



## TOYOTA/LEXUS U140/U240 SERIES ENGAGEMENT ISSUES IN REVERSE OR 4TH GEAR

**COMPLAINT #1:** Before or after overhaul, a Toyota/Lexus vehicle equipped with the U140/U240 series transaxle may exhibit a complaint of no application, or, a chatter/bucking sensation in reverse. The condition may be more prevalent and/or violent when the vehicle is hot.

**COMPLAINT #2:** Before or after overhaul, a Toyota/Lexus vehicle equipped with the U140/U240 series transaxle may exhibit a complaint of no application, or, a slip into 4th gear while driving. The condition may be more prevalent when the vehicle is hot.

**CAUSE #1:** One cause may be the oil transfer tube in the case feeding the Underdrive Brake (B3) leaking because it is cracked or worn where it goes into the case.

The Underdrive Brake (B3) is located in the case in the underdrive section of the U240/U140 transaxles. The brake is applied in reverse and drive (1st thru 3rd) gears. When the Underdrive Brake (B3) is applied, it keeps the underdrive sun gear stationary. With the sun gear stationary, the underdrive planetary pinion gears also remain stationary which causes the counter driven gear along with the differential drive pinion gear to be driven either clockwise or counter clockwise to provide movement in reverse or forward (1st thru 3rd) gears. In reverse, if the Underdrive Brake (B3) can not hold the sun gear stationary, the underdrive planetary will be allowed to rotate and there will be no power flow through the counter driven gear and differential drive pinion gear. The result will be a neutral condition in reverse gear. In forward, if the Underdrive Brake (B3) can not hold the sun gear stationary, the underdrive planetary will be held by the Underdrive (F2) One Way Clutch, and the sun gear will remain stationary.

Refer to the diagram in figure 1 for a brief explanation of power flow in reverse. Refer to the diagram in figure 2 for a brief explanation of power flow in drive (1st thru 3rd) gear.

**CAUSE #2:** One cause may be the oil transfer tube in the case feeding the Underdrive Clutch (C3) leaking because it is cracked or worn where it goes into the case.

The Underdrive Clutch (C3) is located in the underdrive section of the transaxle. The Underdrive Clutch (C3) is applied to obtain 4th gear while driving. When the clutch is applied, the sun gear (*which is welded to the Underdrive Clutch (C3) drum*) is connected to the planetary, and the whole planetary assembly rotates as a complete unit. The result is a direct drive condition. If the Underdrive Clutch (C3) drum can not hold the planetary carrier, the result will either be a slip into 4th, or no ratio change at all and the transmission will remain in 3rd gear.

Refer to the diagram in figure 3 for a brief explanation of power flow in 4th gear.



## Technical Service Information

### TOYOTA/LEXUS U140/U240 SERIES ENGAGEMENT ISSUES IN REVERSE OR 4TH GEAR

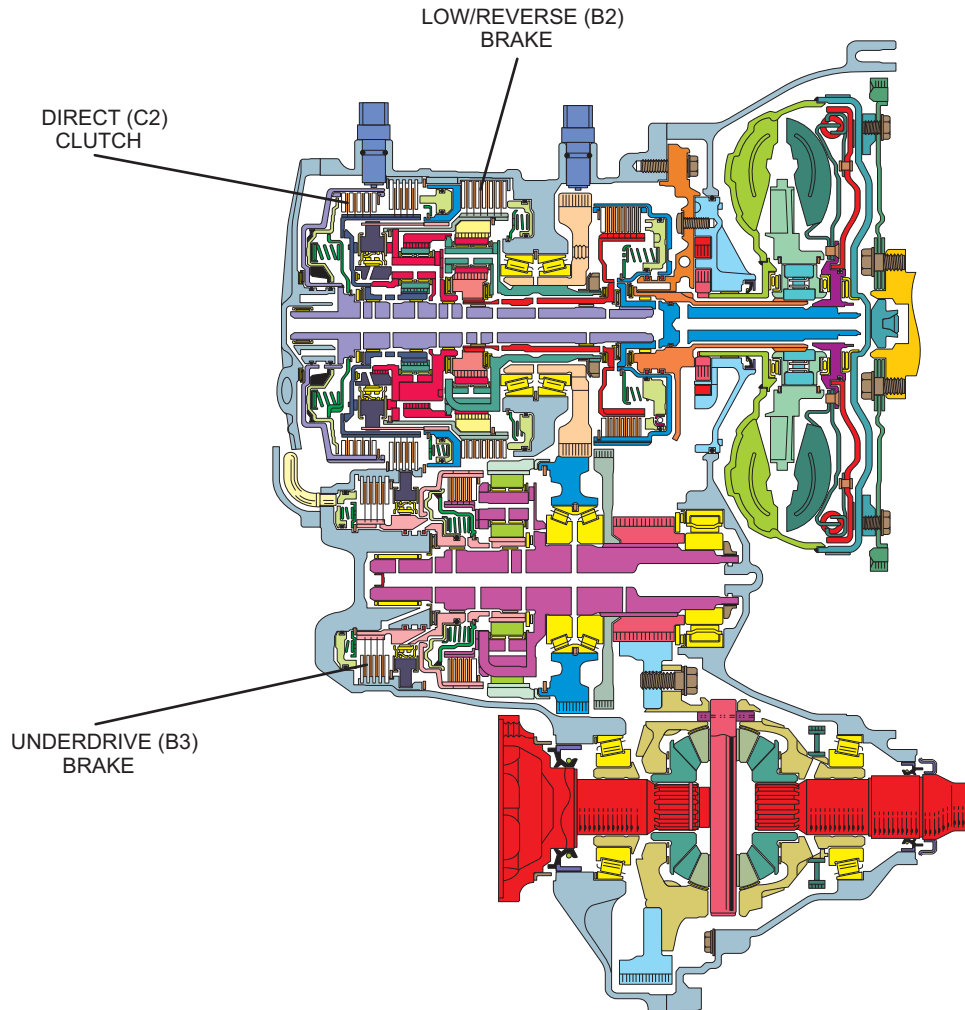
**CORRECTION #1:** Using a pressure gauge, check pressure on the Direct Clutch (C2) in reverse. Clutch pressure should be the same as line pressure. Refer to figure 4 for both tap locations and line pressure specifications.

If pressure is within specification on the Direct Clutch (C2) tap, remove the transaxle rear cover and using the diagram in figure 5, check the Underdrive Brake (B3) oil transfer tube for wear or cracks. If no cracks are present, see if the tube fits loosely in the case. A repair can be made to the tube by slightly flaring the end with a flaring tool, or by installing a small o-ring onto the tube and installing back into the case. Check the sealing ability of the tube by adding some ATF into the B3 pressure port in the case and apply approximately 40 - 50 psi of compressed air pressure into the port. Use the diagram in figure 6 as a reference. When no more leaks are detected, reassemble the transmission.

**CORRECTION #2:** Using a pressure gauge, check pressure on the Underdrive Clutch (C3) pressure port and verify proper pressures using the diagram and pressure specifications chart in figure 4.

If pressures are not within specification, remove the transaxle rear cover and using the diagram in figure 5, check the Underdrive Clutch (C3) oil transfer tube for wear or cracks. If no cracks are present, see if the tube fits loosely in the case. A repair can be made to the tube by slightly flaring the end with a flaring tool, or by installing a small o-ring onto the tube and installing back into the case. Check the sealing ability of the tube by adding some ATF into the C3 pressure port in the case and apply approximately 40 - 50 psi of compressed air pressure into the port. Use the diagram in figure 6 as a reference. When no more leaks are detected, reassemble the transmission.

## U240/U140 POWER FLOW IN REVERSE



Gear Range	Fwd Clutch C1	Dir Clutch C2	U/D Clutch C3	2nd Brake B1	L/R Brake B2	U/D Brake B3	No. 1 One Way Clutch F1	UD One Way Clutch F2
Reverse		ON			ON	ON		

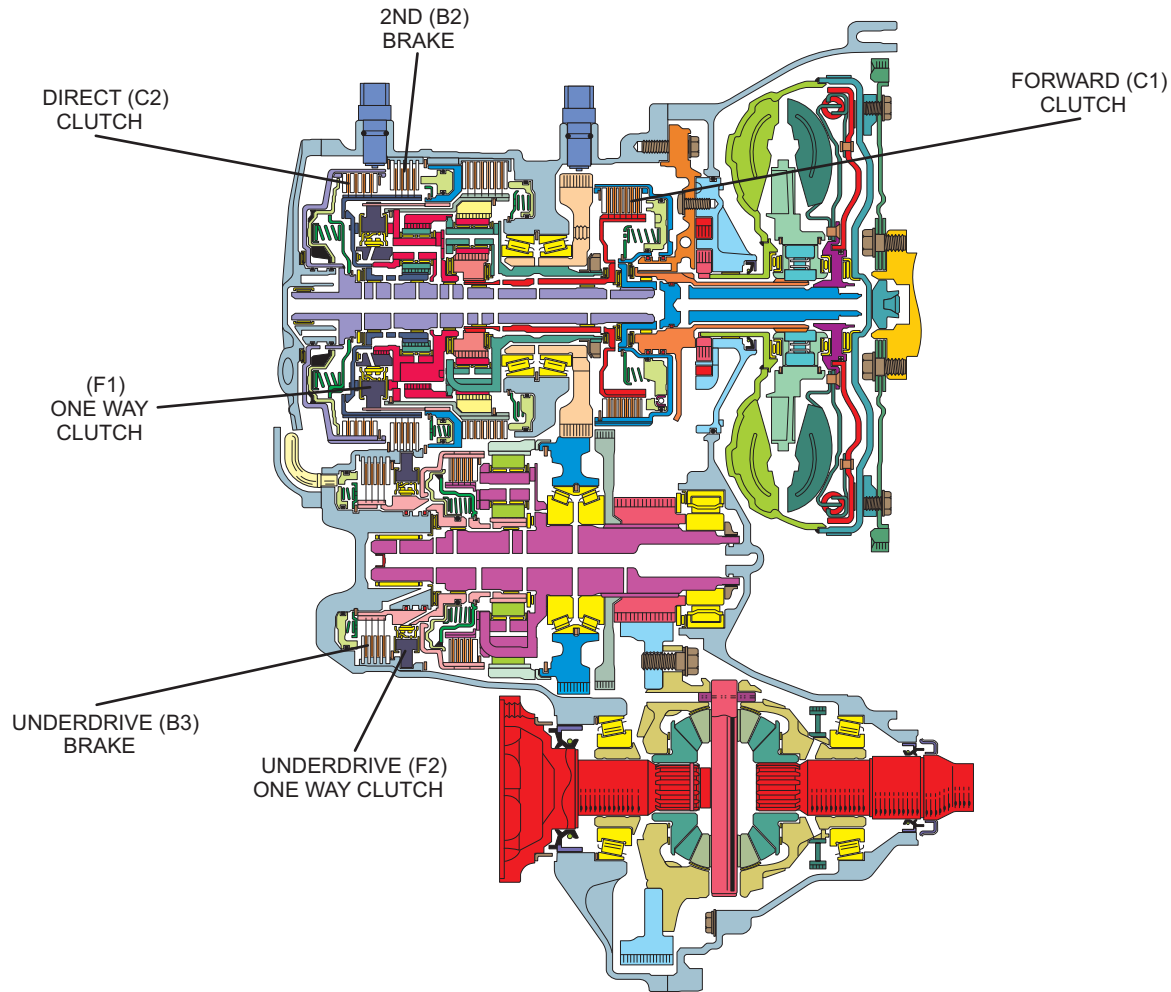
The direct (C2) clutch is applied and drives the rear planetary sun gear clockwise. The lo/rev (B2) brake is applied and holds the rear planetary carrier stationary. This forces the front planetary and counter drive gear to rotate counter clockwise. The underdrive (B3) brake is applied and locks the underdrive sun gear. This drives the underdrive planetary and differential drive pinion clockwise which drives the differential ring gear counter clockwise providing movement in reverse.

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Figure 1

## U140/U240

### POWER FLOW IN DRIVE 1ST THRU 3RD GEARS



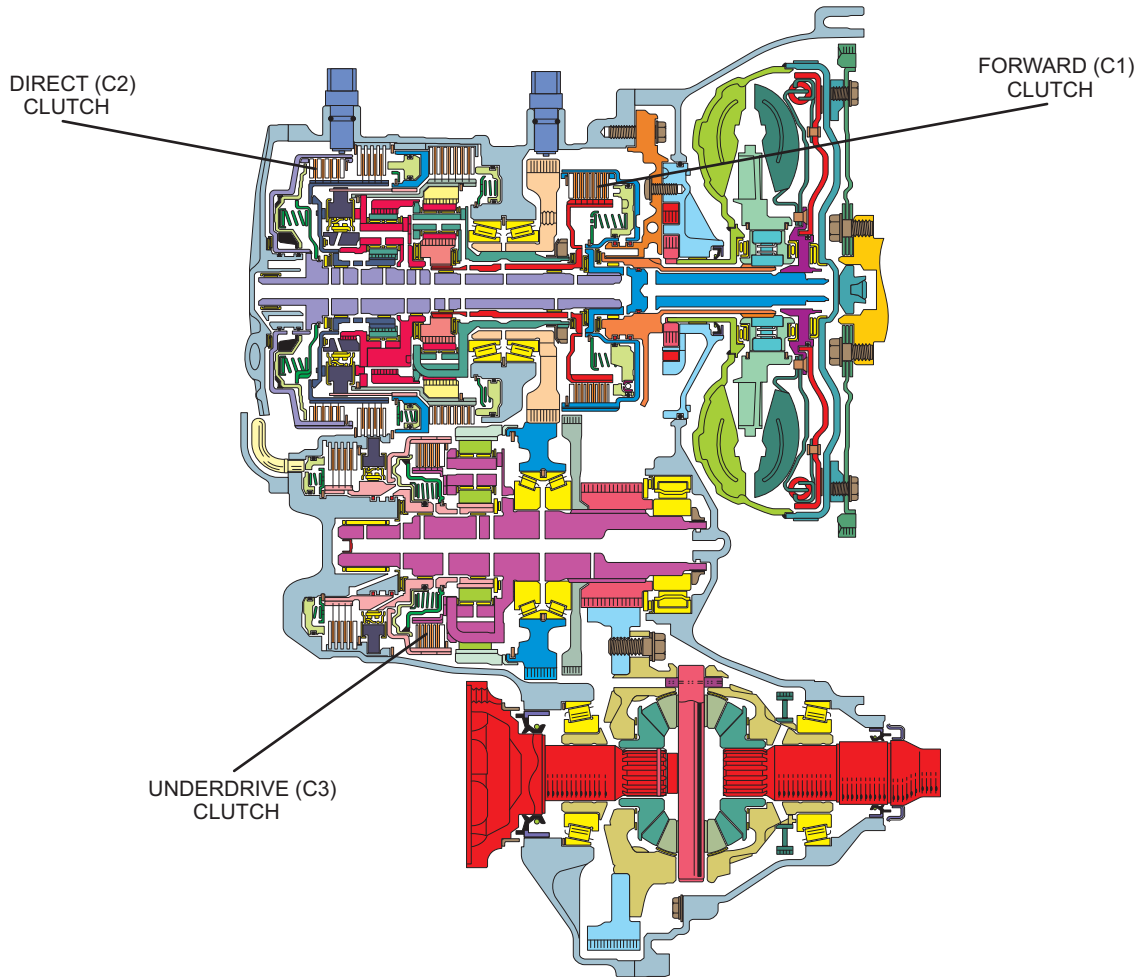
Gear Range	Fwd Clutch C1	Dir Clutch C2	U/D Clutch C3	2nd Brake B1	L/R Brake B2	U/D Brake B3	No. 1 One Way Clutch F1	U/D One Way Clutch F2
D-1st. Gear	ON					ON	ON	ON
D-2nd. Gear	ON			ON		ON		ON
D-3rd. Gear	ON	ON				ON		ON

The forward (C1) clutch is applied and drives the front sun gear and the counter drive gear clockwise. The underdrive (F2) one way clutch is locked and the underdrive (B3) brake is applied and they lock the underdrive sun gear. This drives the underdrive planetary and differential drive pinion counter clockwise which drives the differential ring gear clockwise providing movement forward in drive.

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Figure 2

## U140/U240 POWER FLOW IN DRIVE 4TH GEAR



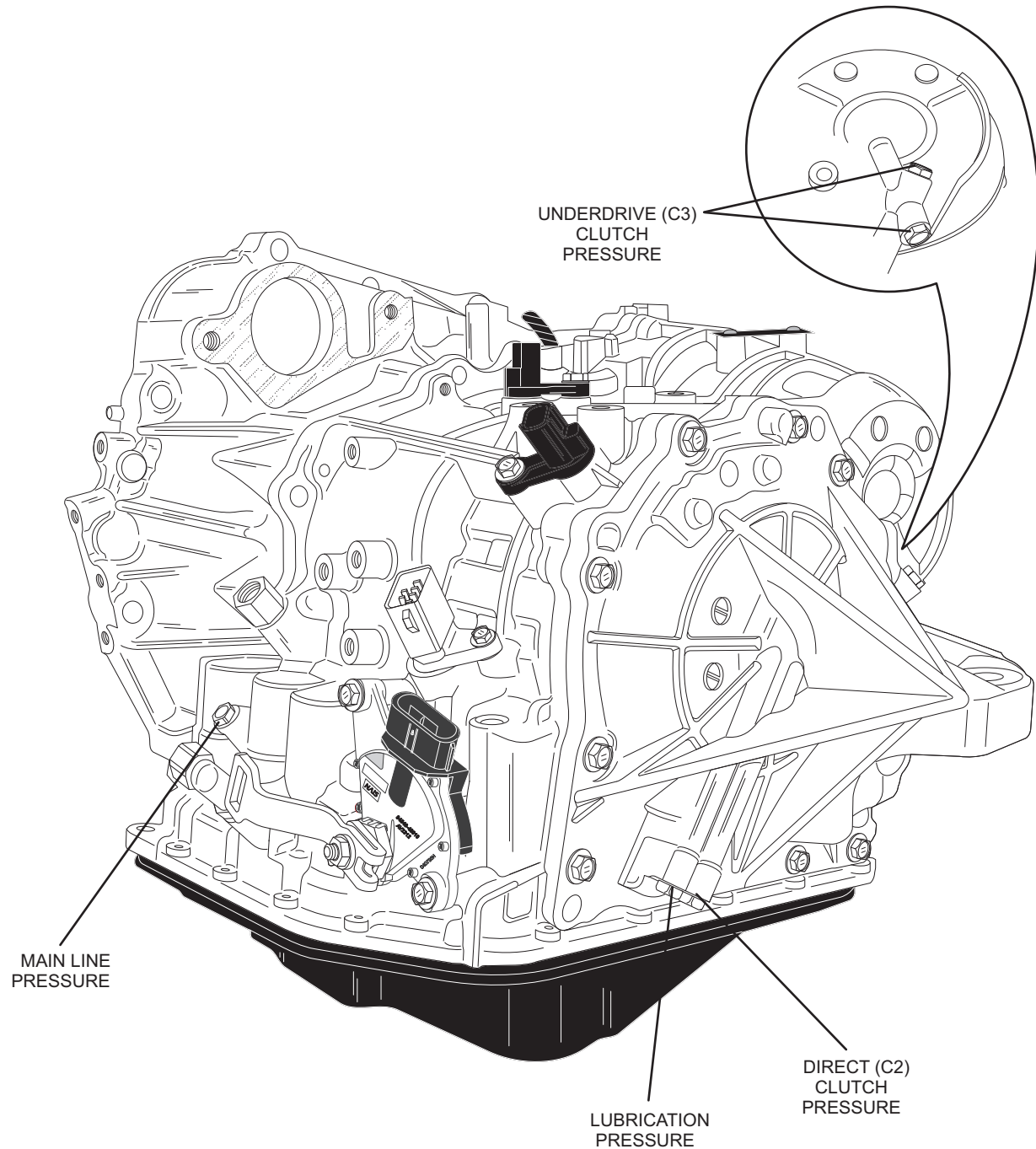
Gear Range	Fwd Clutch C1	Dir Clutch C2	U/D Clutch C3	2nd Brake B1	L/R Brake B2	U/D Brake B3	No. 1 One Way Clutch F1	U/D One Way Clutch F2
D-4th. Gear	ON	ON	ON					

The forward (C1) clutch is applied and drives the front sun gear and the counter drive gear clockwise. The direct (C2) clutch is applied and locks the rear planetary sun gear so the front and rear planetary gear sets turn in the same direction as a unit. The underdrive (C3) clutch is applied and locks the underdrive sun gear to the underdrive planetary gear set so the gear train rotates as a unit, creating a direct drive. The counter driven gear and differential drive pinion rotate counter clockwise which drives the differential ring gear clockwise providing 4th gear ratio in drive.

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Figure 3

## ***PRESSURE TAP LOCATIONS AND SPECIFICATIONS***



### ***LINE PRESSURE SPECIFICATIONS***

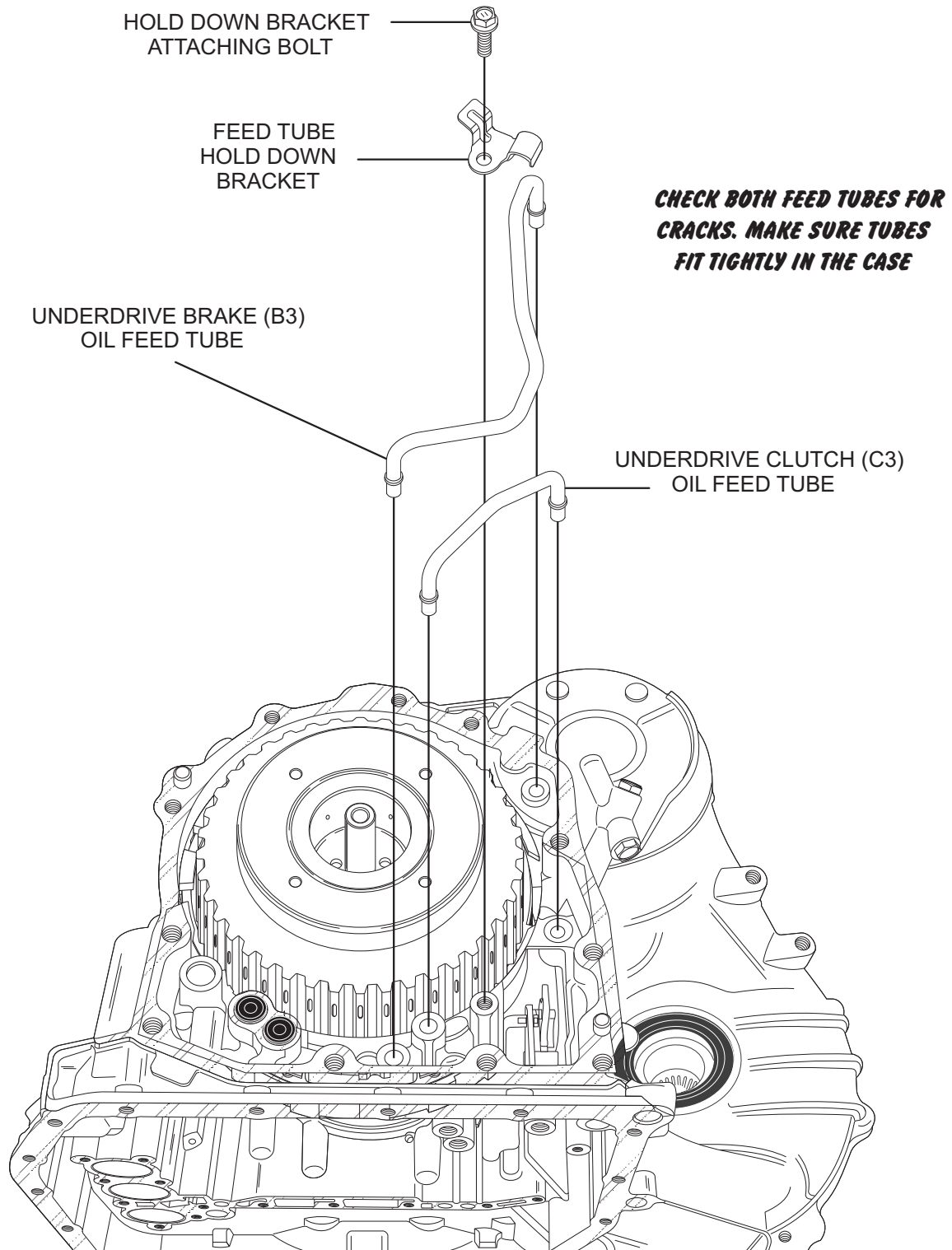
<b><i>GEAR RANGE</i></b>	<b><i>IDLE PRESSURE</i></b>	<b><i>STALL PRESSURE</i></b>
REVERSE	95-110 PSI	250-300 PSI
DRIVE	52-62 PSI	135-150 PSI

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Figure 4



## ***UNDERDRIVE BRAKE (B3) AND UNDERDRIVE CLUTCH (C3) FEED TUBE LOCATIONS***



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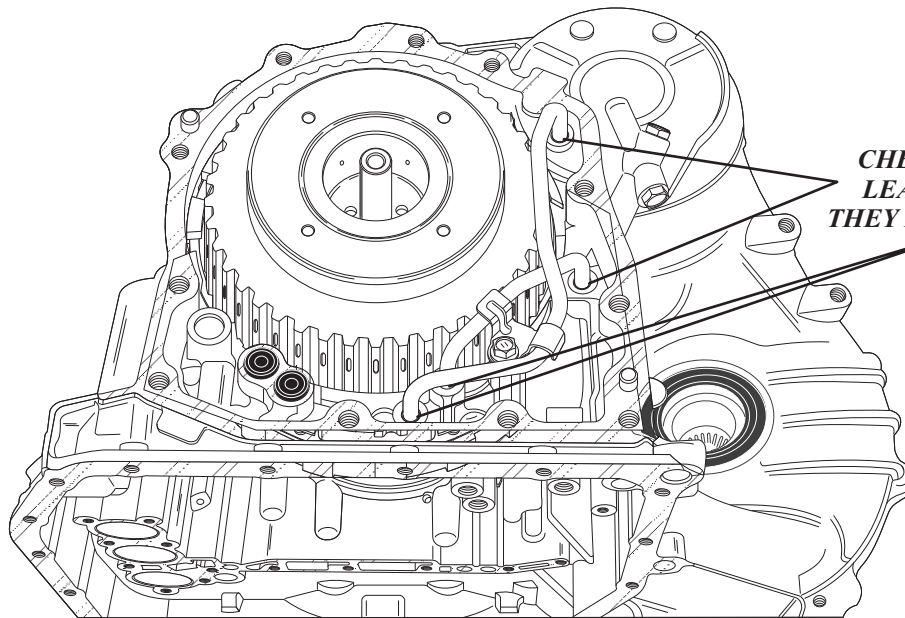
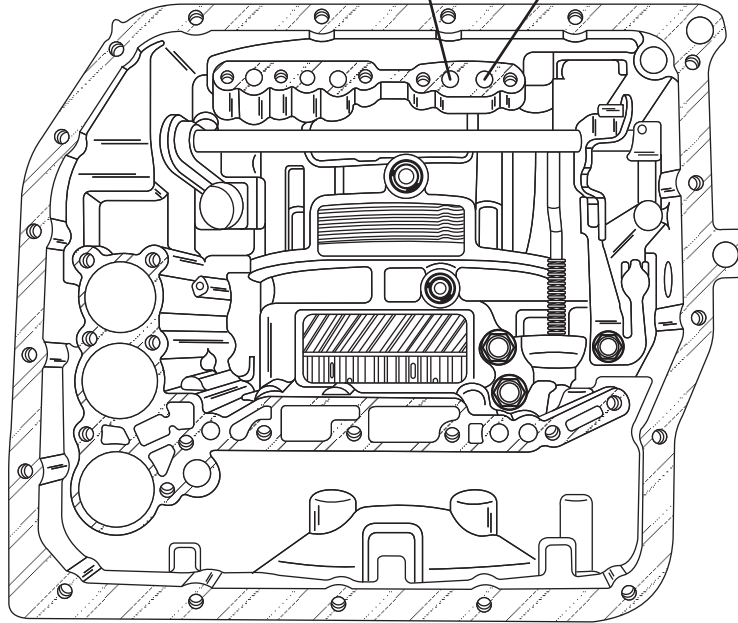
Figure 5

## **UNDERDRIVE BRAKE (B3) AND UNDERDRIVE CLUTCH (C3) APPLY PORT LOCATIONS**

**ADD A SMALL AMOUNT OF ATF  
THEN APPLY APPROXIMATELY  
40 - 50 PSI OF COMPRESSED AIR  
INTO PRESSURE PORT LOCATIONS**

B3 BRAKE  
APPLY PORT

C3 CLUTCH  
APPLY PORT



**CHECK FOR TUBES  
LEAKING WHERE  
THEY FIT IN THE CASE**

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Figure 6