**Transfer 1 : Standard Strategy (change plane-change pericenter-bitangent PA)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 3695.7504 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.9993 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 5937.1528 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.3724 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 6176.5450 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *0.4299* | *0* | 0.5863 |
| *10422.1787* | *0.2850* | *0.5284* | *3.0230* | *0.4299* | *0* |
| 11470.9723 | *10422.1787* | *0.2850* | *0.5284* | *3.0230* | *0.4299* | *3.1416* | 0.1642 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *3.1416* |
| 17464.4130 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 2 : Standard Strategy (change plane-change pericenter-bitangent AP)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 3695.7504 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.9993 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 5937.1528 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.3724 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 9986.7633 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *0.4299* | *3.1416* | 0.1886 |
| *8807.5701* | *0.0545* | *0.5284* | *3.0230* | *0.4299* | *3.1416* |
| 14099.8266 | *8807.5701* | *0.0545* | *0.5284* | *3.0230* | *0.4299* | *0* | 0.5784 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0* |
| 14461.7429 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 3 : Standard Strategy (bitangent-change plane-change pericenter PA)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 5697.7605 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *0* | 0.5863 |
| *10422.1787* | *0.2850* | *0.8487* | *1.5339* | *1.1849* | *0* |
| 10992.1880 | *10422.1787* | *0.2850* | *0.8487* | *1.5339* | *1.1849* | *3.1416* | 0.1642 |
| *10860* | *0.2332* | *0.8487* | *1.5339* | *1.1849* | *3.1416* |
| 14115.3731 | *10860* | *0.2332* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.1840 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 16892.4727 | *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.7105 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 17523.1496 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 4 : Standard Strategy (bitangent-change plane-change pericenter AP)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 5697.7605 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *3.1416* | 0.1886 |
| *8807.5701* | *0.0545* | *0.8487* | *1.5339* | *1.1849* | *3.1416* |
| 9810.8238 | *8807.5701* | *0.0545* | *0.8487* | *1.5339* | *1.1849* | *0* | 1.5784 |
| *10860* | *0.2332* | *0.8487* | *1.5339* | *1.1849* | *0* |
| 18565.5333 | *10860* | *0.2332* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.1840 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 21342.6330 | *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.7105 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 21973.3098 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 5 : Standard Strategy (bitangent-change plane-change pericenter AA)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 1887.5422 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *3.1416* | 0.9379 |
| *11340.1221* | *0.1809* | *0.8487* | *1.5339* | *4.3265* | *0* |
| 7896.6199 | *11340.1221* | *0.1809* | *0.8487* | *1.5339* | *4.3265* | *3.1416* | 0.1600 |
| *10860* | *0.2332* | *0.8487* | *1.5339* | *4.3265* | *3.1416* |
| 11019.8052 | *10860* | *0.2332* | *0.8487* | *1.5339* | *4.3265* | *4.4179* | 5.1840 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *3.0775* | *4.4179* |
| 15947.3993 | *10860* | *0.2332* | *0.5284* | *3.0230* | *3.0775* | *1.8178* | 2.8175 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *4.4654* |
| 18728.5707 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 6 : Standard Strategy (bitangent-change plane-change pericenter PP)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 5697.7605 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *0* | 0.1904 |
| *7889.6266* | *0.0555* | *0.8487* | *1.5339* | *1.1849* | *0* |
| 9184.8726 | *7889.6266* | *0.0555* | *0.8487* | *1.5339* | *1.1849* | *3.1416* | 0.9592 |
| *10860* | *0.2332* | *0.8487* | *1.5339* | *4.3265* | *0* |
| 17939.5821 | *10860* | *0.2332* | *0.8487* | *1.5339* | *4.3265* | *4.4179* | 5.1840 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *3.0775* | *4.4179* |
| 18845.6580 | *10860* | *0.2332* | *0.5284* | *3.0230* | *3.0775* | *4.9594* | 2.8175 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *1.3238* |
| 28868.3598 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 7 : Standard Strategy (change plane- bitangent-change pericenter PA)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 3695.7504 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.9993 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 5697.7605 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *0* | 0.5863 |
| *10422.1787* | *0.2850* | *0.5284* | *3.0230* | *6.2190* | *0* |
| 10992.1879 | *10422.1787* | *0.2850* | *0.5284* | *3.0230* | *6.2190* | *3.1416* | 0.1642 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *3.1416* |
| 15041.7985 | *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.7105 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 15603.0824 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 8 : Standard Strategy (change plane- bitangent-change pericenter AP)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 3695.7504 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 5.9993 |
| *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *4.4179* |
| 5697.7605 | *8369.7488* | *0.1097* | *0.5284* | *3.0230* | *6.2190* | *3.1416* | 0.1886 |
| *8807.5701* | *0.0545* | *0.5284* | *3.0230* | *6.2190* | *3.1416* |
| 10992.1879 | *8807.5701* | *0.0545* | *0.5284* | *3.0230* | *6.2190* | *0* | 0.5784 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *0* |
| 15041.7985 | *10860* | *0.2332* | *0.5284* | *3.0230* | *6.2190* | *0.2470* | 0.7105 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *6.0362* |
| 15603.0824 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Tabella riassuntiva strategie standard**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strategy | Δt (s) | Δt (h) | Δv (km/s) | ΔvΔt (km) |
| Pla-per-bit PA | 17464.4130 | 4.8512 | 7.1222 | 124384 |
| Pla-per-bit AP | 14461.7429 | 4.0172 | 7.1386 | 103237 |
| Bit-pla-per PA | 17523.1496 | 4.8675 | 6.6450 | 116440 |
| Bit-pla-per AP | 21973.3098 | 6.1037 | 6.6614 | 146374 |
| Bit-pla-per AA | 18728.5707 | 5.2024 | 9.0993 | 170418 |
| Bit-pla-per PP | 28868.3598 | 8.0190 | 9.1511 | 264178 |
| Pla-bit-per PA | 15603.0824 | 4.3342 | 7.4603 | 116403 |
| Pla-bit-per AP | 14421.7183 | 4.0060 | 7.4767 | 107827 |

**Transfer 7 : Alternative Strategy (strategia tangente di Alex)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 6543.2337 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *0.8537* | 0.6212 |
| *10499.6909* | *0.2755* | *0.8487* | *1.5339* | *1.6789* | *0.3597* |
| 13660.9278 | *10499.6909* | *0.2755* | *0.8487* | *1.5339* | *1.6789* | *3.9239* | 4.6024 |
| *10499.6909* | *0.2755* | *0.5284* | *3.0230* | *0.4299* | *3.9239* |
| 22266.2293 | *10499.6909* | *0.2755* | *0.5284* | *3.0230* | *0.4299* | *3.1416* | 0.1338 |
| *10860.1616* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *3.1416* |
| 27897.8793 | *10860.1616* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0* | 0.00004 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0* |
| 28259.7957 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 8 : Alternative Strategy (secante magica Alex)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | 0.8132 |
| *10269.8173* | *0.2189* | *0.7796* | *1.5492* | *2.1779* | *0.7990* |
| 4932.1735 | *10269.8173* | *0.2189* | *0.7796* | *1.5492* | *2.1779* | *3.3856* | 4.3174 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *3.8777* |
| 8964.9024 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Transfer 9 : Alternative Strategy (strategia alternativa silvia easy)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| t (s) | a (km) | e (-) | i (rad) | Ω (rad) | ω (rad) | θ (rad) | Δv (km/s) |
| 0 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *1.8025* | - |
| 5697.7605 | *8369.7488* | *0.1097* | *0.8487* | *1.5339* | *1.1849* | *0* | 0.5863 |
| *10422.1787* | *0.2850* | *0.8487* | *1.5339* | *1.1849* | *0* |
| 10992.1879 | *10422.1787* | *0.2850* | *0.8487* | *1.5339* | *1.1849* | *3.1416* | 0.8425 |
| *13392.5520* | *0* | *0.8487* | *1.5339* | *1.1849* | *3.1416* |
| 14125.2636 | *13392.5520* | *0* | *0.8487* | *1.5339* | *1.1849* | *4.4179* | 4.8691 |
| *13392.5520* | *0* | *0.5284* | *3.0230* | *6.2191* | *4.4179* |
| 26416.5152 | *13392.5520* | *0* | *0.5284* | *3.0230* | *6.2191* | *3.6356* | 0.6783 |
| *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *3.1416* |
| 32409.9559 | *10860* | *0.2332* | *0.5284* | *3.0230* | *0.4299* | *0.3316* | - |

**Tabella riassuntiva strategie alternative**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strategy | Δt (s) | Δt (h) | Δv (km/s) | ΔvΔt (km) |
| Alex tangente | 28259.7957 | 7.8499 | 5.3574 | 151400 |
| Alex diretta secante |  |  |  |  |
|  |  |  |  |  |
| Silvia alternativa easy | 32409.9559 | 9.0027 | 6.9762 | 226097 |
|  |  |  |  |  |
|  |  |  |  |  |