

## PERFORMANCE TESTS

### Cummins ISM

#### Scope

Although the ISM is truly a new engine test, it is being treated as simply a replacement for the M11-EGR engine that is no longer in production. It is not being subjected to even precision Matrix testing as part of PC-10.

#### Test Conditions

The test procedure is exactly the same as the M11-EGR, but the test length is shortened from six 50 hour segments and 300 total hours to four 50 hour segments and 200 total hours. End of test soot levels **drop** from around 9% to around 6%, and overall valve train wear is reduced significantly due to both lower soot and more robust hardware design.

Parameter	Units	Stage A	Stage B	Stage C	Stage D
Stage Length	H	50	50	50	50
Speed	r/min	1800 ±5	1600 ±5	1800 ±5	1600 ±5
Power	kW	Record	Record	Record	Record
Torque (Typical) <sup>(A)</sup>	N•m	1300 1220	1930 1830	1300 1220	1930 1830
Fuel Flow	kg/h	58 ±1	64.4 ±1	58 ±1	64.4 ±1
Intake Manifold Temp.	°C	80	65.5	80	65.5
Blowby Flow	L/min	Record	Record	Record	Record
Coolant Out Temp.	°C	65.5 ±2	65.5 ±2	65.5 ±2	65.5 ±2
Coolant In Temp.	°C	Record	Record	Record	Record
Coolant Delta Temp.	°C	Record	Record	Record	Record
Fuel In Temp.	°C	40 ±2	40 ±2	40 ±2	40 ±2
Oil Gallery Temp.	°C	115 ±2	115 ±2	115 ±2	115 ±2
Turbo Inlet Temp.	°C	Record	Record	Record	Record
Intake Manifold Press.	kPa abs.	≥300	≥320	≥300	≥300
Exhaust Temp.	°C	Record	Record	Record	Record
Fuel Pressure	kPa	Record	Record	Record	Record
Oil Gallery Pressure	kPa	Record	Record	Record	Record
Oil Filter Delta Press.	kPa	Record	Record	Record	Record
Coolant System Press. <sup>(B)</sup>	kPa	99-107	99-107	99-107	99-107
Exhaust Pressure	kPa abs.	107 ±1	107 ±1	107 ±1	107 ±1
Crankcase Pressure	kPa	Record	Record	Record	Record
Inlet Air Pressure	kPa abs.	Record	Record	Record	Record
Intake CO <sub>2</sub>	%	0.97-1.09	0.97-1.09	0.97-1.09	0.97-1.09

(A) = At standard atmospheric temperature and pressure.

(B) = Measure the coolant pressure on the top of the expansion tank.