WHAT HAPPENED ON JUNE 21, 2018?

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WELCOME

What happened on June 21, 2018?

Overview of the presentation

- Bad news and good news
- What happened on June 21, 2018
- Punch Powertrain: the Company
- Conclusions

BAD NEWS AND GOOD NEWS

Bad news and good news

Bad news:

- This year I can only speak for about 30 minutes

Good news:

- Someone else is covering quite a bit of last year's content
- His jokes are better than mine

https://www.youtube.com/watch?v=2b3ttqYDwF0

WHAT HAPPENED ON JUNE 21, 2018?

What is so special about this day?

- International Yoga Day
- Summer solstice & the longest/shortest day in N/S hemisphere
- World Music Day

In my personal case, on June 21, 2018 I was handed over the keys of

A brand new plug-in Totota Prius

And I would like to share some of my experiences with you

Some vehicle and use data

- Motor power: ± 60 kW and ± 30 kW
- Engine: 1,8l with Atkinson cycle, 105 Nm and 70 kW
- Planetary gear transmission with engine reversing lock
- Combined out power 90 kW
- Battery pack 8.8 kWh
- EV-range 40 km (US EPA) – 63 km (EU-NEDC)

Use data:

- Commute to work: either 53 km (50/50) or 43 km (no motorway)
- Drive style: 99% of the time energy saving

Vehicle EV range

- Experience this far is in mild to warm conditions
- These conditions favour usefull battery capacity and driving resistance

- When warm predicted range approaching 70 km, now dropping
- Distance to work including motorway (53 km) is about the range
- Returning the same way leaves about 10% capacity
- Returning without motorway (43 km) leaves about 20% capacity

- Hypermiling is possible when conditions are right

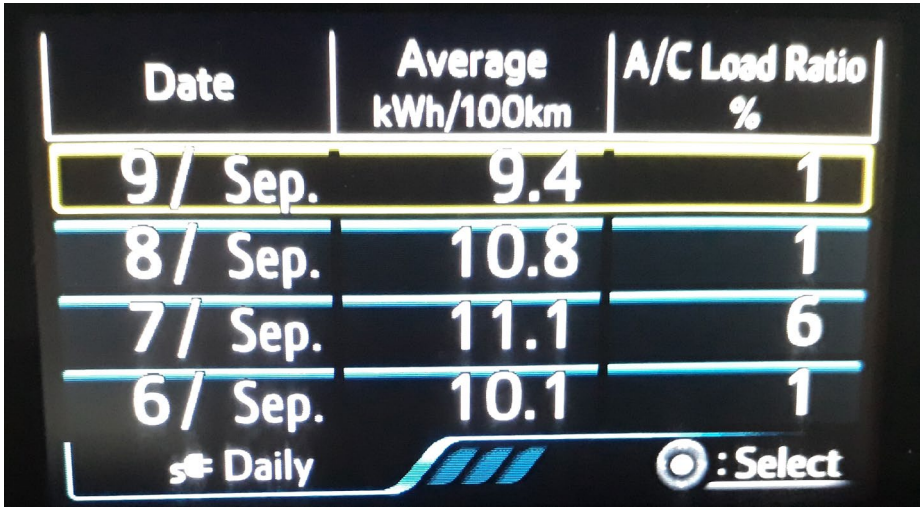
Vehicle EV range – Test ride on September 9, 2018

- Started driving fully charged with 69.6 km EV range avialable
- Drove 54.1 km to destination
- Estimated EV-range left 12.3 km
- Total EV-range is 60-65 km

Some remarks

- Driven in summer and economic drive style
- Expect only 40 km in cold winter

Electric energy consumption



Normal drives are about 11,0 kWh/100 km

Comparison with other Evs

- Tesla Model 3 ➔ 16 kWh/100 km
- Mercedes EQ ➔ 22 kWh/100 km
- Jaguar iPace ➔ 26 kWh/100 km

Charging the battery

- Standard wall outlet, either at 13 A or 8 A (programmed in vehicle)
- A full charge takes 3.5 hours @ 13 A
- A few charging events are recorded ➔ only 6,0 Ah or 70% is used

What can a standard wall outlet mean for EV charging Prius & others:

- @ 13 A = 14 km/hr in summer and 10 km/hr in winter
- @ 16 A and less efficient vehicle (40%): 12 km/hr and 8,4 km/hr
- Overnight charging results in 100+ km range (@ office, 9 hrs 76+ km)
- 1 or 2 EVs in every household will not take down the grid

Fuel consumption

4000+ km so far:

- Most trips >95% of distance in EV-mode
- Charge AMAP
- Trips beyond range, first and last miles in EV-mode, motorway in hybrid mode
- Hybrid mode has similar fuel consumption as standard Prius
- Results are biased by a hot summer

Filled the tank on September 9, 2018:

- Driven distance 4534 km
- Fuel tanked 12.67 l
- Fuel cons. 0.28 l/100 km

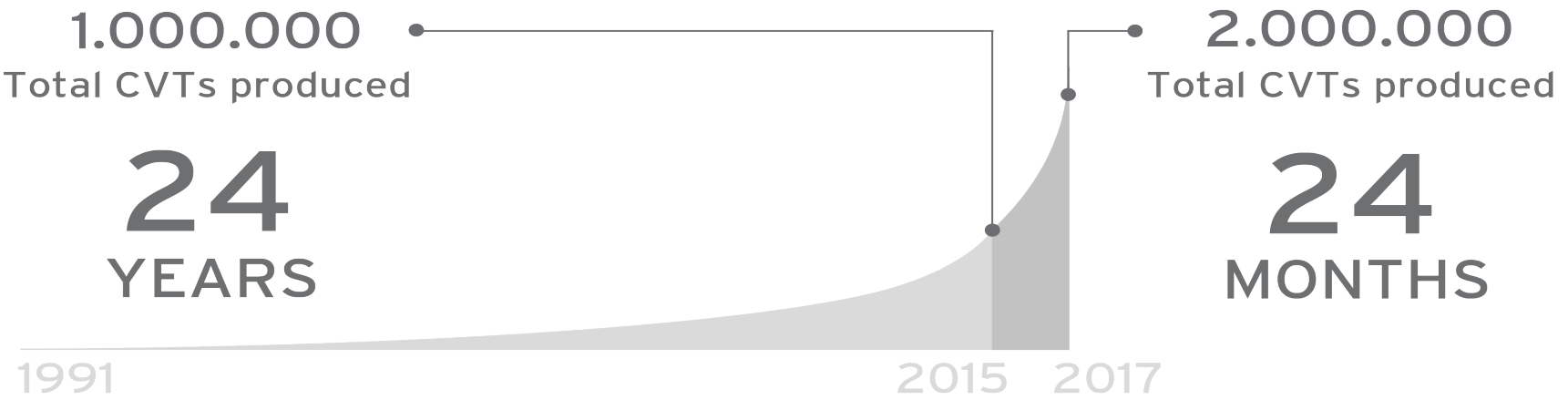
PUNCH POWERTRAIN: THE COMPANY

punch powertrain
Gear up for the future

Punch Powertrain

intends to become the leading **independent** provider of **innovative clean** powertrain technologies for car manufacturers.

Historic growth

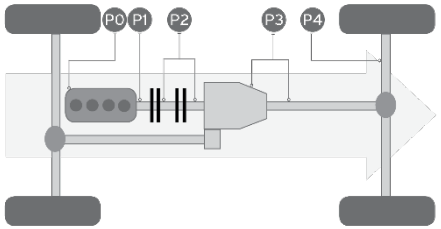


Chinese Domestic OEMs:

- Second largest automatic transmission supplier
- 14% of all automatic transmissions is Punch CVTs
- 80% of all CVTs is from Punch

Clean Solutions for all levels of electrification

Solutions for all fastest growing powertrain segments, for all possible configurations



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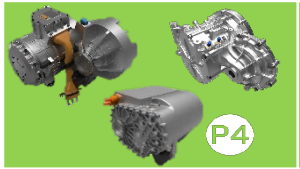
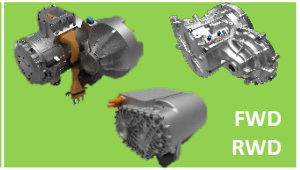
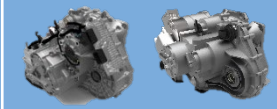
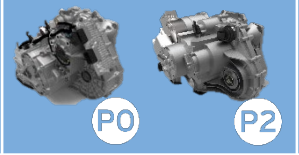
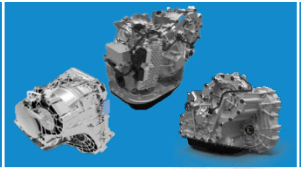
ELECTRIC DRIVES				
DCT SOLUTIONS				
CVT SOLUTIONS				

Multinational presence

Multinational Employment

Opportunities – www.punchpowertrain.com

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Gear up for the future

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COMPANY PRODUCTS NEWS EVENTS CAREERS CONTACT

At Punch Powertrain, we hope that you **find fun** in your job and that you practice your passion by being an **entrepreneur** with us. We invite you to **challenge things** and to **speak up** and in return we promise to **listen** to what you have to say.

We want to be a **partner for our customers** and believe that their problem is ours.

Therefore we **do what we promise** by completely committing ourselves to our customers and our colleagues.

CONCLUSIONS

Conclusions

Efficient plug-in hybrid vehicles can provide a solution for drastic cutting CO_2:

- Efficient vehicle and powertrain design (Cx, mass, PT-losses)
- EV-range fitting most vehicle use
- Discipline of driver to charge vehicle whenever possible
- Driving style for reduced energy consumption
- Fuel economy much beyond type approval

No special infrastructure required:

- Standard wall outlet will do
- No electricity grid overload

Thank you for your attention!

For more info about us, please visit our website www.punchpowertrain.com

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