UNIT-5

OVERHAUL PROCEDURES

MAINTENANCE PROCEDURES

- Engine Overhaul procedures
- Inspections and cleaning of components
- Repairs schedules for overhaul
- Balancing of Gas turbine components
- Trouble Shooting - Procedures for rectification – Condition monitoring of the engine on ground and at altitude-engine health monitoring and corrective methods

OVERHAUL

- After a certain number of hours of operation , an engine undergoes various changes which makes overhaul necessary.
- **Critical dimensions** in the engine are a changed as a result of wear and stress thus decrease the performance
- Foreign materials ,including sludge ,gums, coorecive substances and abrasive substances, accumulate in engine.
- One or more parts may actually fail.
- The recommendation overhaul time is determined by the manufacturer.

THE BASIC STEPS OF THE OVERHAUL PROCESS

- Receiving inspection
- Disassembly
- Visual inspection
- Cleaning
- Structural inspection
- Dimensional inspection
- Repair and replacement
- Reassembly
- Installation
- Engine testing and run in
- Preservation and storage

Piston Engine Testing Procedure After Overhaul

- **Pre-oiling: B**efore the engine is started for the first time, it should be pre-oiled to remove air trapped in oil passages and lines and to ensure that all bearing surfaces are lubricated.
- **One method:** One spark plug is removed from each cylinder. The crankcase or external oil tank to be filled with oil for run in, and the engine is cranked with the starter until an oil pressure indication is read on the oil pressure gage.

Piston Engine Testing Procedure After Overhaul

- **Another** method: oil is forced by means of a pressure oiler at a prescribed pressure, through the oil galleries until it comes out an oil outlet or the opposite end of an oil gallery.
- **Power check:** Manufacturer's overhaul manual provides instruction and run in schedule for a newly overhauled engine. The purpose of run in is to permit newly installed parts to burnish or wear in, piston rings to seat against cylinder wall, and valves to become seated. And also makes it possible to observe the engines operation under controlled conditions and to ensure proper operation from idle to 100 percent power. The time during which an engine is operated at full power is referred to as power check. The run in should be accomplished with the engine installed in a test cell equipped as specified in the manufacturer's overhaul manual.

Piston Engine Testing Procedure After Overhaul

- **Oil consumption run:** An oil consumption run is made at the end of the test. Record the oil temperature. Stop the engine. Place a previously weighed container under the oil tank or oil sump and remove the drain plug. Allow the oil to drain for 15 mints. Replace the drain plug. Weigh the oil and the container. Record the weight of the oil (total weight less the weight of the container). Replace the oil in the tank or sump. Start the engine, warm up the engine to the specified rpm± 20rpm and operate at this speed for 1 hour. At the end of one hour of operation with the same oil temperature drain the oil as before. The difference in oil weights at the start and end of the run will give the amount of oil used in 1hour.

Manufacturer's overhaul manual

Every engine overhaul manual must be carried out in accordance with the instructions given to the manufacturer's manual.

It provides information on all procedures of a special nature and on general procedures for disassembly, cleaning, inspection, repair, modification, reassembly and testing of engines.

Certification of overhaul station

- To provide overhaul services for certificated aircraft engines, an overhaul agency should be an FAA certified repair station with ratings covering all the types of overhaul work performed.
- A facility for the maintenance,repair,and alterations of airframes, power plants, propellers, or appliances ,holding a valid repair station certificate with appropriate ratings issued by the administrator.

Shop safety and preparation for overhaul

In the preparation of the overhaul shop all required equipment must be on hand.

In the operation of the shop it is more important that adequate safety practices be exercised.

Safety involves design ,arrangement of the shop ,use of proper tools and equipment and observance of safety practices by overhaul technicians and their helpers.

Safety engineer should be asked to make periodic inspections of the shop and shop operations to check unsafe practices and conditions