2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro

DIAGNOSIS AND TESTING

NAG1

CONDITION	POSSIBLE CAUSES	CORRECTION		
	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .		
	2. Transmission in limp-home mode.	2. Check TCM for DTCs. Repair as needed.		
	3. Driveline lash/movement.	3. Check engine mounts, transmission mount, driveshaft couplings, rear crossmember mounts, axle mounts and axle lash.		
Harsh N-D Engagement or Harsh N-R Engagement	4. Converter clutch or lock up control valve malfunction.	4. Perform converter clutch diagnostics test. Inspect valve body for stuck or sticky lock up control valve. If valve motion is free, replace lock up solenoid and retest.		
	5. Valve Body Malfunction.	5. Inspect valve body for stuck or sticky regulator valve.		
	6. Clutch or planetary component damage.	6. Remove, disassemble and repair transmission as necessary.		
	7. Water in Trans.	7. Perform TSB, recommend to split and clean VB if heavily contaminated.		
	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .		
	2. Torque converter fluid drain back, delayed soft engagement.	2. If vehicle moves normally after 3 seconds of shifting into gear, no repair is necessary. If longer, inspect pump for worn bushing.		
DELAYED N-D OR N-R ENGAGEMENT	3. Fluid Level Low.	3. Check and adjust fluid level. See <u>STANDARD</u> <u>PROCEDURE</u> .		
	4. Filter plugged.	4. Check TC out pressure, if < 10psi, check for plugged filter. Replace if needed.		
	5. Filter damaged or missing, missing o-ring.	5. Check for damaged/missing filter or cut/missing o-ring.		

	6. Valve Body Malfunction. 7. Oil pump gears worn/damaged.	6. Inspect valve body for stuck/sticky regulator valve or shift group valves.7. Inspect pump for damage or excessive clearances. Replace if needed.	
	1. Misadjusted/damaged shift cable.	1. Inspect shift system. Adjust and/or replace worn/damaged parts.	
	2. Fluid level low.	2. Check and adjust fluid level. See STANDARD PROCEDURE .	
	3. Filter plugged.	3. Check TC out pressure, if < 10psi, check for plugged filter. Replace if needed.	
	4. Filter damaged or missing, missing filter o-ring.	4. Check for damaged/missing filter or cut/missing o-ring.	
	5 Hydraulic system-Low/no line pressure.	5. Remove Electrohydraulic Unit. Inspect or sticky/stuck regulator valve. If valve motion is free, replace line pressure solenoid and retest. If condition still exists check for worn/damaged pump. Replace pump assembly if needed.	
NO DRIVE OR REVERSE	6. TCM in Limp Mode	6. Clear codes and reset.	
ENGAGEMENT (vehicle will not move)	7. Stuck Pressure Regulator Valve	7. Split Electrohydraulic Unit t and inspect pressure regulator valve. Remove debris if present. Be certain all shift valves are free, if any valve can't be freed replace Electrohydraulic Unit.	
	8. Broken Weld at Front Annulus	8. Replace Hard Parts as Necessary.	
	9. Broken Input Shaft Weld	9. Replace Hard Parts as Necessary.	
	10. Defective T/C	10. Replace T/C, make sure filter is not clogged.	
	11. Broken Output Shaft Weld	11. Replace parts as necessary	
	12. Broken/Missing Rear Annulus Weld.	12. Replace parts as necessary.	
	13. Unseated Rear Annulus Gear snap ring.	13. Properly install or replace snap ring.	
		Split Electrohydraulic Unit and inspect 3-4 command valve as	

	14. Valves not returned to their home position.	well as all other valves, being certain they move freely and are free of debris.	
SHUDDER GARAGE SHIFT R-D OR D-R	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .	
SHIFT R-D OR D-R	2. Customer applying throttle while shift is in progress.	2. Instruct customer to wait until shift is complete prior to applying throttle.	
HA BEH BOLLING	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .	
HARSH ROLLING GARAGE SHIFT R-D OR D-R	2. Customer shifting into desired range with vehicle motion.	2. Instruct customer to only shift into the desired range with the vehicle stopped and the service brake applied.	
	3. Transmission in limp-home mode.	3. Check TCM for DTCs. Repair as needed.	
	1. TCC Solenoid Wire in Harness.	Inspect for and repair any short, ground, or open.	
	2. TCC Solenoid Defective, Bent Terminals or Debris Shorting Terminals.	Check for codes, refer to Diagnostic and testing.	
ENGINE STALLS	3. Debris sticking the TCC Solenoid Open.	Remove the TCC Solenoid and try to blow air through it. No air should flow. If air flows freely, replace the TCC Solenoid.	
	4. TCC LU Control Valve Stuck.	Split the Electrohydraulic Unit and inspect the TCC LU valve for any debris. Remove debris if present. If valve can't be freed replace Electrohydraulic Unit.	
ENGINE STALLS WHEN TRANSMISSION IS SHIFTED INTO R OR D.	1. Converter clutch or lock up control valve malfunction.	1. Perform converter clutch diagnostics test. Inspect valve body for stuck or sticky lock up control valve. If valve motion is free, replace lock up solenoid and retest.	
CLUNK/CLICK NOISE DURING GARAGE SHIFT FROM R-D OR D-R	 Defective torque converter. Stick-slip condition between output flange and output shaft nut upon torque reversal from R to D or D to R. Click on first launch. 	Replace torque converter. Replace output flange and nut.	

	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .		
HARSH UPSHIFT OR DOWNSHIFT	2. Electrohydraulic Unit malfunction.	2. Inspect valve body for sticky/stuck valves. Repair as needed. If valve motion is free, replace shift pressure solenoid and line pressure solenoid and retest.		
	3. Damaged or misbuilt clutch.	3. Remove, disassemble and repair transmission as needed.		
	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .		
EMCC SHUDDER	2. Fluid condition, contamination or wrong type.	2. Change fluid per service information procedures. See STANDARD PROCEDURE .		
AND/OR ROUGH SHIFTs	3. Electrohydraulic Unit malfunction.	3. Remove Electrohydraulic Unit. Inspect for sticky/stuck lock up control valve. If valve motion is free, replace the lock up solenoid and retest.		
	4. Defective torque converter.	4. Replace torque converter.		
GRATING OR SCRAPING NOISE PROPORTIONAL	Torque converter bolts contacting dust shield.	1. Dust shield bent. Replace if needed. Torque converter bolt backed out. Replace with new bolt and torque to proper level.		
TO ENGINE SPEED	2. Damaged/broken drive plate.	2. Inspect driveplate. Replace if needed.		
GRATING OR SCRAPING	1. Driveshaft or rear axle noise.	1. Check driveshaft, center bearing and axle for noise or contact with other components.		
NOISE PROPORTIONAL TO TRANSMISSION OUTPUT SPEED	2. Transmission output bearing noise.	2. Replace output bearing and retest.		
OCTIOT STEED	3. Internal transmission damage.	3. Remove, disassemble and repair transmission as needed.		
	1. Fluid level low.	1. Check and adjust fluid level. See <u>STANDARD</u> <u>PROCEDURE</u> .		
	2. Transmission in limp-home mode.	2. Check TCM for DTCs. Repair as needed.		
	3. Filter plugged.	3. Check TC out pressure, if < 10psi, check for plugged filter.		

		Replace if needed.		
HIGH PITCHED	4. Filter damaged or missing.	4. Check for damaged/missing filter or cut/missing o-ring.		
	5. Oil pump bushing worn/damaged.	5. Visually inspect for worn or damaged pump bushing. Replace pump assembly if needed.		
	6. Oil pump gears worn/damaged.	6. Inspect for worn or damaged pump gears. Replace pump assembly if needed.		
NOISE ONLY IN 1ST OR 5TH GEAR	1. Broken Tab on K1/K2 Thrust bearing.	Replace K1/K2 Thrust bearing.		
	1. Failed F1 ORC. See OPERATION .	1. Replace F1 ORC, B1 Retainer and K1 Retainer.		
FLARES ON THE 1 - 2 SHIFT	2. Stuck 1-2/4-5 valve.	2. Split Electrohydraulic Unit and inspect 1-2/4-5 valves. Remove debris if present. If valve can't be freed replace Electrohydraulic Unit.		
BUMPSHIFT ON 2-1 DOWNSHIFT	1. K1 belleville retainer snap ring.	1. K1 Belleville retainer snap rings may become unseated. Disassemble trans and re-seat snap ring. Verify there are no stuck 1-2/4-5 shift valves in the Electrohydaulic unit prior to removing the trans.		
	1.K2 Piston Bottomed Out.	1. Replace Input Shaft Assembly. This issue can be verified by making immediate repeated shifts between 2nd and 3rd. If the flare is eliminated on subsequent shifts to 3rd, It is likely that this is the issue.		
	2. Failed F2 ORC. See OPERATION .	2. Replace F2 ORC, Rear Sun Gear and Front Sun Gear		
FLARES ON THE 2-3 SHIFT	3. Stuck 2-3 Valves.	3. Split Electrohydraulic Unit and inspect 2-3 valves. Remove debris if present. If valve can't be freed replace Electrohydraulic Unit.		
	4. K2 Clutch Slipping.	4. Inspect and if damaged replace K2 Clutch Discs and Seals.		
		5. It is possible that when the steel cover plate was screwed to the Electrohydraulic Unit, the spring was pinched thus deforming the bore and sticking the valve.		

	5. 2-3 Shift Pressure Valve Spring Deformed.	Remove the Electrohydraulic Unit and remove the steel plate covering the 2-3 shift pressure valve. If the valve can't be freely removed from the bore, the spring was pinched and the Electrohydraulic Unit requires replacement.	
	6. B1 bushing missing.	6. Replace B1 retainer and input shaft.	
	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .	
SLIPS ON 2-3 UPSHIFT	2. Fluid level low.	2. Check and adjust fluid level. See <u>STANDARD</u> <u>PROCEDURE</u> .	
SLIPS ON 2-3 OPSHIFT	3. Filter damaged or missing.	3. Check for damaged/missing filter or cut/missing o-ring.	
	4. Valve body malfunction.	4. Check for sticky/stuck 2-3 shift pressure valve or regulator valve.	
	5. F2 or B2 clutch damaged.	5. Disassemble transmission, inspect for damaged F2 or B2 clutch. Repair as needed.	
	1. Debris sticking the 3-4 Holding Valve	1. Split Electrohydraulic Unit and remove the 3-4 Shift Pressure and 3-4 Holding Valves. Flush the valves and bores with a solvent such as mineral spirits. (Note:	
FLARE OR NEUTRALS ON THE 3-4/4-3 SHIFT	2. Debris Sticking the 3-4 Shift Pressure Valve	Debris can be a very small sliver unnoticable unless flushing onto filter paper.) Only if the valve can not be freed should the Electrohydraulic Unit be replaced.	
	3. Two Plastic Check Balls in one pocket.	3. Split the Electrohydraulic Unit and inspect and verify that there is only one plastic check ball in each of the 4 pockets. If there are two in any pocket, remove one and reassemble.	
SLIPS, BANGS INTO GEAR, DELAYED ENGAGEMENT, VENT TUBE LEAK	1. Casting Void in the Bell Housing.	1. Disassemble the transmission, remove the pump and gears from the bell housing. Inspect the pump gear face in the bell housing for a 3/16" diameter void between the pump suction and drainback	

		circuits. If void is present, replace	
	1. Transmission adaptation/calibration.	the bell housing. 1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE.	
	2. Fluid level low.	2. Check and adjust fluid level. See STANDARD PROCEDURE.	
SLIPS ON 3-4 UPSHIFT	3. Filter damaged or missing.	3. Check for damaged/missing filter or cut/missing o-ring.	
	4. Valve body malfunction.	4. Check for sticky/stuck 3 - 4 shift pressure valve or regulator valve.	
	5. K3 or B2 clutch damaged.	5. Disassemble transmission, inspect for damaged K3 or B2 clutch. Repair as needed.	
	1. Transmission adaptation/calibration.	1. Check for latest level TCM software. Perform the TCM adaptation procedure. Refer to STANDARD PROCEDURE .	
	2. Fluid level low.	2. Check and adjust fluid level. See <u>STANDARD</u> PROCEDURE .	
SLIPS ON 4-5 UPSHIFT	3. Filter damaged or missing.	3. Check for damaged/missing filter or cut/missing o-ring.	
	4. Electrohydraulic Unit malfunction.	4. Check for sticky/stuck 1 -2/4- 5 shift pressure valve or regulator valve.	
	5. B1 or K1 clutch damaged.	5. Disassemble transmission, inspect for damaged B1 or K1 clutch. Repair as needed.	
IN-GEAR SHUDDER ON	1. Fluid level low.	1. Check and adjust fluid level.	
	20, 21, 20, 20, 10, 10, 11, 11, 11, 11, 11, 11, 11, 1	See <u>STANDARD</u> <u>PROCEDURE</u> .	
IN-GEAR SHUDDER ON HEAVY ACCELERATION	2. Filter damaged or missing.	•	
HEAVY ACCELERATION NO DRIVE		PROCEDURE. 2. Check for damaged/missing	
HEAVY ACCELERATION	2. Filter damaged or missing.1. Customer shifting into N at vehicle speeds greater than 25 mph and tipping	PROCEDURE. 2. Check for damaged/missing filter or cut/missing o-ring. 1. Instruct the customer that they should not shift into N at vehicle	

REVERSE GEAR POSITION BLOCKED	1. Customer shifting into R at vehicle speeds greater than 7 mph.	position is blocked at vehicle speeds greater than 7 mph.		
ENGAGEMENT WHEN MOVING SHIFT LEVER FROM D POSITION	2. Shift system malfunction.	2. Inspect shift system for proper adjustment or damage. Check shifter for DTCs. Repair as needed.		
	1. Gearshift cable adjustment.	1. Adjust shift cable and retest.		
NO ENGINE CRANKING IN P OR N	2. Shift system malfunction.	2. Check shifter DTCs. Inspect shift cable and lever assembly. Adjust and/or replace worn/damaged parts.		
IVI OKIV	3. Valve body malfunction.	3. Starter lockout contact malfunction. Remove valve body, replace lead frame assembly. See OPERATION .		
INCORRECT TRANSMISSION TEMPERATURE	1. Defective Trans Temp Sensor.	Verify proper temperature sensor operation.		
	1. Loose/Corroded TCM Connector (Both C1 and C2 Connectors).	1. Disconnect, inspect, and reconnect TCM connector. Make sure to check for any pushed out pins.		
SPEED SENSOR ERROR	2. Unlatched Electrohydraulic Unit connector.	2. Remove the Electrohydraulic Unit connector and inspect for any oil or damaged pins. (Note: There is no Electrohydraulic Unit connector pin in position #5) Reattach the connector and insure that the locking ring tab is fully latched.		
	3. Wires Shorted or Open.	3. Ohm the speed sensor wires to make sure there is not a short to another circuit or ground. Visually inspect for any chafing of the wires. Repair as necessary.		
	4. TCM Defective.	4. After checking the wiring and connectors replace the TCM.		
	1. Leak in area of bell housing.	1. Check bolt torque on internal bell housing bolts. If loose, replace fastener and torque to proper level. If bolts are to proper torque level, check pump outer seal and impeller seal. Replace if needed.		
	2. Leak in area of control unit (valve	2. Check connector for damaged (cut), flattened or missing o-rings.		

2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro

	body) electrical connector.	Replace as needed.	
	3. Leak in area of pan gasket.	3. Check for proper torque on oil pan clamps. Check for mispositioned or rolled gasket. Repair as needed.	
	4. Leak in area of park guide plug.	4. Remove park guide plug. Check for damaged (cut) or missing o-ring. If o-ring is in good condition, install new plug.	
	5. Leak in area of shift lever.	5. Check for damaged shift lever seal or damaged lever. Repair as needed.	
FLUID LEAK	6. Leak in area of output flange.	6. Check for worn/damaged slinger seal and output seal. Visually inspect output flange seal surface for damage. Repair as needed.	
	7. Leak in area of transmission vent.	7. Check fluid level for overfill condition. Adjust as needed. If fluid level is within specification, ride check vehicle. Monitor transmission temperature. If high operating temperatures are observed, fluid may be contaminated or cooling system malfunctioning. Change fluid per service information procedures. Refer to cooling system diagnostics if needed.	
	8. Leak in area of transmission fill tube.	8. Inspect fill tube cap for proper installation. Inspect fill tube	

GENERAL CONDITIONS

CAUTION: Before attempting any repair on a NAG1 automatic transmission, check for Diagnostic Trouble Codes with the appropriate scan tool.

Transmission malfunctions may be caused by these general conditions:

Poor engine performance.

Improper adjustments.

Hydraulic malfunctions.

2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro

Mechanical malfunctions.

Electronic malfunctions.

Transfer case performance (if equipped).

Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level and condition, gearshift cable adjustment. Then perform a road test to determine if the problem has been corrected or if more diagnosis is necessary.

PRELIMINARY - NAG1

Two basic procedures are required. One procedure for vehicles that are drivable and an alternate procedure for disabled vehicles (will not back up or move forward).

VEHICLE IS DRIVABLE

- 1. Check for transmission fault codes using the appropriate scan tool.
- 2. Adjust gearshift cable if complaint was based on delayed, erratic, or harsh shifts.
- 3. Road test and note how transmission upshifts, downshifts, and engages.
- 4. Check fluid level and condition.

VEHICLE IS DISABLED

- 1. Check for broken or disconnected gearshift cable.
- 2. Check for cracked, leaking cooler lines, or loose or missing pressure-port plugs.
- 3. Check fluid level and condition.
- 4. Check shifter linkage: Is cable connected to lever at transmission and does the lever move with gear change on the console shifter? If no movement, repair shift cable and or shifter.
- 5. With shifter in Park, attempt to rotate drive shaft(s) to ensure transmission output shaft coupler/flange is secure.
- 6. Check the transfer case operation (if equipped).
- 7. Raise and support vehicle on safety stands, start engine with transmission in Park position and allow to idle for several minutes, shift transmission into gear, and note following:
 - If propeller shaft turns but wheels do not, problem is with differential or axle shafts.
 - If propeller shaft does not turn and transmission is noisy, stop engine. Remove oil pan, and check for debris. If pan is clear, remove transmission and check for damaged driveplate, converter, oil pump, or input shaft.
 - If propeller shaft does not turn and transmission is not noisy, perform hydraulic-pressure test to determine if problem is hydraulic or mechanical.
- 8. Air pressure test the B1, K3, and B2 clutch circuits. See **DIAGNOSIS AND TESTING**.
- 9. Check the TCM, Wiring, Valve body, and Solenoids (Utilize fault codes to diagnose if available).
- 10. Remove oil pan and check filter presence and condition (not plugged and seated).
- 11. If debris is found in the pan, tear down transmission and inspect all hard parts, Front Annulus Gear and

2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro

Gear to Retainer and Input Shaft (Shaft to Retainer) etc., and clutches. If the hard parts did not show signs of damage replace the torque converter and filter.

- 12. Remove valve body, disassemble, and inspect Line Pressure Regulating valve for being stuck, clean and remove debris.
- 13. Check pump rotor for failed inner lugs that are driven by the T/C hub.

ROAD TESTING - NAG1

Before road testing, be sure the fluid level and control cable adjustments have been checked and adjusted if necessary. Verify that all diagnostic trouble codes have been resolved.

Observe engine performance during the road test. A poorly tuned engine will not allow accurate analysis of transmission operation.

Operate the transmission in all gear ranges. Check for shift variations and engine flare which indicates slippage. Note if shifts are harsh, spongy, delayed, early, or if part throttle downshifts are sensitive.

Slippage indicated by engine flare, usually means clutch, overrunning clutch, or line pressure problems.

A slipping clutch can often be determined by comparing which internal units are applied in the various gear ranges. The Clutch Application chart provides a basis for analyzing road test results.

CLUTCH APPLICATION									
GEAR	RATIO	B1	B2	В3	K1	K2	К3	F1	F2
1	3.59	X*	X	-	-	-	X*	X	X
2	2.19	-	X	-	X	-	X*	-	X
3	1.41	-	X	-	X	X	-	-	-
4	1.00	-	-	-	X	X	X	-	-
5	0.83	X	-	-	-	X	X	X*	-
N	N/A	X	-	-	-	-	X	-	-
R	3.16	X*	-	X	-	-	X	X	-
R - Limp 1.93 X X X X In or 4WD Low Range									
* = The shift components required during coast.									

AIR CHECKING TRANSMISSION CLUTCH OPERATION

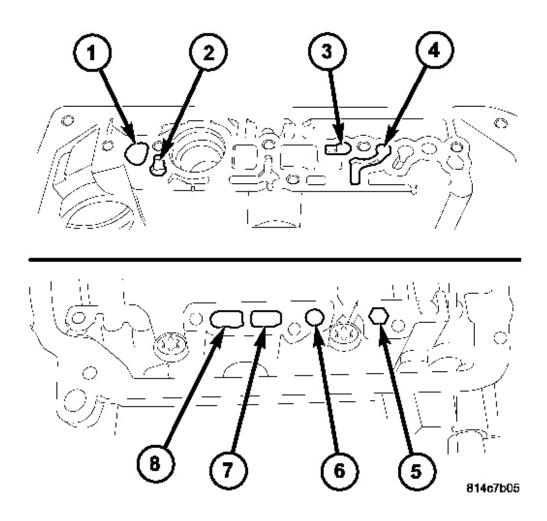
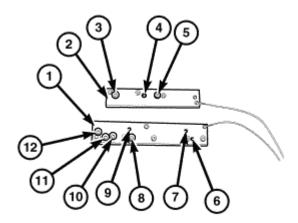


Fig. 26: NAG1 Clutch Application Ports Courtesy of CHRYSLER LLC

- 1 K1 CLUTCH APPLY PORT
- 2 B1 CLUTCH APPLY PORT
- 3 K2 CLUTCH APPLY PORT
- 4 TORQUE CONVERTER CLUTCH APPLY PORT
- 5 B3 CLUTCH APPLY PORT
- 6 B2 CLUTCH COUNTER-PRESSURE PORT
- 7 K3 CLUTCH APPLY PORT
- 8 B2 CLUTCH APPLY PORT

2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro



81b7a696

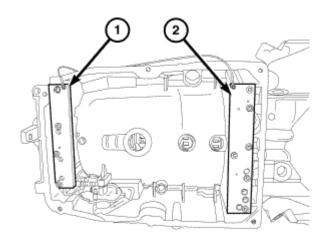
Fig. 27: NAG1 Air Adapter Plates Courtesy of CHRYSLER LLC

- 1 NAG1 AIR CHECK ADAPTER PLATE 10007-1
- 2 NAG1 AIR CHECK ADAPTER PLATE 10007-2
- 3 B3 CLUTCH PORT
- 4 K3 CLUTCH PORT
- 5 B2 CLUTCH PORT
- 6 K1 CLUTCH PORT
- 7 B1 CLUTCH PORT
- 8 K2 CLUTCH PORT
- 9 TORQUE CONVERTER CLUTCH LOCK UP PORT
- 10 TORQUE CONVERTER IN PORT
- 11 COOLER OUT PORT
- 12 TORQUE CONVERTER OUT PORT

With the use of Air Adapter Plates 10007-1,10007-2, air-pressure testing can be used to check transmission clutch operation. The test can be conducted with the transmission either in the vehicle (where applicable) or on the work bench, as a final check.

Air-pressure testing requires that the oil pan and valve body be removed from the transmission.

2007 AUTOMATIC TRANSMISSION NAG1 - Service Information - Nitro



81b7a1c1

Fig. 28: NAG1 Transmission Adapter Plate Courtesy of CHRYSLER LLC

1 - AIR ADAPTER PLATE 10007-2

2 - AIR ADAPTER PLATE 10007-1

NOTE: The air supply which is used must be free of moisture and dirt. Use a pressure

of 30 psi to test clutch operation.

NOTE: When checking the K1 clutch, air must pass through numerous passages to

reach the clutch it's self, therefore only a slight application will be noted.

1. Remove the oil pan.

- 2. Remove the valve body (electrohydraulic unit). See **<u>REMOVAL</u>**.
- 3. Using the existing valve body (electrohydraulic unit) mounting bolts attach the Air Adapter Plates 10007-1, 10007-2. Tighten the bolt to 8 N.m (71 in. lbs.).
- 4. Apply 30 psi of air pressure to each port

If the clutch is functioning, a soft thump will be heard as the clutch is applied. The clutch application can also be felt by touching the appropriate element while applying air pressure. As the air pressure is released, the clutch should also release.