DrivAer — CFD Data Exchange

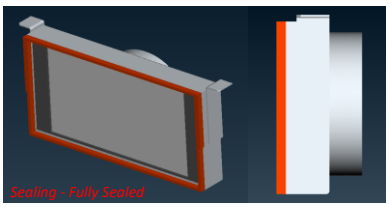
COMPANY	Ford Motor Company	DATE	19/09/2017	CONTACT	Brendan Luneman
DrivAer Configuration	N_EB_wM_wW_woL_oG			EMAIL	bluneman@ford.com

CFD Solver		Mesh Settings		Tunnel Size	
Vendor	CD-adapco	Mesh Type	Trim	WT length upstream [m]	20
Software	STAR-CCM+	Minimum Cell Size [mm]	2.5	WT length downstream [m]	40
Version	v11.06.011	Total Number Cells [x10^6]	66.85	WT width / height [m]	22 / 9

Flow Boundary Conditions		Turbulence Settings		Vehicle Options	
Yaw Angle [deg]	0	Turbulence Model Class	DES	Bodystyle	Notchback
Vehicle Speed [ms-1]	38.89	Turbulence Model	k-w SST	Mirrors	OCDA
Density [kg m-3]	1.204	Near wall treatment	Hybrid	Front Ride Height (mm)	686
Absolute Ref. Pressure [Pa]	101325	Compressible Flow	No	Rear Ride Height (mm)	682
Solution Method	NS-Transient				

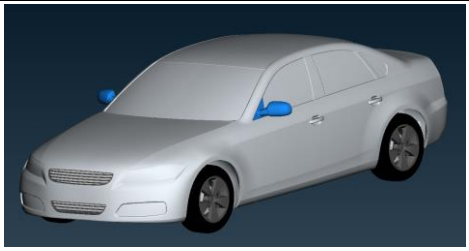
Heat Exchanger/Cooling Package Data		
Heat Exchanger		Ford HX1 (baseline)
HX Pressure Drop $\Delta p = A*v + B*v^2$	A:	5.78
	B:	17.31
HX x-Position [mm]		35
HX Thickness [mm]		27
Fan Shroud x-Pos. [mm]		209.44
Sealing		Fully sealed
Leakage Area (mm^2)		0

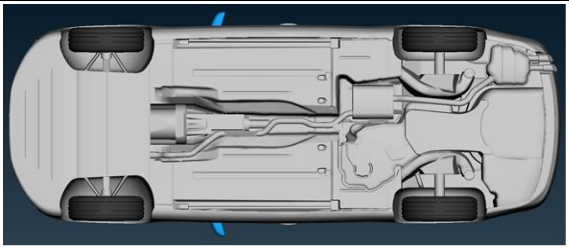
Cooling Configuration



Cooling Package (CAD)

Vehicle Configuration	
UPPER COOLING INTAKE	Open
LOWER COOLING INTAKE	Open
Wheel Type	OC DrivAer
Wheel Type (Comments)	- rigid / no deformation solid contact patch
Road Simulation	Static
Rim Simulation	Static
Tire Simulation	Static



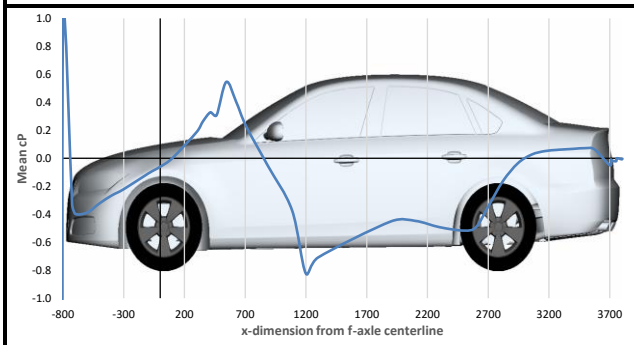


CFD Model

COMMENTS	standard open bar grills mirrors included solid wheels (milled, as CAD data) wheel house air exit open rear lower engine exit open

CFD Results					
Drag (Cx) [-]	0.287	Radiator Mass Flow [kg/s]	1.369	Wheelhouse LHS Flow [kg/s]	0.370
Frontal Area [m2]	2.170	Upper Grill Flow [kg/s]	0.391	Wheelhouse RHS Flow [kg/s]	0.316
Front Lift (Czf) [-]	-0.026	Lower Grill Flow [kg/s]	0.978	Tunnel Flow [kg/s]	0.663
Rear Lift (Czr) [-]	0.097				
Underhood Ref Pressure (#415) (Cp) [-]:		-0.108	Wheel-house Ref Pressure (#566) (Cp) [-]:		-0.184

Upperbody Centerline Pressure (Cp)



Underbody Centerline Pressure (Cp)