**Falcon-9**

Falcon-9 is a liquid fueled orbital launch vehicle for medium to heavy sized missions, which is developed by SpaceX (Space Exploration Technologies Corp.). It is technologically based on the Falcon-1 launch vehicle. Both stages are Kerosene / LOX fueled.

The first stage, which is potentially reusable after recovery by parachutes (v1.0) or by powered landing (v1.1 and later), is powered by 9 of the SpaceX built Merlin-1C (v1.0) or Merlin-1D (v1.1) engines with regenerative cooling. The upper stage uses a single Merlin engine and will also be potentially reusable. The Falcon-9 is offered with a 5.2 m fairing.

Launch site for low inclination launches is Cape Canaveral launch pad SLC-40. High inclination launches will launch from Vandenberg AFB. An additional launch site near Brownsville, Texas, is also under consideration.

The Falcon-9 will also lift the Dragon space capsule for ISS cargo flights, which might be developed into a manned spacecraft.

The first flight for a Falcon-9 v1.0 took place in June 2010. In 2013, the enlarged Falcon-9 v1.1 took over, featuring higher powered Merlin-1D engines in a new octagonal arrangement and larger tanks.

The first landings on a barge was tried on the Dragon CRS-5 and Dragon CRS-6 missions, but both failed. The first mission of the Falcon-9 v1.2 performed a successful landing of the first stage on land. Some later flights might also use a floating barge for landing, if performance requires it.

<table>
<thead>
<tr>
<th>Version</th>
<th>Strap-On</th>
<th>Stage 1</th>
<th>Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falcon-9 v1.0</td>
<td>-</td>
<td>Stage 1 / 9 x Merlin-1C</td>
<td>Stage 2 / Merlin-1D-Vac</td>
</tr>
<tr>
<td>Falcon-9 v1.1</td>
<td>-</td>
<td>Stage 1 (str, reusable) / 9 x Merlin-1D</td>
<td>Stage 2 (str.) / Merlin-1D-Vac</td>
</tr>
<tr>
<td>Falcon-9 v1.1(ex)</td>
<td>-</td>
<td>Stage 1 (str.) / 9 x Merlin-1D</td>
<td>Stage 2 (str.) / Merlin-1D-Vac</td>
</tr>
</tbody>
</table>
### Performance (kg)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Serial/Core</th>
<th>Date</th>
<th>LS</th>
<th>Payload</th>
</tr>
</thead>
</table>

#### Falcon-9 v1.0
- **No.**: 1
- **Type**: Falcon-9 v1.0
- **Serial/Core**: 80003
- **Date**: 04.06.2010
- **Payload**: Dragon Qualification Unit

#### Falcon-9 v1.1
- **No.**: 2
- **Type**: Falcon-9 v1.0
- **Serial/Core**: 80000
- **Date**: 08.12.2010
- **Payload**: Dragon Qualification Unit

#### Falcon-9 v1.2
- **No.**: 3
- **Type**: Falcon-9 v1.0
- **Serial/Core**: 10450
- **Date**: 05.07.2017
- **Payload**: Dragon Qualification Unit

#### Falcon-Heavy
- **No.**: 4
- **Type**: Falcon-9 v1.2
- **Serial/Core**: 90000
- **Date**: 08.07.2017
- **Payload**: Dragon Qualification Unit

#### Falcon-9 v1.2(ex)
- **No.**: 5
- **Type**: Falcon-9 v1.0
- **Serial/Core**: 90000
- **Date**: 29.01.2017
- **Payload**: Dragon Qualification Unit

#### Falcon-9 v1.3
- **No.**: 6
- **Type**: Falcon-9 v1.0
- **Serial/Core**: 90000
- **Date**: 26.06.2017
- **Payload**: Dragon Qualification Unit

### Note:
- Several of the CC launches might launch from CCK or BC
- Falcon-9 v1.2
- xx.xx.2020
- CC
- AMOS 8
- Falcon-9 v1.2
- xx.xx.2019
- CC
- AMOS 12
- Falcon-Heavy
- xx.xx.2018
- CCK LC-39A
- ARABSAT 6A
- Falcon-9 v1.2
- 81046.1
- xx.xx.2018
- CCK LC-39A
- Bangabandhu 1
- Falcon-9 v1.2
- 81039.2
- xx.xx.2018
- CCK LC-39A
- Dragon CRS-14 / RMWS+ / PCF6+ / RemoveDEBRIS+ / DebrisSat 1 / DebrisSat 2

### Planned Launches:
- Falcon-9 v1.2
- xx.xx.2020
- CC
- AMOS 8
- Falcon-9 v1.2
- xx.xx.2019
- CC
- AMOS 12
- Falcon-Heavy
- xx.xx.2018
- CCK LC-39A
- ARABSAT 6A
- Falcon-9 v1.2
- 81046.1
- xx.xx.2018
- CCK LC-39A
- Bangabandhu 1
- Falcon-9 v1.2
- 81039.2
- xx.xx.2018
- CCK LC-39A
- Dragon CRS-14 / RMWS+ / PCF6+ / RemoveDEBRIS+ / DebrisSat 1 / DebrisSat 2
Launch sites:

Flight 49: Stage 1 core stage landing failure
Flight 48: Stage 1 intentionally not recovered
Flight 26: Stage 1 landed hard on recovery attempt
Flight 21: Stage 1 landed hard on recovery attempt
Flight 19: Vehicle broke up 2 min 19 sec into the flight due to stage 2 overpressure problem
Flight 14: Stage 1 landed hard on recovery attempt
Flight 10: Stage 1 intentionally not recovered
Flight 9: Stage 1 intentionally not recovered
Flight 4: One engine of stage one failed 80 sec into the flight, but vehicle was able to compensate for a successful primary mission; second burn before secondary payload release took place.

Failures:

beta - deployed via ISS airlock
* = non free-flyer payload to be attached to the ISS

F  failure
P  partial failure
p  partial failure (prime payload in usable orbit)
F  recovery failure (prime mission successful)
n  no recovery attempted (only for recoverable missions)

Launch sites: