3.3.6. SIMULATION PARAMETERS

The powertrain system parameters used in simulation were recorded in a Matlab m-file, this m-file should be run before simulation running. Table 3.1 contains these parameters.

Table 3.1 Powertain system parameters used in simulation

Af = 2.1	frontal aria (m^2)
Cc = 0.05	clutch disc angular damping coefficient (Nm/rad/s)
Cd = 0.7	coefficient of drag
Cm = 0.012	the main shaft angular damping coefficient (Nm/rad/s)
Cpt = 90	other powetrain system "propeller shaft" angular damping coefficient (N.m/rad/s)
eff = 95	percentage of transmission efficiency (%)
fr = 0.025	rolling resistance coefficient
Grad = 0	gradient percentage (%)
id = 4.5	final reduction ratio
ig1 = 4.25	first gearbox shift reduction ratio
ig2 = 2.65	second gearbox shift reduction ratio
ig3 = 1.65	third gearbox shift reduction ratio
ig4 = 1	fourth gearbox shift reduction ratio
Jc = 0.5	the clutch disc polar mass moment of inertia (kg. $m^{2)}$
Je = 0.159 + 0.0159	equivalent engine and flywheel polar mass moment of inertia (kg. $m^{2)}$
Jgb = 0.01	the polar mass moment of inertia of the gearbox shafts (kg. $m^{2)}$
Jpt = 0.02	other powetrain system "propeller shaft" polar mass moment of inertia (kg. $m^{2)}$
Kc = 1182	clutch disc angular stiffness (N.m/rad)
Kpt = 6000	other powetrain system "propeller shaft" angular stiffness (N.m/rad)
mv = 1500	vehicle mass (Kg)
rw = 0.32	tire radius (m)
row = 1.225	air density (kg/m^3)
fa = 0.5*row*Cd*Af	air resistance factor (kg/m)
Fg = mv*9.81*sin(theta)	gradient resistance (N)
Fr = fr*mv*9.81*cos(theta)	rolling resistance (N)
Jv = (mv * ((rw^2)/(id^2)))+ Jpt	reduced mass polar moment of inertia for the vehicle at the gearbox output shaft (kg. $m^{2)}$