POWER PLANT - MAINTENANCE PRACTICES (PT6A-114/PT6A-114A)

1. General

A. Powerplant maintenance practices include the PT6A-114/PT6A-114A engine removal/installation and engine build-up.

2. Engine Removal/Installation

A. Remove Engine (Refer to Figure 201 and Figure 202).

CAUTION: Chock main wheels and place a tailstand under tailcone before attempting engine removal.

(1) Turn electrical power off.

(2) Pull fuel firewall shutoff control out (off).

(3) Remove upper cowling doors and lower cowling panels.

(4) Drain residual fuel from lines and fuel filter using filter drain. Remove fuel supply hose at fuel heater. Remove fuel motive flow hose at fuel control unit.

(5) Remove right nose cap and oil cooler.

(6) Remove top cowl center panel assembly and nosecap.

(7) Remove propeller.

(8) Disconnect and remove propeller speed control cable.

(9) Remove the left nose cap/induction air duct/inertial air separator.

(10) Disconnect cabin heater bleed air line at flow control valve and bleed air hose at mixing air valve.

(11) Remove starter/generator cooling air hose from starter/generator.

(12) Remove engine fire detector wiring harness.

(13) Disconnect electrical wiring connectors and ground wires at the following equipment locations:

(a) Propeller overspeed governor and ITT harness (left front of engine).

(b) Propeller tachometer generator (right front of engine).

(c) Cabin bleed air heater flow control valve (lower right side of engine).

(d) Oil temperature sensor (right side of engine).

(e) Fuel control heater (right rear of engine).

(f) Gas generator section tachometer generator (lower right side of engine).

(g) Starter/generator (center top of engine accessory case).

(h) Ignition exciter high tension leads at ignition exciter (right engine mount truss).

(14) Disconnect engine power control cables at fuel control unit.

(15) Remove torquemeter pressure and vent lines at forward upper right side of engine mount truss.

(16) Connect hoist sling to forward and aft lifting brackets and connect sling to engine hoist.

(17) Raise hoist to just support weight of engine and remove nuts and bolts at each of four corners of engine mounting ring.

(18) Ensure all wiring and lines are free, then carefully move hoist and engine forward to clear engine mount truss.

(19) If engine is to be returned for overhaul or replaced, remove the following items:

(a) Engine induction air plenum. Refer to Chapter 71, Engine cowling and Nose Cap - Maintenance Practices.

(b) Engine mount ring, elastomers, and engine mount brackets. Refer to Chapter 71, Engine mount - Maintenance Practices.

(c) Propeller overspeed governor. Refer to Chapter 61, Propeller Control - Maintenance Practices.

(d) Propeller tachometer generator. Refer to Chapter 77, Propeller RPM Indicator - Maintenance Practices.

(e) Oil temperature sensing sensor . Refer to Chapter 79, Oil Indicating - Maintenance Practices.

(f) Oil cooler bracket and pressure/return hoses. Refer to Chapter 79, Oil Distribution - Maintenance Practices.

(g) Standby alternator (if equipped). Refer to Chapter 24, Standby Electrical System - Maintenance Practices.

(h) Torque sensing line and fittings.

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B. Install Engine (Refer to Figure 201 and Figure 202).

(1) Install engine mount brackets, elastomers, and engine mount ring. Refer to Chapter 71, Engine mount - Maintenance Practices.

(2) Connect lifting hoist sling to forward and aft lifting brackets on engine and lift engine into position forward of engine mount truss.

(3) Make sure that all engine lines and equipment are clear.

(4) Put lubrication on the engine mount bolts before you install them to prevent corrosion.

(5) Move the hoist and engine aft to align the engine mount ring holes with the holes in the engine mount truss.

(6) Install the mount bolts (engine mount truss to engine mount ring) and torque the bolt/nuts to 450 to 500 inch-pounds (50.8 to 56.4 N-m). Remove the hoist and sling.

(7) Connect torquemeter pressure and vent lines at upper left firewall. Bleed torquemeter indicating system.

(8) Connect engine power controls at fuel control unit. Rig controls.

(9) Connect the electrical leads of the following items of electrical equipment:

(a) Ignition exciter high tension leads at ignition exciter (right engine mount truss).

(b) Starter/generator (center top of engine accessory case).

(c) Gas generator section tachometer generator (lower right side of engine).

(d) Fuel control heater (right rear of engine).

(e) Oil temperature sensor (right rear of engine).

(f) Cabin bleed air heater flow control valve (lower right side of engine).

(g) All engine to engine mount ground straps.

(h) Propeller overspeed governor and ITT harness (left front of engine).

(i) Propeller tachometer generator (right front of engine).

(10) Install engine fire detector warning harness.

(11) Connect starter/generator cooling air hose to starter/generator.

(12) Connect engine bleed air line to cabin bleed air heater flow control valve. Connect engine bleed air hose to cabin bleed air heater mixing air valve.

(13) Install left nosecap/induction air duct/inertial air separator, if not previously installed.

(14) Install propeller, if not previously installed.

(15) Install and connect propeller governor control cable.

(16) Install left and right nosecap bulkhead assemblies and top cowling center panel.

(17) Install oil cooler and right nosecap.

(18) Connect fuel supply hose at fuel heater and fuel motive flow hose at fuel control unit.

(19) Push fuel firewall shutoff control fully in.

(20) With fuel line disconnected at fuel manifold below engine, motor engine with starter to purge fuel lines.

(21) Start engine and perform operational check. Refer to Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual.

(a) Use the Pratt and Whitney PT6A-114/-114A/-135/-135A Engine Maintenance Manual with the Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual to do the operational check of the different components on the engine.

(22) Shut down engine and check for fluid leaks, connections or hardware, etc.

(23) Replace engine cowling.

3. Engine Build-Up Precautions

A. The following precautions should be followed throughout the build-up of an engine.

(1) Take extreme care to prevent dirt, hardware, tools or other foreign material from entering engine.

(2) Do not remove packings and gaskets from their packages until needed for assembly purposes.

(3) Clean packings and gaskets, if necessary, prior to installation with dry air under pressure or with clean, lint-free rags

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Do not use solvents.

(4) Visually inspect all packings and gaskets for cuts, nicks, and other flaws prior to installation. In no case shall packings and gaskets that are damaged or altered be used.

(5) Lubricate gaskets, packings, and back-up rings with the appropriate system fluid before installation.

(6) Handle fuel and oil lines carefully to avoid denting or scratching them. Be especially careful not to damage the threads of fittings and line coupling nuts.

(7) Caps should not be removed from lines until immediately before installation. If lines are disconnected for any reason, they should be recapped until ready for connection. Also, all installed lines, ducts, and electrical connectors that terminate with open ends should be capped or covered in a suitable manner to exclude the entrance of dirt and foreign objects.

(8) Before installing any part, be sure it is thoroughly clean. Brushes used in cleaning should not mar or scratch the metal surface.

(9) When making fuel and oil connections, apply anti-seize compound (JAN-A- 669) to male threads sparingly, being careful not to permit entry into lines.

(10) Do not twist hose assemblies when installing. The stripe on the sides of the hose will show if any twist exists. A twisted hose under pressure may fail or loosen itself.

(11) It is important to use correct size and type of clamps when securing various hoses, tubing, and wire bundles directly to engine or to engine via brackets. If clamps of insufficient size are used and tightened excessively, the line may be damaged by not being able to slip through the clamps when the engine grows because of thermal expansion. Route and clamp all lines as shown. This will aid in keeping line chafing to a minimum after engine installation.

(12) All electrical bonding, grounding, and mating surfaces shall be clean metal surfaces free of anodic films, oxides, grease, paint, or other high-resistance film. Whenever paint has been removed to make connections, the connections shall be refinished to prevent corrosion.

(13) Use lockwire to secure bolts and fittings as required.

4. Engine Build-Up

A. Install the following items of equipment on the engine before proceeding to install on the airplane.

(1) Standby alternator (if equipped). Refer to Chapter 24, Standby Electrical System - Maintenance Practices.

(2) Oil cooler pressure and return hoses. Refer to Chapter 79, Oil Distribution - Maintenance Practices.

(3) Primary exhaust stack. Refer to Chapter 78, Primary and Secondary Exhaust Duct - Maintenance Practices.

(4) Starter/generator. Refer to Chapter 80, Starter/Generator - Maintenance Practices.

(5) Oil temperature sensing sensor. Refer to Chapter 79, Oil Indicating - Maintenance Practices.

(6) Propeller tachometer generator. Refer to Chapter 77, Propeller RPM Indicator - Maintenance Practices.

(7) Propeller overspeed governor. Refer to Chapter 61, Propeller Control - Maintenance Practices.

(8) Engine induction air plenum. Refer to Chapter 71, Engine cowling and Nose Cap - Maintenance Practices.

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Figure 201 : Sheet 1 : Engine Installation

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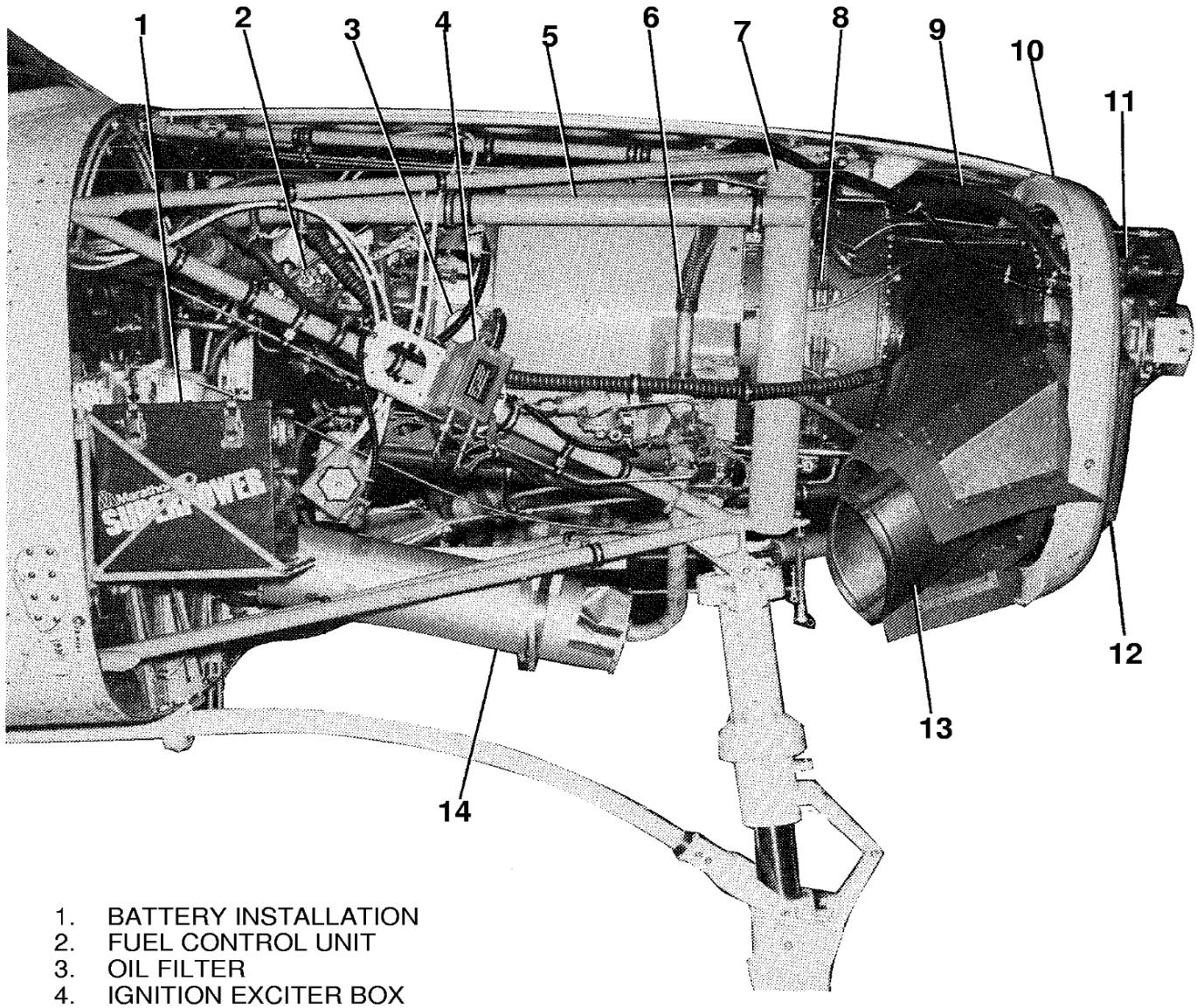

1. BATTERY INSTALLATION
2. FUEL CONTROL UNIT
3. OIL FILTER
4. IGNITION EXCITER BOX
5. STARTER/GENERATOR COOLING AIR BLAST TUBE
6. BLEED AIR PRESSURE LINE
7. ENGINE MOUNT RING
8. FUEL MANIFOLD
9. OIL RETURN FROM OIL COOLER
10. RIGHT COWLING BULKHEAD
11. PROPELLER GOVERNOR
12. OIL COOLER
13. PRIMARY EXHAUST STACK
14. BLEED AIR HEATER MUFFLER

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Figure 201 : Sheet 2 : Engine Installation

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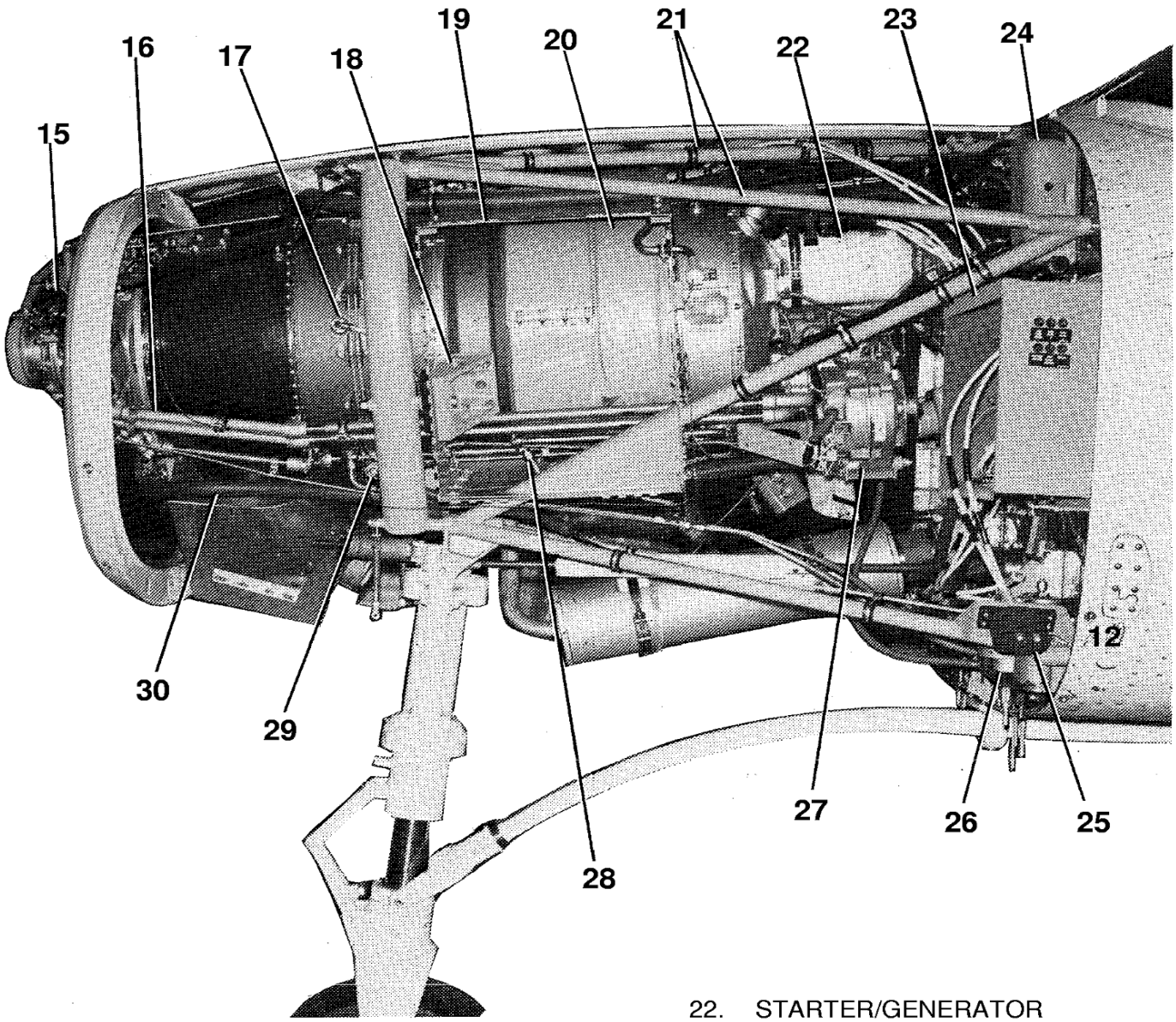

15. PROPELLER OVERSPEED GOVERNOR
16. REDUCTION GEARBOX OIL LINES
17. SPARK IGNITER
18. ENGINE MOUNT BRACKET
19. INDUCTION AIR PLENUM
20. COMPRESSOR INLET
21. ENGINE MOUNT TRUSS
22. STARTER/GENERATOR
23. POWER DISTRIBUTION BOX
24. STANDBY ALTERNATOR CONTROL UNIT
25. AUXILIARY POWER RECEPTACLE
26. FUEL FILTER
27. STANDBY ALTERNATOR
28. COMPRESSOR DRAIN LINE
29. FUEL MANIFOLD DUMP VALVE
30. OIL COOLER PRESSURE HOSE

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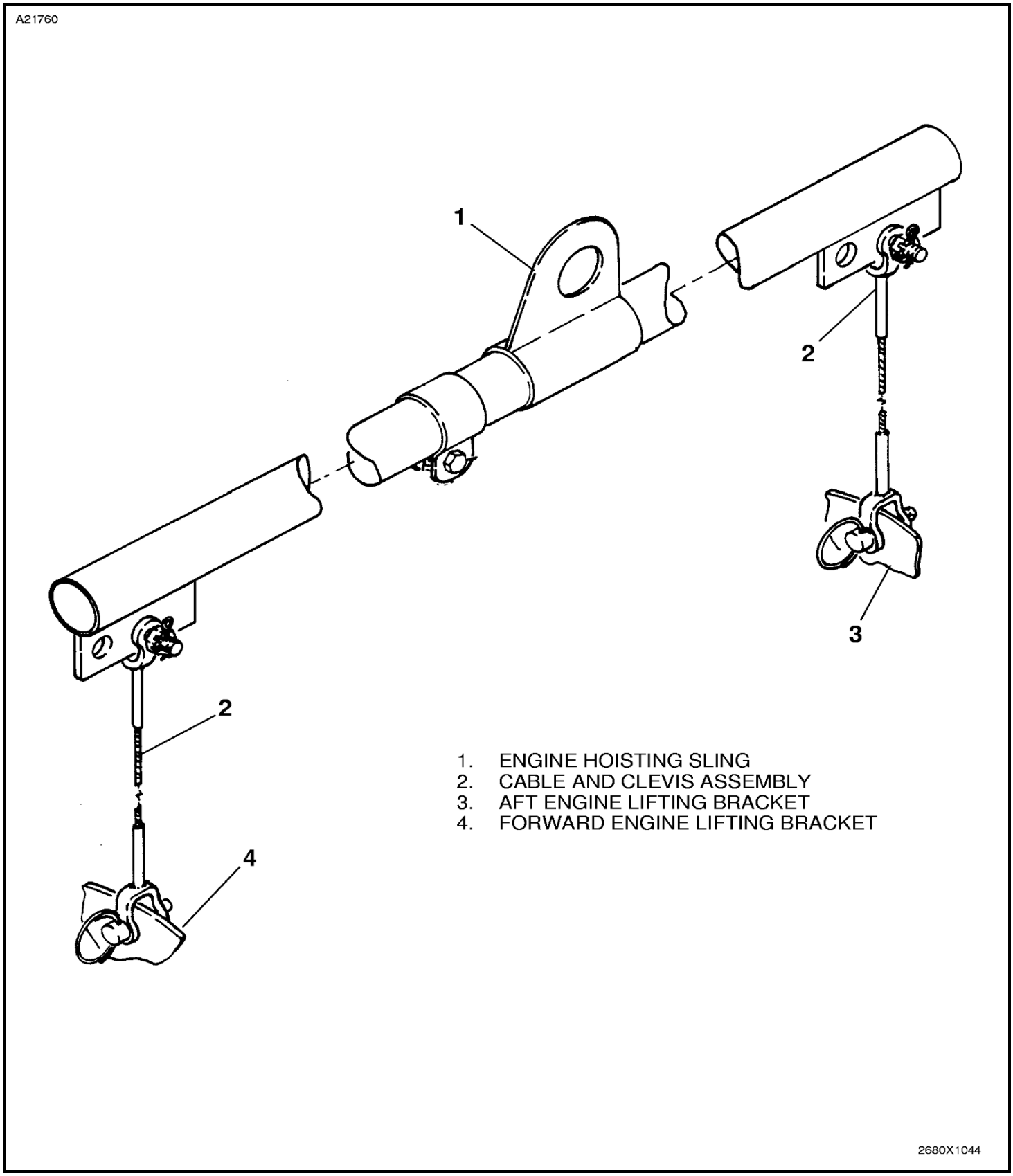
Figure 202 : Sheet 1 : Engine Hoisting Sling



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