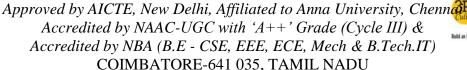
SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution)





DEPARTMENT OF AEROSPACE ENGINEERING

19ASB303 AIRCRAFT MAINTENANCE ENGINEERING

UNIT II - GROUND SERVICING OF VARIOUS SUB SYSTEMS Ground Units Used in Aircraft Maintenance

Ground units are essential tools and equipment used to maintain, service, and support aircraft operations while on the ground. They play a crucial role in ensuring the aircraft remains in optimal condition, adheres to safety standards, and is ready for its next flight.

Key Ground Units and Their Functions

- 1. Ground Power Unit (GPU)
- **Function:** Provides electrical power to the aircraft while it is on the ground and the engines or Auxiliary Power Unit (APU) are off.
- Applications:
- o Powering avionics systems for pre-flight checks.
- o Operating lights, air conditioning, and other systems during boarding.
- **Example:** A 28-volt DC or 115-volt AC GPU is used for modern aircraft like the Boeing 737 or Airbus A320.
- 2. Air Start Unit (ASU)
- **Function:** Supplies compressed air to start the aircraft's engines when the onboard APU is unavailable or non-functional.
- Applications:
- Starting engines of larger aircraft, such as Boeing 777 or Airbus A350.
- Used in extreme weather conditions where the APU might struggle.
- **Example:** A pneumatic ASU connected to the engine bleed air system.
- 3. Hydraulic Ground Power Unit (Hydraulic Mule)
- **Function:** Provides hydraulic pressure to test and operate hydraulic systems during maintenance.
- Applications:
- o Testing landing gear operation, flight control surfaces, and brakes.
- o Flushing hydraulic systems to remove contaminants.
- **Example:** Hydraulic test rigs used for the Boeing 747's landing gear systems.
- 4. Aircraft Tug or Tow Tractor
- **Function:** Moves aircraft on the ground without using its engines, conserving fuel and reducing wear.
- Applications:

- Towing aircraft to maintenance hangars or parking areas.
- Repositioning aircraft for gate or runway access.
- **Example:** Electric tow tractors for small aircraft and diesel-powered tugs for larger aircraft like the Airbus A380.

5. Fuel Bowser (Fuel Truck)

- **Function:** Supplies aviation fuel to the aircraft during refueling operations.
- Applications:

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- Refueling during routine maintenance or pre-flight operations.
- o De-fueling to inspect fuel tanks or during repairs.
- **Example:** Jet A-1 fuel trucks for commercial airlines.

6. Air Conditioning Unit (ACU)

- **Function:** Supplies conditioned air (heating or cooling) to the aircraft cabin while on the ground.
- Applications:
- o Maintaining cabin temperature for passenger and crew comfort during boarding or maintenance.
- o Testing and troubleshooting the onboard air conditioning system.
- **Example:** Mobile air conditioning carts for ground use.

7. Nitrogen Cart

- **Function:** Supplies nitrogen for inflating tires and pressurizing hydraulic systems.
- Applications:
- Aircraft tire inflation to maintain proper pressure.
- o Pressurizing accumulators in hydraulic systems.
- **Example:** Portable nitrogen carts for routine maintenance.

8. De-Icing Unit

- **Function:** Removes ice, snow, or frost from the aircraft's critical surfaces.
- Applications:
 - De-icing during winter operations to ensure safe takeoff.
- o Anti-icing application to prevent future ice accumulation.
- **Example:** Glycol-based de-icing trucks used at airports.

9. Lavatory Service Vehicle

- **Function:** Removes waste from aircraft lavatories and replenishes them with clean water.
- Applications:
- Regular servicing of lavatory systems before flights.
- o Ensuring passenger comfort and hygiene.
- **Example:** Vacuum-based lavatory servicing vehicles.

10. Potable Water Truck

- **Function:** Supplies fresh water to the aircraft for passenger and crew use.
- Applications:
- o Filling water tanks for galley and lavatory use.

- Ensuring potable water supply for long-haul flights.
- **Example:** Water trucks with sterilized hoses for hygiene compliance.

11. Oxygen Servicing Cart

- **Function:** Refills oxygen systems used for passenger masks and cockpit operations.
- Applications:
- Supplying oxygen to emergency systems.
- o Refilling oxygen bottles after a deployment or routine check.
- **Example:** Portable oxygen filling carts used for commercial aircraft.

12. Fire Extinguishing Equipment

- **Function:** Provides fire safety during maintenance and servicing.
- Applications:
- Emergency response in case of fire during fueling or repairs.
- o Ensuring safety during engine or APU tests.
- **Example:** Foam-based fire extinguishers and fire suppression systems.