

**TECHNICAL MANUAL
CHECKLIST**

**CONCURRENT FUEL
SERVICING OF COMMERCIAL
CONTRACT CARGO AND
PASSENGER AIRCRAFT**

**APPLICABLE TO B-707, B-727,
B-737,
B-747, B-757, B-767, B-777, DC-8,
DC-9, DC-10, L-1011, MD-11,
MD-81,
MD-82, MD-83, MD-88, MD-90, AND
AIRBUS
A300/A310/A318/A319/A320/A321
/A330/A340/A380 AIRCRAFT**

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FOREWORD

1 GENERAL.

This checklist provides, in abbreviated form, procedures for concurrent fuel servicing of commercial contract cargo and passenger aircraft (with or without passengers on board). The items in this checklist preceded by an asterisk will be used for concurrent fuel servicing cargo aircraft and aircraft without passengers on board. The intent of this checklist is to eliminate the probability of the omission of a step in the accomplishment of an intended task. The procedures contained herein are presented in the shortest practical form for use by qualified personnel and are not intended to provide full technical instructions.

NOTE

On C/KC-135 (all models), MAF and Commercial aircraft, concurrent servicing SSEA is not required unless loading/downloading munitions or explosives, OR servicing LOX while performing maintenance. If none of the above apply, simultaneous servicing of fuel while loading passengers and cargo, performing maintenance, aircrew members performing inspections, or operating aircraft systems is considered to be a normal CONCURRENT servicing operation. Restrictions listed in Paragraph 5.6 and Paragraph 5.7 still apply.

2 PURPOSE.

The requirements of this checklist must be adhered to when the concurrent fuel servicing of commercial aircraft is accomplished on a military installation. Concurrent servicing is the simultaneous servicing of fuel or oxygen with either passengers on board or the performance of minor maintenance, fleet servicing, or baggage or cargo loading/unloading operations.

3 SCOPE.

This checklist contains the steps necessary for preparation and performance of concurrent servicing. It does not contain all the safety precautions, notes, cautions, and warnings of a general or specific nature con-

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tained in TO 00-25-172. It is the responsibility of all involved functional managers to make sure personnel participating in the operation are thoroughly trained in these procedures.

4 ABBREVIATIONS.

All abbreviations used in this manual are shown in the list of abbreviations below. Standard abbreviations are in accordance with ASME Y14.38, Abbreviations and Acronyms for Use on Drawings and Related Documents.

AF	Air Force
AFTO	Air Force Technical Order
AIS	Aircraft Interior Supervisor
ARFF	Aircraft Rescue and Fire Fighting
CONCOR	Contract Coordinator
CSS	Chief Servicing Supervisor
FSSZ	Fuel Servicing Safety Zone
GPU	Ground Power Unit
PSI	Pounds per Square Inch
RAT	Ram Air Turbine
REO	Refueling Equipment Operator
SCR	Supervisory Contractor Representative
SPR	Single Point Receptacle
TO	Technical Order
WVM	Wing Vent Monitor

5 RELATED PUBLICATIONS.

NOTE

When searching Technical Order (TO) numbers in the Enhanced Technical Information Management System (ETIMS) catalog, please use the wildcard (*) after typing in the TO number. Many TOs are not available in paper format, (i.e., digital (WA-1) or Compact Disk (CD-1)). This ensures TOs in all media formats will populate the search.

The following publications contain information in support of this technical manual.

List of Related Publications

Number	Title
ASME Y14.38	Abbreviations and Acronyms for Use on Drawings and Related Documents
DODI 5330.03_AFI 33-395	Defense Logistics Agency (DLA) Document Services
TO 00-5-1	AF Technical Order System
TO 00-25-172	Ground Servicing of Aircraft and Static Grounding/Bonding
TO 00-25-234	General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment
TO 36-1-191	Technical and Managerial Reference for Motor Vehicle Maintenance

6 RECORD OF APPLICABLE TIME COMPLIANCE TECHNICAL ORDERS (TCTOs).

List of Time Compliance Technical Orders

TCTO Number	TCTO Title	TCTO Date
None		

7 HCI HARDNESS CRITICAL ITEMS (HCI).



The HCI symbol (**HCI**) establishes special requirements limiting changes and substitutions and that the specific parts listed must be used to ensure hardness is not degraded.

If included, items with nuclear survivability requirements are marked with the HCI symbol (**HCI**). All changes to, or proposed substitutions of, HCIs must be approved by the acquiring activity.

8  ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) ITEMS.



All ESDS parts shall be handled in accordance with the ESDS device handling procedures in TO 00-25-234.

If included, items containing ESDS parts are marked with the ESDS symbol ().

9 CHANGE RECOMMENDATIONS.

Recommendations proposing changes to this technical order shall be submitted on an Air Force Technical Order (AFTO) Form 22 in accordance with TO 00-5-1. Forward completed AFTO Form 22 to the Technical Order Management Agency (TOMA) at: robins.ce.afto22@us.af.mil.

SAFETY SUMMARY

1 GENERAL SAFETY INSTRUCTIONS.

This manual describes physical and/or chemical processes which may cause injury or death to personnel, or damage to equipment, if not properly followed. This safety summary includes general safety precautions and instructions that must be understood and applied during operation and maintenance to ensure personnel safety and protection of equipment. Prior to performing any specific task, the WARNINGS, CAUTIONS, and NOTES included in that task shall be reviewed and understood.

2 WARNINGS, CAUTIONS, AND NOTES.

WARNINGS and CAUTIONS are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are considered essential to protection of personnel (WARNING) or equipment (CAUTION). WARNINGS and CAUTIONS immediately precede the step or procedure to which they apply. WARNINGS and CAUTIONS consist of four parts: heading (WARNING, CAUTION, or icon), a statement of the hazard, minimum precautions, and possible results if disregarded. NOTES are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are not essential to protection of personnel or equipment. NOTES may precede or follow the step or procedure, depending upon the information to be highlighted. The headings used and their definitions are as follows:

**WARNING**

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in injury to, or death of, personnel or long term health hazards.



Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Highlights an essential operating or maintenance procedure, condition, or statement.

CHAPTER 1

SUPPORT EQUIPMENT FOR CONCURRENT REFUELING OPERATIONS

The following support equipment is required to follow the procedures set forth in this checklist.

- Electrical Generator Unit, if required.
- Aviation Hydrant Servicers (with passengers on board) or R5/R9/R11 refuelers with deadman controls and non-collapsible fuel servicing hose.
- Ground and Bonding Wires (as required).
- Ground and Bonding Wires (as required).
- Intercom Headsets, Contractor Supplied - A minimum of three (except B-757/767/777 aircraft which requires only two) for Air Force use with passengers on board (one 100-foot and two 50-foot or longer cords) and one for the contractor fuel control panel operator (four total). A minimum of two for Air Force use on non-passenger aircraft (one 100-foot and one 50-foot or longer cords) and one for the contractor fuel control panel operator (three total). If don't have access to commercial communication cords and headsets, hand held intrinsically safe radios should be used.
- Air Conditioner (if required).
- Fire Extinguisher, 150-pounds Halon, or equivalent.
- Vest with Chief Servicing Supervisor (CSS) Lettering.
- Aircraft Rescue and Fire Fighting (ARFF) Vehicle (required only when servicing with JP-4 or Jet B fuel and passengers are on board).
- Passenger Handling Equipment.
- Ramp and Stairs (as required).
- Baggage Handling Equipment (as required).
- Fleet Servicing and Catering Equipment (as required).
- Maintenance Stands.
- Cargo Handling Equipment.

1.1 PERSONNEL AND PERSONNEL LOCATIONS.

*CSS

Stationed at nose of aircraft. Moves as required. Monitor wing fuel vents on the opposite side of the aircraft from the Single Point Receptacle (SPR).

	(One individual can monitor both fuel vents/SPR's on cargo aircraft and when passengers are not on board).
*Refueling Equipment Operator (REO)	Stationed at refueling equipment unit.
Transportation	Passenger and baggage/cargo areas as required.
Contract Coordinator (CONCOR)	Passenger and cabin area as required.
Aircraft Interior Supervisor (AIS)	Stationed in the cockpit of B-757/767/777 aircraft to maintain voice contact with the CSS and to alert personnel remaining in the cabin area in case of emergencies.

NOTE

When fuel servicing with government-provided fuel on a United States Air Force (or other) installation, the United States Air Force (or other service) shall furnish additional personnel for monitoring each fuel nozzle connection where the number of personnel required exceeds those specified in the contract.

*Supervisory Contractor Representative (SCR)	Stationed at maintenance stand with access to refueling control panel and SPR nozzle connections. This duty can be performed by a designated representative allowing the SCR to position himself as required. Monitor fuel vents on the same side of the aircraft as the SPR connections and/or fuel control panel.
Cabin Crew	One attendant positioned at each passenger exit when passengers are on board.

NOTE

*The CSS will wear a reflective vest with the letters CSS on the front and back. Letters will be at least six inches in height and four inches wide, and of reflective material. Reflective material used must be at least one inch wide.

- a. The refueling team will consist of a CSS, SCR, and, when fuel servicing with passengers on board the aircraft, a passenger compartment monitor.

- b. THE CSS SHALL HAVE FULL AND FINAL AUTHORITY DURING ALL PHASES OF THE CONCURRENT SERVICING OPERATION. RESPECTIVE TEAM CHIEFS FROM TRANSPORTATION, FLEET SERVICING, AND CATERING WILL BE RESPONSIBLE TO THE CSS TO ENSURE THEIR PERSONNEL COMPLY WITH ALL REQUIRED PROCEDURES DURING THE CONCURRENT SERVICING OPERATION. THE DEPLOYMENT OF ARFF EQUIPMENT AND PERSONNEL WILL BE UNDER THE CONTROL OF THE ON-SCENE FIRE CHIEF.

WARNING

Passengers may enter or exit the aircraft during fuel servicing provided either: a jetway is used; or, if a mobile staircase or aircraft integral stairs are used and the fuel servicing operation is on the opposite side of the aircraft and the passengers do not come closer than 25 feet from any aircraft fuel vent outlet. Failure to comply could result in injury to, or death of, personnel or long term health hazards.

CAUTION

*The 40K loader open-flame heater will not be used within the Fuel Servicing Safety Zone (FSSZ). Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

c. PRIOR TO CONCURRENT FUEL SERVICING OPERATIONS:

*The CSS must:

- (1) *Meet with SCR to determine, define, or make sure:
 - (a) *Status/condition of aircraft and its systems.
 - (b) *Specific servicing requirements.
 - (c) *If any unfamiliar system characteristics or deficiencies exist.
 - (d) *The duties and physical positioning of the carriers technical personnel during the concurrent servicing operation.
 - (e) *Timing of any maintenance required, cargo/baggage loading/unloading, fleet servicing, catering/food service functions, and any other function that requires personnel or equipment movement within the FSSZ.
 - (f) *Verify that any civilian vehicles, such as catering trucks

etc., involved in the concurrent servicing operation meet the requirements outlined in TO 36-1-191, pertaining to authorizations for use in the FSSZ. Powered support equipment is allowed in the FSSZ as long as it is at least 25 feet from pressurized servicing components and fuel vent outlets. Vehicles not designed or approved for use within a hazardous location may be moved into or within the FSSZ, if pressurization of the refueling equipment is stopped. Re-pressurization of the refueling equipment will not resume until the servicing vehicle's engine is shut down while in the FSSZ, or the vehicle leaves the FSSZ.

- (g) *Intercom headsets, required to be furnished by the contractor, will be available. (Two sets, one with 100 and one with 50 foot or longer cord for the use of military personnel and one set for contract carrier fuel control panel operator, total of three each, except for B-757/767/777 aircraft which requires only two). If don't have access to commercial communication cords and headsets, hand held intrinsically safe radios should be used.
- (2) *Brief each individual team chief on their duties and responsibilities. They are responsible for briefing their personnel on the following requirements:
 - (a) *Report to the CSS any condition that might jeopardize safety.
 - (b) *Coordinate all phases of their operation with the CSS.
 - (c) *When concurrent servicing operations are in progress, all personnel, unless previously cleared, shall report to and receive the CSS's concurrence prior to entering the concurrent servicing area.
 - (3) *Brief team members on emergency procedures. In the event of an emergency:
 - (a) *CSS shall stop fuel flow.

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- (b) *CSS shall determine if evacuation of passenger/team members from aircraft is required.
 - (c) *Initiate normal or emergency evacuation of aircraft as necessary.
 - (d) *If situation/hazard warrants, bring ARFF vehicle into action and turn operation over to ARFF personnel.
 - (e) *Assist ARFF personnel as required.
- (4) Ensure the Fire Department is notified at least 15 minutes before starting concurrent servicing operations, and, if personnel are remaining on board the aircraft, informed of the number of people involved.
 - (5) Verify ARFF vehicle is present in the immediate area when the aircraft is being serviced with JP-4 or Jet B fuel and when passengers are on board. ARFF vehicle is not required when servicing is not with JP-4 or Jet B fuel or when passengers are not on board or for cargo aircraft. However, Fire Department should be notified of impending concurrent servicing.
 - (6) Fueling stops if ARFF is withdrawn.
- d. BEFORE COMMENCING OPERATIONS:
- (1) *The CSS will coordinate:
 - (a) *Parking, chocking, and grounding or bonding of aircraft.



*Ground Power Unit (GPU) must be positioned outside the fuel servicing zone and when possible, uphill of the fuel servicing area, pressurized fuel servicing equipment, and fuel vents. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

(b) *Positioning and connecting GPU.

- (c) *Connection of intercom headsets.

NOTE

- *The CSS will remain in constant voice contact with personnel in the cockpit (when passengers, flight or ground crew members are on board), SPR/fuel vent monitor(s) and fuel control panel operator (Wing Vent Monitor (WVM) not required on B-757/767 aircraft).
 - *The B-757/767/777 aircraft have two completely separate intercom systems, flight and servicing. Therefore, the individual in the cockpit must take responsibility for notifying personnel in the cabin area in the event of an emergency.
- (2) *The CSS will:
- (a) *Check with the SCR to determine the status of the aircraft and its systems. If the fuel jettison system was used, fuel servicing will not be started until it is determined and verified that the jettison valves are closed.
 - (b) *Make sure cabin crew personnel have briefed passengers concerning fuel servicing.
- (3) *The CSS will direct and monitor the following equipment and personnel movement/positioning/connections:
- (a) *Direct support equipment to be positioned at aircraft.
 - (b) Positioning of air conditioner (if required) will be outside the FSSZ.
 - (c) Position lavatory servicing truck and portable water truck as required.
 - (d) *Positioning and bonding of hydrant hose cart(s) or refueling vehicles as required.



- Fuel hoses will not be connected to hydrant or aircraft SPR until deplaning passengers via a portable staircase are outside the concurrent servicing area. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.
- *Maintenance stands and equipment used in concurrent servicing must be positioned to make sure aircraft is not damaged when it settles during refueling operations. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.
 - (e) *Position maintenance stands and bond metallic stands to the aircraft when using the stands to access the aircraft SPR's or support a fuel servicing hose during fuel servicing operations.
 - (f) Make sure ramps and stairs are in their proper position and unobstructed to enable emergency egress.
 - (g) Advise servicing personnel to avoid the Ram Air Turbine (RAT) doors behind the right main landing gears on B-757/767/777 aircraft.

WARNING

Voice contact must be established and maintained at all times during the fuel servicing portion of concurrent servicing operations when passengers, flight or ground crew members are on board the aircraft. The aircraft intercom system should be used as the primary means of maintaining voice contact between the fuel servicing team members. If the aircraft intercom system is inoperative and cannot be used to maintain voice communications, portable hand-held radios may be used to provide voice contact subject to the following stipulations. Radios can be used within the FSSZ; however, only intrinsically safe radios can be used within 10 feet of any aircraft fuel vent outlet, fuel spill or fuel tank truck being filled from aircraft defueling. Failure to comply could result in injury to, or death of, personnel or long term health hazards.

- (4) *Direct all refueling team members to take their positions and establish voice contact.
 - (5) Make sure ARFF vehicle is in place prior to starting the refueling operation when servicing with JP-4 or Jet B fuel and when passengers are on board.
- e. *FUEL TRANSFER PHASE OF CONCURRENT SERVICING OPERATIONS:

WARNING

- *Maintenance and repair of aircraft electrical, radio, radar, fuel, or other systems requiring use of electrical power, shall not be accomplished during fueling operations. In addition, lines containing flammable or combustible liquids shall not be opened. Failure to comply could result in injury to, or death of, personnel or long term health hazards.
- *Only those aircraft switches required for concurrent servicing operations will be operated. Failure to comply could result in injury to, or death of, personnel or long term health hazards.
- *Vehicles shall not be allowed to operate/pass within 25 feet of aircraft fuel vents and pressurized fuel servicing system components (except Boeing 747/757/777 aircraft, including KC-46, which are acceptable for having authorized vehicles pass underneath but may not stop or be parked directly beneath the fuel vent outlets). Failure to comply could result in injury to, or death of, personnel or long term health hazards.
- *A malfunction of any component of the fueling system will require an immediate shutdown of the fueling operation until defect is repaired. Failure to comply could result in injury to, or death of, personnel or long term health hazards.

CAUTION

- *All ground power units and air conditioners will be connected prior to starting fuel servicing. Equipment shall remain connected until fuel servicing is terminated. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.
- *High-lift trucks will not be raised/lowered or moved within the FSSZ while refueling equipment is pressurized unless the high-lift truck is designed, approved and maintained for use within, a hazardous location. Failure to comply could

result in damage to, or destruction of, equipment or loss of

mission effectiveness.

NOTE

The MD-11 aircraft contain fuel in the horizontal stabilators. Avoid placing personnel or equipment underneath the stabilator fuel vent outlet.

- (1) Fueling operations will begin only when deplaning passengers are clear of the concurrent servicing area.
- (2) *The CSS will:
 - (a) *Instruct the SPR/Vent monitor(s) to verify all wheels are chocked as required.
 - (b) *Inform refueling team members on intercom that fuel transfer is to begin.

NOTE

*The SCR will receive and connect/disconnect fuel nozzle to SPR.

- (3) *The SCR, or his designated representative; will:
 - (a) *Remove cover from fuel nozzle, and visually inspect locking pins/lugs and seal for serviceability before connecting to aircraft.



*Prior to pressurizing the system, the SCR or his designated representative shall check the strainer coupling quick disconnect locking, and shall ensure the refueling nozzle is securely locked to the aircraft by attempting to remove the nozzle with the poppet valve in the open position. If the refueling nozzle can be removed from the aircraft with valve open, the refueling unit/hydrant hose cart operator will be immediately notified to remove the nozzle from service. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

- (b) *Connect fuel nozzle to applicable SPR adapter, open valve, and verify nozzle is locked by trying to remove nozzle.
- (c) *Set applicable tank refuel switches to open.
- (d) *Inform CSS ready for refueling.
- (4) *The CCS will inform all refuel team members the aircraft is ready for refueling.



*Do not exceed 55 Pounds per Square Inch (PSI) (Airbus 50 PSI), refueling pressure, as indicated at refueling source. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

- (5) *Start fuel flow.

NOTE

*Refueling will be accomplished in accordance with applicable refueling directives.

WARNING

*Stop refueling operation if fuel flow does not stop during precheck. Refueling will not be resumed until the problem has been corrected. Failure to comply could result in injury to, or death of, personnel or long term health hazards.

- (6) *Perform fuel flow precheck.
- (7) *Direct fueling equipment operator to stop fuel flow when desired quantity is loaded.
- (8) *Set all fuel switches to close.

CAUTION

The SCR must make sure fuel flow has stopped and hose is depressurized/evacuated prior to disconnecting nozzle from SPR adapter. Make sure nozzle handle is closed prior to depressurizing hose. Failure to comply could result in damage to, or destruction of, equipment or loss of mission effectiveness.

- (9) *Close the refueling nozzle and disconnect nozzle from SPR adapter.
- (10) *Reinstall SPR adapter cap.

NOTE

*Be sure SPR adapter cup is properly secured.

- (11) *Wrap and store all refueling hoses, remove grounding bonding wires, and clear fuel servicing and support equipment from the area.
- (12) *The CSS will have SPR/Vent monitor(s) reposition aircraft wheel chocks as required.

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- (13) *Release ARFF vehicle from area.
- (14) *Release refuel team members.
- (15) *Notify flight crew/contractor representative refueling is complete.