

Reference Materials: Note: This exam may contain some "accepted practice" type questions not found in the reference material **NFPA 1911**, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus* National Fire Protection Association, Quincy, MA, (800) 344-3555 or www.nfpa.org

Allison Publications: The new EVS (Emergency Vehicle Series) lineup will include the 3000EVS and 4000EVS close ratio models and the 3500EVS and 4500EVS wide ratio models.

Mechanics tips booklets and Operators <http://allisontransmissionpublications.com/>

MT600/HT700 Products

MT1366EN HT700 - Mechanics Tips

1000/2000 EVS Products

OM3761EN - 4th Gen. EVS Controls Op. Man.

MT7325EN - 5th Gen. Mech. Tips

Drivelines

TS2714EN - Driveline Troubleshooting Man.

3000/4000 EVS Products

MT2159EN - WTEC II Mechanics Tips

MT3004EN - WTEC III Mechanics Tips

MT4015EN - Gen 4 Mechanics Tips

OM2157EN - WTEC II Operators Manual

OM2995EN - WTEC III Operators Manual

OM3656EN - Gen 4 Operators Manual

OM5823EN - Gen 4 3000/4000 Op. Man.

OM7154EN - Gen 5 3000/4000 Op. Man

Shift Selector

SA7497 - 5th Gen

SA797EN - WTEC III

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:

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| <ul style="list-style-type: none"> a. Hydraulic systems <ul style="list-style-type: none"> (1) Clutch applications (2) Clutch apply sequence b. Torque Converters <ul style="list-style-type: none"> (1) Components of a torque converter (2) Function of a torque converter (3) Lock up clutch operation c. Driving Tips <ul style="list-style-type: none"> (1) Downhill braking/using engine to slow the vehicle (2) Proper towing techniques (3) Coasting (4) Cold weather starts (5) Using hydraulic retarder (6) Rocking out (7) Normal PTO operation | <ul style="list-style-type: none"> d. Model Numbers <ul style="list-style-type: none"> (1) Location of number on transmission e. Water Pump Operations <ul style="list-style-type: none"> (1) Shift sequence f. External Component Identification <ul style="list-style-type: none"> (1) Mechanical modulator (2) Shift selectors (3) Neutral safety switch (4) Reverse signal port g. 3000/4000 series shift selector function <ul style="list-style-type: none"> (1) Oil life monitor (2) Prognostics enabled h. 3000/4000 series lockup mode i. 5th Gen Shift Inhibits |
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2. Preventive Maintenance Support: Understand preventive maintenance support of the Allison

Transmission as found in emergency vehicles to include:

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| <ul style="list-style-type: none"> a. PTO Installation <ul style="list-style-type: none"> (1) Gaskets / sealing material (2) Sealing compounds b. Dipstick Calibrations & Fluid Levels <ul style="list-style-type: none"> (1) Fluid level checks (2) Hot check (3) Fluid types (4) Filter and fluid change intervals (5) Level check using shift selector (6) Sump screen (7) Calibration (8) Electronic fluid check procedure (9) Filter recommendations (10) Oil filter change procedures (11) Oil life calculation c. Identification of shift selector control <ul style="list-style-type: none"> (1) Identification (2) External linkage adjustments | <ul style="list-style-type: none"> d. Driveline and Output flanges <ul style="list-style-type: none"> (1) Retaining nut reuse (2) Phasing and angularity (3) Output flange and seal (4) Removal and installation of output flange (5) Driveline inspections e. NFPA 1911 PM inspections f. NFPA 1911 Out-of-Service criteria g. NFPA 1911 service recommendations h. Periodic inspection and care <ul style="list-style-type: none"> (1) vehicle cooling system check (2) fluid leak repair (3) Unusual sounds (4) Exterior inspection i. Preparing vehicle for transmission installation <ul style="list-style-type: none"> (1) Torque converter j. 1000/2000 Transmission Removal |
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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) Governor malfunction
 - (3) Pump mode
 - (4) 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. Stall Test
 - (1) Purpose
 - (2) Warning/caution
 - (3) Stall test results
- f. Diagnostic reference material
 - (1) Code descriptions
 - (2) Power and ground
 - (4) Opens, shorts, short to ground
 - (5) Understanding schematics
 - (6) Welding precautions
 - (7) Range selection/ shift inhibit
 - (8) Mode indicator LED
 - (9) Troubleshooting - "no codes present"
- g. 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
 - (12) Unadapted Shifts
- 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
 - (5) Mobile radio installation locations (RFI)
 - (6) Intermittent Faults
 - (7) "Do Not Shift" light
 - (8) 4th generation codes
 - (9) 5th gen speed sensor codes
- 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
 - (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