

Requirement	PC-10/CJ-4
Chemical Limits (non-critical)	
D 874 Sulfated Ash, max.	1.0%
D 4951 Phosphorus, weight %, max.	0.12%
D 4951 or D 2622 Sulfur, weight %, max.	0.4%
Engine Tests	
Mack T-12 EGR	
Mack Merit Rating, min. (Annex 1)	1,000
Mack T-11	
Minimum TGA % Soot @ 4.0 cSt increase @ 100° C	3.50/3.38/3.33%
Minimum TGA % Soot @ 12.0 cSt increase @ 100° C	6.00/5.91/5.87%
Minimum TGA % Soot @ 15.0 cSt increase @ 100° C	6.70/6.59/6.55%
Cummins ISM EGR	
Cummins Merit Rating, min. (Annex 1)	1,000
Top Ring Weight Loss, max.	100
Cummins ISB EGR	
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. (Annex 1)	1,000
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.	3/4/5
Oil Consumption (0-252 hrs) g/kwh, max.	0.5
Piston/ring/liner scuffing	NONE
Piston ring stick	NONE
Caterpillar 1P* Caterpillar reviewing necessity 2/3/06	
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 IIIF	
EOT Kinematic Viscosity / % Increase @ 40° C, max. (MTAC) ^a	275%/275%(MTAC)/275%(MTAC)
(alternative to IIIF)	
EOT Kinematic Viscosity / % Increase @ 40° C, max. (MTAC) ^a	150%/150%(MTAC)/150%(MTAC)
Roller Follower Wear Test D 5596	
Average pin wear, mils, max.	0.30/0.33/0.36
or (μm), max.	7.6/8.4/9.1
D 6894 (EOAT)	
Aeration, Volume %, max. (MTAC) ^a	8.0%/8.0%(MTAC)/8.0%(MTAC)

^a Multiple Test Acceptance Criteria (MTAC) is described in ASTM D 4485 Annex A1

Requirement	PC-10/CJ-4
Bench Tests	
Mack T-11A Used MRV TP-1	
180 hour T-11 Drain MRV, mPa-s, max.	25,000
MRV Yield Stress, Pa	< 35
High Temperature/High Shear D4683	
Viscosity @ 150°C, mPa-s, min.	3.5
Corrosion ASTM D 6594 (135° C, HTCBT)	
Cu, ppm increase, max.	20
Pb, ppm increase, max.	120
Copper strip rating, max.	3
Shear Stability ASTM D 7109	
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%
Foaming ASTM D 892	
Foaming / Settling Sequence I	10/0 ml max.
Sequence II	20/0 ml max.
Sequence III	10/0 ml max.
Seal Compatability Tests ASTM D 7216	
Nitrile	
Volume Change	+5 / -3
Hardness	+7 / -5
Tensile Strength	+10 / -TMC 1006
Elongation	+10 / -TMC 1006
Silicone	
Volume Change	+TMC 1006 / -3
Hardness	+5 / -TMC 1006
Tensile Strength	+10 / -45
Elongation	+20 / -30
Polyacrylate	
Volume Change	+5 / -3
Hardness	+8 / -5
Tensile Strength	+18 / -15
Elongation	+10 / -35
FKM	
Volume Change	+5 / -2
Hardness	+7 / -5
Tensile Strength	+10 / -TMC 1006
Elongation	+10 / -TMC 1006
Vamac G	
Volume Change	+TMC 1006 / -3
Hardness	+5 / -TMC 1006
Tensile Strength	+10 / -TMC 1006
Elongation	+10 / -TMC 1006

PC-10/CJ-4 Merit Systems

Mack T-12 EGR Engine Test

PC-10/CJ-4 1000	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	Oil Filter Pressure Delta	Ave. Engine Sludge	Ave. Valve Adj. Screw Wt. Loss
Weight	350	150	150	350
Maximum	7.1	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.