

ARCHIVAL MATERIAL FROM 1Q08

ILSAC GF-5: WHY

The proposed ILSAC (International Lubricant Standardisation and Approval Committee) GF-5 specification is driven by needs expressed by the original equipment manufacturers (OEMs):

To capture defined improvements in

- Fuel economy
- Fuel economy retention
- Protection of emission control systems

To service expanding use of new hardware technologies

- Variable valve actuation (VVA)
- Turbochargers
- Spark ignition direct injection (SIDI) engines
- Alternative fuels, particularly E85

To affect engine oil robustness

- Increased IIIG WPD limit
- Increased VG AES, RCS and decreased OSC limits
- Decreased TEOST MHT limit

ILSAC GF-5: WHAT

ILSAC issued a draft specification - ILSAC GF-5 Standard for Passenger Car Engine Oils - on February 21, 2007, which stipulated:

Tighter limits

- Phosphorus maximum level reduced from 0.08% to 0.07%
- Sludge (Sequence VG) and deposits (Sequence IIIG Weighted Piston Deposits [WPD])
- TEOST MHT
- Oil screening clogging (Sequence VG)
- Foaming

New tests

- Phosphorus volatility/retention
- Fuel economy (Sequence VID)

- Rust and emulsion for E85
- Seal compatibility
- Aeration
- ROBO (used oil viscometrics)

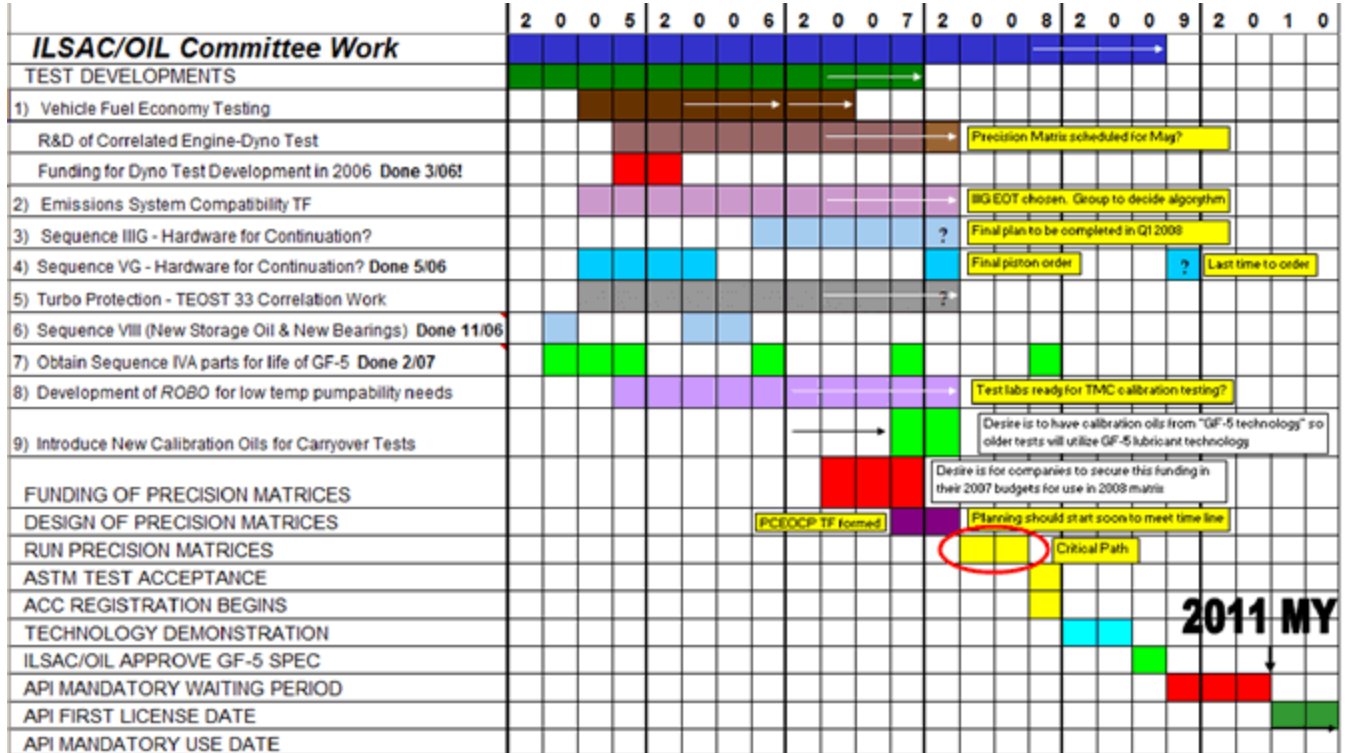
ILSAC GF-5: HOW

Following is a comparison of the proposed new specification versus the current ILSAC GF-4 in terms of tighter limits and new tests

Performance Parameter	Test Method	ILSAC Standard	
		GF-4	GF-5 ⁽¹⁾
Seq. IIG Piston Deposits, merits, min.	Seq. IIG	3.5	5.0
Seq. IIGA Aged Oil Low Temp Vis.	Seq. IIGA	MRV+1grade	—
Seq. VG Engine Sludge, merits, min.	Seq. VG	7.8	8.3
Seq. VG Rocker Sludge, merits, min.	Seq. VG	8.0	8.5
Seq. VG Oil Screen Clogging % max.	Seq. VG	20.0	5.0
Seq. VB Fuel Economy, %, min.	Seq. VB	Base	—
Phosphorous, mass%, min.	ASTM D4951	0.06	0.06
Phosphorous, mass%, max.	ASTM D4951	0.08	0.07
Sulfur Content, mass%, max.	ASTM D4951 or ASTM D2622	0.5 (0W & 5W) 0.7 (10W)	0.5
Fresh Oil Foaming/Hi Temp Foaming Charact.	D892/6082 OptA	10 min settling	1 min settling pd
TEOST MHT, deposit weight, mg	ASTM D7097	35	30
Seq. VD Fuel Economy, %, min.	Seq. VD	—	+0.5% vs. GF-4
Used Engine Oil Aeration Volume, %, max.	ASTM D6894	—	6
Phos. Volatility	TBD	—	TBD
TEOST 33C, deposit weight, mg	ASTM D6335	—	25
ROBO - Used Oil Pumpability	ROBO	—	MRV pass in orig. CCS grade or +1 grade of used oil
Emulsion Retention test	Chrysler to provide	—	No separation 0°C, 24 hours 25°C, 24 hours
Rust Protection (100hrs sand blasted panel)	ASTM D1748	—	No Rust
Seal Compatability	GM	—	Passing

ILSAC GF-5: WHEN

The following represents the original timeline for new specification development:



The impact of key items from the ILSAC GF-5 timeline will affect timing:

- Estimated industry funding of GF-5 precision matrices
 - Biggest item will be the Sequence VID
 - Official timing to run matrices is 2Q/3Q 2008
 - ACC estimates cost range for precision matrices at \$1.2-1.9M
 - ACC estimate of cost range for BOI/VGRA test at \$400K=\$1M
 - Historically, API, ACC and ILSAC split one-third each for precision part of matrix
 - Estimate of individual trade association share for precision matrices at \$400-620K
- Completion of Sequence VID test development
 - Official timing end 1Q08
- Definition of category demonstration oil
 - Difficult to define without clearer picture about Gf-5, including chemical limits, and most likely tests and performance limits
- First license date targeted for July 1, 2010