Troubleshooting Manual

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TS3989EN

Allison Transmission

VOCATIONAL MODELS

3000 VOCATIONAL MODELS

3000 HS	3500 RDS		B 300(P)(R)
3000 RDS	3500 EVS		B 400(P)(R)
3000 EVS			T 200
3000 MH			T 300
3000 PTS			
3000 TRV			
3200 SP	3500 SP	3700 SP	
3200 TRV			

4000 VOCATIONAL MODELS

4000 EVS	4500 EVS	4700 EVS	4800 EVS	B 500
4000 HS	4500 HS	4700 RDS		B 500P
4000 MH	4500 RDS	4700 OFS		B 500R
4000 RDS	4500 SP			B 500PR
4000 TRV	4500 TRV			T 425
				T 450

Allison Transmission

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TABLE OF CONTENTS

Page

Foreword ii

SAFETY INFORMATION

Important Safety Notice III
Warnings, Cautions, and Notes III
Trademarks Used in This Manual IV
Shift Selector Terms and Display Indications IV

SECTION 1. GENERAL DESCRIPTION

1–1. TRANSMISSION 1–1
1–2. TRANSMISSION CONTROL MODULE (TCM) 1–3
1–3. SHIFT SELECTOR 1–4
A. Pushbutton Shift Selector 1–4
B. Lever Shift Selector 1–5
1–4. THROTTLE POSITION SENSOR 1–5
1–5. SPEED SENSORS 1–6
1–6. CONTROL MODULE 1–7
1–7. WIRING HARNESSES 1–9
A. External Wiring Harness 1–9
B. Internal Wiring Harness 1–11
1–8. VEHICLE INTERFACE MODULE 1–12
1–9. AUTODETECT FEATURE 1–12
A. Retarder 1–13
B. Oil Level Sensor (OLS) 1–13
C. Throttle Source 1–13
D. Engine Coolant Temperature 1–14
1–10. TRANSID (TID) 1–14

SECTION 2. DEFINITIONS AND ABBREVIATIONS

2–1. CHECK TRANS LIGHT 2–1
2–2. ALLISON TRANSMISSION DIAGNOSTIC TOOL 2–1
2–3. ABBREVIATIONS 2–3

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DIAGNOSTIC TROUBLE CODES (DTC)

- If the condition is intermittent, connect Allison DOC™ For PC–Service Tool and observe the speed sensor indicated by the code. If the signal is erratic, investigate and eliminate the following:
  - Intermittent wiring connection
  - Excessive vibration (driveline or engine torsionals)
  - Irregular sensor gap (loose sensor, loose tone wheel, or damaged tone wheel).

Test Description

The numbers below refer to step numbers on the diagnostic table.

2. This step tests for proper transmission fluid level.
3. This step tests for active diagnostic codes.
4. This step tests ignition voltage.
5. This step tests speed sensor readings.
6. This step tests for C4 clutch pressure from PCS4.
7. This step tests for evidence of clutch failure.
8. This step tests for stuck or sticking valves and damaged valve body gaskets.

DTC P2714 Pressure Control Solenoid 4 (PCS4) Stuck Off

Step	Action	Value(s)	Yes	No
1	Was Section 3–5, Beginning The Troubleshooting Process, performed?		*Go to Step 2*	*Go to Section 3–5, Beginning the Troubleshooting Process*
2	Perform the Fluid Checking Procedure (refer to the appropriate mechanic's tips). Is the transmission fluid level correct?		*Go to Step 3*	*Go to Fluid Check Procedure (refer to mechanic's tips)*
3	1. Install the Allison DOC™ For PC–Service Tool. 2. Turn ON the ignition, leave engine OFF. 3. Record the failure records. 4. Clear the DTC. 5. Drive the vehicle. Attempt to duplicate same operating conditions observed in failure records. ***NOTE: This DTC indicates that the TCM has detected a slip condition and could not verify the correct oncoming ratio following a shift.*** Did DTC P2714 return?		*Go to Step 4*	*Go to Diagnostic Aids*
4	1. Install the Allison DOC™ For PC–Service Tool. 2. Start the engine. 3. Record the DTC Failure Record data. 4. Using the Allison DOC™ For PC–Service Tool, measure ignition voltage. Is the voltage within the specified value?	9–18V (12V TCM) 18–32V (24V TCM)	*Go to Step 5*	*Go to General Troubleshooting Section 8*
5	1. Start the engine and drive the vehicle under normal operating conditions. 2. Using Allison DOC™ For PC–Service Tool, monitor turbine, engine, and output speed sensor readings using the strip chart display. Is speed sensor data erratic or are dropouts in signal indicated?	Watch for erratic speed sensor signals	*Go to appropriate speed sensor DTC*	*Go to Step 6*

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APPENDIX B—CHECKING CLUTCH AND RETARDER PRESSURES

Table B–2. Main Pressure and Clutch Pressure Specifications (Sump Fluid Temperature Same as in Table B–1) *(cont'd)*

Transmission Model/Test Type	Engine rpm	Range	Main Press. Spec kPa [psi]	Clutches Applied	Range Clutch Press. Spec* kPa [psi]	Lube Pressure Spec* kPa [psi]	Dropbox Main Press. Spec* kPa [psi]
4000 Product Family—High Speed	1780–1820	Neutral Main Mod OFF	1805–2055 (260–300)	C5	1730–2055 (250–300)	160–240 (23–35)	
		Neutral Main Mod ON	1415–1725 (205–240)	C5	1340–1725 (195–240)	160–240 (23–35)	
		Reverse	1805–2055 (260–300)	C3, C5	1730–2055 (250–300)	160–240 (23–35)	
		Low C (4000 7-Speed)	1550–1795 (225–260)	C1, C6	1475–1795 (215–260)	160–240 (23–35)	
		1C	1550–1795 (225–260)	C1, C5	1475–1795 (215–260)	160–240 (23–35)	
		2C	1550–1795 (225–260)	C1, C4	1475–1795 (215–260)	160–240 (23–35)	
		2L	1080–1365 (155–200)	C1, C4, LU	1005–1365 (145–200)	160–240 (23–35)	
		3C	1550–1795 (225–260)	C1, C3	1475–1795 (215–260)	160–240 (23–35)	
		3L	1080–1365 (155–200)	C1, C3, LU	1005–1365 (145–200)	160–240 (23–35)	
		4C	1550–1795 (225–260)	C1, C2	1475–1795 (215–260)	125–200 (18–30)	
		4L	1080–1365 (155–200)	C1, C4, LU	1005–1365 (145–200)	125–200 (18–30)	
		5C	1550–1795 (225–260)	C2, C3	1475–1795 (215–260)	125–200 (18–30)	
		5L	1080–1365 (155–200)	C2, C3, LU	1005–1365 (145–200)	125–200 (18–30)	
		6C	1345–1590 (195–230)	C2, C4	1270–1590 (185–230)	125–200 (18–30)	
		6L	1035–1235 (150–180)	C2, C4, LU	960–1235 (140–180)	125–200 (18–30)	

* To pass this specification, measured clutch pressures **must be** within 75kPa (10 psi) of actual measured main pressure and still be within the minimum and maximum value of this specification.

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APPENDIX H—HYDRAULIC SCHEMATICS

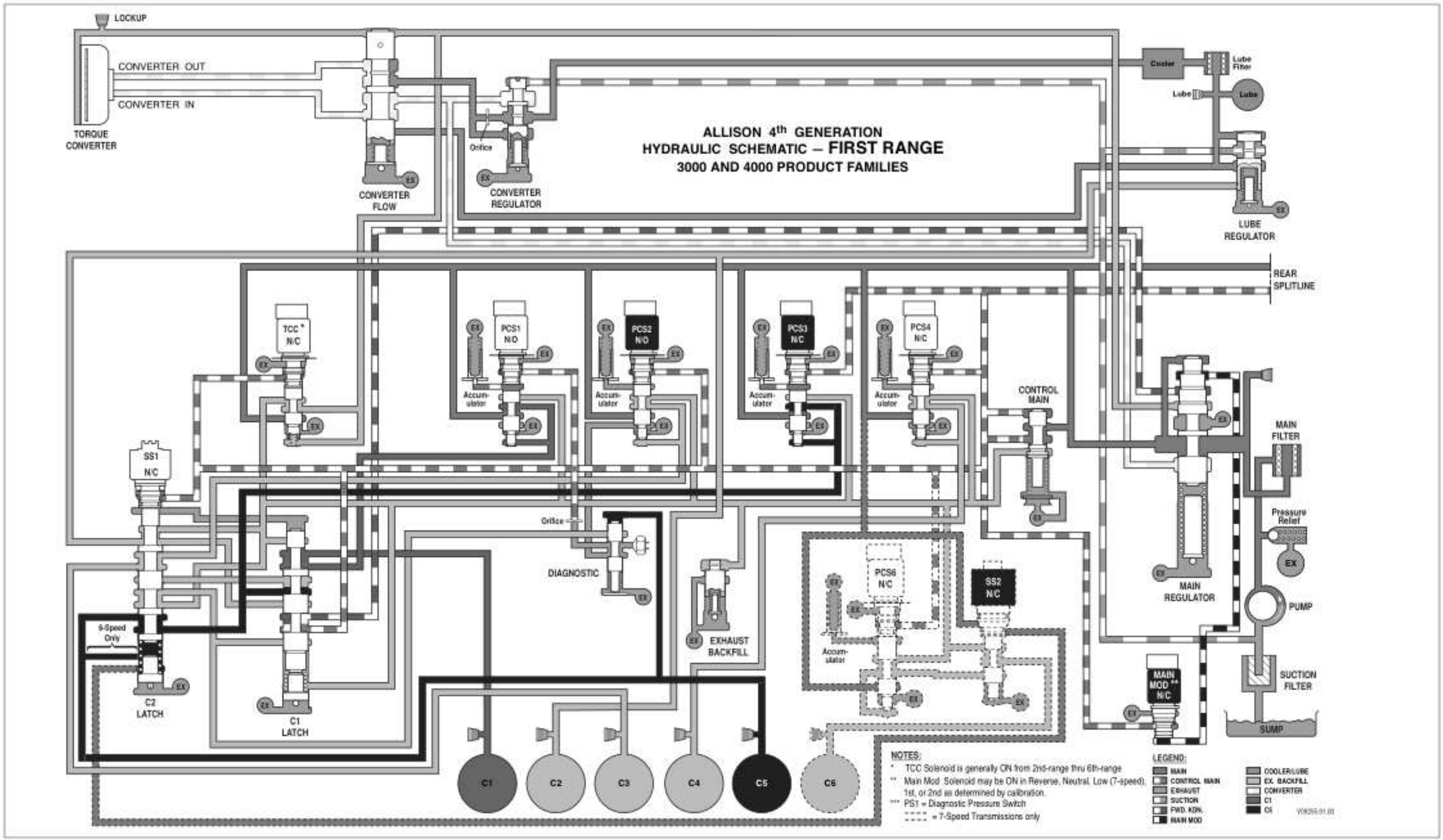


Figure H–5. 3000 and 4000 Product Families Hydraulic Schematic—First Range

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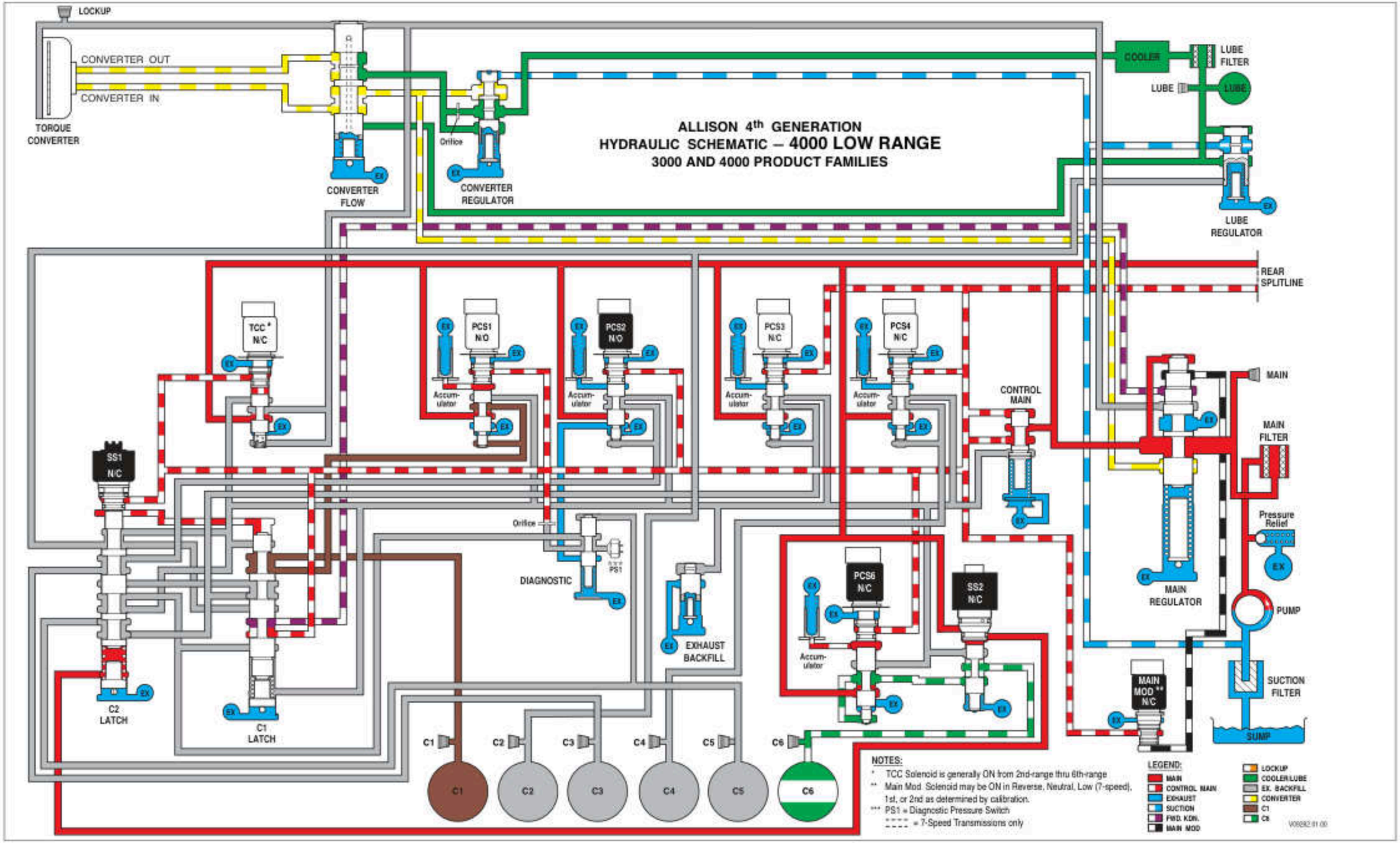


Figure H–4. 4000 Product Family Hydraulic Schematic—7-Speed, Low Range

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