

## Passenger Car Engine Test Category For API SJ And SL

Requirements	Test	Properties	Unit	Limits	
				SJ/EC GF-2	SL/EC GF-3
<b>1. LABORATORY TESTS</b>					
1.1 Viscosity Grades		All those that apply, typically SAE 0W-20, 0W-30, 5W-30 and 10W-30.		Manufacturer sets targets within SAE J300 specification	
1.2 Foam Test	ASTM D892	Sequence I Sequence II Sequence III Sequence IV	ml initial Foam/ml after settling	10/0 max 50/0 max 10/0 max 200/50 max	10/0 max 50/0 max 10/0 max 100/0 max
1.3 Phosphorus	ASTM D4951 or D5185	Phosphorus Content	%	0.10 max	0.10 max <sup>(1)</sup>
1.4 EOFT	GM 9099P	0.6% Water - with dry ice - % reduction in flow	%	50 max	50 max
1.5 EOWTT	ASTM D6794	0.6% Water - without dry ice - % rate of change 1.0% Water - without dry ice - % rate of change 2.0% Water - without dry ice - % rate of change 3.0% Water - without dry ice - % rate of change	% % % %	report report report report	50 max 50 max 50 max 50 max
1.6 TEOST	ASTM D6335	Total Deposits, max	mg	60 max	NR
1.7 TEOST (MHT4)	ASTM D7097	Total Deposits, max	mg	NR	45 max
1.8 Homogeneity and Miscibility	FTM STD 791C	Oil Compatibility		pass	pass
1.9 Scanning Brookfield	ASTM D5133	Gelation Index		12 max	12 max
1.10 Volatility	ASTM D5800 ASTM D6417	Volatility (Noack), % off Volatility (GCD), % off	% %	22 max 17 max	15 max 10 max
1.11 BRT	ASTM D6557	Rust rating	Gray value	100 min	100 min
<b>2. ENGINE TESTS FOR API SJ and SL</b>					
2.1 Sequence IIIF	ASTM D1491	% Viscosity increase at 60 hours, max % Viscosity increase at 80 hours, max Average piston skirt varnish rating, min Weighted piston deposit rating, min Cam plus lifter wear avg, max Hot stuck rings Oil consumption, max Low temperature viscosity performance	% % merits merits microns # liters Cp	325 max NR 8.5 min 3.2 min 20 max none 6.5 NR	NR 275 9.0 min 4.0 min 20 max none 5.2 max rate and report
2.2 Sequence IVA	ASTM D6891	Cam wear average, max	microns	120 max	120 max
2.3 Sequence VG	ASTM D6593	Average engine sludge, min Rocker arm cover sludge, min Average piston skirt varnish, min Average engine varnish, min Oil screen clogging, max Hot stuck compression rings Cold stuck rings Oil screen debris Oil ring clogging	merits merits merits merits % # # % %	7.8 min 8.0 min 7.5 min 8.9 min 20 max none rate and report rate and report rate and report	7.8 min 8.0 min 7.5 min 8.9 min 20 max none rate and report rate and report rate and report
2.4 Sequence VE (Only if oil Phosphorus < 0.08%)	ASTM D5302	Cam wear Average, max Maximum, max	microns microns	NR NR	127 max 380 max
2.5 Sequence VIII	ASTM D6709	Bearing weight loss, max 10 hr. stripped viscosity	mg cSt	26.4 max Stay in grade	26.4 max Stay in grade
2.6 Sequence VIB (FEI1 using BC before only)	ASTM D6837	For viscosity grades: SAE 0W-20 and 5W-20 Other SAE 0W- and 5W- multigrades All SAE 10W- multigrades	% improvement % improvement % improvement	2.0 min 1.6 min 0.9 min	NR NR NR
2.7 Sequence VIB	ASTM D6837	SAE 0W-20 and 5W-20 (FEI1/FEI2/sum), min SAE 0W-30 and 5W-30 (FEI1/FEI2/sum), min All other viscosity grades (FEI1/FEI2/sum), min	% improvement % improvement % improvement	NR NR NR	2.0/1.7/NR min 1.6/1.3/3.0 min 0.9/0.6/1.6 min

<sup>(1)</sup> There is also a 0.08 min P requirement, unless a successful Sequence VG test has been run.