R1 = 1K2
R2 = 1K2
R3 = 26R
R4 = 0R15 (2Watt)
R5 = 330R
R6 = 120K
R7 = 75R

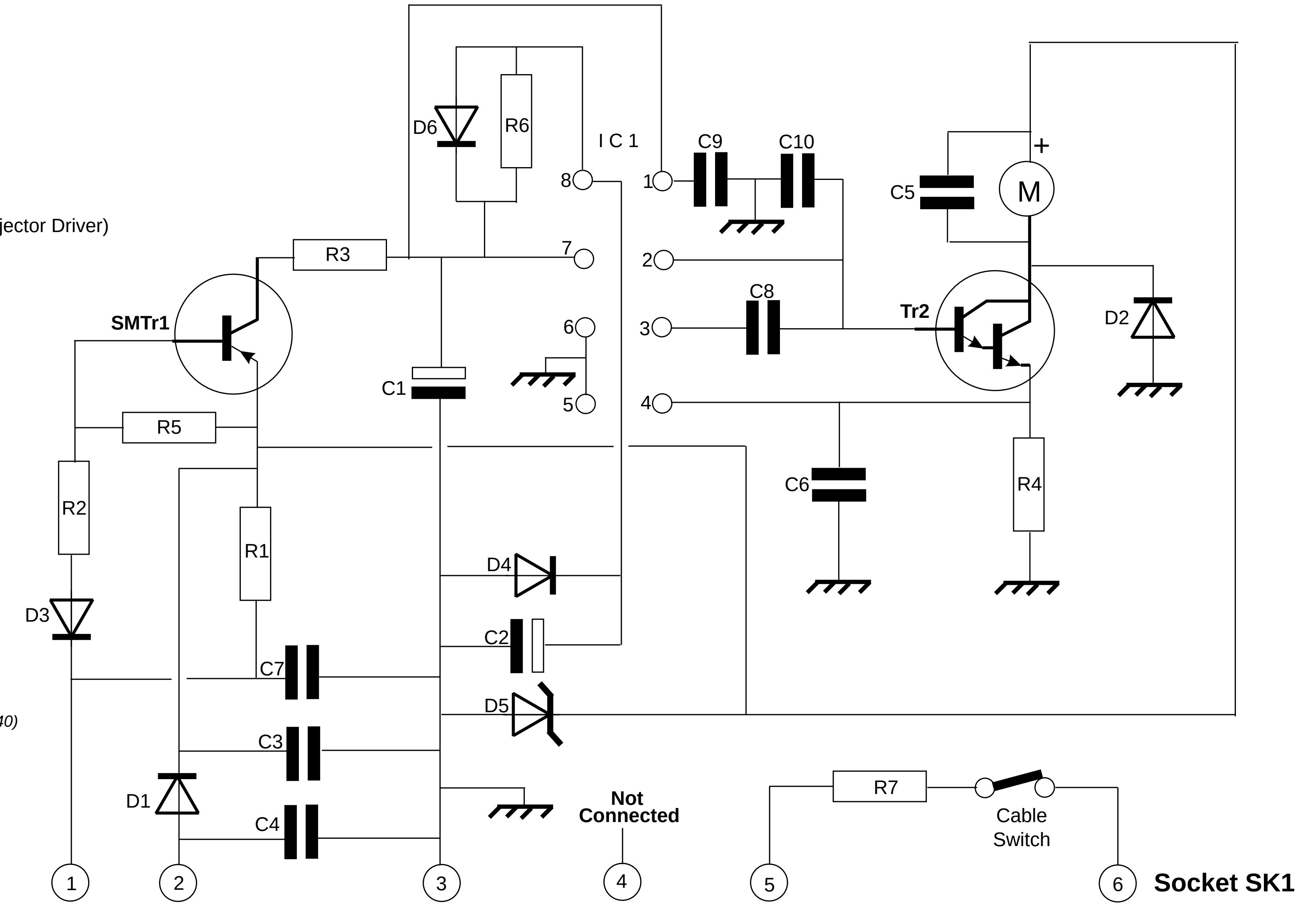
C1 = 0151
C2 = 0151
C3 to C10 = 10nF

D1 =
D2 =
D3 =
D4 =
D5 =
D6 =

SMTr1 = MMBTA56
(Marked G2M)

Tr2 = MJF6388
6043
BDX33C
TiP102
BDW93C
2N6045
TiP132

Ic1 = Lm1949 (Injector Driver)

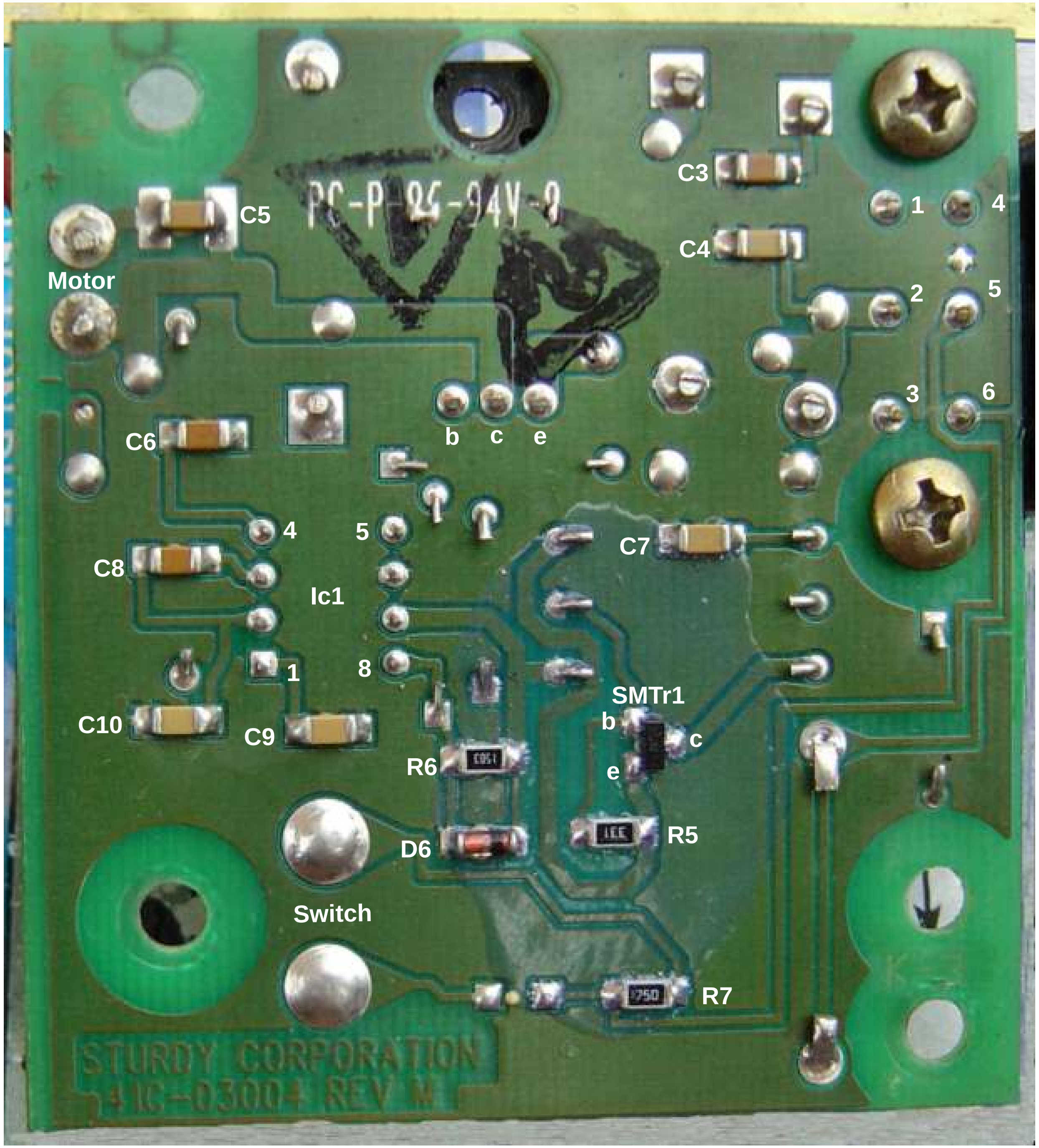


Socket SK1

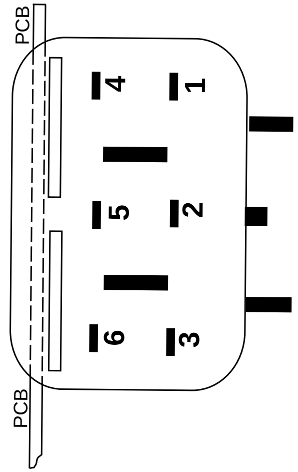
Pin 1 = Black/Red *(Pin 12 on PCM)*
Pin 2 = Green/White *(Switched +ve Fuse F40)*
Pin 3 = Black/White *(Chassis G106)*
Pin 4 = Blank Pin
Pin 5 = Black/Blue *(Pin 3 on PCM)*
Pin 6 = Brown/White *(Pin 91 PCM)*

Note: Case is Isolated
from Chassis & Board ground at pin 3

Ford Mondeo Mk3 V6 IMRC Circuit Diagram



Socket SK1



R5=330R

R6=120K

R7=75R

C3 to C10 = 10nF

D6=

SMTr1= 2GM=MMBTA56

Ford Mondeo Mk3 V6 IMRC Topside of PCB

R1=220R

R2=220R

R3=260R

R4=0.15R

C1= 0151

C2= 0151

Tr2=MJF6388

OR Any of:

BDW93C

BDX33C

TiP102

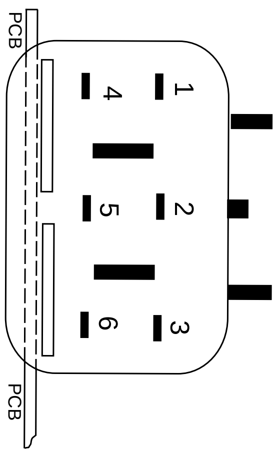
TiP132

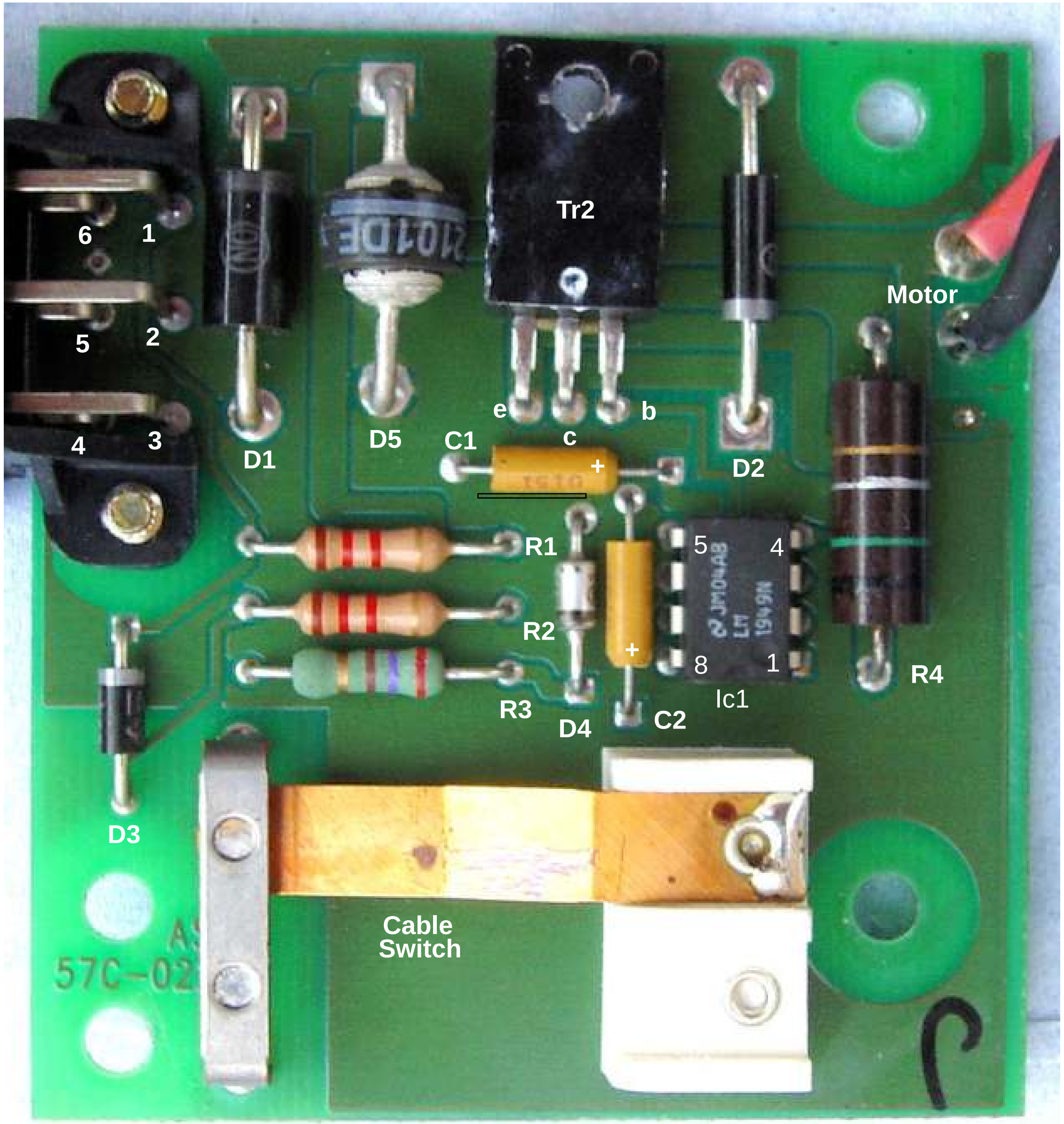
2N6045

6043

Ic1= Lm1949N (Injector Driver)

Socket SK1





Ford Mondeo Mk3 V6 IMRC Underside of PCB

Inlet Manifold Runner Control

The Printed Circuit Board (PCB), electric motor and associated gear box are contained within a die cast aluminium box, normally bolted to the front of the engine casting. This assembly is termed the Inlet Manifold Runner Control (IMRC) . The electronic circuit on the PCB controls the operation of a dc electric motor which, through a gear train, operates a Bowden type cable to open a second inlet throttle spindle controlling the fuel flow to 6 of the 12 inlet valves. This action occurs at approximately 3500 rpm, thus providing more air and fuel to the engine, and giving extra torque when more rapid acceleration in lower gears is required.

Unfortunately, because of its location just above the exhaust manifold, the IMRC tends to get very hot which causes failure of one or more of the electronic components on the PCB. Since during normal driving, the engine revs are mostly below 3000 rpm, failure of this devise may not be obvious to the inexperienced driver.

Simplified Circuit Description (Refer to Page 1 - Circuit Diagram)

The heart of the circuit is a dedicated Integrated Circuit (IC1) which was originally designed to operate individual fuel injectors. In this circuit, however, it is used to operate the electric motor (M) which, through gearing, operates the cable to open the secondary throttle spindle. Strong springs at the throttle lever and within the box, close the throttle and return the cable to its rest position, respectively, when engine revs fall below 3500 rpm.

The signal to initiate operation is provided by the vehicle's Power Control Module (PCM), sometimes known as the ECU. At the appropriate engine revs, a negative 5V pulse from the PCM is applied to Pin 1 of Socket SK1, attached to the PCB.

Diode D3 is therefore forward biased by this negative pulse, allowing it to pass to the base of surface mount p.n.p. transistor SMTr1 located on the top side of the PCB. With an ignition switched supply of 12V from the battery present at Pin2 of SK1, the transistor conducts, producing a positive pulse at the collector.

NOTE: The operation of IC1 (LM1949N) in this circuit is different from that originally intended and that which is described in the associated Data sheet.

Ic1 is dormant, without power, until the pulse at the collector of Tr1 is applied, as its voltage supply, to pin 7. This pulse is also applied simultaneously to its normal trigger input at pin1, causing the output at pin 2 to rise. The length of time this pulse remains high is determined by R6 and C1 and after this period it falls to approximately half of its original value. This output pulse is applied to the base of the Darlington transistor Tr2 which is therefore triggered to its conducting state for the duration of the pulse. The Darlington Tr2 allows a heavy current flow in proportion to the level of the pulse from Pin2 of IC1, and this powers the electric motor 'M' which has 12v from the vehicle battery applied at its positive terminal via D1. This high current pulse causes the motor to rotate from rest very quickly, this overcoming the inertia of the gear box and cable drag to the throttle spindle.

After a very short time but long enough to allow the motor to fully open the associated throttle spindle, the pulse at the base of Tr2 falls to its half level, as described previously, thus limiting the current through the motor which is now stalled by the throttle stop preventing further rotation. Without this action, the motor would overheat very quickly and possibly burn out. The current through the motor thus remains at a sufficient level just to keep the throttle open against the return spring tension.

When the pulse to Pin1of SKT1 of the PCB is removed by the vehicle's PCM, transistor SMTr2 is returned to its open circuit state, thus removing the supply voltage from pin 7 of IC1. This, in response, causes pin2 to fall to near zero volts which opens the Darlington switch Tr2. Current through the motor 'M' is thus removed as the Darlington is now open circuit. The throttle spring returns the secondary throttle to its closed position and the return spring within the box, acting on the cable cam pulls the cable back into the box.

Signals to the PCM, which indicate the current position of the cable, are supplied from Pins 5 and 6 of the PCB. At rest, the cable cam within the box holds the Cable Switch open, leaving an open circuit between Pins 5 and 6. When the motor turns the cable cam, driven by the gearbox, rotates, to a position which allows