

ALLISON HYBRID

HYDRAULICS



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ALLISON HYBRID H 40/50 EP Hydraulics

Introduction

- The Electronic Control and hydraulic systems work together to control clutch application and provide internal cooling and lubrication.
- The Allison Hybrid H 40/50 EP System hydraulics also provide cooling for the Dual Power Inverter Module (DPIM).



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RESOURCES: Hydraulic Schematics

Mode One and Reverse

Legend:

- MAIN PRESSURE (Red)
- CONTROL MAIN PRESSURE (Blue)
- EXHAUST BACKFILL (Green)
- BOOST (Purple)
- CLUTCH APPLIED PRESSURE (Yellow)
- LUBRICATION COOLER (Light Blue)

Components and Flow:

- Control Main Regulator** and **Exhaust Backfill** are connected to the **MAIN SUPPLY**.
- Control Main Relief** and **Control Main Filter** are connected to the **CONTROL MAIN**.
- Trim Solenoid Filter** and **Trim Solenoid (C1, C2)** are connected to the **CONTROL MAIN**.
- Back Solenoid (C1, C2)** and **Boost Solenoid (C1)** are connected to the **MAIN SUPPLY**.
- Main Solenoid** is connected to the **MAIN SUPPLY**.
- DPIM** (Direct Pressure Indicator Manifold) is connected to the **MAIN SUPPLY** and **BOOST SIGNAL**.
- Sump** is connected to the **MAIN SUPPLY** and **BOOST SIGNAL**.
- Cooler Bypass** and **Cooler Return Filter** are connected to the **MAIN SUPPLY**.
- Trans Cooler** and **Cooler** are connected to the **MAIN SUPPLY**.
- Main Regulator Valve** and **Main Relief** are connected to the **MAIN SUPPLY**.
- Gerddor Pump** is connected to the **MAIN SUPPLY** and **BOOST SIGNAL**.
- Suction Filter** is connected to the **MAIN SUPPLY**.
- Sump** is connected to the **MAIN SUPPLY** and **BOOST SIGNAL**.

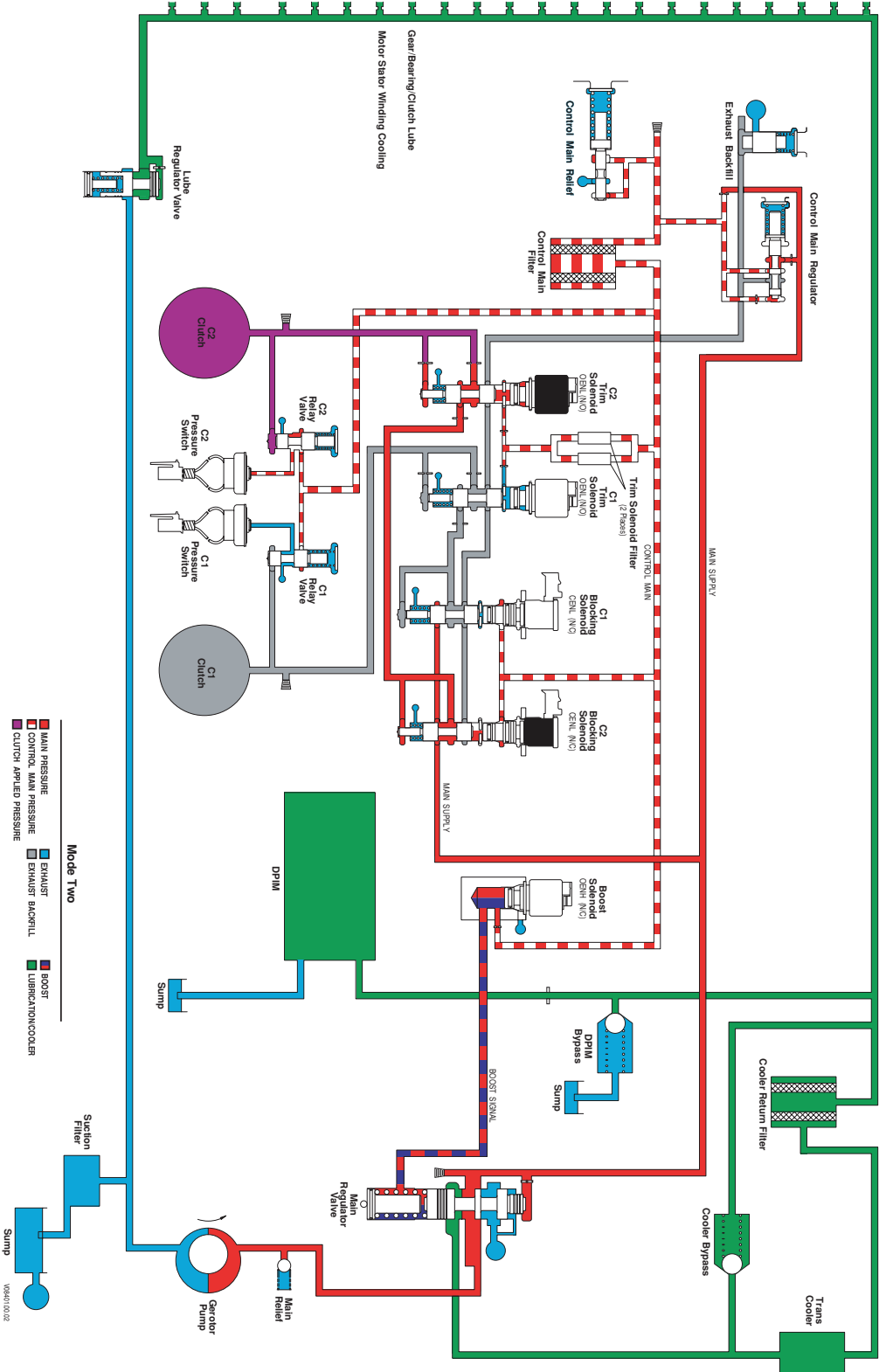
Mode One and Reverse

	MAIN PRESSURE		EXHAUST		BOOST
	CONTROL, MAIN PRESSURE		EXHAUST BACKFILL		LUBRICATION COOLER
	CLUTCH, APPLIED PRESSURE				

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RESOURCES: Hydraulic Schematics

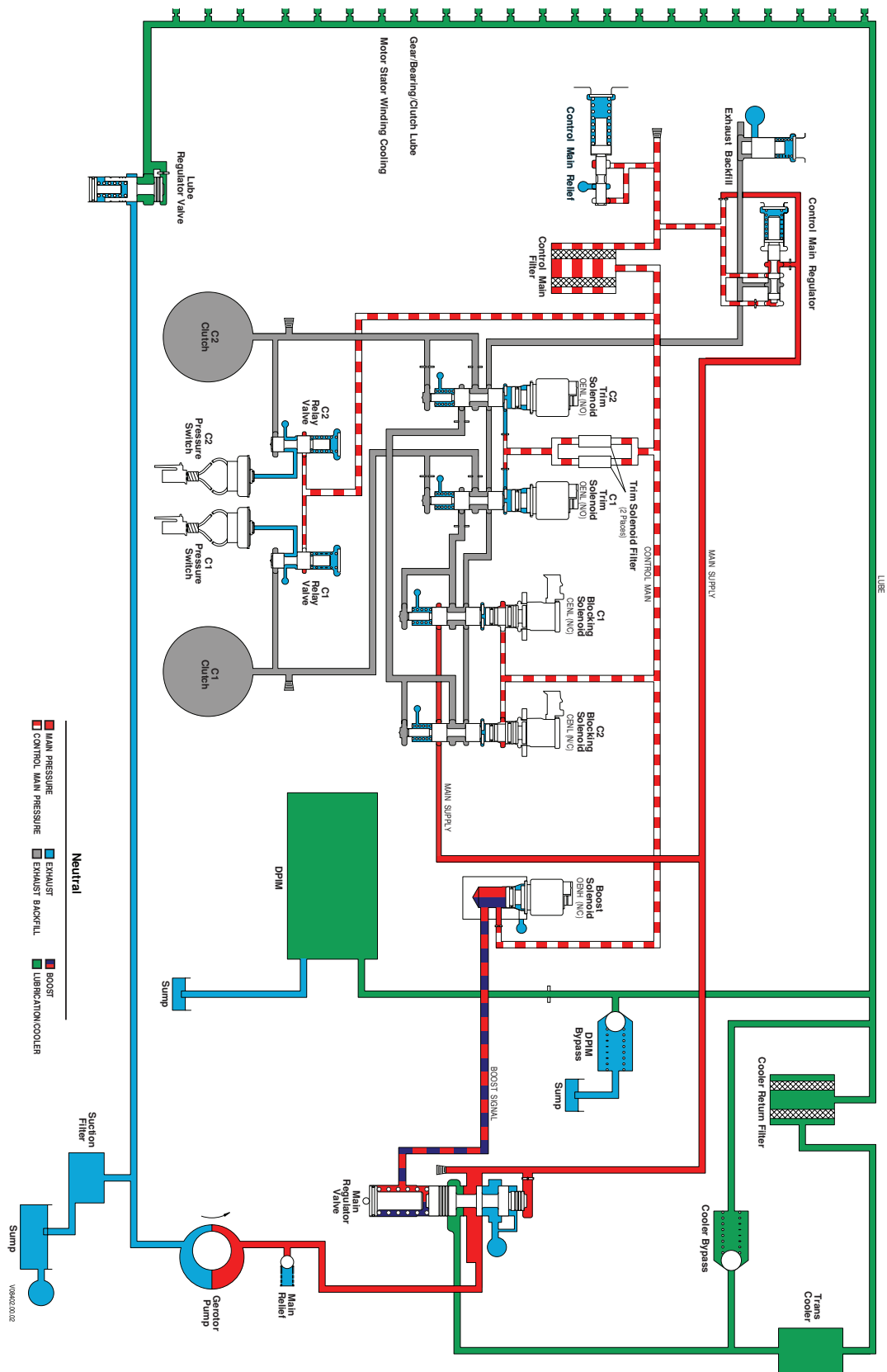
APPENDIX G—HYDRAULIC SCHEMATICS



Foldout G-2. Mode Two Range

RESOURCES: Hydraulic Schematics

APPENDIX G—HYDRAULIC SCHEMATICS



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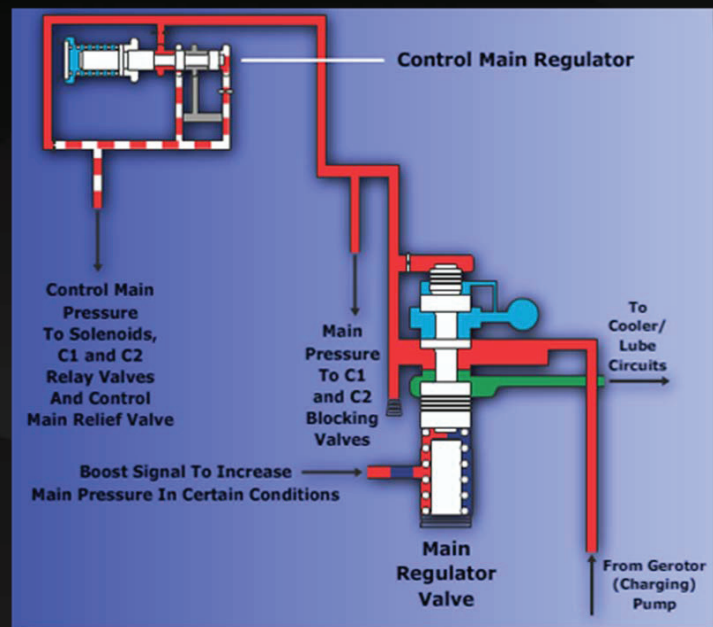
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Main Pressure And Control Main Pressure

- The charging pump and main regulator valve create main pressure.
 - *Main pressure is directed to components throughout the drive unit, including the control main regulator.*
- The control main regulator creates and maintains consistent control main pressure.



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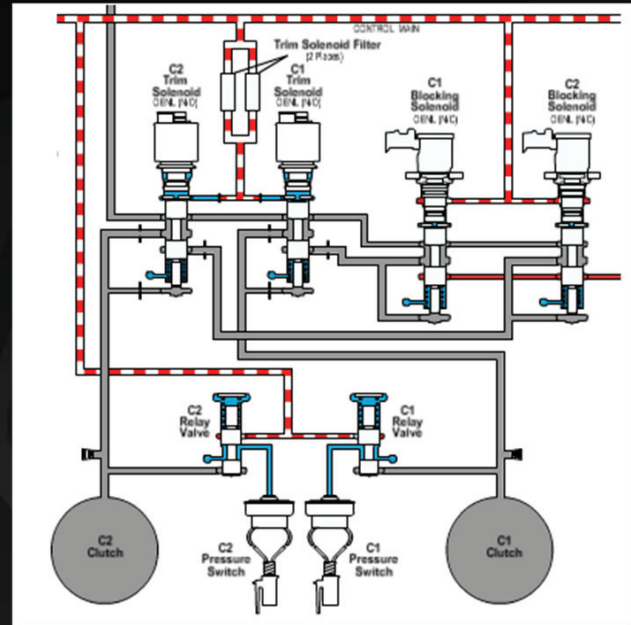
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Neutral Range Hydraulic Flow

- No solenoids are energized and no clutches are applied.
 - C1 and C2 blocking valves remain up and main pressure is not directed to the C1 and C2 trim valves.
 - Control main pressure flows to the C1 and C2 relay valves.
 - No clutches are applied and no control main pressure flows to either pressure switch.



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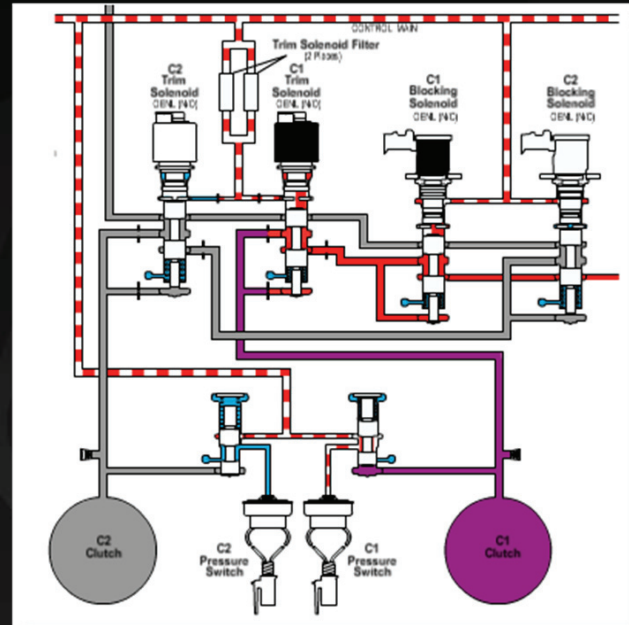
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Mode 1 and Reverse Range Hydraulic Flow

- C1 trim and C1 blocking solenoids are energized, C1 clutch is applied and Mode 1 Forward or reverse is attained depending on Motor B rotational direction.
 - C1 blocking valve is down allowing main pressure to the C1 trim valve.
 - C1 trim valve is down allowing main pressure to the C1 clutch circuit.
 - C1 relay valve is up allowing control main pressure to the C1 pressure switch, signaling the TCM that C1 clutch is applied.



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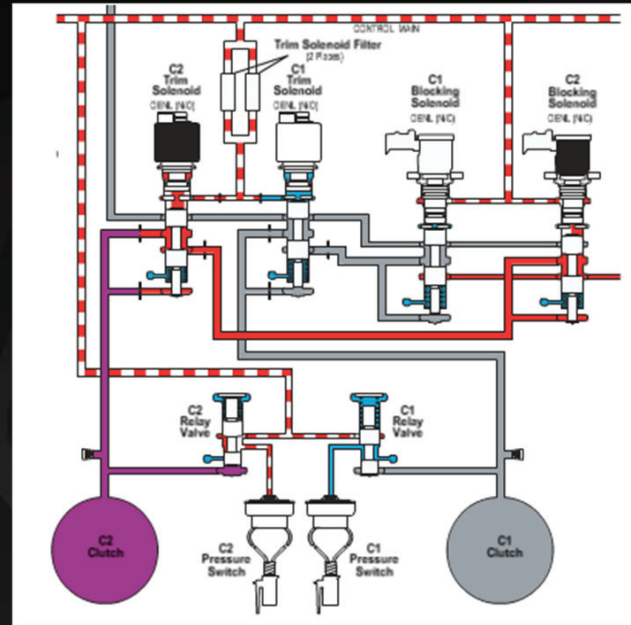
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Mode 2 Hydraulic Flow

- C2 trim and C2 blocking solenoids are energized and C2 clutch is applied.
 - C2 blocking valve is down allowing main pressure to the C2 trim valve.
 - C2 trim valve is down allowing main pressure to the C2 clutch circuit.
 - C2 relay valve is up allowing control main pressure to the C2 pressure switch, signaling the TCM that C2 clutch is applied.



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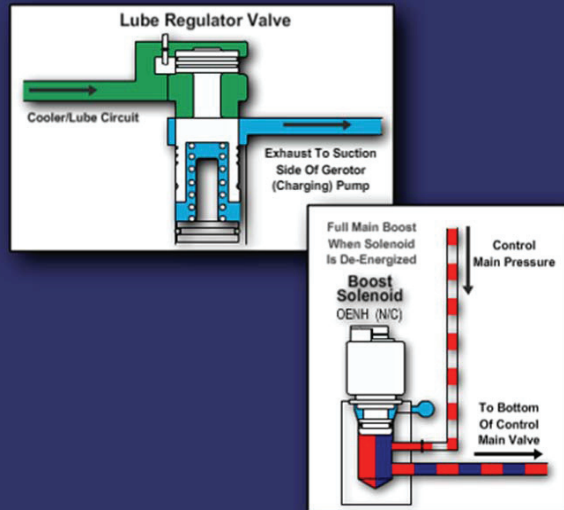
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Lube Regulator Valve And Boost Solenoid

- The lube regulator valve controls pressure in the cooling and lube circuits.
 - *Main pressure overage flows through the lube circuit to cool the DPIM, lubricate drive unit components and cool the drive unit motor stator windings.*
 - *The lube regulator valve exhausts to the suction side of the gerotor (charging) pump.*
- The boost solenoid helps control main pressure.
 - *The TCM energizes and de-energizes the boost solenoid to modulate main pressure during various operating conditions.*
 - *Full boost assist occurs when the boost solenoid is de-energized.*



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