



## ProTecta Synthetic Transmission Treatment

### HEFCAD DEXRON® III PLATE CLUTCH FRICTION TEST

Description: The DEXRON® III test was conducted for the frictional characteristics of automatic transmission fluid (ATF). It was performed on an automatic transmission plate clutch pack immersed in the ATF at 140°C. One half-shaft from the clutches is held stationary and fitted with strain gauges to measure the torque on it. The other half-shaft rotated freely with a motorized flywheel energy source. The motor turns the flywheel at 3600 rpm and then 175 kilopascals (kPa) (40 psi) is applied to the clutch to press the six plates together. The flywheel is stopped within one second. The strain gauges transmit the torque on the stationary half-shaft to a computer and the amount of torque on the stationary half-shaft to a computer and of the amount of torque as the flywheel is stopped. The procedure is then repeated three times per minute for a total of 100 hours

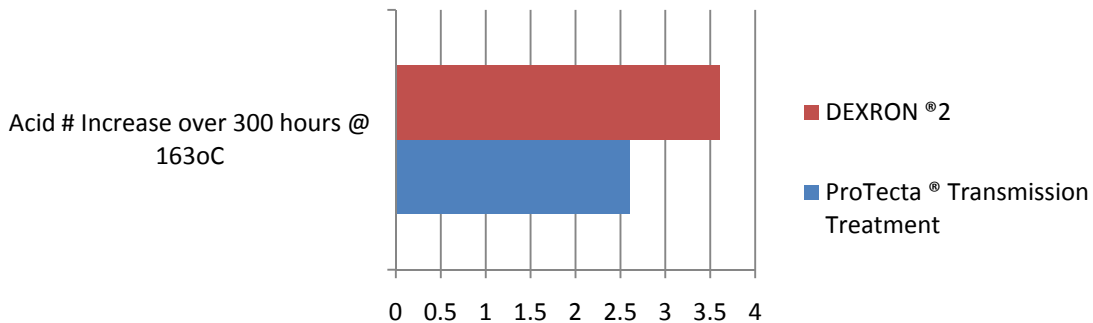
Test	DEXRON® III with ProTecta Transmission Treatment	DEXRON® III	
Lock-up time	0.57 – 0.59	0.50 – 0.60	PASS
	DEXRON® III Plate friction test parts conditioning rating with ProTecta Transmission Treatment		
Fibre Plates	There is no flaking, glazing or pitting visible		PASS
Steel Plates	Outer steel show no discolouration and no hot spots		PASS

### DEXRON® III TURBO HYDRA-MATIC OXIDATION TEST

This test is conducted to gauge the thermal and oxidative stability of automatic transmission fluids (ATF). A General Motors 4L60 transmission is utilized for the test. ATF is circulated and an external heater brings the fluid to a constant 163°C. The test is run continuously without interruption for a period of 300 hours throughout the operating transmission with air being injected into it. The transmission is shifted in a set pattern throughout the test at 100, 200 and 250 hours as well as at the end of the test. The fluid is then tested for damage and the transmission is dismantled for measurement purposes.

Value	Requirement	Final Result	PASS/FAIL
Ending Viscosity			
cST @ 100oC	>5.4 cSt	7.53 cSt	PASS
CP @ -20oC	<2000 cP	1450 cP	PASS
Total Acid #	<3.25	2.62	PASS
Carbonyl Absorb.	<.45	.41	PASS
Pentane Insolubles		0.01	PASS
Sludge		"Trace"	PASS
Seals		Minor hardening	PASS
Clutches and Bands		No abnormalities	PASS

Conclusion: The clutches, seals and fluid viscosity had no abnormal deductions. Acid formation is reduced due to synthetic base with anti-oxidation additives.



### DEXRON® III VICKERS® VANE PUMP WEAR TEST

The Dexron® III Wear test utilizes the Vickers® sliding vane pump which operates for 100 hours at a temperature of 79.4 oC. General motors factory fill ATF was used with the ProTecta® Transmission Treatment. The vanes fit into slots in the impeller and are forced against the oval outside ring caused by centrifugal force. They slide in and out in slots following the shape of the oval – creating compartments of fluid. The fluid then enters the large compartment and pressure develops as the space is reduced in size. The vanes slide against the ring continuously causing metal-to-metal contact. When the test is complete the ring and vanes are measured for weight loss of materials. To qualify for DEXRON® III approval the weight loss can not exceed 15 mg.

