















Requirement	PC-10/CJ-4
Mack T-12 EGR Engine Test	
Mack Merit Rating, min.	1,000
Cylinder Liner Wear (Avg. 6 cylinders, 12 locations)	 20
Top Ring Weight Loss (Avg. of 6 Cylinders)	 70
End of Test Lead	 25
Delta Lead 250 - 300 hrs.	 10
Oil Consumption (Phase II)	 65
Mack T-11 Engine Test	
Minimum TGA % Soot @ 4.0 cSt increase @ 100° C	3.5%
Minimum TGA % Soot @ 12.0 cSt increase @ 100° C	6.0%
Minimum TGA % Soot @ 15.0 cSt increase @ 100° C	6.7%
Mack T-11A Used MRV TP-1	
180 hour T-11 Drain MRV (-20C for 0W, 5W, 10W, 15W), mPa max.	25,000
Fresh oil MRV (-20C for 0W, 5W, 10W, 15W), mPa max. (for read only)	20,000
Cummins ISM EGR Engine Test	
Cummins Merit Rating, min.	1,000
Crosshead Avg. Wt. Loss	 5.7
Top Ring Weight Loss	 100
Oil Filter Differential Pressure @ 150 hr.	 13
Average Engine Sludge / CRC Merits @ EOT	 9.0
Average Valve Adjusting Screw Weight Loss, mg.	 27
Cummins ISB EGR Engine Test	
Average Slider Tappet Weight Loss, mg, max.	100/108/112
Average Cam Lobe Wear, µm, max.	55/59/61
Average Crosshead Weight Loss, max.	R&R
Caterpillar C13 Deposit/Oil Consumption Test	
CAT Merit Rating, min.	1,000
Oil Consumption Delta (125=>475 hours), g/hr.	 25
Top Groove Carbon	 46
Top Land Carbon	 30
Second Ring Top Carbon	 22
Hot-stuck piston ring	NONE
Caterpillar 1N	
Weighted Demerits, max.	286.2/311.7/323.0
Top Groove Fill, max.	20/23/25
Top Land Heavy Carbon, max.	3/4/2005
Oil Consumption (0-252 hrs) g/kwh, max.	0.5
Piston/ring/liner scuffing	NONE
Piston ring stick	NONE
Caterpillar 1P	
Weighted Demerits, max.	350/378/390
Top Groove Carbon, max.	36/39/41
Top Land Carbon, max.	40/46/49
Oil Consumption (0 to 360 hrs) g/hr, max.	12.4
Final OC (312-360 hrs), max.	14.6
Piston/ring/liner scuffing	NONE
Sequence III F Engine Test	
EOT Kinematic Viscosity / % Increase @ 40° C, max.	275%
Sequence III G Engine Test (alternative to III F)	
EOT Kinematic Viscosity / % Increase @ 40° C, max.	150%
Roller Follower Wear Test D 5596	
Average pin wear, mils, max.	0.30

Requirement	PC-10/CJ-4
Chemical Limits (non-critical)	
Sulfated Ash, max.	1.0%
Phosphorus, weight %, max.	0.12%
Sulfur, weight %, max.	0.4%
Bench Tests	
Corrosion ASTM D 6594 (135° C, HTCBT)	
Cu, max.	20
Pb, max.	120
Sn, max.	50
Copper strip, max.	3
Shear Stability ASTM D 6278	
Kinematic Viscosity after 90 pass Shearing cSt @ 100° C, min. XW-30 / XW-40	9.3/12.5
Volatility ASTM D 5800 (NOACK)	
Evaporative Loss @ 250° C, max. [Viscosities other than 10W-30]	13%
Evaporative Loss @ 250° C, max. [10W-30]	15%
D 6894 (EOAT)	
Aeration, Volume %, max.	8.0%
Foaming ASTM D 892 (NO Option A)	
Foaming / Settling Sequence I	10/0 ml max.
Sequence II	20/0 ml max.
Sequence III	10/0 ml max.
Seal Compatability Tests	
Nitrile	
Volume Change (ASTM D 471)	+5 / -3
Hardness (ASTM D 2240)	+7 / -5
Tensile Strength (ASTM D 412)	+10 / -TMC 1006
Elongation (ASTM D 412)	+10 / -TMC 1006
Silicone	
Volume Change (ASTM D 471)	+TMC 1006 / -3
Hardness (ASTM D 2240)	+5 / -TMC 1006
Tensile Strength (ASTM D 412)	+10 / -45
Elongation (ASTM D 412)	+20 / -30
Polyacrylate	
Volume Change (ASTM D 471)	+5 / -3
Hardness (ASTM D 2240)	+8 / -5
Tensile Strength (ASTM D 412)	+18 / -15
Elongation (ASTM D 412)	+10 / -35
FKM	
Volume Change (ASTM D 471)	+5 / -2
Hardness (ASTM D 2240)	+7 / -5
Tensile Strength (ASTM D 412)	+10 / -TMC 1006
Elongation (ASTM D 412)	+10 / -TMC 1006
Vamac G	
Volume Change (ASTM D 471)	+TMC 1006 / -3
Hardness (ASTM D 2240)	+5 / -TMC 1006
Tensile Strength (ASTM D 412)	+10 / -TMC 1006
Elongation (ASTM D 412)	+10 / -TMC 1006

PC-10/CJ-4 Merit Systems

Mack T-12 EGR Engine Test

PC-10/CJ-4	Cylinder Liner Wear	Top Ring Wt. Loss	Delta Pb Final	Delta Pb 250-300 hr.	Oil Consumption
Weight	250	200	200	200	150
Maximum	24	105	35	15	85
Anchor	20	70	25	10	65
Minimum	12	35	10	0	50

Caterpillar C13 Deposit/Oil Consumption Test

PC-10/CJ-4 1000	Delta Oil Consumption	Ave. Top Land Carbon	Ave. Top Groove Carbon	2nd Ring Top Carbon
Weight	300	300	300	100
Maximum	31	35	53	33
Anchor	25	30	46	22
Minimum	10	15	30	5

ISM EGR Engine Test

PC-10/CJ-4 1000	Crosshead Ave. Wt. Loss	Top Ring Weight Loss	Oil Filter Pressure Delta	Ave. Engine Sludge	Ave. Valve Adj. Screw Wt. Loss
Weight	350	0	150	150	350
Maximum	7.1	100	19	8.7	49
Anchor	5.7		13	9	27
Minimum	4.3		7	9.3	16

Notes:

Maximum - At the Maximum you get zero merit points. Performance worse than the Maximum for any parameter is an automatic FAIL

Anchor - At the Anchor you receive merit points equal to the Weight

Minimum - At the Minimum you receive merit points equal to twice the Weight. There are no additional points for better performance than the minimum.