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NUCLEAR DIVISION

Report No. RN-S-0082

(Revision 5)

MASTER

To

AEC-NASA Space Nuclear Propulsion Office

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

Nerva Program

Contract SNP-1

January 1968

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REPORT NO. RN-S-0082
(REVISION 5)

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

NERVA PROGRAM

CONTRACT SNP-1

NUCLEAR ROCKET OPERATIONS

JANUARY 1968

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A SUBSIDIARY OF THE GENERAL TIRE & RUBBER COMPANY

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REPORT NO. RN-S-0082
(REVISION 5)

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

C.M. Rice
Program Manager
Nuclear Rocket Operations

INTRODUCTION

The NERVA Support Equipment Technical Description Handbook, RN-S-0082, describes NERVA NRX and XE Ground Support Equipment. This issue (Revision 5) provides current descriptions of all nonnuclear GSE for the NRX and XE series and most of the nuclear GSE through the NRX-A5 series. The nuclear GSE for NRX-A6 and the XE series will be described in a later revision to this handbook. The equipment list and the data sheets of all items of existing equipment are in numerical order by Provisioning List Number. The items for which there are no data sheets at this time are marked in the equipment list by an asterisk.

Additional information concerning equipment in this handbook may be obtained from L. E. Little, Department 7890, NRO Support Systems, Aerojet-General Corporation, Sacramento, California, Telephone (916) 355-3777.

PROV.
LIST ITEM
NO.

EQUIPMENT LIST

DRAWING NO.

9	Tool Kit, Rocket Disassembly, Remote	293752
10	Tool, Bolt Removal, Forward Closure/Nozzle, Remote	1115360
11	Adapter, Right Angle, Remote Bolt Removal	276312
14	Tool, Removal, Hot Bleed Port Nut	
17	Cover, Nozzle, Cooldown, Remote	276470
18	Tool Kit, Instrumentation Removal, Remote	1115786
19	Tool, Nut Removal, Radiation Shield	
20	Puller, Hot Gas Bleed Port	1116471
21	Tool, Bolt Removal, Remote	1117491
22	Socket, Impact Wrench	1117516
135	Stand, Pressure Vessel, Rocket Engine	276380
137	Fixture, Nozzle Examination	276450
142	Fixture, Bolt Holding, Remote	293300
151	Tool Set, Lapping, Nuclear Engine	276462
210	Fixture, Lifting, Propellant Inlet Line, Remote	276440
211	Fixture, Lifting, Rocket Engine Forward Closure, Remote	276300
218	Fixture, Lifting, Floor Mounted Support Equipment, Remote	276410
265	Polisher and Grinder, Remote	276465
267	Saw, Specimen Metal Cutting, Remote	276425
270	Fixture, Holding, Nozzle Section, Remote	276389
273	Cutter, Seal Manifold, Remote	276390
452	Closure Kit, Pressure Testing, Rocket Engine	293235
453	Closure Kit, Pressure Testing, Nozzle Throat, Rocket Engine (Modified)	293333
455	Protector, Flange, Pressure Vessel	253371
456	Modification Kit, Nozzle Throat Closure Plug	1115803

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
469	Kit, Dimensional Checking, Rocket Engine	293200
475	Closure, Reactor/Pressure Vessel Assembly Pressure Test	1114363
501	Stand, Turbopump, Remote	1114410
502	Sling, TPA, NRX/EST Assembly	1114392
503	Sling, Direct Radiation Shield	1114652
504	Fixtures, Handling, Propellant Lines, Remote	1115450, 1115030, 1115338, 1115339, 1115796
505	Stand, Direct Radiation Shield	1114651
506	Fixture, Holding, Turbine Inlet Line Elbow, Remote	1115864
704	Container, Shipping and Storage, Rocket Engine Nozzle	278500
730	Fixture, Alignment, Coolant Manifold	278509
801	Sling, Multiple Leg, Multiple Purpose, 3000 lb Capacity	278580
803	Fixture, Lifting, Rocket Engine Forward Closure	279150
809	Sling, Beam Type	278570
814	Beam, Hoisting, Nozzle, Rocket Engine	278660
817	Sling, Multiple Leg, 12,000-pound Capacity	278670
915	Stand, Rocket Engine	279050
916	Maintenance Platform, Rocket Engine	279110
917	Stand, Forward Closure, Rocket Engine	279160
919	Stand, Nozzle, Rocket Engine	279180
921	Adapter, Handling, Pressure Vessel, Pneumatic	
922	Fixture, Turnover, Forward Closure	278590
923	Fixture, Disassembly, Thrust Chamber/Reactor, Remote	1115427
924	Stand, Disassembly Fixture	1115636

PROV.
LIST ITEM
NO.

EQUIPMENT LIST

DRAWING NO.

*1001	Spectrometer, 400 Channel (Gamma)	E-675498
*1002	Proportional Beta Counting System, 2 Pi Gas Flow	E-675496
*1003	Colorimeter	NT650053
*1021	Wall Periscope	E-675482
*1022	Shield, Beta Counter	
*1023	Steromicroscope, Remotely Operated	E-675476
*1024	Stage, Stereomicroscope	NT650094
*1027	Balance, Remote	E-675500
*1032	Tester, Remotely Operated Spring	NT650427
*1036	Reader, Microdosimeter	NT650372
*1060	Radio Chemical Equipment	
*1062	Shield, 2 Pi Beta Counting	
*1063	Balance, Marco	
*1065	Adapter, Stereomicroscope	NT650260
*1067	Meter, pH	NT650262
*1068	Crystal, Scintillation Detector, Harshaw	Mod 12S12
*1069	Spectrophotometer	Mod 12000B
*1080	Measuring Kit, No. 1	NT650275
1091	Table, Balance	NT650286
1092	Fixture, Coil Spring Testing	NT650418
1093	Fixture, Leaf Spring Testing	NT650419
*1100	Hot Cell, Medium Duty Prefabricated	E-675494
1102	Tool, Removal, Control Drum Bearing Housing Bolt	NT650135
1103	Fixture, Lifting, Control Drum Assembly	NT650011
1104	Stand, Storage, Control Drum Assembly	NT650009

*Entry to be supplied at a later date

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
1105	Stand, Control Drum Disassembly	NT650015
1106	Fixture, Lifting, Outer Reflector Assembly	NT650002
1110	Fixture, Lifting, Outer Reflector Sector	NT650012
*1119	Container, Lateral Support Parts	NT650070
*1122	Stand, Inner Reflector Segment Assembly	NT650016
1123	Stand, Cylinder Slitting	NT650060
1126	Stand, Storage, Inner Shipping Container	NT650006
*1131	Handling Fixture, Universal	3-509976
1132	Stand, Closure/Control	3-510221
*1133	Fixture, Handling, Nozzle	3-510797
*1134	Stand, Vessel/Nozzle Disassembly	3-510276
1135	Fixture, Handling, Shield	3-509800
*1138	Stand, Privy Plug Assembly, Upper Portion	3-509958
1139	Inspection Equipment	
1143	Fixture, Handling, Reactor Assembly	NT650000
1145	Pallet, Simulated Shield	NT650138
1149	Fixture, Lifting, Nozzle End Support Ring, Outer Reflector	NT650004
1151	Fixture, Handling, Reactor Adapter Ring	3-510004
1153	Fixture, Handling, Screen	3-509904
1158	Stand, Drive Shaft Storage	NT650141
1160	Fixture, Lifting, Shipping Container	NT650005
*1162	Pallet, Support, Top Cover	NT650007
*1163	Pallet, Support, Inner Container Cover	NT650008
1164	Fixture, Handling, Control Drum	NT650014
1168	Container, Control Drum Hardware	NT650175

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
1171	Tool, Outer Reflector Tie Bolt	NT650142
1172	Fixture, Handling, Cylinder Slitting Stand	NT650124
*1176	Container, Shipping, Poison Wires	976D166
*1180	Tool, Instrumentation Seal Nut Removal	3-512103
1181	Fixture, Support, Instrumentation and Control Drum Shaft	3-509937
1182	Fixture, Trunnion, Reactor	3-510022
1193	Pallet, Disposal	566F441D
*1195	Container, Support Tool and Hardware	3-507827
1199	Rack, Tool Holder	NT650143
1200	Drill, Mechanical Remote	NT650036
1209	Clips, Retainer, Control Shaft	3-510299
1211	Tool, Simulated Shield Nut Installation	NT650322
1218	Fixture, Chucking, Mechanical Remote Drill	NT650020
*1220	Tool, Guide Tube Removal	3-510806
*1221	Mill, Bolt Head	3-511854
1224	Instrumentation Recorders and Cabinets, Shipping	
*1225	Closure, Leak Test	3-511773
*1226	Fixture, Handling, Disposal Pallet	NT650331
1229	Fixture, Handling, Control Drum Disassembly Stand	NT650018
1230	Fixture, Closing, Large Disposal Pail	NT650329
*1232	Fixture, Core Loading	NT650033
*1233	Fixture, Handling, Core Barrel	NT650021
*1235	Fixture, Seal Retainer	NT650063
1237	Fixture, Closing, Small Disposal Pail	NT650328
*1239	Fixture, Cluster Assembly (Regular)	NT600013

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*1240	Fixture, Cluster Assembly (Irregular)	NT600014
*1241	Fixture, Lifting, Control Drum	NT600019
*1242	Fixture, Lifting, Outer Reflector Sector	NT600020
*1243	Storage Rack, Control Drum	NT650035
*1247	Platform, Personnel, Reactor/Vessel-Car	709J743
1249	Semitrailer, Reactor and Shield Shipping	NT600082
1251	Trunnion Cage, Reactor/Vessel	3-510081
*1256	Stand, Barrel Support	NT650023
1258	Insert, Element Cask	NT650434
*1259	Container, No. 1 Hardware	NT650074
*1264	Container, Simulated Shield	710J071
*1280	Container, Lateral Support Plunger and Tie Rod Groups	NT650194
*1285	Tool, Seal Segment Withdrawal	NT650200
1290	Cutter, Control Drum Assembly	NT650297
*1302	Trunnion Fixture, Post Operations	NT650309
*1304	Tester, Air Flow Impedance	NT650311
*1305	Rack No. 1, Transfer	NT650312
1308	Adapter, Periscope	NT650315
*1311	Fixture, Seal Segment Guide	NT650318
*1312	Tool, Drill Bushing Assembly, Seal Segment Removal	NT650319
*1317	Container, Fuel Cluster Tie Rod	NT650064
*1320	Container, Cluster Nut Hardware	NT650073
*1321	Container, Fuel Cluster Support	NT650068
*1327	Tester, Electrical Resistivity	NT650440
1334	Adapter, Drive Shaft Torque	NT650131

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
1337	Fixture, Retaining, Trunnion Cage	NT650326
1339	Gage, Drive Shaft Location	NT650072
*1340	AGC Transition Block	3-510510
*1341	Tool, Simulated Shield Nut, 1-1/2" Thd	NT650184
*1342	Tool, Simulated Shield Nut, 1-1/4" Thd	NT650185
1343	Tool, Simulated Shield Support Sleeve	NT650186
*1344	Handling Fixture - Key Cluster	NT650188
*1354	Oil Filter System	Mod 217-1
1355	Stand, Assembly and Installation	3-508159
*1356	Stand, Privy Plug Assembly, Lower Portion	3-505435
*1357	Cover, Protective Ports	NT600877
1358	Fixture, Handling, Postoperative, Sector	NT650333
1359	Cradle, Postoperative Sector	NT650334
1360	Fixture, Handling, Postoperative, Control Drum	NT650335
1363	Tool, Retraction, Poison and Calibration Wire	NT650338
1364	Gage, Reflector Assembly, Bow	NT650339
1369	System, Nozzle Hood Emplacement	NT650341
*1370	Lock, Control Drum	3-512003
*1371	Micrometer, Optical Gage (With Non-Browning Lens)	NT650307
*1372	Cask, Dosimeter	Mod CL.6-44
*1374	Scaffold, Dosimeter Recovery	NT650413
*1375	Trunnion Cage, Reactor	3-509940
*1376	Adapter, 25 Ton Crane Hook	NT650523
*1380	Container, Long Parts Disposal	NT650431

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*1381	Container, Sector, Outer Reflector	NT650432
*1385	Fixture, Reactor Assembly Handling	NT650436
*1386	Puller, Cluster Nut	NT650435
*1387	Fixture, Segment Lifting	NT650438
*1389	Clamp, Slip Prevention	NT650526
*1392	Fixture, Wrench Changing	NT650439
*1394	Lock, Transfer, Jr Hot Cell	NT650441
*1395	Sleeve, Periscope, 6 ft	NT650529
*1401	Checker, Nuclear Channel Criticality and Safety	945C411
*1402	Checker, Control Drum Actuator	909E463
*1406	Checker, Wiring and Transducer	928F932G01
*1407	Calibration Sources and Containers	N5-5
*1414	Neutron Source, Reactor Startup and Container	
*1418	Tester, Eddy Current (WANL Type)	799D587
*1421	Transducer Test Equipment	928F918G01
*1433	Checker, Operational Control and Data Amplifier	1FC-1065
*1435	Test Cell "A" Radial Rabbit Gun	715J030
*1500	Stand, Adapter, Trunnion Fixture	NT650530
*1501	Cutter, Plier Type, Instrumentation	NT650448
*1502	Cutter Head, Guillotine Type, Instrumentation	NT650449
*1503	Fixture, Instrumentation Cutter Changing	NT650450
*1504	Tool, Tie Bolt Disassembly	NT650451
*1505	Gage, Indicating Plus	Mod. 844V
*1506	Cask, Shipping, 3T-6DX14L	NT650443
*1507	Cask, Shipping 4T-5DX14L	NT650444

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*1508	Cask, Shipping, 4T-3DX30L	NT650445
*1509	Wrench, Air Impact, Cluster Nut	Skil. Mod. 1080
*1511	Tray, Folding Transfer	NT650442
*1512	Tool, Core Support Ring Bolt Removal	NT650453
*1513	Tool, Tie Rod Nut Removal	NT650455
*1514	Driver, Pneumatic Screw	NT650454
*1515	System, Remote Weighing	
*1516	Stand, Sector Disassembly/Inspection	NT650531
*1517	Stand, Shielded Inspection	NT650532
*1518	Shaft, Interchangeable Reactor/Vessel Trunnion Cage	
*1560	Adapter, O-MAN	NT650456
*1561	Wrench, Air Impact, 1 Inch Square Drive	NT650457
*1562	Adapter, Offset	
*1564	Grinder, Pneumatic, Sidewall	NT650569
1702	Flat Car, Reactor Shipping	711J066
1703	Instrumentation Car, Reactor Shipping	709J825
*1706	Container, Shipping, NRX-A Reactor in Vessel	E-675544
2001	Vehicle, Engine Installation (EIV)	89-71-1000
2002	Car, Control, Manned (MCC)	89-73-1000
2003	System, Overhead Positioning (OPS)	89-80-1000
2012	Carriage, Mobile, Floor Mounted Handling System	89-81-1100
2013	Dolly, Remote Handling, Floor Mounted Handling System	89-81-1200
2014	Turntable Assembly, Portable, 9-Foot, 6-Inch Diameter, Floor Mounted Handling System	89-81-1800
2017	Turntable Assembly, Portable, 15-Foot Diameter, Floor Mounted Handling System	80-81-1850

*Entry to be supplied at a later date.

PROV. LIST ITEM NO.	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
2031	Stand, Reactor Positioning Head, Floor Mounted Handling System	89-80-1950
4000	Stand, UTS/TSA Assembly	1117448-9
4008	Stand, External Shield	1117127-9
4009	Fixture, Lifting, External Shield	1117216-9
4011	Head Assembly, Positioning, Thrust Structures	1114421-9
4012	Stand, Positioning Head, Thrust Structure	1114447-9
4021	Stand, Engine Assembly	1117307-9
4027	Stand, Assembly, Storage, Upper Thrust Structure Module	1116300-9
4043	Adapter Kit, Checkout, Remote	1117850
4045	System, Materials Transfer, Postoperative Cell	1115585
4046	Sling, Intercell Transfer Car	1115598
4048	Sling, Handling, Mobile Table	1115589
4049	Cover, Fluid Line, Remote	1115155-9
4059	Platform, Maintenance, ETS-1	1118696-9
4087	Lifting Device, Turbopump Assembly	1117189-19
4088	Closure, Engine Nozzle	1116894
4090	Spacer, Installation, Test Stand Adapter	1116912
4094	Stand, PVARA	1116098
4095	Cover, Auxiliary Duct, ETS-1	1117881
4099	Stand, Engine Holding	1116222
4101	Lifting Device, Collar, Line Shielding	1117105
4102	Platform, Internal, UTS	1115073
4103	Kit, Guide, Flange, Fluid Lines	1117996
4104	Wrench Assembly, Impact	1116315
4105	Clamp, Line Alignment, Remote	1116852

PROV. LIST ITEM NO.	EQUIPMENT LIST	DRAWING NO.
4108	Closure, Turbine Exhaust Nozzle	1118799
4111	Stand, External Shield, Ball Loading	1117236
4112	Tool, UTS/TSA Nut Removal, Remote	1117870
4115	Guides, Control Drum Drive Shaft Housing	1117666
4116	Fixture, Lifting, XE Lower Module	1116340
4117	Coupling Device, Fluid Line, Remote, 9.00-Inch C-C Hex	A-06771-D
4118	Coupling Device, Fluid Line, Remote, 7.62-Inch C-C Hex	A-06728-D
4119	Coupling Device, Fluid Line, Remote, 6.50-Inch C-C Hex	A-06726-D
4120	Coupling Device, Remote, 4.75-Inch C-C Hex	A-06760-D
4121	Device, Nut Actuation, Remote UTSM/TSA Lines	A-06799-D
4122	Stand, Engine Reassembly	1118465
4123	Tool, UTS Shield Nut, Remote	A-06863-D
4124	Kit Tool, Seal Installation	1133893
4125	Target Assembly, Parallel	1117337
4126	Container, Shipping, Upper Module Assembly	1118743
4133	Adapter, Fixture, Lifting	1118664
4134	Fixture, Lifting, Insulating Shield, XE	1117458
4135	Protector, Flange, Pressure Vessel	1118755
4142	Kit, Modification, Handling Fixture, Forward Closure, Remote	1134013
4143	Adapter, Poison Wire Retention, Nozzle Throat Plug	1134556
4400	Set, Functional Valve and Leak Test	1117286
4401	Set, Electrical Test	1117297
4402	Set, Detector, Helium Leak, Remote	1118395
4404	Kit, Closure, Engine Leak Testing	1117450
4408	Fixture, Retention, Central Core Poison Wire	1117446

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
4409	Simulator, Electrical	1118560
4412	Closure Assembly, Vent Line	1134414
4420	Simulated Engine Test Stand No. 1	SPE 69-1-65
4701	Adapter, Handling, Thrust Structure	278930
4708	Platform, Maintenance, Engine	1118630
4709	Fixture, Lifting, Rocket Engine	278850
4746	Sling, Test Stand Adapter	1117077
4749	Fixture, Handling, Fluid Line, Remote	1117682
5002	Shear, Bench, Hydraulic	P-03339-D
5003	Cleaner, Vacuum Remote	
5006	Torch, Acetylene Remote	
5007	Mounts, Binocular	
5009	Tester, Macrohardness, Remote	
5014	Shield, Personnel	
5015	Television System Equipment	
5019	Periscope, Wall Type, Hot Disassembly Bay	
5021	Car, Storage, High Activity	
5022	Remote, Durometer	
5023	Periscope, Wall Type, Post Mortem Cell	
5026	Transfer System, Plug Door	
5029	Spacer Car	
5035	Shears, Pneumatic, Hedge Type	
5036	Shears, Pneumatic, Hook Type	
5038	Screw Driver, Remote	
*5202	Scanner, Incremental Gamma, Mechanical	

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*5203	Scanner, Gross Gamma, Electrical	E-675520A
*5204	Scanner, Incremental Gamma, Electrical	E-675521A
*5206	Pulverizer	E-675514
*5207	Blender, Remotely Operated	E-675515A
*5209	Library, Fuel Element	E-675542
*5210	Saw, Slitting	E-675524
*5211	Metallograph, Remotely Operated	E-675508A
*5214	Grinder, Course	E-675530
*5215	Polisher, Metallographic	E-675516
*5216	Cut-Off Machine	E-675480
*5217	Oven, Drying Vacuum	E-675531
*5218	Cleaner, Ultrasonic	E-675526
*5219	Press, Mounting	E-67522
*5220	Etcher, Electrolytic	NT650521A
*5221	Etcher, Vacuum Cathodic	E-675523
*5222	Holder, Speciment	E-675536
*5223	Tester, Microhardness	E-675507
*5226	Dolly, Receiving	E-675532
*5227	Wrench, Impact, 1/2 Inch Drive	E-675533
*5228	Wrench, Impact, 3/4 Inch Drive	E-675534
*5229	Wrench, Impact, One Inch Drive	E-675535
*5230	Covers, Spent Fuel Storage Car	E-675519
*5231	Machine, Univeral Testing (Small)	E-675481
*5233	Load Cell, Compressive	NT650415
*5237	Stereomicroscope, Remotely Operated, No. 2	E-675510

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*5238	Stand, Shielding, FEPS, Gross Gamma Scanner	
*6035	FEPS Installation Miscellaneous Hardware	
*6036	Tray, FEPS Receiving, Gross Gamma Scanner	
*6037	Fixture, Lifting, FEPS, Conveyor	
*6038	Stand, Shielding, FEPS, Gross Gamma Scanner	
*6039	FEPS Equipment Mounting Hardware	
*6040	Fuel Element Photography Equipment	WT-650462A
*6042	Fuel Element Electrical Resistivity Tester Equipment	WT-650590B
*6044	Scanner, Gross Gamma, Electrical and Mechanical	WT-650586A
*6045	Mirror Assembly, FEPS Conveyor	3-513360B
*6046	Positioner and Table Assembly, FEPS Element	3-513069D
*6047	FEPS Conveyor Equipment	WT-650587C
*6048	FEPS Master Control Sequencers	
*6049	FEPS Master Conveyor Control	
*6051	Checker, Pneumatic Actuator	9375860B
*6114	Adapter, 40 Ton Hook	WT-650579A
*6147		
*6150		
*6151		
*6152		
*6153		
*6156	Cluster Transfer System	WT-650580
*6157	Cluster Disassembly Table	WT-650581A
*6158	Element Cast Insert and Fixture	
*6159	Stand, Center Element Disassembly	WT-650583A

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*6173	Plate, Nozzle Guide	938J037H01
*6174	Fixture, Lifting, Reactor Vessel Assembly	NT601102A
*6180	Tool, Actuator Clamp Removal	WT-650572A
*6181	Tool, Actuator Removal	WT-650571B
*6182	Stand, Actuator Storage	WT-650575A
*6183	Tool, Drive Shaft Installation	WT-650589A
*6193	Tool, Control Shaft Removal	WT-650573A
*6195	Tool, Pedestal Connector Nut Removal	WT-650576A
*6196	Tool, Pedestal Handling Tool	
*6198	Fixture, Handling, Inner Reflector Segment	
*6199	Tooling, Retractor Plate	WT-650596
*7000	Stand, Reactor Disassembly	
*7001	Fixture, Reactor Retaining	
*7003	Fixture, Handling, Reactor	
*7004	Fixture, Removal, Tie Bolt Nut	
*7006	Tool, Dome End, Seal Screw Removal	
*7009	Tool, Instrumentation Assembly Ring Screw Removal	
*7010	Tool, Core Support Screw Removal	
*7011	Tool, Control Drum Bearing Housing Screw Removal.	
*7014	Tool, Plunger Spring Retention Cap Removal	
*7015	Fixture, Handling, Nozzle End Locating Ring	WT-650544A
*7017	Tool, Backup, Seal Removal	WT-650546A
*7018	Fixture, Handling, Core	WT-650547C
*7019	Fixture, Handling, Reflector	WT-650548D

*Entry to be supplied at a later date.

<u>PROV. LIST ITEM NO.</u>	<u>EQUIPMENT LIST</u>	<u>DRAWING NO.</u>
*7021	Stand, Disassembly, Reflector	WT-650550C
*7022	Tool, Handling, Reflector Segment	WT-650551A
*7023	Rack, Tool Holder	WT-650552B
*7024	Fixture Filler Strip Retaining	WT-650553A
*7025	Rods, Poison	WT-650554C
*7027	Tool, Reflector Grooving	WT-650556D
*7028	Tool, Reflector Parting	WT-650598A
*7029	Tools, Grinding, Reflector	WT-650558D
*7030	Collector, Dust	WT-650559B
*7031	Fixture, Handling, Reactor Disassembly Stand	WT-650560B
*7032	Tool, Plunger Removal	WT-650561A
*7033	Tool, Reactor/Vessel Bolt Removal	WT-650562B
*7034	Cutter, Anchor Tie Bolt	WT-650563B
*7037	Stand, Insulating Cylinder Removal	WT-650566A
*7038	Cutter Insulating Cylinder	WT-650567A
*7039	Clamp Retention, Reflector	WT-650568B
*7040	Rack, Parting and Grooving Tool	WT-650463A
*7041	Poison Wire Cups and Bails	WT-650594A
*7042	Tester, Permeability	WT-650599A
*7043	Gage, Reflector, Bow	WT-650597A
*7044	Stripper, Line	WT-650600B
*7045	Gage, Reflector Thickness	WT-650601A
*7046	Gage, Reflector Ring Length	WT-650602A

*Entry to be supplied at a later date.

TECHNICAL DESCRIPTION SHEETS

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 9

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EQUIPMENT TITLE _____

TOOL KIT, ROCKET ENGINE DISASSEMBLY

DESCRIPTION: The Rocket Engine Disassembly Tool Kit is used for the remote removal of the forward closure and nozzle bolts during engine disassembly. The kit consists of a seven-inch-long flank-drive socket, a universal adapter which is enclosed in a 15° housing, and an impact-wrench adapter, all in a special tool box.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 9 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 293752 GOVT. INV. CONTROL NUMBER NASA SNP1-L-630
PART NUMBER 293752-9
CONTRACTOR AGC COST \$950.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 18" WIDTH 12" HEIGHT 12"
WEIGHT 30 LB LOAD CAPACITY N/A LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 1.5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Operation and Maintenance Instructions Manual available for this item from AGC (no number issued)

OPERATING EQUIPMENT

MANIPULATOR Sidewall or O-MAN LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT R-MAD Remote Operated Wrenches
PART OR ITEM Forward Closure & Nozzle Bolts DRAWING NO. P/N 286664-1 & -13
REMARKS _____

EQUIPMENT TITLE
TOOL, BOLT REMOVAL, FORWARD CLOSURE/NOZZLE, REMOTE

DESCRIPTION: The Remote Forward Closure/Nozzle Bolt Removal Tool is a pneumatically operated, electrically actuated, impact tool which grips the forward closure or nozzle bolt heads for removal. The tool provides a maximum torque of 450 lb-ft. A mechanism for gripping the head of a bolt is provided in the 12-point socket end. The tool automatically retracts and ejects each bolt. One electrically operated valve controls the impact-wrench motor: another controls the gripping mechanism. Two manipulator wrist attachment points, at right angles to each other, permit horizontal or vertical manipulation.

NOTE: This tool performs the same functions as P/L Item 21 except that P/L 21 has greater torque capacity.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 10 FIRST PROVIDED FOR NRX/EXT
DRAWING NUMBER 1115360 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1115360-19
CONTRACTOR AGC COST \$4,911

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 13.25" WIDTH 5.25" HEIGHT 7"
WEIGHT 23 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Output torque 450 lb-ft with 90 psi air pressure.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION Facility Air Lube
ELECTRICAL 115 VOLTS 60 CPS 1 PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA See RN-S-0264

OPERATING EQUIPMENT

MANIPULATOR Model 300 LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Model 300 Manipulator
PART OR ITEM Forward Closure or Nozzle Bolts DRAWING NO. AGC 286664-1 and 298725-3
REMARKS 13/16" (.817") socket size.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

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EQUIPMENT TITLE

ADAPTER, RIGHT ANGLE, REMOTE BOLT REMOVAL

DESCRIPTION: The Remote Bolt Removal Right Angle Adapter is a one-inch square-drive, right-angle, impact-wrench adapter used with the socket of remote rocket engine disassembly tool kit, P/L 9. It can also be used as a one-inch drive impact-wrench for removing nozzle bolts. Maximum input-torque to the adapter is 650 lb-ft. Output-torque at the socket is 585 lb-ft.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 11 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 276312 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 276312-9 SNP-1-L-662
CONTRACTOR AGC COST \$492.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 8" WIDTH 3" HEIGHT 5.8"
WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA See RN-S-0120

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT ACFI P/N 3-520517 (Housing P/N 293751-1 P/L Item 9) and Socket P/N 293750
PART OR ITEM Nozzle or F/C Bolts DRAWING NO. _____
REMARKS _____

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SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

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EQUIPMENT TITLE

TOOL, REMOVAL, HOT BLEED PORT NUT

DESCRIPTION: The Hot Bleed Port Nut Removal Tool is a commercial, 12-point socket, ratchet-wrench attachment used to remove the sixteen 7/16-inch nuts which secure the hot gas port to the nozzle. It is used with a Gardner-Denver 17C3-12 air motor modified for manipulator usage.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 14 FIRST PROVIDED FOR NRX/EST
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER Gardner-Denver AA-9D-6096-15 None Assigned
CONTRACTOR AGC COST \$95.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH _____ WIDTH _____ HEIGHT _____
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA This tool is driven by a Gardner-Denver 17C3-12 air motor available at NRDS and not supplied as a part of this provisioning list item.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA The air motor is provided with a manipulator grip handle which is compatible with any of the R-MAD or E-MAD manipulators.

INTERFACES

EQUIPMENT Gardner-Denver Air Motor 17C3-12 and Hot Gas Port Nuts
PART OR ITEM Hot Gas Port Nuts DRAWING NO. P/N AS 1437-05
REMARKS _____

EQUIPMENT TITLE
COVER, NOZZLE, COOLDOWN, REMOTE

DESCRIPTION: The Remote Cooldown Nozzle Cover is a closure containing three concentric internal screen filters to protect the nozzle and reactor against airborne contaminants during post-operative cooldown on the test stand. It is designed to cover the nozzle, prohibiting entrance of atmospheric debris while still permitting outflow of cooldown gas. A lifting bail permits remote installation and handling. Three rubber-covered wedges are used to position the cover when it is placed on the nozzle.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 17 FIRST PROVIDED FOR NRX-A2
DRAWING NUMBER 276470 GOVT. INV. CONTROL NUMBER NASA SNP1-L-652
PART NUMBER 276470-9
CONTRACTOR AGC COST \$2,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 48" LENGTH N/A WIDTH N/A HEIGHT 28.25"
WEIGHT 458 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 13 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA See RN-S-0147

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY N/A LB MAX
CRANE Test Cell "A" LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Test Cell "A" Crane
PART OR ITEM Nozzle DRAWING NO. 707630-9, 1114263-39
REMARKS _____

EQUIPMENT TITLE

TOOL KIT, INSTRUMENTATION REMOVAL, REMOTE

DESCRIPTION: The Remote Instrumentation Removal Tool Kit consists of standard crowfoot wrenches which are adapted for use by either the O-MAN or the sidewall manipulators. This kit provides the capability of removing external transducers without damage. However, the kit does not provide tools for removal of patch-type strain gages or similar items.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 18 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1115786 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1115786-9 _____
CONTRACTOR AGC COST \$1800.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 14" WIDTH 14" HEIGHT 13-1/2"
WEIGHT 60 LB LOAD CAPACITY * LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA *Size of wrenches are 7/16", 1/2", 9/16", 11/16", 5/8", 3/4", 13/16", 7/8", 15/16", 1", 1-1/16", 1-3/16", 1-1/8", 1-1/4" (14 wrenches total)

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR O-MAN or Sidewall LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT O-MAN or Sidewall Manipulator
PART OR ITEM *Transducers (External) DRAWING NO. _____
REMARKS *Not for removal of transducers on the interior of the pressure vessel

EQUIPMENT TITLE
TOOL, NUT REMOVAL, RADIATION SHIELD

DESCRIPTION: The Radiation Shield Nut Removal Tool consists of a commercial 1350-ft-lb, one-inch square-drive, pneumatic impact-wrench equipped with a 16-inch extension bar and a 1 7/8-inch socket. The extension bar and socket are attached with pins and rubber O-rings. The tool is provided with a manipulator grip-frame for use in the remote disassembly bay of the E-MAD Building.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 19 FIRST PROVIDED FOR NRX/EST
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1116035 SNP-1-L-1309
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 5.65" LENGTH 35.25" WIDTH _____ HEIGHT _____
 WEIGHT 27 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA Output Torque - 1350 ft-lb when operated at 90 psi input air pressure.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION Facility Air Lub.
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

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TECHNICAL DESCRIPTION HANDBOOK

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ITEM NO. 20

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EQUIPMENT TITLE

PULLER, HOT GAS BLEED PORT

DESCRIPTION: The Hot Gas Bleed Port Puller is used for removing the hot-bleed-port from the nozzle after the 16 fastening nuts have been removed. The puller consists of a standard manipulator grip-frame attached to a four-arm puller assembly. The end of each arm has a contoured pawl to interface with the underside of the Marman-type flange of the hot-bleed-port. The pulling force is provided by the manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 20 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1116471 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1116471-19
CONTRACTOR AGC COST \$975.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 8" WIDTH 10" HEIGHT 10"
WEIGHT 4 LB LOAD CAPACITY 100 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR R-MAD Model 300 Sidewall LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT R-MAD Sidewall Manipulator - Model 300
PART OR ITEM Hot-Bleed-Port DRAWING NO. AGC 706967
REMARKS _____

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SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 21

DATE January 1968

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EQUIPMENT TITLE

TOOL, BOLT REMOVAL, REMOTE

DESCRIPTION: The Remote Bolt Removal Tool is a pneumatically operated, electrically actuated impact-wrench which grips the forward closure or nozzle bolt heads for removal. The tool provides a maximum output-torque of 1350 lb-ft. It provides: (1) a self-contained retraction feature to eliminate the need to retract the manipulator while unscrewing the bolts; and (2) a bolt-ejection feature for positive release of the bolts after their removal.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 21 FIRST PROVISIONED FOR NRX-A5
DRAWING NUMBER 1117491 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1117491-9 SNP-1-L-1350
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 27.3" WIDTH 5" HEIGHT 9.2"
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Output torque 1350 lb-ft with 90 psi facility air pressure.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION Facility Air Lube.
ELECTRICAL 115 VOLTS 60 CPS 1 PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA See TDI-0013.

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM _____ DRAWING NO. _____
REMARKS Interfaces with bolt heads conforming to NAS 632 (12 point - .812, 13/16)

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**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
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EQUIPMENT TITLE

SOCKET, IMPACT WRENCH

DESCRIPTION: The Impact Wrench Socket is a 13/16-inch, 12-point, flank-drive socket with a 1-inch square-drive. It is used with the radiation shield nut removal tool, P/L 19, for remote removal of forward closure and nozzle bolts.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 22 FIRST PROVISIONED FOR NRX-A5
 DRAWING NUMBER 1117516 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1117516-1 _____
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	3
TOTAL	3

DIMENSIONS AND CAPACITY

DIA 2" LENGTH 7.50" WIDTH _____ HEIGHT _____
 WEIGHT 2.4 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA This item is used with P/L Item 19, Tool, Nut Removal, Radiation Shield and a Sidewall, O-MAN, or OPS Manipulator

INTERFACES

EQUIPMENT P/L Item 19, Tool, Nut Removal, Radiation Shield
 PART OR ITEM Nozzle & Forward Closure Bolts DRAWING NO. AGC 298725 and 702999
 REMARKS Socket Proof Tested to 1000 + 50 ft-lb torque using the above bolts.

EQUIPMENT TITLE _____

STAND, PRESSURE VESSEL, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Pressure Vessel Stand supports the NRX pressure vessel during manual or remote assembly, disassembly, maintenance, and post-operative operations as follows: (1) supports the pressure vessel during remote removal of the trunnion cage-reactor vessel, P/L 1150, in the disassembly bay; (2) supports the pressure vessel during installation and removal of handling adapters; and (3) supports the pressure vessel/nozzle assembly during nozzle-removal operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 135 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER 276380 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-631
 PART NUMBER 276380-9
 CONTRACTOR AGC COST \$3,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 5' 8" LENGTH N/A WIDTH N/A HEIGHT 8' 7"
 WEIGHT 1000 LB LOAD CAPACITY 4000 LB PROOF LOAD 8000 LB
 FLOOR AREA REQUIRED 33 SQ FT OPERATING FLOOR LOAD 125 LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Operation and Maintenance Instruction Available (No number other than P/N given).

OPERATING EQUIPMENT

MANIPULATOR O-Man LOAD CAPACITY 500 LB MAX
 CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Manipulator
 PART OR ITEM Pressure Vessel DRAWING NO. 294053-49, 706989-3
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 137

DATE January 1968

REVISION D

EQUIPMENT TITLE

FIXTURE, NOZZLE EXAMINATION

DESCRIPTION: The Nozzle Examination Fixture supports and positions the nozzle for remote visual examination and for sectioning of the nozzle for post-operative examination. The fixture consists of an H-shaped base with two vertical support members. A nozzle adapter ring mates to the vertical members through a manipulator-drive gearbox system and provides nozzle rotation capability. The adapter ring is provided with four manipulator-operated clamps contoured to mate with the nozzle/pressure vessel flange to clamp the nozzle into the fixture. The photograph shows the fixture with the remote floor mounted support equipment lifting fixture, P/L 213, attached.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 137 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER 276450 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-649
 PART NUMBER 276450-9
 CONTRACTOR AGC COST \$3,210.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 7' 7" WIDTH 5' 5" HEIGHT 5' 6"
 WEIGHT 600 LB LOAD CAPACITY 1250 LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 41 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION SAW-90 Oil
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA Operating and Maintenance Instruction available - no document
number other than part number given.

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY 65 LB MAX
 CRANE R-MAD LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA *Not to be used for lifting fixture.

INTERFACES

EQUIPMENT Item 218, Fixture, Lifting, Crane
 PART OR ITEM Nozzle DRAWING NO. 284800, 707630-9
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 142

DATE
January 1968

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EQUIPMENT TITLE

FIXTURE, BOLT HOLDING, REMOTE

DESCRIPTION: The Remote Bolt Holding Fixture retains 12 nozzle or forward-closure bolts selected for post-operative examination during engine disassembly. The fixture consists of an aluminum H-member with 12 drilled holes to accept the bolts and a lifting bail for handling within the hot disassembly areas. It performs the following functions: (1) Positions the bolts for easy manipulator-handling during post-mortem operations; (2) provides a means of holding the bolts for decontamination cleaning; and (3) safeguards the bolts from physical damage.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 142 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 293300 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 293300-9 NASA-SNPI-L-632 & 633
CONTRACTOR AGC COST \$275.00 (550.00 Total)

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 14.5" WIDTH 14" HEIGHT 9.7"
WEIGHT 20 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 1.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Sidewall LOAD CAPACITY 65 LB MAX
CRANE N/A LOAD CAPACITY N/A LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Sidewall Manipulator
PART OR ITEM Nozzle & Forward Closure Bolts DRAWING NO. 286664-1 & -13
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 151

DATE January 1968

REVISION A

EQUIPMENT TITLE

TOOL SET, LAPPING, NUCLEAR ENGINE

DESCRIPTION: The Lapping Tool Set refinishes the seal surfaces of the pressure vessel and forward closure, pressure vessel and nozzle, and seal surfaces of the forward-closure instrumentation ports. The set is used to remove minor imperfections if leakage at the seal surfaces occurs during pressure testing. Large scratches or dents however, cannot be removed from seal surfaces.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 151 FIRST PROVIDED FOR NRX-A3
 DRAWING NUMBER 276462 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-1118
 PART NUMBER 276462-9 & -1132
 CONTRACTOR AGC COST \$830

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	1
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 25-1/2" WIDTH 6" HEIGHT 4-1/2"
 WEIGHT 30 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT N/A
 PART OR ITEM Pressure Vessel, Forward Closure DRAWING NO. 294053-49(PV) 706989-3 (PV)
 REMARKS and Nozzle 1114354-9 (Closure) 703887-5 (Closure)
1114263-39 (Nozzle) 707630-9 (Nozzle)

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	210
DATE	January 1968
REVISION	

EQUIPMENT TITLE _____

FIXTURE, LIFTING, PROPELLANT INLET LINE, REMOTE

DESCRIPTION: The Remote Propellant Inlet Line Lifting Fixture permits remote lifting and handling of the horizontal section of the propellant inlet line during its removal from the NRX test car. It consists of two clamp halves mounted on a common pivot and actuated by a drive screw. Eyes are provided on the drive screw for remote actuation by a sidewall manipulator. A lifting bail provides a means of lifting the fixture with a 5-ton crane hook.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 210 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER 276440 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-634
 PART NUMBER 276440-9
 CONTRACTOR AGC COST \$350.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 10" WIDTH 23.25" HEIGHT 20.25"
 WEIGHT 56 LB LOAD CAPACITY 100 LB PROOF LOAD 200 LB
 FLOOR AREA REQUIRED 7 SQ FT OPERATING FLOOR LOAD N/Z LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION Oil-Working Joints and Screws
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL 6 Months
 ADDITIONAL DATA Operation and maintenance instructions available, no number other than P/N given.

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY 65 LB MAX
 CRANE R-MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA For Closing the fixture only

INTERFACES

EQUIPMENT Crane & Sidewall Manipulator
 PART OR ITEM Propellant Inlet Line DRAWING NO. 298065-19, 1114090-29
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 211

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, LIFTING, ROCKET ENGINE FORWARD CLOSURE, REMOTE

DESCRIPTION: The Remote Rocket Engine Forward Closure Lifting Fixture has a frame-mounted, split-ring clamping device which closes around the neck of the forward closure flange by means of a screw jack which is manipulator operated. A bail is provided so the fixture can be used to lift and position the forward closure during disassembly operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 211 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 276300 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-548
PART NUMBER 276300-9
CONTRACTOR AGC COST \$2,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 43.75" WIDTH 34.50" HEIGHT 13.25"
WEIGHT 130 LB LOAD CAPACITY 350 LB PROOF LOAD 700 LB
FLOOR AREA REQUIRED 12 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA Operating Instructions N-211

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY _____ LB MAX
CRANE R-MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA *Not to be used for lifting the fixture

INTERFACES

EQUIPMENT Crane, Manipulator (Sidewall)
PART OR ITEM Forward Closure DRAWING NO. P/N 283095-9, 298252-9
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 218

DATE
January 1968

REVISION
B

EQUIPMENT TITLE

FIXTURE, LIFTING, FLOOR MOUNTED SUPPORT EQUIPMENT, REMOTE

DESCRIPTION: The Remote Floor Mounted Support Equipment Lifting Fixture lifts the remote nozzle examination fixture, P/L 137, with or without the nozzle installed. The fixture consists of a strong back with lifting bail and two rigid, vertical legs which attach to the trunnions of the remote nozzle examination fixture. The lifting bail is used with a remotely controlled five-tone crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 218 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 276410 GOVT. INV. CONTROL NUMBER None
PART NUMBER 276410-9
CONTRACTOR AGC COST \$500.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 65" WIDTH 5" HEIGHT 64.6"
WEIGHT _____ LB LOAD CAPACITY 1500 LB PROOF LOAD 3000 LB
FLOOR AREA REQUIRED 30 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA Operation and Maintenance Instructions available from
NRO - GSE, no number other than part number given

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE Remote Overhead Crane LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT P/L Item 137 and Hot Bay 5 Ton Crane
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 265

DATE January 1968

REVISION C

EQUIPMENT TITLE

POLISHER AND GRINDER, REMOTE

DESCRIPTION: The Remote Polisher and Grinder consists of a commercial pneumatic grinder, an adapter for manipulator use, a slotted rubber cone, and abrasive cloth cones to mount on the rubber cone. The abrasive cones are held on the grinder during operation by centrifugal force on the slotted rubber cone which causes it to expand and grip the inside of the abrasive cones. When the grinder spindle is not rotating, the slotted cone contracts and the tapered abrasive cones can be easily removed and replaced. The unit is used to remove burrs and sharp edges from specimens.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 265 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 276465 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-651
 PART NUMBER 276465-9
 CONTRACTOR AGC COST \$507.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 12" WIDTH 9" HEIGHT 9"
 WEIGHT 8 LB LOAD CAPACITY N/A LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

**

GASES Air PRESSURE 100 LB/SQ IN. VOLUME 43 CFM LUBRICATION Oil in Air Supply
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED *12,000 RPM(No Load) IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL (Maintenance) 8 Hours, Oil; after 12 months disassemble, clean, check
 ADDITIONAL DATA See RN-S-0111 re-oil, reassemble
 * Speed is Governed to prevent exceeding this speed
 **At maximum power (1.3 HP), volume at maximum speed (no load) is 20 CFM

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY 100 & 10 LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT M/S Manipulator
 PART OR ITEM Metallic Specimens DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 267

DATE January 1968

REVISION C

EQUIPMENT TITLE

SAW, SPECIMEN METAL CUTTING, REMOTE

DESCRIPTION: The Remote Metal Cutting Specimen Saw, remotely operated and pneumatically driven, is used to section the nozzle, pressure vessel, and other components for post-operative specimen examination. The saw blades can be changed with manipulators, and are capable of cutting stainless steels and aluminum alloys to a maximum thickness of six inches.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 267 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 276425 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-650
 PART NUMBER 276425-9
 CONTRACTOR AGC COST \$500.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 26" WIDTH 5" HEIGHT 10"
 WEIGHT 26.5 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA Maximum depth of cut is 6"

OPERATING DATA

GASES Air PRESSURE 100 LB/SQ IN. VOLUME 6 CFM LUBRICATION Oil in air supply
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED *1100 Strokes per minute N./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See RN-S-0112
Length of cutting stroke 1.75"
*Adjustable from 1 to 1100 strokes/min.

OPERATING EQUIPMENT

MANIPULATOR Sidewall or Master/Slave LOAD CAPACITY 65 or 100 & 10 LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Also the O-Man may be used

INTERFACES

EQUIPMENT Sidewall manipulator, Master/Slave, O-man
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS Any metallic item within its cutting capacity

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE _____

FIXTURE, HOLDING, NOZZLE SECTION, REMOTE

PROV. LIST
ITEM NO. 270

DATE January 1968

REVISION A

DESCRIPTION: The Remote Nozzle Section Holding Fixture is used to remotely support and position sections of the nozzle to permit cutting of smaller test samples. It consists of a commercial, air-operated vise with a swivel base and an adjustable jaw opening. The jaw opening is 11.0 inches, jaw width is 4.5 inches and the power stroke is 1.5 inches.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 270 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 276389 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 276389-
 CONTRACTOR AGC COST \$373

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 32" WIDTH 10.5" HEIGHT 12"
 WEIGHT 134 LB LOAD CAPACITY *5000 LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 2.4 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA *Clamping Force

OPERATING DATA

GASES Air PRESSURE 100 LB/SQ IN. VOLUME N/A CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See RN-S-0113

OPERATING EQUIPMENT

MANIPULATOR Master/Slave of MAD hot cells LOAD CAPACITY 100 & 10 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Manipulator (M/S)
 PART OR ITEM Nozzle Section DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 273

DATE January 1968

REVISION A

EQUIPMENT TITLE _____

CUTTER, SEAL MANIFOLD, REMOTE

DESCRIPTION: The Remote Cutter Seal Manifold is used to remove the welded seal-manifold from the pressure vessel/forward closure while the NRX assembly is on the test car. The cutter has a ring unit mounted on the outside of the pressure vessel on which a self-propelled cutting machine is mounted. The cutting machine is propelled around the ring by a geared air-motor. The cutter head of the machine is driven by another geared air-motor at the proper speed for the particular diameter cutter being used and the material being cut. Depth of cut is adjustable to the limit of the depth-control wheel. The cutter must be protected during storage.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 273 FIRST PROVIDED FOR NRX-A3
 DRAWING NUMBER 276390 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 276390-9 _____
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 84" WIDTH 94" HEIGHT 33"
 WEIGHT 1910 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 55 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE 80 LB/SQ IN. VOLUME 110 CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See RN-S-0224

OPERATING EQUIPMENT

MANIPULATOR O-Man, Sidewall LOAD CAPACITY 500 & 65 LB MAX
 CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane, O-Man, Sidewall Manipulators
 PART OR ITEM Pressure Vessel/Forward Closure DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 452

DATE January 1968

REVISION C

EQUIPMENT TITLE

CLOSURE KIT, PRESSURE TESTING, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Pressure Testing Closure Kit consists of the equipment necessary to close and seal inlet and instrumentation ports and control drum actuator openings on the forward closure of NRX assemblies. This item, used in conjunction with the nozzle throat pressure testing closure kit, Item P/L 453, permits pressure testing of the NRX assembly. The closures are cover plates and plugs, together with fasteners and seals which interface with the various external NRX ports. They are designed for manual installation and removal. Maximum leakage rate is 10^{-2} lb/sec/inch of seal diameter during NRX systems leak tests. A storage/carrying case is provided with adequate space and support to store the closures, accessories, and spare parts.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 452 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 293235 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-551
PART NUMBER 293235-39
CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 19" WIDTH 13" HEIGHT 12"
WEIGHT 100 LB LOAD CAPACITY N/A LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 1.8 SQ FT OPERATING FLOOR LOAD 5.6 LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See Operation and Maintenance Instruction, Number 9792:01:0021

OPERATING EQUIPMENT

MANIPULATOR None LOAD CAPACITY _____ LB MAX
CRANE None LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM NRX Assembly DRAWING NO. 299066-9
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 453

DATE January 1968

REVISION C

EQUIPMENT TITLE _____

CLOSURE KIT, PRESSURE TESTING, NOZZLE THROAT,

ROCKET ENGINE (MODIFIED)

DESCRIPTION: The Rocket Engine Nozzle Throat Pressure Testing Closure Kit consists of a nozzle plug, seals, fasteners, pressure application and relief system, storage/carrying case, and accessories. The kit seals the nozzle throat of Aerojet or Rocketdyne nozzles on NRX assemblies. When used in conjunction with the pressure testing closure kit, P/L 452, a NRX assembly can be leak tested. The plug withstands an internal working pressure of 50 ± 3 psi, and incorporates a safety pressure-relief-valve set of 56 ± 3 psi. A case is provided to store the nozzle plug assembly, accessories, hardware, and spare parts for the closure kit.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 453 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 293333 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-552
PART NUMBER 293333-9
CONTRACTOR AGC COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 11-3/8" LENGTH 52" WIDTH *N/A HEIGHT *N/A
WEIGHT 92 LB LOAD CAPACITY N/A LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA *When closure kit is packaged in its carrying case, the width is 14", height is 13-1/4".

OPERATING DATA

GASES He PRESSURE 50 ± 3 LB/SQ IN. VOLUME 660 CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See Operation and Maintenance Instruction, Number 9790:01:0024, Pressure Relief Valve set at 56 ± 3 psig

OPERATING EQUIPMENT

MANIPULATOR None LOAD CAPACITY _____ LB MAX
CRANE None LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT None
PART OR ITEM Nozzle DRAWING NO. 289800, 707630-9, 1114263-39
REMARKS For use during cold Assembly

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 455

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

PROTECTOR, FLANGE, PRESSURE VESSEL

DESCRIPTION: The Pressure Vessel Protector Flange protects the pressure-vessel forward flange and the forward-closure seal surface during reactor and shield installation and other operations performed prior to installation of the forward closure. It consists of a flat three-segmented plastic ring with indexing pins which engage the bolt holes in the pressure-vessel forward-closure flange.

NOTE: The protector has been superseded by the pressure vessel flange protector, P/L 4135.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 455 FIRST PROVISIONED FOR NRX-A3
 DRAWING NUMBER 253371 GOVT. INV. CONTROL NUMBER NASA-SNPI-L-1115
 PART NUMBER 253371-9
 CONTRACTOR AGC COST \$1200.00 each (set)

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	9
B. WANL	
C.	
D. NRDS	6
TOTAL	*15

5 Complete Assemblies

DIMENSIONS AND CAPACITY

DIA 54.5" LENGTH N/A WIDTH N/A HEIGHT 2"
 WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED *5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA *Segments stacked

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR None LOAD CAPACITY _____ LB MAX
 CRANE None LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Item used during cold assembly only, no equipment used for installation.

INTERFACES

EQUIPMENT _____
 PART OR ITEM *Pressure Vessel DRAWING NO. _____
 REMARKS *Assembly is composed of three segments, and is to be used as an assembly only.

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST

ITEM NO.

456

DATE

January 1968

REVISION

EQUIPMENT TITLE

MODIFICATION KIT, NOZZLE THROAT CLOSURE PLUG

DESCRIPTION: The Nozzle Throat Closure Plug Modification Kit consists of an impact wrench, lifting bail, and weight to adapt the nozzle throat plug, P/L 453, for remote operation. The 100-pound weight is installed at the base of the plug to seat the plug as it is remotely installed in the nozzle with an overhead crane or manipulator. The impact wrench and lifting-bail assembly mates to the plug actuation-shaft to secure the plug in the nozzle throat.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 456 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1115803 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1115803-29
CONTRACTOR AGC COST \$2,397.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 9.5" LENGTH 24" WIDTH _____ HEIGHT _____
WEIGHT 110 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA See RN-S-0267

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM P/L Item 453 DRAWING NO. AGC 293333-9
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 469

DATE January 1968

REVISION C

EQUIPMENT TITLE

KIT, DIMENSIONAL CHECKING, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Dimensional Checking Kit consists of gages and measuring devices to measure the critical dimensions of the nozzle, nozzle bolts, and forward-closure bolts of the NRX assembly. Included in the kit are (1) measuring devices adapted for use with the master slave manipulator in the remote areas; and (2) standard measuring devices which are used for making dimensional checks manually.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 469 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 293200 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-685
 PART NUMBER 293200-9
 CONTRACTOR AGC COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA No size given for the items that comprise this kit. Kit is composed of standard "off-the-shelf" items, with specially made handles to adapt them to remote operation.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR O-MAN, Sidewall & Master/Slave LOAD CAPACITY 500, 65, 100 & 10 LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT O-MAN & Sidewall Manipulator
 PART OR ITEM Nozzle DRAWING NO. 284800-9
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 475

DATE January 1968

REVISION A

EQUIPMENT TITLE

CLOSURE, REACTOR/PRESSURE VESSEL ASSEMBLY PRESSURE TEST

DESCRIPTION: The Reactor/Pressure Vessel Assembly Pressure Test Closure seals the nozzle end of the pressure vessel/reactor assembly during leak tests. When used with the nozzle guide plate, P/L 6173, it is utilized to ship the Reactor/Pressure Vessel Assembly from WANL to NRDS in the shipping container, P/L 1706. The closure, which is used for cold, manual operations only, is made of aluminum, and does not have a protective finish. The closure is provided with a wooden box which also contains 100 nozzle bolts, 100 K-seals, three-eyebolts, and a three-legged wire-rope sling.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 475 FIRST PROVISIONED FOR NRX/EST
 DRAWING NUMBER 1114363 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1114363-9 _____
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	2
B. WANL	
C.	
D. NRDS	
TOTAL	2

DIMENSIONS AND CAPACITY

DIA 44.84" LENGTH N/A WIDTH N/A HEIGHT 9-1/8"
 WEIGHT 446 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 16 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE MAD Cold Bay LOAD CAPACITY 50,000 or 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane
 PART OR ITEM Pressure Vessel/Reactor Assem. DRAWING NO. _____
 REMARKS Reactor Shipping Ring Guide Plate

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 501

DATE January 1968

REVISION

EQUIPMENT TITLE

STAND, TURBOPUMP, REMOTE

DESCRIPTION: The Remote Turbopump Stand supports the TPA during cold assembly, remote (hot) disassembly, and post-operative operations. The stand can be rotated 360° around the longitudinal horizontal axis by a manipulator-operated gear reducer, which is self-locking at any rotation point. A bail is provided for lifting the stand with the TPA to permit rotation of the stand around its vertical axis.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 501 FIRST PROVIDED FOR NRX/EST
 DRAWING NUMBER 1114410 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-1215
 PART NUMBER 1114410-9
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 42.75" WIDTH 48.50" HEIGHT 48.62"
 WEIGHT 260 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 15 SQ FT OPERATING FLOOR LOAD *8.5 LB/SQ IN
 ADDITIONAL DATA *This includes weight of stand and TPA.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA Stand is rotated by O-Man in the vertical axis and by sidewall manipulator in the horizontal axis. See RN-S-0227

OPERATING EQUIPMENT

MANIPULATOR O-Man and *Sidewall LOAD CAPACITY 500 & 65 LB MAX
 CRANE R-MAD Facility LOAD CAPACITY 50000 LB MAX
 ADDITIONAL DATA *Not to be used for lifting the stand, for turning and locking Operations only

INTERFACES

EQUIPMENT O-Man, sidewall manipulator and facility crane
 PART OR ITEM Turbopump Assembly DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 502

DATE January 1968

REVISION

EQUIPMENT TITLE

SLING, TPA, NRX/EST ASSEMBLY

DESCRIPTION: The NRX/EST Assembly TPA Sling is a beam type with an adjustment to compensate for variations in the TPA center-of-gravity. Sling legs and clamps can be adjusted approximately 5/8 of an inch along the beam for variations in location of the TPA pickup-point. The sling legs automatically engage two special pick-up lugs spaced 180° apart on the TPA pump section. The turbine clamps have rubber cushioning on the pick-up surfaces. The clamp is opened or closed by a manipulator operated turnbuckle.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 502 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1114392 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-1124
PART NUMBER 1114392-9
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 20" WIDTH 18.20" HEIGHT 29.12"
WEIGHT 75 LB LOAD CAPACITY 500 LB PROOF LOAD 1000 LB
FLOOR AREA REQUIRED 3 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-S-0223. Crane picks up sling, the sidewall manipulator operates turnbuckle (clamp) screw and assists in attaching the sling legs to the TPA lifting bolts.

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY 65 LB MAX
CRANE R-MAD Facility LOAD CAPACITY 50,000 or 10,000 LB MAX
ADDITIONAL DATA *Not to be used for lifting the fixture, loaded or unloaded.

INTERFACES

EQUIPMENT Crane, Sidewall Manipulator
PART OR ITEM TPA DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 503

DATE January 1968

REVISION

EQUIPMENT TITLE

SLING, DIRECT RADIATION SHIELD

DESCRIPTION: The Direct Radiation Shield Sling is a beam type with two fixed and two self-adjusting wire-rope legs with safety hooks. The sling is used to lift the NRX/EST direct radiation shield, the direct radiation shield stand, P/L 505, separately, or the shield and stand together.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 503 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1114652 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-1123
PART NUMBER 1114652-9
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 94" WIDTH 14" HEIGHT 11"
WEIGHT 325 LB LOAD CAPACITY 25,000 LB PROOF LOAD 50,000 LB
FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL N/A VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR O-Man & Sidewall LOAD CAPACITY _____ LB MAX
CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane; O-Man Sidewall Manipulators
PART OR ITEM 505 DRAWING NO. 1114651
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 504

DATE

January 1968

REVISION

EQUIPMENT TITLE

FIXTURES, HANDLING, PROPELLANT LINES, REMOTE

DESCRIPTION: Fixed and adjustable Remote Propellant Lines Handling Fixtures are used. While the two adjustable types are reusable, the fixed types are not. All are handled either by the O-Man or sidewall manipulator. Drawings for the items comprising P/L 504 are listed below:

- 1115450 - Bail Clamp, Adjustable, 30 to 8-inch Pipe
- 1115030 - Sling, Double Hook
- 1115338 - Bail, Clamp, 3-1/2 inch OD Pipe
- 1115339 - Bail, Clamp, 1.9 inch OD Pipe
- 1115796 - Bail, Lifting Turbine Exhaust

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 504 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER * GOVT. INV. CONTROL NUMBER _____
PART NUMBER _____
CONTRACTOR AGC COST \$7500.00 (est.)

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA * LENGTH * WIDTH * HEIGHT *
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA *See the drawings listed on the front of this sheet for the size of
the items comprising this system.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR O-MAN & Sidewalls LOAD CAPACITY 500 & 65 LB MAX
CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane, O-MAN & Sidewall Manipulators, Lifting Fixture of Item 1251
PART OR ITEM Nozzle DRAWING NO. 1114263
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	505
DATE	January 1968
REVISION	A

EQUIPMENT TITLE _____

STAND, DIRECT RADIATION SHIELD _____

DESCRIPTION: The Direct Radiation Shield Stand supports the shield during cold assembly or hot disassembly. The stand (either loaded or unloaded) is lifted by a crane utilizing P/L 503 with the direct radiation shield sling. The sling is hooked to the lifting eyes provided on the stand when unloaded. When loaded, the sling is hooked to lifting eyes on the direct radiation shield and the stand locked to the shield so both can be lifted together.

PROVISIONING LIST ITEM NUMBER 505
DRAWING NUMBER 1114651
PART NUMBER 1114651-9
CONTRACTOR AGC

FIRST PROVIDED FOR NRX/EST
GOVT. INV. CONTROL NUMBER NASA-SNP1-L-1122
COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 104" WIDTH 72" HEIGHT 47"
WEIGHT 755 LB LOAD CAPACITY 25,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 52 SQ FT OPERATING FLOOR LOAD *40 LB/SQ IN
ADDITIONAL DATA *Shield weight plus stand weight

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR *O-MAN or *Sidewall LOAD CAPACITY 500 & 65 LB MAX
CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA *Not to be used for lifting, use for sling hook attachment
only (remote operations)

INTERFACES

EQUIPMENT Sling, Item 503, Crane
PART OR ITEM Direct Radiation Shield DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 506

DATE January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, HOLDING, TURBINE INLET LINE ELBOW, REMOTE

DESCRIPTION: The Turbine Inlet Line Elbow Holding Fixture consists of a line-clamping device attached (through two 90°-opposed gearboxes) to a tripod stand mounted on a rectangular base. The fixture is capable of rotating the turbine inlet line elbow in two planes as required to position it for post-operative cutting operations with abrasive-disc cutters. Rotational movements and line clamping action is manipulator-operated. The fixture also provides a lifting bail for movement within the hot areas with an overhead crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 506 FIRST PROVISIONED FOR NRX/EST
DRAWING NUMBER 1115864 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1115864-9 _____
CONTRACTOR AGC COST \$3,799.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 44" WIDTH 40" HEIGHT 65"
WEIGHT 414 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 12.5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-S-0262

OPERATING EQUIPMENT

MANIPULATOR O-MAN or Sidewall LOAD CAPACITY _____ LB MAX
CRANE Remote 5 Ton or 25 Ton LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM Turbine Inlet Line Elbow DRAWING NO. AGC 1013495-9
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 704

DATE

January 1968

REVISION

C

EQUIPMENT TITLE

CONTAINER, SHIPPING AND STORAGE, ROCKET ENGINE NOZZLE

DESCRIPTION: The Rocket Engine Nozzle Shipping and Storage Container is a reusable container designed to provide a means of transporting an engine nozzle from the manufacturing facility to the engine test site. The container also provides temporary storage for the nozzle. The primary functions of this container are to provide environmental protection and storage, safety, and efficiency during transportation and handling, and a means of securing the nozzle against unauthorized observation in accordance with security regulations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 704 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 278500 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-553
PART NUMBER 278500-29 & 554
CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	1
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 53-1/2" WIDTH 53-1/2" HEIGHT 73"
WEIGHT 375 (empty) LB LOAD CAPACITY 1250 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 21 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Cover of container is provided with lifting eyes for use with sling and crane. Container base is provided with fork-lift slots for handling.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA Operation and Maintenance instruction available, no number given other than P/N.

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY N/A LB MAX
CRANE MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane and Fork Lift
PART OR ITEM Nozzle DRAWING NO. P/N 284800
REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 730

DATE January 1968

REVISION A

EQUIPMENT TITLE

FIXTURE, ALIGNMENT COOLANT MANIFOLD

DESCRIPTION: The Coolant Manifold Alignment Fixture consists of a 1.5-inch-diameter tube, bent into an arc of 140° with a radius of 22 inches and provided with a support and handling frame. It is used during NRX assembly to assure proper alignment of the coolant manifold brackets while tightening the pressure vessel to the nozzle.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 730 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER 278509 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____ SNP-1-L-661
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 47" WIDTH 22" HEIGHT 1.5"
 WEIGHT 20 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 8 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM Coolant Manifold Brackets DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 801

DATE January 1968

REVISION A

EQUIPMENT TITLE

SLING, MULTIPLE LEG, MULTIPLE PURPOSE, 3000 LB CAPACITY

DESCRIPTION: The Multiple Purpose Multiple Leg Sling is a three-legged wire rope sling with safety hooks. The three legs are joined together through a pear-shaped lifting link. Two of the three legs are provided with turnbuckles for leveling. The sling lifts various components, including the nozzle and forward closure, during assembly operations when used in conjunction with other support equipment.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 801 FIRST PROVISIONED FOR NRX-A1
 DRAWING NUMBER 278580 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 278580-9 NASA-SNP1-L-557 THRU 561 (INCL.)
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	3
B. WANL	
C.	
D. NRDS	2
TOTAL	5

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 25" WIDTH 25" HEIGHT 63"
 WEIGHT 50 LB LOAD CAPACITY 3,000 LB PROOF LOAD 6,000 LB
 FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Multiple Use Item
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 803

DATE January 1968

REVISION A

EQUIPMENT TITLE

FIXTURE, LIFTING, ROCKET ENGINE FORWARD CLOSURE

DESCRIPTION: The Rocket Engine Forward Closure Lifting Fixture consists of a 0.625-inch-thick steel ring which bolts to the forward closure with 12 bolts. The ring provides three eyes for lifting with a three-legged sling and overhead crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 803 FIRST PROVISIONED FOR NRX-A1
 DRAWING NUMBER 279150 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 279150-9 NASA-SNP1-L-562, 563, 564
 CONTRACTOR AGC COST \$600.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	2
B. WANL	
C.	
D. NRDS	1
TOTAL	3

DIMENSIONS AND CAPACITY

DIA 37" LENGTH _____ WIDTH _____ HEIGHT 3.75"
 WEIGHT 26 LB LOAD CAPACITY 320 LB PROOF LOAD 640 LB
 FLOOR AREA REQUIRED 7.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA See Operating Instructions N-803

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT P.L. Item 801 (Three Legged Sling)
 PART OR ITEM Forward Closure DRAWING NO. 283095
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 809

DATE January 1968

REVISION B

EQUIPMENT TITLE _____

SLING, BEAM TYPE

DESCRIPTION: The Beam Type Sling is a lifting device with a box-beam main structure. It is provided with a movable lifting-eye to compensate for any shift in center of gravity. Eyes are also used to attach lifting legs (4 cables) to each end. The sling lifts, positions, and lowers the NRX non-nuclear assembly and/or pressure vessel in a horizontal position during assembly, disassembly, and other moving operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 809 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 278570 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-565,
PART NUMBER 278570- 566
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	1
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 65" WIDTH 53" HEIGHT 83"
WEIGHT 100 LB LOAD CAPACITY 10,000 LB PROOF LOAD 20,000 LB
FLOOR AREA REQUIRED 3.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Used during cold assembly/disassembly operations at AGC Sacramento.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Operating Instructions N-809

OPERATING EQUIPMENT

MANIPULATOR Sidewall LOAD CAPACITY 65 LB MAX
CRANE Bldg 2002 (Sacto), R-MAD Facility LOAD CAPACITY 30,000 & 50,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane (Sacto), Crane (R-MAD Facility)
PART OR ITEM 914-Adapter DRAWING NO. 279025
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE _____

BEAM, HOISTING, NOZZLE, ROCKET ENGINE

PROV. LIST

ITEM NO. 814

DATE

January 1968

REVISION

B

DESCRIPTION: The Rocket Engine Nozzle Hoisting Beam lifts the engine nozzle during cold assembly. It is a three-legged (equally spaced), steel T-section frame fitted with three contoured clamps (one per leg) for attaching the beam to the nozzle inlet torus. A lifting eye fitted with a shackle is provided to attach the beam to a crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 814 FIRST PROVIDED FOR NRX-A2
DRAWING NUMBER 278660 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-567
PART NUMBER 278660-9
CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 23.75" WIDTH 23.75" HEIGHT 12"
WEIGHT 40 LB LOAD CAPACITY 750 LB PROOF LOAD 1500 LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL N/A VERTICAL _____
CALIBRATION INTERVAL 6 Months
ADDITIONAL DATA Operating Instructions N-814

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE R-MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane
PART OR ITEM Nozzle DRAWING NO. 70630-9, 1114263-39, 298650-29
REMARKS Item 814 is Item 813 Modified

EQUIPMENT TITLE
SLING, MULTIPLE LEG, 12,000-POUND CAPACITY

DESCRIPTION: The 12,000-Pound Capacity Multiple Leg Sling is a rigid, box-shaped, cross-membered frame of square steel-tubing with four, flexible steel cables. The cables are connected by pins to the frame corners (two cables are adjustable to level the load) and all have safety lifting-hooks. The four lifting cables on the top of the sling are connected by clevises and pins to the frame corners. One cable is adjustable and all are attached to a single lifting eye.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 817 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 278670 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-568,
PART NUMBER 278670-9 569
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	1
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 56" WIDTH 52" HEIGHT 126"
WEIGHT 325 LB LOAD CAPACITY 12,000 LB PROOF LOAD 24,000 LB
FLOOR AREA REQUIRED 18 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

WIRE ROPE, USE
MIL-P-116, Type
P-11 Perservative

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL Every 6 Months (Proof Load)
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY N/A LB MAX
CRANE R-MAD Facility LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane
PART OR ITEM 914, Adapter DRAWING NO. 279025
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 915

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Stand is a floor-mounted structure which supports the engine assembly during cold assembly and disassembly operations. It is constructed of 5-inch-square steel tubing and includes a set of manually-fastened couplings for connection to the trunnion mounts of the pneumatic pressure vessel handling adapter, P/L 921, or the thrust chamber/reactor disassembly fixture, P/L 923, which adapt the engine to the stand. The stand is capable of rotating the engine 360° about a transverse axis by means of an electrically driven and controlled hydraulic motor system. It is capable of being locked by a disc-brake system at any point of rotation.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 915 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER 279050 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____ NASA-SNP1-L-571
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	2*
B. WANL	
C.	
D. NRDS	
TOTAL	2

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 17' 6" WIDTH 14' HEIGHT 10'
 WEIGHT 2,500 LB LOAD CAPACITY 11,500 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 238 SQ FT OPERATING FLOOR LOAD 80 LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
 LIQUIDS Hydr. Fluid* PRESSURE _____ LB/SQ IN. QTY REQ'D 5 Gal.
 SPEED _____ IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA *Only one stand is equipped with a hydraulic drive system
for rotation of the engine. Operating Instructions N-915.

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT P/L Items 921, 923 and 916
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 916

DATE January 1968

REVISION A

EQUIPMENT TITLE

MAINTENANCE PLATFORM, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Maintenance Platform consists of two caster-mounted aluminum tubing scaffolds which are fastened together by removable platform panels which fit between the two scaffolds to complete the platform around the engine assembly. It provides work levels at 7- and 13-ft heights. The platform is used in conjunction with the rocket engine stand, P/L 915. The platform, designed to support manual, cold operations on NRX assemblies, provides adequate work space, access, and support for men and materials at major working levels.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 916 FIRST PROVIDED FOR NRX-A1
DRAWING NUMBER 279110 GOVT. INV. CONTROL NUMBER _____
PART NUMBER _____ NASA-SNP1-L-572 and 573
CONTRACTOR AGC COST \$7,775

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	2
B. WANL	
C.	
D. NRDS	
TOTAL	2

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 180" WIDTH 108" HEIGHT 18' 6"
WEIGHT 700 LB LOAD CAPACITY 2,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 135 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Operating Instructions N-916

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT P/L Item 915
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

EQUIPMENT TITLE

STAND, FORWARD CLOSURE, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Forward Closure Stand is a flat-plate structure with a 41-inch hole in the center for weight reduction. The stand is mounted on four 11-inch legs. Each leg is provided with an elongated hole which serves as a lifting eye when used with a multiple-leg sling and overhead crane. The stand supports the NRX forward-closure during storage, manual assembly, and remote disassembly or maintenance operations. A rubber-pad on the interface surface protects the forward-closure flanges.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 917 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER 279160 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-577,
 PART NUMBER 279160-9 578
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	2
TOTAL	3

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 62" WIDTH 62" HEIGHT 12"
 WEIGHT 378 LB LOAD CAPACITY 350 LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 36 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY 65 LB MAX
 CRANE MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA *Not to be used for lifting the stand

INTERFACES

EQUIPMENT Crane, Manipulator (Sidewall)
 PART OR ITEM Forward Closure DRAWING NO. P/N 283095-9, 298252-9
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 919

DATE January 1968

REVISION C

EQUIPMENT TITLE

STAND, NOZZLE, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Nozzle Stand is a flat-plate structure with a 40-inch diameter hole in the center to reduce weight. The stand is mounted on four 12-inch legs. Each leg is provided with an elongated hole which serves as a lifting eye when used with a multiple-leg sling and an overhead crane. The stand supports the NRX nozzle assembly during storage, manual assembly, and remote disassembly and maintenance operations. A rubber-pad on the interface surface protects the surface area of the nozzle/pressure vessel interface-flange.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 919 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 279180 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-574
 PART NUMBER 279180-19 575, 576
 CONTRACTOR _____ COST \$1,200

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	2
TOTAL	3

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 62" WIDTH 62" HEIGHT 12"
 WEIGHT 378 LB LOAD CAPACITY 750 LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 25 SQ FT OPERATING FLOOR LOAD 21 LB/SQ IN
 ADDITIONAL DATA Modified from Item 918

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR *Sidewall LOAD CAPACITY 65 LB MAX
 CRANE MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA *Not to be used for lifting, stand, use for attaching the sling hooks.

INTERFACES

EQUIPMENT Sidewall Manipulator, R-MAD Crane
 PART OR ITEM Nozzle DRAWING NO. P/N 298650-29
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO.

921

DATE

January 1968

REVISION

EQUIPMENT TITLE

ADAPTER, HANDLING, PRESSURE VESSEL, PNEUMATIC

DESCRIPTION: The Pneumatic Pressure Vessel Handling Adapter provides a means of attachment to the pressure vessel, or various engine subassembly configurations which contain the pressure vessel. The adapter consists of two structural rings joined by longitudinal members to form a cage structure. The inner circumference of each ring contains two pneumatic tires which press against the outer surface of the pressure vessel when inflated to provide a friction grip. The longitudinal members provide trunnion blocks for attachment of the adapter to the engine assembly stand, P/L 915. Mechanical safety catches prevent dropping of the pressure vessel assembly in the event of pneumatic-system failure. Eyes are provided for lifting the adapter either horizontally or vertically.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 921 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER 278746
CONTRACTOR AGC COST \$12,378

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 65" O.D. LENGTH 64" WIDTH _____ HEIGHT _____
WEIGHT _____ LB LOAD CAPACITY 25,000 LB PROOF LOAD 50,000 lb (12,500 lb/tire)
FLOOR AREA REQUIRED 23 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE 60 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA Lift vertically with P/L 817, horizontally with P/L 809 or 4709.

INTERFACES

EQUIPMENT NRX Pressure Vessels
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	922
DATE	January 1968
REVISION	A

EQUIPMENT TITLE

FIXTURE, TURNOVER, FORWARD CLOSURE

DESCRIPTION: The Forward Closure Turnover Fixture has a structural ring-base to hold the forward closure. The base is provided with a rubber surface to protect the closure seal-surface. The forward closure, with guide tubes installed, is clamped to the padded surface of the ring base by four swing-away clamps. The structural ring-base is connected to the tubular-ring frame through two pivot joints which lock the ring frame in either of two horizontal positions, 180° apart, with manually inserted ball-detent pins. The lock pins are secured to the frame by a nylon lanyard. The fixture is intended for cold-assembly use only.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 922 FIRST PROVIDED FOR NRX-A3
DRAWING NUMBER 278590 GOVT. INV. CONTROL NUMBER NASA-SNP1-L-955
PART NUMBER 278590-9
CONTRACTOR AGC COST \$1430.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 57" LENGTH N/A WIDTH N/A HEIGHT 46"
WEIGHT _____ LB LOAD CAPACITY 700 LB PROOF LOAD 1400 LB
FLOOR AREA REQUIRED 23 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL 6 Months
ADDITIONAL DATA See RN-S-0149

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE E-MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane
PART OR ITEM Forward Closure DRAWING NO. P/N 703887-5
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO.

923

DATE

January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, DISASSEMBLY, THRUST CHAMBER/REACTOR - REMOTE

DESCRIPTION: The Remote Thrust Chamber/Reactor Disassembly Fixture provides a means of remote attachment to the nozzle flange of the thrust chamber reactor assembly for lifting the assembly from the NRX test car. It also adapts the assembly to the reactor trunnion fixture, P/L 1182, to support and rotate the assembly during remote disassembly operations. The fixture minimizes the number of instrumentation transducers that must be removed prior to disassembly and maintains maximum accessibility for manipulators and remote tools used in disassembly. The fixture consists of a hexagon-shaped structural ring provided with six manipulator-operated clamps for attachment to the nozzle/pressure vessel flange. Two legs, each approximately 40 inches long, extend from the ring to provide trunnion blocks on the approximate center of gravity of the thrust chamber/reactor assembly for attachment to P/L 1182.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 923 FIRST PROVISIONED FOR NRX/EST
 DRAWING NUMBER 1115427 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1115427-29 SNP-1-L-1292
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 77" LENGTH _____ WIDTH _____ HEIGHT 50"
 WEIGHT 2,175 LB LOAD CAPACITY 13,000* LB PROOF LOAD 26,000 LB
 FLOOR AREA REQUIRED 38 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA *13,000 pound maximum load to be rotated, 40,000 pounds in static
upright position. Proof loaded to 80,000 lbs in upright attitude.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA See RN-S-0276

OPERATING EQUIPMENT

MANIPULATOR MAD Sidewall* LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Overhead crane and lifting fixture portion of P. L. Item 1251
used for lifting operations.

*Used for closing and opening clamps

INTERFACES

EQUIPMENT P. L. Items 1182, 1251 (lifting fixture only), 924
 PART OR ITEM Nozzle Flange DRAWING NO. 1114263
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 924

DATE January 1968

REVISION

EQUIPMENT TITLE

STAND, DISASSEMBLY FIXTURE

DESCRIPTION: The Disassembly Fixture Stand supports the thrust chamber/reactor disassembly fixture, P/L 923, when it is not in use. The stand is a three-legged structure attached to an upper ring which supports the fixture. A central lifting bail is provided for moving the stand with an overhead crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 924 FIRST PROVISIONED FOR NRX/EST
 DRAWING NUMBER 1115636 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1115636-29 SNP-1-L-1293
 CONTRACTOR AGC COST \$1,428

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 92" LENGTH _____ WIDTH _____ HEIGHT 67"
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 38 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA See RN-S-0276

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE Overhead Crane LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Fixture, Disassembly, Thrust Chamber/Reactor-Remote
 PART OR ITEM P/L 923 DRAWING NO. 1115427
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1091

DATE January 1968

REVISION C

EQUIPMENT TITLE

TABLE, BALANCE

DESCRIPTION: The Balance Table supports and protects the balance (P/L 1027) from vibration during remote readout operations. The table can be remotely leveled. Bubble level indicators and lifting eyes are provided.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1091 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650286 GOVT. INV. CONTROL NUMBER NT650286-001
PART NUMBER NT650286
CONTRACTOR WANL COST \$630.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 36" WIDTH 24" HEIGHT 38.75"
WEIGHT 100 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY 10 or 100 LB MAX
CRANE R-MAD Facility LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Manipulator, Master/Slave
PART OR ITEM Balance, Item 2027 DRAWING NO. E-675500
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1092

DATE
January 1968

REVISION
A

EQUIPMENT TITLE

FIXTURE, COIL SPRING TESTING

DESCRIPTION: The Coil Spring Testing Fixture when used in the Remotely Operated Spring Tester (P/L 1032) is utilized for postoperative compression testing of coil springs used in the NRX engine.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1092 FIRST PROVIDED FOR NRX-A3
DRAWING NUMBER NT650418 GOVT. INV. CONTROL NUMBER _____
PART NUMBER NT650418
CONTRACTOR WANL COST \$75.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8 inches LENGTH N/A WIDTH N/A HEIGHT 3.26"
WEIGHT 3.7 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY 10 or 100 LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Remotely Operated Spring Tester, P/L 1032
PART OR ITEM *963B483, B484, B702, B993, B994 DRAWING NO. _____
REMARKS *Used with P/L 1032 to support coil springs listed above during compression testing of each spring.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1093

DATE January 1968

REVISION A

EQUIPMENT TITLE

FIXTURE, LEAF SPRING TESTING

DESCRIPTION: The Leaf Spring Testing Fixture when used with the remotely operated spring tester (P/L 1032) is utilized for postoperative testing of leaf springs used in the NRX engine.

FIXTURE ONLY

FIXTURE & SAFETY
ENCLOSURE

FIXTURE WITH
TEST SPRING

W/SAFETY ENCLOSURE

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1093 FIRST PROVISIONED FOR NRX-A3
DRAWING NUMBER NT 650419 GOVT. INV. CONTROL NUMBER _____
PART NUMBER NT 650419
CONTRACTOR WANL COST \$600.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 7" WIDTH 6.5" HEIGHT 12"
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY 10 or 100 LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Remotely Operated Spring Tester, P/L 1032
PART OR ITEM 977D851 and D852 DRAWING NO. _____
REMARKS Used with P/L 1032 to support and position the leak springs 977D851 and D852 during testing of each spring.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1102

DATE January 1968

REVISION C

EQUIPMENT TITLE

TOOL, REMOVAL, CONTROL DRUM BEARING HOUSING BOLT

DESCRIPTION: The Control Drum Bearing Housing Bolt Removal Tool is an 18-inch long extension wrench with a 1/2-inch square drive on one end and a 7/16-inch socket on the other. An internal spring-loaded sliding shaft provides linear retraction motion while the tool is being rotated in a fixed plane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1102 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650135 GOVT. INV. CONTROL NUMBER NT650135-001
PART NUMBER NT650135
CONTRACTOR WANL COST \$734.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 0.75" LENGTH 18" WIDTH N/A HEIGHT N/A
WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 65 LB MAX
CRANE N/A LOAD CAPACITY N/A LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Impact Wrench, Class A Manipulator
PART OR ITEM Control Drum Housing Bolts DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1103

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, LIFTING, CONTROL DRUM ASSEMBLY

DESCRIPTION: The Control Drum Assembly Lifting Fixture is attached to the control-drum drive shaft coupling. This fixture uses a Class A manipulator to remove the drum from the outer reflector and to place it in a storage stand. It also lifts the control drum assembly in subsequent disassembly operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1103 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT 650011 GOVT. INV. CONTROL NUMBER NT 650011-001
 PART NUMBER NT 650011
 CONTRACTOR WANL COST \$360.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 18" WIDTH 5" HEIGHT 5"
 WEIGHT 15 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 500 or 65 LB MAX
 CRANE N/A LOAD CAPACITY N/A LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
 PART OR ITEM Control Drum Coupling DRAWING NO. 928F578H01B
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1104

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

STAND, STORAGE, CONTROL DRUM ASSEMBLY

DESCRIPTION: The Control Drum Assembly Storage Stand holds 12 control drums in a vertical position. It consists of 12 flared-end cylindrical containers welded onto a base and supported by an upper plate below each tube flaring.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1104 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER NT 650009 GOVT. INV. CONTROL NUMBER NT 650009-001
 PART NUMBER NT 650009
 CONTRACTOR WANL COST \$1352.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 30" WIDTH 30" HEIGHT 73"
 WEIGHT 200 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 6.5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane and Class A Manipulator
 PART OR ITEM Control Drum Assembly DRAWING NO. 937J090G01A
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 1105

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, CONTROL DRUM DISASSEMBLY

DESCRIPTION: The Control Drum Disassembly Stand consists of a complex of air-operated special clamps and tools for control drum disassembly operations. All are mounted on a table and provided with the necessary air hoses, controls, and connections. The stand can accept a control drum assembly in the vertical position and turn it to the horizontal position. It also permits the clamping (using air-operated trunnion clamps) and removal of all hardware components from the control drum by means of remote tools (which are an integral part of the stand) operated by a Class A manipulator.

一、二、三、四、五、六、七、八、九、十、十一、十二、十三、十四、十五、十六、十七、十八、十九、二十、二十一、二十二、二十三、二十四、二十五、二十六、二十七、二十八、二十九、三十、三十一、三十二、三十三、三十四、三十五、三十六、三十七、三十八、三十九、四十、四十一、四十二、四十三、四十四、四十五、四十六、四十七、四十八、四十九、五十、五十一、五十二、五十三、五十四、五十五、五十六、五十七、五十八、五十九、六十、六十一、六十二、六十三、六十四、六十五、六十六、六十七、六十八、六十九、七十、七十一、七十二、七十三、七十四、七十五、七十六、七十七、七十八、七十九、八十、八十一、八十二、八十三、八十四、八十五、八十六、八十七、八十八、八十九、九十、九十一、九十二、九十三、九十四、九十五、九十六、九十七、九十八、九十九、一百。

PROVISIONING LIST ITEM NUMBER	1105	FIRST PROVIDED FOR	NRX-A2
DRAWING NUMBER	NT650015	GOVT. INV. CONTROL NUMBER	NT650015-001
PART NUMBER	NT650015		
CONTRACTOR	WANL	COST	\$30,952.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 6' WIDTH 5' HEIGHT 3'
WEIGHT 500 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE 80-100 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA _____
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA Operation and Maintenance Instruction, WANL-EOM-008

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 500 and 65 LB MAX
CRANE LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA *Crane is used to lift entire stand and to position it.

INTERFACES

EQUIPMENT Handling Fixture (P/L 1229) and Manipulators
PART OR ITEM Control Drum Assembly DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1106

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

FIXTURE, LIFTING, OUTER REFLECTOR ASSEMBLY

DESCRIPTION: The Outer Reflector Lifting Fixture is a 3-legged device for lifting either the entire outer-reflector assembly with the dome-end support ring attached or the dome end support ring alone. Threaded eyebolts on the end of each leg position the movable lugs to the flange of the dome-end support ring. The eyebolts are turned by a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1106 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT 650002 GOVT. INV. CONTROL NUMBER NT 650002-001
 PART NUMBER NT 650002
 CONTRACTOR WANL COST \$1755.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 62" LENGTH N/A WIDTH N/A HEIGHT 24"
 WEIGHT 200 LB LOAD CAPACITY 2500 LB PROOF LOAD 5000 LB
 FLOOR AREA REQUIRED 25 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL 6 Months
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 65 LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane and Class A Manipulator
 PART OR ITEM Dome End Support Assembly and DRAWING NO. 937J081G01
 REMARKS Outer Reflector

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1110

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

FIXTURE, LIFTING, OUTER REFLECTOR SECTOR

DESCRIPTION: The Outer Reflector Sector Lifting Fixture is used to lift an outer reflector sector by first entering the control-drum cavity, then expanding to obtain a frictional grip on the cavity wall through neoprene-covered friction shoes. The fixture is comprised of three major items: the lifting fixture assembly, a storage stand and a test fixture. The frictional gripping mechanism is operated by rotating the lifting bail approximately 90° after releasing the shaft lock with a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1110 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650012 GOVT. INV. CONTROL NUMBER NT650012-001
PART NUMBER NT650012
CONTRACTOR WANL COST \$2550.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8" LENGTH 51" WIDTH N/A HEIGHT N/A
WEIGHT 150 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED * SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA *The stand is 30" in diameter by 30" high. The test fixture has a base 12" square and a height of 31.25"

OPERATING DATA

GASES N/A PRESSURE LB/SQ IN. VOLUME CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS CPS PHASE KVA
LIQUIDS N/A PRESSURE LB/SQ IN QTY REQ'D
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL VERTICAL
CALIBRATION INTERVAL N/A
ADDITIONAL DATA

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 500 and 65 LB MAX
CRANE N/A LOAD CAPACITY LB MAX
ADDITIONAL DATA Class A manipulators are used to lock the item to the reflector sector, and to unlock the frictional shoe operating mechanism.

INTERFACES

EQUIPMENT Class A Manipulators
PART OR ITEM Outer Reflector Sectors DRAWING NO. 909E533H01B
REMARKS

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	1123
DATE	January 1968
REVISION	K

EQUIPMENT TITLE
STAND, CYLINDER SLITTING

DESCRIPTION: The Cylinder Slitting Stand receives the core assembly and supports it for removal of the cluster nuts, core support plates, and the inner reflector hold-down spring components. It is capable of trunnioning the core assembly 90 degrees to a horizontal position and continuous rotation around the longitudinal axis of the cylinder. The cutting head has feed, traverse, and plunge-cut action and is equipped with a vacuum cleaning unit for removal of cutting dust. The top section of the stand cage can be elevated for component removal when positioned horizontally.

SIDE VIEW

END VIEW

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1123 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650060 GOVT. INV. CONTROL NUMBER NT650060-001
 PART NUMBER NT650060
 CONTRACTOR WANL COST \$99,743.00 (Includes Modification)

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 9', 4" HEIGHT 7', 8"
 WEIGHT 2600 LB LOAD CAPACITY 5000 LB PROOF LOAD 12,000 LB
 FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD 65 LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL 120/208 VOLTS 60 CPS 3 PHASE 9.4 KVA
 LIQUIDS N/A PRESSURE N/A LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED 1 in./min
 MEASURING ACCURACY N/A HORIZONTAL N/A VERTICAL N/A
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY 65 LB MAX
 CRANE * LOAD CAPACITY 50,000 or 10,000 LB MAX
 ADDITIONAL DATA *For lifting stand only, not for performing any operations

INTERFACES

EQUIPMENT Cylinder Slitting Stand Handling Fixture
 PART OR ITEM 1172 DRAWING NO. NT650124
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 1126

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, STORAGE, INNER SHIPPING CONTAINER

DESCRIPTION: The Inner Shipping Container Storage Stand is a structural-steel stand designed to support a loaded inner portion of the reactor shipping container by the three lugs of the inner container. It also provides personnel access to the dome end of the reactor when the container cover is removed. The stand has a circular opening in the center to receive the inner container. A handrail, one section of which is removable, encloses the work platform. The legs of the stand are provided with leveling jacks. A ladder is attached for access.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1126 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER NT650006 GOVT. INV. CONTROL NUMBER NT650006-001
PART NUMBER NT650006
CONTRACTOR WANL COST \$1219.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 10' HEIGHT 9'
WEIGHT 800 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA Handled by a portable crane

INTERFACES

EQUIPMENT Portable Crane
PART OR ITEM Inner Container DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1132

DATE January 1968

REVISION B

EQUIPMENT TITLE

STAND, CLOSURE/CONTROL

DESCRIPTION: The Closure/Control Stand consists of a three-legged steel-pipe stand, a top ring and clamp assembly (composed of 12 shaft-retainer brackets) and three clamps. A ring and pad are also provided to support the vessel closure. Three locating plugs facilitate centering on the portable turntable. The design also includes a load ring assembly, which may be raised or lowered remotely, and an elevator drive assembly used to raise and lower the load ring assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1132 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER 3-510221 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____
 CONTRACTOR WANL/ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 5' LENGTH N/A WIDTH N/A HEIGHT 8'
 WEIGHT 1300 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 22 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL 220/440 VOLTS 60 CPS 3 PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Portable Turntable, Reactor Adapter Ring Handling Fixture (P/L 1151)
 PART OR ITEM Control Shafts, Forward Closure DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1135

DATE January 1968

REVISION C

EQUIPMENT TITLE

FIXTURE, HANDLING, SHIELD

DESCRIPTION: The Shield Handling Fixture is a strongback used to pick up either the simulated shield or the reactor shield. The three pick-up points engage lifting lugs, located 120° apart, which can be operated manually or by a manipulator. Positive locks are incorporated with the lugs. The fixture can be used with either an overhead crane or a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1135 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 3-509800 GOVT. INV. CONTROL NUMBER 3-509800-001
PART NUMBER 3-509800
CONTRACTOR ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 54" LENGTH N/A WIDTH N/A HEIGHT 13"
WEIGHT 150 LB LOAD CAPACITY 5000 LB PROOF LOAD 10,000 LB
FLOOR AREA REQUIRED 20 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane and Class A Manipulator
PART OR ITEM Simulated and Reactor Shields DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1139

DATE January 1968

REVISION B

EQUIPMENT TITLE _____

INSPECTION EQUIPMENT _____

DESCRIPTION: The Inspection Equipment consists of typical, standard precision hand-tools: e.g., vernier calipers, inside and outside micrometers, thread micrometers, depth micrometers, hole micrometers, and dial gages.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1139 FIRST PROVISIONED FOR NRX-A1
 DRAWING NUMBER N/A GOVT. INV. CONTROL NUMBER _____
 PART NUMBER N/A
 CONTRACTOR WANL COST \$22,000.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1143

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, HANDLING, REACTOR ASSEMBLY

DESCRIPTION: The Reactor Assembly Handling Fixture handles the reactor assembly by three lugs which engage the underside of the core support plate when the reactor is in the nozzle-down position. The fixture is a rigid, three-legged, welded-steel device with a centrally located lifting bail, designed for manual operation with an overhead crane or for remote operation with a Class A manipulator and overhead crane. Positive locking and lifting-lug position indication are provided to insure safe handling of the reactor assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1143 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER NT650000 GOVT. INV. CONTROL NUMBER NT650000-001
 PART NUMBER NT650000
 CONTRACTOR WANL COST \$1372.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 42" LENGTH N/A WIDTH N/A HEIGHT 30"
 WEIGHT 130 LB LOAD CAPACITY 7000 LB PROOF LOAD 21,000 LB
 FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane and Class A Manipulator
 PART OR ITEM Reactor Assembly DRAWING NO. 937J250G01A
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1145

DATE January 1968

REVISION C

EQUIPMENT TITLE

PALLET, SIMULATED SHIELD

DESCRIPTION: The Simulated Shield Pallet is an aluminum structure fitted with neoprene pads to protect the simulated shield while it is moved. The pallet consists of a ring (supported and reinforced with a triangular truss) and fitted with lifting eyes on three vertical support arms.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1145 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650138 GOVT. INV. CONTROL NUMBER NT650138-001
 PART NUMBER NT650138
 CONTRACTOR WANL COST \$1115.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 6' LENGTH N/A WIDTH N/A HEIGHT 32"
 WEIGHT 175 LB LOAD CAPACITY 2300 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A* LOAD CAPACITY _____ LB MAX
 CRANE R-MAD Facility (Auxiliary Hook) LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA *Not for lifting pallet; use to attach the lifting sling to the pallet.

INTERFACES

EQUIPMENT Crane and Class A Manipulator
 PART OR ITEM Simulated Shield DRAWING NO. 936J387GOIE
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1149

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

FIXTURE, LIFTING, NOZZLE END SUPPORT RING, OUTER REFLECTOR

DESCRIPTION: The Outer Reflector Nozzle End Support Ring Lifting Fixture is used to lift the nozzle end support ring of the outer reflector from the reactor trunnion cage after it has been remotely disassembled and removed from the cage. The fixture can be handled by either a Class A manipulator or an overhead crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1149 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650004 GOVT. INV. CONTROL NUMBER NT650004-001
 PART NUMBER _____
 CONTRACTOR WANL COST \$1418.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	<u>1</u>
TOTAL	<u>1</u>

DIMENSIONS AND CAPACITY

DIA 42" LENGTH N/A WIDTH N/A HEIGHT 85"
 WEIGHT 100 LB LOAD CAPACITY 100 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 12 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator and Crane
 PART OR ITEM Nozzle End Support Ring DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1151

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, HANDLING, REACTOR ADAPTER RING

DESCRIPTION: The Reactor Adapter Ring Handling Fixture is a three-point strongback lifting device designed for either manual or remote handling of the adapter ring or the forward closure with the adapter ring attached. It is used with an adjustable chain sling and is equipped with a safety locking device to insure a positive lift.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1151 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER 3-510004 GOVT. INV. CONTROL NUMBER NT650237-001
 PART NUMBER _____
 CONTRACTOR WANL/ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 50" LENGTH N/A WIDTH N/A HEIGHT 12"
 WEIGHT 168 LB LOAD CAPACITY 2166 LB PROOF LOAD 6500 LB
 FLOOR AREA REQUIRED 14 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Crane
 PART OR ITEM Reactor Adapter Ring, DRAWING NO. _____
 REMARKS Forward Closure with Adapter Ring Attached

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1153

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, HANDLING, SCREEN

DESCRIPTION: The Screen Handling Fixture is a three-legged aluminum strongback which engages the screen with three spring clips located at the ends of the three legs. The fixture can be used with a three-legged sling or handled by the central lifting bail, in either manual or remote operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1153 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 3-509904 GOVT. INV. CONTROL NUMBER NT650234-001
PART NUMBER 3-509904
CONTRACTOR WANL/ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 30" LENGTH N/A WIDTH N/A HEIGHT 24"
WEIGHT 65 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
PART OR ITEM Screen and Crane DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1158

DATE January 1968

REVISION C

EQUIPMENT TITLE

STAND, DRIVE SHAFT STORAGE

DESCRIPTION: The Drive Shaft Storage Stand provides storage for 12 control-drum shafts during cold or hot disassembly. It is equipped to be handled by a Class A manipulator or an overhead crane with a five-ton capacity.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1158 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650141 GOVT. INV. CONTROL NUMBER NT650141-001
 PART NUMBER NT650141
 CONTRACTOR WANL COST \$2100.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 32" WIDTH 27" HEIGHT 87"
 WEIGHT 450 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD less than 10 LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator and Crane
 PART OR ITEM Control Drum Shafts DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	1160
DATE	January 1968
REVISION	F

EQUIPMENT TITLE _____

FIXTURE, LIFTING, SHIPPING CONTAINER

DESCRIPTION: The Shipping Container Lifting Fixture is a steel, three-legged strongback with extension arms capable of handling a loaded shipping container or its cover. The three equally spaced legs are joined at the center, and welded to cover plates and a centrally located lifting bail. The extension arms engage the lifting lugs of the container or its cover with quick-acting mechanical ball-lock pins. A large pear link is located on the lifting bail to accommodate the various sizes and shapes of crane hooks which might be employed in lifting operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1160 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER NT650005 GOVT. INV. CONTROL NUMBER NT65005-001
PART NUMBER NT650005 and NT650005-002
CONTRACTOR WANL COST Unit 1137 total 2274

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	1
C.	
D. NRDS	1
TOTAL	2

DIMENSIONS AND CAPACITY

DIA 110" LENGTH _____ WIDTH _____ HEIGHT 31.5"
WEIGHT 980 LB LOAD CAPACITY 27,000 max LB PROOF LOAD 75,000 LB
FLOOR AREA REQUIRED see below SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Will fit in rectangular space 100-1/2", 60 sq. ft.
Will fit in circular space 56" radius, 69 sq. ft.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA N/A

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT NRX Shipping Container and Crane Hook
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1164

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

FIXTURE, HANDLING, CONTROL DRUM

DESCRIPTION: The Control Drum Handling Fixture grips the control drum by its stub shaft on the dome end for handling after all hardware components have been removed. Adapter jaws are used with a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1164 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650014 GOVT. INV. CONTROL NUMBER NT650014-001
 PART NUMBER NT650014
 CONTRACTOR WANL COST \$200.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 5" WIDTH 4" HEIGHT 4"
 WEIGHT 20 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
 PART OR ITEM Control Drum DRAWING NO. _____
 REMARKS _____

EQUIPMENT TITLE

CONTAINER, CONTROL DRUM HARDWARE

DESCRIPTION: The Control Drum Hardware Container is used to store bearings, retaining nuts, and other control drum assembly hardware during post-operative disassembly and before examination. The container is fitted with lifting lugs.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1168 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650175 GOVT. INV. CONTROL NUMBER NT650175-001
PART NUMBER NT650175
CONTRACTOR WANL COST \$2600.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 28" WIDTH 13" HEIGHT 40"
WEIGHT 75 LB LOAD CAPACITY N/A LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR O-MAN Class A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
PART OR ITEM Control Drum Assembly Hardware DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1171

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

TOOL, OUTER REFLECTOR TIE BOLT

DESCRIPTION: The Outer Reflector Tie Bolt tool is a modified electric hammer designed for use with a Class A manipulator. It is used to dislodge the outer reflector tie bolt from the tie bolt locking device and the dome and support. It may also be used as a back-up tool for other operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1171 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650142 GOVT. INV. CONTROL NUMBER NT650142-001
PART NUMBER NT650142
CONTRACTOR WANL COST \$3,498.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 30" WIDTH 8" HEIGHT 8"
WEIGHT 75 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
PART OR ITEM Outer Reflector Tie Bolt DRAWING NO. 978D319H01
REMARKS _____

EQUIPMENT TITLE _____

FIXTURE, HANDLING, CYLINDER SLITTING STAND

DESCRIPTION: The Cylinder Slitting Stand Handling Fixture hooks into mating eyes on the cylinder slitting stand for handling of the stand and core during the core disassembly operations. It is used with an overhead crane or a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1172 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650124 GOVT. INV. CONTROL NUMBER NT650124-001
PART NUMBER NT650124
CONTRACTOR WANL COST \$1123.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 90" WIDTH 65" HEIGHT 21"
WEIGHT 250 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 4 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator and Crane
PART OR ITEM Cylinder Slitting Stand, DRAWING NO. NT650060
REMARKS P/L 1123

EQUIPMENT TITLE

FIXTURE, SUPPORT, INSTRUMENTATION AND CONTROL DRUM SHAFT

DESCRIPTION: The Instrumentation and Control Drum Shaft Support Fixture is designed to be used for assembly only in conjunction with the Reactor/Vessel Trunnion Cage (P/L 1150 or 1251) to maintain the vertical alignment of the control-drum shafts during installation of the forward closure. The fixture is of aluminum construction and basically consists of two rings separated by twelve rods, each of which contain two spring-loaded shaft supports.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1181 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER 3-509937 GOVT. INV. CONTROL NUMBER NT650235-001
PART NUMBER _____
CONTRACTOR WANL/ACF1 COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 61" LENGTH N/A WIDTH N/A HEIGHT 37.5"
WEIGHT 140 LB LOAD CAPACITY 110 LB PROOF LOAD 220 LB
FLOOR AREA REQUIRED 20 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM P/L 1150 or 1251 DRAWING NO. _____
REMARKS This item is used for cold assembly only.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	1182
DATE	January 1968
REVISION	B

EQUIPMENT TITLE _____

FIXTURE, TRUNNION, REACTOR

DESCRIPTION: The Reactor Trunnion Fixture is designed to receive either the reactor trunnion cage (P/L 1147 or 1278) or the reactor/vessel trunnion cage (P/L 1150 or 1251) during cold assembly and disassembly operations or remote disassembly operations. The fixture provides a means of elevating either of the two cages and has the capability of continuous rotation at a speed of 0.5 rpm. An output torque of 116,000 inch pounds is produced at the trunnion by a double worm-gear speed reducer and 3 hp motor. The trunnion clamps are designed to permit either cage to be inserted, rotated 180 degrees, and removed. Construction is primarily mild steel with an epoxy coating. The fixture is complete with various personnel platforms and a lifting fixture for handling the empty fixture.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1182 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER 3-510022 GOVT. INV. CONTROL NUMBER NT650228-001
 PART NUMBER _____
 CONTRACTOR WANL/ACF1 COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 13' WIDTH 10' HEIGHT 12.5'
 WEIGHT _____ LB LOAD CAPACITY 16,000 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 130 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION Oils & greases as re-
 ELECTRICAL 220/440 VOLTS 60 CPS 3 PHASE _____ KVA quired
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A Manipulators LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Reactor Trunnion Cage or Reactor/Vessel Trunnion Cage
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	1193
DATE	January 1968
REVISION	A

EQUIPMENT TITLE _____

PALLET, DISPOSAL

DESCRIPTION: The Disposal Pallet is used to handle disposal pails, reactor parts, and scrap. A pallet can be lifted by a handling fixture or a fork lift. Construction is steel tubing and hardwood decking.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1193-B4
 DRAWING NUMBER 566F441
 PART NUMBER _____
 CONTRACTOR WANL

FIRST PROVIDED FOR NRX-A3
 GOVT. INV. CONTROL NUMBER NT650330-012-022
 COST \$65.00 to \$676.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	10
TOTAL	10

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 55" WIDTH 55" HEIGHT 10 to 35"
 WEIGHT _____ LB LOAD CAPACITY 2500 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 22 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 50,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Fixture and Fork Lift
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1199

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

RACK, TOOL HOLDER

DESCRIPTION: The Tool Holder Rack provides positioned storage for interface tools and is used with Class A and sidewall manipulators. It consists of a caster-wheeled table (fitted with storage slots, fixtures, and tool holders) and is provided with a lifting bail to permit handling by a crane or a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1199 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER NT650143 GOVT. INV. CONTROL NUMBER NT650143-001
 PART NUMBER NT650143
 CONTRACTOR WANL COST \$2999.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 42" WIDTH 42" HEIGHT 47.3"
 WEIGHT 350 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 13 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulators, Facility Crane
 PART OR ITEM Tools for Manipulators DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1200

DATE
January 1968

REVISION
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EQUIPMENT TITLE

DRILL, MECHANICAL, REMOTE

DESCRIPTION: The Mechanical Remote Drill is a back-up tool used to remove galled or frozen threaded-fasteners. The unit uses standard, high-speed drills from 3/8- to 7/8-inch diameter. It is used with a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1200 FIRST PROVIDED FOR NRX-A2
DRAWING NUMBER NT650036 GOVT. INV. CONTROL NUMBER NT650036-001
PART NUMBER NT650036
CONTRACTOR WANL COST \$2797.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 36" WIDTH 10" HEIGHT 6"
WEIGHT 25 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 2.5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulators
PART OR ITEM P/L 1218, Chucking Fixture DRAWING NO. NT650020
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1209

DATE
January 1968

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EQUIPMENT TITLE

CLIPS, RETAINER, CONTROL SHAFT

DESCRIPTION: The Control Shaft Retainer Clips attach to and hold the control shafts to the guide tubes during remote disassembly of the forward closure from the pressure vessel. Each clip is a spring wire with a plastic handle. It is manufactured from 1045 spring steel wire, 0.090 inch in diameter. The plastic handle is cast adiprene.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1209 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 3-510299 GOVT. INV. CONTROL NUMBER 3-510299-001
PART NUMBER _____
CONTRACTOR WANL/ACF1 COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1 set
TOTAL	1 set

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 8" WIDTH 2" HEIGHT 1/2"
WEIGHT _____ LB LOAD CAPACITY 30 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulator
PART OR ITEM Control Shafts and Guide Tubes DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1211

DATE

January 1968

REVISION

C

EQUIPMENT TITLE

TOOL, SIMULATED SHIELD NUT INSTALLATION

DESCRIPTION: The Simulated Shield Nut Installation Tool is used to install the simulated shield nut into the instrumented reactor assembly. This tool is a spanner adapted for use with a manual 1/2-inch square-drive torque wrench.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1211 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650322 GOVT. INV. CONTROL NUMBER NT650322-001
PART NUMBER NT650322
CONTRACTOR WANL COST \$295.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 4.8" WIDTH 2.25" HEIGHT 1.75"
WEIGHT 2 LB LOAD CAPACITY 40' LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA Torque Wrench - 1/2" square drive

INTERFACES

EQUIPMENT Torque Wrench, 1/2" square drive, under 40 ft-lb
PART OR ITEM Simulated Shield Nut DRAWING NO. 946C110H01
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1218

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

FIXTURE, CHUCKING, MECHANICAL REMOTE DRILL

DESCRIPTION: The Mechanical Remote Drill Chucking Fixture provides positioning and holding capabilities for the remote installation of tools in the mechanical drill. It uses a Class A manipulator to lock and release the chuck. The fixture mounts on a tool rack.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1218 FIRST PROVIDED FOR _____
DRAWING NUMBER NT650020 GOVT. INV. CONTROL NUMBER NT650020-001
PART NUMBER NT650020
CONTRACTOR WANL COST \$1200.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 6" WIDTH 6" HEIGHT 12"
WEIGHT 25 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT N/A
PART OR ITEM Drill, Mechanical, Remote, DRAWING NO. _____
REMARKS P/L 1200

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PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1224

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

INSTRUMENTATION RECORDERS AND CABINETS, SHIPPING

DESCRIPTION: The Shipping Instrumentation Recorders and Cabinets consist of four brush electric-pen oscillographs (with associated amplifiers and signal conditioning equipment) shock mounted by pairs in weatherproof transportation cabinets. A time-pulse generator is also furnished for providing trace timing-marks. The cabinets are secured to the reactor and shield shipping semi-trailer (P/L 1249). The recorders are connected by cables to transducers installed on and in the reactor shipping container. This item records transportation and environmental data obtained from reactor instrumentation during shipment. Electrical power for the recorders and instrumentation is provided by a diesel-generator mounted on the semi-trailer.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1224 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER _____
CONTRACTOR WANL COST \$13,000.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1 set
TOTAL	1 set

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 36" WIDTH 40" HEIGHT 72"
WEIGHT 550 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA *Electrical power in transit is supplied by the diesel-generator set mounted on the trailer.

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Reactor Shipping Semi-Trailer, Reactor Transportation Instrumentation
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1229

DATE January 1968

REVISION C

EQUIPMENT TITLE

FIXTURE, HANDLING, CONTROL DRUM DISASSEMBLY STAND

DESCRIPTION: The Control Drum Disassembly Stand Handling Fixture is used to lift the control drum disassembly stand. A Class A manipulator or an overhead crane with a five-ton capacity attaches to the four lifting lugs on the stand.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1229 FIRST PROVIDED FOR NRX-A2
DRAWING NUMBER NT650018 GOVT. INV. CONTROL NUMBER NT650018-001
PART NUMBER NT650018
CONTRACTOR WANL COST \$770.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 75" WIDTH 50" HEIGHT 40"
WEIGHT 150 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 27 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM Control Drum Disassembly Stand, DRAWING NO. NT650015
REMARKS P/L 1105

PROV. LIST
ITEM NO. 1230

DATE
January 1968

REVISION
C

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

EQUIPMENT TITLE _____

FIXTURE, CLOSING, LARGE DISPOSAL PAIL

DESCRIPTION: The Large Disposal Pail Closing Fixture is used to remotely crimp and seal the lugs on covers of the large disposal pails. It consists of a commercial closing tool, air motor and adaption framework, linkage, and air accessories. The pail to be closed is placed on the base of the frame and slid into position under the closing tool. The tool is brought down onto the pail and actuated by the air cylinder, locking the cover on the pail.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1230 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650329 GOVT. INV. CONTROL NUMBER NT650329-001
 PART NUMBER NT650329
 CONTRACTOR WANL COST \$1915.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 35.53" WIDTH 28.22" HEIGHT 51"
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 9 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE 100 LB/SQ IN. VOLUME N/A CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulators
 PART OR ITEM Large Disposal Pail DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1237

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

FIXTURE, CLOSING, SMALL DISPOSAL PAIL

DESCRIPTION: The Small Disposal Pail Closing Fixture is used to remotely press covers on small disposal pails. It consists of a frame, an air cylinder, a pressure plate, and necessary air accessories. The frame is a vertical column with cylinder spacers, a base, pail guides, and a lifting bail. The base is rectangular and suitable for bench mounting. The cylinder is vertically attached to the column over the pail guides and by the cylinder spacers with the push-rod acting downward. It is a spring-return type and includes the push rod and pressure plate. An air hose, lever-operated valve, and remote connector are included.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1237 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650328 GOVT. INV. CONTROL NUMBER NT650328-001
PART NUMBER NT650328
CONTRACTOR WANL COST \$650.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 22" WIDTH 13-5/8" HEIGHT 23-1/2"
WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Maximum closing force 300 pounds

OPERATING DATA

GASES Air PRESSURE 100 LB/SQ IN. VOLUME N/A CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulators
PART OR ITEM Small Disposal Pail DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1249

DATE
January 1968

REVISION
C

EQUIPMENT TITLE

SEMI-TRAILER, REACTOR AND SHIELD SHIPPING

DESCRIPTION: The Reactor and Shield Shipping Semi-Trailer is a modified 30-ton, double-drop, low-bed trailer with an air-cushion ride and spring-loaded safety brakes. Tie downs and anchors are provided for the reactor and shield shipping container. Mounts for the diesel generator, control cabinets, and nitrogen supply bottles are also provided. The trailer is equipped with adequate signs and lights for "over-the-road" use.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1249 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT600082 GOVT. INV. CONTROL NUMBER NT600082-001
 PART NUMBER NT600082
 CONTRACTOR WANL COST \$8175.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 29' WIDTH 8' HEIGHT 13.5'
 WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 290 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA *Total width with reactor container "on board" is 10 feet

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Truck Tractor, Standard Railroad Flat Car
 PART OR ITEM Reactor/Shield - DRAWING NO. _____
 REMARKS Shipping Container, P/L 1224

PROV. LIST
ITEM NO. 1251

DATE
January 1968

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C

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PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE

TRUNNION CAGE, REACTOR/VESSEL

DESCRIPTION: The Reactor/Vessel Trunnion Cage is used with the reactor trunnion fixture and is designed to handle the following components or assemblies in either manual or remote operations: (1) the pressure vessel alone; (2) the pressure vessel and nozzle; and (3) the NRX vessel/reactor assembly. A strong-back lifting fixture is provided for handling of the cage, either loaded or unloaded, from either end. The cage is capable of being lowered over a complete NRX assembly in the nozzle-up position.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1251 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 3-510081 GOVT. INV. CONTROL NUMBER NT650232-001
PART NUMBER 3-510081
CONTRACTOR WANL/ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS (R-MAD)	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 80" LENGTH 90" WIDTH N/A HEIGHT N/A
WEIGHT 2650 LB LOAD CAPACITY 10,000 LB PROOF LOAD 20,000 LB
FLOOR AREA REQUIRED 35 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY 50,000 LB MAX
ADDITIONAL DATA A crane lifts the cage by use of the lifting fixture.

INTERFACES

EQUIPMENT Lifting Fixture (part of this item) and Reactor Trunnion Fixture (P/L 1182)
PART OR ITEM Reactor/Pressure Vessel Assem. DRAWING NO. _____
REMARKS This item was made from P/L 1150.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1258

DATE
January 1968

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A

EQUIPMENT TITLE

INSERT, ELEMENT CASK

DESCRIPTION: The Element Cask Insert is used for storing fuel elements after a test. It is fabricated of aluminum plates and boral poisoning. Its size and shape are compatible with existing LASL shielded shipping containers. One set of 20 inserts is required for each reactor.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1258 FIRST PROVISIONED FOR NRX-A3
DRAWING NUMBER NT650434 GOVT. INV. CONTROL NUMBER _____
PART NUMBER NT650434
CONTRACTOR WANL COST \$635.00 each

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	*1 set
TOTAL	1 set

*Set is composed of 20 inserts for one reactor.

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 58" WIDTH 15.65" HEIGHT 7.56"
WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 7 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Lifting Fixture and Class A Manipulator
PART OR ITEM Fuel Elements DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1290

DATE January 1968

REVISION C

EQUIPMENT TITLE

CUTTER, CONTROL DRUM ASSEMBLY

DESCRIPTION: The Control Drum Assembly Cutter consists of two motor-driven rotating support rollers, a motor driven cutter, a support base, and necessary electrical controls and connections. The unit is remotely operated and is used to cut the aluminum control drum cylinders at the drive shaft end to permit removal of the poison plate without cutting the toxic material within the control drum. A control drum is held horizontally by the two sets of motor-driven rollers. The pivoted grinding head is positioned over the drum and the drum is cut while being rotated by the support rollers. The cutter is provided with lifting eyes for remote lifting.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1290 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650297 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER NT650297
 CONTRACTOR WANL COST \$1000.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 51" WIDTH 14.75" HEIGHT 20.5"
 WEIGHT 100 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 5.2 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA *Used for moving the item, not for operation

INTERFACES

EQUIPMENT Class A Manipulator
 PART OR ITEM Control Drum Assembly DRAWING NO. 936J278
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1308

DATE
January 1968

REVISION
B

EQUIPMENT TITLE

ADAPTER, PERISCOPE

DESCRIPTION: The Periscope Adapter permits the periscope to penetrate a hot cell wall. The unit minimizes air flow through the penetration from the hot area and provides radiation protection equal to that of the hot cell wall.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1308 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER NT650315 GOVT. INV. CONTROL NUMBER NT650315-00
 PART NUMBER NT650315
 CONTRACTOR WANL COST \$620.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA * LENGTH 72.72" WIDTH N/A HEIGHT N/A
 WEIGHT 290 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA * Inside diameter 8.02", outside diameter (tube) 8.93", flanges, outside diameter, 11.75".

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM Periscope DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1334

DATE January 1968

REVISION C

EQUIPMENT TITLE

ADAPTER, DRIVE SHAFT TORQUE

DESCRIPTION: The Drive Shaft Torque Adapter consists of a square steel block with a pilot for the control shaft and five pins on one side to hold the splines, and a square drive socket on the other. The adapter, which is furnished with a torque wrench, is used for checking torque on the control-drum scram springs.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1334 FIRST PROVISIONED FOR NRX-A1
DRAWING NUMBER NT650131 GOVT. INV. CONTROL NUMBER NT650131-001
PART NUMBER NT650131
CONTRACTOR WANL COST \$197.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 2" WIDTH 2" HEIGHT 1"
WEIGHT 1 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED .03 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Torque Wrench
PART OR ITEM Control Drum Scram Springs DRAWING NO. _____
REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 1337

DATE January 1968

REVISION B

EQUIPMENT TITLE

FIXTURE, RETAINING, TRUNNION CAGE

DESCRIPTION: The Trunnion Case Retaining Fixture is a cylindrical, tubular device which holds the outer reflector in place during removal of the outer reflector segment.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1337 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650326 GOVT. INV. CONTROL NUMBER NT650326
PART NUMBER NT650326
CONTRACTOR WANL COST \$750.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 51" LENGTH N/A WIDTH N/A HEIGHT 24.25"
WEIGHT 54 (est.) LB LOAD CAPACITY LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 15 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA

OPERATING DATA

GASES N/A PRESSURE LB/SQ IN. VOLUME CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS CPS PHASE KVA
LIQUIDS N/A PRESSURE LB/SQ IN QTY REQ'D
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL VERTICAL
CALIBRATION INTERVAL N/A
ADDITIONAL DATA

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY LB MAX
CRANE N/A LOAD CAPACITY LB MAX
ADDITIONAL DATA

INTERFACES

EQUIPMENT Trunnion Cage (ACFI Dwg. 3-509940-00)
PART OR ITEM Outer Reflector Sector DRAWING NO.
REMARKS

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1339

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

GAGE, DRIVE SHAFT LOCATION

DESCRIPTION: The Drive Shaft Location Gage is used to determine the proper shim thickness required during assembling of the spacer, actuator, and feedback assembly to the NRX test car privy roof. It is composed of a circular pilot plate (which bolts to the underside of the privy car roof) and a surface plate (which has a recess in its center to engage the end of the drive shaft). Three thumb screws are provided for adjustment.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1339 FIRST PROVIDED FOR NRX-A1
 DRAWING NUMBER NT650072 GOVT. INV. CONTROL NUMBER NT650072-001
 PART NUMBER NT650072
 CONTRACTOR WANL COST \$625.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 9" LENGTH N/A WIDTH N/A HEIGHT 2"
 WEIGHT 20 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM NRX Privy Roof DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1343

DATE January 1968

REVISION B

EQUIPMENT TITLE

TOOL, SIMULATED SHIELD SUPPORT SLEEVE

DESCRIPTION: The Simulated Shield Support Sleeve Tool is used to prevent twisting of electrical leads which extend through the instrumentation seal nut. It is used with the simulated shield nut tool (P/L 1211) and engages the slot in the dome end of the support sleeve.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1343 FIRST PROVIDED FOR NRX-A1
DRAWING NUMBER NT650186 GOVT. INV. CONTROL NUMBER NT650186-001
PART NUMBER NT650186
CONTRACTOR WANL COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 12" WIDTH 2.5" HEIGHT 1"
WEIGHT 3 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA This item is used during cold assembly operations

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Tool, Simulated Shield Nut Installation, P/L 1211
PART OR ITEM Simulated Shield Nut DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1355

DATE

January 1968

REVISION

A

EQUIPMENT TITLE

STAND, ASSEMBLY AND INSTALLATION

DESCRIPTION: The Assembly and Installation Stand is a narrow platform, with protective railings, which fastens to three sides of an NRX test car privy roof. The stand increases roof working area to a reasonably large, protected working area for cold assembly operations with the reactor/pressure vessel assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1355 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER 3-508159 GOVT. INV. CONTROL NUMBER _____
PART NUMBER _____
CONTRACTOR WANL/ACFI COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 8' WIDTH 3' HEIGHT N/A
WEIGHT 200#/sq ft LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Stands that are suspended from the test car privy roof on the 90°, 180°, 270° sides are normally used, 6 sections comprise the complete assembly.

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
CRANE R-MAD Facility LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Test Car Privy Roof
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1358

DATE
January 1968

REVISION
B

EQUIPMENT TITLE

FIXTURE, HANDLING, POSTOPERATIVE, SECTOR

DESCRIPTION: The Sector Postoperative Handling Fixture is used to handle the outer reflector sector in a horizontal position during disassembly operations and transport. It is a spring-loaded, positive drive, double-link, double-tong clamp, and is handled by a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1358 FIRST PROVIDED FOR NRX-A2
DRAWING NUMBER NT650333 GOVT. INV. CONTROL NUMBER NT650333-001
PART NUMBER NT650333
CONTRACTOR WANL COST \$3450.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 19-3/8" WIDTH 17.25" HEIGHT 16.75"
WEIGHT _____ LB LOAD CAPACITY 500 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2-1/2 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A Manipulators
PART OR ITEM Outer Reflector Sectors DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1359

DATE
January 1968

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B

EQUIPMENT TITLE

CRADLE, POSTOPERATIVE, SECTOR

DESCRIPTION: The Postoperative Sector Cradle is used to support the sector on the universal length gage (P/L 1295) while measuring the sector length. It is provided with rollers to permit lateral positioning of the sector for measuring lengths at various points on the sector cross-section. A spacer frame is provided for insertion between the gage and cradle to position the sector for peripheral measurements. The cradle and spacer frames are capable of being locked in position on the gage.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1359 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER NT650334 GOVT. INV. CONTROL NUMBER NT650334-001
 PART NUMBER NT650334
 CONTRACTOR WANL COST \$1560.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 30" WIDTH 24" HEIGHT _____
 WEIGHT 50 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Gage, Universal Length, Measuring, Manipulators (P/L 1295)
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

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ITEM NO. 1360

DATE
January 1968

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B

EQUIPMENT TITLE

FIXTURE, HANDLING, POSTOPERATIVE, CONTROL DRUM

DESCRIPTION: The Control Drum Postoperative Handling Fixture is used for lifting and transferring the control drum assembly, housing, and cylinder to measuring and cutting stations during postoperative procedures. It has elastomer-padded clamshell arms, mechanically actuated and spring-loaded for positive closing action.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1360 FIRST PROVISIONED FOR NRX-A2
 DRAWING NUMBER NT650335 GOVT. INV. CONTROL NUMBER NT650335-001
 PART NUMBER NT650335
 CONTRACTOR WANL COST \$970.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 12" WIDTH 6" HEIGHT 8"
 WEIGHT 25 LB LOAD CAPACITY 200 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A
 PART OR ITEM Control Drum Assembly* DRAWING NO. _____
 REMARKS *Cylinder and Housing

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ITEM NO. 1363

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B

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE

TOOL, RETRACTION, POISON AND CALIBRATION WIRE

DESCRIPTION: The Poison and Calibration Wire Retraction Tool is used to manually remove the poison wires, poison-wire retractor plate, calibration wires, and calibration-wire retractor plate from the reactor with the nozzle installed. It consists of a holder assembly (pole) which has a built-in battery-powered light, hook, head assembly, bails and plate. The combination of holder assembly and hook permits the retraction of the poison wires and poison-wire retraction plates by means of the addition of the bails to the poison-wire retractor plate. The combination of holder assembly and head assembly permits the retraction of the calibration wires and retractor plate. A lanyard, which attaches to the holder assembly during operation, restricts movement of the retraction device to prevent damage to the reactor assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1363 FIRST PROVIDED FOR NRX-A2
 DRAWING NUMBER NT650338 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER NT650338 _____
 CONTRACTOR WANL COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 2" LENGTH 69" WIDTH N/A HEIGHT N/A
 WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
 ELECTRICAL * 1.5 VOLTS N/A CPS N/A PHASE N/A KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN. QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA *C size battery

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE Monorail Hoist LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Monorail Hoist
 PART OR ITEM Poison Wire Retractor Plate & DRAWING NO. 977D812
 REMARKS Poison Wires, P/N 944C797, Calibration Wires and Retractor Plate

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 1364

DATE

January 1968

REVISION

B

EQUIPMENT TITLE

GAGE, REFLECTOR ASSEMBLY, BOW

DESCRIPTION: The Bow Reflector Assembly Gage is used to measure the bowing which occurs in each sector during operation. It measures the changes of relationship of each sector to the dome end ring and nozzle end ring. This is accomplished by comparing data taken before and after reactor operation.

The vertical member of the gage is equipped with five dial indicators used to measure bowing along the center line of the sector. At each end of the vertical member there are dial indicators to contact the dome end and nozzle end rings for measurement of sector deformation. The upper end of the gage is fitted with rollers to support the gage from the top surface of the dome end ring. Pins are provided to prevent the gage from falling from the reflector assembly. At each end of each of the crossbars (which are fitted to the vertical member at the elevation of the rings) two dial indicators are mounted, one to contact the ring and the other to contact the sector. These determine the relationship of the sector to the rings. The gage is provided with a grip on the vertical member for handling by a Class A manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1364 FIRST PROVISIONED FOR NRX-A2
DRAWING NUMBER NT650339 GOVT. INV. CONTROL NUMBER NT650339-001
PART NUMBER NT650339
CONTRACTOR WANL COST \$1000.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 68" WIDTH 12" HEIGHT 4-5/8"*
WEIGHT 35 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA *Includes Master Gage Blocks

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Class A LOAD CAPACITY _____ LB MAX
CRANE N/A LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Class A
PART OR ITEM Outer Reflector DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

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B

EQUIPMENT TITLE

SYSTEM, NOZZLE HOOD EMPLACEMENT

DESCRIPTION: The Nozzle Hood Emplacement System is a remotely controlled jib boom with a vertical emplacement slide arm at the end of the boom. The vertical slide arm is provided with a rigid hook to hold a nozzle hood during emplacement and removal operations. All motions are controlled remotely by limit switches. Reversible electric motors are used to power all motions. The boom can be locked in any position.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER	1369
DRAWING NUMBER	NT650341
PART NUMBER	NT650341
CONTRACTOR	WANL

FIRST PROVISIONED FOR NRX-A2
GOVT. INV. CONTROL NUMBER NT650341-001
COST \$7917.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 28.3' WIDTH 6' HEIGHT 19.5'
WEIGHT _____ LB LOAD CAPACITY 450 LB PROOF LOAD 1350 LB
FLOOR AREA REQUIRED 170 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION N/A
ELECTRICAL 220 VOLTS 60 CPS Three PHASE .67 KVA
LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED N/A IN./MIN (RPM) CUTTING SPEED N/A
MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL N/A
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ N/A _____ LOAD CAPACITY _____ LB MAX
CRANE _____ N/A _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT N/A
PART OR ITEM Nozzle Hood DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1702

DATE January 1968

REVISION B

EQUIPMENT TITLE

FLAT CAR, REACTOR SHIPPING

DESCRIPTION: The Reactor Shipping Flat Car consists of a standard 50-foot railroad flat car, modified with tie-down brackets, bolts, and shoring to secure the reactor shipping container during transit. Two 5 kw and one 10 kw diesel generators, a diesel fuel storage tank, flood lights, safety rails, safety equipment, and power and instrumentation cabling are mounted on the deck and frame of the flat car. Heavy steel cables are used to secure the reactor shipping container to the tie-down brackets. The car remains coupled to the instrumentation car during reactor shipping.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1702 FIRST PROVISIONED FOR NRX-A1
 DRAWING NUMBER 711J066 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____
 CONTRACTOR WANL COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	1
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 50' WIDTH 8' HEIGHT N/A
 WEIGHT 57,600 LB LOAD CAPACITY 140,000 LB PROOF LOAD *N/A LB
 FLOOR AREA REQUIRED 400 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA * Load Limit 162,400 Pounds

OPERATING DATA

GASES Nitrogen PRESSURE * LB/SQ IN. VOLUME _____ CFM LUBRICATION Grease and Oils
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA * 2000-pound bottles regulated to the requirements of the shipping container.

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Standard Railroad Locomotive

INTERFACES

EQUIPMENT Reactor Instrumentation Shipping Car, P/L 1703
 PART OR ITEM Reactor Shipping Container, DRAWING NO. _____
 REMARKS P/L 1706

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 1703

DATE
January 1968

REVISION
B

EQUIPMENT TITLE

INSTRUMENTATION CAR, REACTOR SHIPPING

DESCRIPTION: The Reactor Shipping Instrumentation Car consists of a standard 50-foot railroad baggage car modified to provide, within a controlled environment, working space, power, lighting, and equipment mounts for monitoring instrumentation required during NRX reactor shipments. An insulated, air-conditioned room is constructed within the baggage car. The room contains fluorescent lighting, power receptacles, power panels, an exhaust fan system, instrumentation rack floor anchors, and an instrumentation cable raceway. Outside of the insulated room, storage space, cabinets, and work tables are provided.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 1703 FIRST PROVISIONED FOR NRX-A1
 DRAWING NUMBER 709J825 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____
 CONTRACTOR WANL COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	1
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH 50' WIDTH 8' HEIGHT _____
 WEIGHT _____ LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
 FLOOR AREA REQUIRED 400 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION Greases and Oils
 ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA *Power received from the reactor shipping flat car (P/L 1702)

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Reactor Shipping Flat Car, P/L 1702
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 2001

DATE January 1968

REVISION A

EQUIPMENT TITLE

VEHICLE, ENGINE INSTALLATION (EIV)

DESCRIPTION: The Engine Installation Vehicle (EIV) is a special-purpose railway car for use at NRDS to install a NERVA engine in the test stand, remove it, and convey it to or from the E-MAD building. It is propelled by the prime mover and/or the manned control car (MCC). During remote engine handling operations, the EIV is controlled from the MCC through an umbilical system: for "cold" engine operation, a portable controller is provided for use by "on-the-stand" personnel. The EIV is a railroad flatcar with a superstructure and tower to support and guide an engine-handling carriage system. An engine dust cover and actuator is located at the top of the tower to protect the engine interface during transport. A nozzle-closure actuator is located at the bottom of the tower. A manipulator and boom system, which also mounts television cameras and lights, is mounted on each side of the tower for use during remote installation, checkout, and removal of the engine at the test stand. Outboard jacks level the engine during installation and removal. A counterbalance and electrical interface cabinet are located near the coupler end of the car.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2001 FIRST PROVIDED FOR XE
DRAWING NUMBER 89-71-1000 GOVT. INV. CONTROL NUMBER SNP-1-L-1352
PART NUMBER Same
CONTRACTOR AMF/AGC COST \$1,060,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 170,000 est. LENGTH 50' WIDTH 19' 1" max. HEIGHT 29' 7"
WEIGHT 170,000 est. LB LOAD CAPACITY 40,000 LB PROOF LOAD 75,000 LB
FLOOR AREA REQUIRED 1,000 SQ FT OPERATING FLOOR LOAD LB/SQ IN
ADDITIONAL DATA Outboard-jacks support gross weight on four jack pads provided in the
E-MAD and at ETS-1. 40,000 lb counterweight is provided.

OPERATING DATA

GASES Air PRESSURE 85 LB/SQ IN. VOLUME CFM LUBRICATION
ELECTRICAL 440 VOLTS 60 CPS 3 PHASE KVA
LIQUIDS PRESSURE LB/SQ IN QTY REQ'D
SPEED 6 MPH Max. IN./MIN (RPM) CUTTING SPEED
MEASURING ACCURACY HORIZONTAL VERTICAL
CALIBRATION INTERVAL
ADDITIONAL DATA Operates on standard AAR gauge track, minimum curve 250' radius.
Inching drive 12 inches/min. Standard AAR trucks and coupler. See RN-S-0362.

OPERATING EQUIPMENT

MANIPULATOR On Boom Assembly (2) LOAD CAPACITY 90 with TV camera & lights LB MAX
CRANE LOAD CAPACITY LB MAX
ADDITIONAL DATA Vertical carriage travel 10', longitudinal carriage travel 10"
lateral carriage travel + 5", asimuth carriage travel + 5°.

INTERFACES

EQUIPMENT Manned Control Car, P/L 2002
PART OR ITEM XE Engine Assembly DRAWING NO.
REMARKS May also be propelled by the prime mover. The EIV carriage interfaces with
the XE engine. The EIV must clear all ETS-1, E-MAD, and NRDS railroad trackage structures.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 2002

DATE
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REVISION
A

EQUIPMENT TITLE

CAR, CONTROL, MANNED (MCC)

DESCRIPTION: The Manned Control Car (MCC) is a special railway locomotive with a shielded cab for protection of two operators who control the prime mover locomotive and EIV in a radioactive environment. The cab is provided with leaded window for direct observation during car operation: an electrically operated door, with a leaded window, is provided for access to the cab. The MCC contains an electrical power-supply (consisting of an electrical generator and internal-combustion engine), a cab air-conditioning unit, an emergency mechanical-drive system for moving the MCC and the prime mover, a closed-circuit television monitor, all controls for the MCC, EIV, and prime mover, and a two-way radio. An umbilical assembly connects the MCC to the EIV while the car is uncoupled and separated from the EIV to a maximum of 15 feet during XE-engine handling.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2002 FIRST PROVISIONED FOR XE
DRAWING NUMBER 89-73-1000 GOVT. INV. CONTROL NUMBER SNP-1-L-1351
PART NUMBER Same
CONTRACTOR AMF/AGC COST \$1,080,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 31' 6" WIDTH 12' HEIGHT 18'
WEIGHT 215,000 LB LOAD CAPACITY N/A LB PROOF LOAD N/A LB
FLOOR AREA REQUIRED 400 SQ FT OPERATING FLOOR LOAD N/A LB/SQ IN
ADDITIONAL DATA Cab is 8' 5" long, 8' 8" wide, and 8' high and weights 100,000 lbs.

OPERATING DATA

GASES Air PRESSURE 85 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 440 VOLTS 60 CPS 3 PHASE 75 KVA
LIQUIDS Diesel Fuel PRESSURE _____ LB/SQ IN QTY REQ'D 300 gal.
SPEED 6 MPH Max. IN./MIN (RPM) _____ CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Operates on standard AAR gauge track. Torque-converter transmission from 250 HP traction diesel motor. Electric power diesel provided for MCC power. 32V batteries for diesel starting and safety circuits.
See RN-S-0362

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT EIV, P/L 2001 and Prime Mover
PART OR ITEM _____ DRAWING NO. _____
REMARKS May be connected to the spacer car, P/L 5029

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	2003
DATE	January 1968
REVISION	A

EQUIPMENT TITLE _____

SYSTEM, OVERHEAD POSITIONING (OPS)

DESCRIPTION: The bridge, trolley, mast, and auxiliary manipulators are the principal components of the Overhead Positioning System (OPS). This system is capable of remotely handling the NERVA engine and its subassemblies in conjunction with the FMHS and WMHS during assembly and disassembly operations in the E-MAD Building. The traveling bridge spans the width of the main hot bay. The trolley travels the length of the bridge and supports the 3-section telescoping mast, which has an azimuth drive and a floating head in the lower section for adapting to special positioning-heads. The auxiliary manipulator is also mounted within the lower mast. Bridge and trolley movement permits the vertical axis of the mast to be positioned over any set of horizontal coordinates within its range of travel. A control system and consoles are provided for all remote operations of the bridge, trolley, mast, manipulator, and positioning heads.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2003 FIRST PROVISIONED FOR XE
DRAWING NUMBER 89-80-1000 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same _____
CONTRACTOR AMF COST \$2,100,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 68' WIDTH 24' HEIGHT 57' Extended
285,000 LB LOAD CAPACITY 40,000 LB PROOF LOAD 60,000 25' Retracted
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Bridge travels the length of hot bay (E-MAD) to within 12' of either end;
trolley travels on the bridge to within 5' of the east-west wall; the mast will travel
39' 6"; the manipulator will handle 600 lb in any position, or 5,000 lb on the elbow hook.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA The unit is remotely operated from the master control position in the
E-MAD or by portable controller. See AMF Report No. RN-S-0187.

* 440 Vac, 3 Ph., 60 Cy
220 Vac, 3 Ph., 60 Cy
120 Vac, Single Phase, 60 Cy

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Positioning head, upper thrust-structure
PART OR ITEM 4011 DRAWING NO. 1114421
REMARKS Also uses a reactor-positioning head provided as part of the OPS. The
manipulator is utilized universally as required.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST ITEM NO.	2012
DATE	January 1968
REVISION	A

EQUIPMENT TITLE _____

CARRIAGE, MOBILE, FLOOR MOUNTED HANDLING SYSTEM

DESCRIPTION: The Mobile Carriage is an electrically driven, four-wheel, standard-gage flat car for transporting engine subassemblies, the loaded nozzle-stand, or the reactor core and stand. It is operated remotely, and runs on the main track in the hot bay of the E-MAD building.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2012 FIRST PROVISIONED FOR XE
DRAWING NUMBER 89-81-1100 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AMF COST \$160,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 17' WIDTH 9' HEIGHT 17"
WEIGHT 5,000 LB LOAD CAPACITY 60,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 160 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA 4 wheels (two driven)

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 24 VOLTS DC CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED 12 ft/min IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Remotely controlled: forward, stop, reverse. Power from buss system
next to tracks in E-MAD building hot bay and tunnel using shoe pickup.
See AMF Report No. RN-S-0188.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA When loaded, can be lifted by adequate sling and crane.

INTERFACES

EQUIPMENT Various stands (e.g., engine, reactor, and nozzle)
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 2013

DATE
January 1968

REVISION
A

EQUIPMENT TITLE

DOLLY, REMOTE HANDLING, FLOOR MOUNTED HANDLING SYSTEM

DESCRIPTION: The Remote Handling Dolly is an electrically driven 4-wheel, standard-gage, flat car for transporting a shield-fuel cask, engine components, or core components. It runs on tracks in the E-MAD Building and is operated remotely from a control panel in the E-MAD control room.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2013 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 89-81-1200 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AMF COST \$120,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 9' HEIGHT 17"
 WEIGHT 4,000 LB LOAD CAPACITY 50,000 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA 4 Wheels (two driven)

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 24 VOLTS DC CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED 12 ft/min IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Remotely controlled: forward, stop, reverse. Power is from the buss system next to the tracks in the E-MAD Building using a shoe pickup. See AMF Report No. RN-S-0188.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA When loaded, can be lifted by adequate sling and crane

INTERFACES

EQUIPMENT Shield-fuel casks, core components
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 2014

DATE January 1968

REVISION A

EQUIPMENT TITLE

TURNTABLE ASSEMBLY, PORTABLE, 9 FOOT, 6 INCH DIAMETER,

FLOOR MOUNTED HANDLING SYSTEM

DESCRIPTION: The Portable Turntable Assembly is used in the remote assembly and disassembly of major engine subassemblies. It is capable of rotating major component of the engine mounted in their support stands. It will support and rotate a concentrically placed load of 30,000 pounds and through an electrical drive-system, is capable of continuous rotation in either direction at a constant speed of one-eighth rpm. The turntable is controlled remotely and is provided with pneumatic and electrical outlets. Lifting devices are provided to permit its transportation by the overhead crane. The assembly can be moved into the core and engine disassembly cells by the FMHS carriage or dolly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2014 FIRST PROVIDED FOR XE
DRAWING NUMBER 89-81-1800 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AMF COST 50,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

DIA 9' 6" LENGTH _____ WIDTH _____ HEIGHT 20"
WEIGHT 7,800 LB LOAD CAPACITY 30,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 80 SQ FT OPERATING FLOOR LOAD 50 LB/SQ IN
ADDITIONAL DATA 4 manual, leveling-jacks provided: operated remotely by WMHS.

OPERATING DATA

GASES Air PRESSURE 125 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED 1/8 (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Continuous rotation provided. A peripheral scale and pointer indicate position. Air pressure provided for engine assembly as required See AMF Report No. 0188.
*440VAC, 3 Ph., 60 cy (motor)
110VAC, 1 Ph., 60 cy (receptacles)

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA May be lifted by sling and crane.

INTERFACES

EQUIPMENT Stands for engine, UTSM, nozzle and reactor components
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 2017

DATE January 1968

REVISION A

EQUIPMENT TITLE

TURNTABLE ASSEMBLY, PORTABLE, 15 FOOT DIAMETER,

FLOOR MOUNTED HANDLING SYSTEM

DESCRIPTION: The Portable Turntable Assembly is used in the remote assembly and disassembly of major engine subassemblies. It is capable of rotating major subsystems or components of the engine mounted in their support stands. It will support and rotate a concentrically placed load of 30,000 pounds through an electrical drive-system, is capable of continuous rotation in either direction at a constant speed of one-eighth rpm. The turntable is controlled remotely and is provided with pneumatic and electrical outlets. Lifting devices permit its transportation by an overhead crane.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2017 FIRST PROVIDED FOR XE
DRAWING NUMBER 80-81-1850 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AMF COST \$70,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	3
TOTAL	3

DIMENSIONS AND CAPACITY

DIA 15' LENGTH _____ WIDTH _____ HEIGHT 20"
WEIGHT 15,500 LB LOAD CAPACITY 30,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 175 SQ FT OPERATING FLOOR LOAD 50 LB/SQ IN
ADDITIONAL DATA Four manual, leveling-jacks provided: operated remotely by the WMHS.

OPERATING DATA

GASES Air PRESSURE 125 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED 1/8 (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Continuous rotation provided. A peripheral scale and pointer indicate position. Air pressure and 110 VAC provided for engine assembly as required. See AMF Report No. 0188.
*440 VAC, 3 Ph. 60 cy (motor)
110 VAC, 1 Ph. 60 cy (receptacle)

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA May be lifted by sling and crane.

INTERFACES

EQUIPMENT Various stands, as required.
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 2031

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, REACTOR POSITIONING HEAD,

FLOOR MOUNTED HANDLING SYSTEM

DESCRIPTION: The Reactor Positioning Head Stand is a three-legged structure supporting a 5-foot, 4-inch diameter positioning head nesting ring. It serves as a receptacle for the reactor positioning head when the head is not in use.

NOTE: This item is no longer required for the purpose intended (see P/L 2006).

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 2031
 DRAWING NUMBER 89-80-1950
 PART NUMBER Same
 CONTRACTOR AMF

FIRST PROVIDED FOR XE
 GOVT. INV. CONTROL NUMBER _____
 COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 500 LENGTH 7' WIDTH 7' HEIGHT 7'
 WEIGHT 3,000 LB LOAD CAPACITY 50 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD 50 LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Leveling screw provided in each floor pad.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Reactor Positioning Head, P/L 2006
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS May be lifted through 3 eyelets by sling and crane.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4000

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, UTS/TSA ASSEMBLY

DESCRIPTION: The UTS/TSA Assembly Stand is a circular, open steel-structure with a UTS support and personnel platform on the top. A removable guard rail and ladder for access to the UTS are provided for personnel use. A separate TPA stand, which sets on the structure platform, supports the TPA during cold assembly. The stand permits the UTS assembly to be lowered over the TPA module for installation and alignment of the TPA.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4000 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117448-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1919
PART NUMBER Same
CONTRACTOR AGC COST \$15,600

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 9' LENGTH _____ WIDTH _____ HEIGHT 8-1/2'
WEIGHT _____ LB LOAD CAPACITY 2500 LB PROOF LOAD 5000 LB
FLOOR AREA REQUIRED 60 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
ADDITIONAL DATA Dimensions with guard rails. Unit also provides a ladder and TPA support stand as associated items.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM UTS and TPA DRAWING NO. 1115459 and 1115700
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4008

DATE January 1968

REVISION A

EQUIPMENT TITLE

STAND, EXTERNAL SHIELD

DESCRIPTION: The External Shield Stand is a three-legged pedestal with shield retainer clamps on each pedestal. The clamps may be positioned manually or with a manipulator. The stand supports the external shield during cold assembly and hot disassembly operations. It supports the shield completely loaded with steel balls and can provide required clearance below the shield for the control-drum shafts.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4008 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117127-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1916
PART NUMBER Same
CONTRACTOR AGC COST \$3,700

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 10' HEIGHT 5'
WEIGHT _____ LB LOAD CAPACITY 25,000 LB PROOF LOAD 50,000 LB
FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM External Shield DRAWING NO. 1013372
REMARKS _____

PROV. LIST
ITEM NO. 4009

DATE January 1968

REVISION

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE

FIXTURE, LIFTING, EXTERNAL SHIELD

DESCRIPTION: The External Shield Lifting Fixture is a three-legged strongback with rigid legs which permit the lower surface of the shield to be engaged by manually or remotely operated locators. The fixture is used to lift and position the external shield both manually and remotely.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4009 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117216-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1915
 PART NUMBER Same
 CONTRACTOR AGC COST \$4,300

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 920 LENGTH 11' WIDTH 11' HEIGHT 9'
 WEIGHT 920 LB LOAD CAPACITY 33,000 LB PROOF LOAD 68,000 LB
 FLOOR AREA REQUIRED 120 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE E-MAD LOAD CAPACITY 80,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD 40 Ton Crane and WMHS Manipulators
 PART OR ITEM Engine External Shield DRAWING NO. 1013372
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4011
DATE January 1968
REVISION

EQUIPMENT TITLE

HEAD ASSEMBLY, POSITIONING, THRUST STRUCTURES

DESCRIPTION: The Thrust Structures Positioning Head Assembly is a circular box-beam ring with three equally spaced holes for engaging and securing the assembly to the OPS floating head. Twelve linkage-driven grippers are equally spaced about the periphery of the lower surface. Grippers are actuated by a manipulator handle and drive system. One handle is located internally for actuation by the OPS manipulators. The other handle is located on the ring periphery for either manual or remote operation by the WMHS manipulator. A sling is provided for cold handling operations. The assembly is used to lift and position the UTS, LTS, and the complete XE engine into and out of the EIV, the engine assembly stand, and the engine hold stand.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4011 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1114421-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1356
PART NUMBER Same
CONTRACTOR AGC COST \$23,700

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 10' LENGTH _____ WIDTH _____ HEIGHT 2-1/2' *
WEIGHT 3,000 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
FLOOR AREA REQUIRED 800 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA A separate 1-1/8" diameter cable sling and three legs, each 8' 4" long, are provided for cold handling.

*Without sling

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN. QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR OPS Auxiliary LOAD CAPACITY 600 LB MAX
CRANE E-MAD LOAD CAPACITY 80,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT OPS or Crane (Floating Head)
PART OR ITEM UTS/LTS DRAWING NO. 1114122/1113854
REMARKS Is set into and stored in stand, P/L 4012

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4012
DATE January 1968
REVISION

EQUIPMENT TITLE

STAND, POSITIONING HEAD, THRUST STRUCTURE

DESCRIPTION: The Thrust Structure Positioning Head Stand is a triangular, three-legged steel structure with three support pads and guides at the top to support the positioning head when not in use. Its height permits the OPS to engage the positioning head when required for remote operations in the E-MAD Building hot bay. A lifting bail is provided at the center of a structural spider for lifting the stand with or without the positioning head.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4012 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1114447-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1357
PART NUMBER Same
CONTRACTOR AGC COST \$2,100

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 9' WIDTH 9' HEIGHT 8'
WEIGHT 1,000 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 80 SQ FT OPERATING FLOOR LOAD 50 LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE E-MAD LOAD CAPACITY 30,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane - 15 Ton
PART OR ITEM Positioning Head, P/L 4011 DRAWING NO. 1114421
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4021

DATE January 1968

REVISION

EQUIPMENT TITLE

STAND, ENGINE ASSEMBLY

DESCRIPTION: The Engine Assembly Stand is a steel frame with an electrically driven, single-axis C-shaped rotating head which engages the XE engine external shield. Its height permits rotation of the engine "end-for-end" through 360°. It is used to hold and position the engine during cold assembly operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4021 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117307-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1918
 PART NUMBER Same
 CONTRACTOR AGC COST \$80,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA LENGTH 29' 10" WIDTH 17' HEIGHT 20' 3"
 WEIGHT 25,000 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
 FLOOR AREA REQUIRED 350 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
 ADDITIONAL DATA The head-drive mechanism lock is in position when drive power is removed.

OPERATING DATA

GASES PRESSURE LB/SQ IN. VOLUME CFM LUBRICATION
 ELECTRICAL 440 AC VOLTS 60 CPS 3 PHASE KVA
 LIQUIDS PRESSURE LB/SQ IN QTY REQ'D
 SPEED * IN./MIN (RPM) CUTTING SPEED
 MEASURING ACCURACY HORIZONTAL VERTICAL
 CALIBRATION INTERVAL
 ADDITIONAL DATA *Rotates engine end-for-end through 360° in 7.5 minutes. See Operation and Maintenance Instructions (No report No. assigned - see NRO GSE Engineering)

OPERATING EQUIPMENT

MANIPULATOR LOAD CAPACITY LB MAX
 CRANE LOAD CAPACITY LB MAX
 ADDITIONAL DATA

INTERFACES

EQUIPMENT Facility 440 VAC, 3 Phase Power Receptacle
 PART OR ITEM XE Engine DRAWING NO.
 REMARKS

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4027

DATE
January 1968

REVISION

EQUIPMENT TITLE

STAND, ASSEMBLY, STORAGE, UPPER THRUST STRUCTURE MODULE

DESCRIPTION: The UTSM Storage Stand Assembly is a four-legged structure with an eight-foot diameter top-ring which is the base and guide for the UTSM. Its height permits lines projecting from the UTSM to clear the floor. The assembly also provides access to these lines. The stand is used for UTSM storage prior to remote reassembly and after removal of the UTSM from the engine assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4027 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1116300-9 GOVT. INV. CONTROL NUMBER SNP-1-L-1360/1804
 PART NUMBER Same
 CONTRACTOR AGC COST \$2,200

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

DIA 12' LENGTH 5,000 WIDTH 7' 4" HEIGHT 7' 4"
 WEIGHT 1,000 LB LOAD CAPACITY 5,000 LB PROOF LOAD 10,000 LB
 FLOOR AREA REQUIRED 120 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
 ADDITIONAL DATA Four lifting eyes provided.

OPERATING DATA

GASES PRESSURE LB/SQ IN. VOLUME CFM LUBRICATION
 ELECTRICAL VOLTS CPS PHASE KVA
 LIQUIDS PRESSURE LB/SQ IN QTY REQ'D
 SPEED IN./MIN (RPM) CUTTING SPEED
 MEASURING ACCURACY HORIZONTAL VERTICAL
 CALIBRATION INTERVAL
 ADDITIONAL DATA

OPERATING EQUIPMENT

MANIPULATOR LOAD CAPACITY LB MAX
 CRANE E-MAD LOAD CAPACITY 15 Ton LB MAX
 ADDITIONAL DATA

INTERFACES

EQUIPMENT Crane/OPS and Sling
 PART OR ITEM Upper Thrust Structure DRAWING NO. 1115459-29
 REMARKS

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4043

DATE January 1968

REVISION

EQUIPMENT TITLE

ADAPTER KIT, CHECKOUT, REMOTE

DESCRIPTION: The Remote Checkout Adapter Kit, is used in the E-MAD Building hot bay for remote leak and electrical checkout of the XE engine after remote replacement of the UTSM. The remote connecting interface is at Engine Station 42.89 (top). Manipulators are used to handle the cable and pneumatic line adapters. Kit operation utilizes other checkout equipment located in the operator area.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4043 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117850 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same COST \$30,000
CONTRACTOR AGC

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH N/A WIDTH N/A HEIGHT N/A
WEIGHT 600 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The kit consists of several small parts as listed. Remote cables and hoses are 85' long. The pneumatic control box is 14" x 27" x 21" and weighs 90 lb.

OPERATING DATA

GASES Helium PRESSURE 50-100 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 110 VAC VOLTS 60 CPS 1 PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Leak-test gas and control is provided by P/L Item 4400. Engine electrical checkout control is provided by P/L Item 4401. See RN-DR-0120.

OPERATING EQUIPMENT

MANIPULATOR E/MAD/WMHS or OPS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS or OPS Manipulator
PART OR ITEM XE Engine (Sta. 42.89) DRAWING NO. _____
REMARKS Connects to the electrical test set, P/L 4401, and functional valve and leak test set, P/L 4400.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4045

DATE January 1968

REVISION

EQUIPMENT TITLE

SYSTEM, MATERIALS TRANSFER, POST-OPERATIVE CELL

DESCRIPTION: The Post-Operative Cell Materials Transfer System (POCMTS) consists of a hot-cell materials transfer subsystem (HCMTS) and an intercell transfer subsystem (ITS), together with associated busrails, car rails, power supplies, and control panels. The HCMTS includes a powered table in each hot cell which travels between the cell and the adjacent cell service-area, together with electrical controls at each operating position. The ITS includes powered cars which travel between adjacent cells through openings in the intercell walls. Cargo trays can be elevated and aligned with cell tables and controlled from a control panel at each operating position. The system consists of the following: Intercell Transfer Subsystem Cars (3); Control Panel (16); Power Supplies (4); Car Rails (as required); Hot Cells Materials Transfer Subsystem Powered Tables (13); Busrail System (2); Miscellaneous Brackets and Connectors.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4045 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1115585 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$120,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA N/A LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT 70,000 LB LOAD CAPACITY * LB PROOF LOAD 2X LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Equipment permanently installed in E-MAD post-mortem area. Busrails, ITS car track, ITS cars, and HCMTS cars in hot area. Control boxes and power supplies in operator area. ITS car is 64" long, 26" wide, and 9 to 37" high, and weighs 380 lb. The HCMTS table is 6' square, 16" high, and weighs 3500 lb. *ITS Car Weight: 750 lb. HCMTS car weight: 10,000 lb.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL * VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED ITS - 4/16, HCMTS 5 ft. IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA The ITS car table-tray elevates to 34-1/2" above the rails from 7" when bottom at 1-2' minute. See RN-S-0306.

*ITS Car - 110 VAC, single phase, 60 cy.

HCMTS Car - 208 VAC, 3 phase, 60 cy/110 VAC, single phase, 60 cy

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE E-MAD Post Mortem Area LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Post Mortem Area
 PART OR ITEM Reactor and Engine Components DRAWING NO. _____
 REMARKS The ITS car is handled with a crane using sling, P/L 4046. The HCMTS tables are handled with a crane using sling, P/L 4048.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4046

DATE January 1968

REVISION

EQUIPMENT TITLE

SLING, INTERCELL TRANSFER CAR

DESCRIPTION: The Intercell Transfer Car Sling is a light, box-beam strongback with a lifting bail and four solid-bar legs (two legs at each end) free to swing parallel to the beam axis. Each leg is formed with a hook at the end so it can be attached and removed remotely. The sling lifts and positions the car during maintenance or if a malfunction occurs. It can pick up an empty or loaded car with the tray retracted or extended.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4046 FIRST PROVIDED FOR XE
DRAWING NUMBER 1115598 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 5-1/2' WIDTH 1' HEIGHT 5'
WEIGHT 150 LB LOAD CAPACITY 1,000 LB PROOF LOAD 2,000 LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE E-MAD LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane
PART OR ITEM ITS Car DRAWING NO. 1115500
REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4048

DATE January 1968

REVISION

EQUIPMENT TITLE

SLING, HANDLING, MOBILE TABLE

DESCRIPTION: The Mobile Table Handling Sling is a beam strongback with a five-position bail and four chain legs (two with hooks) on each end. It is used to lift and position mobile table bases with or without load. It is also capable of remote attachment and removal.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4048 FIRST PROVIDED FOR XE
DRAWING NUMBER 1115589 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$3,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 300 LENGTH 6' WIDTH 6' HEIGHT 8'
WEIGHT 300 LB LOAD CAPACITY 15,000 LB PROOF LOAD 30,000 LB
FLOOR AREA REQUIRED 151 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE E-MAD LOAD CAPACITY 30,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane
PART OR ITEM HCMTS Table DRAWING NO. 1115501
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4049

DATE January 1968

REVISION

EQUIPMENT TITLE _____

COVER, FLUID LINE, REMOTE

DESCRIPTION: The Remote Fluid Line Cover is a set of four, welded aluminum cup-assemblies, each with a five-inch long, one-inch Hex bar handle. They are used to protect open lower-line sections from contamination during remote replacement of the UTS/TPA assembly on XE engines. They can be installed and removed remotely with a manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4049 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1115155-9 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$1,300

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

(2) 8"
 (1) 6-1/2"
 DIA (1) 5-1/2" LENGTH 7" WIDTH _____ HEIGHT _____
 WEIGHT 15 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS
 PART OR ITEM Engine Fluid Lines DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4059

DATE January 1968

REVISION

EQUIPMENT TITLE _____

PLATFORM, MAINTENANCE, ETS-1

DESCRIPTION: The ETS-1 Maintenance Platform is a square, three-level, open-grating, aluminum personnel stand which provides access to all levels of the XE engine and the TSA in ETS-1. The stand is mounted on the ETS-1 mobile duct cover shield. A removable section permits the stand to be positioned around the engine when the shield is rolled into place. Access stairways, protective railing, and kickplates are provided.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4059 FIRST PROVIDED FOR SE
 DRAWING NUMBER 1118696-9 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$25,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 26' WIDTH 19' HEIGHT 23'
 WEIGHT _____ LB LOAD CAPACITY 5,000 LB PROOF LOAD 10,000 LB
 FLOOR AREA REQUIRED 500 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA The stand can be assembled or disassembled by two men. It is permanently mounted on the duct shield cover.

INTERFACES

EQUIPMENT ETS-1 Duct Cover and Shield
 PART OR ITEM XE Engine DRAWING NO. _____
 REMARKS _____

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SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4087

DATE
January 1968

REVISION

EQUIPMENT TITLE

LIFTING DEVICE, TURBOPUMP ASSEMBLY

DESCRIPTION: The Turbopump Assembly Lifting Device is a stainless-steel, bent-bar sling with a rigid interface-attachment point at each end. The attachments bolt to the TPA. The device is used to handle the TPA, and to lift and position the TPA during its installation into the UTS/TPA assembly stand.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4087 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117189-19 GOVT. INV. CONTROL NUMBER SNP-1-L-1917
 PART NUMBER Same
 CONTRACTOR AGC COST \$600

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 19" WIDTH 4" HEIGHT 15"
 WEIGHT _____ 20 LB LOAD CAPACITY 500 LB PROOF LOAD 1,000 LB
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Bolts to the TPA

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE E-MAD/with Hydraset LOAD CAPACITY 10,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Hydraset
 PART OR ITEM Turbopump Assembly DRAWING NO. 1115700
 REMARKS _____

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PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4088

DATE
January 1968
REVISION

EQUIPMENT TITLE

CLOSURE, ENGINE NOZZLE

DESCRIPTION: The Engine Nozzle Closure consists of an aluminum plate with a dovetail O-ring groove, a rubber O-ring and, mounted on the plate, a three-segment V-band coupling which is actuated by three air motors supplied as part of the coupling. Also mounted on the plate is a manifold (to distribute supply air to the three motors) which contains two separate chambers with wire-mesh filters, two male halves of a pair of quick-disconnect couplings, and a solenoid-actuated valve for relieving engine pressure. Flexible hoses connect the manifold to the air motors. A coupling assembly (containing the female halves of the quick-disconnect couplings and an electrical connection) is provided to attach air to the manifold and electric power to the solenoid valve. The assembly is used on the XE engine to close the nozzle exit so proof testing, leak testing, and engine inerting can be performed. With a three-legged sling, the assembly is also used to lift and handle the nozzle during cold assembly operations. A vent valve is provided in the closure for inerting the engine at ETS-1 prior to testing.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4088 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1116894 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$20,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 54" (plate) LENGTH 7' 8" WIDTH 6' 5" HEIGHT 7"
 WEIGHT 170 LB LOAD CAPACITY 100 psi LB PROOF LOAD 125 psi LB
 FLOOR AREA REQUIRED 50 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Adapts P/L 4408 to provide poison-wire retention during assembly.

OPERATING DATA

GASES Air PRESSURE 70-90 LB/SQ IN. VOLUME 63 CFM LUBRICATION _____
 ELECTRICAL 115 VAC VOLTS 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Air required to actuate clamp air motors (3), solenoid-actuated inerting vent valve. May be installed to the XE engine nozzle in either the nozzle-up or nozzle-down. See RN-TM-0432.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS or EIV LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Clamp and solenoid operate remotely through interface coupling from MCC. Operates from facility air and power for cold operations in the E-MAD Building.

INTERFACES

EQUIPMENT EIV Closure Boom and Hose and Cable Interface Coupling.
 PART OR ITEM Engine Nozzle DRAWING NO. 706988
 REMARKS Use 278580 sling to lift nozzle closure, with or without the nozzle, during cold operations.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4090

DATE January 1968

REVISION

EQUIPMENT TITLE

SPACER, INSTALLATION, TEST STAND ADAPTER

DESCRIPTION: The Test Stand Adapter Installation Spacer is a welded, steel, three-legged stand on a ring-beam base. Each of the trussed legs has a pad at its top. The bottom ring is the same diameter as the engine external shield and nests in the EIV-carriage engine mounting-blocks. It is secured to the carriage with four hook/turnbuckles. The top three pads bolt to the TSA at three of the 12 TSA/UTS mounting bolt holes. The spacer holds the TSA during EIV transportation to ETS-1 and facilitates its installation into the test stand.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4090 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1116912 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$800

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8' 6" LENGTH 8' 4" WIDTH _____ HEIGHT _____
WEIGHT 1,000 est. LB LOAD CAPACITY 4,500 LB PROOF LOAD 9,000 LB
FLOOR AREA REQUIRED 55 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
ADDITIONAL DATA Hinging hooks with turnbuckles are provided in four places to secure the spacer to the EIV carriage.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT EIV Carriage
PART OR ITEM Test Stand Adapter DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4094

DATE
January 1968

REVISION

EQUIPMENT TITLE

STAND, PVARA

DESCRIPTION: The PVARA Stand is a floor-level X-stand constructed of steel box-beams with a PVARA mounting ring and guides in the center. Bolted clamp-blocks secure the PVARA in position: lifting eyes are provided for handling. The stand supports the pressure vessel and reactor assembly (PVARA) in the nozzle-down position. It also supports the PVARA during installation and/or removal of the loaded shield and the LTS.

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FIRST PROVIDED FOR XE
GOVT. INV. CONTROL NUMBER SNP-1-L-1358/1359

COST \$5,100

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

ADDITIONAL DATA _____

OPERATING DATA

ADDITIONAL DATA Clamp PVARA in position with four bolted clamp-blocks.

OPERATING EQUIPMENT

ADDITIONAL DATA _____

INTERFACES

REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4095

DATE January 1968

REVISION

EQUIPMENT TITLE _____

COVER, AUXILIARY DUCT, ETS-1

DESCRIPTION: The ETS-1 Auxiliary Duct Cover is an aluminum-faced, aluminum-honeycomb disk with two folding handles. It is used to cover the ETS-1 duct opening during periods when the duct cover shield is not in place. Its thin section provides clearance for the EIV to install the engine into the stand, and permits removal of nozzle closures.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4095 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117881 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 85" LENGTH _____ WIDTH _____ HEIGHT 1-1/2"
 WEIGHT 75 LB LOAD CAPACITY 200 LB PROOF LOAD 600 LB
 FLOOR AREA REQUIRED 50 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Not designed to support personnel. May be removed remotely with EIV.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR EIV Manipulator LOAD CAPACITY 90 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA May be handled by one or two persons.

INTERFACES

EQUIPMENT EIV Manipulator
 PART OR ITEM ETS-1 Exhaust Duct DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST

ITEM NO. 4099

DATE January 1968

REVISION

EQUIPMENT TITLE _____

STAND, ENGINE HOLDING

DESCRIPTION: The Engine Holding Stand is a four-legged, trussed steel structure sitting on two integral-base skids. The three-sided top structure mounts three engine support pads which engage the lower periphery of the engine external shield. The stand's height and openings at the top and one side provide access to the nozzle and lines and permit installation of the complete engine assembly without excessively high engine-handling crane heights. The stand stores the XE engine or subassemblies in the E-MAD Building in the nozzle-down position. A sling is provided for handling the empty, assembled stand.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4099 FIRST PROVISIONED FOR XE *

DRAWING NUMBER 1116222 GOVT. INV. CONTROL NUMBER SNP-1-L-13551

PART NUMBER Same

CONTRACTOR AGC COST \$7,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

*
*

* Three units delivered. One unit converted to P/L 4122 in 1967.

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 10' HEIGHT 15' 5"

WEIGHT 5,800 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB

FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN

ADDITIONAL DATA Special retainer clamps are provided for use with the RADA engine only;
may be removed when not required.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____

ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA

LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____

SPEED _____ IN./MIN (RPM) CUTTING SPEED _____

MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____

CALIBRATION INTERVAL _____

ADDITIONAL DATA -9 configuration is bolted construction and can be disassembled.
-19 configuration is welded construction and cannot be disassembled. See Aerojet
Report TDI-0004.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX

CRANE E-MAD Facility LOAD CAPACITY 80,000/20,000 LB MAX

ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane - Cold Bay

PART OR ITEM XE Engine (Shield) DRAWING NO. _____

REMARKS Use provided sling to lift unloaded stand only.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4101

DATE January 1968

REVISION

EQUIPMENT TITLE

LIFTING DEVICE, COLLAR, LINE SHIELDING

DESCRIPTION: The Line Shielding Collar Lifting Device consists of a flat steel-plate with a lifting bail which attaches to the collars by two bolts. It is used to lift and position the shielding collars for their assembly into the external shield.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4101 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117105 GOVT. INV. CONTROL NUMBER SNP-1-L-1914
 PART NUMBER Same
 CONTRACTOR AGC COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 15 LENGTH 12" WIDTH 4" HEIGHT 13"
 WEIGHT 15 LB LOAD CAPACITY 300 LB PROOF LOAD 700 LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE Sacto. Assembly Area LOAD CAPACITY 2,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Sacto. Assembly Area Crane/Hydraset
 PART OR ITEM Line Shield Collars DRAWING NO. 1114124
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4102

DATE January 1968

REVISION

EQUIPMENT TITLE _____

PLATFORM, INTERNAL, UTS

DESCRIPTION: The UTS Internal Platform consists of two pieces. One is of aluminum grating-and-beam construction covered with aluminum sheet one-foot-wide and sufficiently long to nearly span the interior of the UTS. The second piece is of the same construction and reaches from the first piece to the side of the UTS. It supports a man when he unlocks the control rod actuators in the UTS. This is required when the external shield is in position and just prior to the engine being moved to ETS-1.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4102 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1115073 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 90" WIDTH 13" HEIGHT 18-1/2"
 WEIGHT 55 LB LOAD CAPACITY 180 LB PROOF LOAD 360 LB
 FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Item consists of two parts: (1) through platform; and (2) cross platform. Weight (1) = 35 lb, (2) = 20 lb.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA The through platform is installed in the UTS. Its installation is followed by that of the cross platform. See RN-TDI-0032.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM UTS and External Shield DRAWING NO. _____
 REMARKS Item rests on the UTS access-opening sill and the shield 18-inch interface.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4103

DATE January 1968

REVISION

EQUIPMENT TITLE

KIT, GUIDE, FLANGE, FLUID LINES

DESCRIPTION: The Fluid Lines Flange Guide Kit consists of four, circular line-flange caps. Each cap has a handle and three equally spaced, normally closed, spring-loaded, external clamping-jaws. The jaws are opened by cam-action when the handle pins are compressed manually or remotely. When used with a manipulator, the handle also provides a means for remote handling and positioning. The kit contains two storage boxes, each containing two guides. The kit guides the lower sections of the XE engine pump discharge line (5-inch), turbine inlet line (4-inch), and two turbine exhaust lines (6-inch) through their openings in the external shield during manual or remote assembly of the UTSM with the engine lower module assembly and their disassembly. The guides also protect line flanges during penetration and retraction as well as act as dust covers when the lines are not connected.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4103 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1117996 GOVT. INV. CONTROL NUMBER SNP-1-L-1802
 PART NUMBER Same
 CONTRACTOR AGC COST \$4,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 6 - 8-1/2" LENGTH _____ WIDTH _____ HEIGHT 5-6"
 WEIGHT 50 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 3 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA The kit contains three sizes of guides: (1) 6" dia (1) 7" dia and (2) 8" dia.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Handling and operation of the clamp jaws is performed manually or with manipulator parallel-jaw hand. See Aerojet Report TDI-0017.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS/OPS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS
 PART OR ITEM Engine Fluid Lines DRAWING NO. _____
 REMARKS Engine lines openings at Station 185. Two turbine exhaust pump discharge and turbine inlet lines.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4104

DATE January 1968

REVISION

EQUIPMENT TITLE

WRENCH ASSEMBLY, IMPACT

DESCRIPTION: The Impact Wrench Assembly consists of two air-motors with extension shafts fitted into a special manipulator-adapter. The adapter includes two motor/extension shaft bearing-housings which are variable in center-to-center spacing by a remote-manipulator drive-screw mechanism. The center distance is variable from six to 12 inches. The assembly remotely couples and uncouples the remote Marman clamps on the engine propellant lines.

NOTE: This item is superseded by P/L 4117, 4118, 4119, and 4121. However, it may be retained for back-up use.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4104 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1116315 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

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DIMENSIONS AND CAPACITY

DIA _____ LENGTH 15" WIDTH 16" HEIGHT 18"
 WEIGHT Est. 75 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA To provide to 700 in.-lb torque to line clamp-screw to engage or
open remote line joints.

OPERATING DATA

GASES Air PRESSURE 0-100 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

* Item was prototype only and was not used. It has been superseded by
 P/L 4117, 4118, 4119, and 4121.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4105

DATE January 1968

REVISION

EQUIPMENT TITLE

CLAMP, LINE ALIGNMENT, REMOTE

DESCRIPTION: The Remote Line Alignment Clamp consists of two separate but similar devices: one used with the engine pump discharge line (5-inches diameter) and the other with the turbine inlet line (4-inches diameter). The clamp incorporates a base (which has a remote handling bracket) and a saddle with two clamps which secure the upper line to the saddle. The base also contains a slide assembly with a saddle and two clamps for holding the lower line. The clamps and the slide are actuated by air cylinders remotely controlled by solenoid valves. In operation, the lower-line section on the engine is engaged to the lower line clamp and secured. The upper-line section is then engaged by the upper clamp, mounted on the slide and secured. This aligns the mating line sections. The slide is then driven as required to mate or separate the line sections: the slide provides five inches of travel. The clamps hold, align, and assist in remote mating or separating of the upper and lower sections of the pump discharge and turbine inlet lines during the remote disassembly and reassembly of the UTSM with the ELM at Station 185.14. It may also be used during cold assembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4105 FIRST PROVIDED FOR XE
DRAWING NUMBER 1116852 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$16,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 34" WIDTH 28" HEIGHT 24"
WEIGHT 255 LB LOAD CAPACITY 25 LB PROOF LOAD 50 LB
FLOOR AREA REQUIRED 8 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The item consists of two clamps: -19 for the pump discharge line and -29 for the turbine inlet line. The data shown are for each clamp assembly.

OPERATING DATA

GASES Air PRESSURE 90-120 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 110 AC VOLTS 60 CPS 1 PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Will align the lines to within 0.020". The slide and clamp actuating-air pistons are electrically, remotely controlled valves which also have manual controls for emergency use by the manipulator. See Aerojet Report TDI-0011.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE Facility LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA Electrical wiring to the control valves on the clamps from the operator area.

INTERFACES

EQUIPMENT E-MAD/WMHS Manipulator
PART OR ITEM Engine Propellant Lines as noted DRAWING NO. _____
REMARKS Facility air 90-120 psi required. Connection to remote electrical control circuitry.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4108

DATE January 1968

REVISION

EQUIPMENT TITLE

CLOSURE, TURBINE EXHAUST NOZZLE

DESCRIPTION: Each Turbine Exhaust Nozzle Closure consists of an outer shell, or body, and an inner plug. The outer body mounts the retainer clamps and the pneumatic coupling and gage: it also has a manipulator handle to position and actuate the clamps mounted on one side. The inner plug, which bolts to the outer body, contains a pneumagrip seal around its recessed peripheral groove. The pneumagrip is connected through a flexible line to the pneumatic quick-disconnect coupling and gage on the outer shell. In operation, the oval-shaped turbine exhaust nozzle opening fits into the gap between the shell and plug and seats at the bottom of the shell base. The clamps are engaged and the pneumagrip inflated to establish a rubber seal between closure and the nozzle inner surface. Two turbine exhaust nozzle closures are used to close the two XE-engine turbine exhaust line nozzles for all engine system leak tests and for engine inerting at ETS-1. It is used and handled under both cold and hot conditions.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4108 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1118799 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$6,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 18" WIDTH 8" HEIGHT 9"
 WEIGHT Each 30 LB LOAD CAPACITY 50 LB PROOF LOAD 75 lb/sq. in.
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Has 1/4-inch Wiggins pneumatic line quick-disconnect fitting to inflate and deflate the pneumagrip. A pressure gage is also provided.

OPERATING DATA

GASES Air PRESSURE 75-85 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Pneumagrip may be leak tested at 20-25 psi: inflating air controls are on separate equipment. See RN-DR-0122.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS and EIV LOAD CAPACITY 90 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Facility and MCC/EIV air supply and control are required.

INTERFACES

EQUIPMENT E-MAD and EIV Manipulators
 PART OR ITEM Turbine Exhaust Line Nozzles DRAWING NO. _____
 REMARKS A separate pneumatic line with 1/2-inch Wiggins disconnect must be provided for pneumagrip inflation.

EQUIPMENT TITLE

STAND, EXTERNAL SHIELD, BALL LOADING

DESCRIPTION: The Ball Loading External Shield Stand is a commercial welding-positioner with an adapter to hold the shield. The adapter consists of a steel ring with six equally spaced, rectangular steel-tube radial arms mounted on the center of the positioner table. Each arm has a locating pad at the end and a shear block located on the lower side to index the table diameter. In operation, the shield is secured to the ring by four bolts. The locating pad at the end of each arm is wedged to the shield periphery to support the shield in the tilted position. The shield may be rotated and tilted during cold assembly operations to load the shielding balls into the 12 shield-segments.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4111 FIRST PROVIDED FOR XE
DRAWING NUMBER 1117236 GOVT. INV. CONTROL NUMBER SNP-1-L-1083
PART NUMBER Same
CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 13' WIDTH 10' HEIGHT 9'
WEIGHT 16,500 LB LOAD CAPACITY 18,000 LB PROOF LOAD 36,000 LB
FLOOR AREA REQUIRED 130 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The item is an adaptation of a Ransome Company welding positioner,
30,000 lb rated load. Table and tilt are electrically driven and
controlled from a box on the positioner.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 440 VOLTS 60 CPS 3 PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Table rotation (0.3 rpm) controlled by 5 hp motor. Tilt (0-90°)
controlled by 4 hp motor. For additional information see Aerojet
Operation and Maintenance Instructions for Stand, Assembly,
External Shield, P/L 4111.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Facility Power
PART OR ITEM External Shield DRAWING NO. 1013372
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4112

DATE January 1968

REVISION

EQUIPMENT TITLE

TOOL, UTS/TSA NUT REMOVAL, REMOTE

DESCRIPTION: The Remote UTS/TSA Nut Removal Tool is a standard, electrical impact-wrench with a manipulator adapter and tool power-receptacle replacing the handle. The wrench drive-end is adapted with an offset drive and socket to fit and work with the UTS/TSA nuts. In operation, the tool is remotely engaged, positioned, and driven by the EIV manipulators at ETS-1 under hot conditions. This tool is needed only in emergencies when the integral TSA nut drive-motors fail.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4112 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117870 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$8,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	2
TOTAL	2

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 23" WIDTH 21" HEIGHT 5"
WEIGHT _____ LB LOAD CAPACITY 250 in/ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The tool is an adaptation of an Ingersol Rand 3/11"-drive, electrical impact-wrench. The handle and power inlet is replaced with a PaR manipulator hand adapter and power take-off.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 0-115 VOLTS DC CPS Variable PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Control for the tool installation and operation is from the manipulator console in the MCC.

OPERATING EQUIPMENT

MANIPULATOR EIV LOAD CAPACITY 90 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT EIV Manipulator
PART OR ITEM UTS/TSA Nuts DRAWING NO. 1116962
REMARKS The tool will be carried on the EIV.

EQUIPMENT TITLE

GUIDES, CONTROL DRUM DRIVE SHAFT HOUSING

DESCRIPTION: The Control Drum Drive Shaft Housing Guides are a set of 12 aluminum plugs with tapered heads ranging in length from 5-1/2 to 16-1/2 inches. They fit into the upper end of the control-rod line assemblies to pilot and protect the lines as they pass through the shield penetration during LTS shield installation. A wooden container is provided for storage.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4115 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117666 GOVT. INV. CONTROL NUMBER SNP-1-L-1920
PART NUMBER Same
CONTRACTOR AGC COST \$600

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 3-3/4" LENGTH 5-1/2 to 16-1/2" WIDTH _____ HEIGHT _____
WEIGHT 125 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 3 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA A wooden container holds the 12 pieces which range from 5-1/2 to 16-1/2 inches in length. The container is 25" x 16" x 10" with hinging top.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM Control Drum Drive Housing DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4116

DATE
January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, LIFTING, XE LOWER MODULE

DESCRIPTION: The XE Lower Module Lifting Fixture is an aluminum structure consisting of a short, cylindrical section which matches and attaches to the UTS, shield, or LTS. The cylindrical section is sufficiently long to clear the connectors, couplings, and fittings on the external shield. The upper end of the cylinder is supported by a spider structure with a single centered lifting-bail. The fixture has two bins for storing the hand knobs, studs, and bolts used during attachment and the ten counterweights used in various combinations to compensate for the weigh eccentricities of the hardware to be lifted. The fixture is used during engine assembly operations in the cold bay of the E-MAD building to transfer the XE engine lower module for the PVARA stand to the engine assembly stand. It will also lift the shield, shield-with-LTS, LTS alone, or the complete engine assembly when attached to the UTS.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4116 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1116340 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1116340 SNP-1-L-1913
CONTRACTOR AGC COST \$8,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8 ft 10 in. LENGTH _____ WIDTH _____ HEIGHT 6' 5"
WEIGHT 1600 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
FLOOR AREA REQUIRED 60 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Guide Studs, Handles, etc., furnished for use with various engine components. Counterweights are also furnished to level the fixture as required when used with various engine components.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Attaches manually to component in E-MAD Cold Bay

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE E-MAD Cold Bay LOAD CAPACITY 80,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane
PART OR ITEM UTS, External Shield and LTS DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4117

DATE January 1968

REVISION

EQUIPMENT TITLE

COUPLING DEVICE, FLUID LINE, REMOTE, 9.00" C-C HEX

DESCRIPTION: The 9.00-inch C-C Remote Fluid Line Coupling device is air powered and has dual torque-heads with ball-shaped hex-studs at the end capable of simultaneously operating both sockets on the fluid-line Marman coupling. Torque is adjusted by varying air pressure. Air-motor control is by a remotely controlled solenoid valve: direction of rotation is preset by a master-slave manipulator. An automatic shutoff arm senses a "coupling-open" position to stop the drive before the coupling is opened too far. The device is handled by a manipulator and has connecting hoses and cable. The air-motors are gear-timed for 1:1 synchronization of the hex-studs. The projection drive shafts have spring-loaded universal joints to permit a maximum of 7-1/2° misalignment of the studs. The tool body incorporates level indicators. The device remotely couples and uncouples the remote Marman coupling located on the two turbine exhaust lines at Engine Station 185.14.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4117 FIRST PROVIDED FOR XE
DRAWING NUMBER A-06771-D GOVT. INV. CONTROL NUMBER _____
PART NUMBER A-06771-D
CONTRACTOR AGC (PAR) COST \$5,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 48" WIDTH 16" HEIGHT 17"
WEIGHT 100 LB LOAD CAPACITY 300/600 in./lb PROOF LOAD _____ LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The coupling engaging ball hex-studs on the end of each drive shaft are 7/8" across flats and permit 7-1/2° misalignment. Fifty ft. air lines are provided. Electrical control power is from facility. Drive position-sensor is provided between shafts.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. / VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 110 VOLTS AC 60 CPS 1 PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Air and electrical connections are made remotely when picking up the tool. See Programmed and Remote Systems Corp. Operators' Manual 66600.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Manipulator - WMHS Class-A, 3 Finger Hand
PART OR ITEM Turbine Inlet Line Remote ~~XXXXXXXXXX~~ Coupling
REMARKS Uses facility remote air-supply regulated to 90 psi maximum.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO.

4118

DATE

January 1968

REVISION

EQUIPMENT TITLE

COUPLING DEVICE, FLUID LINE, REMOTE, 7.62" C-C HEX

DESCRIPTION: The 7.62-inch C-C Remote Fluid Line Coupling Device is air powered and has dual torque-heads with ball-shaped hex-studs at the end capable of simultaneously operating both sockets on the fluid-line Marman coupling. Torque is adjusted by varying air pressure. Air-motor control is by a remotely controlled solenoid valve: direction of rotation is preset by a master-slave manipulator. An automatic shutoff arm senses a "coupling-open" position to stop the tool before the coupling is opened too far. The tool is handled by a manipulator and has connecting hoses and cable. The air motors drive 1.73:1 gear-reduction sets which, in turn, are gear-timed for 1:1 synchronization of the hex-studs. The projecting drive shafts have spring-loaded universal joints to permit a maximum of 7-1/2° misalignment of the studs. The tool body incorporates level indicators. The device remotely couples and uncouples the remote Marman coupling located on the pump discharge line at Engine Station 185.14.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4118 FIRST PROVISIONED FOR XE
DRAWING NUMBER A-06728-D GOVT. INV. CONTROL NUMBER _____
PART NUMBER A-06728-D
CONTRACTOR AGC (PAR) COST \$5,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 48" WIDTH 14" HEIGHT 16"
WEIGHT 100 LB LOAD CAPACITY 1100/2200 in./lb Proof Load _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The coupling engaging ball hex-studs on the end of each drive shaft are 7/8" across flats and permit 7-1/2° misalignment. Fifty ft air lines are provided. Electrical control power is from facility. Drive is offset 3-1/4" through a 1.73:1.0 reduction and synchronizing gear drive. A shutoff sensor is provided.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. / VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 110 VOLTS 60 AC CPS 1 PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Air and electrical connections are made remotely when picking up the tool. See Programmed and Remote Systems Corp. Operators' Manual 66600.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Manipulator - WMHS Class-A, 3 Finger Hand
PART OR ITEM Pump Discharge Line Remote Coupling.
REMARKS Uses facility remote air supply regulated to 90 psi maximum.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO.

4119

DATE

January 1968

REVISION

EQUIPMENT TITLE

COUPLING DEVICE, FLUID LINE, REMOTE, 6.50" C-C HEX

DESCRIPTION: The 6.50-inch C-C Fluid Line Coupling device is air powered and has dual torque heads with ball-shaped hex-studs at the end capable of simultaneously operating both sockets on the fluid-line Marman coupling. Torque is adjusted by varying air pressure. Air-motor control is by a remotely controlled solenoid valve: direction of rotation is preset by a master-slave manipulator. An automatic shutoff arm senses a "coupling-open" position to stop the tool before the coupling is opened too far. The tool is handled by a manipulator and has connecting hoses and cable. The driving air-motors are gear-timed for 1:1 synchronization of the hex-studs. The projecting drive shafts have spring-loaded universal joints to permit a maximum of 7-1/2° misalignment of the studs. The tool body incorporates level indicators. The device remotely couples and uncouples the remote Marman coupling located on the turbine inlet line at Engine Station 185.14.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4119 FIRST PROVISIONED FOR XE
 DRAWING NUMBER A-06726-D GOVT. INV. CONTROL NUMBER _____
 PART NUMBER A-06726-D
 CONTRACTOR AGC (PAR) COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 48" WIDTH 15" HEIGHT 15"
 WEIGHT 100 LB LOAD CAPACITY 300/600 in/ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA The coupling engaging ball hex studs on the end of each drive shaft are 7/8" across flats and permit 7-1/2° misalignment. Fifty ft air lines are provided.
Electrical control power is from facility. Drive-position sensor is provided between shafts.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 110AC VOLTS 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Air and electrical connections are made remotely when picking up the tool. See Programmed and Remote System Corp. Operators' Manual 66600.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Manipulator WMHS Class-A, 3 Finger Hand.
 PART OR ITEM Turbine Inlet Line Remote Coupling.
 REMARKS Uses facility remote air-supply regulated to 90 psi maximum.

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4120

DATE January 1968

REVISION

EQUIPMENT TITLE

COUPLING DEVICE, REMOTE, 4.75" C-C HEX

DESCRIPTION: The 4.75-inch C-C- Remote Coupling Device is air powered and has dual torque-heads with ball-shaped hex-studs at the end capable of simultaneously operating both sockets on the pedestal remote Marman coupling. Torque is adjusted by varying air pressure. Air-motor control is by a remotely controlled solenoid valve: direction of rotation is preset by a master slave manipulator. The tool is handled by a manipulator and has connecting hoses and cable. The driving air-motors are gear-timed for 1:1 synchroization of the hex-studs. The short drive-shafts are at the outboard end of each offset, enclosed, chain-driven drive. Power is from the air-motor take-off in the gearbox. The tool body incorporates level indicators. The device uncouples the remote Marman coupling located on the actuator pedestal base at Engine Station 136.20.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4120 FIRST PROVISIONED FOR XE
 DRAWING NUMBER A-06760-D GOVT. INV. CONTROL NUMBER _____
 PART NUMBER A-06760-D _____
 CONTRACTOR AGC (PAR) COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 100 LENGTH 30" WIDTH 14" HEIGHT 20"
 WEIGHT 100 LB LOAD CAPACITY 300/600in./lb PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 3 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA The coupling engaging ball hex-studs on the two drive shafts are 7/8"
across flats. Fifty ft. air lines provided. Electrical control power is from the
facility. The drive is short coupled and is offset 5-1/2".

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 110 VOLTS AC, 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Air and electrical connections are made remotely when picking up the
tool. See Programmed and Remote Systems Corp. Operator's Manual 66600.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Manipulator - WMHS Class-A, 3 Finger Hand
 PART OR ITEM Actuator Pedestal Base DRAWING NO. _____
 REMARKS Uses facility remote air-supply regulated to 90 psi maximum.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST	
ITEM NO.	4121
DATE	January 1968
REVISION	

EQUIPMENT TITLE _____

DEVICE, NUT ACTUATION REMOTE, UTSM/TSA LINES

DESCRIPTION: The Remote UTSM/TSA Lines Nut Actuation Device is a commercial electrical impact-tool adapted to fit and receive power from the EIV manipulator. The tool drive-end incorporates a self-aligning hex-nut socket. The adapter bracket has a coupling removal hook. In operation, the tool is remotely engaged to the manipulator wrist: the hook is engaged by the manipulator to the drive platform to retract the line-clamp primary drive and drop it free. The socket is engaged alternately to the coupling-drive studs to evenly loosen the remote clamp. The device is required only when the propellant and cooldown line remote-clamp mechanism at Engine Station 42.89 fails to operate at ETS-1 after an engine firing.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4121 FIRST PROVIDED FOR XE
DRAWING NUMBER A-06799-D (PAR) GOVT. INV. CONTROL NUMBER _____
PART NUMBER A-06799-D (PAR)
CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 4" LENGTH 28" WIDTH _____ HEIGHT _____
WEIGHT 15 LB LOAD CAPACITY 95-130 ft/lb PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA The tool has a 9/16" hex socket attached to the drive through a Universal joint to permit up to 7 1/2° misalignment: a hook is provided to withdraw the primary drive unit.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 V VOLTS DC PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED 1800 (RPM) Impact Load 95-130 ft-lb torque
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See Programmed and Remote Systems Corp. Operator's Manual 66600.

OPERATING EQUIPMENT

MANIPULATOR EIV LOAD CAPACITY 100 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA MEC/EIV Manipulator Control Circuitry

INTERFACES

EQUIPMENT EIV Manipulator(s) Tool/Hand Socket
PART OR ITEM Remote Fluid Line Marman Coupling at Engine Station 42.89, Dwg. No. 1116947
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4122

DATE January 1968

REVISION

EQUIPMENT TITLE

STAND, ENGINE REASSEMBLY

DESCRIPTION: The Engine Reassembly Stand is a modification of the engine holding stand, P/L 4099. The modification includes addition of four remotely operated engine propellant-line supports and a floor spacer. The stand is a four-legged, trussed steel structure with a base formed of skids which are, in turn, mounted on a floor spacer. The three-sided top structure mounts three engine support-pads which engage the lower periphery of the engine external shield. The stand's height and openings at the top and one side provide access to the nozzle and lines and permit installation of the complete engine assembly without excessively high engine handling-crane heights. The remote line-clamps are hinged to the side and top structure. A manipulator is used to swing them into line position and grip the lower line-segments below the joint flange. They hold the line segment and return it to position within 0.020 inch for reassembly. The stand supports the XE engine and lower line-segments during remote removal and reinstallation of the UTSM in the E-MAD Building.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4122 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1118465 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1118465
CONTRACTOR AGC COST *
*Cost of modification of P/L 4099.

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 10' WIDTH 10' HEIGHT 17'
WEIGHT 7200 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
FLOOR AREA REQUIRED 100 SQ FT OPERATING FLOOR LOAD 25 LB/SQ IN
ADDITIONAL DATA Remote line-clamp assemblies are integrally mounted on the original engine stand P/L 4099; a floor spacer is also provided to give greater nozzle-to-floor space. Clamps - 2 position each; vertical load 150 lb; radial load 400 lb.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See Aerojet Report TDI-0022.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE E-MAD LOAD CAPACITY 20,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS - 3 Finger Hand
PART OR ITEM Turbine Inlet, Pump Discharge, & Turbine Exhaust Lines; & the Engine Shield.
REMARKS Use sling to lift empty stand through eyelets with 40-ton crane.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4123

DATE January 1968

REVISION

EQUIPMENT TITLE

TOOL, UTS/SHIELD NUT, REMOTE

DESCRIPTION: The Remote UTS/Shield Nut Tool is an adaptation of a commercial air impact-tool for remote handling by a manipulator hand. It provides an offset, right-angle drive to a 3/4-inch Hex self-aligning socket. It also has pneumatic drive and exhaust lines and a solenoid-valve control cable. The tool is used in the E-MAD Building with the WMHS to remotely remove and reset the UTSM/shield nuts. ON-OFF power is remotely controlled: forward, reverse, and torque adjustments are mechanically preset.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4123 FIRST PROVISIONED FOR XE
 DRAWING NUMBER A-06863-D (PAR) GOVT. INV. CONTROL NUMBER _____
 PART NUMBER A-06863-D (PAR)
 CONTRACTOR AGC (PAR) COST \$2,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 14" WIDTH 6" HEIGHT 22"
 WEIGHT 25 LB LOAD CAPACITY 30-185 ft/LB torque _____ LB
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Right-angle drive extension with a 3/4" hex socket attached provided at a 6" offset from the manipulator handle. Wrench is driven by an air impact-tool with torque and direction mechanically adjustable.

OPERATING DATA

GASES Air PRESSURE 90 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 110AC VOLTS 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED 1700 Impacts Per IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Air and electrical connections are made remotely when picking up the tool. See Programmed and Remote Systems Corp. Operator's Manual No. 66600.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS Class C - Parallel Jaw Hand
 PART OR ITEM 12 UTS/Shield Nuts DRAWING NO. _____
 REMARKS Uses facility air regulated to 90 psi.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4124

DATE January 1968

REVISION

EQUIPMENT TITLE

KIT, TOOL, SEAL INSTALLATION

DESCRIPTION: The Seal Installation Tool Kit consists of six different, remote seal-installation tools and eight seal dispensers (three of one size are required). The seal-installation tool consists of a housing, pilot, manipulator-handle assembly and three, equally spaced, spring-loaded brass hooks. The handle provides a "floating" universal joint between the manipulator and the tool. The dispensers are cup-shaped with a contoured lip to facilitate removal of the replacement seal. In operation, the tool, with a pre-installed seal, is handled by a manipulator to insert the tool pilot into the inside of the line flange. When properly positioned into the flange, the hook automatically operates to drop the seal in place. The kit permits remote installation of the propellant-line seals after remote removal of the UTSM, and prior to remote installation of the original or replacement UTSM on the XE-engine lower module.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4124 FIRST PROVIDED FOR XE
DRAWING NUMBER 1133893 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1133893
CONTRACTOR AGC COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA * 5.5 to 9.5" LENGTH 12-1/2" WIDTH _____ HEIGHT _____
WEIGHT Total 55 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

*Tool sizes - Dispensers 4-3/4 to 8-3/4" dia; all 2-1/2" long.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See AGC Report TD1-0027

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Manipulator, 3 Finger Hand
PART OR ITEM Conoseal - 4 Sizes DRAWING NO. 1117225
REMARKS Tools and dispensers to be located in a convenient, visible location in the
E-MAD hot bay, preloaded with a seal.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4125

DATE
January 1968

REVISION

EQUIPMENT TITLE

TARGET ASSEMBLY, PARALLEL

DESCRIPTION: The Parallel Target Assembly consists of three optical targets used to indicate parallelism between the UTSM and the engine external shield prior to mating these units during remote reassembly of an XE engine. Each target consists of a window with a visual centering pattern on a spring-loaded target plate which moves vertically back of the window when a force is applied at its top. The assembly base supports the window-frame assembly, indicator lights, limit switches, a battery, and a handle. One light indicates center position; two lights indicate 0.030 inch below center.

In operation, the target assemblies are remotely placed, equally spaced, on the external shield studs on the top of the shield. This provides visual observation of the centering pattern and indicator lights from assigned E-MAD Building hot bay windows as the UTSM is lowered in preparation for mating. When the UTSM contacts the targets, it is leveled by the OPS until all targets read the same, indicating that the UTSM and external shield surfaces are parallel. The UTSM is then raised by the OPS hoist and the targets are removed by a manipulator.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4125 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117337 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1117337 _____
 CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY *

DIA _____ LENGTH 12" WIDTH 4" HEIGHT 10"
 WEIGHT 5 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Indicator lights: One indicates center position; two indicate center +0.030" low

*For each of three target assemblies.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 12 VOLTS DC CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Each target is set onto a shield stud using a manipulator. See RN-TM-0398.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS Manipulator
 PART OR ITEM ELM/UTSM DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4126

DATE January 1968

REVISION

EQUIPMENT TITLE

CONTAINER, SHIPPING, UPPER MODULE ASSEMBLY

DESCRIPTION: The Upper Module Assembly Shipping Container consists of four structural steel elements: a cradle; a lower support; an upper support; and a cover frame. The upper- and lower-supports bolt to the upper module at the 12 bolt-interfaces. The lower support also terminates the propellant lines extending below the upper module. The upper- and lower-supports bolt to the cradle at four rubber isolation blocks. The upper module is installed vertically into the support and cradle: the assembly is placed horizontally on the vehicle bed. The cover frame fits over, and is secured to, the assembly on the truck bed: it is covered with a tarp for protection during transportation. The shipping container handles and transports the UTSM from the factory to the engine assembly and test facility. It provides the required shock isolation, structural support, tie-down, and environmental protection during transport.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4126 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1118743 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1118743
CONTRACTOR AGC COST \$15,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 4500 LENGTH 13' 10" WIDTH 10' HEIGHT 10'
WEIGHT 4500 LB LOAD CAPACITY 3400 LB PROOF LOAD 6800 LB
FLOOR AREA REQUIRED 150 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Supports UTSM at 12 bolt-interfaces at Stations 42.87 and 137.64;
supports lines at Stations 158.64 and 185.14. Has shock isolation to 2g
transverse and 0.7g horizontal. Limits horizontal vibration to 6 cps.
Has protective cover.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-TD1-0030. Maximum speed of truck 35 MPH

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE Sacto/E-MAD LOAD CAPACITY 10,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT 2-legged Sling - Facility - 10,000 lb/min.
PART OR ITEM UTSM DRAWING NO. 1117060
REMARKS Base interfaces with a 40,000-lb truck flatbed. May be lifted by 10,000-lb
capacity fork lift.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4133

DATE January 1968

REVISION

EQUIPMENT TITLE

ADAPTER, FIXTURE, LIFTING

DESCRIPTION: The Lifting Fixture Adapter is a steel link with removable engagement pins for use with a crane, or hydraset hook, and GSE lifting bails. The adapter adapts the lifting bails on the external shield lifting fixture, P/L 4009, and the XE lower module lifting fixture, P/L 4116, to a 10- and 15-ton crane hook and to the 50-ton hydraset hook.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4133 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1118664 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1118664
 CONTRACTOR AGC COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 14" WIDTH 17" HEIGHT 40"
 WEIGHT 150 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
 FLOOR AREA REQUIRED 4 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Removable shear bolts facilitate connecting to crane hook and GSE.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE Sacramento and E-MAD LOAD CAPACITY 10 Ton/15 Ton LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT 10/15-Ton Crane Hook and 50-Ton Hydraset
 PART OR ITEM P/L 4009 and 4116 DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4134

DATE January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, LIFTING, INSULATING SHIELD, XE

DESCRIPTION: The XE Insulating Shield Lifting Fixture is a three-legged, steel strongback with a manipulator handle as the lifting bail at the center. The legs are essentially equally spaced and have a horizontal member at each lower end. When the legs are lowered with a manipulator through three 5-inch-diameter control-drum actuator access holes in the shield and the fixture rotated a few degrees, the horizontal members engage the underside, and a manipulator can be used to lift the insulating shield from the external shield. The fixture is required for remote removal of the XE insulating-shield from the external shield after remote removal of the UTSM during postfire engine disassembly operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4134 FIRST PROVIDED FOR XE
DRAWING NUMBER 1117458 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1117458 _____
CONTRACTOR AGC COST \$700

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 45" WIDTH 50" HEIGHT 24"
WEIGHT 100 LB LOAD CAPACITY 500 LB PROOF LOAD 1000 LB
FLOOR AREA REQUIRED 16 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Has manipulator handle.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS Manipulator, Class A
PART OR ITEM Insulating Shield DRAWING NO. 1118621
REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4135

DATE January 1968

REVISION

EQUIPMENT TITLE _____

PROTECTOR, FLANGE, PRESSURE VESSEL

DESCRIPTION: The Pressure Vessel Flange Protector is a flat, three-segment plastic ring which bolts to the pressure-vessel forward closure flange. It protects the pressure-vessel forward flange and the forward-closure seal surface during reactor and shield installation and other operations performed prior to installation of the forward closure.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4135 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1118755 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1118755
CONTRACTOR AGC COST \$900 (Set)

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	3
C.	
D. NRDS	
TOTAL	3

DIMENSIONS AND CAPACITY

DIA * 56" LENGTH _____ RIM WIDTH 2" HEIGHT 1-1/2"
WEIGHT 10 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 6 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Three segments form ring - bolt to PV flange.

*Dimensions of 3 equal-segments in form of a ring.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM Pressure Vessel Forward Flange DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4142

DATE
January 1968

REVISION

EQUIPMENT TITLE

KIT, MODIFICATION, HANDLING FIXTURE FORWARD CLOSURE, REMOTE

DESCRIPTION: The Remote Forward Closure Handling Fixture Modification Kit consists of replacement feet and retainers to adapt the reactor assembly handling fixture, P/L 1143, for remote handling of the XE forward-closure during XE-engine disassembly in the E-MAD Building hot bay. The feet engage the forward closure 36-inch-diameter flange. Handling and operation procedures are identical with those for P/L 1143.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4142 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1134013 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1134013
CONTRACTOR AGC COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 20 (Kit) LENGTH 500 WIDTH 1000 HEIGHT _____
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Consists of three replacement feet, six replacement retainer plates and six shims to modify P/L 1143 for remote use with the XE forward-closure.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/OPS/WMHS LOAD CAPACITY 600 LB MAX
CRANE E-MAD LOAD CAPACITY 15 TON LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Crane or OPS and WMHS.
PART OR ITEM Forward Closure, Pressure Vessel DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4143

DATE January 1968

REVISION

EQUIPMENT TITLE

ADAPTER, POISON WIRE RETENTION, NOZZLE THROAT PLUG

DESCRIPTION: The Nozzle Throat Plug Poison Wire Retention Adapter is an aluminum column with a rubber-covered disk top. The column fits over and attaches to the plug projection-end (after cap removal) of the nozzle-throat plug assembly, P/L 453. It retains XE-engine central poison wires during final assembly operations when the P/L 4088-P/L 4408 combination is not available.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4143 FIRST PROVIDED FOR XE
DRAWING NUMBER 1134556 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1134556
CONTRACTOR AGC COST \$500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8-1/2" LENGTH 29" WIDTH _____ HEIGHT _____
WEIGHT 10 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Attaches to Nozzle Plug, P/L 453, to use in XE Nozzle/PVARA Assembly
to retain central poison wires. Secures to P/L 453 with set screws.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT P/L 453, Nozzle Plug
PART OR ITEM Nozzle/PVARA Assembly DRAWING NO. _____
REMARKS Rubber-covered disk extends through the nozzle throat to support and retain
central poison wires.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4400

DATE January 1968

REVISION

EQUIPMENT TITLE

SET, FUNCTIONAL VALVE AND LEAK TEST

DESCRIPTION: The Functional Valve and Leak Test Set is a console unit containing electrical controls and indicating meters, a power supply, and a pneumatic control-panel. The set also includes the connecting cable assemblies for connection to the engine/component; pneumatic hose assemblies for leak and functional check of the engine/component; fluid hoses for filling and draining of the external shield, and various adapters and tools for attachment to the engine/component. A separate TPCV actuator test-set is provided which, when used with the console, requires a separate power supply, recorder, and function generator. The console provides cable and hose connections on the rear panel. Storage for some cables, hoses, and accessories is provided in the back. A desk top is provided on the front. Front drawers store miscellaneous equipment and data. Doors cover and protect the operating panels when the set is not in use. The set leak tests the XE-engine pneumatic lines and system modules during and after assembly. It also provides the electrical controls, interconnection system, and pneumatic supply and control system to functionally check engine valves and actuators.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4400 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117286 GOVT. INV. CONTROL NUMBER SNP-1-L-1861
 PART NUMBER 1117286
 CONTRACTOR AGC COST \$25,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 46" * WIDTH 44" * HEIGHT 52" *
 WEIGHT * LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 15 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Includes eight electrical cable assemblies, four pneumatic hose assemblies,
and ten adapter and tools, including the TPCV actuator test set.

*Console Only

OPERATING DATA

GASES He/N PRESSURE 0-1000 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS AC, 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See RN-DR-0097.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Facility Helium/Nitrogen Supplies. Facility Power
 PART OR ITEM XE Engine/Components Electrical/Pneumatic Connectors.
 REMARKS Requires external facility power-supply, recorder, and function generator for
check of TPCV with the TPCV actuator test set.

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 4401

DATE January 1968

REVISION

EQUIPMENT TITLE _____

SET, ELECTRICAL TEST

DESCRIPTION: The Electrical Test Set is a console unit containing a patch board, coaxial cable terminals, dual-resistance decade box, and an impedance (RLC) bridge. The set also includes cable assemblies for connection to the engine/component, transducer-checkout cables and hose, and a connector removal-tool. The console provides cable connections on the rear panel. Storage shelves for some cables are provided in the back of the console. A desk top is provided on the front: drawers are provided on the front for patch cords, tools, and data storage. Doors cover and protect the operating panels when the set is not in use. The test set verifies operation of the XE engine's electrical control-harness, electrical instrumentation, and electrical controls when used in conjunction with the WANL-provisioned car wire-and-transducer checker, and the portable transducer checker.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4401 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1117297 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1117297 SNP-1-L-1860
 CONTRACTOR AGC COST \$15,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 46"* WIDTH 44"* HEIGHT 52"*
 WEIGHT * LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 15 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Two electrical cable assemblies and a hose assembly for transducer test, eleven engine checkout cable assemblies, and a connector removal tool are a part of this item.

*Dimension for the Console Only

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See Aerojet Report RN-DR-0119, Operating and Maintenance Instructions for Electrical Test Set - 4401

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT WANL Items 1406, 1421 and 6051 (Racks Only)
 PART OR ITEM XE Engine/Components Electrical Connections
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 4402

DATE

January 1968

REVISION

EQUIPMENT TITLE

SET, DETECTOR, HELIUM LEAK, REMOTE

DESCRIPTION: The Remote Helium Leak Detector Set is a modified USON Series-500 leak detector consisting of a remote detector head with a sampling hose, manipulator adapter, and a 100-foot electrical control cable. It also includes a meter and control box, a power-supply box, connecting cables, and a storage or carrying case. The set remotely determines the leakage rates from specific XE-engine line joints and fittings after remote replacement of the UTSM on a hot XE engine. The leakage indication, when compared with specification limits, determines the acceptability of the specific engine-line joint or fitting.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4402 FIRST PROVISIONED FOR XE
 DRAWING NUMBER 1118395 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER 1118395
 CONTRACTOR AGC (USON) COST \$3,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA Carrying Case LENGTH 20" WIDTH 16" HEIGHT 8"
 WEIGHT 40 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 2 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Set consists of detector head assembly with 100 cable, a control box, a power supply, and connecting cables. The 100-foot cable is installed through the E-MAD wall so the control is in the operator area.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 110 VOLTS AC 60 CPS 1 PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See RN-DR-0137.

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD/WMHS
 PART OR ITEM Equipment Rack P/L DRAWING NO. _____
 REMARKS Used with a manipulator to place near and sense leakage from Marman clamp/conoseal line joints.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4404

DATE January 1968

REVISION

EQUIPMENT TITLE

KIT, CLOSURE, ENGINE LEAK TESTING

DESCRIPTION: The Engine Leak Testing Closure Kit consists of 12 small closures and couplings (2-3/4 inch), 14 large line-and-port closures and couplings (4 to 8 inch), a security clamp for the nozzle hot-bleed-port closure, and two storage boxes. Except for two, dish-shaped nozzle port closures, all closures are shallow disks made of CRES or aluminum with hex-bar pedestal handles. The couplings are Marman V-band or two-section V-clamps. The large 8-inch line closure contains a pneumatic fitting for engine pressure-testing. A set of conoseal gaskets are included. The kit is used to close ports and lines in the engine propellant system for leak testing of the engine and engine subassemblies during and after cold assembly operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4404 FIRST PROVIDED FOR XE
DRAWING NUMBER 1117450 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 1117450
CONTRACTOR AGC COST \$10,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 2 Boxes Each LENGTH 28" WIDTH 12" HEIGHT 18"
WEIGHT 100 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Closures used during leak testing of engine assembly or subassemblies to 50 psi. Proof test of closures is 100 psi. Seals are normally supplied from facility stock.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-DR-0121.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA All manual operations performed with standard tools.

INTERFACES

EQUIPMENT _____
PART OR ITEM Engine/Subassembly Line Ports and Lines
REMARKS Closures and couplings provided for 5" and 8" line ports at Engine Station 41.42; control-drum actuator ports, Station 136.47; 4" 5" and 6-1/2" ports/lines, Station 185.14; and two hot-bleed-ports.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4408

DATE January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, RETENTION, CENTRAL CORE POISON WIRE

DESCRIPTION: The Central Core Poison Wire Retention Fixture is a tubular aluminum assembly with a mounting plate on one end and a rubber-covered disk on the other. The mounting-plate-end bolts to the inner face of the nozzle closure, P/L 4088, when the fixture is required to retain the central-core poison wires during final engine assembly operations (i.e., after peripheral wire removal and prior to central-wire removal). The rubber-covered disk extends through the nozzle throat to support and retain the central-core poison wires.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4408 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1117446 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 55" WIDTH 9" HEIGHT 25"
 WEIGHT 30 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA The T-bar end secures to nozzle closure, P/L 4088. Rubber-covered disk supports central core poison wires when the fixture and closure are installed.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Manually installed to nozzle closure, P/L 4088.

INTERFACES

EQUIPMENT Nozzle Closure, P/L 4088.
 PART OR ITEM Nozzle/PVARA Assembly DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4409

DATE January 1968

REVISION

EQUIPMENT TITLE

SIMULATOR, ELECTRICAL

DESCRIPTION: The Electrical Simulator is a portable test unit containing a patch panel, special test-equipment binding posts, millivolt power supply, compatible electrical connectors, and electrical resistance, inductance, capacitance, and resistance bridges equated to engine components for checkout and verification purposes. The unit sets on a table and has two recessed handles for lifting and a panel cover for protection when not in use. The simulator electrically represents the engine to verify the electrical system and interconnecting cables of Functional Valve and Leak Test Set, P/L 4400; Electrical Test Set, P/L 4401; and Remote Checkout Adapter Kit, P/L 4043. It also verifies interconnection of WANL-supplied equipment as required for the overall checkout system. It also establishes cable resistance and capacitance constants, serves as a "trouble-shooting" tool, and electrically verifies equipment after modification.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4409 FIRST PROVIDED FOR XE
DRAWING NUMBER 1118560 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$6,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 30" WIDTH 24" HEIGHT 22"
WEIGHT 120 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Connectors are the same as on the engine. Circuits are patched through a panel to represent any engine-component electrical parameter. A millivolt meter and variable resistances with a voltmeter are also provided. Binding-post terminals are used with external equipment.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-DR-0099.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM Electrical Cables From P/L 4400/4401
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4412

DATE January 1968

REVISION

EQUIPMENT TITLE

CLOSURE ASSEMBLY, VENT LINE

DESCRIPTION: The Vent Line Closure Assembly is a modified 1-1/4-inch Wiggins quick-disconnect hydraulic coupling using a solid plug, with an O-ring seal, and a remote adapter-sleeve. To seal the actuator vent line, the closure may be manually or remotely installed and removed from the engine control-drum actuator during engine leak tests and inerting operations.

NOTE: The unit currently provided to NRDS and shown here is for manual operation only. Modification, including the remote adapter sleeve, will be provided during CY 1968.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4412 FIRST PROVIDED FOR XE
DRAWING NUMBER 1134414 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same
CONTRACTOR AGC COST \$300

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 5" LENGTH 6" WIDTH _____ HEIGHT _____
WEIGHT 5 LB LOAD CAPACITY 50 LB/IN.² PROOF LOAD _____ lb/in.²
FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Interim (manual) unit at NRDS will be modified with a manipulator
adapter-sleeve for manual/remote use. Uses Wiggins coupling quick-disconnect action
to secure and remove closure.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA May be handled manually or by manipulator

INTERFACES

EQUIPMENT Manipulator E-MAD
PART OR ITEM Engine Vent Line Flange DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4420

DATE January 1968

REVISION

EQUIPMENT TITLE

SIMULATED ENGINE TEST STAND NO. 1

DESCRIPTION: The Simulated Engine Test Stand No. 1 dimensionally represents ETS-1 with respect to engine installation and the standard-gage railroad facility. It is a four-column, steel structure with top peripheral and cross members to which are mounted four engine test-stand attachment fittings. Tie braces are provided on three sides; the fourth side, open to the rail end, is braced externally by cables to facility deadmen. The structure sits on four foundation-pads. The columns adjacent to the open end have sheet-metal skirts to simulate ETS-1 column diameter. The stand is used to develop engine/stand handling procedures with the MCC/EIV prior to ETS-1 availability.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4420 FIRST PROVIDED FOR XE
DRAWING NUMBER SPE 69-1-65 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same SNP-1-L-1391
CONTRACTOR AGC COST \$5,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 33' WIDTH 33' HEIGHT 33'
WEIGHT _____ LB LOAD CAPACITY 45,000 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM XE Engine TSA DRAWING NO. 1115459
REMARKS Stand is located at NRDS near the E-MAD Building at the end of the
turn-around railroad spur.

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4701

DATE January 1968

REVISION

EQUIPMENT TITLE

ADAPTER, HANDLING, THRUST STRUCTURE

DESCRIPTION: The Thrust Structure Handling Adapter is a steel, wheel-like fixture with 12 equally spaced axial holes in the flange of the cross-braced rim for bolting to the thrust structure's attachment points. A sling portion interfaces with the crane hook to lift the thrust structures. The adapter is used for handling and positioning of the UTSM and LTS during cold factory-assembly and disassembly operations. It is capable of lifting the assembled engine by attaching it to the UTSM.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4701 FIRST PROVIDED FOR XE
DRAWING NUMBER 278930 GOVT. INV. CONTROL NUMBER _____
PART NUMBER 278930-39
CONTRACTOR AGC COST \$1,800

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 8-1/2' LENGTH _____ WIDTH _____ HEIGHT 6'
WEIGHT 1,000 LB LOAD CAPACITY 40,000 LB PROOF LOAD 80,000 LB
FLOOR AREA REQUIRED 60 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Attaches with bolts to attachment brackets on UTS or LTS.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA See RN-S-0155.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE High Bay - Sacramento LOAD CAPACITY 80,000 LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT 40-ton Crane, Sacramento
PART OR ITEM UTSM or LTS DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4708

DATE January 1968

REVISION

EQUIPMENT TITLE _____

PLATFORM, MAINTENANCE, ENGINE

DESCRIPTION: The Engine Maintenance Platform is constructed of welded aluminum tubing and plate with aluminum-grate platforms at two levels. An auxiliary stand is located atop the second level for work on the engine nozzle. The platform gratings contain clearance holes for the engine and four propellant-lines. The stand can be dismantled and is equipped with stairs and guard rails which are removable. The platform is used in the E-MAD Building cold bay in conjunction with the engine assembly stand, P/L 4021, to provide personnel access during XE-engine assembly and checkout operations.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4708 FIRST PROVIDED FOR XE
 DRAWING NUMBER 1118630 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$20,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 20' WIDTH 12' HEIGHT 22'
 WEIGHT 3,000 LB LOAD CAPACITY 1,500 LB PROOF LOAD 3,000 LB
 FLOOR AREA REQUIRED 240 SQ FT OPERATING FLOOR LOAD 10 LB/SQ IN
 ADDITIONAL DATA The assembled, unloaded platform assembly may be lifted by a sling.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See Aerojet Report TD1-0033.

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE E-MAD LOAD CAPACITY 20,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Facility Slings - Crane
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS Clear for engine access, the engine assembly stand, P/L 4021, and the engine envelope and outboard lines.

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4709

DATE January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, LIFTING, ROCKET ENGINE

DESCRIPTION: The Rocket Engine Lifting Fixture is a four-legged sling, the frame of which is composed of a main beam with adjustable positions for two cross-beams. Each beam has adjustable-sling leg positions. The adjustable-sling leg position also serves as the pickup point for the four-legged, apex-type lifting sling which provides the interface to the crane for lifting the fixture with its load. Standard sling-rope and hooks are used with standard clevises: adjustment is made by securing a shear pin through the clevis at the selected hole of a series of holes in the beam element. The fixture is used to lift the engine with the UTS lifting fixture, P/L 4701, or the PVARA with the pneumatic pressure vessel handling adapter, P/L 921.

NOTE: Basic use of this fixture was for CFDTs

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4709 FIRST PROVIDED FOR XE
 DRAWING NUMBER 278850 GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Same
 CONTRACTOR AGC COST \$2,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	1
B. WANL	
C.	
D. NRDS	
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 79" WIDTH 54" HEIGHT 84"
 WEIGHT 1000 LB LOAD CAPACITY 25,000 LB PROOF LOAD 50,000 LB
 FLOOR AREA REQUIRED 30 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA The 4-point pickup is variable from 29 to 49" by 40 to 70".

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE Sacramento-High Bay LOAD CAPACITY 80,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT 40-Ton Crane, Sacramento
 PART OR ITEM P/L 4701 and P/L 921 DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO.

4746

DATE

January 1968

REVISION

EQUIPMENT TITLE

SLING, TEST STAND ADAPTER

DESCRIPTION: The Test Stand Adapter Sling is a four-legged, standard wire-rope sling. Four lifting eyes bolt to the upper flange-surface of the ETS-1 test-stand adapter. The sling is used to handle the test-stand adapter during fabrication, shipping, and for required UTS "fit-checks". It is also used to lift the adapter into position on the TSA installation spacer, P/L 4090 (located on the EIV carriage) for ETS-1 installation of the adapter.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4746 FIRST PROVISIONED FOR XE
DRAWING NUMBER 1117077 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same SNP-1-L-1922
CONTRACTOR AGC COST \$450.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 125 LENGTH 1' WIDTH 1' HEIGHT 10'
WEIGHT 125 LB LOAD CAPACITY 10,000 LB PROOF LOAD 20,000 LB
FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Four eye-assemblies bolted to the TSA upper surface.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE E-MAD/NRDS LOAD CAPACITY 80,000 LB MAX
ADDITIONAL DATA Standard tools required to bolt eyes to TSA.

INTERFACES

EQUIPMENT Crane E-MAD/NRDS
PART OR ITEM Test Stand Adapter DRAWING NO. 1010020
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 4749

DATE January 1968

REVISION

EQUIPMENT TITLE

FIXTURE, HANDLING, FLUID LINE, REMOTE

DESCRIPTION: The Remote Fluid-Line Handling Fixture is a modified PaR Class "A" parallel hand-assembly. One jaw-face is replaced with a yoke assembly to accept and hold cylindrical shapes from three to 6-5/8-inch diameter. The hand assembly is compatible with the WMHS manipulator. The fixture is used to remotely handle engine propellant-lines during remote disassembly and reassembly of the engine in the E-MAD Building.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 4749 FIRST PROVIDED FOR XE
DRAWING NUMBER 1117682 GOVT. INV. CONTROL NUMBER _____
PART NUMBER Same _____
CONTRACTOR AGC COST \$600

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 13" WIDTH 12" HEIGHT 6"
WEIGHT 10 LB LOAD CAPACITY 600 LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 1 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Unit is modified PaR Class "A" parallel hand-assembly. Fits wrist of
WMHS manipulator. Capacity is 3" OD to 6-5/8" OD line or object.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR E-MAD/WMHS LOAD CAPACITY 600 LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Manipulator wrist/tool socket - WMHS
PART OR ITEM Engine Lines DRAWING NO. _____
REMARKS _____

NERVA
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SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO.

5002

DATE

January 1968

REVISION

EQUIPMENT TITLE

SHEAR, BENCH, HYDRAULIC

DESCRIPTION: The Hydraulic Bench Shear is a commercial bench shear modified by the adaptation of a hydraulic cylinder to power the shears for remote operations. The shear incorporates a spring-loaded clamping bar to clamp the workpiece to be cut. The hydraulic cylinder is a double-acting cylinder capable of approximately a 30-ton shear force when used with a 2000-psi, single-acting hand pump. A hydraulic hand-valve is supplied with the hand pump for use in the operating gallery. The shear is used for cutting test specimens from engine parts during post-operative examination. It is capable of shearing stainless steel sheet 0.06-inch thick and 20-inches wide. The blades can be remotely replaced.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5002 FIRST PROVIDED FOR E-MAD ADD-ON
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER P-03339-D (PaR)
CONTRACTOR AGC COST \$1,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 1425 LENGTH 30" WIDTH 12" HEIGHT 35"
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Capable of cutting 0.060" stainless steel sheet, 20" long.

OPERATING DATA

GASES Air PRESSURE 100 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS Hydraulic Fluid PRESSURE 2,000 LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Uses commercial petroleum-base hydraulic fluid. See Operating Instructions, PaR 64351.

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Miscellaneous engine hardware to be cut
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5003

DATE January 1968

REVISION

EQUIPMENT TITLE

CLEANER, VACUUM, REMOTE

DESCRIPTION: The Remote Vacuum Cleaner is a standard tank-type, upright vacuum cleaner equipped with an absolute filter. It is operated by manipulators in the E-MAD Building remote disassembly bays or post-operative cells for dust and chip collection in the facility decontamination processes and to remove radioactive dust and particles from engine components during remote disassembly or post-operative examination.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5003 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER * _____
 CONTRACTOR AGC COST \$590.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	3
TOTAL	3

DIMENSIONS AND CAPACITY

DIA _____ LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT _____ LB LOAD CAPACITY 10 gal PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA 10-gallon capacity, shop-type, upright vacuum with an absolute filter.

*Part No. Cambridge Filter Corp. 2VC-80A-10 (Vacuum Cleaner)
 Pre-filter Kit 66-1169

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS single PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA The remote vacuum cleaner can be operated with any of the manipulators available at NRDS.

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

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SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5006

DATE January 1968

REVISION

EQUIPMENT TITLE

TORCH, ACETYLENE, REMOTE

DESCRIPTION: The Remote Acetylene Torch consists of a basic oxygen/acetylene torch provided with a cutting tip, a heating tip, and a remote torch-igniter. Controls in the operating-gallery regulate gas pressure and torch flame. Torch tips are designed for remote changing with manipulators. The torch can be used for cutting test specimens and as an emergency means of engine disassembly in the event of failure of other remote-handling equipment.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5006 FIRST PROVISIONED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER ACFI 3-513645-000
 CONTRACTOR AGC COST _____

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

Oxygen &
 GASES Acetylene PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR * LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____
*Can be used with any of the facility manipulators

INTERFACES

EQUIPMENT Facility "through-wall" requirements for gas hoses and electric controls.
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

**NERVA
PROGRAM**

**SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK**

PROV. LIST
ITEM NO. 5007

DATE January 1968

REVISION

EQUIPMENT TITLE _____

MOUNTS, BINOCULAR

DESCRIPTION: The Binocular Mounts are used for holding and positioning binoculars at all viewing windows in the E-MAD Building. They provide smooth horizontal and vertical movement with provisions for binocular positioning, swivelling, and locking. The mounts consist of a set of vertical slide-bars mounted to wall brackets on each side of a viewing window. A horizontal bar slides on the vertical members for vertical positioning. The vertical positioning movements are provided with a weighted counterbalance system for ease of operation. The binocular mounting-bracket slides on the horizontal bar for horizontal positioning and provides a ball swivel-joint for positioning the binoculars. All movements can be locked at any position.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5007 FIRST PROVIDED FOR E-MAD ADD-ON
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER PaR AI-06251-D
CONTRACTOR AGC COST \$445.00 Each

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	20 Sets
TOTAL	20 Sets

DIMENSIONS AND CAPACITY

DIA _____ LENGTH _____ WIDTH _____ HEIGHT _____
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Vertical and horizontal members are sized to span the individual windows
at which they are installed. The outer extreme of the binocular mount is 24" from
the window surface

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT E-MAD Facility, USN Mark 45 Mod. "O" Binoculars
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5009

DATE January 1968

REVISION

EQUIPMENT TITLE

TESTER, MACROHARDNESS, REMOTE

DESCRIPTION: The Remote Macrohardness Tester is a standard commercial Rockwell hardness tester provided with the necessary controls for remote operation from the operator gallery. The tester is capable of applying preset major loads of 15, 30, 45, 60, 100, and 150 kilograms. It is supplied with: (1) Diamond Braile Penetrators to cover scales 15N, 30N, 45N, A, D, and C; (2) Ball Penetrators (1/16-inch) to cover scales 15T, 30T, 45T, F, B, and G; and (3) Ball Penetrators (1/8 inch) to cover scales E, K, and H. The tester is used during post-operative examination to determine the effect of the engine test-environment on the hardness of engine materials.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5009 FIRST PROVISIONED FOR E-MAD ADD-ON
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER Wilson Model 5.5TY
CONTRACTOR AGC COST \$9,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 26-7/8" WIDTH 23-1/2" HEIGHT 72-1/4"
WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED 5 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA Control-console mounted in operating gallery.

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave CRL-8 LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT Miscellaneous test specimens.
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5014

DATE January 1968

REVISION

EQUIPMENT TITLE

SHIELD, PERSONNEL

DESCRIPTION: The Personnel Shield is a lead-shielded box structure with three sides and a top. The front side is provided with a radiation-shielding window. The top of the shield provides a bail for lifting with a remote overhead crane. The shield is used to provide radiation shielding for one man in the event that it is necessary to send a man into the E-MAD Building disassembly bay for visual inspection of radioactive hardware.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5014 FIRST PROVISIONED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Ameray Corp. AM 2714-1
 CONTRACTOR AGC COST \$9,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 36" WIDTH 38" HEIGHT 100"
 WEIGHT 15,000 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED 10 SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE E-MAD Remote Crane LOAD CAPACITY 80,000 LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST

ITEM NO. 5015

DATE

January 1968

REVISION

EQUIPMENT TITLE

TELEVISION SYSTEM EQUIPMENT

DESCRIPTION: The Television System Equipment provides the necessary components for a closed-circuit television system for viewing operations within the E-MAD Building remote disassembly bay and cells. The system consists of the following components: 5 Television Monitors; 7 Vidio Distribution Amplifiers; 11 Camera Control Units; 11 Accessory Control Panel Modules; 7 Mobile Television Monitor Consoles; 13 Television Cameras; 13 Zoom Lens Assemblies; 13 Pan and Tilt Units; 103 Video Distribution Cables; and 7 Portable Camera Mount Assemblies.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5015 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____
 CONTRACTOR AGC COST \$75,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	
TOTAL	

DIMENSIONS AND CAPACITY

DIA N/A LENGTH _____ WIDTH _____ HEIGHT _____
 WEIGHT N/A LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED N/A SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Equipment supplied by Systems Design Corporation, Las Vegas, Nevada

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5019

DATE January 1968

REVISION

EQUIPMENT TITLE

PERISCOPE, WALL TYPE, HOT DISASSEMBLY BAY

DESCRIPTION: The Periscope is an L-shaped instrument designed for remote viewing of operations within the E-MAD Building disassembly bay. It consists of a swiveling objective at the hot-bay end of a horizontal "through-wall" arm, and a swiveling eyepiece in the lower end of a vertical arm. The horizontal arm is mounted in a radiation-tight outer tube and flange and extends through the hot-bay wall in such a manner that it is free to rotate 360 degrees. This allows the height of the eyepiece to vary to suit an individual observer. The swiveling objective and eyepiece are mechanically coupled to provide a hemispheric scan capability. The periscope is provided with a camera adapter for remote photography and a filar eyepiece to measure objects on the hot-bay side of the wall within a minimum solid-angle of 180 degrees centered about the objective end.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5019 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Lennox Instr. Co. No. 120000
 CONTRACTOR AGC COST \$14,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 68-7/16" WIDTH 21-7/16" HEIGHT 28-3/8"
 WEIGHT 920 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Manufactured by Lennox Instrument Company per AGC Equipment
Specification S-5019

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA Operating and Maintenance Instructions LICO 4958

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Manually positioned and adjusted by operator.

INTERFACES

EQUIPMENT E-MAD 6' thick wall section
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5021

DATE January 1968

REVISION

EQUIPMENT TITLE

CAR, STORAGE, HIGH ACTIVITY

DESCRIPTION: The High Activity Storage Car consists of a railroad flat-car modified by the addition of a metal plate deck and three removable top covers. The car provides a portable storage facility for radioactive engine parts. The car is loaded in the hot disassembly bay and covers placed into position to cover the radioactive load. The car is then pushed or pulled over the facility railroad system to the high-activity storage area and parked. The prime mover may be either the LASL electric locomotive or the locomotive-MCC-space-car train.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5021 FIRST PROVISIONED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER ACFI 3-513745-000
 CONTRACTOR AGC COST \$16,875

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 32' WIDTH 10' HEIGHT 12'
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA 40-Ton overhead crane used for lifting and positioning covers.

INTERFACES

EQUIPMENT LASL Locomotive or Locomotive-MCC-Spacer Car Train
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5022

DATE January 1968

REVISION

EQUIPMENT TITLE

REMOTE DUROMETER

DESCRIPTION: The Remote Durometer is a standard durometer modified by the addition of adjustment handles that are compatible for use with remote manipulators. The durometer is used to periodically check the hardness of critical rubber components of equipment that is utilized within the radioactive environment of the engine disassembly areas.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5022 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER _____
 CONTRACTOR AGC COST \$600.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	<u>1</u>
TOTAL	<u>1</u>

DIMENSIONS AND CAPACITY

DIA * LENGTH * WIDTH * HEIGHT *
 WEIGHT * LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED * SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

*To be supplied later

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR Master/Slave LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5023

DATE January 1968

REVISION

EQUIPMENT TITLE

PERISCOPE, WALL TYPE, POST MORTEM CELL

DESCRIPTION: The Hot Disassembly Bay Wall Type Periscope is an L-shaped instrument designed for remote viewing of operations within an E-MAD post-operative examination cell. It consists of a swiveling objective at the hot-bay end of a horizontal through-wall arm, and a swiveling eyepiece in the lower end of a vertical arm. The horizontal arm is mounted in a radiation-tight outer tube and flange through the hot-bay wall and rotates 360 degrees. This allows the height of the eyepiece to vary to suit the individual observer. The swiveling objective and eyepiece are mechanically coupled to give the periscope a hemispheric scan capability. The periscope is provided with a camera adapter for remote photography and a filar eyepiece to measure objects on the hot-bay side of the wall within a minimum solid-angle of 180 degrees centered about the objective end.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5023
 DRAWING NUMBER _____
 PART NUMBER Lennox Instr. Co. No. 120000
 CONTRACTOR AGC

FIRST PROVISIONED FOR E-MAD ADD-ON
 GOVT. INV. CONTROL NUMBER _____
 COST \$14,500

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH 48" WIDTH 21 7/16" HEIGHT 28 3/8"
 WEIGHT 920 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

Manufactured by Lennox Inst. Co. per AGC Equipment Specification S-5019

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL _____ VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA See Operating and Maintenance Instructions LICO 4958

OPERATING EQUIPMENT

MANIPULATOR N/A LOAD CAPACITY _____ LB MAX
 CRANE N/A LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA Manually positioned and adjusted by operator.

INTERFACES

EQUIPMENT E-MAD 4-ft-thick wall section.
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5026

DATE January 1968

REVISION

EQUIPMENT TITLE

TRANSFER SYSTEM, PLUG DOOR

DESCRIPTION: The Plug Door Transfer System consists of a sliding drawer assembly through the plug doors of E-MAD Building post-operative cells 165 and 166. Each drawer extends into its respective cell to receive radioactive material to be transferred. When loaded, the drawer is pushed into the plug door with a manipulator and a shielding door on the cell side of the drawer opening is closed. A shielding door on the cell service side is then opened with a manipulator and the transfer drawer is withdrawn into the cell service area for unloading. This system allows the transfer of material between post-operative cells 165 and 166.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5026
 DRAWING NUMBER _____
 PART NUMBER Ameray Corp. AM-2715-1
 CONTRACTOR AGC

FIRST PROVIDED FOR E-MAD ADD-ON
 GOVT. INV. CONTROL NUMBER None
 COST \$15,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

External overall dimensions:

DIA _____ LENGTH 41-1/2" WIDTH 37-1/2" HEIGHT 44"
 WEIGHT _____ LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA Internal dimensions of transfer opening: length 30", width 16",
height 15".

OPERATING DATA

GASES N/A PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL N/A VOLTS _____ CPS _____ PHASE _____ KVA
 LIQUIDS N/A PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED N/A IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY N/A HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL N/A
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA System operated on cell side with CRL-8 Master/Slave Manipulators, on
cell service side with PaR Model 3000 Manipulator.

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5029

DATE January 1968

REVISION

EQUIPMENT TITLE

SPACER CAR

DESCRIPTION: The Spacer Car is a standard railroad flatcar modified by the addition of a 1/2-inch thick aluminum deck plate, a special railroad coupler (ACFI P/N 3-501192-00), and stainless-steel mirrors which permit visual observation of coupling operations. The car's primary function is to provide an additional 50 feet of space between a manned locomotive or the manned control car (P/L 2002) and a radioactively loaded railroad car (e.g., the engine installation vehicle, P/L 2001, or the high-activity storage car, P/L 5021). The Spacer car may also be used for transportation of material over the NRDS railway system.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5029 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER Page & Page 6512-4 None Assigned
 CONTRACTOR AGC COST \$20,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA _____ LENGTH (Floor) 40'10"* WIDTH (Floor) 9'4½" HEIGHT 5'10"
 WEIGHT 34,300 LB LOAD CAPACITY 100,000 LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____
 *Overall length of car and couplers is 44'3½"

OPERATING DATA

GASES Air PRESSURE 80 LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 110 VOLTS D.C. CPS _____ PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____

OPERATING EQUIPMENT

MANIPULATOR _____ LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5035

DATE January 1968

REVISION

EQUIPMENT TITLE _____

SHEARS, PNEUMATIC, HEDGE TYPE

DESCRIPTION: The Hedge Type Pneumatic Shears consist of a pneumatic actuator which operates a set of sliding hedge-type cutters. The shears are supplied with the necessary interconnecting hoses, an electrically operated air-control valve, and a manipulator grip. The shears are used for severing small instrumentation wires during remote disassembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5035 FIRST PROVIDED FOR E-MAD ADD-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER ACFI 3-511557-000 None
 CONTRACTOR AGC COST \$1,400

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 3" LENGTH 20" WIDTH _____ HEIGHT _____
 WEIGHT 20 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE * LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS single PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____
*Operating pressure 70 psi minimum, 150 psi maximum.

OPERATING EQUIPMENT

MANIPULATOR WMHS, OPS, O-MAN LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

SUPPORT EQUIPMENT TECHNICAL DESCRIPTION HANDBOOK

PROV. LIST
ITEM NO. 5036

DATE January 1968

REVISION

EQUIPMENT TITLE

SHEARS, PNEUMATIC, HOOK TYPE

DESCRIPTION: The Hook Type Pneumatic Shears consists of a pneumatic actuator which operates a single hook-type cutter head. The shears are supplied with the necessary interconnecting hoses, an electrically operated air-control valve, and a manipulator grip. The shears are used for severing instrumentation wires during remote disassembly.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5036 FIRST PROVIDED FOR E-MAD ADO-ON
 DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
 PART NUMBER ACFI 3-511057-00
 CONTRACTOR _____ COST \$650.00

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 3" LENGTH 16" WIDTH _____ HEIGHT _____
 WEIGHT 16 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
 FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
 ADDITIONAL DATA _____

OPERATING DATA

GASES Air PRESSURE * LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
 ELECTRICAL 115 VOLTS 60 CPS single PHASE _____ KVA
 LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
 SPEED _____ IN./MIN (RPM) CUTTING SPEED _____
 MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
 CALIBRATION INTERVAL _____
 ADDITIONAL DATA _____
*Operating pressure 70 psi minimum, 150 psi maximum.

OPERATING EQUIPMENT

MANIPULATOR WMHS, OPS, O-MAN LOAD CAPACITY _____ LB MAX
 CRANE _____ LOAD CAPACITY _____ LB MAX
 ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
 PART OR ITEM _____ DRAWING NO. _____
 REMARKS _____

PROV. LIST
ITEM NO. 5038

DATE January 1968

REVISION

NERVA
PROGRAM

SUPPORT EQUIPMENT
TECHNICAL DESCRIPTION HANDBOOK

EQUIPMENT TITLE

SCREWDRIVER, REMOTE

DESCRIPTION: The Remote Screwdriver is a modified Ingersoll-Rand electrical power tool equipped with a PaR A-03494-D tool power adapter and a screwdriver bit adapter.

Various sizes of remotely interchangeable screwdriver bits are provided for the following types of screw heads: slotted head, phillips head, reed and prince, clutch head, and hex socket head. Power is provided through the manipulator wrist adapter and is controlled at the manipulator control console. The screwdriver incorporates a telescoping barrel assembly which permits screw runout through a distance of 1-1/2 inches without tool repositioning.

TECHNICAL SUMMARY

PROVISIONING LIST ITEM NUMBER 5038 FIRST PROVISIONED FOR E-MAD ADD-ON
DRAWING NUMBER _____ GOVT. INV. CONTROL NUMBER _____
PART NUMBER PaR A-03788-D _____ None _____
CONTRACTOR _____ COST \$1,000

USE LOCATION	QTY REQ'D
A. AGC SACRAMENTO	
B. WANL	
C.	
D. NRDS	1
TOTAL	1

DIMENSIONS AND CAPACITY

DIA 7-3/4" LENGTH 20-3/4" WIDTH _____ HEIGHT _____
WEIGHT 26 LB LOAD CAPACITY _____ LB PROOF LOAD _____ LB
FLOOR AREA REQUIRED _____ SQ FT OPERATING FLOOR LOAD _____ LB/SQ IN
ADDITIONAL DATA _____

OPERATING DATA

GASES _____ PRESSURE _____ LB/SQ IN. VOLUME _____ CFM LUBRICATION _____
ELECTRICAL 115 VOLTS 60 CPS Single PHASE _____ KVA
LIQUIDS _____ PRESSURE _____ LB/SQ IN QTY REQ'D _____
SPEED 800 (RPM) CUTTING SPEED _____
MEASURING ACCURACY _____ HORIZONTAL _____ VERTICAL _____
CALIBRATION INTERVAL _____
ADDITIONAL DATA Operators Manual PaR 64350

OPERATING EQUIPMENT

MANIPULATOR E-MAD Class A & B LOAD CAPACITY _____ LB MAX
CRANE _____ LOAD CAPACITY _____ LB MAX
ADDITIONAL DATA _____

INTERFACES

EQUIPMENT _____
PART OR ITEM _____ DRAWING NO. _____
REMARKS _____

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