatic Flow Control Regulators A1185 and A1190, Pneumatic Pressure Controller A1188, and Vaporizer A1189 are primary items associated with tank pressurization. Functioning interdependently, these items control ullage pressure between 63 and 66 psig, vent excess GN_2 when tank pressure exceeds 66 psig, and provide additional pressurization when tank pressure is less than 63 psig.

The pressurized ullage area of the LN_2 tank provides the necessary head pressure to effect LN_2 transfer to the environmental control system vaporizer unit and to the four converter and vaporizer units.

Manual Supply Valve A1161 permits LN_2 flow from Storage Tank A1150 to the pressurization system. LN_2 flows past 150-psig Relief Valve A1192, through the normally open Pneumatic Tank Pressure Regulator A1190 into Vaporizer A1189 where the LN_2 is converted to GN_2. The GN_2 then flows into the ullage space of Storage Tank A1150.

As ullage pressure increases to approximately 25 psig, Pneumatic Controller A1188 output pressure begins to close Tank Pressure Regulator A1190 to

reduce the rate of tank pressurization. When ullage pressure reaches 63 psig, controller output completely closes the regulator and further tank pressurization stops. Heat transfer from the previously warm tank walls and from the pressurizing gas causes further boil-off from the LN_2, and ullage pressure increases above 63 psig. At 66 psig, Pneumatic Controller A1188 output begins to open the normally closed pneumatic Tank Vent Valve A1185; and excess GN_2 flows out of the storage tank through the pressurization line, Shut-Off Valve A1187, pneumatic Tank Vent Valve A1185, and Check Valve A1184 to the atmosphere. Reduction in ullage pressure to 63 psig by venting, or by LN_2 transfer from the tank, initiates repressurization.

1.4. GN_2 Transfer to Environmental Control System (figure 2)

Of the two identical Vaporizers A1229-1 and A1229-2, A1229-1 is the main operating unit while A1229-2 is maintained on standby and operated only when it becomes necessary to defrost Vaporizer A1229-1.

Manual Supply Valve A1165 permits LN_2 flow from Storage Tank A1150, through Strainer A1175, past 150-psig Relief Valve A1177 to Manual Throttling Valve A1179. Manual Throttling Valve A1179 permits LN_2 flow past 150-psig Relief Valve A1181, Manual Drain Valve A1182, to the vaporizer supply header, through Manual Shut-Off Valve A1221-1, and past Pressure Monitor Gage A1180 to Vaporizer A1229-1. The vaporizer converts LN_2 supply to GN_2 and discharges the GN_2 at 50 psig to the environmental control system. The vaporizer unit vents through Relief Valve A1231, Vent Valve A1232, and Check Valve A1389. Flowmeter A1235, in conjunction with Temperature Transducer A1234 and Pressure Transducer A1233, indicates the rate (scfm) of GN_2 flow from either vaporizer. Based on this indication, appropriate adjustment of Manual Throttling Valve A1179 ensures LN_2 input commensurate with the required GN_2 output. GN_2 flows through Valve A8520 to the environmental control system (Volume VI).

1.5. LN_2 Converter and Vaporizer Operation (figures 2 and 4)

Under normal operations, three identical converter and vaporization units are simultaneously involved in the conversion of LN_2 to GN_2.

A fourth converter and vaporization unit, identical to the other three, remains on standby. For the sake of brevity and to avoid confusion, the operational sequence of only one converter and vaporization unit will be described. It should be remembered that each item referred to in the described unit has a counterpart that functions concurrently in the other three units. The high pressure gas storage battery, through which GN_2 flows to the Pneumatic Control Distributor, contains six identical GN_2 storage banks. Again, to avoid confusion, the functions of only one storage bank will be explained in the functional description.

Supply Shut-Off Valve A1164 releases LN_2 at 65 psig, through Strainer A1176, past 150-psig Relief Valve A1178, Drain Valve A1183, through Manual Shut-Off Valves A1218-1 and A1218-2, and into the LN_2 converter supply header.

LN_2 flows from the supply header, through Manual Supply Valves A1219-1, A1219-2, A1219-3, and A1219-4 into Converter A1142. Relief Valves A1217-1 and A1217-2 provide overpressure protection for the supply header.

LN_2 (at -320°F) vaporizes upon entering the relatively warm converter and vents to the atmosphere through Manual Vent Valve A1201-1 and Check Valve A1198. Venting continues until the converter cools to LN_2 temperature.

Pump discharge Manual Vent Valve A1212 and LN_2 pump Blow-By Throttling Valve A1206 are opened and Vaporizer A1132 is started. After converter cool-down, Pump Motor A1137 is actuated to operate LN_2 Pump A1208. When LN_2 flows from Manual Vent Valve A1212, both Manual Vent Valves A1201-1 and A1212 are slowly closed. Should the results of pump cavitation be observed, Manual Purge Valve A1202 would be opened to vent the gas.

LN_2 pump blow-by pressure is maintained approximately equal to the pump inlet pressure, by slowly closing Pump Blow-By Throttling Valve A1206 until Pressure Gages A1204 (blow-by) and A1203 (inlet) read the same. Relief Valve A1205 and Burst Disc A1415 provide overpressure protection for the converter sump. Burst Discs A1210-1 and A1210-2 provide like protection for the vacuum jacket on the LN_2 converter.

LN_2 at 6000 psig transfers from Pump A1208 past Surge Suppressor A1211, which maintains an even flow of LN_2, and Vent Valve A1212 to Vaporizer A1132. GN_2 at 6000 psig discharges from the vaporizer at ambient temperature ±30°F through Manual Shut-Off Valve A1225 and Check Valve A1226 to the GN_2 purification unit.

Gage A1214 and Pressure Switch A1213 monitor vaporizer discharge pressure and shut down LN_2 Pump A1208 if pressure exceeds 6700 psig. Relief Valve A1224 prevents overpressure in the discharge area by venting excess GN_2 at 6800 psig. (If the GN_2 temperature downstream from the vaporizer decreases to 0°F or below, Temperature Switch A1227 will stop LN_2 Pump A1208.) GN_2 flows past Vent Valve A1237, Check Valve A1386, and replenish line Pressure Gage A1239. Pressure in excess of 6400 psig vents through Relief Valve A1236.

After passing through Check Valve A1250, GN_2 can be alternately routed into the hydrocarbon removal unit, through Shut-Off Valves A928-1 and A928-2 and related Desiccant Holders A934-1 and A934-2. This dual capability facilitates the periodic replacement of desiccant cartridges and the draining of collected hydrocarbons through Drain Valves A933-1 and A933-2.

GN_2 from the hydrocarbon removal unit flows through Check Valve A937-1 or A937-2 and enters the water vapor removal unit. This unit has dual capability for maintenance purposes. GN_2 is alternately routed through Solenoid Valves A938-1 and A938-2, Desiccant Holders A942-1 and A942-2, and related Check Valves A944-1 and A944-2.

Gages A935-1, A935-2, A943-1, and A943-2 monitor the pressure in the hydrocarbon and water vapor removal desiccant holders.

From the water vapor removal unit, GN_2 flows past Pressure Gage A1251, through 20-micron Filter A1252, which is shunted by 50-psig Differential Pressure Switch A1243, to GN_2 replenish line Back Pressure Regulator A1253. To obtain maximum filtering efficiency from the purification unit, Pressure Regulator A1253 remains closed until back pressure rises to 3500 psig. With back pressure at 3500 psig, Pressure Regulator A1253 begins to open and GN_2 flows through Replenish Line Shut-Off Valve A1246. The pressure regulator opens fully when line pressure increases to 6000 psig (normal operating pressure).

GN_2 at 6000 psig flows past Pressure Monitor Gage A1254, 6400-psig Relief Valve A1247, and through Flowmeter A1249. The flowmeter in conjunction with Pressure Transducer A1248 and Temperature Transducer A1255 convert the flowrate to 1000-scfm readings. From Filter A1252 to Manual Drain Valve A927, the GN_2 replenish line vents through Manual Vent Valves A1245-1, A1245-2, and A1256.

The GN_2 flows past replenish line Manual Drain Valve A927, through cross-country Manual Supply Valve A8521 and into a 2-1/2 in. line that routes the 6000-psig GN_2 to the high pressure gas storage battery.

1.6. High Pressure Gas Storage Battery Operation (figure 4)

The storage battery consists of twelve 200-cu-ft storage vessels and various components for control purposes. The battery stores the GN_2 and supplies it as necessary to the launch complex pneumatic systems.

Upon entering the storage battery, the GN_2 flows past Vent Valve A1305 and Pressure Monitor Gage A1297, past 6400-psig Relief Valve A1304, through Manual Shut-Off Valve A1298, and through 20-micron Filter A1303, which is shunted by 50-psig Differential Pressure Switch A1299.

GN_2 flow continues through Check Valve A1300 and past Pressure Monitor Gage A1302 into a manifold that serves as a common duct for filling or replenishing the storage banks and as a direct supply for the pneumatic control distributor and control panels. Pressure Transducer A1274 and Pressure Gage A1280 monitor the manifold pressure. Temperature Transducer A1273 monitors the manifold temperature. Relief Valves A1277-1, A1277-2, and A1277-3 provide overpressure protection for the manifold. The manifold vents through Manual Vent Valves A1275-1, A1275-2, A1275-3 and Check Valves A1276-1, A1276-2, and A1276-3.

GN_2 flows from the manifold, past Vent Valves A1275-2 and A1275-3 and through Manual Fill Valve A1272-1 into Storage Vessels A1260-1 and A1260-2. Gages A1259 and A1269 monitor pressure in the storage vessels. Overpressure protection for each storage bank is provided by Relief Valve A1270 and by Burst Disc A1271, which ruptures at 16000 ±1000 psig. Manual Vent Valve A1258 vents pressure to atmosphere from the storage bank through Check Valve A1257 and the vent line.

1.7. GN_2 Transfer to Pneumatic Control Distributor and LOX, RP-1, and LH_2 Control Panels

The storage battery supplies 6000-psig GN_2 to the pneumatic control distributor for distribution to various valve panels (described in Volume V), and 3500-psig GN_2 to the LOX, RP-1, and LH_2 storage facility control panels for component control.

GN_2 flows from the manifold, through Manual Shut-Off Valves A1278-1, A1278-2, and A1278-3 and past Pressure Gages A1279-1, A1279-2, and A1279-3 into the pneumatic control distributor.

The LOX, RP-1, and LH_2 pneumatic control panels receive GN_2 through a single line connected to the manifold. GN_2 at 6000 psig flows past Vent Valve A1275-3, through Manual Shut-Off Valve A1268, and past Pressure Monitor Gage A1261 to Pressure Regulator A1267. Reduced by Pressure Regulator A1267 to 3500 psig, GN_2 flows past 3750-psig Relief Valve A1263, Pressure Monitor Gage A821, and Vent Valve A1266; through Manual Shut-Off Valve A1264; and past Pressure Monitor Gage A1262 to the pneumatic control panels.

When the storage banks have been pressurized to 6000 psig, LN_2 Pump A1208 and Vaporizer A1132 are shut down. After complete shutdown of the pumping unit, the LN_2 supply system and associated equipment are evacuated by: closing Supply Valves A1161 and A1164, which shut off LN_2 flow to the LN_2 storage tank vaporizer and to the pumping unit; opening By-Pass Valve A1186, which vents the storage tank ullage; opening Manual Drain Valve A1183, which drains the pumping unit LN_2 supply line; and opening Manual Vent Valves A1201-1, A1201-2, A1201-3, and A1201-4 and Blow-By Throttling Valve A1206, which vent the LN_2 converters.

The GN_2 transfer lines, storage banks, and associated equipment are not evacuated after use, but are vented only as necessary to create a low-pressure environment for effecting line repairs. Required venting of the transfer lines and storage banks may be accomplished by opening Manual Vent Valves A1237, A1245-1, A1245-2, A1256, A1305, A1275-1, A1275-2, A1275-3, A1258, and A1266.

2. HELIUM STORAGE FACILITY

The helium facility equipment consists of three identical compressor units and four identical helium storage banks. During normal operations, two compressors are used while the third remains on standby. For the sake of brevity and to avoid confusion, the functioning of only one compressor unit and one storage bank will be described.

The functions of most of the helium facility equipment require no explanation other than the system schematics and the parts list. Pressure regulating components are more complex and require a more detailed description. A manually adjusted pressure regulator reduces the 2200-psig helium pressure to 120 psig

for compatibility with compressor inlet requirements. The regulator remains open until downstream pressure rises to 120 psig and then restricts flow to prevent an increase above this pressure.

A pneumatically operated back pressure regulator maintains a pressure of 3500 psig within the purification section of each helium compressor unit. A regulator maintains a 3500 psig back pressure in the helium compressor facility purification unit.

2.1 Helium Compressor Operation (figure 3)

The helium storage facility receives its supply from 2,200-psig service trailers in one major operation by a compression and purification system.

Starting of Compressor A1391 by Motor A1050 automatically opens Solenoid Valve A1369.

Supply Valves A1362-1, A1362-2, and A1362-3 admit helium from the service trailers through Coupling-Halves A1363-1, A1363-2, and A1363-3, and Check Valves A1361-1, A1361-2, and A1361-3. Gages A1356-1, A1356-2, A1364-1, A1364-2, and A1364-3 monitor induction line pressure.

Helium passes through Filter A1358, which is shunted by 50-psig Differential Pressure Switch A1393 (normal induction pressure is 2200 psig); past Vent Valve A1359; past Relief Valve A1357; through Compressor Manual Supply Valves A1353-1, A1353-2, and A1352-3; past Vent Valves A1354-1, A1354-2, and A1354-3; through Pressure Regulator A1365; and past Pressure Gage A1366. Helium then enters Inlet Trap A1368 and flows through Solenoid Valve A1369 into Compressor A1391.

As compressor pressure builds up, Solenoid Valve A1323 briefly actuates Unloader A1324 to exhaust oil and moisture present in Traps A1053, A1056, A1371, and A1376.

First, second, and third stage Intercoolers A1370, A1052, and A1055 and Aftercooler A1373 reduce compression heat to within ±20°F of ambient temperature.

Intercooler Traps A1053, A1371, and A1056 and Aftercooler Trap A1376 collect oil and water present in the gas stream. Relief Valves A1403, A1405, and A1407 provide overpressure protection for the first, second, and third stage traps by venting excess helium to atmosphere at 435 psig, 1400 psig, and 4300 psig, respectively. Burst Disc A1409 relieves the fourth stage trap at 11,000 psig. Gages A1054, A1372, A1057, and A1374 monitor first, second, third, and fourth stage discharge pressure on Compressor A1391.

Crankcase blow-by (or leakage) gas from Compressor A1391 passes through Check Valve A1325, Precooler A1049, and Precooler Trap A1048 and returns to Receiver A1368 for reinduction. Drain Valve A1047 removes any oil and moisture present in Precooler Trap A1048.

Helium discharging from the compressor at 6000 psig passes through Aftercooler Trap A1376 and Check Valve A1399 to the compressor unit purification system. At this point, Gage A1374 monitors discharge pressure and Pressure Switch A1377 automatically shuts down Compressor A1391 if discharge line pressure exceeds 6400 psig.

Helium enters the purification unit through Shut-Off Valve A1375, and flows through Mechanical Separator A1378 (oil and water remover), Desiccant Holders A1058 and A1402 (water vapor removers), and Filter A1379. Helium flows from the purification unit past Vent Valve A1380, through Shut-Off Valve A1381, and into Back Pressure Regulator A1320. When back pressure reaches 3500 psig, the regulator slowly opens, effecting gradual buildup of discharge pressure to 6000 psig, monitored by Gage A1319.

Helium flows from the compressor units through Shut-Off Valves A1316-1, A1316-2, and A1316-3 and Check Valves A1315-1, A1315-2, and A1315-3 into the helium supply line connecting the final purification unit. The helium supply line vents through Manual Vent Valves A1317-1, A1317-2, and A1317-3.

Helium flow continues past overpressure protection Relief Valves A1326 and A1327 (preset to relieve at 6450 psig), and Manual Vent Valve A1329. Gages A1330, A1388-1, and A1388-2 monitor helium purification unit inlet pressure.

After passing through Check Valve A1351, helium may be routed through Shut-Off Valve A1350-1 and associated Desiccant Holders A1349-1, A1349-2, A1349-3, and A1349-4, or through Shut-Off Valve A1350-2 and associated Desiccant Holders A1349-5, A1349-6, A1349-7, and A1349-8. The desiccant banks are alternately isolated and recharged with clean cartridges. Low pressure environment for replacement of cartridges is maintained by venting helium through Vent Valves A1348-1 and A1348-2 and their respective Check Valves A1347-1 and A1347-2.

Helium flows from the purification unit through Shut-Off Valve A1346-1 or Shut-Off Valve A1346-2, through 20-micron Filter A1332, which is shunted by 50-psig Differential Pressure Switch A1394, to Back Pressure Regulator A1333. The back pressure regulator prevents flow until back pressure reaches 3500 psig as indicated by Gage A1331. Helium Replenish Line Shut-Off Valve A1334 and Manual Supply Valve A8523 are opened and flow of helium past Drain Valve A793 to the storage facility begins. When downstream pressure increases to 3500 psig, Regulator A1333 fully opens and line pressure rises to 6000 psig.

Gage A1335 monitors line pressure downstream from Helium Replenish Line Shut-Off Valve A1334, and Relief Valve A1339 vents excess helium at 6400 psig. Line flow rate is converted to scfm based on measurements from Flowmeter A1337, Pressure Transducer A1338, and Temperature Transducer A1336. (Normal flow: 150 scfm per compressor.) From Filter A1332 to Manual Supply Valve A8523, GN_2 supply line vents through Vent Valves A1342, A1340, and A1385.

2.2. High Pressure Gas Storage Battery Operation (figure 4)

The helium storage battery consists of eight 200-cu-ft storage vessels, and various control components for the storage battery. The storage battery stores helium and supplies it to the pneumatic control distributor (described in Volume V).

Helium flows through the cross-country line and into the high pressure gas storage battery past Vent Valve A1307, Pressure Monitor Gage A1296, 6400-psig Relief Valve A1310, and through Manual Shut-Off Valve A1295. Flow continues through 20-micron Filter A1309, which is shunted by 50-psig Differential Pressure Switch A1294, through Check Valve A1293, and past Pressure Monitor Gage A1291 into the helium storage bank supply manifold.

The helium storage bank supply manifold serves as a common duct for filling or replenishing the storage banks, as a discharge manifold for the storage banks, or as a direct supply manifold for the pneumatic control distributor.

Pressure Transducer A1290 and Gages A1288 and A823 monitor manifold pressure. Temperature Transducer A1289 monitors manifold temperature, and Relief Valves A1285 and A820 provide overpressure protection.

During filling and replenishing operations, helium flows from the manifold, through Manual Shut-Off Valves A1283-1, A1283-2, A1283-3, and A1283-4, into Storage Vessels A1311-1 and A1311-2. Gages A1281 and A1312 monitor inlet and vent manifold pressure. Relief Valve A1284 and Burst Disc A1282 provide overpressure protection.

When helium storage bank pressure reaches 6000 psig, Manual Supply Valves A1382-1 and A1382-2 are opened, transferring helium to the pneumatic control distributor. Gages A1383-1 and A1383-2 monitor pneumatic control distributor line pressure.

When the high pressure gas storage battery has been pressurized to 6000 psig, Helium Compressor A1391 is shut off. The helium storage banks, lines, and associated equipment are not evacuated after use, but are vented only when necessary to effect repairs. Units listed below are vented through the appropriate vent valves and check valves.

Unit Vented	Venting Devices		Figure Number
	Vent Valve	Check Valve	
Supply Line and Manifold	A1359 A1354-1 A1354-2 A1354-3	A1360 A1355-1 A1355-2 A1355-3	3
Compressor Discharge Lines	A1317-1 A1317-2 A1317-3 A1329	A1318-1 A1318-2 A1318-3 A1328	3

Unit Vented	Venting Devices		Figure Number
	Vent Valve	Check Valve	
Purification Unit	A1348-1 A1348-2	A1347-1 A1347-2	3
Purification Unit Discharge Line	A1342 A1340 A1384	A1343 A1341 A1384	3
High Pressure Gas Storage Battery Inlet Line	A1307	A1308	4
High Pressure Gas Storage Battery	A1313 A1287-1 A1287-2	A1314 A1286-1 A1286-2	4

LIST OF FINDING NUMBERS

* FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A793	1	Valve, Manual	Drain			
A794	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A795						
A796	1	Valve, Manual	1/4 in., Shut-off	Vacco PN NV-6P-401B-2M	10428535	
A797	1	Valve, Manual	1/4 in., Shut-off	Vacco PN NV-6P-401B-2M	10428535	
A798 through A801 are not functionally applicable to this system.						
A802	4	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-4010-2M	10428535	
A803 through A819 are not functionally applicable to this system.						
A820	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A821	1	Gage, Pressure	3500 psig - Normal Reading 0-5000 psig Range	Helicoid PN 1366	10428545	
A822	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-401B-2M	10428535	
A823	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	

*Location: A=Ground; B=S-I Stage; E=S-IV Stage; G=Instrument Unit; H=Payload.

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A824 through A835 are not functionally applicable to this system.						
A836	4	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A837 through A840 are not functionally applicable to this system.						
A841	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A842	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A843	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A844	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A845 through A856 are not functionally applicable to this system.						
A857	6	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A858 through A904 are not functionally applicable to this system.						
A905	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A906	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A907 through A909 are not functionally applicable to this system.						
A910	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A911						
A912	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A913 through A918 are not functionally applicable to this system.						
A919						
A920-1	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A920-2	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A920-3	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A921						
A922						
A923-1	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A923-2	1	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A924 through A926 are not functionally applicable to this system.						
A927	1	Valve, Manual	Drain			
A928-1	1	Valve, Manual	Shut-Off		Part of 10428600	
A928-2	1	Valve, Manual	Shut-Off		Part of 10428600	
A929 through A932 are not functionally applicable to this system.						
A933-1	1	Valve, Manual	Drain		Part of 10428600	
A933-2	1	Valve, Manual	Drain		Part of 10428600	
A934-1	1	Desiccant Holder	Hydrocarbon Removal 10 Microns		Part of 10428600	
A934-2	1	Desiccant Holder	Hydrocarbon Removal 10 Microns		Part of 10428600	
A935-1	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range		Part of 10428600	
A935-2	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range		Part of 10428600	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A936						
A937-1	1	Valve, Check			Part of 10428600	
A937-2	1	Valve, Check			Part of 10428600	
A938-1	1	Valve, Solenoid	N.C.		Part of 10428601	
A938-2	1	Valve, Solenoid	N.C.		Part of 10428601	
A939 through A941 are not functionally applicable to this system.						
A942-1	1	Desiccant Holder	Water Vapor Removal, 10 Micron Nominal, .05 min.	Pall Co.	Part of 10428601	
A942-2	1	Desiccant Holder	Water Vapor Removal, 10 Micron Nominal, .05 min.	Pall Co.	Part of 10428601	
A943-1	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range		Part of 10428601	
A943-2	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range		Part of 10428601	
A944-1	1	Valve, Check			Part of 10428601	
A944-2	1	Valve, Check			Part of 10428601	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A945 through A1046 are not functionally applicable to this system.						
A1047	3	Valve, Manual	1/4 in., Drain	Cardair PN AC-15812	Part of 10428623	
A1048	3	Trap	Precooler	Cardair PN AS-30856	Part of 10428623	
A1049	3	Heat Exchanger	1 in. Coil Blow-By Precooler	Cardair	Part of 10428623	
A1050	3	Motor	100 h.p.	Cardair PN 71700210	Part of 10428623	
A1051						
A1052	3	Heat Exchanger	1 in. Coil 1st Stage Intercooler	Cardair	Part of 10428623	
A1053	3	Trap	Intercooler	Cardair PN AC-45988	Part of 10428623	
A1054	3	Gage, Pressure	0-800 psig Range	Cardair PN AS-45300	Part of 10428623	
A1055	3	Heat Exchanger	1/2 in. Coil 3rd Stage Intercooler	Cardair	Part of 1028623	
A1056	3	Trap	Intercooler	Cardair PN AC-45990	Part of 10428623	
A1057	3	Gage, Pressure	0-10000 psig Range	Cardair PN AS-45302	Part of 10428623	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1058	3	Purifier Chamber	Moisture Removal	Cardair PN AS-45456	Part of 10428623	
A1059 through A1131 are not functionally applicable to this system.						
A1132	4	Vaporizer	6000 psig, 1000 scfm	Cosmodyne Part of PN 2410100	Part of 10428625	
A1133 through A1136 are not functionally applicable to this system.						
A1137	4	Motor	50 h.p.	Cosmodyne Part of PN 2409800	Part of 10428625	
A1138 through A1140 are not functionally applicable to this system.						
A1141-1	4	Coupling-Half		Cosmodyne Part of PN 2409800	Part of 10428625	
A1141-2	4	Coupling-Half		Cosmodyne Part of PN 2409800	Part of 10428625	
A1142	4	LN_2 Converter		Cosmodyne Part of PN 3100900	Part of 10428625	
A1143 through A1149 are not functionally applicable to this system.						
A1150	1	Tank	Capacity - 35,000 Gallons Liquid Nitrogen	Pittsburg - Des Moines Steel Co.	10428624	
A1151	1	Valve, Relief	Annular Space Pressure, Relief at $2.0 \begin{smallmatrix} +.25 \\ -0 \end{smallmatrix}$ psig	Oceco PN 14049	Part of 10428624	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1152	1	Disc, Burst	Annular Space Pressure Relief Ruptures at $2.5^{+.25}_{-0}$ psig		Part of 10428624	
A1153	1	Disc, Burst	Tank Pressure Relief Ruptures at 125 ±3 psig	Fike Metal Prod. Corp.	Part of 10428624	
A1154	1	Valve, Relief	Tank Pressure 105 ±3 psig	J. E. Lonergan Co. PN 41W209M	Part of 10428624	
A1155	1	Valve, Manual	1 in., Full Trycock	Powell Co. PN 39844	Part of 10428624	
A1156	1	Gage, Pressure	1.75 psig - Normal Reading 0-5 psig Range		Part of 10428624	
A1157	1	Valve, Manual	Shut-Off	Powell Co.	Part of 10428624	
A1158	1	Gage, Pressure	65 psig - Normal Reading 0-150 psig Range		Part of 10428624	
A1159	1	Gage, Liquid Quantity	0-35000 Gallons Normal Reading, 0-40000 Gallons Range	Barton Inst. Corp.	Part of 10428624	
A1160	1	Valve, Manual	Shut-Off		Part of 10428624	
A1161	1	Valve, Manual	2 in.	Powell Co. PN 70-376F.E.	Part of 10428624	
A1162	1	Valve, Manual	4 in., Fill and Drain	Powell Co. PN 40409	Part of 10428624	
A1163	1	Valve, Manual	Drain	Powell Co.	Part of 10428624	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1164	1	Valve, Manual	2 in., Supply	Powell Co. PN 70-376F.E.	Part of 10428624	
A1165	1	Valve, Manual	3 in.	Powell Co. PN 70-376F.E.	Part of 10428624	
A1166	1	Valve, Manual	Shut-Off	Powell Co.	Part of 10428624	
A1167	1	Valve, Manual	Drain	Powell Co.	Part of 10428624	
A1168	1	Valve, Check	1 in.	Powell Co. PN 19563	Part of 10428624	
A1169	1	Gage, Pressure	1.75 psig Normal Reading, 0-5 psig Range		Part of 10428624	
A1170	1	Regulator, Pressure	50 to 1.75 ±.25 psig		Part of 10428624	
A1171	1	Gage, Pressure	2200 psig - Normal Reading 0-3000 psig Range		Part of 10428624	
A1172						
A1173-1	1	Valve, Manual	1/2 in., Shut-Off	Powell Co. PN 34786	Part of 10428624	
A1173-2	1	Valve, Manual	1/2 in., Shut-Off	Powell Co. PN 34786	Part of 10428624	
A1174-1	1	Tank	GN_2 Supply 1.5 cu. ft., 2200 psig		Part of 10428624	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1174-2	1	Tank	GN_2 Supply 1.5 cu. ft. 2200 psig		Part of 10428624	
A1175	1	Strainer	3 in.	Leslie PN S1176F, Alt. 4	10428578	
A1176	1	Strainer	2 in.	Leslie PN S1176F, Alt. 4	10428565	
A1177	1	Valve, Relief	1 in., 150 ±10.5 Psig	C. M. Bailey Co. PN 119-1	10428568	
A1178	1	Valve, Relief	1 in., 150 ±10.5 psig	C. M. Bailey Co. PN 119-1	10428568	
A1179	1	Valve, Manual	3 in.	Vacco PN M02T-F4610	10428577	
A1180	1	Gage, Pressure	60 psig - Normal Reading 0-300 psig Range	Helicoid PN 3341	10428599	
A1181	1	Valve, Relief	1 in., 150 ±10.5 psig	C. M. Bailey Co. PN 119-1	10428568	
A1182	1	Valve, Manual	1 in., Drain	Powell PN 49008	10428560	
A1183	1	Valve, Manual	1 in.	Powell PN 49008	10428560	
A1184	1	Valve, Check	4 in., Drain	Crane Co. PN K-4795	10428572	
A1185	1	Valve, Pneumatic	4 in., Tank Vent Fully Closed at 10 psid, Fully Open at 15 psid	Annin Co., Model 1560	10428603	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1186	1	Valve, Manual	Bypass		Part of 10428624	
A1187	1	Valve, Manual	4 in., Vent		Part of 10428624	
A1188	1	Controller, Pneumatic Proportional	22 to 85 psig Output, Proportional to 25 to 100 psig Input	Mason-Neilon Model No. 2707	10428602	
A1189	1	Vaporizer	LN_2 Tank Ullage Pressurization		10427318	
A1190	1	Regulator, Pressure	1 in. Tank Pressure, Fully Open at 3 psid, Fully Closed at 9 psid	Annin Co., Model 1560	10428604	
A1191	1	Valve, Manual	1 in., Bypass	Powell Co. PN 39844	Part of 10428624	
A1192	1	Valve, Relief	150 psig	C. M. Bailey Co. PN 119	Part of 10428624	
A1193	1	Strainer	4 in.	Leslie 18233B Dwg. S1176F Alt. 4	10428566	
A1194	1	Valve, Relief	150 ±10.5 psig	C. M. Bailey Co. PN 119-1	10428568	
A1195-1	1	Valve, Manual	3 in., Fill	Powell Co. PN 40402	10428562	
A1195-2	1	Valve, Manual	3 in., Fill	Powell Co. PN 40402	10428562	
A1195-3	1	Valve, Manual	3 in., Fill	Powell Co. PN 40402	10428562	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1196-1	1	Valve, Manual	1 in., Drain	Powell Co. PN 49008	10428560	
A1196-2	1	Valve, Manual	1 in., Drain	Powell Co. PN 49008	10428560	
A1196-3	1	Valve, Manual	1 in., Drain	Powell Co. PN 49008	10428560	
A1197-1	1	Coupling-Half	3 in.	Futurecraft Dwg. 550044-3	10428580	
A1197-2	1	Coupling-Half	3 in.	Futurecraft Dwg. 550044-3	10428580	
A1197-3	1	Coupling-Half	3 in.	Futurecraft Dwg. 550044-3	10428580	
A1198	1	Valve, Check	2 in.	Powell Co. PN 41364	10428570	
A1199 and A1200 are not functionally applicable to this system.						
A1201-1	1	Valve, Manual	Converter Vent	Cosmodyne Part of PN 2409800	Part of 10428625	
A1201-2	1	Valve, Manual	Converter Vent	Cosmodyne Part of PN 2409800	Part of 10428625	
A1201-3	1	Valve, Manual	Converter Vent	Cosmodyne Part of PN 2409800	Part of 10428625	
A1201-4	1	Valve, Manual	Converter Vent	Cosmodyne Part of PN 2409800	Part of 10428625	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1202	4	Valve, Manual	Converter Purge Vent	Cosmodyne Part of PN 2409800	Part of 10428625	
A1203	4	Gage, Pressure	0-100 psig Range	Cosmodyne Part of PN 2409800	Part of 10428625	
A1204	4	Gage, Pressure	0-100 psig Range	Cosmodyne Part of PN 2409800	Part of 10428625	
A1205	4	Valve, Relief	200 psig	Cosmodyne Part of PN 2409800	Part of 10428625	
A1206	4	Valve, Manual	Pump Blow-By Throttling	Cosmodyne Part of PN 2409800	Part of 10428625	
A1207						
A1208	4	Pump	LN_2 6000 psig, 1000 scfm	Cosmodyne Part of PN 3100900	Part of 10428625	
A1209-1	4	Valve, Manual	Vacuum Shut-Off	Cosmodyne Part of PN 2409800	Part of 10428625	
A1209-2	4	Valve, Manual	Vacuum Shut-Off	Cosmodyne Part of PN 2409800	Part of 10428625	
A1210-1	4	Disc, Burst	Rupture at 150 psig	Cosmodyne Part of PN 2409800	Part of 10428625	
A1210-2	4	Disc, Burst	Rupture at 150 psig	Cosmodyne Part of PN 2409800	Part of 10428625	
A1211	4	Surge Cylinder	Surge Suppressor		Part of 10428625	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1212	4	Valve, Manual	Pump Discharge Line Vent	Cosmodyne Part of PN 2409800	Part of 10428625	
A1213	4	Switch, Pressure	Pump Discharge Actuation at 6700 psig	Cosmodyne Part of PN 2410000	Part of 10428625	
A1214	4	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Cosmodyne Part of PN 2410000	Part of 10428625	
A1215	1	Valve, Manual	Annular Space Supply Pressure Vent	Powell Co.	Part of 10428624	
A1216						
A1217-1	1	Valve, Relief	LN_2 Supply Header, 150 ±10.5 psig	C. M. Bailey Co. PN 119-1	10428568	
A1217-2	1	Valve, Relief	LN_2 Supply Header, 150 ± 10.5 psig	C. M. Bailey Co. PN 119-1	10428568	
A1218-1	1	Valve, Manual	2 in., Supply Header Shut-Off	Powell Co. PN 40395	10428561	
A1218-2	1	Valve, Manual	2 in., Supply Header Shut-Off	Powell Co. PN 40395	10428561	
A1219-1	1	Valve, Manual	1 1/2 in., LN_2 Reservoir Supply Shut-Off	Powell Co. PN 43121	10428564	
A1219-2	1	Valve, Manual	1 1/2 in., LN_2 Reservoir Supply Shut-Off	Powell Co. PN 43121	10428564	
A1219-3	1	Valve, Manual	1 1/2 in., LN_2 Reservoir Supply Shut-Off	Powell Co. PN 43121	10428564	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1219-4	1	Valve, Manual	1 1/2 in., LN_2 Reservoir Supply Shut-Off	Powell Co. PN 43121	10428564	
A1220-1	1	Valve, Manual	1 in., LN_2 Supply Header Drain	Powell Co. PN 49008	10428560	
A1220-2	1	Valve, Manual	1 in., LN_2 Supply Header Drain	Powell Co. PN 49008	10428560	
A1221-1	1	Valve, Manual	3 in., Low Pressure Vaporizer Shut-Off	Powell Co. PN 40402	10428562	
A1221-2	1	Valve, Manual	3 in., Low Pressure Vaporizer Shut-Off	Powell Co. PN 40402	10428562	
A1222 and A1223 are not functionally applicable to this system.						
A1224	4	Valve, Relief	6800 psig	Cosmodyne Part of PN 2410000	Part of 10428625	
A1225	4	Valve, Manual	High Pressure Vaporizer Discharge Shut-Off	Cosmodyne Part of PN 2410000	Part of 10428625	
A1226	4	Valve, Check	High Pressure Vaporizer Discharge	Cosmodyne Part of PN 2410000	Part of 10428625	
A1227	4	Switch, Temperature	Actuation at 0°F -75°F to +225°F Range	Cosmodyne Part of PN 2410000	Part of 10428625	
A1228						
A1229-1	1	Vaporizer	Low Pressure LN_2, 200 gpm	Cosmodyne	Part of 10428622	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1229-2	1	Vaporizer	Low Pressure LN_2, 200 gpm	Cosmodyne	Part of 10428622	
A1230						
A1231	1	Valve, Relief	4 in. 125 ±10.5 psig	C. M. Bailey Co. PN 122-4	10428579	
A1232	1	Valve, Manual	2 in. Low Pressure GN_2 Line Vent	Powell Co. PN 23200	10428584	
A1233	1	Transducer, Pressure	0-100 psig Range	Fairchild Controls Corp., PN 990S50-2	10465306	
A1234	1	Transducer, Temperature	-100°F to +250°F	Aero Research PN T-5215	10465310-3	
A1235	1	Flowmeter	Low Pressure GN_2 Line 9000-12000 scfm	Cox Inst. Co. Type 20, Model 192SCRF	10465307	
A1236	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158 SFF	10428540	
A1237	1	Valve, Manual	1/2 in., High Pressure GN_2 Replenish Line Vent	Vacco PN MA-6P-X463-2G	10428534	
A1238						
A1239	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	
A1240 through A1242 are not functionally applicable to this system.						

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1243	1	Switch, Differential Pressure	Actuation at 50 psid	Barksdale Valves PN 9653-1-H		
A1244-1	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1244-2	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1245-1	1	Valve, Manual	1/4 in., GN_2 Replenish Line Vent	Vacco PN NVA-6P-401-2G	10428554	
A1245-2	1	Valve, Manual	1/4 in., GN_2 Replenish Line Vent	Vacco PN NVA-6P-401-2G	10428554	
A1246	1	Valve, Manual	2 1/2 in., GN_2 Replenish Line Shut-Off	Vacco PN M-6P-X469-2G	10428530	
A1247	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	
A1248	1	Transducer, Pressure	GN_2 Replenish Line 0-7000 psig Range	Fairchild Controls Model 990S50-2	10465306	
A1249	1	Flowmeter	2000-8000 scfm	Cox Inst. Co., Model 20 SCRF or Potter Aero Corp. Model 2-5318G	10465308	
A1250	1	Valve, Check	2 1/2 in., GN_2 Replenish Line	Vacco PN CLV-6P-X469	10428537	
A1251	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	
A1252	1	Filter	20 Microns, 2 1/2 in., GN_2 Replenish Line	Microporous Filter Div of Circle Seal PN F-4297	10428543	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1253	1	Regulator, Back Pressure	GN_2 Replenish Line Opens at 3500 psig Fully Open at 6000 psig	Vacco PN BPR-6P-X469-06	10428582	
A1254	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	
A1255	1	Transducer, Temperature	-100°F to +250°F	Aero Research PN T-5215	10465310-1	
A1256	1	Valve, Manual	1/2 in., GN_2 Replenish Line Vent	Vacco PN MA-6P-X463-2G	10428534	
A1257	6	Valve, Check	3/4 in.	Vacco PN CLV-6P-X464	10428538	
A1258	6	Valve, Manual	3/4 in., Vent	Vacco PN M-6P-X464-2G	10428533	
A1259	6	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1260-1	6	Storage Vessel, GN_2	200 cu. ft., 6000 psig	A. O. Smith Corp. PN MV50717 & MV50717A	10428621	
A1260-2	6	Storage Vessel, GN_2	200 cu. ft., 6000 psig	A. O. Smith Corp. PN MV50717 & MV50717A	10428621	
A1261	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1262	1	Gage, Pressure	3500 psig - Normal Reading 0-5000 psig Range	Helicoid PN 1366	10428545	
A1263	1	Valve, Relief	3750 ±100 psig	Ladewig Co. PN N-1072	10428541	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1264	1	Valve, Manual	1 in., Shut-Off	Vacco PN M-6P-X465-2G	10428532	
A1265	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1266	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1267	1	Regulator, Pneumatic	6000 - 3500 psig	Vacco PN DL6P3-X465	10428542	
A1268	1	Valve, Manual	1 in., Shut-Off	Vacco PN M-6P-X465-2G	10428532	
A1269	6	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1270	6	Valve, Relief	6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A1271	6	Disc, Burst	Burst at 16000 ±1000 psig	Black, Sivalls, & Bryson, PN 77-NAS-008	10428536	
A1272-1	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	
A1272-2	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	
A1272-3	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	
A1272-4	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1272-5	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	
A1272-6	1	Valve, Manual	1-1/2 in., Fill	Vacco PN M-6P-X467-2G	10428531	
A1273	1	Transducer, Temperature	-400°F to 2500°F	Aero Research PN T-5215-1	10465310-1	
A1274	1	Transducer, Pressure	0-7000 psig, Range	Fairchild Controls Corp., Model 990550-2	10465306	
A1275-1	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1275-2	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1275-3	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1276-1	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1276-2	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1276-3	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1277-1	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	
A1277-2	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1277-3	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	
A1278-1	1	Valve, Manual	2-1/2 in., Shut-Off	Vacco PN M-6P-X469-2G	10428530	
A1278-2	1	Valve, Manual	2-1/2 in., Shut-Off	Vacco PN M-6P-X469-2G	10428530	
A1278-3	1	Valve, Manual	2-1/2 in., Shut-Off	Vacco PN M-6P-X469-2G	10428530	
A1279-1	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1279-2	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1279-3	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1280	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1281	4	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1282	4	Disc, Burst	Burst at 16000 ±1000 psig	Black, Sivalls, & Bryson, PN 77-NAS-008	10428536	
A1283-1	1	Valve, Manual	1-1/2 in.	Vacco PN M-6P-X467-2G	10428531	
A1283-2	1	Valve, Manual	1-1/2 in.	Vacco PN M-6P-X467-2G	10428531	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1283-3	1	Valve, Manual	1-1/2 in.	Vacco PN M-6P-X467-2G	10428531	
A1283-4	1	Valve, Manual	1-1/2 in.	Vacco PN M-6P-X467-2G	10428531	
A1284	4	Valve, Relief	6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A1285	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A1286-1	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1286-2	1	Valve, Check	Cracking Pressure 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1287-1	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1287-2	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1288	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1289	1	Transducer, Temperature	-400°F to 2500°F	Aero Research PN T-5215-1	10465310-1	
A1290	1	Transducer, Pressure	0-7000 psig Range	Fairchild Controls Corp., Model 990550-2	10465306	
A1291	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1292						
A1293	1	Valve, Check	2-1/2 in.	Vacco PN CVL-6P-X469	10428537	
A1294	1	Switch, Differential Pressure	Actuation at 50 psid	Barksdale Valves PN 9653-1-H		
A1295	1	Valve, Manual	2-1/2 in., Shut-Off	Vacco PN M-6P-X469-2G	10428530	
A1296	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1297	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1298	1	Valve, Manual	2-1/2 in.	Vacco PN M-6P-X469-2G	10428530	
A1299	1	Switch, Differential Pressure	Actuation at 50 psid.	Barksdale Valves PN 9653-1-H		
A1300	1	Valve, Check	2-1/2 in.	Vacco PN CLV-6P-X469	10428537	
A1301						
A1302	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1303	1	Filter	20 Microns	Microporous Filter Div. of Circle Seal PN F-4297	10428543	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1304	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A1305	1	Valve, Manual	1/2 in., GN_2 Replenish Line Vent	Vacco PN MA-6P-X463-2G	10428534	
A1306	1	Valve, Check	1/2 in., Cracking Pressure - 5 psig max.	Security Valve Co. PN A1127-1	10428539	
A1307	1	Valve, Manual	1/2 in., Vent	Vacco PN MA-6P-X463-2G	10428534	
A1308	1	Valve, Check	1/2 in., Cracking Pressure - 5 psig max.	Security Valve Co. PN A1127-1	10428539	
A1309	1	Filter	20 Microns	Microporous Filter Div. of Circle Seal PN F-4297	10428543	
A1310	1	Valve, Relief	1 in., 6400 ±100 psig	Ladewig Co. PN N-1072	10428540	
A1311-1	4	Storage Vessel, He	200 cu. ft., 6000 psig	A. O. Smith Corp. PN MV50717 & MV50717A	10428621	
A1311-2	4	Storage Vessel, He	200 cu. ft., 6000 psig	A. O. Smith Corp. PN MV50717 & MV50717A	10428621	
A1312	4	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1313	4	Valve, Manual	3/4 in., Vent	Vacco PN M-6P-X464-2G	10428533	
A1314	4	Valve, Check	3/4 in.	Vacco PN CLV-6P-X464	10428538	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1315-1	1	Valve, Check	Cracking Pressure 5 psig max., 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1315-2	1	Valve, Check	Cracking Pressure 5 psig max., 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1315-3	1	Valve, Check	Cracking Pressure 5 psig max., 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1316-1	1	Valve, Manual	3/4 in. Helium Compressor Discharge Shut-Off	Vacco PN M-6P-X464-2G	10428553	
A1316-2	1	Valve, Manual	3/4 in. Helium Compressor Discharge Shut-Off	Vacco PN M-6P-X464-2G	10428553	
A1316-3	1	Valve, Manual	3/4 in. Helium Compressor Discharge Shut-Off	Vacco PN M-6P-X464-2G	10428553	
A1317-1	1	Valve, Manual	1/4 in., Helium Compressor Discharge Vent	Vacco PN NVA-6P-401-2G	10428554	
A1317-2	1	Valve, Manual	1/4 in., Helium Compressor Discharge Vent	Vacco PN NVA-6P-401-2G	10428554	
A1317-3	1	Valve, Manual	1/4 in., Helium Compressor Discharge Vent	Vacco PN NVA-6P-401-2G	10428554	
A1318-1	1	Valve, Check	1/4 in., Cracking Pressure 2-4 psig	Security Valve Co. PN 33860-1	10428598	
A1318-2	1	Valve, Check	1/4 in., Cracking Pressure 2-4 psig	Security Valve Co. PN 33860-1	10428598	
A1318-3	1	Valve, Check	1/4 in., Cracking Pressure 2-4 psig	Security Valve Co. PN 33860-1	10428598	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1319	3	Gage, Pressure	6000 psig - Normal Reading 0-16000 psig Range	Cardair PN AS-45406	Part of 10428623	
A1320	3	Regulator, Back Pressure	Cracks at 3500 psig Fully Open at 6000 psig	Cardair PN 35100041	Part of 10428623	
A1321						
A1322	3	Gage, Pressure	Helium Induction Pressure 120 psig - Normal Reading 0-300 psig Range	Cardair PN AS-45399	Part of 10428623	
A1323	3	Valve, Solenoid	N.C.	Cardair PN AS-15572	Part of 10428623	
A1324	3	Unloader		Cardair PN AC-45548-G2	Part of 10428623	
A1325	3	Valve, Check	Helium Blow-By	Cardair Stock No. 16133	Part of 10428623	
A1326	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	
A1327	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158SFF	10428540	
A1328	1	Valve, Check	Cracking Pressure 2-4 psig, 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1329	1	Valve, Manual	3/8 in., Helium Replenish Line Vent	Vacco PN NVA-6P-462-2G	10428553	
A1330	1	Gage, Pressure	He Replenish Line Pressure 6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1331	1	Gage, Pressure	He Replenish Line Pressure 6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	
A1332	1	Filter	20 Microns	Microporous Filter Div. of Circle Seal PN 40842	10428558	
A1333	1	Regulator, Back Pressure	Opens at 3500 psig Fully Open at 6000 psig	Vacco PN BPR-6P-X466-04	10428581	
A1334	1	Valve, Manual	1 in., Helium Replenish Line Shut-Off	Vacco PN M-6P-X466-2G	10428556	
A1335	1	Gage, Pressure	He Replenish Line Pressure 6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428559	
A1336	1	Transducer, Temperature	-100°F to +250°F	Aero Research PN T-5215	10465310-2	
A1337	1	Flowmeter	200-600 scfm	Cox Inst. Div. Model 12 SCRF	10465309	
A1338	1	Transducer, Pressure	Range 0-7000 psig	Fairchild Controls Model 990S50-2	10465306	
A1339	1	Valve, Relief	6400 ±100 psig	Ladewig Co. PN 158 SFF	10428540	
A1340	1	Valve, Manual	3/8 in., Helium Replenish Line Vent	Vacco PN NVA-6P-462-2G	10428553	
A1341	1	Valve, Check	Cracking Pressure 2-4 psig, 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1342	1	Valve, Manual	3/8 in., Helium Replenish Vent	Vacco PN NVA-6P-462-2G	10428553	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1343	1	Valve, Check	Cracking Pressure 2-4 psig, 3/8 in.	Security Valve Co. PN 33860-1	10428549	
A1344	6	Valve, Manual	1/4 in., Shut-Off	Vacco PN NV-6P-401B-2M	10428535	
A1345						
A1346-1	1	Valve, Manual	1 in., Desiccant Bank Discharge Shut-Off	Vacco PN M-6P-X466-2G	10428556	
A1346-2	1	Valve, Manual	1 in., Desiccant Bank Discharge Shut-Off	Vacco PN M-6P-X466-2G	10428556	
A1347-1	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1347-2	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1348-1	1	Valve, Manual	1/4 in., Desiccant Bank Vent	Vacco PN NVA-6P-401-2G	10428554	
A1348-2	1	Valve, Manual	1/4 in., Desiccant Bank Vent	Vacco PN NVA-6P-401-2G	10428554	
A1349-1	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-2	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-3	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1349-4	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-5	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-6	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-7	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1349-8	1	Purifier Chamber	Water and Oil Removal 0.3 Micron min.	Robbins Aviation, Inc. Model RAF-6SP-773 PN A-803-3-773	10428557	
A1350-1	1	Valve, Manual	1 in., Desiccant Bank Inlet Shut-Off	Vacco PN M-6P-X466-2G	10428556	
A1350-2	1	Valve, Manual	1 in., Desiccant Bank Inlet Shut-Off	Vacco PN M-6P-X466-2G	10428556	
A1351	1	Valve, Check	1 in.	Vacco PN CVL-6P-X466	10428555	
A1352						
A1353-1	1	Valve, Manual	3/4 in., Helium Compressor Supply Shut-Off	Vacco PN MA-6P-464-2G	10428552	
A1353-2	1	Valve, Manual	3/4 in., Helium Compressor Supply Shut-Off	Vacco PN MA-6P-464-2G	10428552	
A1353-3	1	Valve, Manual	3/4 in., Helium Compressor Supply Shut-Off	Vacco PN MA-6P-464-2G	10428552	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1354-1	1	Valve, Manual	1/4 in., Helium Compressor Induction Vent	Vacco PN NVA-6P-401-2G	10428554	
A1354-2	1	Valve, Manual	1/4 in., Helium Compressor Induction Vent	Vacco PN NVA-6P-401-2G	10428554	
A1354-3	1	Valve, Manual	1/4 in., Helium Compressor Induction Vent	Vacco PN NVA-6P-401-2G	10428554	
A1355-1	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1355-2	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1355-3	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	
A1356-1	1	Gage, Pressure	120 psig - Normal Reading 0-5000 psig Range	Helicoid PN 3341	10428548	
A1356-2	1	Gage, Pressure	120 psig - Normal Reading 0-5000 psig Range	Helicoid PN 3341	10428548	
A1357	1	Valve, Relief	2800 ±100 psig	Ladewig Co. PN 158SFF	10428550	
A1358	1	Filter	20 Microns, Helium Induction Line Manifold	Microporous Filter Div. of Circle Seal	10428547	
A1359	1	Valve, Manual	1/4 in., Helium Induction Manifold Vent	Vacco PN NV-6P-4018-2M	10428535	
A1360	1	Valve, Check	Cracking Pressure 2-4 psig, 1/4 in.	Security Valve Co. PN 33860-1	10428598	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1361-1	1	Valve, Check	1 in.	Vacco PN CVL-6P-X465	10428546	
A1361-2	1	Valve, Check	1 in.	Vacco PN CVL-6P-X465	10428546	
A1361-3	1	Valve, Check	1 in.	Vacco PN CVL-6P-X465	10428546	
A1362-1	1	Valve, Manual	1 in., Helium Supply Shut-Off	Vacco PN M-6P-X465-2G	10428532	
A1362-2	1	Valve, Manual	1 in., Helium Supply Shut-Off	Vacco PN M-6P-X465-2G	10428532	
A1362-3	1	Valve, Manual	1 in., Helium Supply Shut-Off	Vacco PN M-6P-X465-2G	10428532	
A1363-1	1	Coupling, Helium Supply	1/2 in.		AN815-8C	
A1363-2	1	Coupling, Helium Supply	1/2 in.		AN815-8C	
A1363-3	1	Coupling, Helium Supply	1/2 in.		AN815-8C	
A1364-1	1	Gage, Pressure	2200 psig - Normal Reading 0-5000 psig Range	Helicoid PN 3341	10428545	
A1364-2	1	Gage, Pressure	2200 psig - Normal Reading 0-5000 psig Range	Helicoid PN 3341	10428545	
A1364-3	1	Gage, Pressure	2200 psig - Normal Reading 0-5000 psig Range	Helicoid PN 3341	10428545	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1365	3	Regulator, Pressure	2200-120 psig	Cardair PN AS-46359	Part of 10428623	
A1366	3	Gage, Pressure	2200 psig - Normal Reading 0-5000 psig Range	Cardair PN AS-46002	Part of 10428623	
A1367	3	Valve, Manual	1/4 in., Oil Trap Drain	Cardair PN AC-15812	Part of 10428623	
A1368	3	Trap	Inlet	Cardair PN AD-45970	Part of 10428623	
A1369	3	Valve, Solenoid	1 1/2 in., 2-Way, N.C. Helium Induction Line	Cardair PN AS-4600	Part of 10428623	
A1370	3	Heat Exchanger	3/4 in. Coil 2nd Stage Intercooler	Cardair	Part of 10428623	
A1371	3	Trap	Intercooler	Cardair PN AC-45989	Part of 10428623	
A1372	3	Gage, Pressure	0-3000 psig Range	Cardair PN AS-45301	Part of 10428623	
A1373	3	Heat Exchanger	3/4 in. Coil 4th Stage Aftercooler	Cardair	Part of 10428623	
A1374	3	Gage, Pressure	6000 psig - Normal Reading 0-16000 psig Range	Cardair PN AS-45406	Part of 10428623	
A1375	3	Valve, Manual	3/4 in., 4th Stage Discharge Shut-Off	Cardair PN AS-30700	Part of 10428623	
A1376	3	Trap	4th Stage Aftercooler	Cardair PN AC-45991	Part of 10428623	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1377	3	Switch, Pressure	Actuation at 6400 psig	Cardair PN AS-45299	Part of 10428623	
A1378	3	Filter	Water and Oil Removal	Cardair PN AS-45984	Part of 10428623	
A1379	3	Filter	7-10 Micron	Cardair PN AC-46203	Part of 10428623	
A1380	3	Valve, Manual	3/4 in., 4th Stage Discharge Vent	Cardair PN AS-30700	Part of 10428623	
A1381	3	Valve, Manual	3/4 in., Helium Compressor Discharge Shut-Off	Cardair PN AS-30700	Part of 10428623	
A1382-1	1	Valve, Manual	2 in., Supply	Vacco PN M-6P-X469-2G	10428530	
A1382-2	1	Valve, Manual	2 in,, Supply	Vacco PN M-6P-X469-2G	10428530	
A1383-1	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1383-2	1	Gage, Pressure	6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 1366	10428544	
A1384	1	Valve, Check	Cracking Pressure - 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	
A1385	1	Valve, Manual	1/2 in., Helium Replenish Line Vent	Vacco PN MA-6P-X463-2G	10428534	
A1386	1	Valve, Check	Cracking Pressure - 5 psig max., 1/2 in.	Security Valve Co. PN A1127-1	10428539	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1387						
A1388-1	1	Gage, Pressure	Desiccant Bank 6000 psig - Normal Reading 0-10000 psig Range	Helicoid PN 3341	10428544	
A1388-2	1	Gage, Pressure	Desiccant Bank 6000 psig - Normal Reading 0-1000 psig Range	Helicoid PN 3341	10428544	
A1389	1	Valve, Check	2 in.	Vacco PN CVL-02P-F468	10428583	
A1390	1	Valve, Check	1/2 in.	Security Valve Co. PN A1127-1	B10428539	
A1391	3	Compressor, Helium	4-Stage 120-6000 psig 150 scfm	Cardair PN AE-45980	10428623	
A1392						
A1393	1	Switch, Differential Pressure	Actuation at 50 psid	Barksdale Valves PN 9653-1-H-D		
A1394	1	Switch, Differential Pressure	Actuation at 50 psid	Barksdale Valves PN 9653-1-H-D		
A1395 through A1398 are not functionally applicable to this system.						
A1399	3	Valve, Check		Cardair PN 161568	Part of 10428623	
A1400 and A1401 are not functionally applicable to this system.						

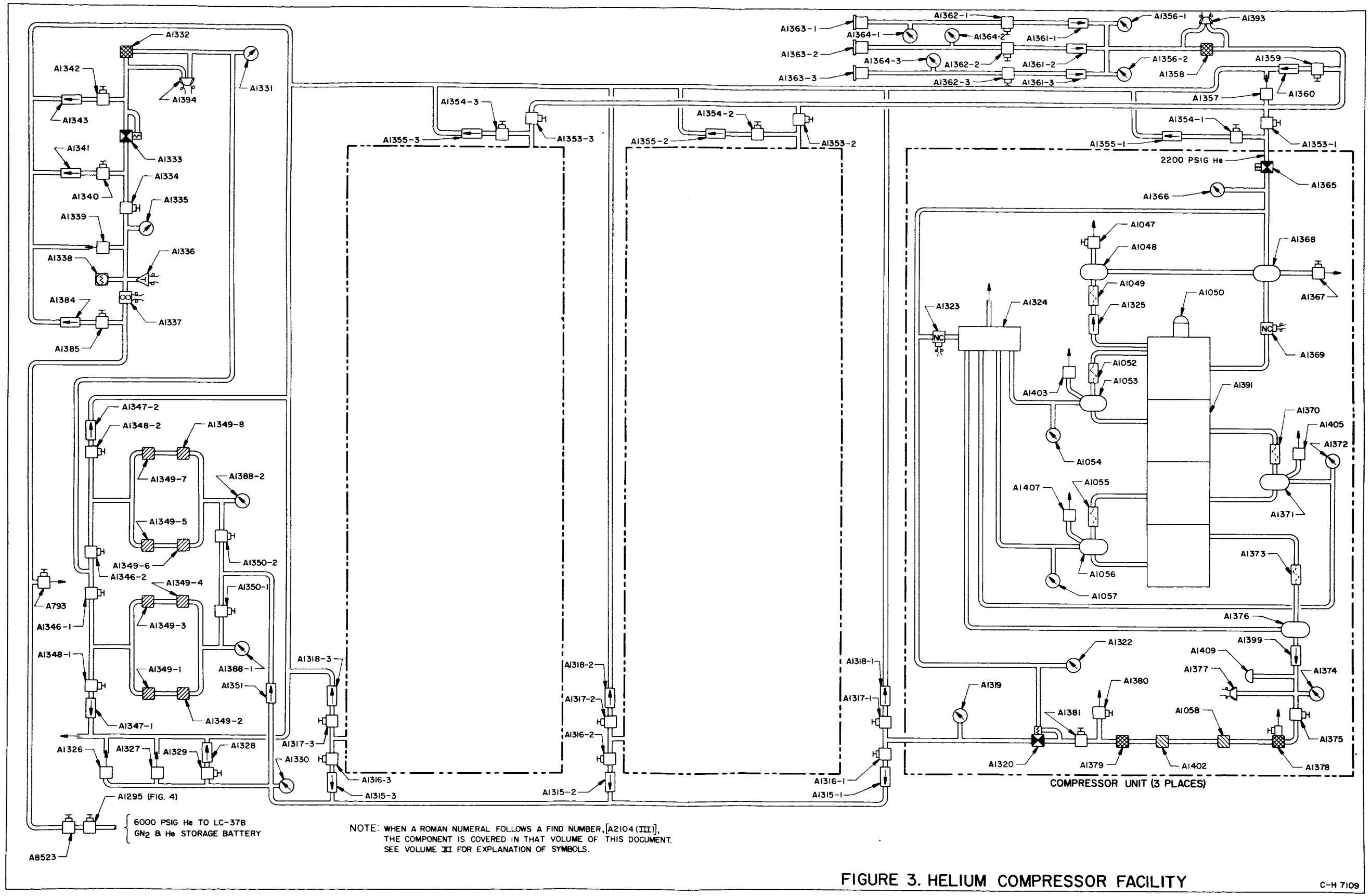


FIGURE 3. HELIUM COMPRESSOR FACILITY

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1402	3	Purifier Chamber	Moisture Removal	Cardair PN AS-45456	Part of 10428623	
A1403	3	Valve, Relief	435 psig	Cardair	Part of 10428623	
A1404						
A1405	3	Valve, Relief	1400 psig	Cardair	Part of 10428623	
A1406						
A1407	3	Valve, Relief	4300 psig	Cardair	Part of 10428623	
A1408						
A1409	3	Disc, Burst	Ruptures at 11,000 psig	Cardair PN AS-46017	Part of 10428623	
A1410 through A1414 are not functionally applicable to this system.						
A1415	4	Disc, Burst	Vacuum Jacket, Ruptures at 150 psig	Part of Cosmodyne Vacuum Jacketed Pump Model No. CL5-125J	Part of 10428625	
A1416 through A1421 are not functionally applicable to this system.						
A1422	4	Valve, Manual	Gage Protector	Cosmodyne Part of PN 2409800	Part of 10428625	

FINDING NUMBER	NO. REQD	COMPONENT	REMARKS	VENDOR	DRAWING NUMBER	ELEC SYM
A1423	1	Regulator, Pressure	2200 to 50 psig Reduction	Ohio Chemical and Surgical Equipment Co.	Part of 1042624	
A1424 through A8519 are not functionally applicable to this system.						
A8520	1	Valve, Manual	12 in. Butterfly	Keystone Valve Corp.		
A8521	1	Valve, Manual	2 in., Valve, 2 1/2 in. Flanges	Vacco PN M-6P-X469-2G	10428530	
A8522						
A8523	1	Valve, Manual	2 in., Valve, 2 1/2 in. Flanges	Vacco PN M-6P-X469-2G	10428530	
A8524 and subsequent finding numbers are not functionally applicable to this system.						

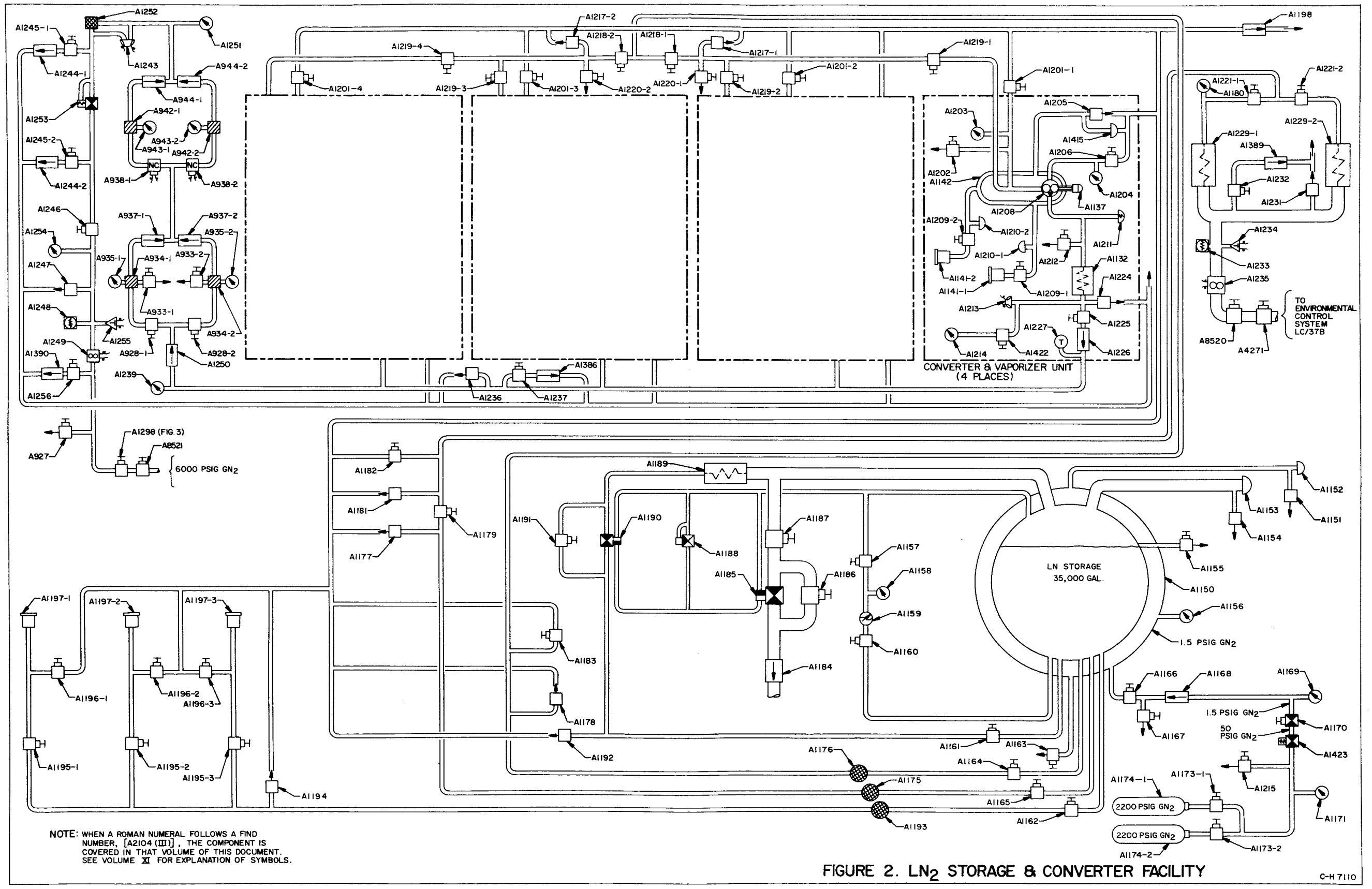
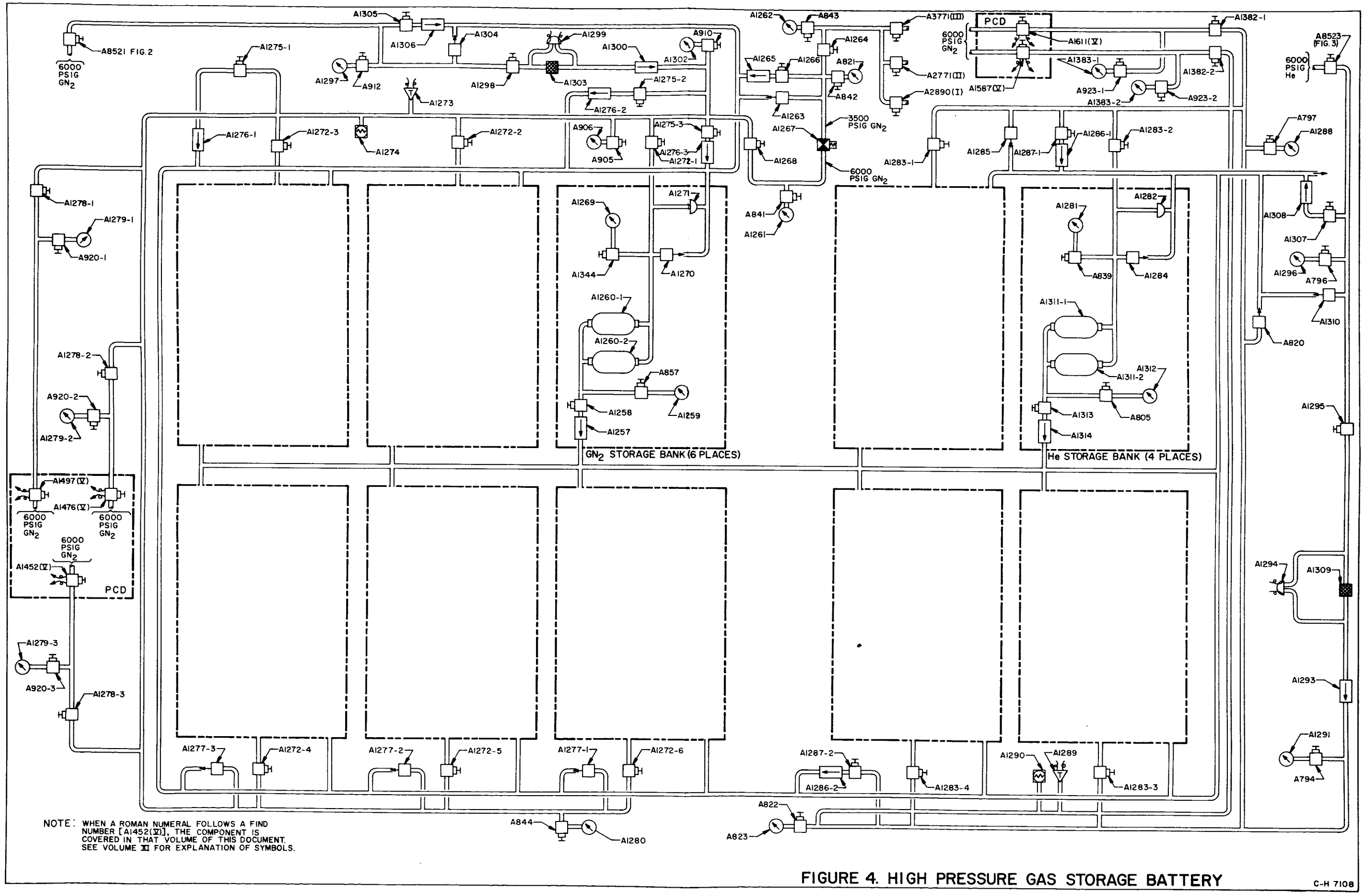


FIGURE 2. LN_2 STORAGE & CONVERTER FACILITY



NOTE: WHEN A ROMAN NUMERAL FOLLOWS A FIND NUMBER [A1452(V)], THE COMPONENT IS COVERED IN THAT VOLUME OF THIS DOCUMENT. SEE VOLUME XI FOR EXPLANATION OF SYMBOLS.

FIGURE 4. HIGH PRESSURE GAS STORAGE BATTERY

C-H 7108

DISTRIBUTION

CCSD-HO (Dept. 4600), BALFOUR, C.L. (10)
CCSD-NO (Dept. 2714), BEAMER, W. (14)
CCSD-NO (Dept. 2240), SIMMONS, F. (2)
DAC (Dept. A2-857), BELWOOD, H.
DAC, KEATING, J.
DAC, HOLLISTER, R. (Dept. A3-770)
I-I/IB-SI, CHAMBERS, J.
I-I/IB-SIV, FERGUSON, W.
I-I/IB-SIVH, LEAGUE, R.
I-I/IB-SIVL/DAC, STOOPS, G.
I-I/IB-SIVL-NASA/DAC-SACTO, TYSON, O.
I-I/IB-SIVL-NASA/DAC-SANTA MONICA, WEAVER, E.
I-MICH-OA, STEVENSON, H.
I-MICH-OA, QUINTON, H.
KN-BS27, WHISENANT, R.
KN-DA, POPPEL, T.
KN-DE2, HAHN, R.
KN-DE2, GRIFFIN, F.
KN-DE2, DZIADON, E. (2)
KN-DE2, REID, R.
KN-DE2, MOORE, R.
KN-DE2, STAHLEY, S.
KN-DE2, CHAPPLE, E.
KN-DE4, DOWNS, J.
KN-DE5, GRIFFIN, F.
KN-DF2, CAREY, T.
KN-DL2, BUCHANAN, D.
KN-DP2, MIMS, W.
KN-DP2, MINTON, C.
KN-DP2, SPARKMAN, O.
KN-DP2, WASILESKI, C.
KN-DP4, NELSON, R.
KN-DP5, WRIGHT, R.
KN-DR2, HOOKER, J. (5)
KN-DS232, BUNCH, M.
KN-ET, BRIDEWELL, C.
KN-FE, DODD, R. (2)
KN-AG, RUSSELL, L. (2)
KN-GT44, HAWKINS, G.
KN-L, GORMAN, R.
KN-LP2, SWEAT, C.
KN-M, PICKETT, A.
KN-P, PETRONE, R.
KN-PA, MATTHEWS, E.
KN-PC, BODY, R. (2)
KN-V, O'HARA, A.
KN-VG, RIGELL, I. (2)
KN-VG2, GREENFIELD, T.
KN-VG22, DOWLING, C. (4)
KN-VG23, ROUSE, C. (4)
KN-VL, GREENE, D. (5)
KN-VL, WHISENANT, E. (2)
KN-VM, PICKETT, A.
KN-VM2, ROBINSON, G.
KN-VM2, RAINWATER, W.
KN-VM3, PANTOLIANO, T. (3)
KN-VM22, DeLaROSA, H.
KN-VM22, FANNIN, L. (8)
KN-VM23, SCOVILLE, D.
KN-VM24, HILL, L.
LVO-DIR, WILLIAMS, M.
LVO-AD, ZEILER, A.
LVO-L, BELLAMY, E. (5)
R-ASTR-E, FICHTNER, H.
R-ASTR-EA, SMITH, R. (5)
R-ASTR-EAA, PASCHAL, L.
R-ASTR-ES, ADEN, R. (3)
R-ASTR-ESI, MILNER, R.
R-ASTR-I, HOBERG, O.
R-ASTR-IM, POWELL, J.
R-ASTR-TR, WAGNON, W.
R-ME-A, NOWAK, M.
R-P&VE-AV, NEIGHBORS, W.
R-P&VE/DAC, MEZO, C.
R-P&VE-PA, REED, K.
R-P&VE-PEM, HOLMES, J. (2)
R-P&VE-PM, FUHRMANN, H. (2)
R-P&VE-PP, HEUSINGER, B.
R-P&VE-PT, WOOD, C.
R-P&VE-V, PALAORO, H.
R-P&VE-VA, HOFFMAN, C.
R-P&VE-VAS, MOON, O.
R-P&VE-VF, ROTHE, K.
R-P&VE-VI, FAULKNER, W. (2)
R-P&VE-VK, BOONE, C.
R-P&VE-VM, BECK, M.
R-P&VE-VNW, DEVENISH, R. (5)
R-P&VE-VO, KISTLER, W. (20)
R-P&VE-VS, SCHULZE, W.
R-P&VE-VSA, PRASTHOFER, W.
R-P&VE-VSI, HURT, W. (2)
R-P&VE-VSI, KRAUS, G. (2)

DISTRIBUTION (Cont'd.)

R-P&VE-VSP, AKINS, J.
R-QUAL-A, URBANSKI, A. (2)
R-QUAL-AAA, CALDWELL, W.
R-QUAL-J, QUINN, C.
R-QUAL-P, BROOKS, C.
R-QUAL-PI, CONAWAY, J.
R-TEST-CF, FORBIS, M.
R-TEST-I, SIEBER, W.
R-TEST-S, DRISCOLL, D.

Please forward any suggested changes, additions, and corrections to the Applied Engineering Communications Section (4612), Chrysler Corporation, Space Division, Huntsville, Alabama.

COPY NO. _____

THIS BOOK CONTAINS _____ PAGES. ☐ ONE SIDE ONLY. ☐ BACK TO BACK

_____ PAGES HAVE BEEN LEFT INTENTIONALLY BLANK.

THIS BOOK WAS INSPECTED BY R E [illegible] AND FOUND TO BE COMPLETE.

SPACE DIVISION CHRYSLER CORPORATION

HUNTSVILLE OPERATIONS