



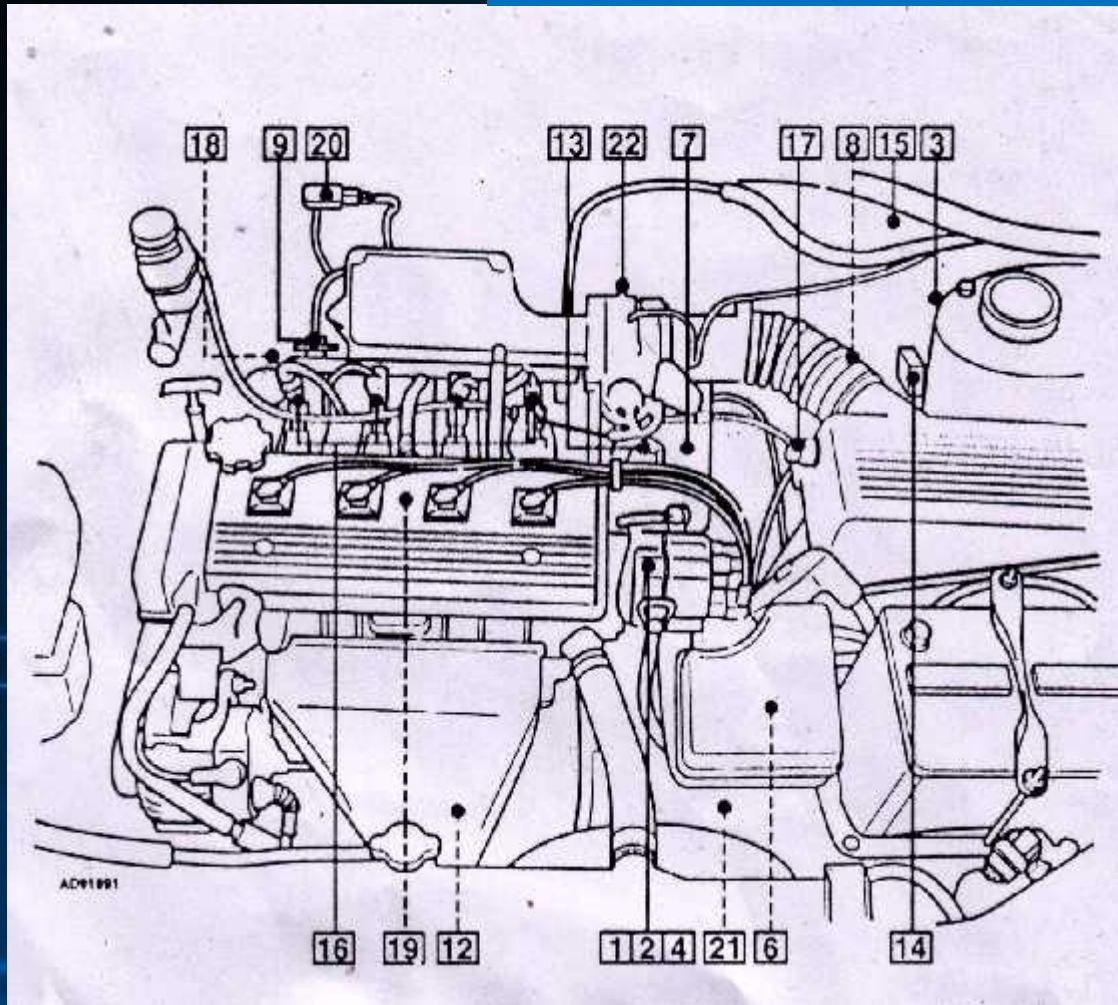
IDENTIFIKASI SYSTEM

EFI

Electronic **F**uel **I**njection

LAYOUT DAN KOMPONEN

ENGINE SOLUNA



1,2,4	CMP,CKP,Distributor
3	DLC
5	ECM-belakang box
6	Engine control relay
7	ECT sensor
8	Fuel filter
9	Fuel pressure regulator
10	Fuel pump-in tank
12	HO2S
13	IAC valve
14	Ignition amplifier
15	Ignition coil
16	Injector
17	IAT
18	Intake manifold air control solenoid
19	KS
20	MAP sensor
21	PNP switch
22	TP sensor
23	VSS-transmisi

Nama dan wujud komponen Engine Soluna



FUSIBLE LINK



EFI FUSE



EFI MAIN RELAY



PUMP RELAY



MIL



Netral Switch



DISTRIBUTOR IIA



PICK-UP COIL



IGNITER



IDLE SPEED CONTROL



INJECTOR



FUEL PUMP



Intake Air Temp.(IAT)-- THA



Manifold Absolute Pressure (MAP)



Engine Coolant Temperature sensor (ECT)-THW



TPS

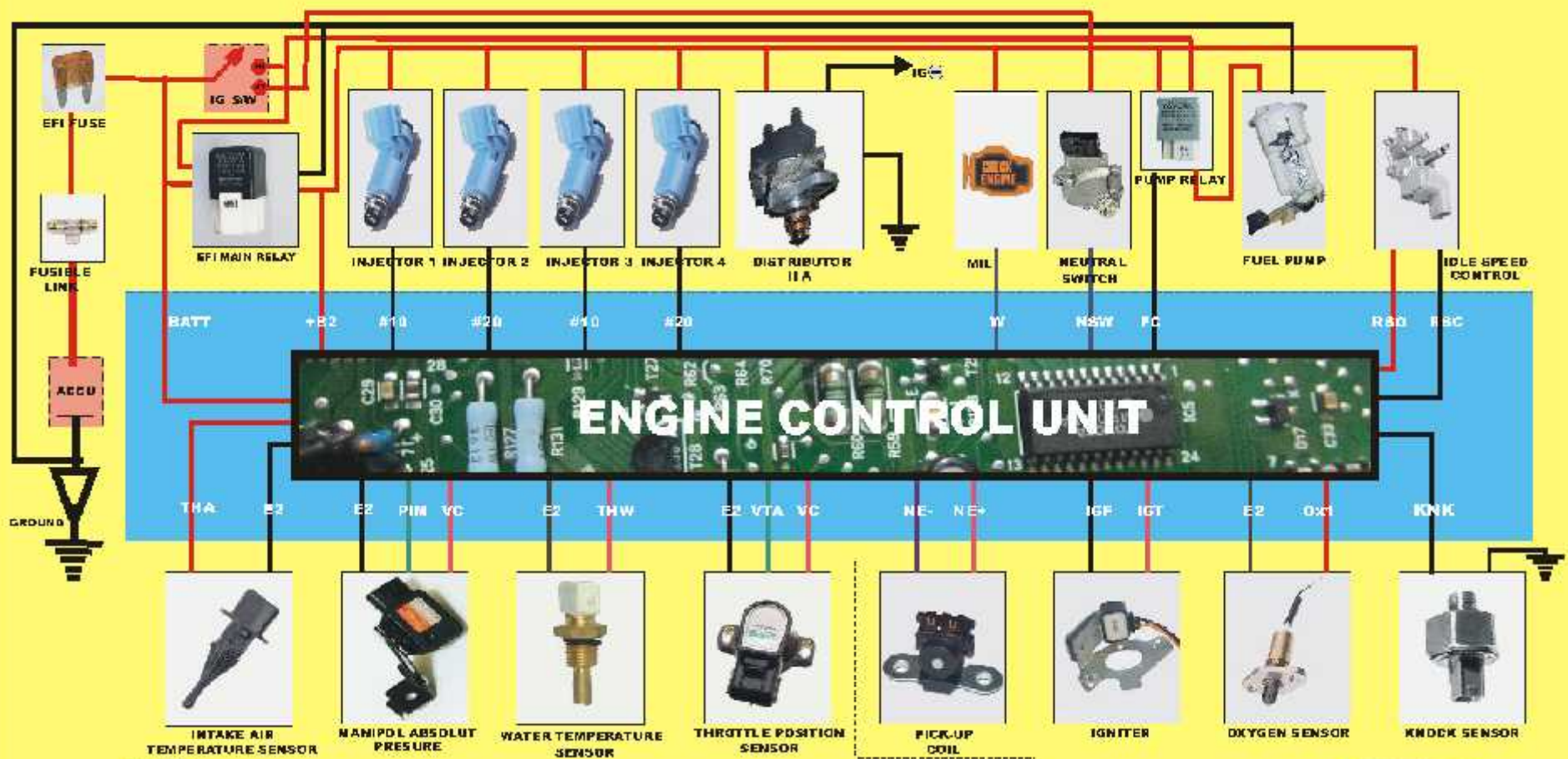


Oxygen Sensor



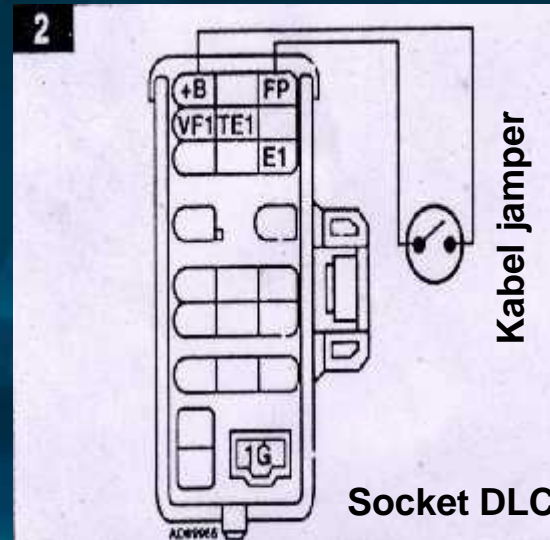
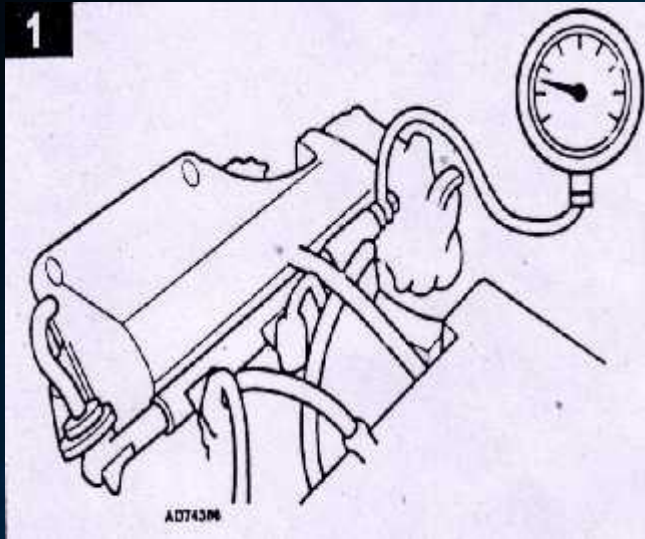
Knock Sensor

SKEMA TOYOTA SOLUNA

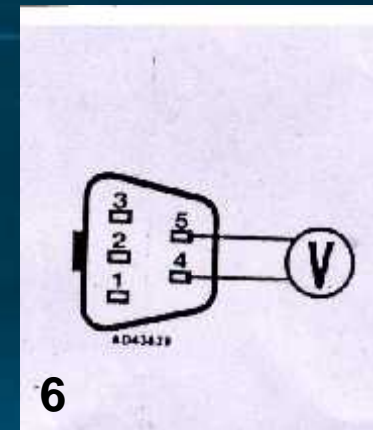


SISTEM BAHAN BAKAR

Cek Tekanan bahan bakar



Pengecekan soket pompa bahan bakar



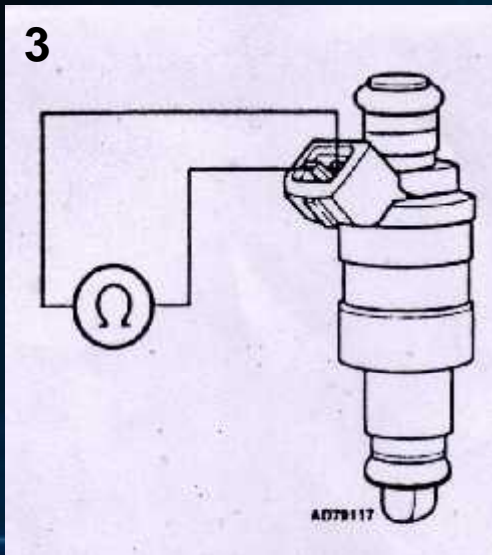
DATA TEKNIS

Pressure	Kondisi	Nilai
Sistem	Vacum OFF	2,7 – 3,1 bar
Regulated	Vacum ON	2,1 – 2,6 bar
Holding	After 5 minutes	1,5 bar

Data teknis :
Terminal 4 & 5 ---= tegangan batere

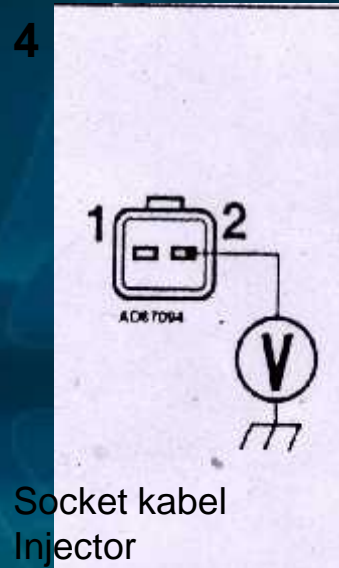
SISTEM BAHAN BAKAR

Injektor



Pengecekan tahanan

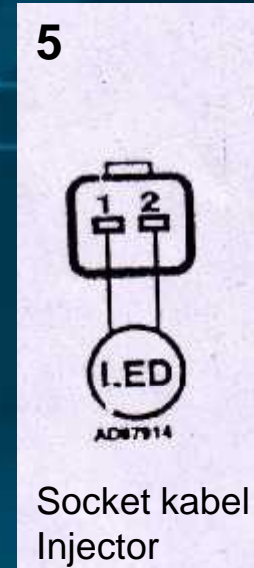
Data teknis :
Resistance -----
13,4 – 14,2 Ohm



Socket kabel
Injector

Pengecekan sup;ai tegangan

Data teknis :
terminal 2 &
massa ----- =
tegangan batere



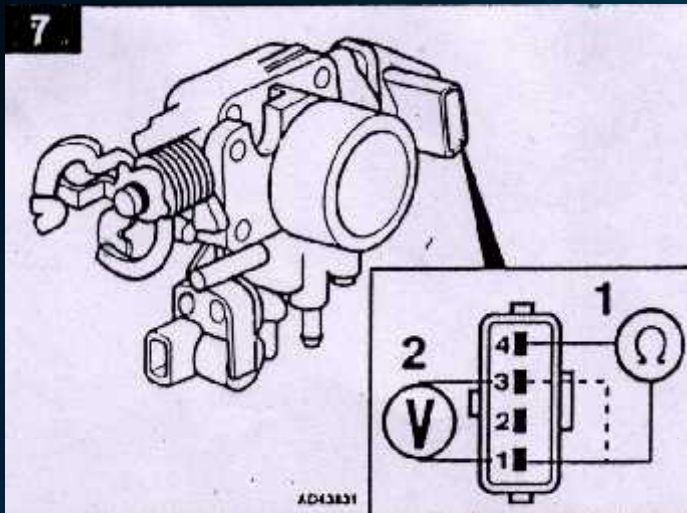
Socket kabel
Injector

Pengecekan sinyal

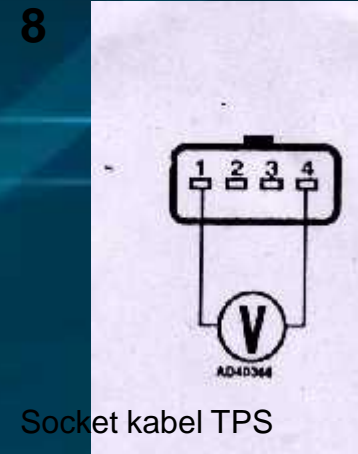
Data teknis :
terminal 1 & 2 ---
LED flashing
(nyala berkedip)

SISTEM INTAKE

Throttle position (TP) sensor, ada 3 proses pengecekan



Pengecekan kerjanya



Socket kabel TPS

Pengecekan suplai tegangan

Data teknis : terminal 1 & 4---
--- tegangan mendekati 5 volt

DATA TEKNIS

Terminal	Kondisi	Resistance
1 & 4	-	Mendekati 3500 ohm
3 & 4	Throttle menutup	Mendekati 3000 ohm
3 & 4	Throttle membuka penuh	Mendekati 950 ohm

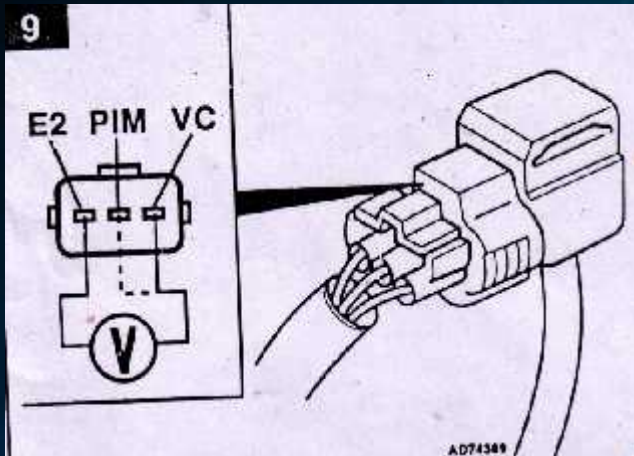
Penyetelan TPS

Gb.7 socket kabel TPS terpasang (tdk dilepas)

Data teknis : terminal 1 & 3 -----tegangan =
0,3 – 0,8 volt

SISTEM INTAKE

Manifold absolute pressure (MAP) sensor



Pengecekan kerjanya

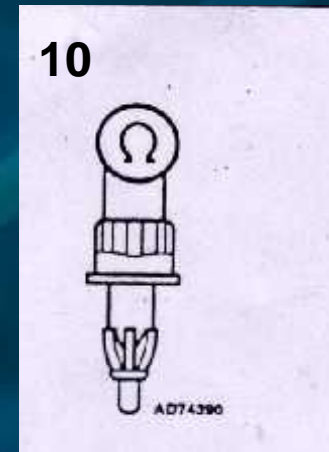
DATA TEKNIS

Terminal	Kondisi	Tegangan
E2 & PIM	Ignition ON	Mendekati 3,6 V
E2 & PIM	Engine Idling	Mendekati 1,5 V

Pengecekan suplai tegangan

Data teknis : Terminal E2 & VC
 -----mendekati 5V

Intake air temperature (IAT) sensor



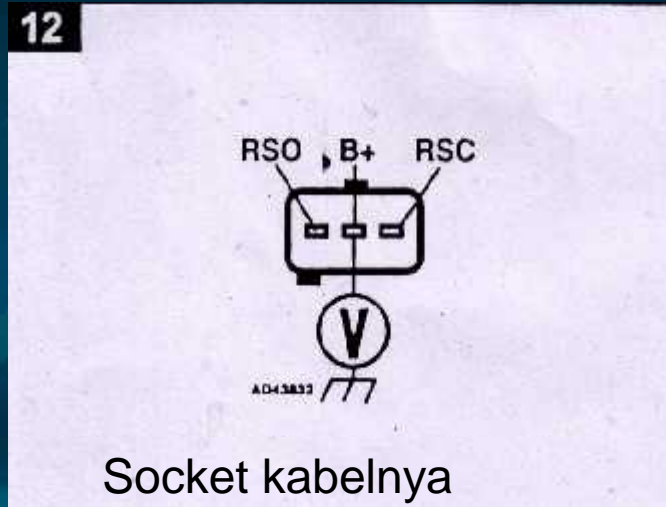
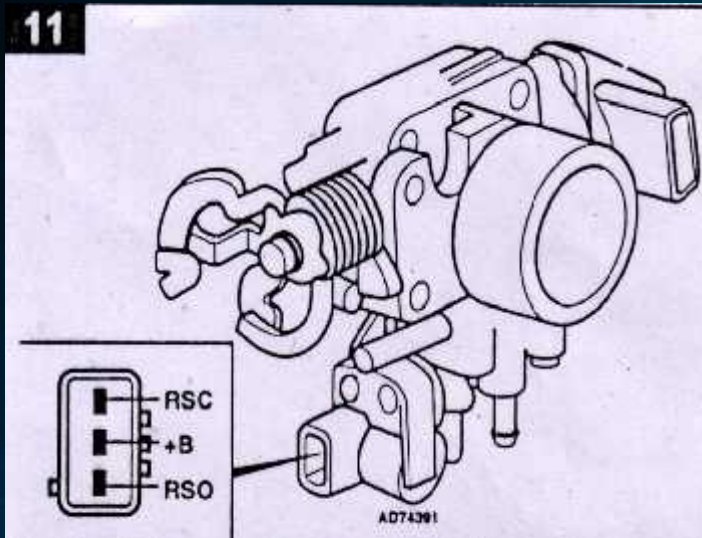
Pengecekan tahanan

DATA TEKNIS

Temperature	Resistance
10 ⁰ C	3000 – 4000 ohm
20 ⁰ C	2000 – 3000 ohm
40 ⁰ C	750 - 1200 ohm
60 ⁰ C	350 - 750 ohm

SISTEM INTAKE

Idle air control (IAC) valve



Socket kabelnya

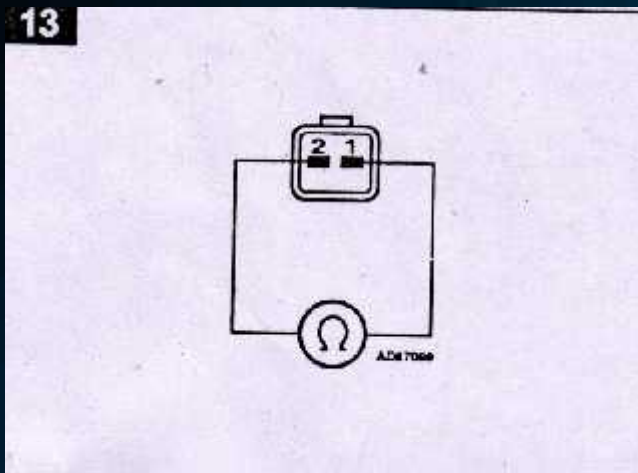
DATA TEKNIS

Terminal	Resistance
B+ & RSO	Mendekati 20 ohm
B+ & RSC	Mendekati 20 ohm

Data teknis : Terminal B+ & massa - nilai tegangan = tegangan batere

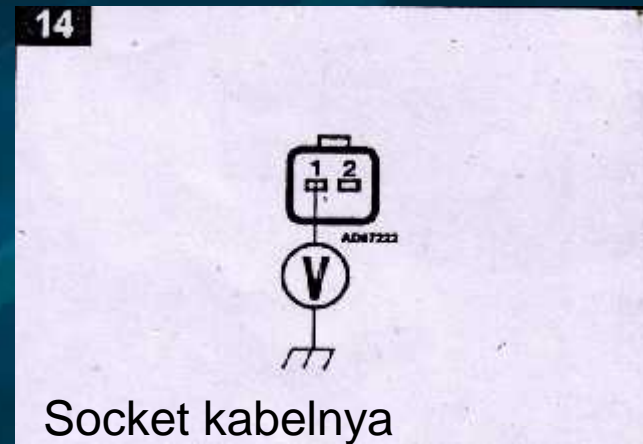
SISTEM INTAKE

Intake manifold air control selenoid



Pengecekan tahanan

Data teknis : terminal 1 & 2 -----
- nilai tahanan = 35 ohm



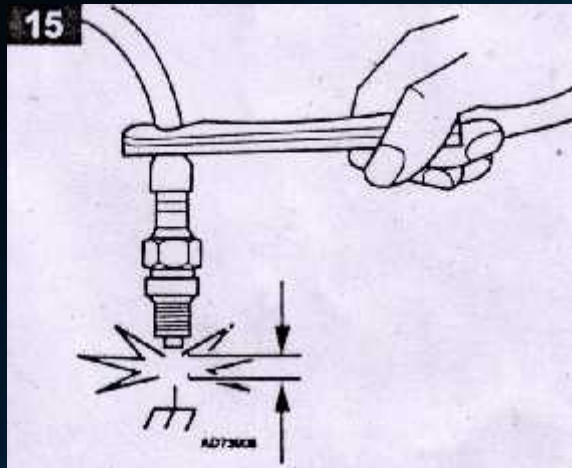
Socket kabelnya

Pengecekan suplai tegangan

Data teknis : terminal 1 &
massa -----nilai tegangan =
tegangan batere

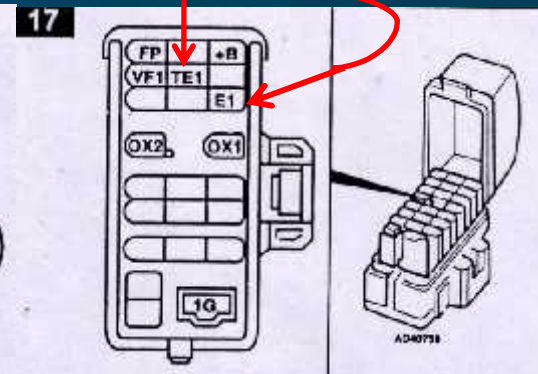
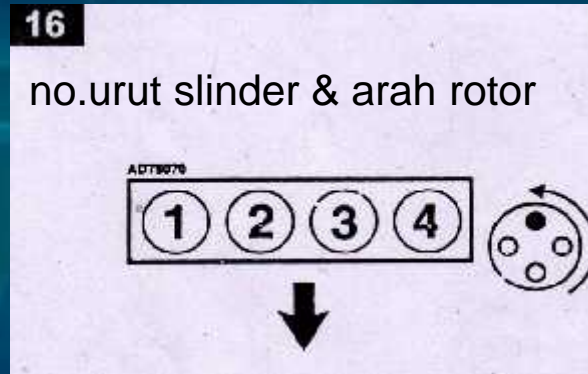
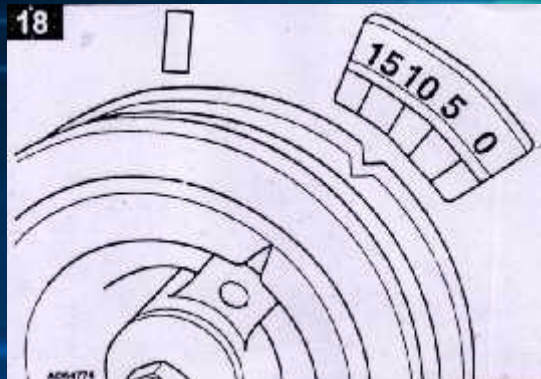
IGNITION SYSTEM

Pengecekan busi tegangan tinggi



Ignition timing & firing order

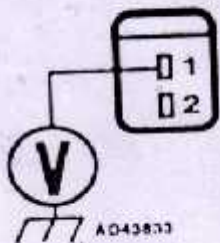
DATA TEKNIS	
Sambung DLC terminal	TE1 & E1
Basic ignition timing – BTDC	10 ⁰ / 700 ±50 rpm
Firing order	1- 3 - 4 - 2
Lepas kabel jumper	
Normal ignition timing - BTDC	5-15 ⁰ / 700 ±50 rpm



IGNITION SYSTEM

Pengecekan suplai tegangan

19



Socket kabel distributor

Pengecekan tahanan primer

20

Coil di distributor



antara terminal (+) dan (-)
Data teknis : nilai tahanan ----
mendekati 0,5 ohm

Pengecekan tahanan sekunder

21

Coil di distributor



antara terminal (+) dan (teg tinggi)

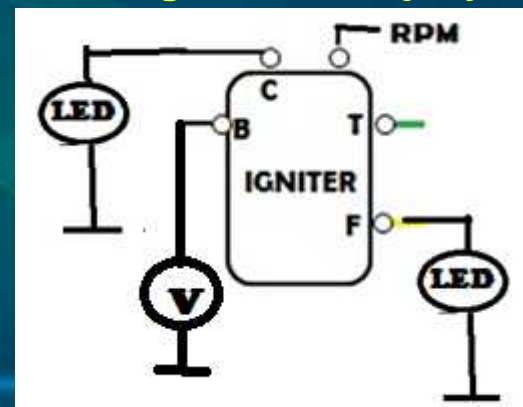
Data teknis : nilai tahanan ----
mendekati 1200 ohm

Pengecekan suplai tegangan



Data teknis : terminal B & massa -----besar tegangan = tegangan batere

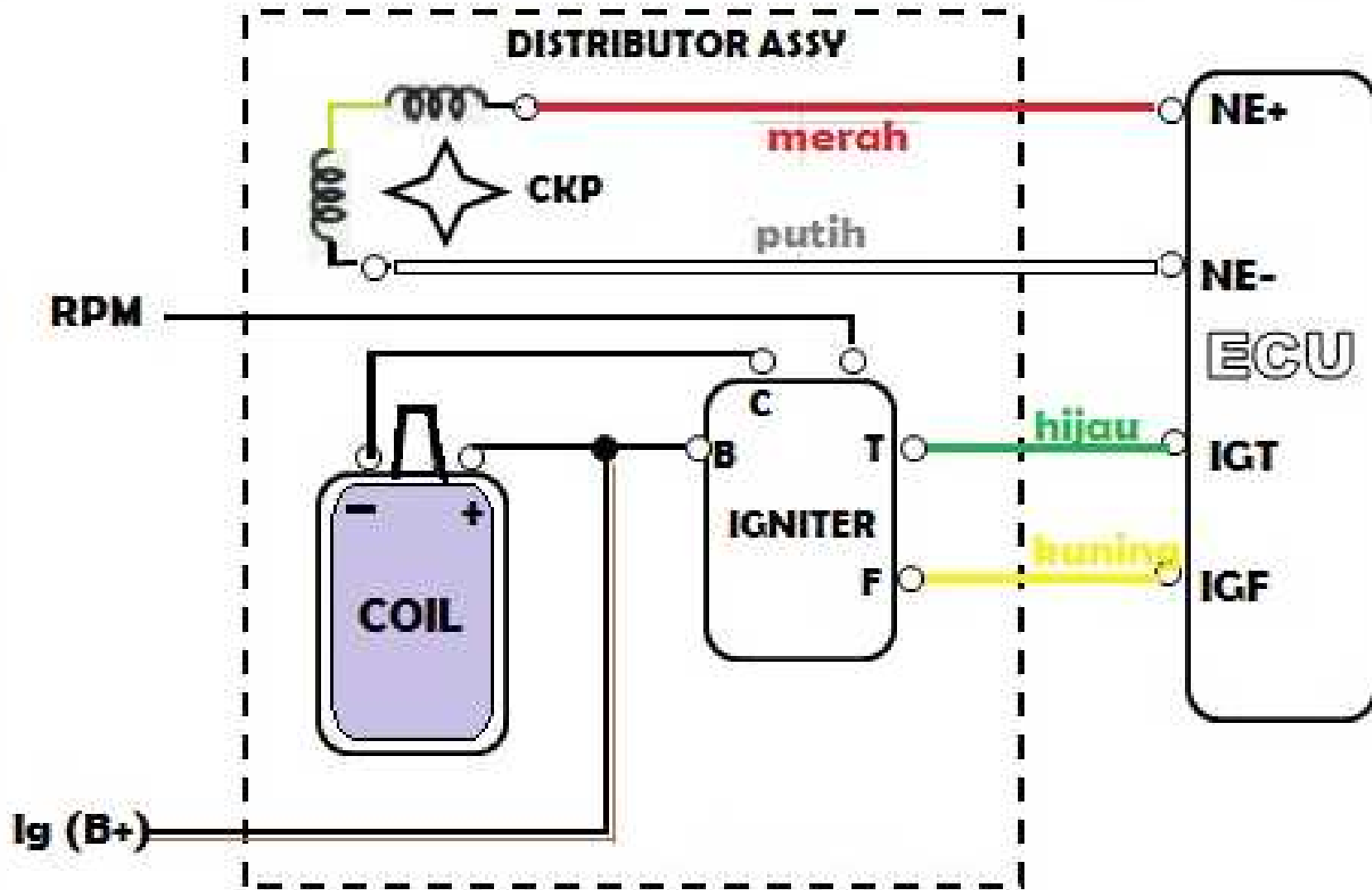
Pengecekan kerjanya



DATA TEKNIS

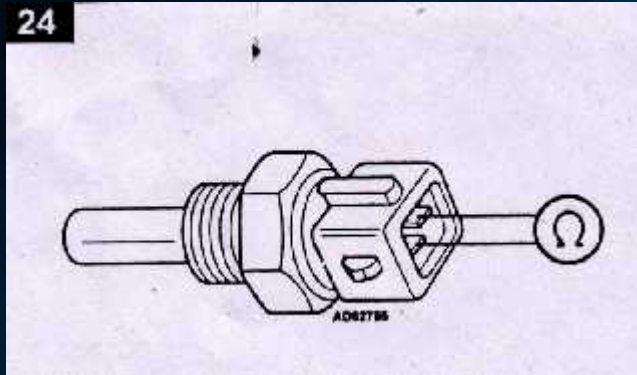
Terminal	LED
C & massa	Flashing (kedip)
F & massa	Flashing (kedip)

RANGKAIAN PENGAPIAN SOLUNA



ENGINE SENSOR

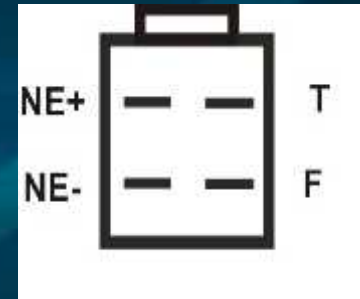
Engine Coolant temperature (ECT) sensor



DATA TEKNIS

Temperature	Nilai Tahanan
0 ⁰ C	4000 – 7000 ohm
20 ⁰ C	2000 – 3000 ohm
60 ⁰ C	450 – 750 ohm
80 ⁰ C	200 – 400 ohm
100 ⁰ C	110 – 250 ohm

Crankshaft position (CKP) sensor



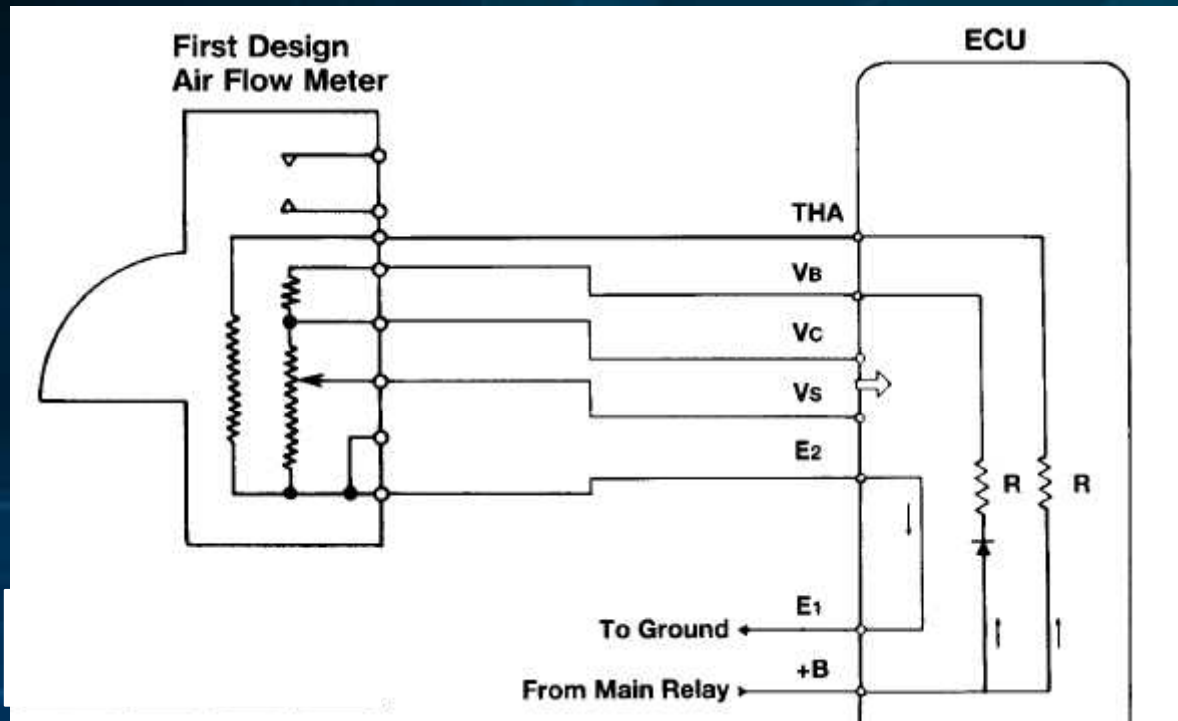
**Data teknis : terminal NE+ & NE- ---
-nilai tahanan mendekati 475 ohm**

Knock sensor (KS)



IDENTIFIKASI TERMINAL

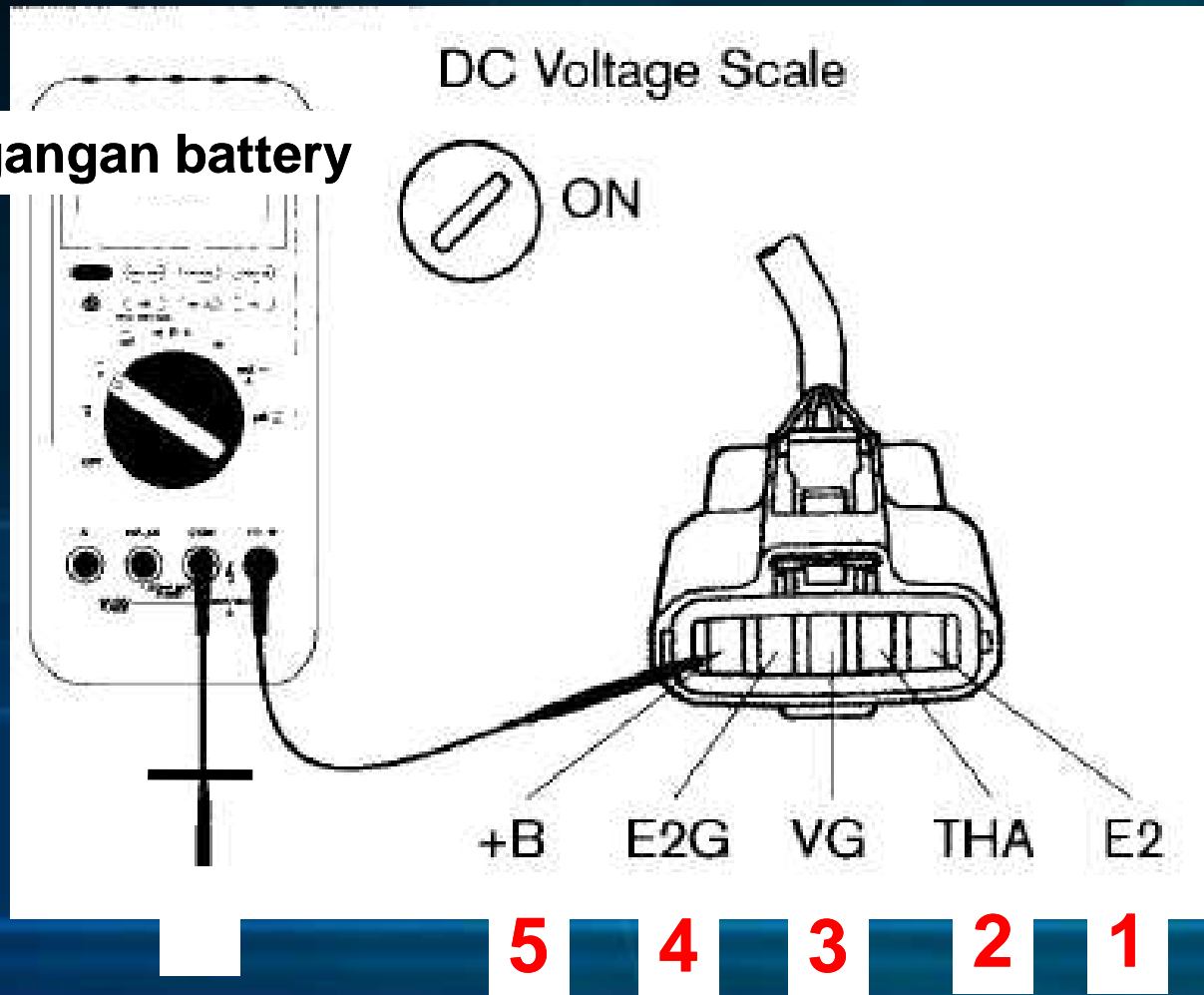
Air Flow Sensor Terminal Identification (First Design Sensor)



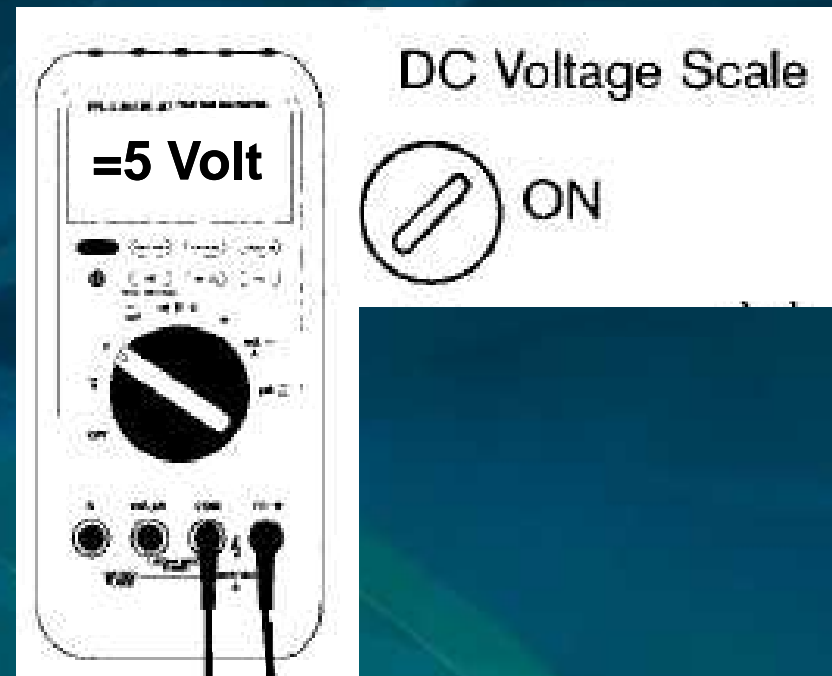
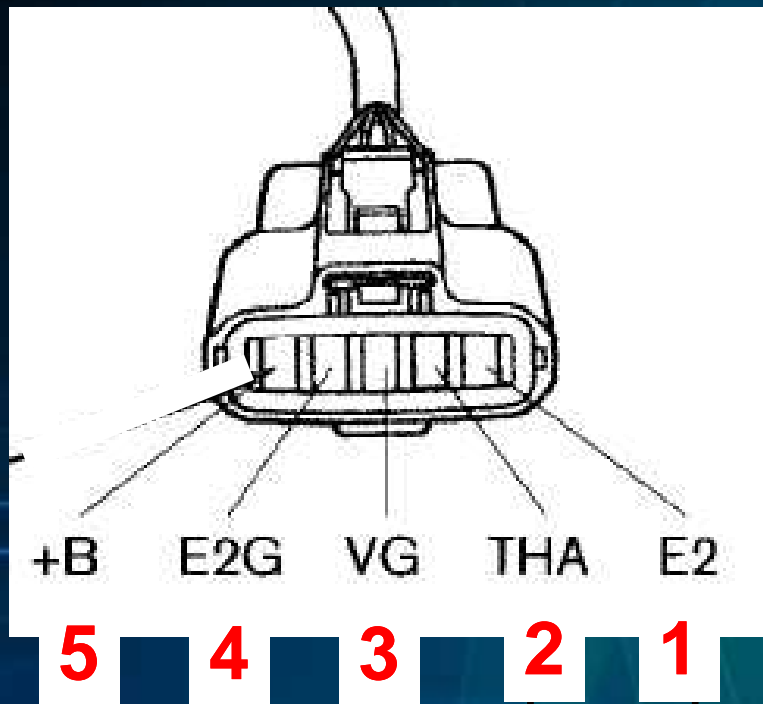
V _B	Voltage Battery	Battery voltage supply to sensor
V _c	Voltage Constant	ECU constant reference voltage
V _s	Voltage Signal	Signal voltage representing air flow
E ₂	Earth Ground	Sensor ground return path

Pengecekan Suplai tegangan Mass Air Flow

=Tegangan battery



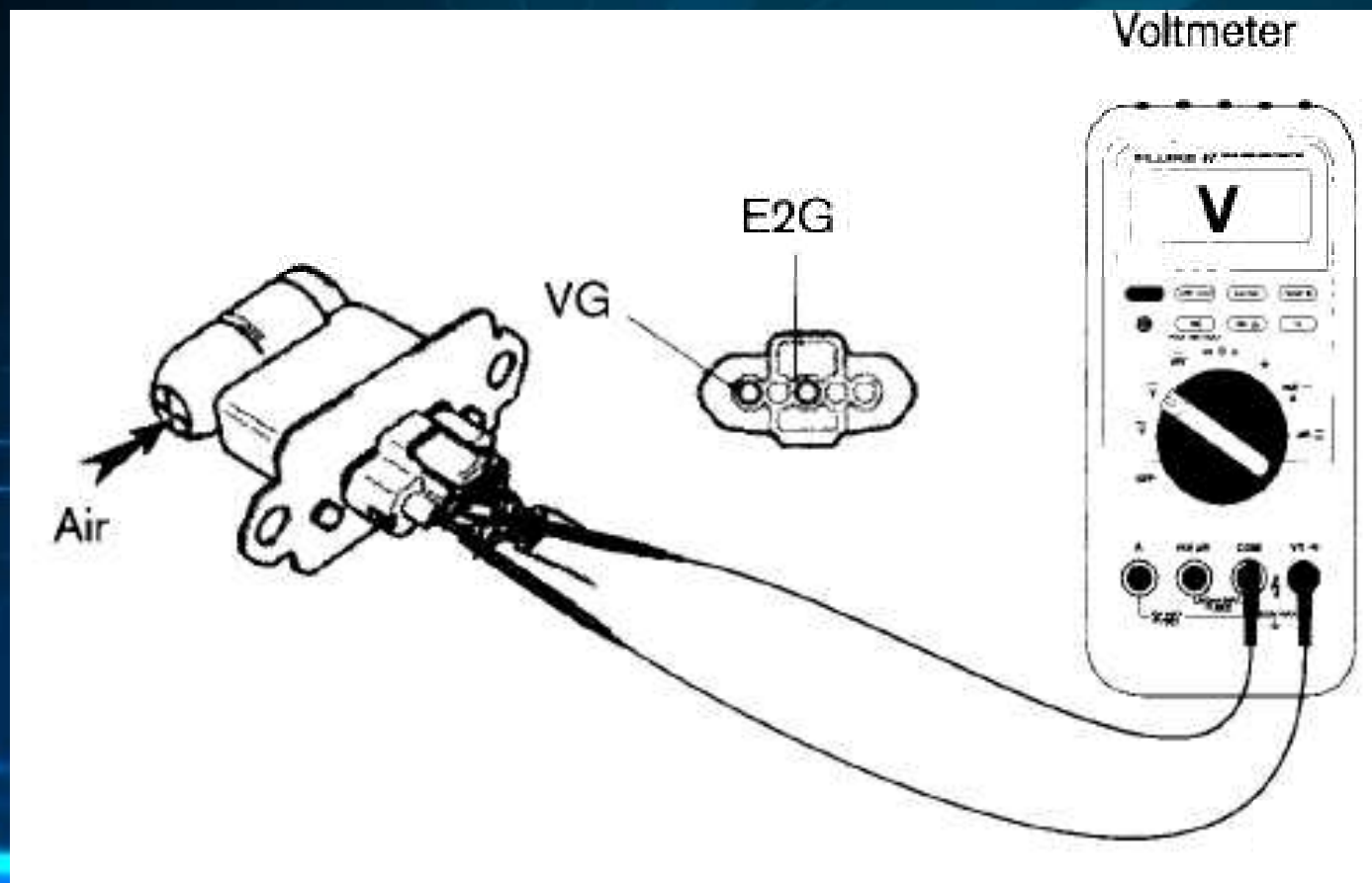
Pengecekan Suplai tegangan Mass Air Flow



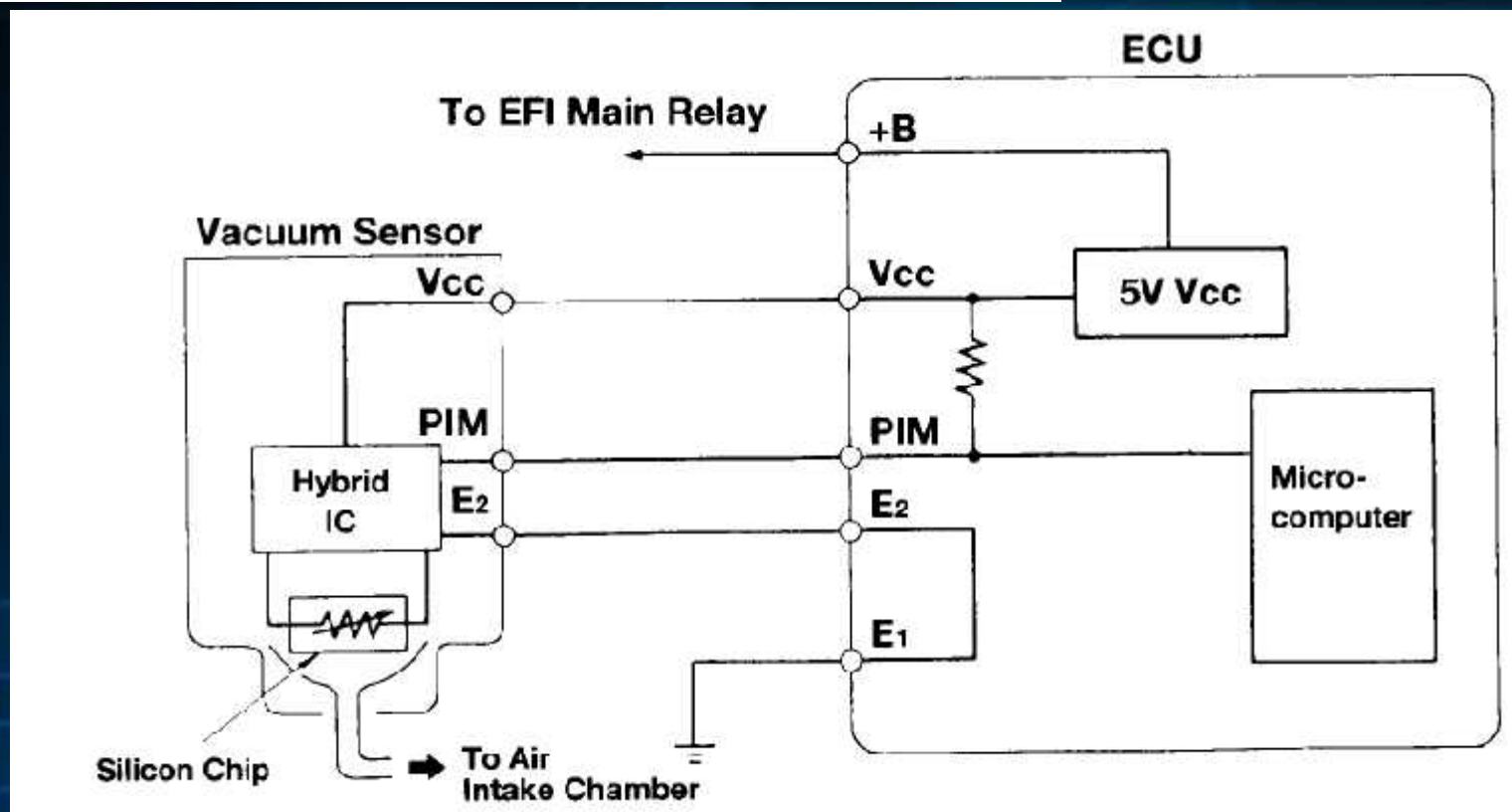
Checking MAF Operation

Hubungkan **+** Voltmeter ke VG dan **-** Voltmeter ke E2G

Hembuskan udara kearah sensor, baca nilai tegangannya



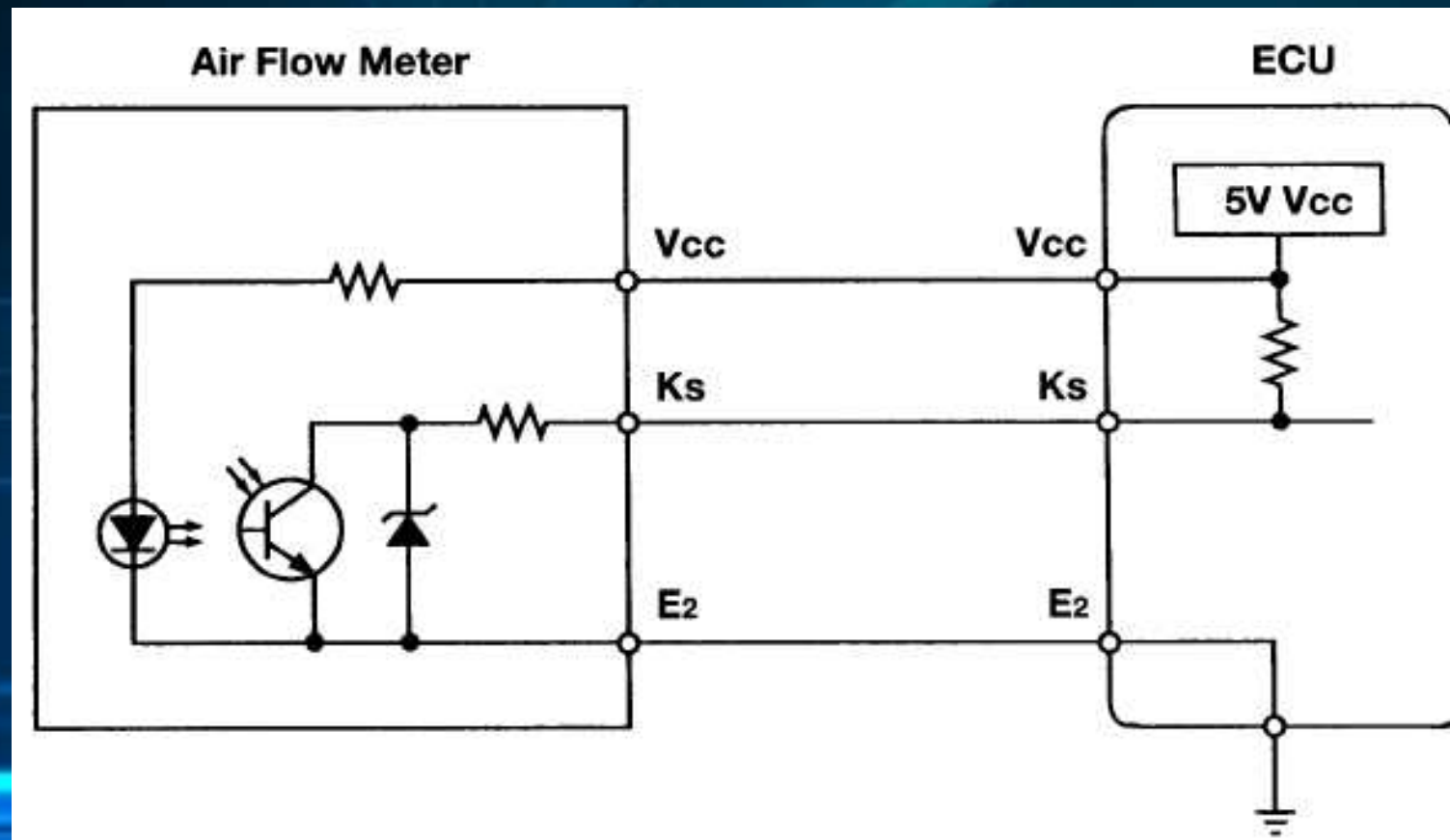
Manifold Absolute Pressure Sensor Terminal Identification (MAP)



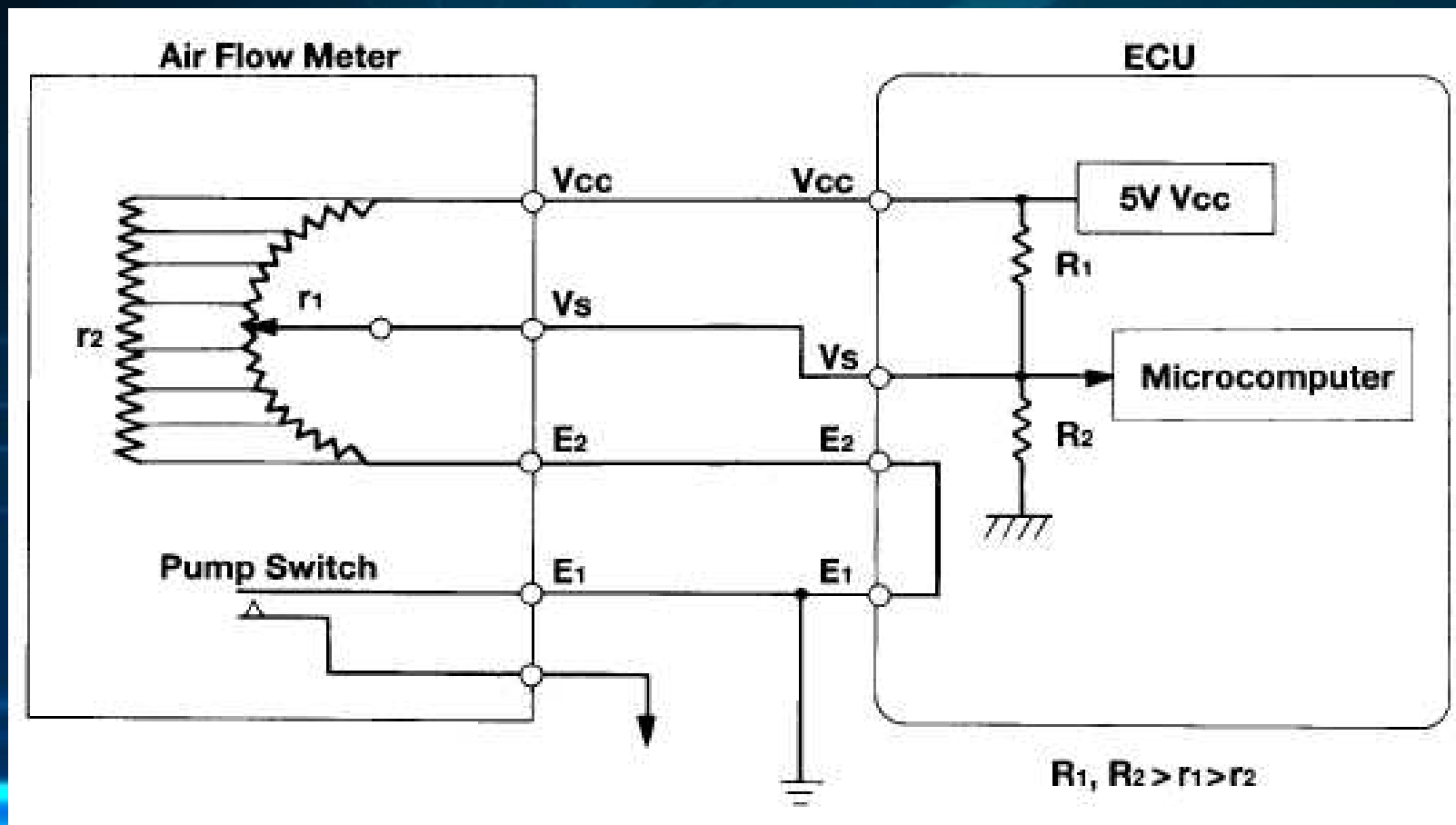
Vcc	Voltage Constant Control	Regulated 5 volt reference
PIM	Pressure Intake Manifold	Signal voltage representing manifold pressure
E2	Earth Ground	Sensor ground return path

Karman Vortex Air Flow Meter Terminal Identification

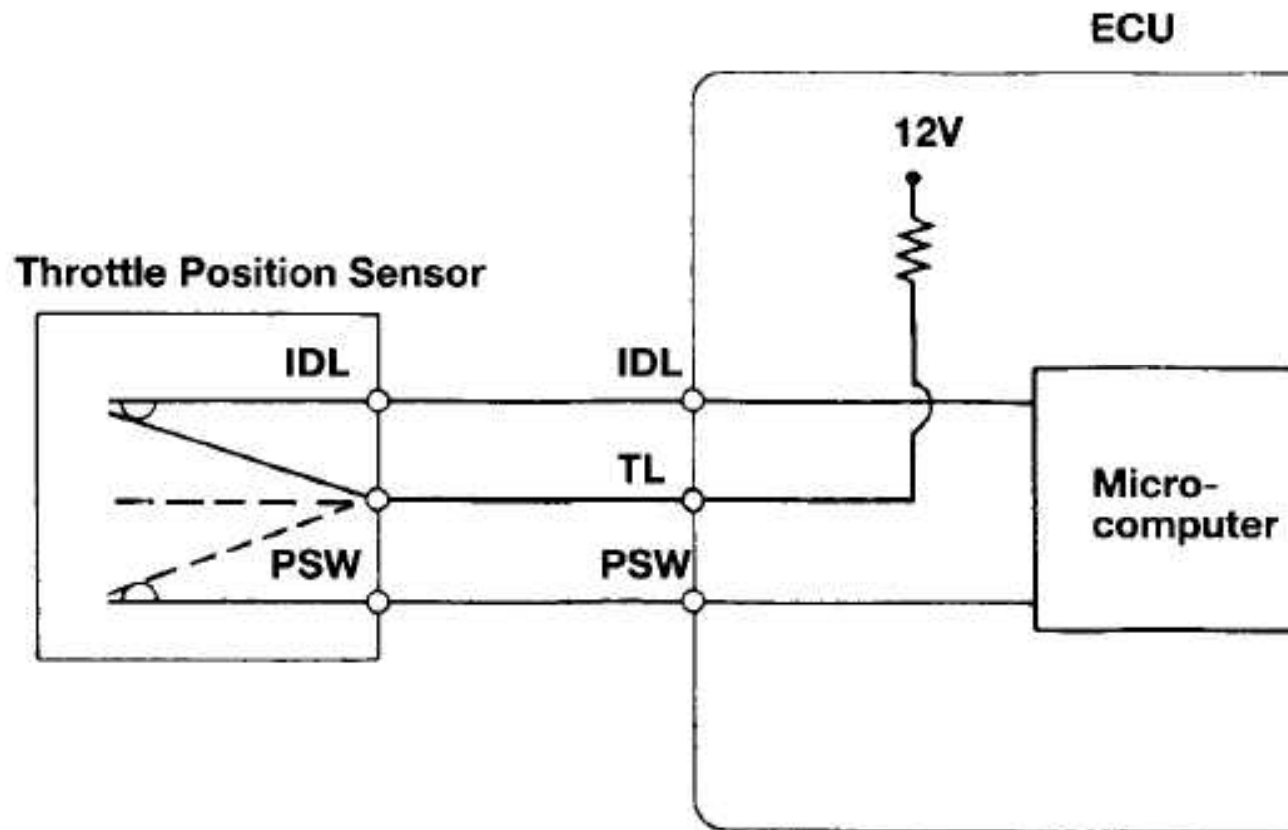
Vcc	Voltage Constant Control	Regulated 5 volt reference
Ks	Karman Signal	Digital frequency signal representing air flow
E2	Earth Ground	Sensor ground return



Vcc	Voltage Constant Control	Regulated 5 volt reference
Vs	Voltage Signal	Signal voltage representing air flow
E2	Earth Ground	Sensor ground return

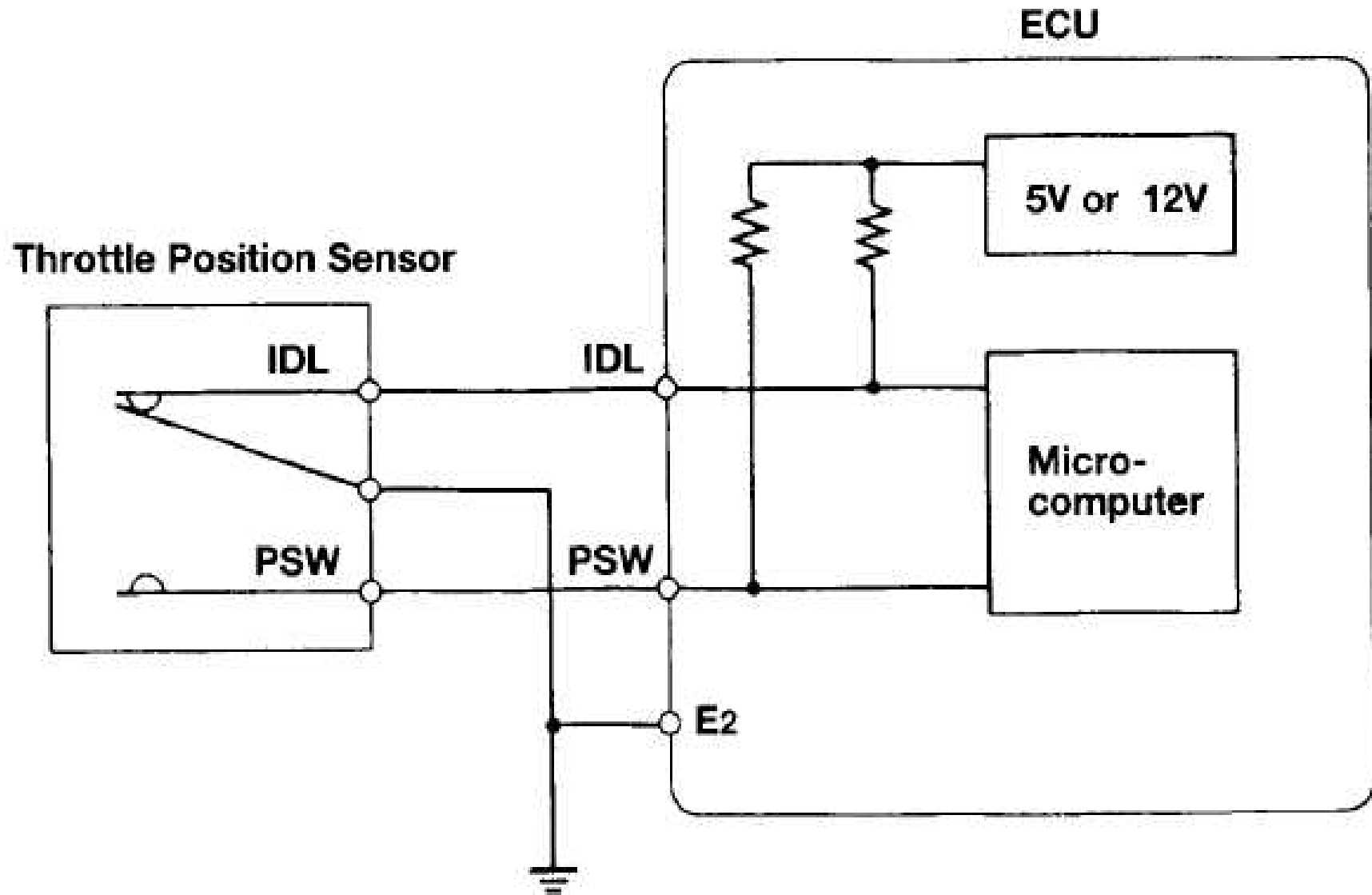


1ST DESIGN THROTTLE SENSOR



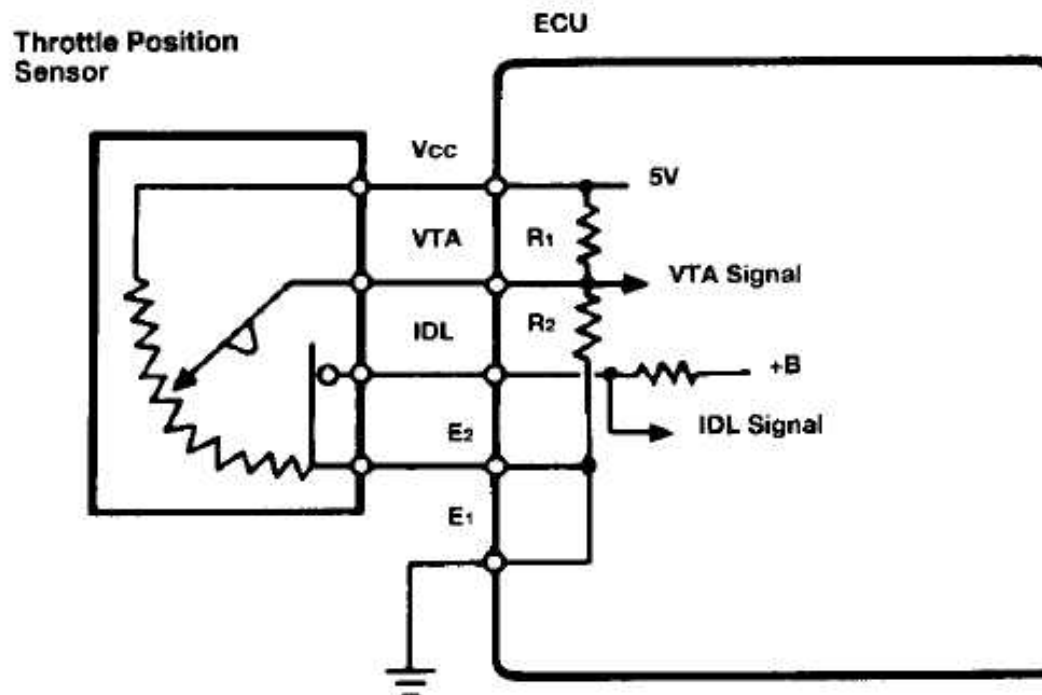
PSW
TL or E
IDL

2ND DESIGN THROTTLE SENSOR

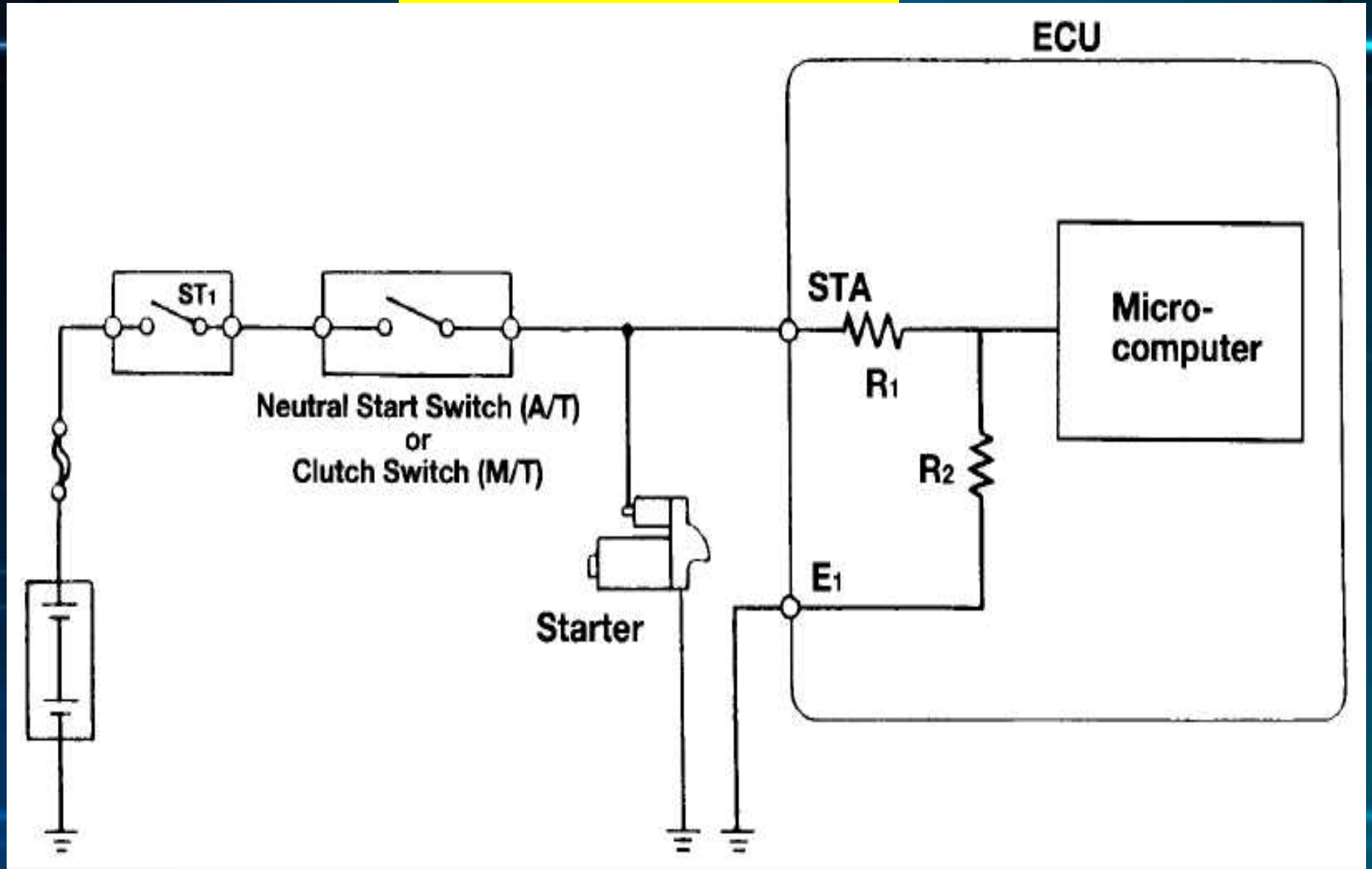


Linear Throttle Position Sensor Terminal Identification

Vcc	Voltage Constant Control	Regulated 5 volt reference
VTA	Voltage Throttle Angle	Analog signal voltage representing throttle angle
IDL	Idle Switch	Digital signal voltage representing closed throttle position
E2	Earth Ground	Sensor ground return path



SENSOR STARTER



Pendahuluan

Scanner Car Brain C168 adalah alat diagnosis profesional yang di gunakan untuk komunikasi antara kendaraan dengan mekanik/user. Semua komunikasi pada kendaraan dikoneksikan keluar dengan menggunakan komunikasi serial. Scanner CarBrain C168 berfungsi hanya sebagai alat scanner untuk mendiagnosa kendaraan.

Pemakaian pada Kendaraan :

Asian : Toyota, Lexus, Honda, Nissan, Mitsubishi, Proton, Mazda, Subaru, Suzuki, Isuzu, Infiniti, Holden, Hyundai, Kia, Daewoo, Ssang Yong, Daihatsu, Samsung

European: Benz, BMW, Audi, Volkswagen, Saab, Renault, Citroen, Peugeot

USA : General Motors, Chrysler, Jeep, Ford

Sistem Pendukung :

Engine, Automatic transaxle, ABS, SRS-Airbag, A/C, Immobilizer, Steering Lock, , Miror, EPS, dll ...

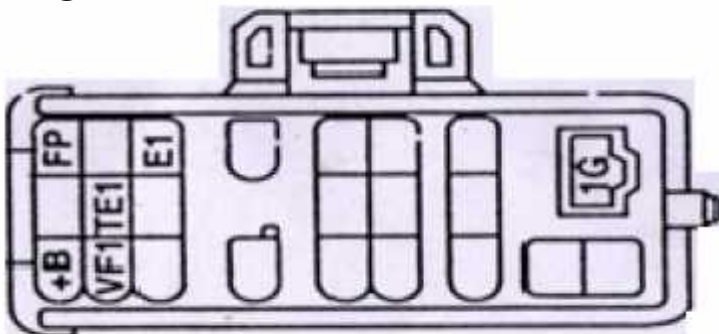
Syarat Sebelum Pemeriksaan

- 1. Tegangan Baterai kendaraan 11 – 14 V, Tegangan kerja x-431 12 V**
- 2. Matikan semua alat elektronik misal AC, Lampu kepala, Audio dll.**
- 3. Katup gas pastikan pada posisi tertutup.**
- 4. Putaran engine idel**
- 5. Temperatur engine pada temperatur kerja**

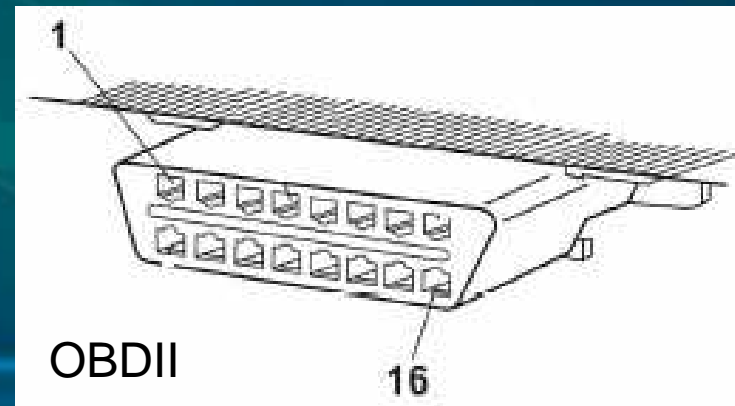
Lokasi Konektor DLC

Kendaraan-kendaraan baru telah menggunakan standar adapter OBDII (On Board Diagnostic) yang mana letaknya mudah ditemukan, biasanya terletak **dibawah dashboard (panel instrument) sebelah kemudi**. Sebelum menghubungkan Scantool pertama-tama yang dilakukan adalah mencari letak DLC. Pencarian yang paling tepat adalah melalui buku manual kendaraan yang bersangkutan **Letak DLC ada yang di ruang Engine (Dekat Box Sekring)**

DLC

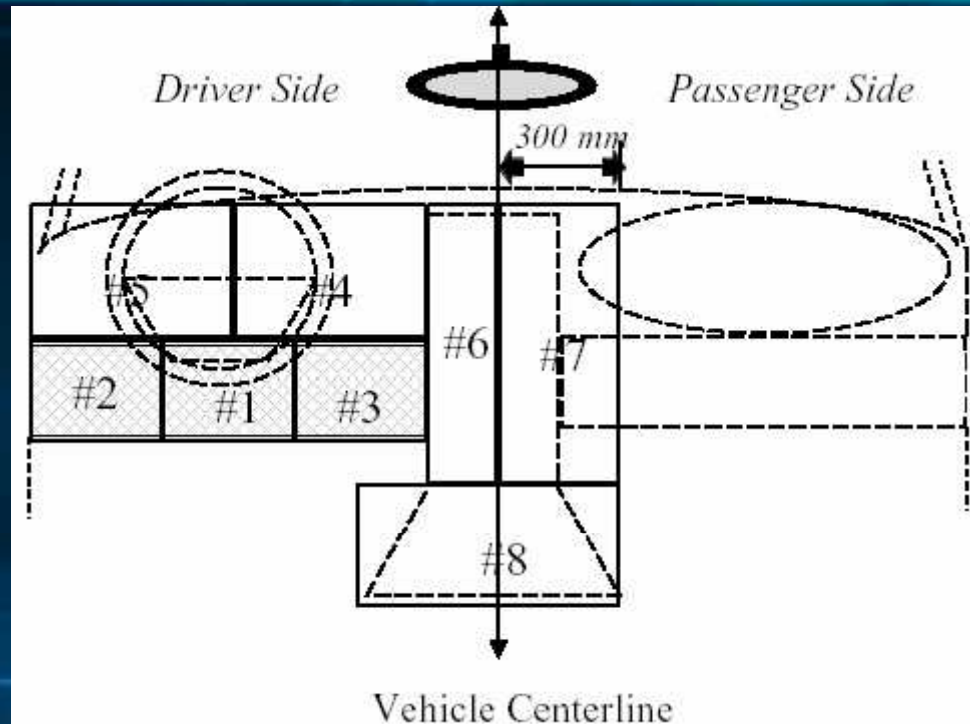


Toyota Soluna



Toyota Avanza

Lokasi DLC pada ruang pengemudi :



3 lokasi utama

1. Lokasi DLC *dibawah dashboard (panel instrument), tepat dibawah kolom steering (atau +/- 150 mm kanan atau kiri dari kolom steering).*
2. Lokasi DLC *dibawah dashboard (panel instrument), diantara bagian pintu pengemudi dan area kolom steering*
3. Lokasi DLC *dibawah dashboard (panel instrument), diantara area kolom steering dan handle Tranmisi*

Lokasi lain yang memungkinkan

4. Lokasi DLC *dibawah dashboard (panel instrument), antara kolom steering dan garis utama kendaraan*
5. Lokasi DLC *dibawah dashboard (panel instrument), antara bagian pintu pengemudi dan kolom steering*
6. Lokasi DLC *di area audio/radio, pada sisi kiri garis utama kendaraan.*
7. Lokasi DLC *di area audio/radio, pada sisi kanan (30 cm) dari garis utama kendaraan.*
8. Lokasi DLC *pada bagian lengan kursi, handbrake area.*
9. Beberapa lokasi selain dari lokasi-lokasi 1-8 *(di belakang penumpang, dibawah jok tempat duduk, ujung dari dashboard dekat kaca depan)*

**TERIMA
KASIH**