**Parameters of Mehran: -**

The Mehran car has a fuel average of 13 KM/L with a fuel tank capacity of 30L. With dimensions of 3300 mm in length, 1405 mm in width, and 1410 mm in height, the Mehran has a seating capacity of 5 persons.

**Kerb weight = 660kg**

**Fuel cylinder Weight: 40kg**

**Passenger Weight: 170 kg**

Battery Weight = 100kg

Engine Weight = 150kg

Drag Force = ½ (pCAv^2)

Density of the air ρ = 1.204 kg/m3

Frontal area A estimated by a-c: A = 1.9 m2

Drag coefficient, Cd = 0.30

Force constant c = ½ (pCAv)

**Mehran on Fuel: -**

**Total Weight** = 660 + 40 + 170 => 870kg

From 0 to 60:

Power = FV => maV => 870 \* 1.04 \* 16.67/2 = 7541.50W

Work = force \* displacement

Power = Work / Time => F\*d / t => F \* V

**Mehran EV: -**

**Total Weight** = 870 – 150 + 100 – 40 => 780

From 0 to 60:

Power = FV => maV => 780 \* 1.04 \* 16.67/2 = 6761.35W

**Mehran Hybrid**: -

**Total Weight** = 870 + 100 => 970 + motor (not available)

Assume motor weight = 30kg

From 0 to 60:

Power = FV => maV => 1000 \* 1.04 \* 16.67/2 =8668.4W

**EV Mehran Specification and calculation: -**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Speed | Drag Force | Power usage | Rolling Resistance Force | Power usage | Total Power usage |
| 40 km/h (11.11 m/s) | 42.35N | 470W | 170.7N | 1.89KW | 2.39KW |
| 60 km/h (16.67 m/s) | 95.35N | 1589W | 170.7N | 2.84KW | 4.42KW |
| 80 km/h (22.22 m/s) | 169.42N | 3.7 KW | 170.7N | 3.79KW | 7.49KW |
| 90 km/h (25 m/s) | 214.46N | 5.3 KW | 170.7N | 4.26KW | 9.56KW |
| 100 km/h (27.78 m/s) | 264.8N | 7.3 KW | 170.7N | 4.74KW | 12KW |
| 120 km/h (33.33 m/s) | 381.2N | 12.7 KW | 170.7N | 5.68KW | 18.38KW |

**Khyber Specification: -**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Speed | Force due to air drag | Power usage  P = F.V | Force due to rolling resistance | Power usage  P = F.V | Total power usage |
| 40 km/h (11.11 m/s) | N | 556 W | 179.9N | 1.99 kW | 2.54 kW |
| 60 km/h (16.67 m/s) | N | 1877 W | 179.9N | 2.99 kW | 4.86 kW |
| 80 km/h (22.22 m/s) | 200.15 N | 4.44 kW | 179.9N | 3.99 kW | 8.43 kW |
| 90 km/h (25 m/s) | 253.37 N | 6.33 kW | 179.9N | 4.50 kW | 10.83 kW |
| 100 km/h (27.78 m/s) | 312.84 N | 8.69 kW | 179.9N | 4.99 kW | 13.68 kW |
| 120 km/h (33.33 m/s) | 450.60 N | 15.02 kW | 179.9N | 5.99 kW | 21.01 kW |

Land Rover 1990 Defender 110

Parameters:

What engine is in a 1990 Land Rover Defender?

The 1990 Land Rover Defender 110 has a 2.5 liter turbo diesel engine (200Tdi) with 122 horsepower at 4200 RPM and 221 lb-ft of torque at 1950 RPM. It has a five-speed manual transmission and all-wheel drive. The 1990 Defender 110 has a top speed of 81 miles per hour (130 kilometers per hour).

Initially held back by the low power of the Land Rover engines (other than the thirsty petrol V8 engine), the 127 benefited from the improvements to the line-up, and by 1990 was only available with the two highest power engines, the 134 hp (100 kW) 3.5-litre V8 petrol, and the 85 hp (63 kW) 2.5-litre turbo diesel .

How fast is the Defender 110? \_

>> it has a top speed of 129 mph and can accelerate from 0 to 60 mph in just 7.7 seconds.

How long is a 1990 Land Rover Defender 110?

The height, measured from the ground to the top of the car, is 2035 mm across all variants. The width ranges from 1786 mm to 1790 mm depending on the variant. The length ranges from 4600 mm to 4684 mm.

1990 Defender 110 with an Electric Tesla Drivetrain

<https://www.evbuildersguide.com/1990-defender-110-with-an-electric-tesla-drivetrain/>

<https://www.electriccarconverts.com/insights/converting-a-land-rover-defender-to-electric/>

[**https://www.google.com/search?q=how+much+motor+is+used+to+drive+land+rover+1990+defender+110+on+ev&oq=how+much+motor+is+used+to+drive+land+rover+1990+defender+110+on+ev&gs\_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRiPAjIHCAIQIRiPAtIBCjgxMTc4ajBqMTWoAgiwAgE&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:d09a41bd,vid:Z2jZdqeCvTw,st:0**](https://www.google.com/search?q=how+much+motor+is+used+to+drive+land+rover+1990+defender+110+on+ev&oq=how+much+motor+is+used+to+drive+land+rover+1990+defender+110+on+ev&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRiPAjIHCAIQIRiPAtIBCjgxMTc4ajBqMTWoAgiwAgE&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:d09a41bd,vid:Z2jZdqeCvTw,st:0)

**kerb weight = 1872kg**

**Fuel cylinder Weight:** 11 kg and measures 28.0 × 71.0 × 77.0 cm.

**Passenger Weight: 170 kg**

Engine Weight = 150kg

Drag Force = ½ (pCAv^2)

Density of the air ρ = 1.204 kg/m3

Frontal area A estimated by a-c: A = 1.9 m2

Drag coefficient, Cd = 0.30

Force constant c = ½ (pCAv)