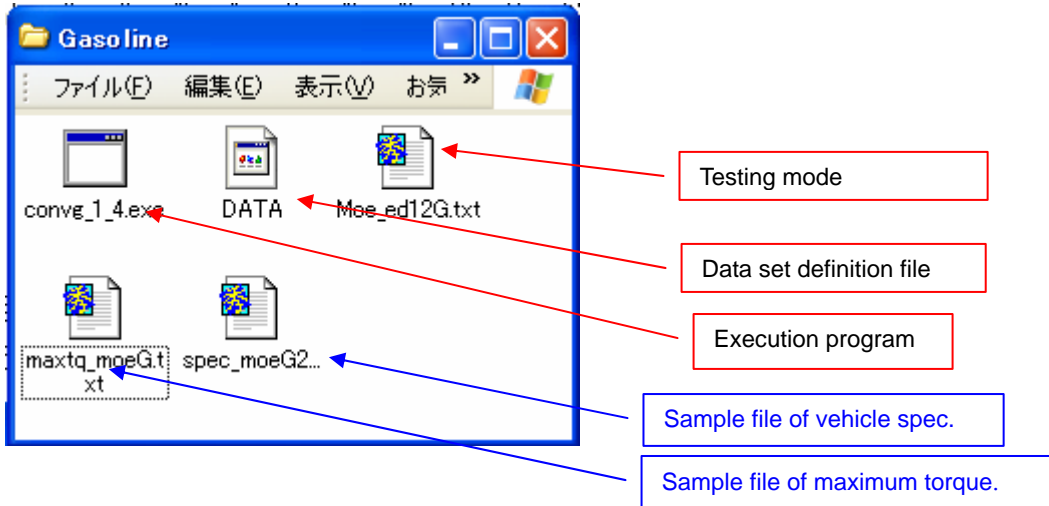


# Instruction manual – Spark Ignition Engine -

## 1. How to use

### ① Construction of transformation program



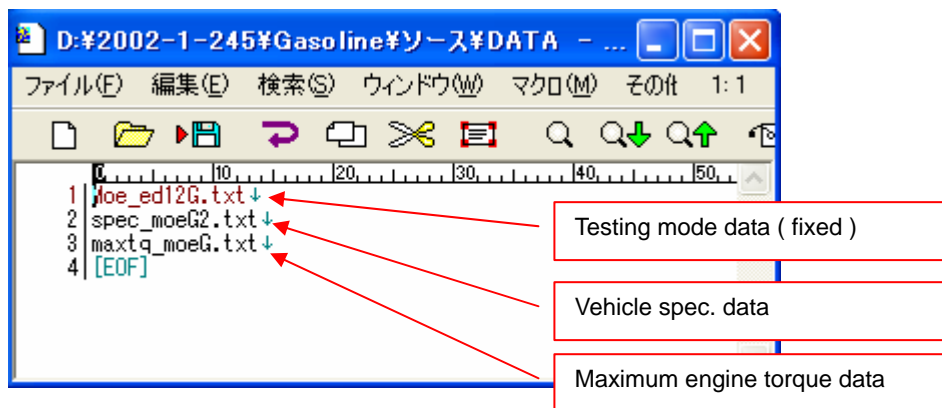
### ② Edit a vehicle specification and maximum engine torque.

How to edit refers 2.- 3.

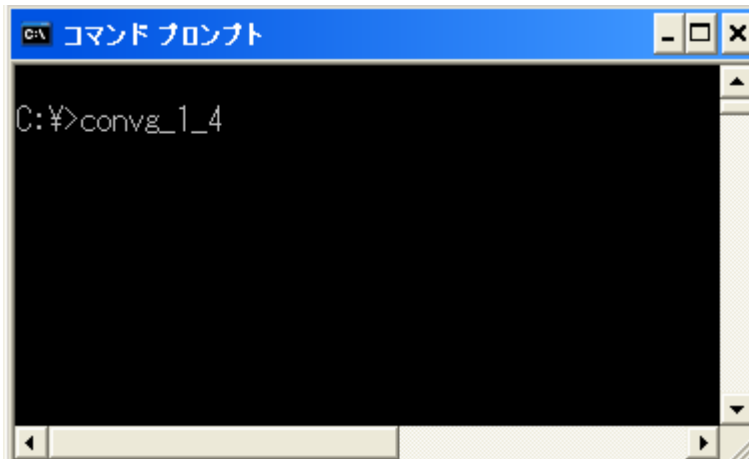
Sample file

vehicle specification data : example) spec\_moeG2.txt  
maximum engine torque data : example) maxtq\_moeG.txt

### ③ Make dataset definition file. **File name must be "DATA".**

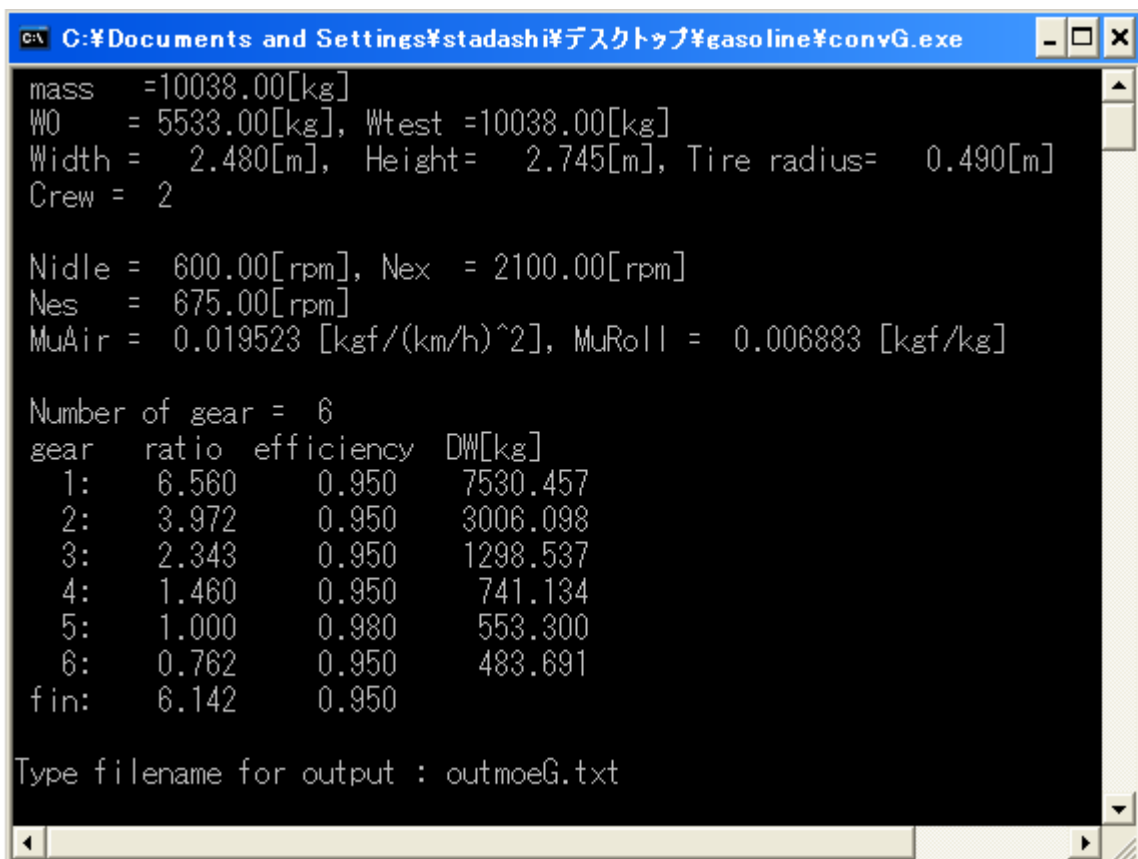


- ⑤ Execute program "convG 1 4.exe".



```
C:\>convg_1_4
```

Designate the output filename



```
C:\Documents and Settings\stadashi\Desktop\gasoline\convG.exe
mass = 10038.00[kg]
W0 = 5533.00[kg], Wtest = 10038.00[kg]
Width = 2.480[m], Height = 2.745[m], Tire radius = 0.490[m]
Crew = 2

Nidle = 600.00[rpm], Nex = 2100.00[rpm]
Nes = 675.00[rpm]
MuAir = 0.019523 [kgf/(km/h)^2], MuRoll = 0.006883 [kgf/kg]

Number of gear = 6
gear ratio efficiency DW[kg]
1: 6.560 0.950 7530.457
2: 3.972 0.950 3006.098
3: 2.343 0.950 1298.537
4: 1.460 0.950 741.134
5: 1.000 0.980 553.300
6: 0.762 0.950 483.691
fin: 6.142 0.950

Type filename for output : outmoeG.txt
```

The output data format refers 4.

## 2 . Input data of vehicle spec.

3400	! curb vehicle mass (kg)
4350	! payload (kg)
2	! crew (persons)
2.41	! overall height (m)
2.23	! overall width (m)
0.388	! tire rolling radius (m)
6	! number of gear
6.098	! 1st gear ratio
3.858	! 2nd gear ratio
2.34	! 3rd gear ratio
1.422	! 4th gear ratio
1	! 5th gear ratio
0.761	! 6th gear ratio
3.9	! final gear ratio
550	! idling engine speed (rpm)
2500	! rated engine speed (rpm)
2700	! governed engine speed (rpm)

## 3 . Input data of maximum engine torque

engine speed : 5% normalized engine speed – governed engine speed

Ne(rpm)	Te(N-m)
2640	323.18
2500	383.5
2000	576
1500	698.5
1000	706
500	553.5
480	543.44

#### 4. Output data format

time (s)	Vtarget (km/h)	Vreal(km/h)	Ne (rpm)	Te (N-m)	n_norm (%)	T_norm (%)	shift
0	0	0	500.0	0.0	0	0	0
1	0	0	500.0	0.0	0	0	0
2	0	0	500.0	0.0	0	0	0
3	0	0	500.0	0.0	0	0	0
4	0	0	500.0	0.0	0	0	0
5	0	0	500.0	0.0	0	0	0
6	0	0	500.0	0.0	0	0	0
7	0	0	500.0	0.0	0	0	0
8	0	0	500.0	0.0	0	0	0
9	0	0	500.0	0.0	0	0	0
10	0	0	500.0	0.0	0	0	0
11	0	0	500.0	0.0	0	0	0
12	0	0	500.0	0.0	0	0	0
13	0	0	500.0	0.0	0	0	0
14	0	0	500.0	0.0	0	0	0
15	0	0	500.0	0.0	0	0	0
16	0	0	500.0	0.0	0	0	0
17	0	0	500.0	0.0	0	0	0
18	0	0	500.0	0.0	0	0	0
19	0	0	500.0	0.0	0	0	0
20	0	0	500.0	0.0	0	0	0
21	0	0	500.0	0.0	0	0	0
22	0	0	500.0	0.0	0	0	0
23	0	0	500.0	0.0	0	0	0
24	0	0	500.0	0.0	0	0	0
25	4.19	4.19	562.5	952.1	5	88.73	2
26	8.32	8.32	770.3	939.2	21.63	61.32	2
27	12.33	12.33	1141.6	913.4	51.33	50.64	2
28	16.05	16.05	1486.0	850.3	78.88	49.46	2
29	18.74	18.74	1020.3	864.8	41.62	47.56	3
30	20.28	20.28	1104.1	520.7	48.33	28.78	3

note) Vtarget : target speed

Vreal : real speed

Ne : engine speed

Te : engine torque

n\_norm : normalized engine speed = (engine speed - idling engine speed)/(rated engine speed - idling engine speed)

T\_norm : normalized engine torque = engine torque / maximum engine torque