DrivAer — CFD Data Exchange

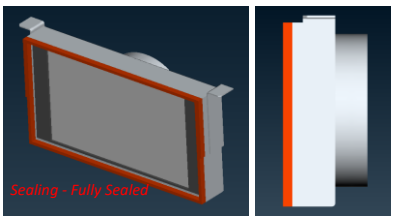
COMPANY	Ford Motor Company	DATE	9/20/2017	CONTACT	Pedro Costa
DrivAer Configuration	N_EB_wM_wW_woL_oG			EMAIL	pcosta37@ford.com

CFD Solver		Mesh Settings		Tunnel Size	
Vendor	EXA	Mesh Type	Trim	WT length upstream [m]	47
Software	PowerFLOW	Minimum Cell Size [mm]	1.25	WT length downstream [m]	56
Version	5.2a	Fine Equivalent Voxels [x10^6]	36.45	WT width / height [m]	54 / 38

Flow Boundary Conditions		Turbulence Settings		Vehicle Options	
Yaw Angle [deg]	0	Turbulence Model Class	VLES	Bodystyle	Notchback
Vehicle Speed [ms-1]	38.89	Turbulence Model	k-epsilon	Mirrors	OCDA
Density [kg m-3]	1.204	Near wall treatment	Enhanced WF	Front Ride Height (mm)	686
Absolute Ref. Pressure [Pa]	101325	Compressible Flow	Yes	Rear Ride Height (mm)	682
Solution Method	LBM				

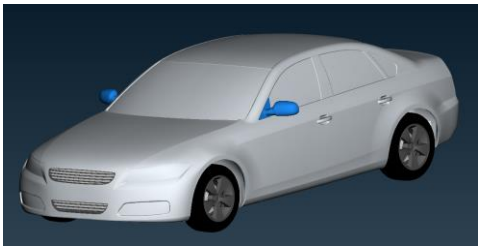
Heat Exchanger/Cooling Package Data		
Heat Exchanger		Ford HX1 (baseline)
HX Pressure Drop $\Delta p = A*v + B*v^2$	A:	5.78
	B:	17.31
HX x-Position [mm]		35
HX Thickness [mm]		27
Fan Shroud x-Pos. [mm]		209.44
Sealing		Fully Sealed
Leakage Area (mm^2)		0

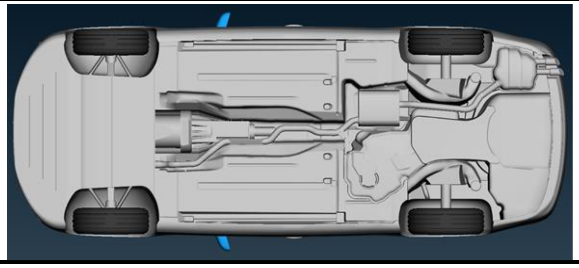
Cooling Configuration



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



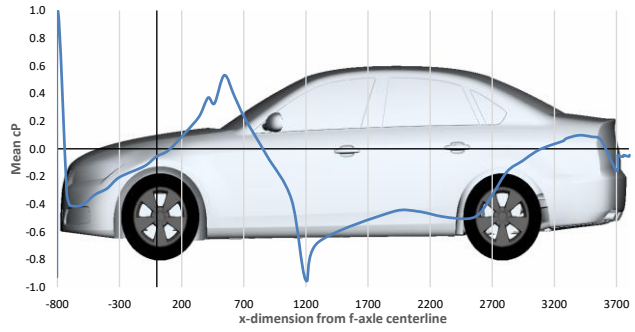


CFD Model

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) [-]	0.274	Radiator Mass Flow [kg/s]	1.374	Wheelhouse LHS Flow [kg/s]	0.354
Frontal Area [m^2]	2.170	Upper Grill Flow [kg/s]	0.366	Wheelhouse RHS Flow [kg/s]	0.307
Front Lift (Czf) [-]	-0.050	Lower Grill Flow [kg/s]	1.008	Tunnel Flow [kg/s]	0.703
Rear Lift (Czr) [-]	0.089				
Underhood Ref Pressure (#415) (Cp) [-]:		-0.135	Wheel-house Ref Pressure (#566) (Cp) [-]:		-0.198

Upperbody Centerline Pressure (Cp)



Underbody Centerline Pressure (Cp)