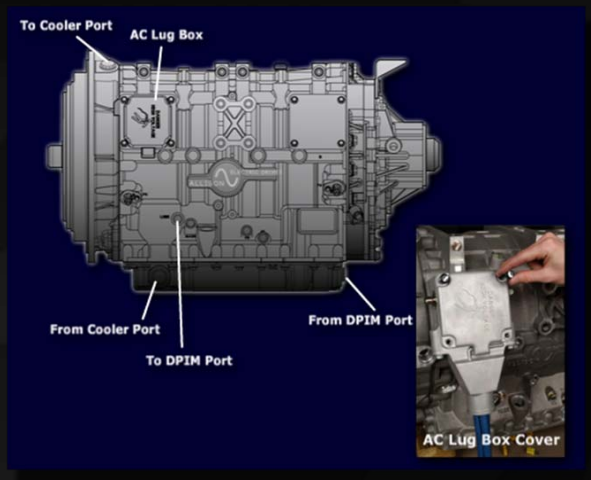
PREVENTIVE MAINTENANCE

Allison Transmission. Instructor Led Training

Preventive Maintenance

Drive Unit And Driveline Inspections

- **Inspect the following:**
  - *Drive unit mounting bolts – check for proper torque.*
  - *Breather – check for debris or obstruction.*
  - *Wiring harnesses – check for debris, corrosion, loose connections, wear and fraying.*
  - *AC lug box covers – check for debris and moisture contamination.*
  - *Fluid hoses – check for damage and loose connections.*
    - *Oil-Air cooler supply and return lines on input housing and lube filter cover.*
    - *DPIM cooler supply and return lines on stator housing and oil pan.*
  - *Universal joints – check for looseness and damage, lubricate as necessary.*
  - *Slip joints – check for proper lubrication and movement.*



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RESOURCES: Drive Unit & Driveline Inspections

E^V DRIVE™ AND POWER PACK INSPECTIONS

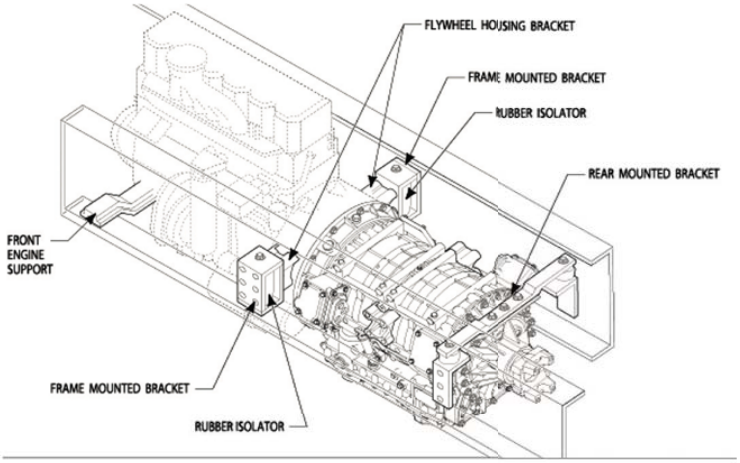
The E^V Drive™ unit and power train need to be inspected during routine preventive maintenance. Begin by inspecting all mounting bolts on the E^V Drive™ for proper bolt torque at the side mounts and/or rear support bracket. Also, check for proper bolt torque at the front engine mount.

Check the main electrical and external sensor harnesses for any wear or fraying. Ensure that the harnesses are not taught. Check for corroded or loose terminals at all harness connection points. Also check for heavy debris of moisture contamination around all of the speed sensors and Motor A/Motor B HVIL lid switches.

Check for damaged or loose fluid hoses connected to the E^V Drive™ unit. These include the oil-air cooler supply and return lines on the input housing and lube filter cover and the DPIM cooler supply and return lines connected to the stator housing and rear of the oil pan.

Inspect all universal joints for looseness or damage and lubricate them as necessary. Check the driveline slip joints for proper lubrication and free movement.

Check the breather on top of the E^V Drive™ unit to ensure it is clean and free of debris. Do not spray the breather directly with water.



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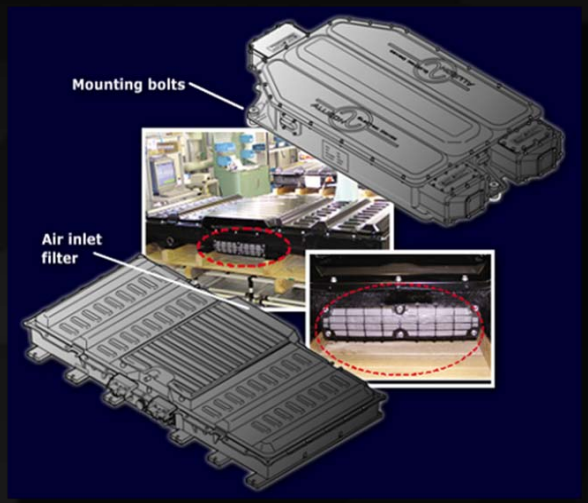
Preventive Maintenance

DPIM And ESS Inspections

- **Inspect both components for:**
  - *Loose bolts on mounting components and grounding straps.*
  - *Loose, worn or frayed electrical connections.*
  - *Improperly routed vehicle electrical harnesses.*
- **DPIM specific inspections:**
  - *Damaged or loose hoses.*
  - *Coolant leaks.*
  - *Be sure exterior is clean and free from debris.*
- **ESS specific inspections:**
  - *Air inlet filter.*
    - *Inspect for dirt and debris.*



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RESOURCES: DPIM Inspection

DPIM INSPECTION

Clean and inspect the exterior of the DPIM at regular intervals. Location of the DPIM and vehicle operating conditions determine the frequency of inspections. An internal cooling circuit removes heat from the DPIM. COOLER IN and COOLER OUT ports are on the front of the DPIM. Transmission fluid regulated inside the E^V Drive™ is used to remove heat from the DPIM.

Inspect the DPIM for:

- Loose bolts—mounting components and grounding straps
- Loose, worn, frayed electrical connections
- Improperly routed vehicle electrical harness
- Damaged or loose hoses
- Coolant leaks

ESS INSPECTION

Clean and inspect the exterior of the ESS at regular intervals. Location of the ESS and vehicle operating conditions determine the frequency of inspections. Inspect the ESS for:

- Loose bolts—mounting components and grounding straps
- Loose, worn, frayed electrical connections
- Improperly routed vehicle electrical harness

ESS AIR INLET FILTER

Check filter element for dirt and debris collection or clogging. If dirt or debris collection or clogging is observed, clean the inlet filter with a vacuum cleaner or an appropriately-sized nylon-bristle brush tip.

Maintenance interval will be based on ESS location, local climate conditions, and OEM adaptation hardware.

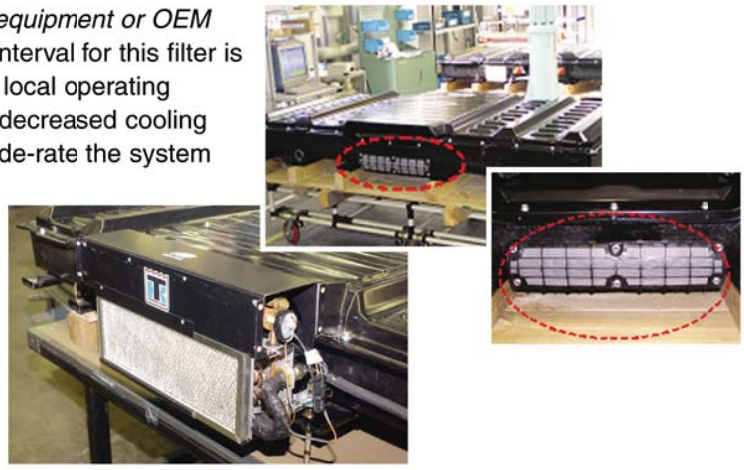
WASHING THE VEHICLE

CAUTION: Exercise care when washing the engine compartment and area surrounding the ESS and DPIM.

- DO NOT spray water or cleaning solution directly at system control components.
- DO NOT spray water or cleaning solution directly at the components when they are not properly installed in the vehicle.

ESS MAINTENANCE

Check the inlet air filter *(whether original equipment or OEM installed)* for dirt and debris. The change interval for this filter is based on the location of the ESS and the local operating environment. A clogged filter will result in decreased cooling capacity for the ESS. This can potentially de-rate the system and reduce the life of the modules in the ESS. Also, check the air inlet heat exchanger filter. Confirm proper operation of the heat exchanger and replace the filter element based on local operating conditions. Visually inspect the housing of the ESS and all harnessing for any damage.



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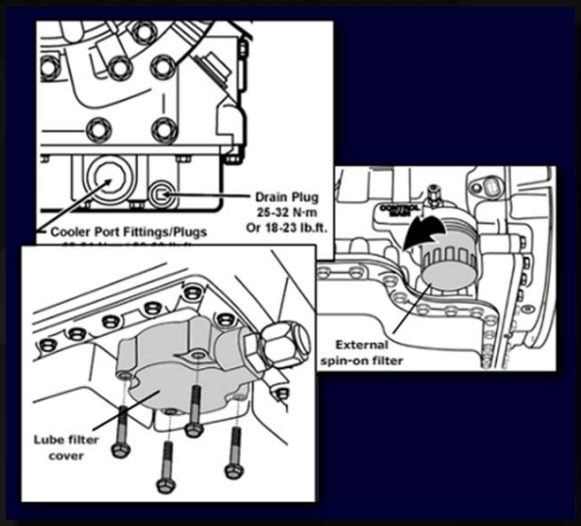
Preventive Maintenance

Fluid And Filter Changes

- **Fluid/Filter change procedure:**
  - *Remove drain plug from rear of oil pan.*
    - *Replace plug after all fluid is drained.*
  - *Remove/replace Control Main filter.*
    - *External spin-on filter.*
  - *Remove/replace Lube Circuit filter.*
    - *Cartridge filter located under lube filter cover on bottom of oil pan.*
  - *Sump filter is located in the oil pan.*
    - *Should only be replaced during overhaul.*
- **Reference SILs 10-TR-99, 13-TR-90 and 14-EP-04 for general fluid/filter change guidelines.**



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NOTE: This resource link has multiple pages and information changes frequently. Reference the source document for complete, current information.

SECTION 3—PREVENTIVE MAINTENANCE

3–1. SCOPE

Proper care and regular maintenance enables the EP 40/50 System™ to meet its duty requirements. Perform the maintenance procedures described in this section on a regular basis to prevent premature EP 40/50 System™ or support equipment failure. The Allison EP 40/50 System™ is manufactured to provide long term, efficient service in its designed applications.

3–2. PERIODIC INSPECTIONS AND CARE

a. EV Drive™ Inspection

CAUTION:

When cleaning the EV Drive™, do not spray steam, water, or cleaning solution directly at the breather (oil vent). Spraying steam, water, or cleaning solution at the breather can force the water or cleaning solution into the EV Drive™ and contaminate the transmission fluid.

- **DO NOT spray water or cleaning solution directly at system control components.**
- **DO NOT spray water or cleaning solution directly at EP 40/50 System™ components when they are not properly installed in the vehicle.**

Clean and inspect the exterior of the EV Drive™ at regular intervals. Severity of service and operating conditions determine the frequency of these inspections. Inspect the EV Drive™ for:

- Loose bolts—EV Drive™ and mounting components.
- Fluid leaks—repair immediately.
- Damaged or loose hoses.
- Worn, frayed, or improperly routed electrical harnesses.
- Worn or frayed electrical connections.
- Dented, worn, or out-of-phase driveline U-joints and slip fittings.
- Clogged or dirty air breather (oil vent).

b. DPIM Inspection

Clean and inspect the exterior of the DPIM at regular intervals. Location of the DPIM and operating conditions determine the frequency of inspections. Inspect the DPIM for:

- Loose bolts—mounting components and grounding straps.
- Loose, worn, or frayed electrical components.
- Improperly routed vehicle electrical harness.
- Damaged or loose hoses.
- Fluid leaks.

An internal cooling circuit removes heat from the DPIM. COOLER IN and COOLER OUT ports are on the front of the DPIM. The DPIM cooling system uses transmission fluid from the EV Drive™ to remove heat.

c. ESS Inspection

Clean and inspect the exterior of the ESS at regular intervals. Location of the component and operating conditions determine the frequency of inspections. Inspect the ESS for:

- Loose bolts—mounting components, grounding straps, and ESS cover.
- Loose, worn, or frayed electrical components.
- Improperly routed vehicle electrical harness.
- Damage to the housing.
- Dirt and debris collection in inlet filter (Figures 3–1 and 3–2).
- Damage to and torque retention in the HVIL cover.
- Damage to and torque retention in low voltage connector.

RESOURCES: OLS Codes

OLS CODES

- o,L,o,k: Fluid level is correct.
- o,L,L,o,1: Fluid level is one quart low.
- o,L,H,I,1: Fluid level is one quart high.
- o,L,-,5,0: Engine rpm is too low.
- o,L,-,5,9: Engine rpm is too high.
- o,L,-,6,5: Neutral range is not selected.
- o,L,-,7,9: Sump fluid temperature is too high.
- o,L,-,8,9: Output shaft rotation is detected.
- o,L,-,9,5: Oil Level Sensor failure.