



2019 Autodatas Benchmark Study of

JAGUAR I-PACE

Project Summary



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Innovation Research



AWD
EV400 HSE
January 15, 2019
I-PACE



01

Specifications
Model **EV400 HSE** Powertrain **AWD**
4682x2011x1565mm Wheelbase 2990mm

02

We teardown I-PACE in January 15, 2019.

03

Range 310 miles (**500 km**) tested
Top speed 124 mph (**200 km/h**)
Acceleration 0-60 mph **4.8 seconds** tested

04

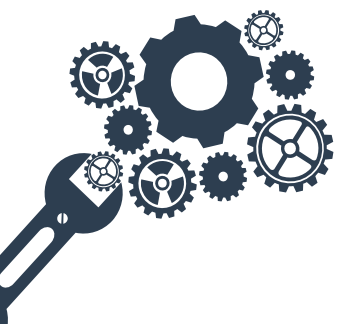
Battery capacity **76.2kWh** (274 MJ)
DC charging 100 km range available after 15 min
AC charging 500 km range after 11.4 hours (220 V)

05

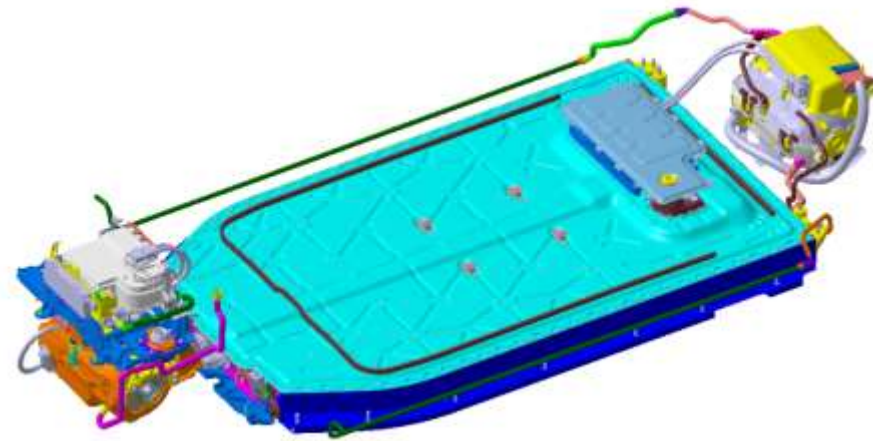
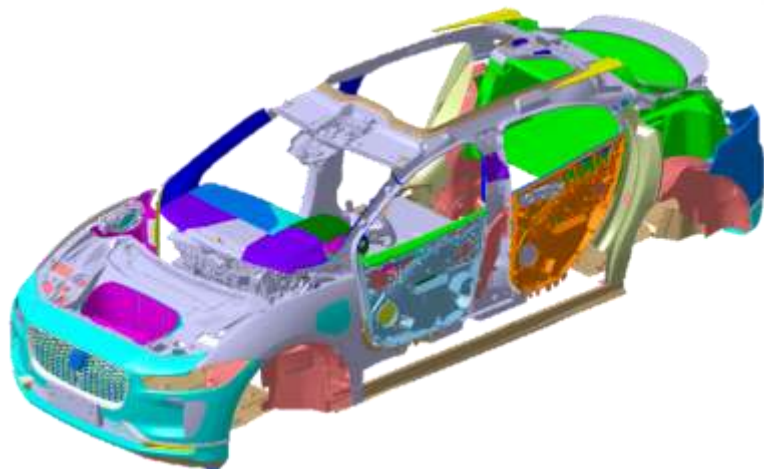
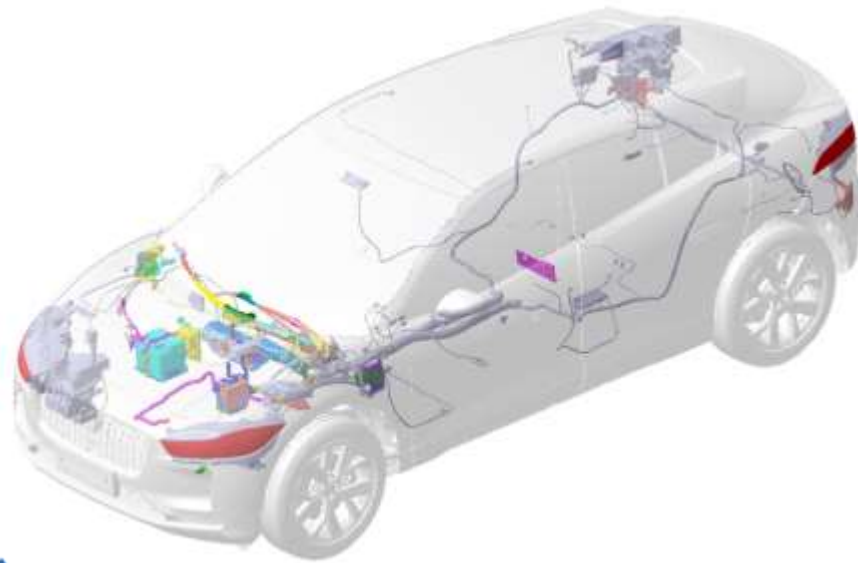
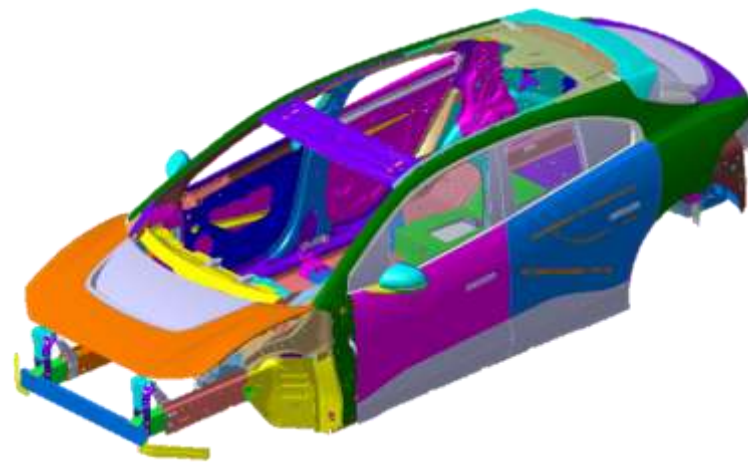
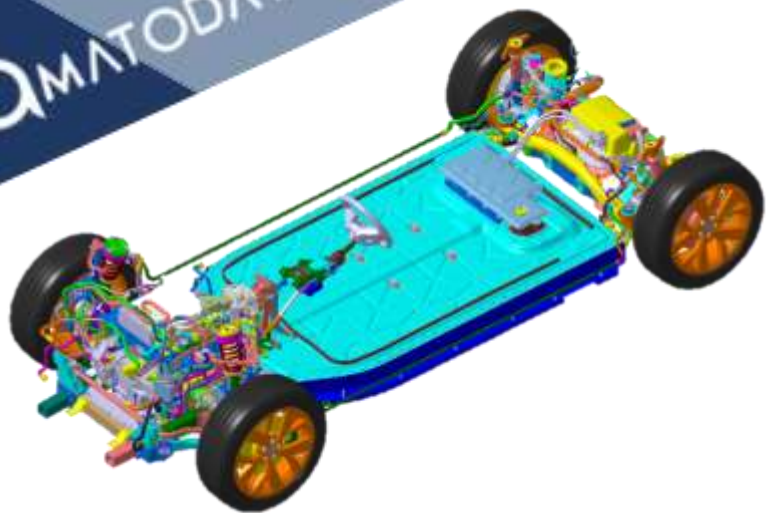
Powertrain	Dual Motor All-Wheel Drive
Motor	Permanent magnet
Curb Weight	2251kg tested
Power	399 hp (298 kW)
Torque	514 lb-ft (696 N-m)



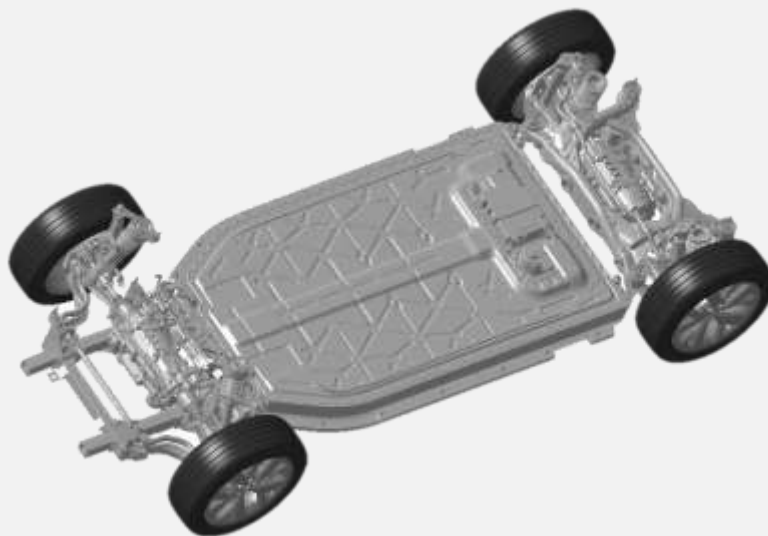
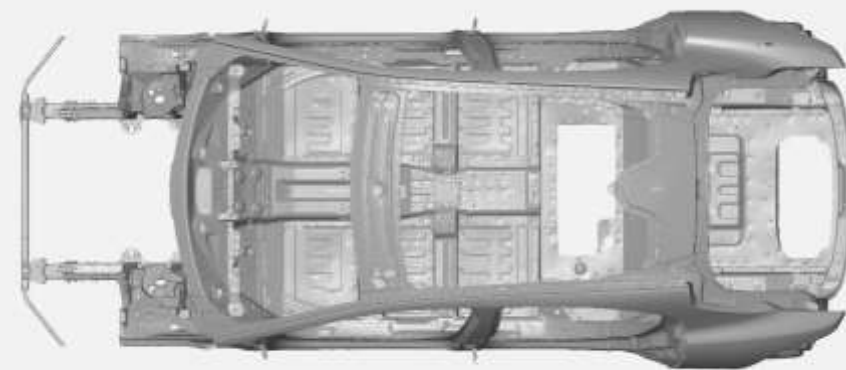
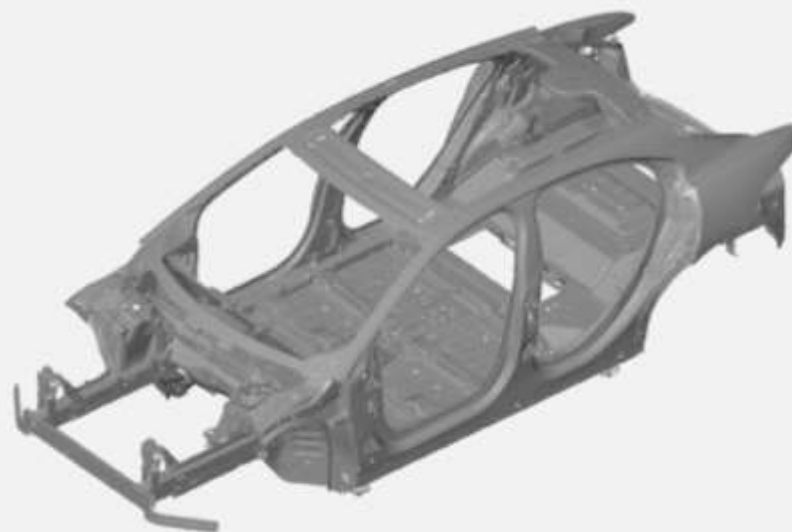
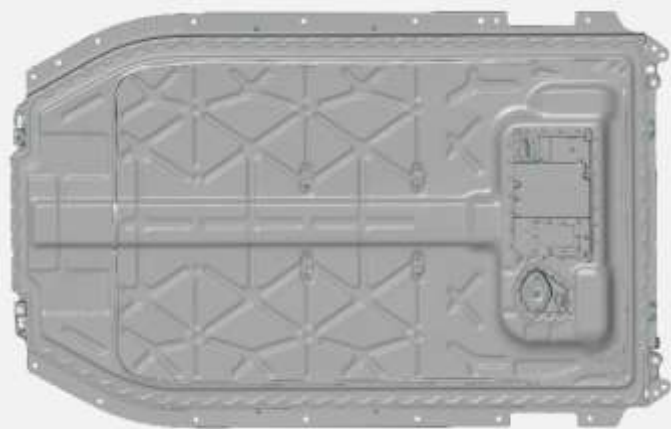
Teardown

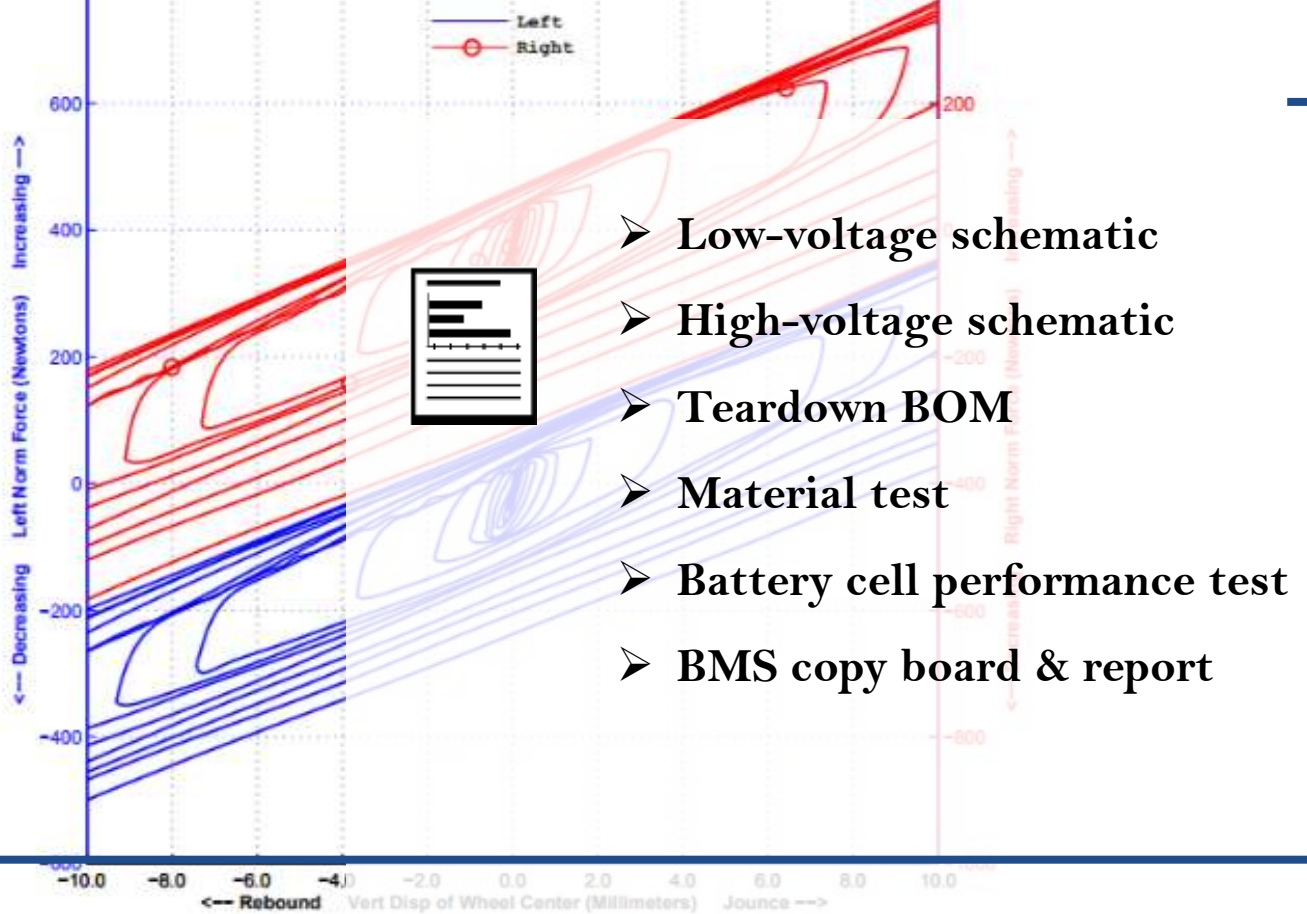


3D Model



Point Cloud

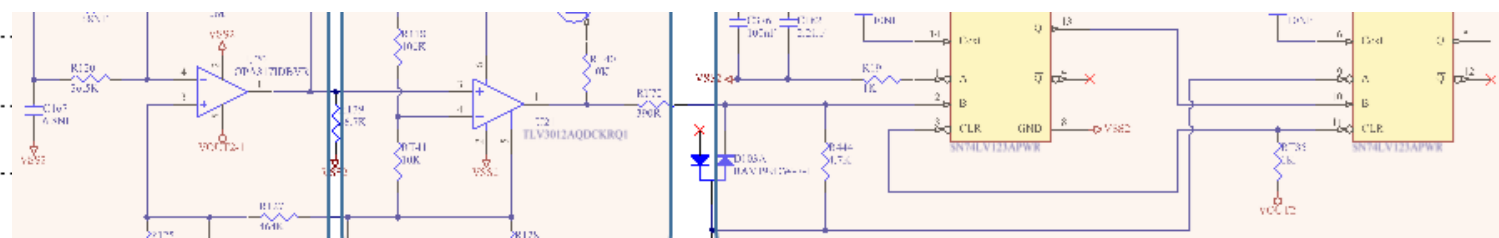
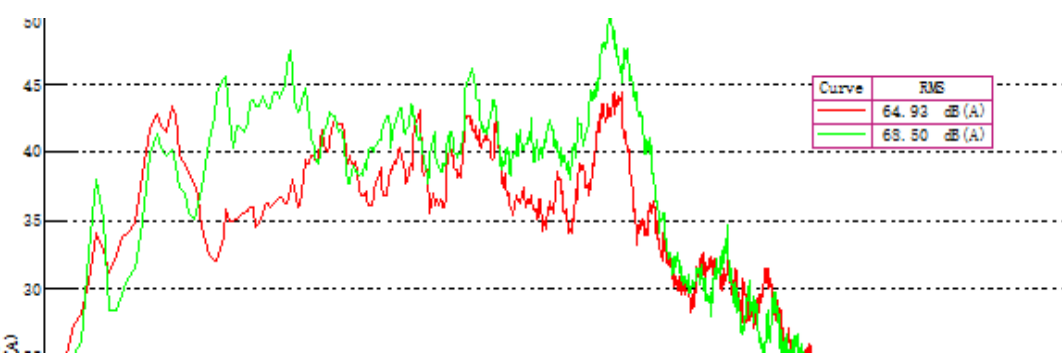




- Low-voltage schematic
- High-voltage schematic
- Teardown BOM
- Material test
- Battery cell performance test
- BMS copy board & report

- Electric motor performance
- Thermal management
- BIW stiffness and modal Analysis results
- CAN code deciphering and control strategy analysis
- CAE virtual simulation
- Topology of vehicle electronic architecture
- Chassis K&C performance test
- Vehicle NVH
- NEDC test
- Vehicle interior seal & air tightness

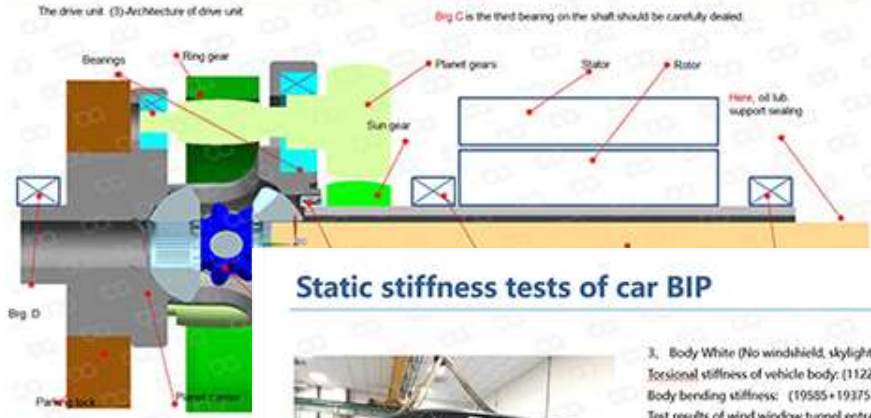
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Electric motor performance

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Material test-cathode

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ICP elements (Weight)	Li	Ni	Co	Mn	Al	Zr	B	Ti	Ni : Co : Al
S8Ah	6.68	36.15	11.51	11.12	0.011	0.371	0.038	0.0002	6.06 : 1.93 : 2.00

EDS Elements (mol, %)	C	O	Ni	Co	Mn	F	Al	Zr	B	Ti
Particle I	14.82	48.04	20.74	7.05	7.18	2.17	-	-	-	-
Particle II	6.95	55.65	21.50	7.24	7.33	1.32	-	-	-	-
Area	26.69	43.42	15.52	5.09	5.44	1.84	-	-	-	-

Test data		S8Ah
Dv10	1.8	

Static stiffness tests of car BIP

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3. Body White (No windshield, skylight, battery pack)
 Torsional stiffness of vehicle body: $(11224 + 11204 + 11323) / 3 = 11250 \text{ Nm}^2$,
 Body bending stiffness: $(19585 + 19375 + 19506) / 3 = 19489 \text{ N/mm}$,
 Test results of wind window tunnel entrance

Position	11204	11204	11204	11323	11323	11323	11224	11224	11224	11224
Opening length(mm)	1480	1480	1480	1810	1810	1810	1480	1480	1480	1480
Deformation at opening (mm)	-0.007	-0.005	0.000	-0.001	-0.001	-0.001	-0.004	-0.005	0.000	-0.1
Opening deformation (mm/%)	0.007	0	0	0	0	0	0.007	0	0	0.8

First

Position	11204	11204	11204	11323	11323	11323	11224	11224	11224	11224
Opening length(mm)	1480	1480	1480	1810	1810	1810	1480	1480	1480	1480
Deformation at opening (mm)	-0.004	-0.005	0.000	-0.001	-0.001	-0.001	-0.004	-0.005	0.000	-0.1
Opening deformation (mm/%)	0.007	0	0	0	0	0	0.007	0	0	0.8

Second

Position	11204	11204	11204	11323	11323	11323	11224	11224	11224	11224
Opening length(mm)	1480	1480	1480	1810	1810	1810	1480	1480	1480	1480
Deformation at opening (mm)	-0.004	-0.005	0.000	-0.001	-0.001	-0.001	-0.004	-0.005	0.000	-0.1
Opening deformation (mm/%)	0.007	0	0	0	0	0	0.007	0	0	0.8

Third

Position	11204	11204	11204	11323	11323	11323	11224	11224	11224	11224
Opening length(mm)	1480	1480	1480	1810	1810	1810	1480	1480	1480	1480
Deformation at opening (mm)	-0.004	-0.005	0.000	-0.001	-0.001	-0.001	-0.004	-0.005	0.000	-0.1
Opening deformation (mm/%)	0.007	0	0	0	0	0	0.007	0	0	0.8

Fig.5 Sensor layout of left door and window opening

BIW stiffness and modal analysis results

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BIW Modal Results

Mode shape	Freq.(Hz)
Battery package local mode/Engine bay local mode	32.4
First torsional mode/roof local mode	40.4
Roof local mode	46.7
Floor local mode/roof local mode	49.6
Floor local mode/roof local mode/Engine bay local mode	52.0
off local mode/Engine bay local mode	55.3
floor bending mode	62.6
off local mode/floor local mode	69.1
Engine bay local mode	69.5
CB local mode	71.9
off local mode/Spare tire pool local mode	73.5

Motor depth analysis report

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Sheet dimension ,thickness=0.3

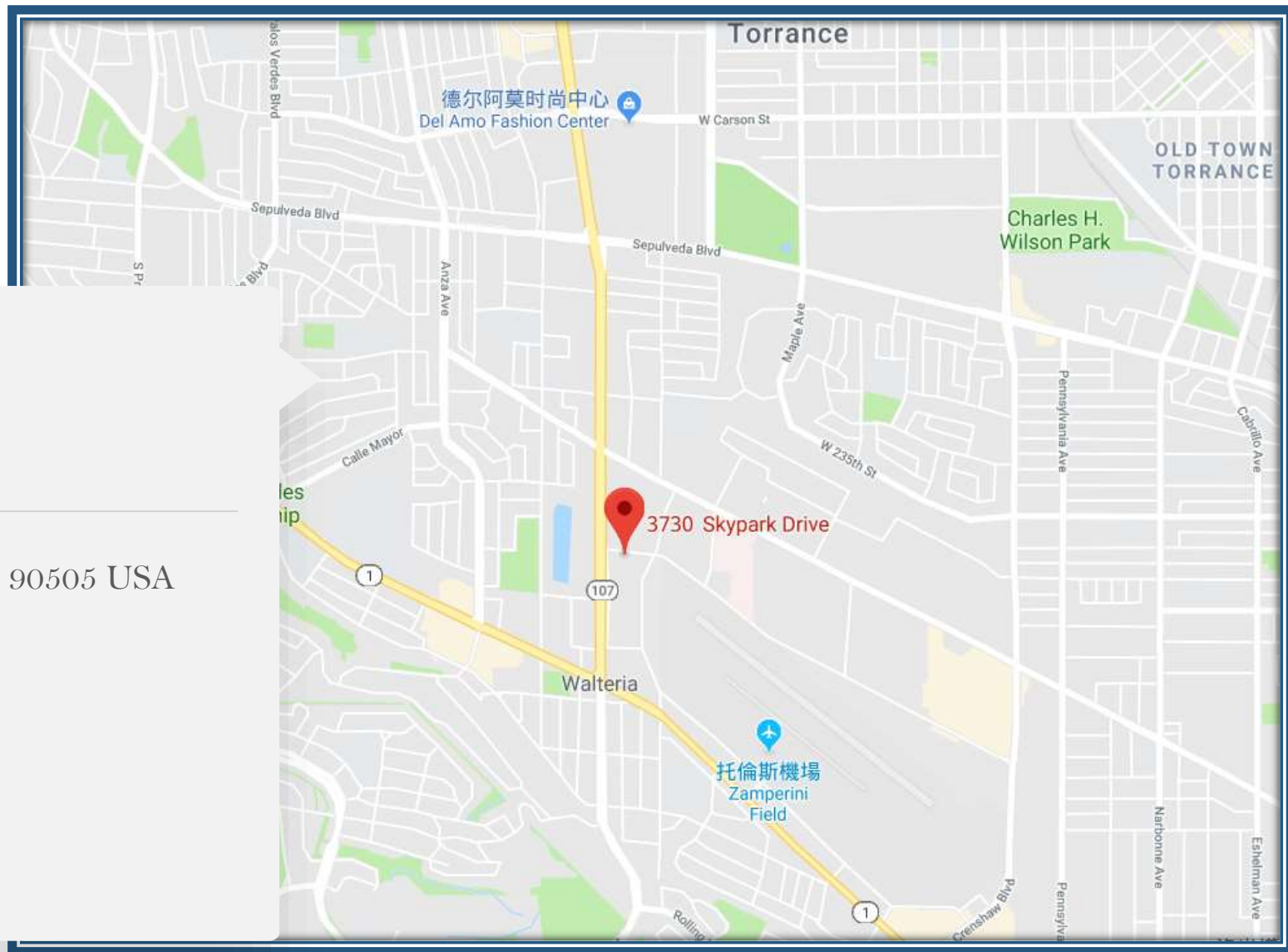
Material of enamel and varnish
Jaguar I-PACE 3.34x3.97mm
 All cross-sectional portraits

Size	H (mm)	W (mm)
External Diameter	3.534	4.158
Conductor Diameter	3.340	3.970
Film Thickness	0.097	0.094

SIZE, thickness = 0.3
 Magnets
 33EH

NEW KUBOTA MOTOR DEVELOPMENT TEST REPORT No. 1

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