

Reference Materials: Note: This exam may contain some "accepted practice" type questions not found in the reference material
NFPA 1910: Standard for the Inspection, Maintenance, Refurbishment, Testing and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels (**NFPA 1911 section**) 2024 edition (800) 344-3555 or www.nfpa.org

Allison Publications:

Mechanics Tips and Operators Manuals <https://ati.gilmoreglobal.com/> Under Technical Publications- each publication is \$18.75 and available to order print book or members can order ebook

1000/2000 EVS Products

3000/4000 EVS Products

Shift Selector - n/c

OM8471 -5th Gen Controls

MT4015EN - Mechanics Tips

SA7497EN - 5th Gen

MT7325EN - 5th Gen. Mech. Tips

MT7151EN - 5th Gen Mechanics Tips

OM8491 - 5th Gen Op Man

Drivelines

TS2714EN - Driveline Troubleshooting Man.

Service Tips-available for no charge <https://allisontransmission.com/parts-service/faq-service-tips>

ST1099 Rev AA Fluid/Filter Change Recommendation

ST5580 Rev C Towing

ST4516 Allison DOC@ V2017.1.0

ST2717 Allison DOC@ V2017.4

ST1898 REV B Water & Ethylene Glycol

LEARNING OBJECTIVES FOR THE F-6 EXAM

1. Operating Principles: Understand basic operating principles of Allison On-Highway transmissions as found in emergency vehicles to include:

- | | |
|---|---|
| <p>a. Hydraulic systems</p> <p>(1) Clutch applications</p> <p>(2) Clutch apply sequence</p> <p>b. Torque Converters</p> <p>(1) Components of a torque converter</p> <p>(2) Function of a torque converter</p> <p>(3) Lock up clutch operation</p> <p>c. Driving Tips</p> <p>(1) Downhill braking/using engine to slow the vehicle</p> <p>(2) Proper towing techniques</p> <p>(3) Coasting</p> <p>(4) Cold weather starts</p> <p>(5) Using hydraulic retarder</p> <p>(6) Rocking out</p> <p>(7) Normal PTO operation</p> | <p>d. Model Numbers</p> <p>(1) Location of number on transmission</p> <p>e. Water Pump Operations</p> <p>(1) Shift sequence</p> <p>f. External Component Identification</p> <p>(1) Shift selectors</p> <p>g. 3000/4000 series shift selector function</p> <p>(1) Oil life monitor</p> <p>(2) Prognostics enabled</p> <p>h. 3000/4000 series lockup mode</p> <p>i. 5th Gen Shift Inhibits</p> |
|---|---|

2. Preventive Maintenance Support: Understand preventive maintenance support of the Allison Transmission as found in emergency vehicles to include:

- | | |
|--|--|
| <p>a. PTO Installation</p> <p>(1) Gaskets / sealing material</p> <p>(2) Sealing compounds</p> <p>b. Dipstick Calibrations & Fluid Levels</p> <p>(1) Fluid level checks</p> <p>(2) Hot check</p> <p>(3) Fluid types & compatibility</p> <p>(4) Filter and fluid change intervals/mixtures</p> <p>(5) Level check using shift selector</p> <p>(6) Sump screen</p> <p>(7) Dipstick Calibration</p> <p>(8) Electronic fluid check procedure</p> <p>(9) Filter recommendations</p> <p>(10) Oil filter change procedures</p> <p>(11) Oil life calculation</p> <p>(12) Fluid Importance</p> | <p>c. Identification of shift selector control</p> <p>(1) Identification</p> <p>(2) External linkage adjustments</p> <p>(a) Driveline and Output flanges</p> <p>(3) Phasing and angularity</p> <p>(4) Output flange and seal</p> <p>(5) Driveline inspections</p> <p>d. NFPA 1911 PM inspections</p> <p>e. NFPA 1911 Out-of-Service criteria</p> <p>f. NFPA 1911 service recommendations</p> <p>g. Periodic inspection and care</p> <p>(1) vehicle cooling system check</p> <p>(2) fluid leak repair</p> <p>(3) Unusual sounds</p> <p>(4) Exterior inspection</p> <p>h. Preparing vehicle for transmission installation</p> <p>(1) Torque converter</p> <p>i. 1000/2000 Transmission Removal</p> |
|--|--|

continued next page

3. Troubleshooting Procedures: Understand basic troubleshooting procedures. Identify problems that can be corrected in chassis requiring seeking outside assistance to include:

- a. Driveline
 - (1) Driveline test (coast)
 - (2) Power train test (road speed)
 - (3) Engine test (RPM)
- b. Shift complaints
 - (1) Diagnosis
 - (2) Pump mode
 - (3) Shift inhibits
- c. PTO installations/operation
 - (1) Backlash adjustments
 - (2) External identifications
 - (3) Pressure port locations
 - (4) Signal port locations
 - (5) PTO pressure installation
- d. Fluid checks
 - (1) Impact of aerated fluid
 - (2) Fluid levels
 - (3) Noise occurring
 - (4) Fluid leak diagnostics
 - (5) Contaminations
 - (6) Breather maintenance
 - (7) NFPA 1911 leakage classes
 - (8) High fluid temperature
- e. Diagnostic reference material
 - (1) Code descriptions
 - (2) Power and ground
 - (3) Opens, shorts, short to ground
 - (4) Understanding schematics
 - (5) Welding precautions
 - (6) Range selection/ shift inhibit
 - (7) Mode indicator LED
 - (8) Troubleshooting - "no codes present"
- f. Checks and Adjustments
 - (1) Road test

4. Electronic Controls: Basic understanding of Allison electronic controls to include:

- a. Electronic control systems
 - (1) Electronic software series
 - (2) Power and ground connections
 - (3) Continuity checks
 - (4) TPS adjustments
 - (5) VIM fused circuits
 - (6) Welding caution
 - (7) Identification of WTEC 2 controls
 - (8) Identification of WTEC 3 controls
 - (9) Identification of 4th generation controls
 - (10) Identification of MY 09 4th generation controls
 - (11) Prognostics
 - (a) Oil life
 - (b) Wrench icon
 - (c) Trans Health driving requirements
 - (12) Shifts/Convergence
 - (a) Unadaptive
 - (b) Adaptive
- b. 3000/4000 series trouble codes
 - (1) Number of stored trouble codes
 - (2) Checking logged diagnostic codes
 - (3) Main codes and sub codes
 - (4) "Check trans" light action
 - (a) Service Indicator
 - (5) Mobile radio installation locations (RFI)
 - (6) Intermittent Faults
 - (7) "Do Not Shift" light
 - (8) 4th & 5th generation codes
 - (9) 5th gen speed sensor codes
 - (10) Datalink
- c. 1000/2000 series
 - (1) Accessing diagnostic trouble codes (DTC)
 - (2) "Check transmission" light action

5. Output Retarder: Understanding of Allison Transmissions output retarders to include:

- a. Components
 - (1) Accumulator/Air System
 - (2) Accumulator locations
 - (3) Retarder locations
- b. Retarder operating parameters
 - (1) Fluid temperature
 - (a) 5th Gen controls
 - (2) Activation signal
 - (3) Oil cooler
 - (4) Safety feature
 - (5) Fluid level

6. Reference Materials: Understanding of Allison Transmission reference material to include:

- a. Understanding Allison Reference Material
 - (1) Owner assistance
 - (2) Stall test procedures
 - (3) Adjustment procedures for TPS and mechanical modulator
 - (4) Engine to transmission adaptation requirements
 - (5) Oil change intervals
 - (6) Speed sensors
 - (7) Allison website