STANDARD PHRASEOLOGY

SECTION E

1. This section of standard phraseology is for general use in mechanical disciplines.

Disassemble each _____, using 2.__ for guidance.

E1a

Disassemble each _____ in accordance with 2.__.

E1b

Protect, blank, wrap, cover, or mask equipment and ***each*** opening to preclude damage and prevent entry of contaminants into ***each*** gas turbine engine to include ***each*** foreign object debris (FOD) screen, uptake spaces, engine room, machinery, equipment, valves, vent system, and other openings prior to cleaning operation.

E2

NOTE: USE AS A SUBPARAGRAPH WHEN DISASSEMBLY IS INVOKED.

Measure and record ***each*** serial number, size, and clearance, of each _____, using 2.__ for guidance.

E4a

Measure and record ***each*** serial number, size, and clearance, of each ____ in accordance with 2.__.

E4b

NOTE: USE FOR NONCRITICAL EQUIPMENT (GENERAL USE).

Include each size, clearance, fit and finish for each wearing part, bearing surface, thrust and journal bearing, seal and packing area, and physical condition of each part not specified for renewal.

E4c

NOTE: USE FOR MISSION CRITICAL EQUIPMENT, ESPECIALLY FORCED DRAFT BLOWERS, MAIN FEED PUMPS, MAIN PROPULSION TURBINES, ETC.

Include each size, clearance, fit, and finish for each wearing part, bearing surface, thrust and journal bearing, seal and packing area, and physical condition of each part not specified for renewal.

E4d

NOTE: USE E5a AS A SUBPARAGRAPH WHEN DISASSEMBLY IS INVOKED.

Inspect each part for wear and defects, in accordance with 2.__.

E5a

Inspect each part for wear and defects, using 2.__ for guidance.

E5b

Remove test fluid and dry the _____ interior and exterior surfaces. Allowable residual fluid: None.

E6

Straighten each _____ to within ____ inch total indicator reading.

E7

Straighten each shaft to within ____ inch total indicator reading.

E8

Straighten each operating lever, linkage, and eccentric to provide freedom of operation.

E9

NOTE: FOR REFERENCE USE DOD-STD-2182, ENGINEERING CHROMIUM PLATING (ELECTRODEPOSITED) FOR REPAIR OF SHAFTING (METRIC). FOR NDT TESTING, USE B26a-B26b.

Chrome-plate each _____ journal in accordance with 2.__.

E10

Machine each _____, using 2.__ for guidance.

E11a

Machine each _____ in accordance with 2.__.

E11b

Machine each new undersize casing wearing ring and each new oversize impeller wearing ring to size specified in 2.__.

E12a

NOTE: USE E12b-E12c FOR IMPELLERS WITHOUT WEARING RINGS.

Machine each new impeller wearing ring area concentric to the impeller bore within 0.001-inch total indicator reading, removing only material required to correct ***each*** out-of-round and eccentric conditions.

E12b

Machine each new undersize casing wearing ring bore concentric to ***each*** casing wearing ring area to size specified in 2.__ for ***each*** mating impeller wearing surface.

E12c

NOTE: USE E12d-E12e FOR IMPELLERS WITH OVERSIZED WEARING RINGS.

Machine each new impeller wearing ring concentric to the impeller bore within 0.001 inch total indicator reading, removing only material required to correct ***each*** out-of-round and eccentric condition.

E12d

Machine each new casing wearing ring bore concentric to ***each*** casing wearing ring area to size specified in 2.__ for ***each*** mating impeller wearing ring surface.

E12e

Machine each new impeller wearing ring, using 2.__ for guidance.

E13a

Machine each new impeller wearing ring in accordance with 2.__.

E13b

Machine each new casing wearing ring, using 2.__ for guidance.

E14a

Machine each new casing wearing ring in accordance with 2.__.

E14b

Fit each wearing ring to ***each*** corresponding groove in upper and lower casing.

E15

Inspect wearing ring fit. Each ring shall not bind and clearance shall be in accordance with 2.__.

E16

Stone ***each*** face of each thrust collar to remove ***each*** high spot.

E17

Stone each _____ journal to remove ***each*** high spot.

E18

Stone each pinion and gear tooth to remove ***each*** high spot.

E19

NOTE: WHEN E20 IS USED, E21 SHALL ALWAYS BE A SUBPARAGRAPH. SPECIFY LABYRINTH OR CARBON PACKING.

Scrape, lap, and fit ***each*** metal-to-metal joint of each turbine packing box, turbine case, turbine case cover, nozzle, steam chest, steam strainer, and steam strainer cover.

E20a

Lap and fit ***each*** metal-to-metal joint of each _____.

E20b

Hand fit and restore the contact between each exposed metal-to-metal, steamtight joint.

E20c

Machine, hand fit, and restore the contact between ***each*** exposed metal-to-metal, steamtight joint.

E20d

Machine, hand fit, and restore the contact between ***each*** exposed metal-to-metal and gasket seating surface, using 2.__ for guidance.

E20e

Inspect contact using blueing transfer method. Contact shall be ___ percent, with a continuous band of contact _____ wide between ***each*** inner bolting perimeter and ***each*** sealing surface pressure source.

E21a

Inspect contact using blueing transfer method. Contact shall be a minimum of ____ percent of total surface area, including a minimum of ____ percent continuous contact across ***each*** pressure sealing surface.

E21b

Inspect contact using blueing transfer method. Contact shall be a minimum of _____ percent of total surface area, including a continuous band with a minimum width of ____ percent of the distance from the pressure source to the inner bolting perimeter.

E21c

NOTE: FOR PUMPS WITH IMPELLER WEARING RINGS.

Inspect each assembled pump rotating assembly for concentricity to the shaft axis. Eccentricity at each bearing shaft sleeve and wearing ring mating area shall not exceed ____ inch total indicator reading.

E22

NOTE: USE FOR MINOR REPAIRS.

Restore each mating surface exposed by _____ removal. Repair by removing ***each*** high spot, burr, abrasion, and foreign matter, where removal can be accomplished by hand tools.

E23a

Remove ***each*** high spot, burr, abrasion, nick, corrosion, gasket material, and foreign matter from each exposed flange and mating surface.

E23b

Remove ***each*** burr and high spot from each exposed sliding surface, screw thread, key, and keyway.

E23c

Assemble each _____, using 2.__ for guidance.

E24a

Assemble each _____ in accordance with 2.__.

E24b

Assemble, install, align, adjust, and connect _____, fit and install each new _____ and each new part in accordance with 2.__:

E24c

Measure and record each final size and clearance, using 2.__ for guidance.

E25a

Measure and record each final size and clearance in accordance with 2.__.

E25b

Adjust and set the height of each worm gear, using 2.__ for guidance.

E26a

Adjust and set the height of each worm gear in accordance with 2.__.

E26b

Verify mesh alignment and contact, using blueing method.

E26d

Ensure ***each*** thrust face ***is*** square with shaft axis to within ____ inch total indicator reading.

E27

NOTE: FOR USE OF PRE-ESTABLISHED PARTS LIST FROM A TECHNICAL MANUAL OR OTHER REFERENCE.

Remove each existing and install new gasket, o-ring, pin, key, stud, bolt, and nut. Material shall conform to specifications in ____ of 2.__.

E28

Manually rotate each shaft prior to installation of pump shaft packing. Rubbing or binding of the rotating assembly not allowed.

E30a

Rotate shaft by hand one complete revolution. Binding or rubbing of the rotating assembly is not allowed.

E30b

NOTE: USE E31 AS A SUBPARAGRAPH WHEN SECURING DETAILS ARE INVOKED.

Apply antiseize compound conforming to MIL-PRF-907 on ***each*** high temperature fastener.

E31

NOTE: FOR TURBINE SEALING SURFACES.

Apply triple boiled linseed oil conforming to _____, with a viscosity of Z-8 or Z-9 on each metal-to-metal steam joint.

E32a

Apply high temperature sealing compound conforming to MIL-S-15204, Type C, on each _____.

E32b

NOTE: FOR REDUCTION GEAR, BEARING AND COUPLING COVERS.

Apply sealant conforming to MIL-S-45180, Type 2, on ***each*** metal-to-metal joint of each _____.

E33

NOTE: FOR STEAM AND STEAM DRAINS (50-100 PSIG - 425 DEGREES FAHRENHEIT).

Remove existing and install each new steam piping joint gasket and fastener. ***Each*** gasket shall conform to Graph Lock 3125SS/Graftech sheet gasket.

E34

NOTE: FOR STEAM AND STEAM DRAINS 600-1500 PSIG, 1000 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new steam piping joint gasket and fastener. ***Each*** gasket shall conform to MIL-G-24716.

E35

NOTE: FOR STEAM AND STEAM DRAINS 150-1500 PSIG, 775 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new steam piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716.

E36

NOTE: FOR PROPULSION PLANT SATURATED FEED SYSTEM 600-2050 PSIG, 300 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new feedwater piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716

E37

NOTE: FOR FRESH WATER - CHILLED WATER, FEEDWATER AND CONDENSATE 100 PSIG, 250 DEGREES FAHRENHEIT (MAXIMUM), i.e., HH-P-151, CLASS I, CLOTH INSERTED RUBBER, MIL-PRF-1149, TYPE II, CLASS I, SYNTHETIC RUBBER.

Remove each existing and install new fresh water piping joint gasket and fastener. Gaskets shall conform to ___, ___, ___.

E39

NOTE: FOR SALT WATER, INCLUDING SUCTION SEA CHEST STEAM OUT CONNECTIONS, 50-250 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new salt water piping joint gasket and fastener. Gaskets shall conform to HH-P-151, Class I, cloth inserted rubber, or MIL-PRF-1149, Type II, Class I, synthetic rubber.

E40

NOTE: FOR SALT WATER 50-250 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new salt water piping joint gasket and fastener. Gaskets shall conform to MIL-PRF-1149, Type I, Class I, synthetic rubber.

E41

NOTE: FOR FUEL OIL 600-1200 PSIG, 775 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new fuel oil piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716.

E42

NOTE: FOR DIESEL FUEL OIL 200 PSIG.

Remove each existing and install new fuel oil piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716.

E43a

NOTE: FOR GAS TURBINE POWERED SHIPS FUEL OIL 200 PSIG, 150 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new fuel oil piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716.

E43b

NOTE: FOR LUBRICATING OIL 50 PSIG, 180 DEGREES FAHRENHEIT (MAXIMUM) i.e., HH-P-151, CLASS I, CLOTH INSERTED RUBBER, MIL-PRF-1149, TYPE II, CLASS I, SYNTHETIC RUBBER.

Remove each existing and install new lubricating oil piping joint gasket and fastener. Gaskets shall conform to ___, ___, ___.

E44

NOTE: FOR LUBRICATING OIL 150 PSIG, 250 DEGREES FAHRENHEIT (MAXIMUM).

Remove each existing and install new lubricating oil piping joint gasket and fastener. Gaskets shall conform to MIL-G-24716.

E45

NOTE: FOR INSTALLATION OF NEW HOLD-DOWN BOLTING FOR MACHINERY WHERE SELF-LOCKING NUTS ARE NOT REQUIRED.

Remove each existing and install new hold-down bolt and nut conforming to MIL-DTL-1222, Type III, Grade 5, alloy steel.

E46

NOTE: FOR INSTALLATION OF NEW HOLD-DOWN BOLTING FOR MACHINERY WHERE SELF-LOCKING NUTS ARE REQUIRED. IDENTIFY TYPE OF MATERIAL FOR SELF-LOCKING NUTS.

Remove each existing and install new hold-down bolt conforming to MIL-DTL-1222, Type III, Grade 5, and self-locking nut conforming to NASM-25027, ___.

E47

Install each new aluminized cloth spray shield on _____ pipe, valve flange and component in accordance with ASTM F 1138.

E48

Fill each _____ to the full mark with new _____ conforming to _____.

E49

Allowable leakage at each new and disturbed joint: None.

E50

NOTE: NICKEL COPPER ALUMINUM (K-MONEL) BOLTING OF SEA VALVES AND PIPE JOINTS - SHALL BE USED ON INBOARD AND OUTBOARD FLANGES AND BONNET JOINTS WHERE INTEGRITY OF THE HULL AGAINST THE SEA IS CONCERNED; ALSO WHERE VALVES ARE NOT READILY ACCESSIBLE FOR INSPECTION OR MAINTENANCE, i.e., MIL-DTL-24696, COMPRESSED ASBESTOS, MIL-G-24716, GASKET, METALLIC-FLEXIBLE GRAPHITE, SPIRAL WOUND OR ASME B16.20.

SELF-LOCKING NUTS SHALL NOT BE USED ON BOILER BLOWDOWN AND DISCHARGE PIPING.

Remove each existing and install new gasket and fastener. Gaskets shall conform to___ , ___, ___.

E51

NOTE: INVOKE APPLICABLE 009-12 REQUIREMENTS.

Weld build-up the ***each*** cracked, worn, and eroded area of each _____ and machine to dimensions and contours in accordance with 2.__.

E52a

Handwork and skim cut each machined, sealing, aligning, mating, and gasket surface.

E53

NOTE: SPECIFY TYPE OF MATERIAL AND MIL-SPEC.

Install and fit each new chock and shim conforming to _____ to accomplish alignment.

E55a

NOTE: FOR PUMPS AND TURBINES, SHIMS SHALL CONFORM TO SAE-AMS-QQ-S-763, CRES, GRADE 304.

Install and fit each new shim conforming to _____ to accomplish alignment.

E55b

Drill and ream each equipment support foot and foundation. Fit and install each new tapered dowel.

E56a

NOTE: SPECIFY TYPE OF MATERIAL.

Drill and ream ***each*** equipment support ***foot*** and foundation. Fit and install new ***each*** _____ tapered dowels in each unit to retain unit alignment.

E56b

NOTE: TO MINIMIZE THE POSSIBILITY OF STRAINER BAG RUPTURE, THE USE OF NYLON VICE MUSLIN FILTER BAGS (BECAUSE OF THEIR GREATER STRENGTH) IS RECOMMENDED.

Install new ***each*** nylon filter bag in each strainer. ***Each*** filter bag shall be of continuous filament nylon cloth, scoured finish, 80 by 80 thread, 75 to 100 micron fiber thickness, 125 to 200 micron holes in cloth.

E59a

NOTE: FOR USE IN LUBE OIL SYSTEMS WHERE RUPTURE OF FILTER BAG IS NOT PROBABLE.

Install new ***each*** cotton muslin filter bag with material conforming to CCC-C-432, Type 7, Class One, in each strainer.

E59b

Chase and tap each exposed threaded area.

E62

Install new ***each*** coupling assembly and key on each _____.

E64a

Bore each coupling hub concentric and to size of shaft diameter within 0.001 inch total indicator reading and perpendicular to the face within 0.001 inch.

E64b

Cut ***each*** keyway in each new coupling and fit ***each*** new key to ***each*** mating shaft and coupling hub.

E64c

Align each coupling concentric to within ____ inch total indicator reading and parallel to within ____ inch gaged at the major diameter of the coupling face.

E64d

Inspect each bearing stave prior to installation aboard ship by probing with a pen knife or similar device at the rubber-metal interface around the total periphery of the stave to locate any unbonding of rubber from metal. A total cumulative length of unbonding greater than one inch, or any unbonding allowing the knife blade to be inserted deeper than one-fourth inch, shall be cause for rejecting the stave.

E65

Measure crankshaft deflection in accordance with 2.__.

E66

Machine each brake drum a minimum amount to remove scoring, pitting, and eccentricity. Each drum shall be concentric to the drum bore within ____ inch total indicator reading.

E67

Clean each sump free of foreign material.

E68

Hone each _____ to remove glazing, scoring, and ridging.

E69

NOTE: USE THE FOLLOWING WHEN CLEANING STEAM TURBINE INTERNALS, i.e., ROTORS, BLADING, CASING INTERNAL SURFACES.

Blast clean each _____ with non-erosive cleaning agent.

E72a

Ensure cleaning agent is aluminum oxide with a particle size no coarser than 220 grit. Other cleaning agents such as glass beads, ash, and walnut shells are acceptable provided that the resultant finish is equivalent to that provided by 220 grit or finer aluminum oxide. The use of sand is prohibited.

E72b

Protect each machined surface against the action of the cleaning agent.

E72c

Measure runout of each _____ shaft using dial indicator.

E73

Assemble each pump rotating assembly, using 2.__ for guidance.

E74

Clear each gage line and fitting free of foreign matter and obstructions.

E75

NOTE: FOR USE WITH A13a AND A13b WHEN LIGHT-OFF ASSESSMENT (LOA)/PROPULSION EXAMINATION BOARD (PEB) RELATED.

Ensure calibration is accomplished within ____ days preceding the scheduled LOA lock-out date.

E77

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E79a-E79d Phrases deleted. Invoke SI 009-115 for Rebabbitting.

Polish each _____ to a _____ root mean square average for roughness.

E82

Align each motor and compressor pulley to within ____ inch parallel alignment. ***Each*** belt shall depress ____ inch at a point midway between ***each*** pulley.

E83

Inert system with a positive pressure of 2 PSIG, using dry, oil-free nitrogen and a nitrogen regulator.

E84a

Install relief valve downstream of nitrogen regulator and set at 5 PSIG.

E84b

NOTE: SPECIFY TYPE OF MATERIAL.

Drill and ream ***each*** equipment support ***foot*** and foundation. Fit and install ***each*** new ____ tapered dowel in each unit. ***Each*** dowel shall be located in accessible locations for ease of removal that will retain unit alignment.

E86

Clear and clean each pocket and passage free of ***each*** obstruction and foreign matter.

E87

Test each remote valve operator assembly for ease of operation and alignment by opening and closing each valve from its remote operating station through 3 complete cycles. Allowable binding: None.

E88

NOTE: FOR USE ON NON-PRESSURE BOUNDARY APPLICATIONS SUCH AS COUPLING TAPER FITS, SPOTTING IN FOUNDATION LINERS, OR OTHER GENERAL APPLICATIONS WHERE BLUEING IS APPROPRIATE.

Inspect contact between _____ and _____ using the blueing transfer method. Contact shall be a minimum of _____ percent, evenly distributed over ***each*** contact surface.

E89