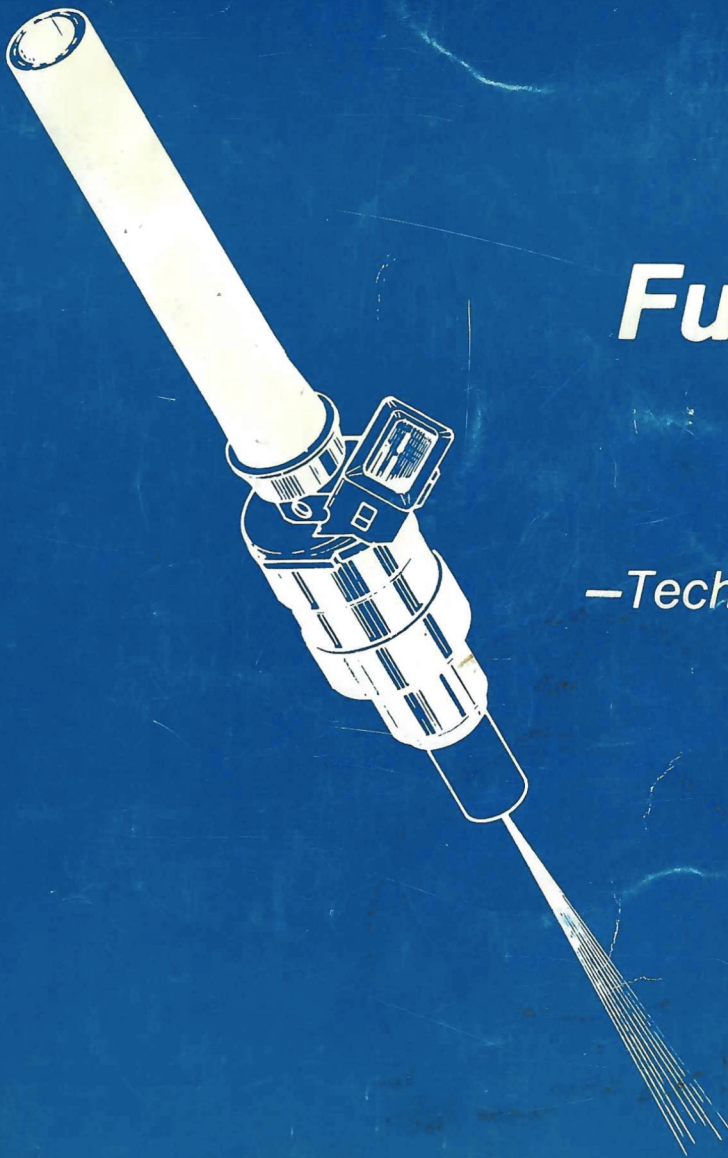


FIAT

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Technical Training



Fuel Injection Diagnosis

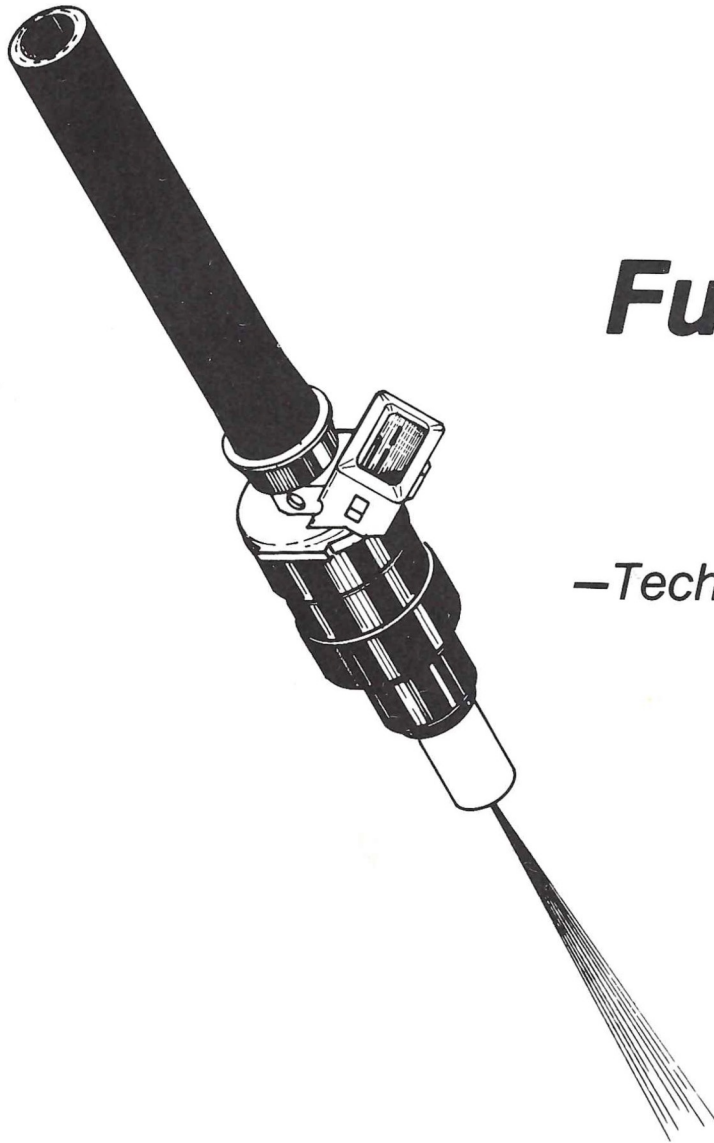
—Technician's Information—

Fiat Motors of North America, Inc.

**PRODUCED
BY
FIAT MOTORS OF NORTH AMERICA, INC.
PUBLICATIONS AND TECHNICAL
TRAINING DEPARTMENT**

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Fuel Injection Diagnosis

—Technician's Information—

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INTRODUCTION

How to Use This Book

This book provides illustrated step-by-step diagnostic procedures for various trouble symptoms. Experience with fuel injection systems has shown that most troubles attributed to the system are really troubles with other systems, such as ignition, engine, electrical, etc. Therefore before troubleshooting the fuel injection system you should road test the car and then check the following:

- condition of battery
- condition of spark plugs
- ignition timing
- valve timing
- engine compression
- idle speed

After you have confirmed that these are correct, find the symptom which best describes the condition. Follow the procedures in this book to isolate the problem.

Throughout the book you will see "If test light does not light check wires indicated in diagram. If wires are good, replace component." The wires to be checked on the diagram are indicated by heavier lines. To check the wires use an ohmmeter and check for continuity from pin to pin.

The electrical system is checked using only an ohmmeter and a test light. When connecting test equipment make sure you are on the correct terminal and not touching any other wire. Make sure you have a good ground point when required.

The symbols use for the test equipment are:



Whenever it is necessary to open the fuel system you will see **WARNING: FIRE HAZARD**. Use care when working with an open fuel system. Do not smoke. Keep any open flame away. Make sure fuel does not come in contact with hot surfaces such as exhaust manifolds. Be careful of sparks from battery or ignition system.

The fuel injection system is highly susceptible to contamination. Make sure the area is clean whenever you remove either the cold start valve or injectors or disconnect a fuel hose. Use extreme care so that no dirt enters the fuel system.

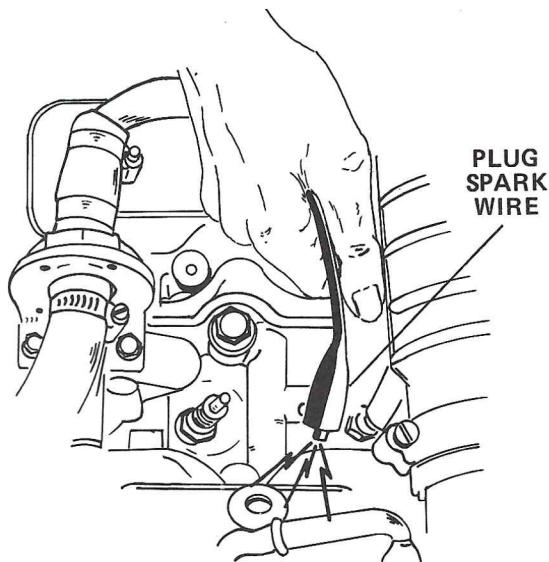
STARTER RUNS, ENGINE WILL NOT START

1. Check Ignition System

Disconnect a spark plug cable and check for spark. If spark is not sufficient, check electronic ignition system.

2. Check Intake Air System

Check all air lines for leaks or damage. Repair leaks or replace lines. See diagram on next page.



3. Check Fuel Feed Pressure

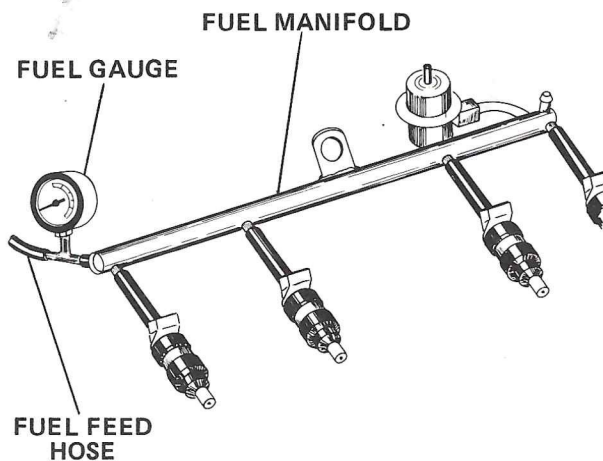
WARNING: FIRE HAZARD

Disconnect fuel line from fuel manifold. Connect pressure gauge to fuel line. Disconnect vacuum line from fuel pressure regulator.

Operate starter and check pressure reading.

FUEL FEED PRESSURE – 2.51 bar.
35.25 psi

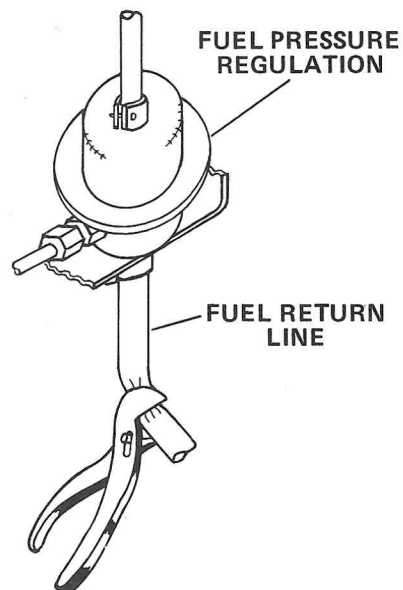
a. If pressure is correct, go to check 4.



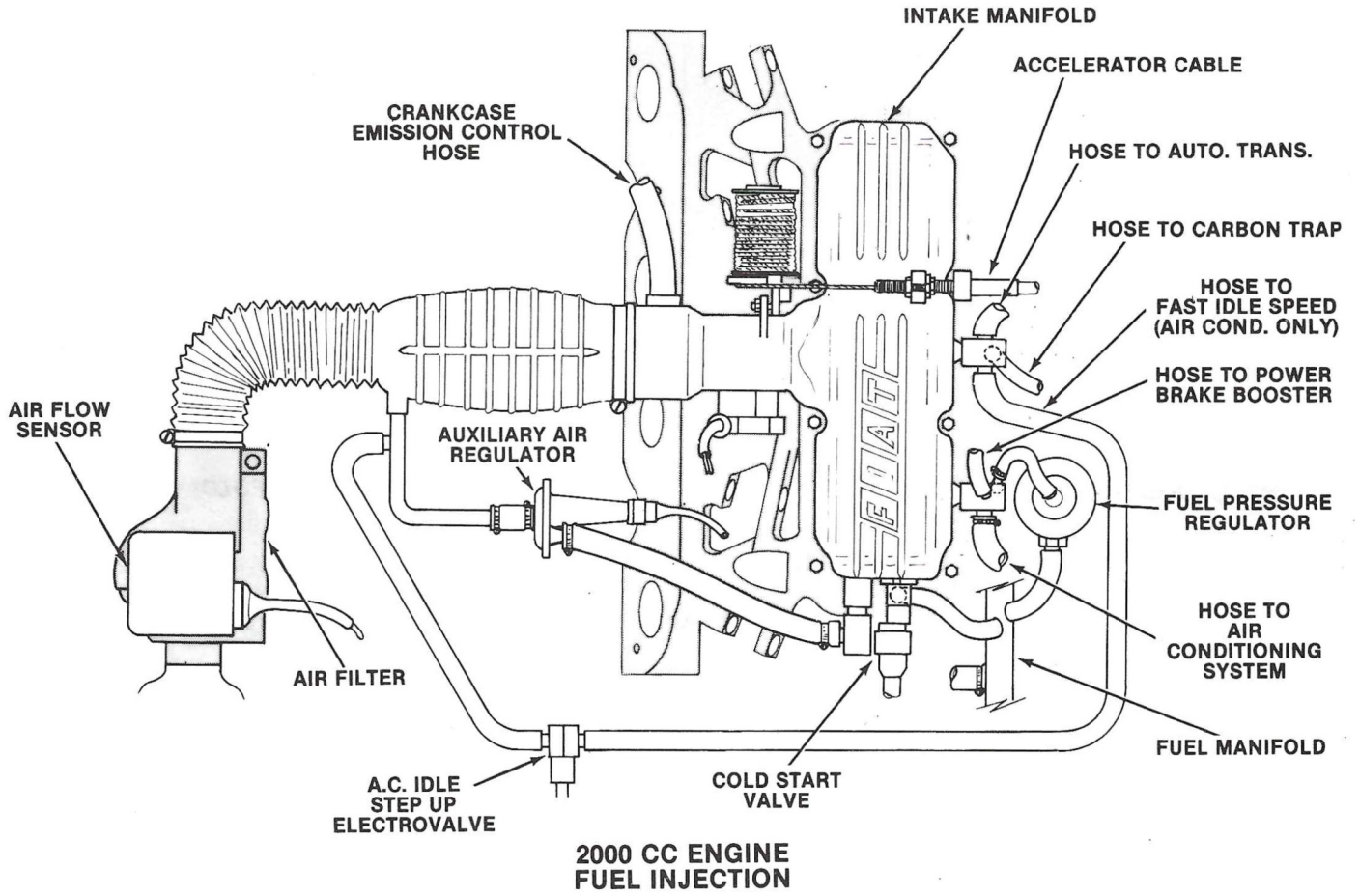
b. If pressure is over specifications, pinch the return fuel line. Use a pair of pliers.

1. If the pressure increases, replace regulator.

2. If the pressure remains constant, inspect return fuel line for damage or blockage.

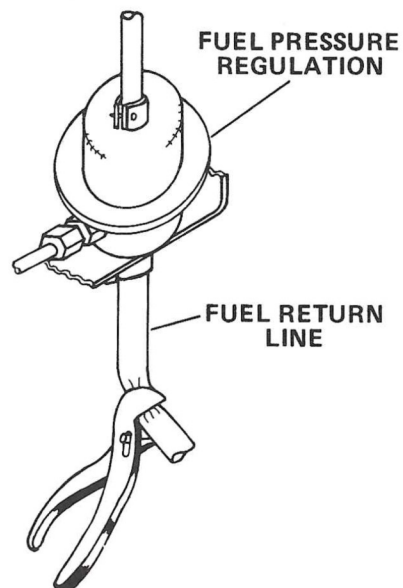


AIR INTAKE SYSTEM

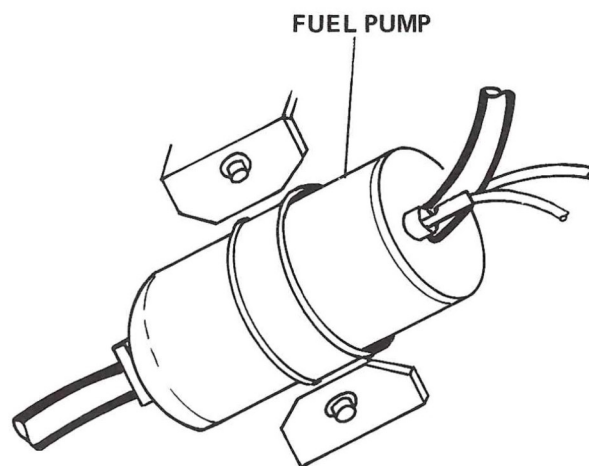


STARTER RUNS, ENGINE WILL NOT START *(continued)*

- c. If pressure is under specifications, pinch the return fuel line. Use pliers.
1. If pressure increases, replace regulator.
 2. If pressure remains constant, inspect feed line for blockage and damage. If feed line is good, replace pump.



- d. If gauge shows no pressure, check if fuel pump is running.
1. If fuel pump is not running, go to test 9.
 2. If fuel pump is running, inspect fuel feed line for blockage or damage. If fuel feed line is OK, replace fuel pump.



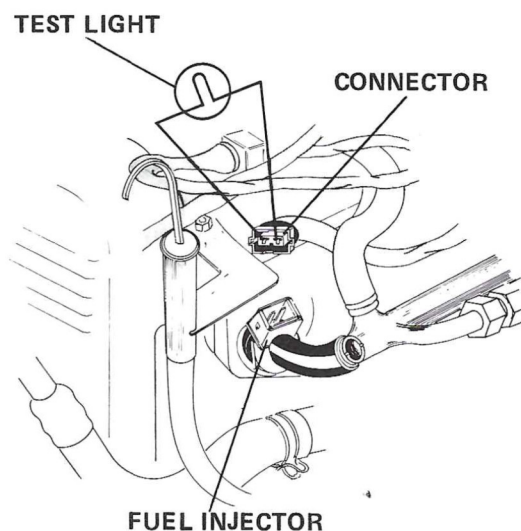
4. Check Voltage at Injectors

Disconnect electrical connector from one injector. Connect a test light between the terminals in the connector.

Operate starter motor and check test light.

The test light should come on with weak and flickering intensity.

- a. If test light comes on with weak and flickering intensity, go to check 5.
- b. If test light does not come on, go to check 11.
- c. If test light is always on, replace electronic control unit.

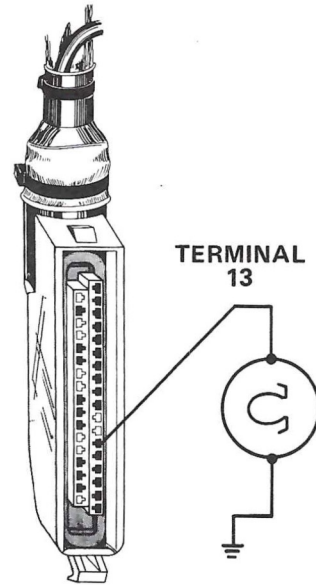


5. Check Coolant Temperature Sensor Resistance

Turn ignition switch off. Disconnect connector from electronic control unit. Connect an ohmmeter between terminals 13 of the connector and ground. (See diagram 1, page 33).

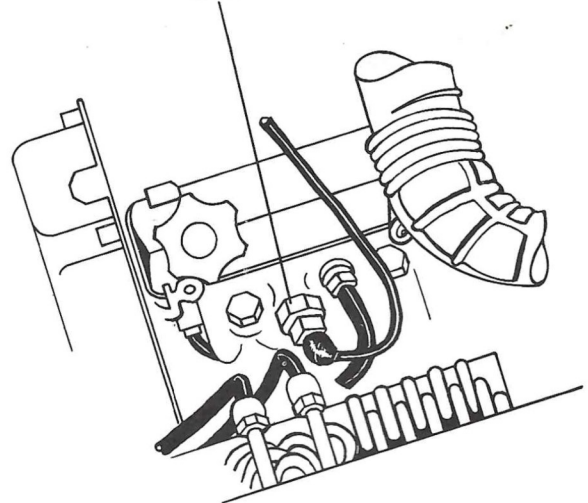
Check ohmmeter reading. Meter should read:

OHMS	COOLANT TEMPERATURE
7,000 to 11,600	-10°C (14°F)
2,100 to 2,900	20°C (68°F)
270 to 390	80°C (176°F)



- a. If reading is good, go to check 6.
- b. If reading is 0 ohms or less than specified, replace sensor.
- c. If reading is ∞ (infinity), check the wires indicated in diagram 1 for breaks. If wires are good, replace sensor.

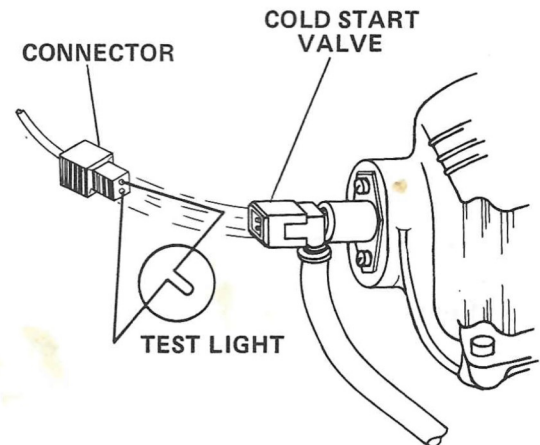
COOLANT TEMPERATURE SENSOR



6. Check Thermo Time Switch

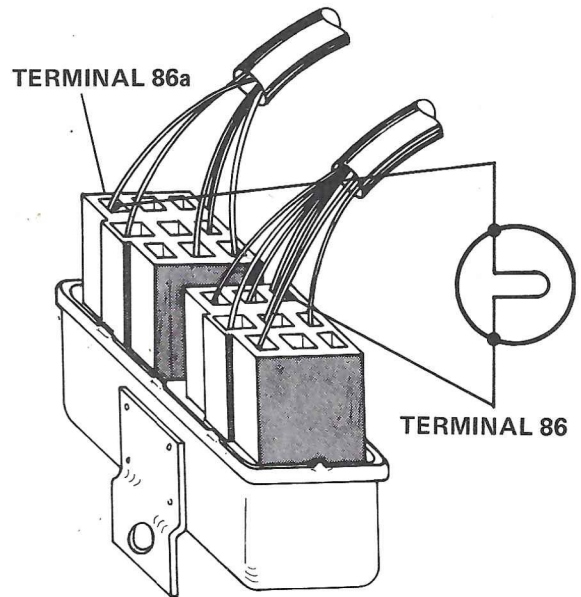
Disconnect connector from cold start valve. Connect test light between terminals in connector. Operate starter and check time that test light is lit. Test light should be on for

TIME	COOLANT TEMPERATURE
1 to 8 seconds	Lower than 35°C (95°F)
No light	Above 35°C (95°F)



STARTER RUNS, ENGINE WILL NOT START (continued)

- a. Test light stays on correctly, go to check 7.
- b. Test light stays on over 8 seconds, replace thermo time switch.
- c. (See diagram 2, page 34) Test light does not come on with coolant temperature below 35°C. Check double relay between terminals 86a and 86.
 1. If relay is good, check wires indicated in diagram 2 for breaks.
 2. If wires are good, replace thermo time switch.



7. Check Cold Start Valve

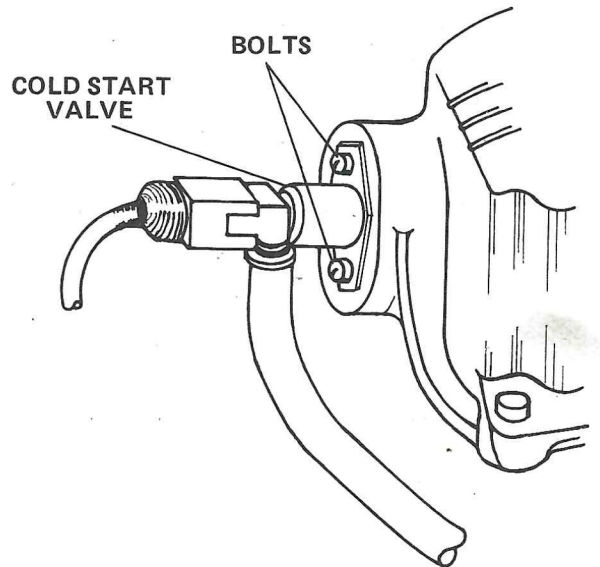
WARNING: FIRE HAZARD

Remove the two bolts holding the cold start valve in the intake manifold. Do not disconnect fuel line or electrical connector. Place cold start valve in a container to catch injected fuel.

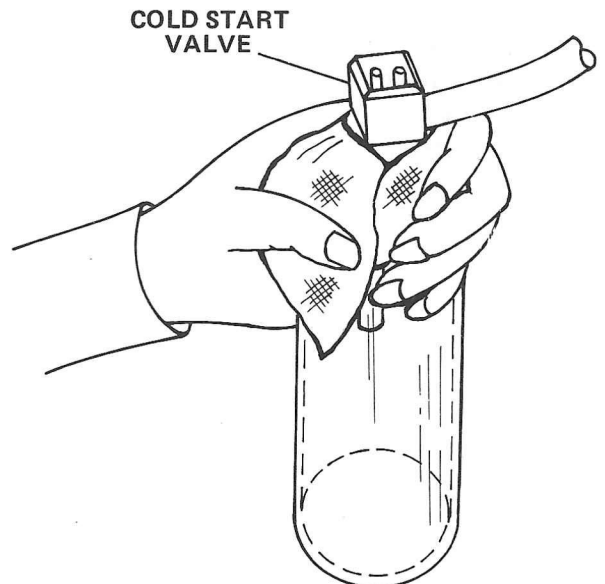
Operate starter and note injection time from cold start valve.

Valve should spray fuel for

TIME	COOLANT TEMPERATURE
1 to 8 seconds	Lower than 35°C (95°F)
No spray or drip	Above 35°C (95°F)



- a. Valve sprays fuel correctly, install cold start valve and go to check 8.
- b. Valve sprays continuously or drips, replace valve.
- c. Valve does not spray with temperature below 35°C, replace valve.

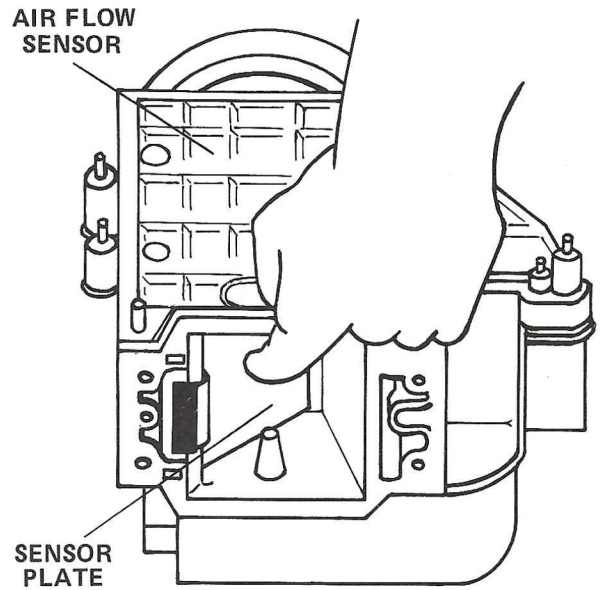


8. Check Air Flow Sensor

Remove the air flow sensor. Check the sensor plate by hand for free movement. Check that plate closes against stop when released.

NOTE: Make sure sensor is clean on inside. If necessary, clean only with a dry cloth.

- a. If sensor plate does not move freely or return to closed position, replace air flow sensor.

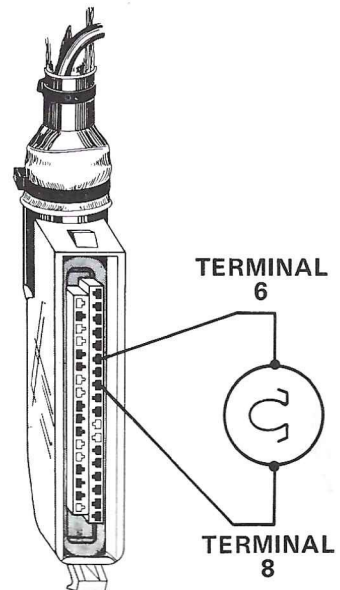


- b. If sensor plate operates properly, turn ignition switch off. Disconnect connector from electronic control unit. Perform steps 1 thru 3 below.

- 1. Connect ohmmeter between terminals 6 and 8 of connector. See diagram 3, page 35.

Resistance should be about 180 ohms. — *BOSH 130-260 OHMS*

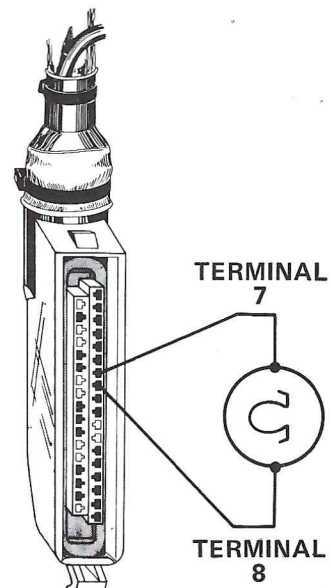
- a. If resistance is correct, go to step 2 below. *325-350 ON CAR (2)*
- b. If resistance is not correct, check wires indicated in diagram 3. If wires are good, replace air flow sensor.



- 2. Connect ohmmeter between terminals 7 and 8 of connector. See diagram 4, page 36.

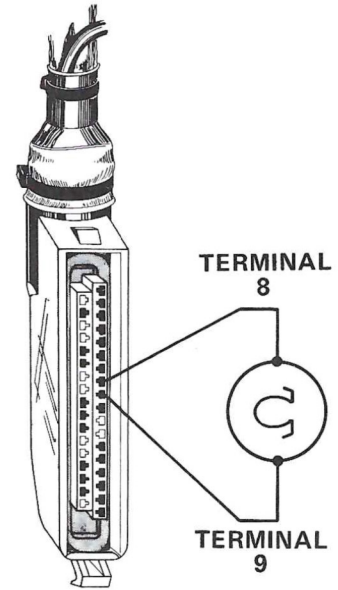
Resistance should be about 150 ohms. *BOSH 100-500*

- a. If resistance is correct, go to step 3 below. *305-325*
- b. If resistance is not correct, check wires indicated in diagram 4. If wires are good, replace air flow sensor.



STARTER RUNS, ENGINE WILL NOT START (continued)

3. Connect ohmmeter between terminals 8 and 9 of connector. See diagram 5, page 37. Resistance should be about 100 ohms. *70-140 Bosh*
 - a. If resistance is correct in all 3 steps, the problem is not in the fuel injection system. *190*
 - b. If resistance is not correct, check wires indicated in diagram 5. If wires are good, replace air flow sensor.

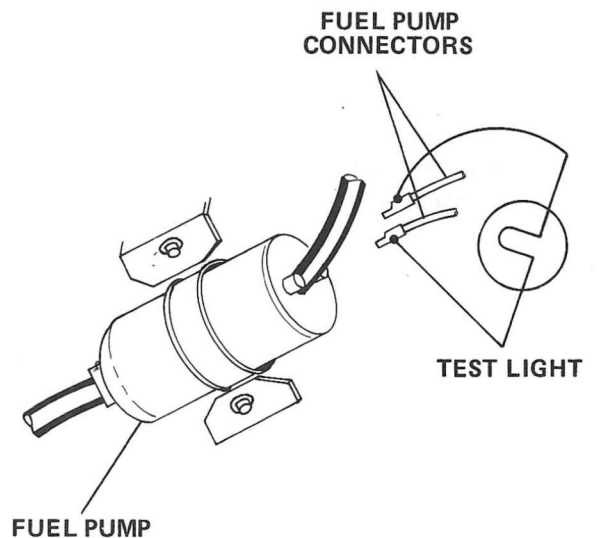


9. Check for Voltage at Fuel Pump

Disconnect 2 wires from Fuel pump. Connect test light between wires. Operate starter and check test light.

Test light should come on.

- a. If test light does not come on, go to check 10.
- b. If test light comes on, replace pump.

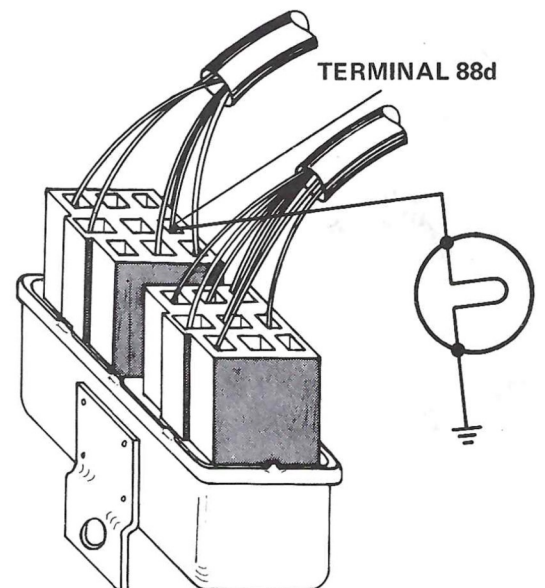


10. Check for Voltage Output to Fuel Pump at Relay Set

Connect a test light between terminal 88d of the relay set connector and a good ground. Operate the starter and check test light. See diagram 6, page 38.

Test light should light.

- a. If test light does not come on, go to check 11.
- b. If test light comes on, check wire from double relay to fuel pump and wire from pump to ground.



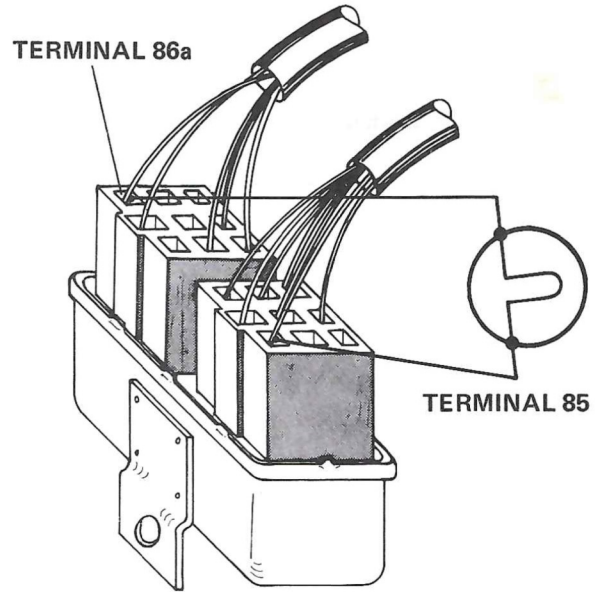
11. Check Voltage Input to Relay Set from Ignition Switch

Connect test light between terminals 86a and 85 of relay set connectors. See diagram 7, page 39.

Operate starter and check test light.

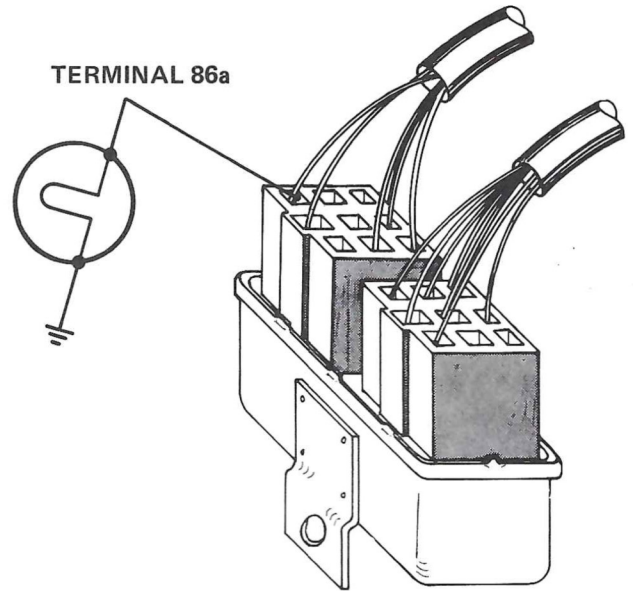
a. If test light comes on, go to check 12.

red/blk



b. If test light does not come on, connect test light between terminal 86a and a good ground. Operate starter and check test light.

1. If test light does not come on, check wiring from double relay to ignition switch.
2. If test light comes on, check wiring indicated in diagram 7 for breaks. If wiring is good, replace control unit.

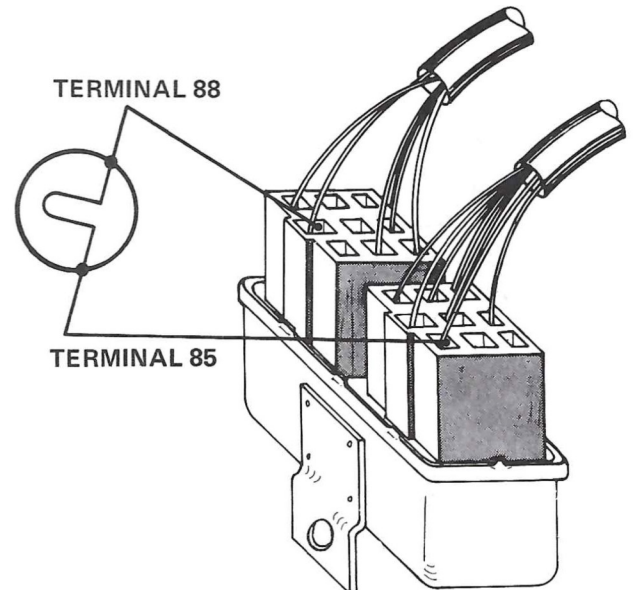


12. Check Voltage Input to Fuel Pump Relay of Relay Set

Connect test light between terminals 88y and 85 of relay set connectors. See diagram 8, page 40. Turn ignition switch on.

Test light should come on.

- a. If test light comes on, replace double relay.
- b. If test light does not come on, check fuse and wiring to double relay connectors.



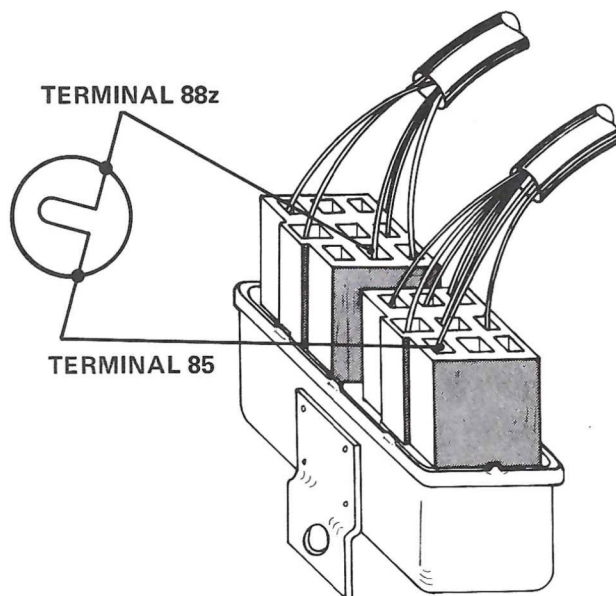
STARTER RUNS, ENGINE WILL NOT START (continued)

13. Check Input Voltage to Control Relay of Relay Set

Connect test light between terminals 88z and 85 of relay set connectors. See diagram 9, page 41.

Test light should come on.

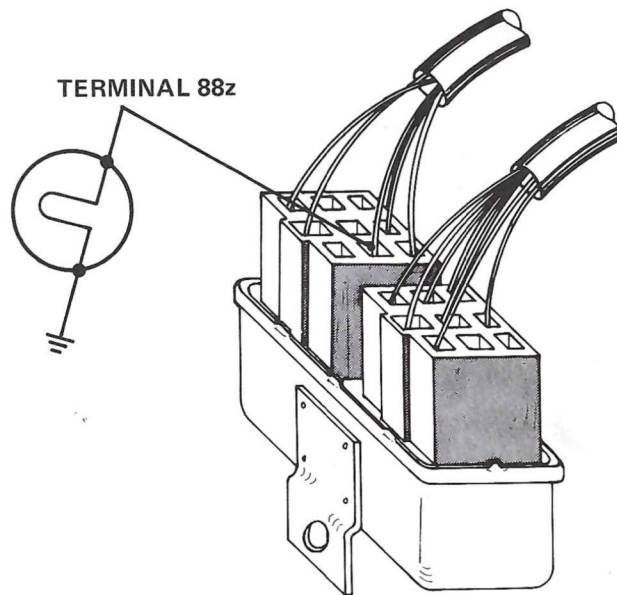
a. If test light comes on, go to check 14.



b. If test light does not come on, connect test light between terminal 88z and ground.

1. If test light does not come on, check wiring between double relay and ground.

2. If test light comes on, check wiring indicated in diagram 9 for breaks. If wiring is good, replace control unit.

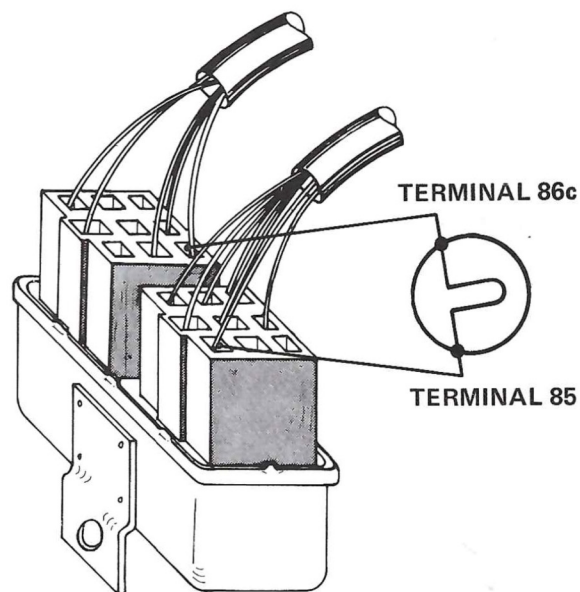


14. Check Input Voltage to Control Relay of Relay Set

Connect test light between terminals 86c and 85 of relay set connectors. See diagram 10, page 42. Turn ignition switch on. Test light should come on.

a. If test light comes on, go to check 15.

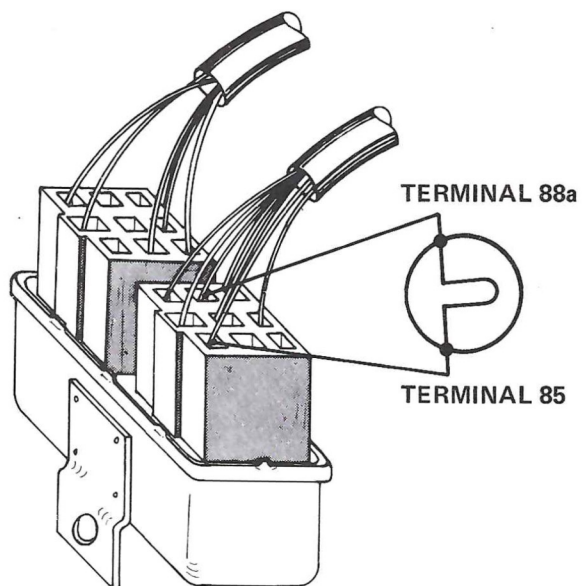
b. If test light does not come on, check wiring between double relay and ignition switch.



15. Check Output Voltage from Control Relay of Relay Set

Connect test light between terminals 88a and 85 of relay set connectors. See diagram 11, page 43. Turn ignition switch on.

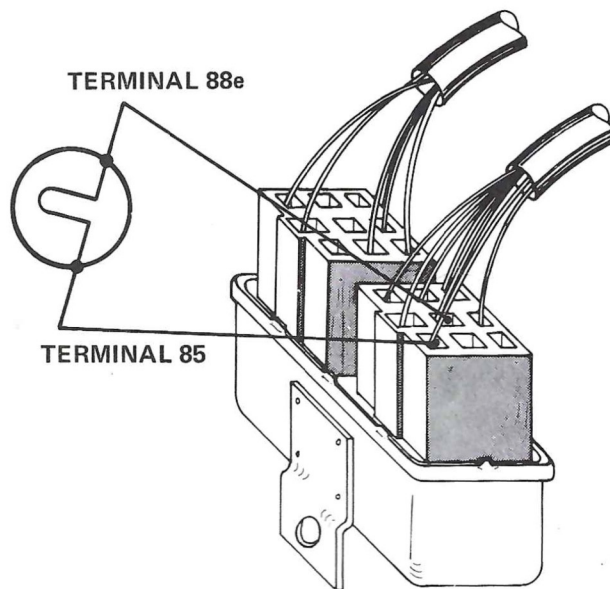
- a. If test light comes on, go to check 16.
- b. If test light does not come on, replace double relay.



16. Check Output Voltage from Control Relay of Relay Set

Connect test light between terminals 88e and 85 of relay set connectors. See diagram 12, page 44.

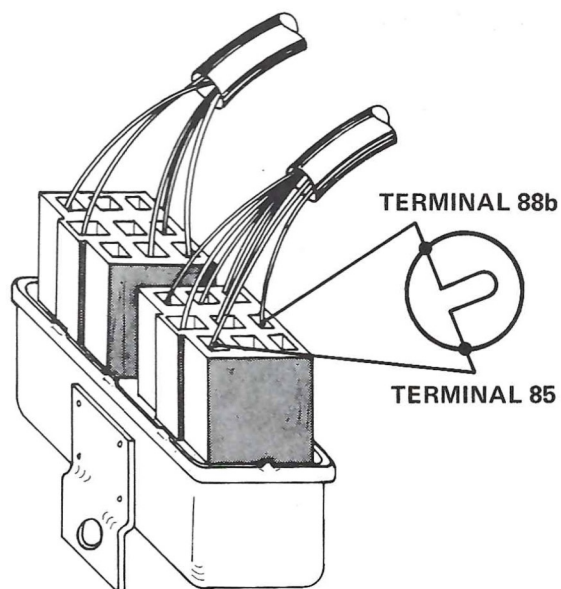
- a. If test light comes on, go to check 17.
- b. If test light does not come on, replace double relay.



17. Check Output Voltage from Control Relay of Relay Set

Connector test light between terminals 88b and 85 of relay set connectors. See diagram 13, page 45.

- a. If test light comes on, go to check 18.
- b. If test light does not come on, replace double relay.



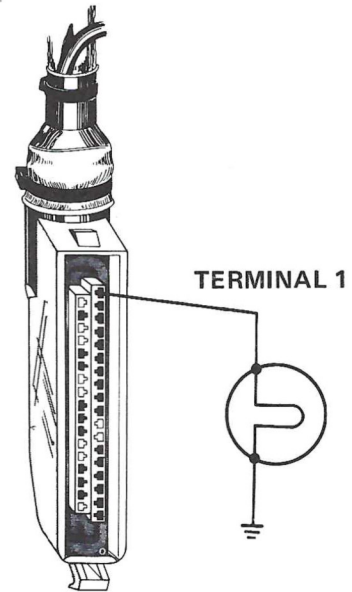
STARTER RUNS, ENGINE WILL NOT START *(continued)*

18. Check Voltage Signal from Coil to Electronic Control Unit

Disconnect connector from control unit. Connect test light between terminal 1 of control unit connector and ground. See diagram 14, page 46. Operate starter and check test light.

Test light should come on with flickering intensity.

- a. If test light comes on with flickering intensity, go to check 19.
- b. If test light does not come on, check wiring indicated in drawing 14 for breaks.

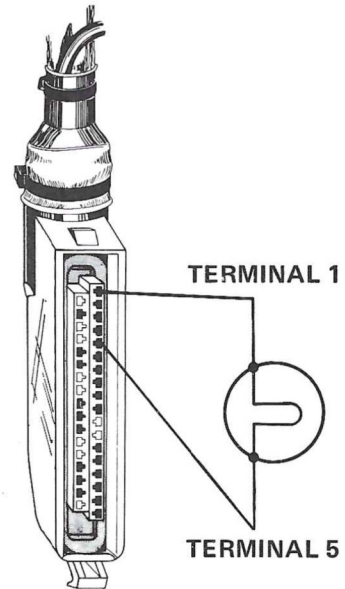


19. Check Ground Circuit for Control Unit

Disconnect connector from control unit. Connect test light between terminals 1 and 5 of control unit connector. See diagram 15, page 47. Turn ignition switch on.

Test light should come on.

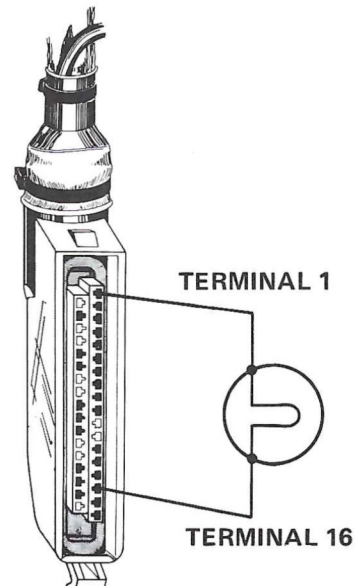
- a. If test light does not come on, check wiring indicated in diagram 15 for breaks.



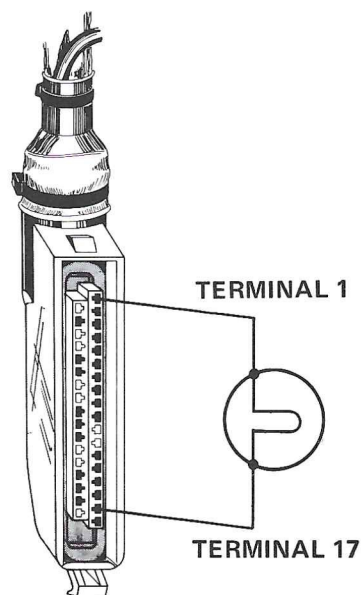
- b. If test light comes on, connect test light between terminals 1 and 16. See diagram 16, page 48.

Test light should come on.

- c. If test light does not come on, check wiring indicated in diagram 16 for breaks.



- d. If test light comes on, connect test light between terminals 1 and 17. See diagram 17, page 49. Test light should come on.
- e. If test light comes on, replace control unit.
- f. If test light does not come on, check wiring indicated in diagram 17 for breaks.



STARTER RUNS, ENGINE WILL NOT START WHEN COLD

20. Make the checks listed below in the order listed.

1. Check ignition system, check 1, page 1.
2. Check thermo time switch, check 6, page 4.
3. Check cold start valve, check 7, page 5.

If checks are good, perform remaining checks of
STARTER RUNS, ENGINE WILL NOT START.

STARTER RUNS, ENGINE WILL NOT START WHEN HOT

21. Make the checks listed below in the order listed.

1. Check ignition system, check 1, page 1.
2. Check fuel feed pressure, check 3, page 1.
3. Check coolant temperature sensor, check 5, page 4.
4. Check thermo time switch, check 6, page 4.
5. Check cold start valve, check 7, page 5.

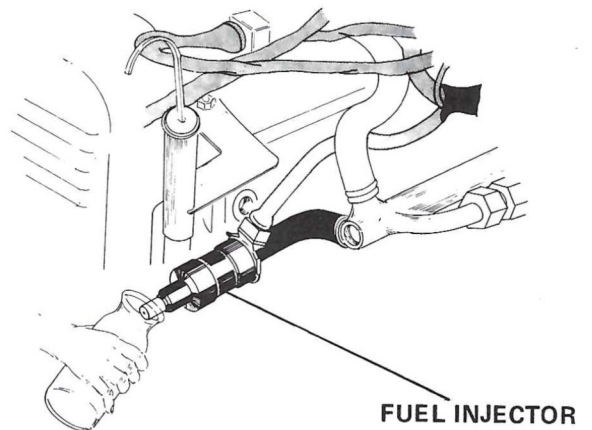
22. Check Injectors for Leaks

WARNING: FIRE HAZARD

Remove injectors from intake manifold. Position injectors in containers to catch fuel. Disconnect wire from terminal 1D of coil. Operate starter and check injectors.

Maximum leakage is 2 drops per minute per injector.

- a. If injectors do not leak, go to check 23.
- b. If any injector leaks excessively, replace it.

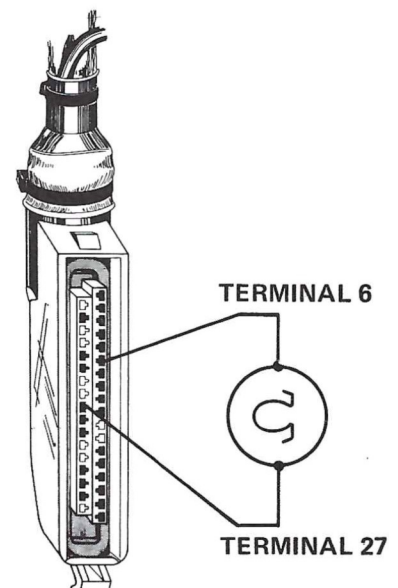


23. Check Air Temperature Sensor Resistance

Turn ignition switch off. Disconnect connector from control unit. Connect ohmmeter between terminals 6 and 27. See diagram 18, page 50.

INTAKE AIR TEMPERATURE	RESISTANCE
-10°C (14°F)	8,260 to 10,560 ohms
20°C (68°F)	2,280 to 2,720 ohms
50°C (122°F)	760 to 970 ohms

- a. If resistance is correct, perform remaining checks under STARTER RUNS, ENGINE WILL NOT START.
- b. If resistance is 0 or other than specified, replace air flow sensor.
- c. If resistance is infinity, check wires indicated in diagram 18. If wires are good, replace air flow sensor.



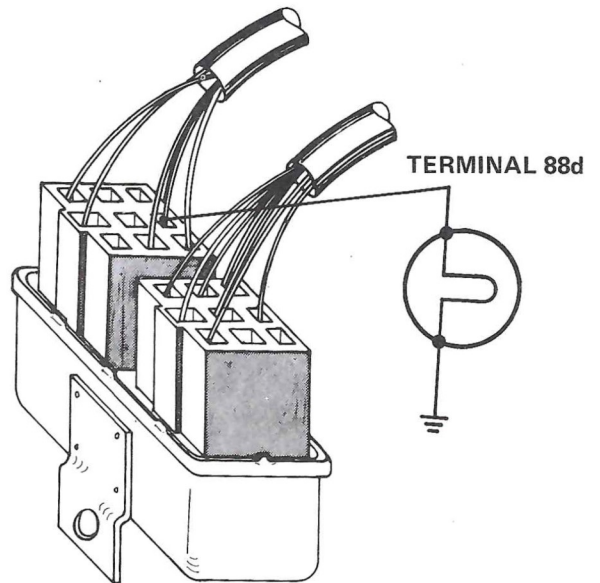
ENGINE STARTS THEN STOPS

24. Check Output to Fuel Pump from Fuel Pump Relay of Relay Set

Disconnect hose to air flow sensor. Connect test light to terminal 88d of relay set and ground. Turn ignition switch on. Move sensor flap and check test light.

With sensor flap closed, test light should be off. With sensor flap open, test light should come on.

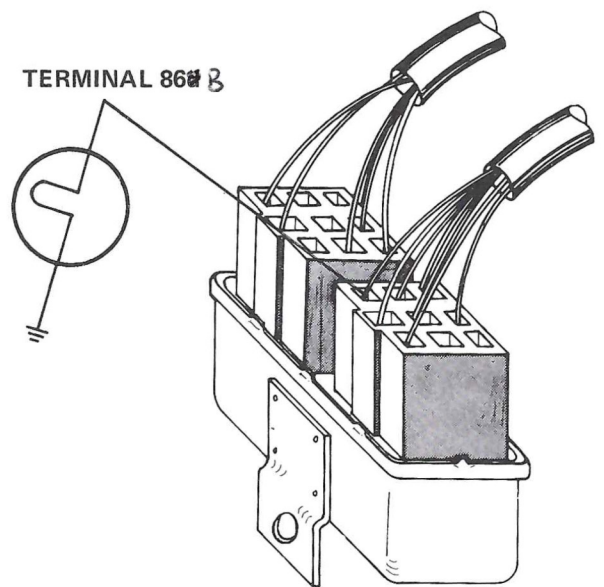
- If test light operates properly, go to check 26.
- If test light does not operate properly, go to check 25.



25. Check Input to Fuel Pump Relay of Relay Set

Connect test light to terminal 86b of relay set and ground. See diagram 19, page 51. Move sensor flap and check test light. With sensor flap closed, test light should be off. With sensor flap open, test light should come on.

- If test light operates properly, replace relay set.
- If test light does not operate properly check wires indicated in diagram 19. If wires are good, replace air flow sensor.

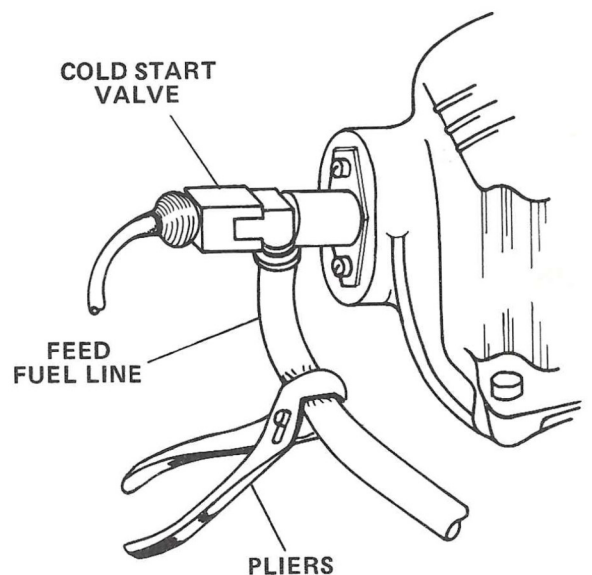


26. Check Cold Start Valve

Pinch off the fuel feed line to the cold start valve. Start engine.

The engine should start and run.

- If engine starts and runs, perform check 7, page 5.
- If engine starts and then stops, perform check 2, page 1, and check 5, page 4. If these checks are OK, perform remaining checks under STARTER RUNS, ENGINE WILL NOT START.

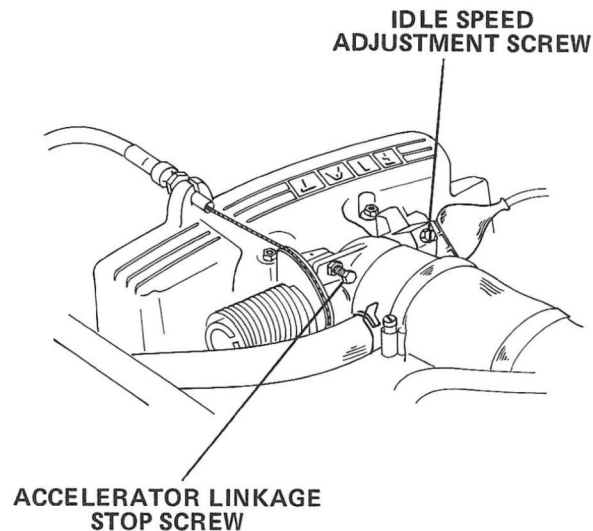


ENGINE IDLES TOO HIGH

27. Check Idle Speed Adjustment

With engine at normal running temperature, turn in idle adjustment screw all the way. Turn accelerator linkage stop screw out all the way. Engine idle speed should drop and engine may stall.

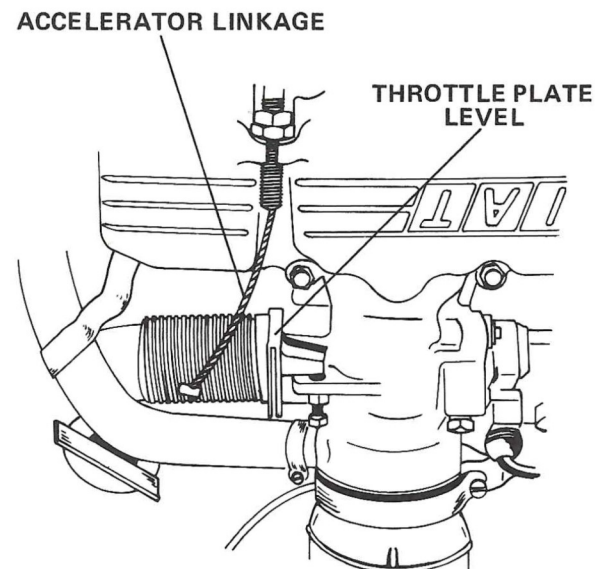
- a. If idle speed does not change, go to check 28.
- b. If idle speed drops, adjust engine idle speed, page 55.



28. Check Accelerator Linkage

Disconnect accelerator linkage from throttle plate lever. Engine idle speed should drop and engine may stall.

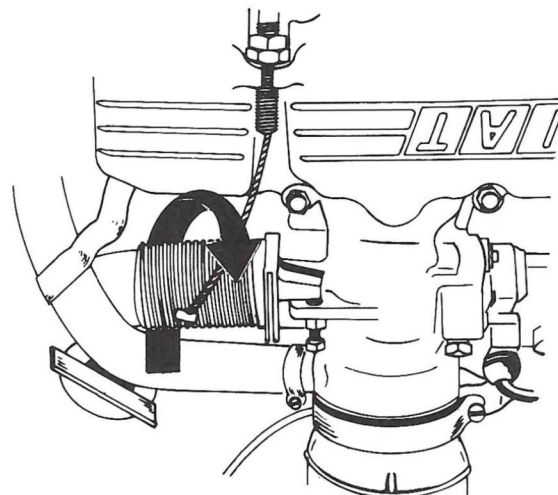
- a. If idle speed does not drop, go to check 29.
- b. If idle speed drops, check accelerator linkage for binding and adjustment.



29. Check Throttle Plate for Binding

Push the throttle plate lever toward the closed position in direction of arrow. Engine idle speed should drop.

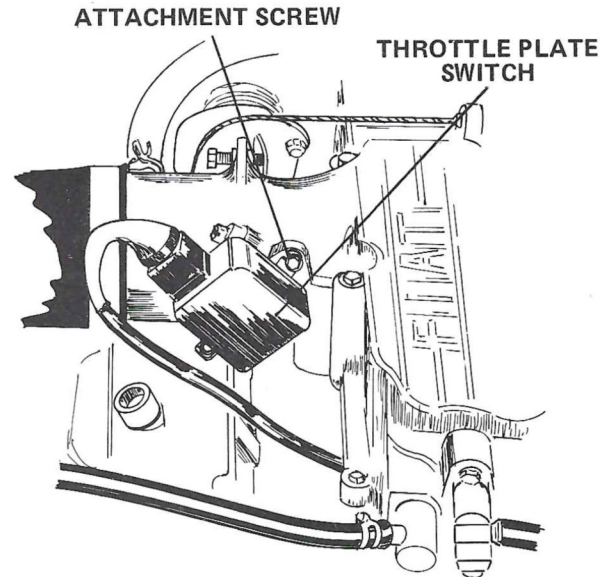
- a. If idle speed does not drop, go to check 31.
- b. If idle speed drops, go to check 30.



30. Check Throttle Plate Switch for Binding

Remove throttle plate switch from throttle shaft. Check throttle plate for free movement and return to idle. Throttle plate should not bind and should go to idle position.

- a. If throttle plate does not bind, check switch for binding with proper adjustment. See THROTTLE PLATE SWITCH ADJUSTMENT, page 57.
- b. If throttle plate binds, repair throttle plate, shaft, or replace.

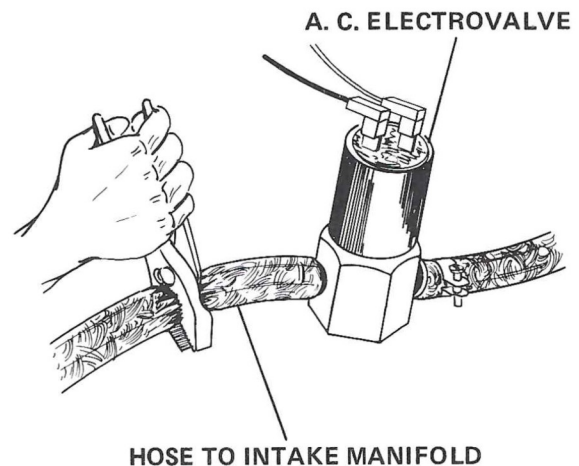


31. Check Air Conditioning Bypass

Make sure air conditioning system is off. Pinch off the air line from the A.C. electrovalve to the intake manifold.

Engine idle speed should not drop.

- a. If idle speed does not drop, go to check 32.
- b. If idle speed does drop, check the air conditioning electrical system.

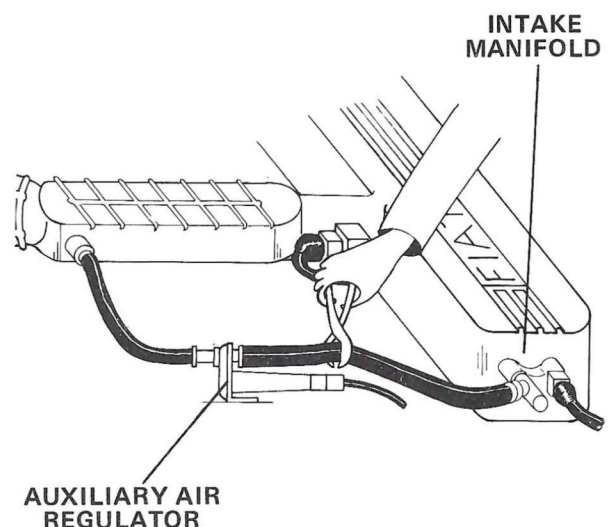


32. Check the Auxiliary Air Regulator

With the engine at normal running temperature, pinch off the air line from the auxiliary air regulator to the intake manifold.

Engine idle speed should not drop.

- a. If idle speed drops, go to check 33.
- b. If idle speed does not drop, check for air leak between throttle plate and intake manifold.



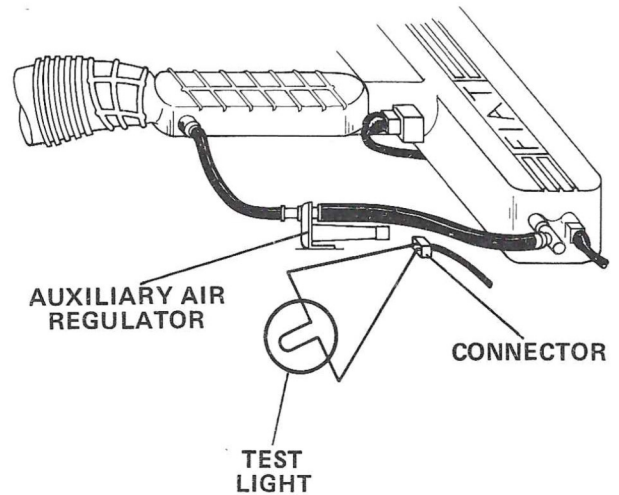
ENGINE IDLES TOO HIGH *(continued)*

33. Check Voltage at Auxiliary Air Regulator

Disconnect the connector from the auxiliary air regulator. See diagram 20, page 52. Connect test light between terminals in connector.

The test light should come on with the engine running.

- a. If test light comes on, replace auxiliary air regulator.
- b. If test light does not come on, check wiring indicated in diagram 20. If wiring is good, replace relay set.



LOW IDLE SPEED OR ROUGH IDLE

34. Perform the checks listed below in the order listed.

1. Adjust engine idle speed, page 55.
2. Check the ignition system, check 1, page 1.
NOTE: Perform the check on all spark plugs. If check is good, check that spark plug rating is correct. Check spark plug gap.
3. Check water temperature sensor resistance, check 5, page 4.
4. Check air temperature sensor resistance, check 23, page 15.
5. Check intake air system, check 2, page 1.
6. Check cold start valve, check 7, page 5.
7. Check injectors for leaks, check 22, page 15.

HESITATION

35. Perform the checks listed below in the order listed.

1. Check distributor advance, both centrifugal and vacuum.
2. Check the ignition system, check 1, page 1.
NOTE: Perform the check on all spark plugs. If check is good, check that spark plug rating is correct. Check spark plug gap.
3. Check water temperature sensor resistance check 5, page 4.
4. Check air temperature sensor resistance, check 23, page 15.
5. Check air flow sensor, check 8, page 6.
6. Check fuel feed pressure, check 3, page 1.
7. Check intake air system, check 2, page 1.
8. Check cold start valve, check 7, page 5.
9. Check injectors for leaks, check 22, page 15.

INADEQUATE POWER AND LOW PERFORMANCE

36. Perform the checks listed below in the order listed.

1. Check that tire size and air pressure is correct.
2. Check operation of all accessories which affect performance.
3. Check that wheels rotate freely.
4. Check air cleaner for dirt or damage.
5. Check distributor advance, both centrifugal and vacuum.
6. Check valve tappet clearance.
7. Check engine compression.
8. Check clutch for proper operation.
9. Check ignition system, check 1, page 1.

NOTE: Perform check on all spark plugs. If check is good, check that spark plug range is correct. Check spark plug gap.

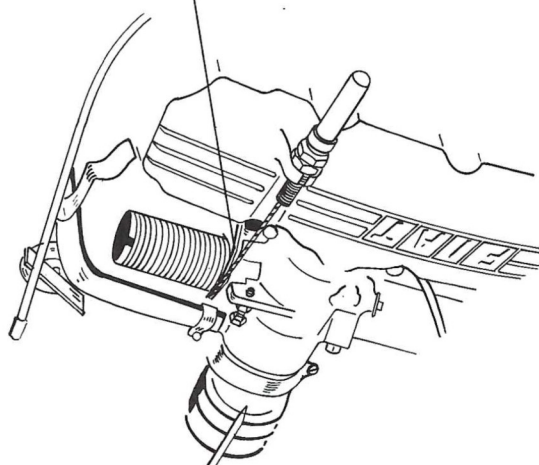
37. Check Opening of Throttle Plate

Press accelerator pedal to floor and hold it. Check that throttle plate is fully open by pressing throttle plate lever.

Throttle plate should be full open.

- a. If throttle plate is full open, go to check 38.
- b. If throttle plate is not full open, check accelerator linkage.

THROTTLE PLATE
LEVER

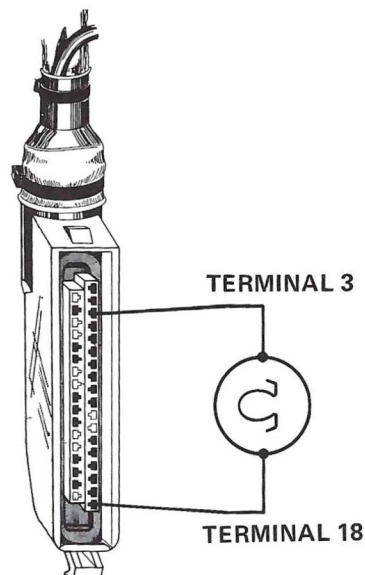


38. Check Full Throttle Contacts of Throttle Plate Switch

Disconnect connector from control unit. Connect ohmmeter to terminals 3 and 18 of connector. See diagram 21, page 53. Operate throttle linkage and check ohmmeter reading.

With throttle open, meter should read 0 ohms. With throttle closed, meter should read infinity.

- a. If meter reads correctly, go to check 39.
- b. If meter does not read correctly, check adjustment of throttle plate switch, see THROTTLE PLATE SWITCH ADJUSTMENT. If switch cannot be adjusted, check wires indicated in diagram 21. If wires are good, replace switch.



39. Perform the checks listed below in the order listed.

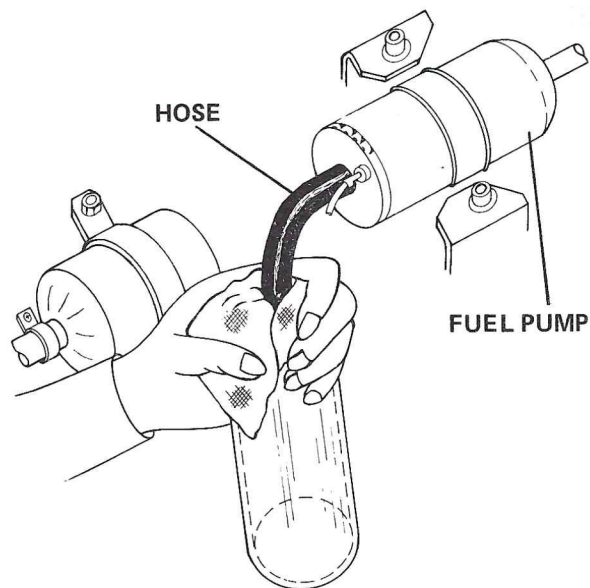
1. Check air flow sensor, check 8, page 6.
2. Check intake air system, check 2, page 1.
3. Check fuel feed pressure, check 3, page 1.

40. Check Fuel Flow**WARNING: FIRE HAZARD**

Disconnect fuel line between fuel pump and filter from the filter. Place hose in a graduated 5 liter container. Turn ignition switch on. Open sensor flap in air flow sensor to close fuel pump contacts.

Fuel flow should be 1.5 to 2 liters after 1 minute.

- a. If fuel flow is not correct, replace pump.
- b. If fuel flow is correct, replace fuel filter. Operate engine. If condition is the same, check fuel lines for blockage or damage.



EXCESSIVE FUEL CONSUMPTION

39. Perform the checks listed below in the order listed.

1. Check that tire size and air pressure is correct.
2. Check distributor advance, both centrifugal and vacuum.
3. Check air cleaner for dirt or damage.
4. Check that throttle plate switch is adjusted properly, see page 57.
5. Check that the wheels rotate freely.
6. Check that the engine reaches normal operating temperature.
7. Check fuel feed pressure, check ~~2~~³, page 1.
8. Check coolant temperature sensor resistance, check 5, page 4.
9. Check air temperature sensor resistance, check 23, page 15.
10. Check cold start valve, check 7, page 5.
11. Check injectors for leaks, check 22, page 15.

CO VALVE TOO HIGH

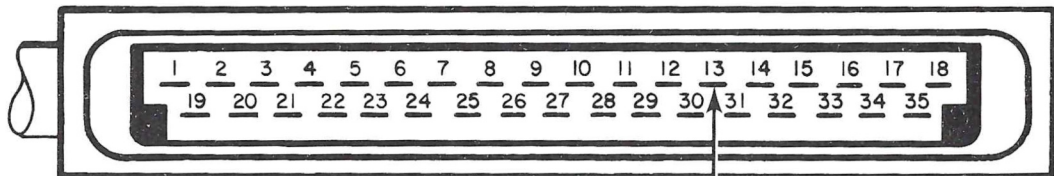
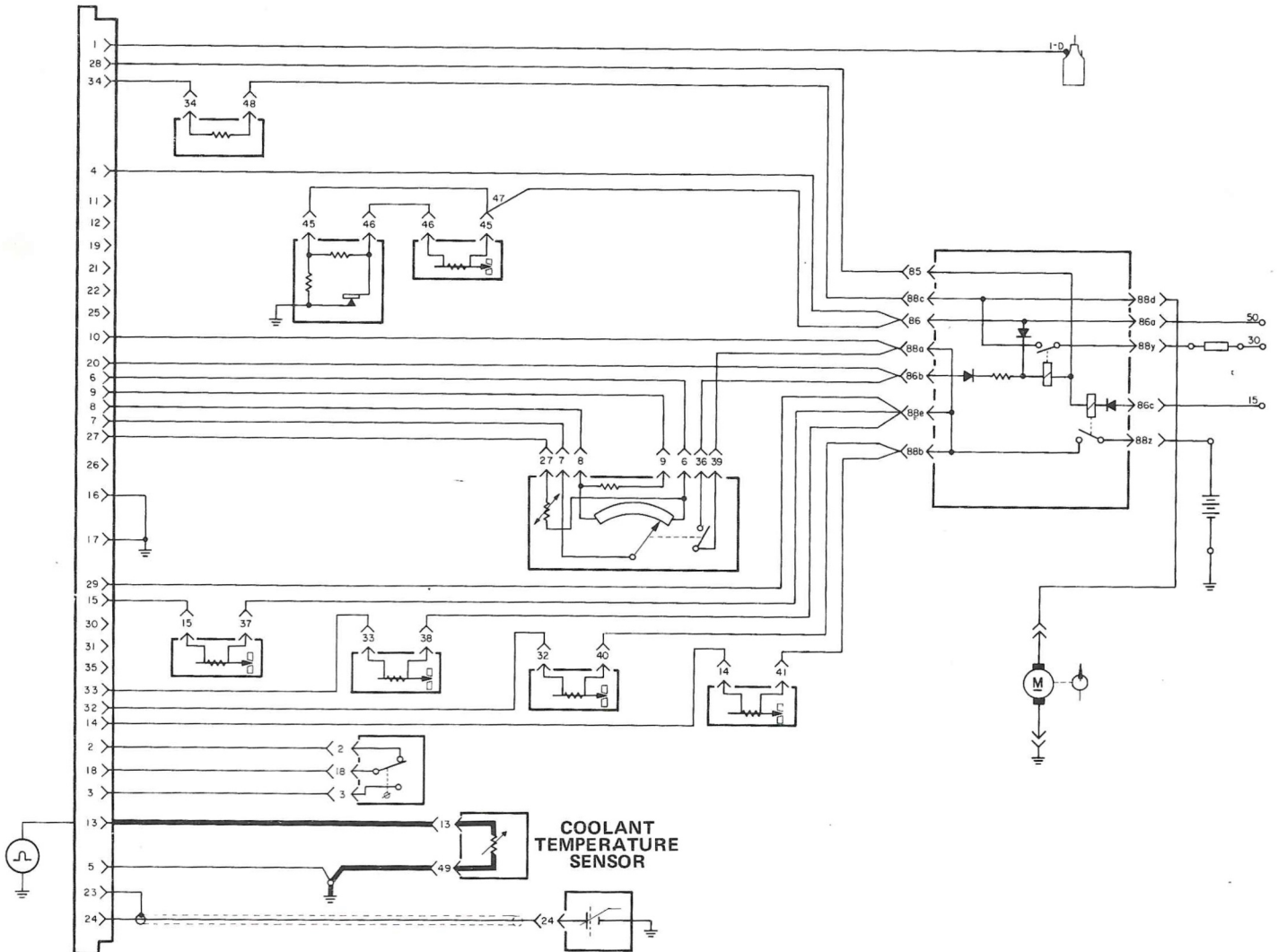
40. Check the distributor advance, both centrifugal and vacuum.

41. Check CO Adjustment. If CO cannot be adjusted, perform the following checks in the order listed.

1. Check fuel feed pressure, check ~~2~~³, page 1.
2. Check coolant temperature sensor resistance, check 5, page 4.
3. Check air temperature sensor resistance, check 23, page 15.
4. Check cold start valve, check 7, page 5.
5. Check injectors for leaks, check 22, page 15.

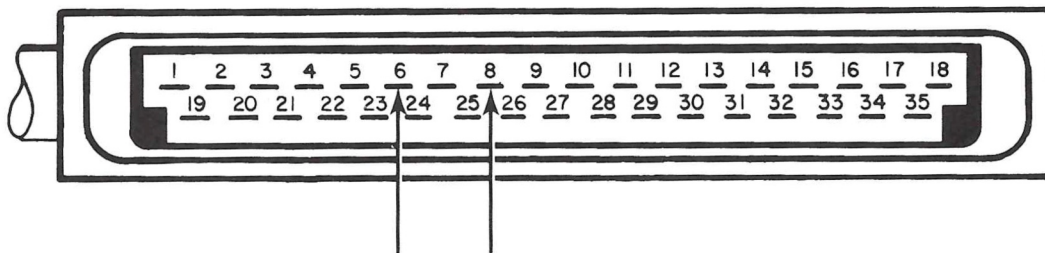
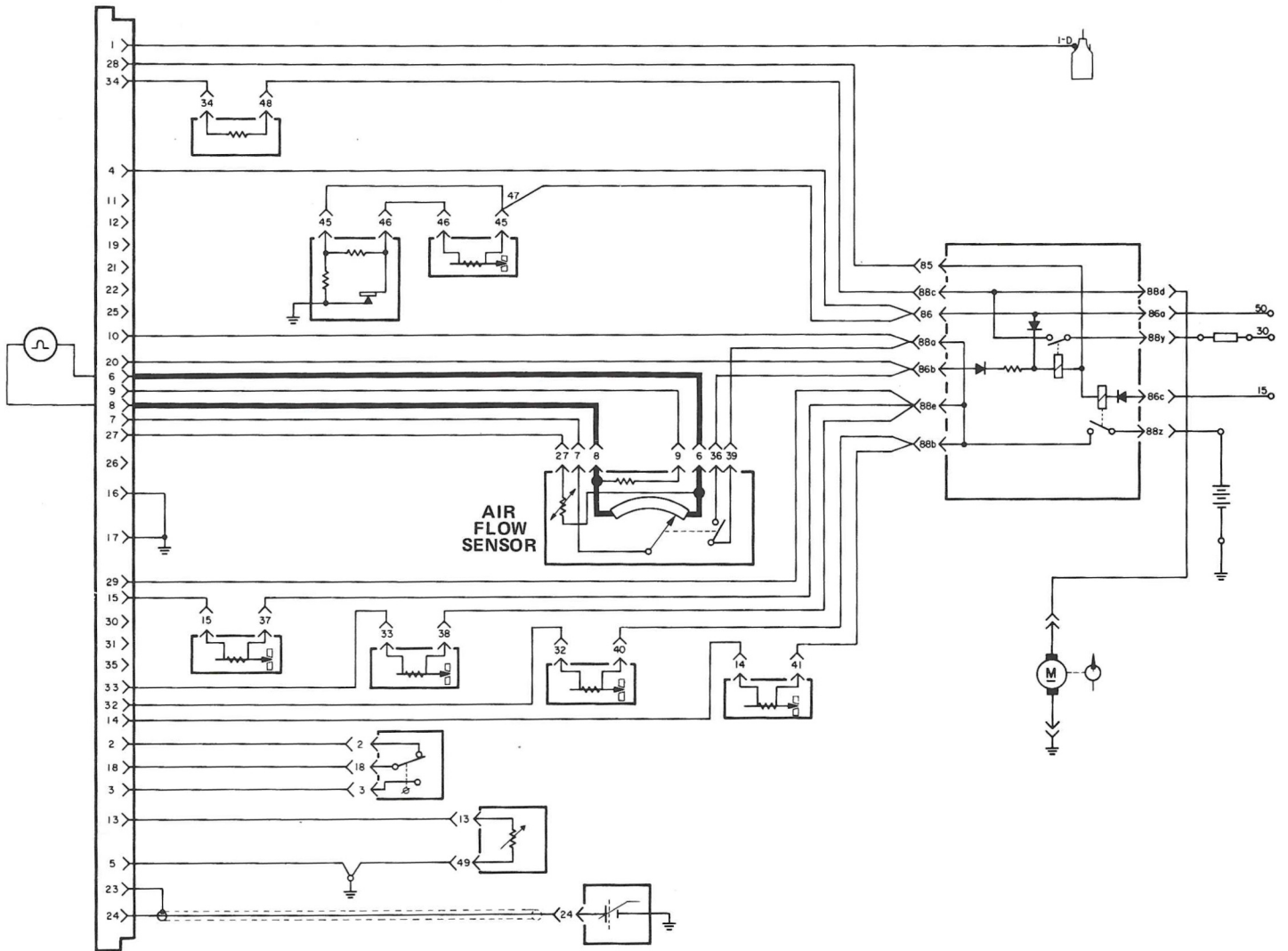
ELECTRICAL DIAGRAM 1

CHECK COOLANT TEMPERATURE SENSOR RESISTANCE



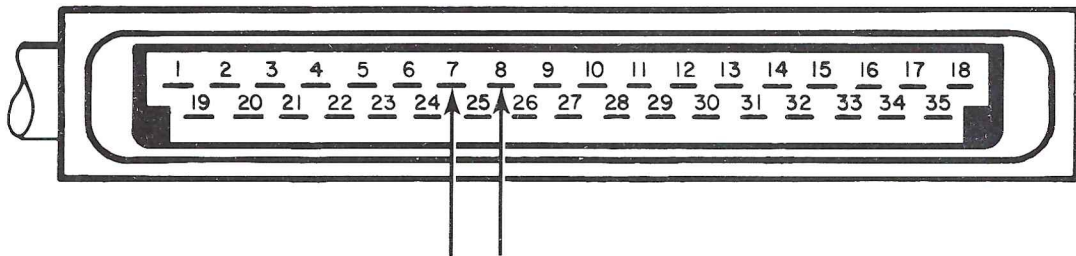
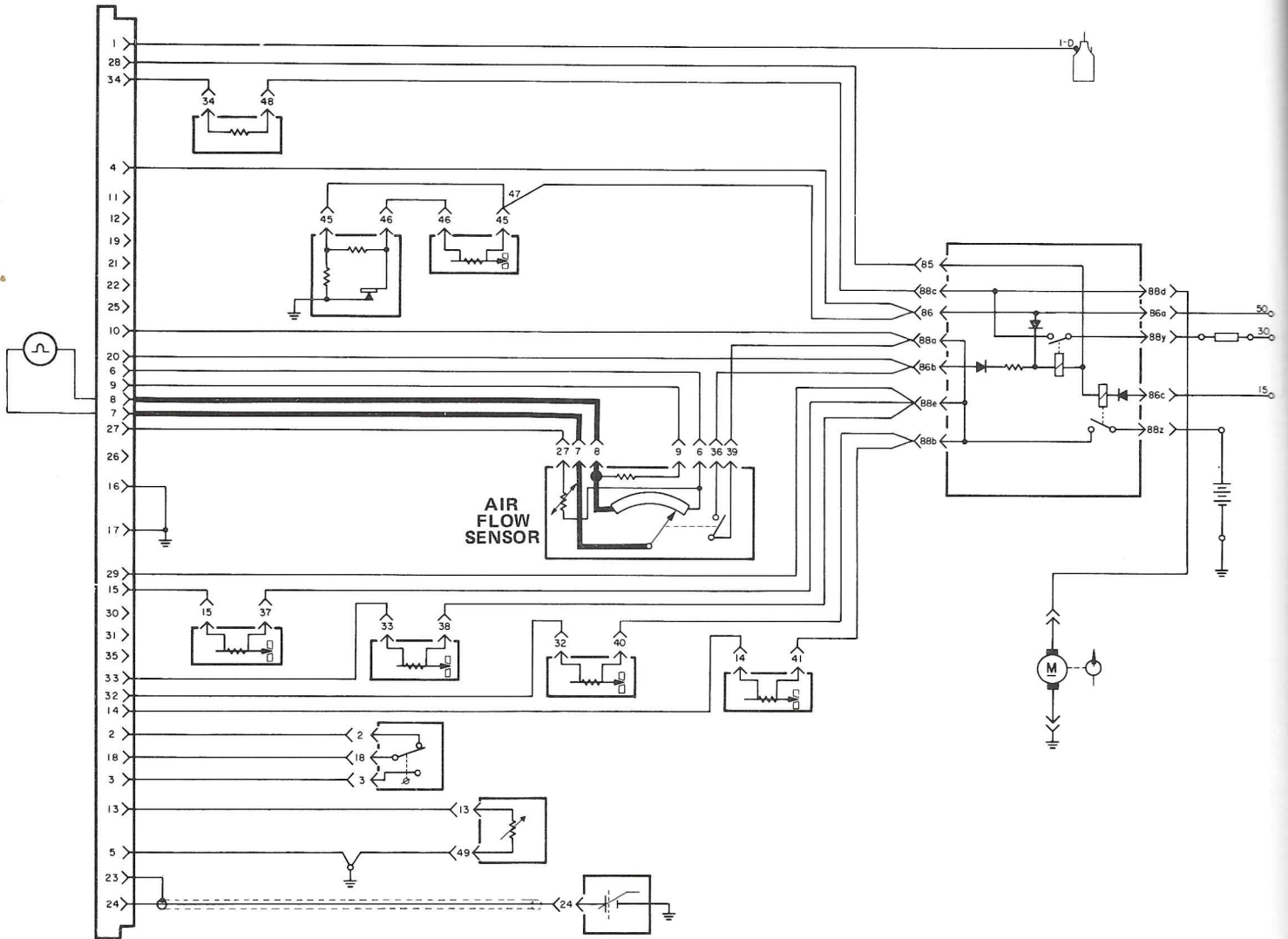
ELECTRICAL DIAGRAM 3

CHECK AIR FLOW SENSOR



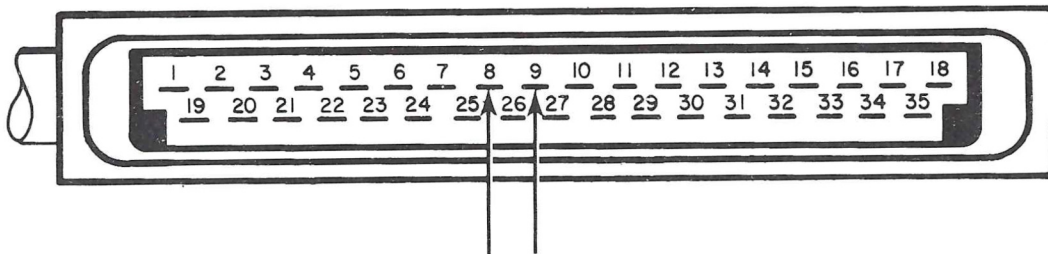
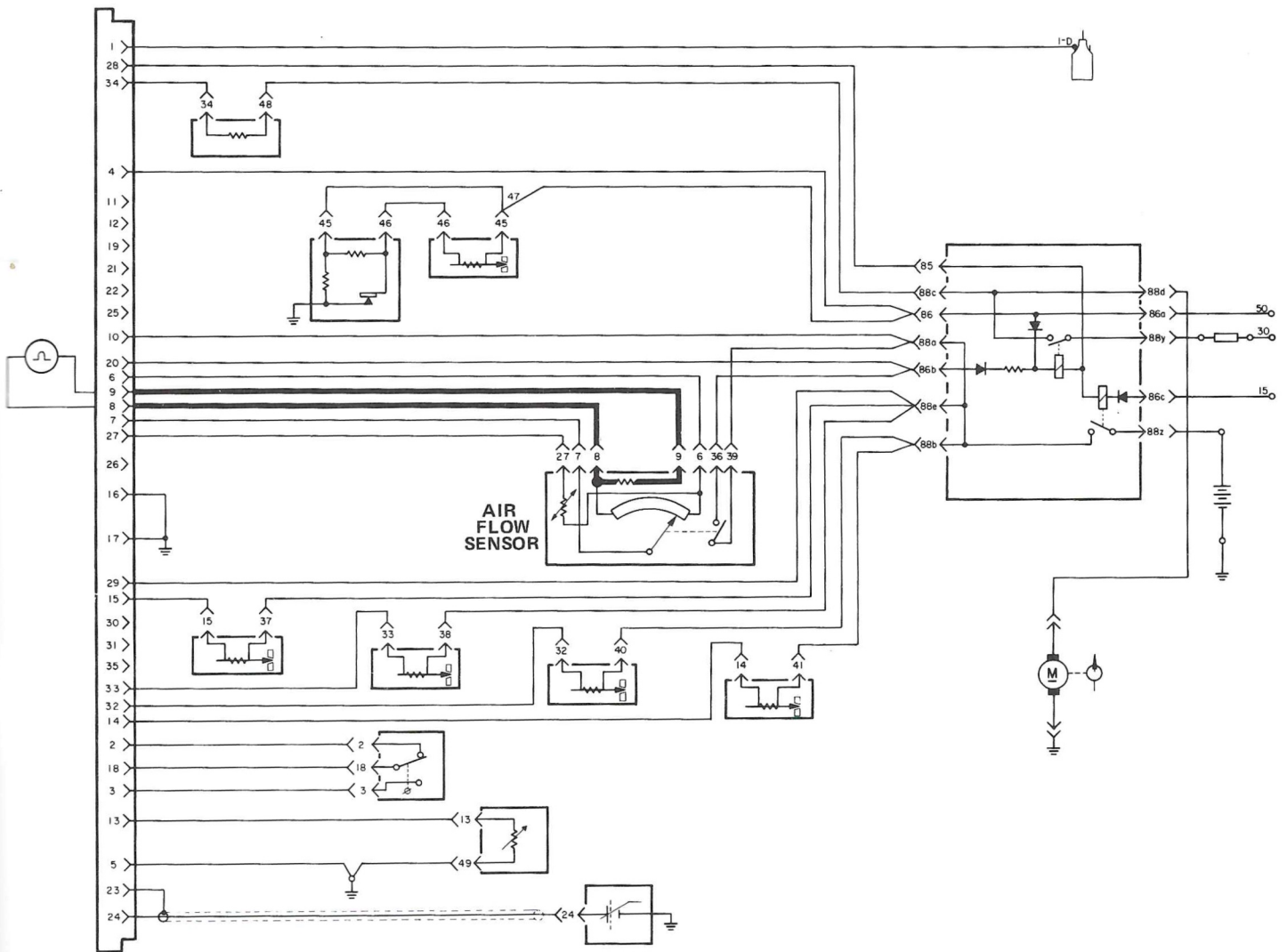
ELECTRICAL DIAGRAM 4

CHECK AIR FLOW SENSOR



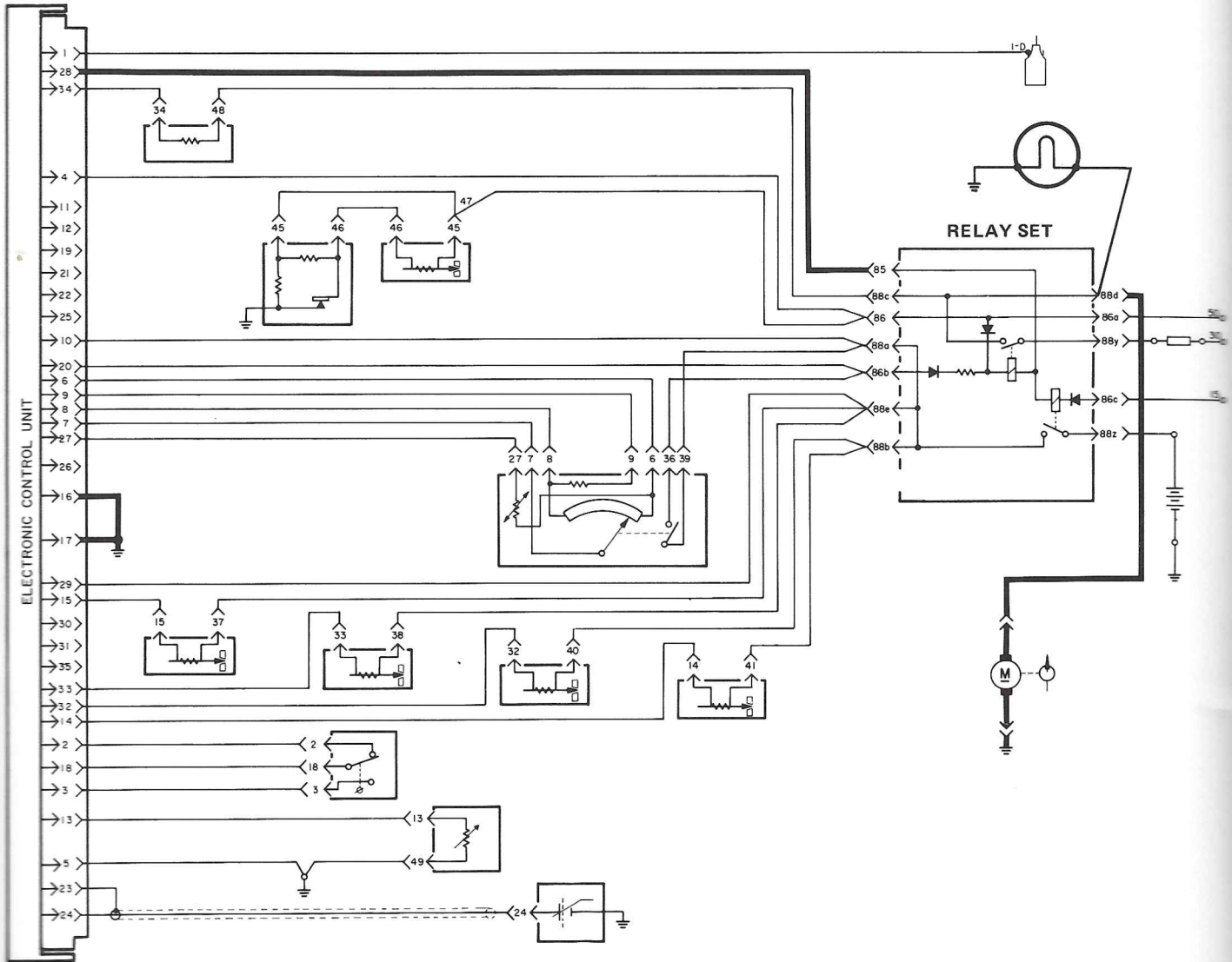
ELECTRICAL DIAGRAM 5

CHECK AIR FLOW SENSOR



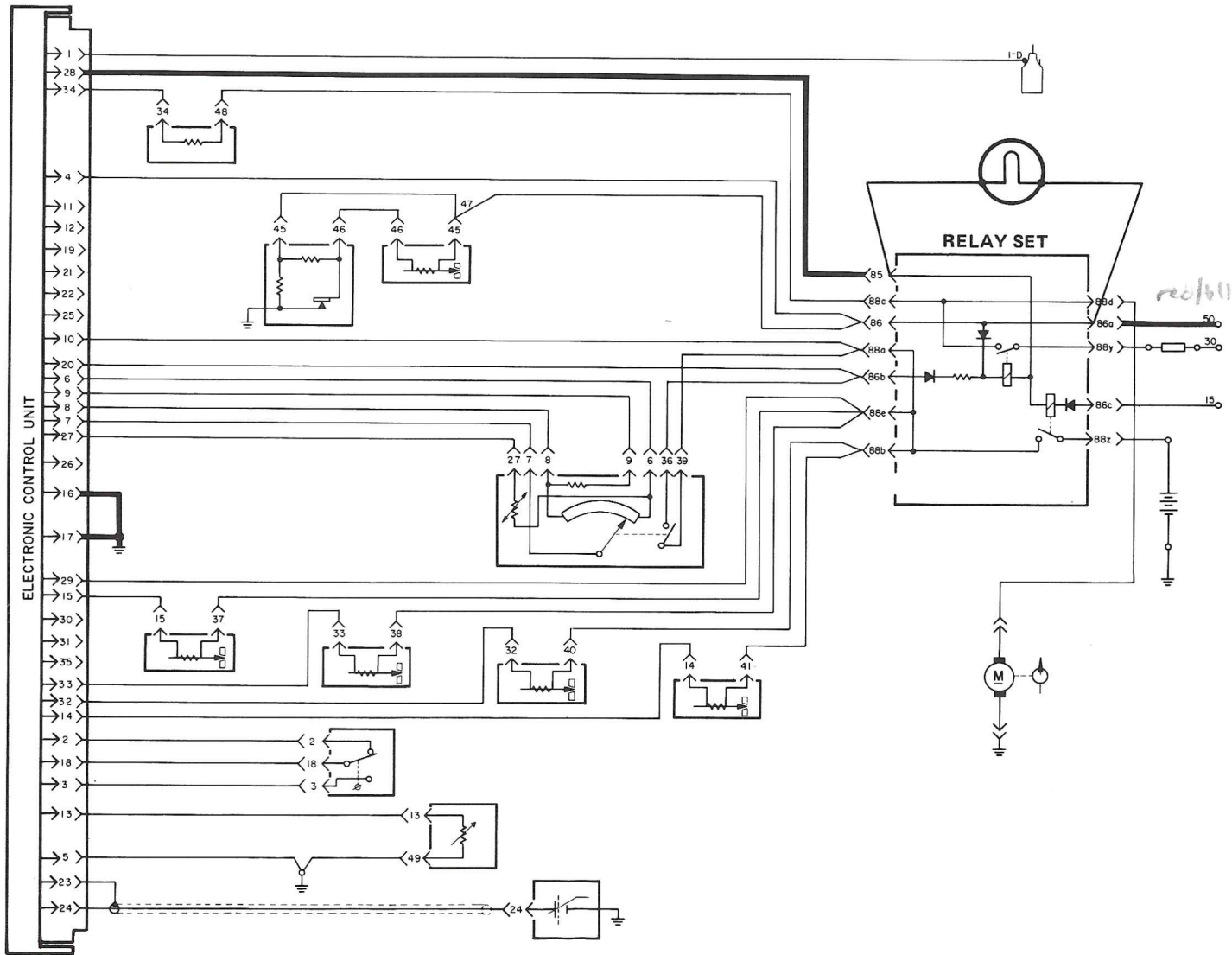
ELECTRICAL DIAGRAM 6

CHECK FOR VOLTAGE OUTPUT TO FUEL PUMP AT RELAY SET



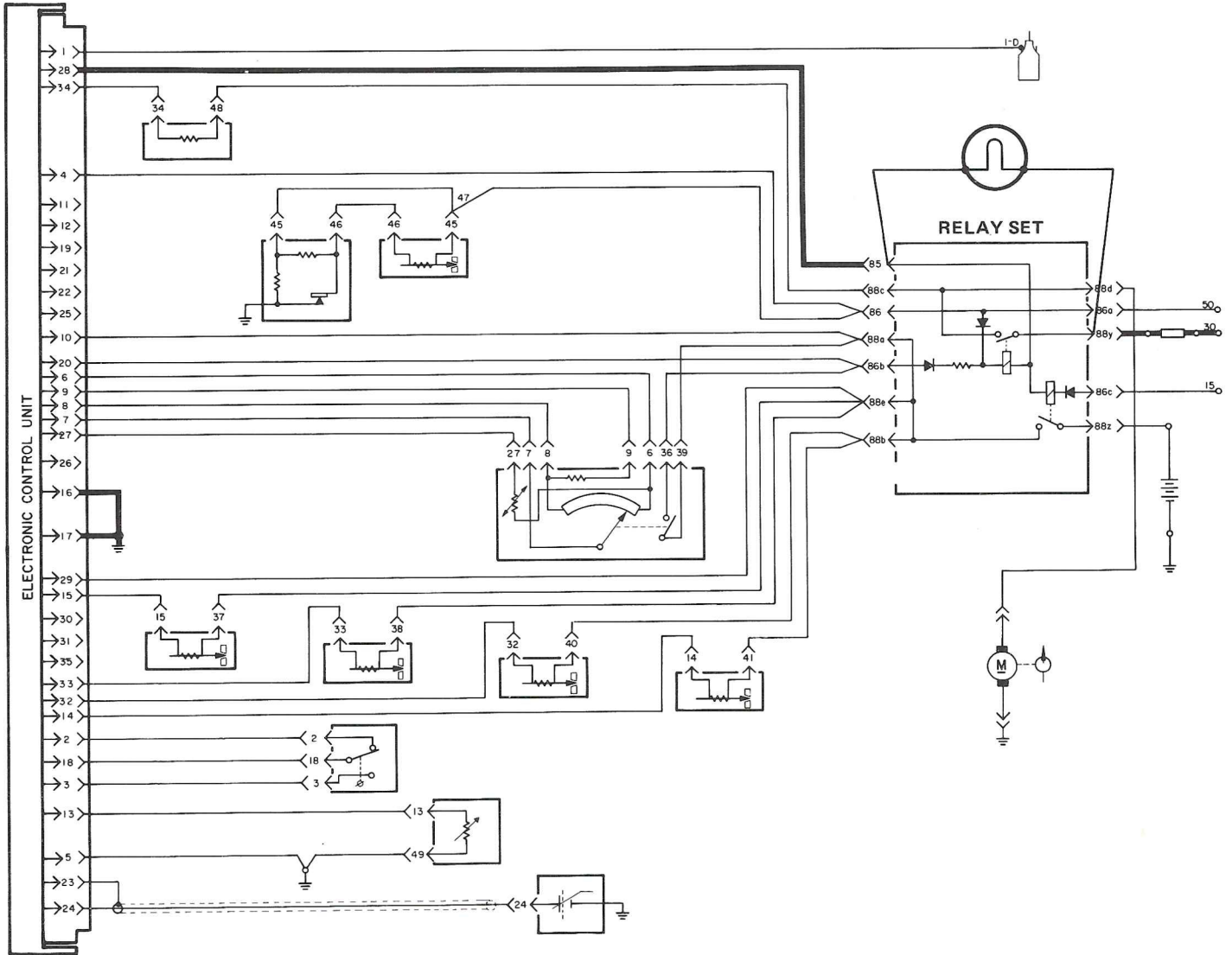
ELECTRICAL DIAGRAM 7

CHECK VOLTAGE INPUT TO RELAY SET FROM IGNITION SWITCH



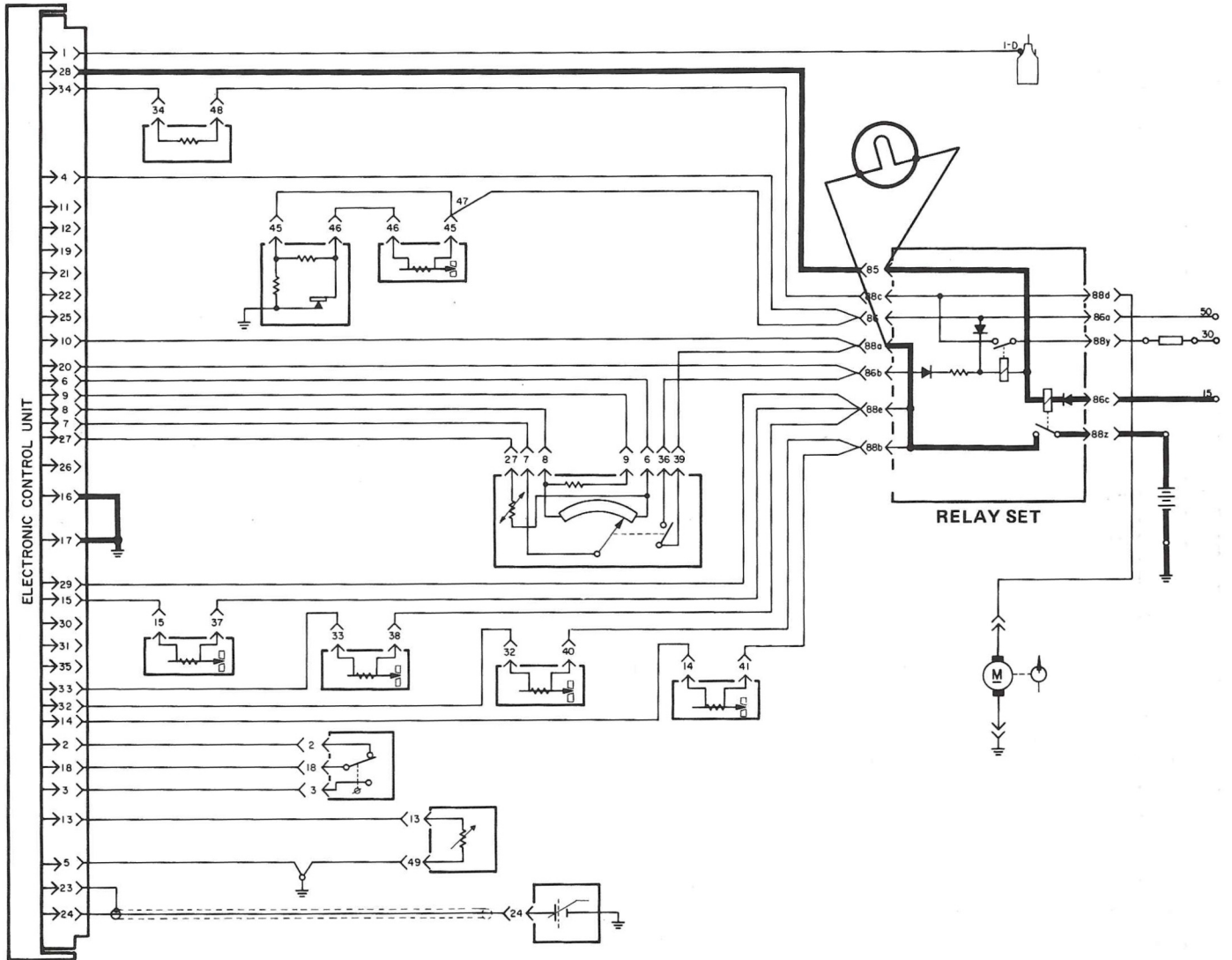
ELECTRICAL DIAGRAM 8

CHECK VOLTAGE INPUT TO FUEL PUMP RELAY OF RELAY SET



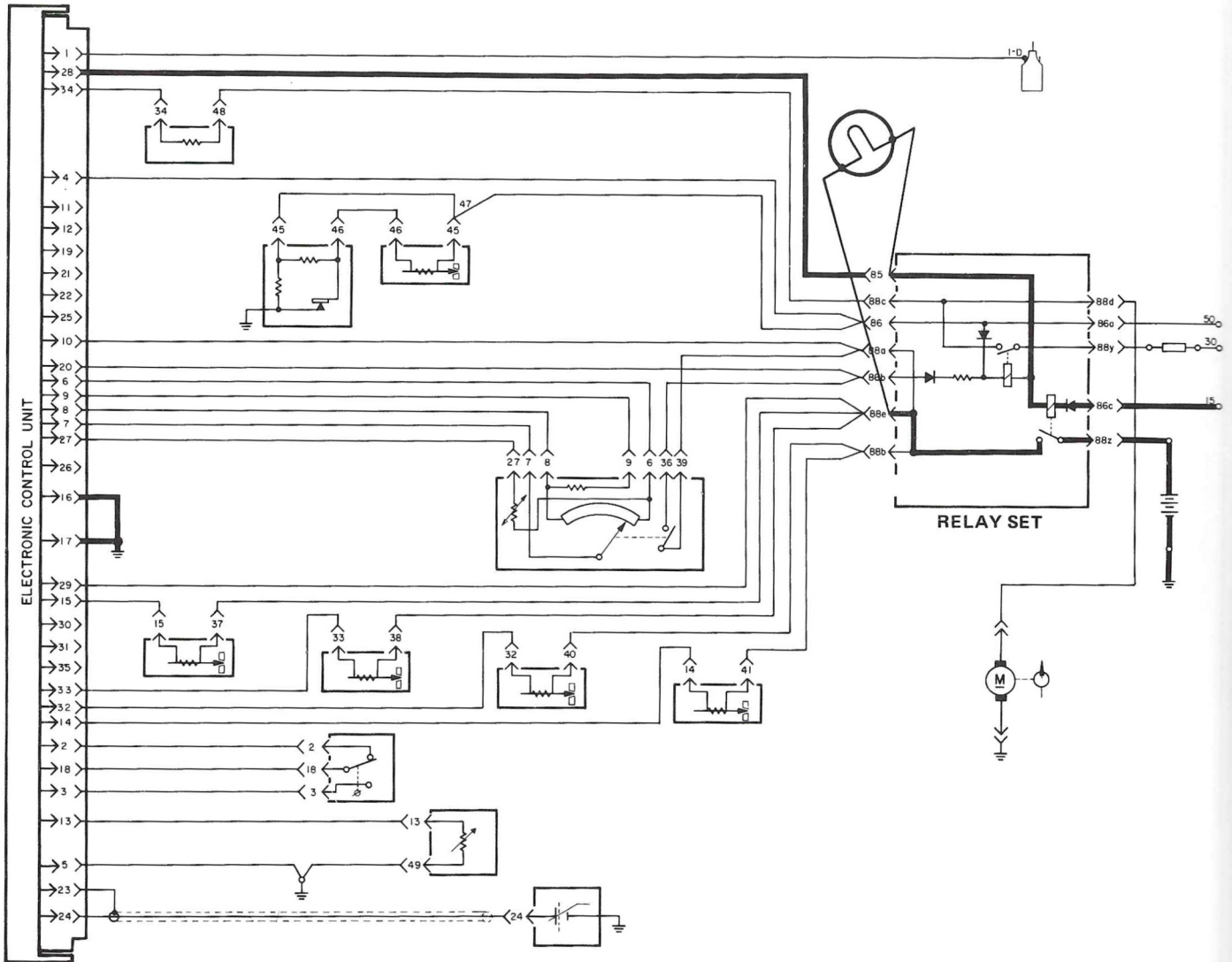
ELECTRICAL DIAGRAM 11

CHECK OUTPUT VOLTAGE FROM CONTROL RELAY OF RELAY SET



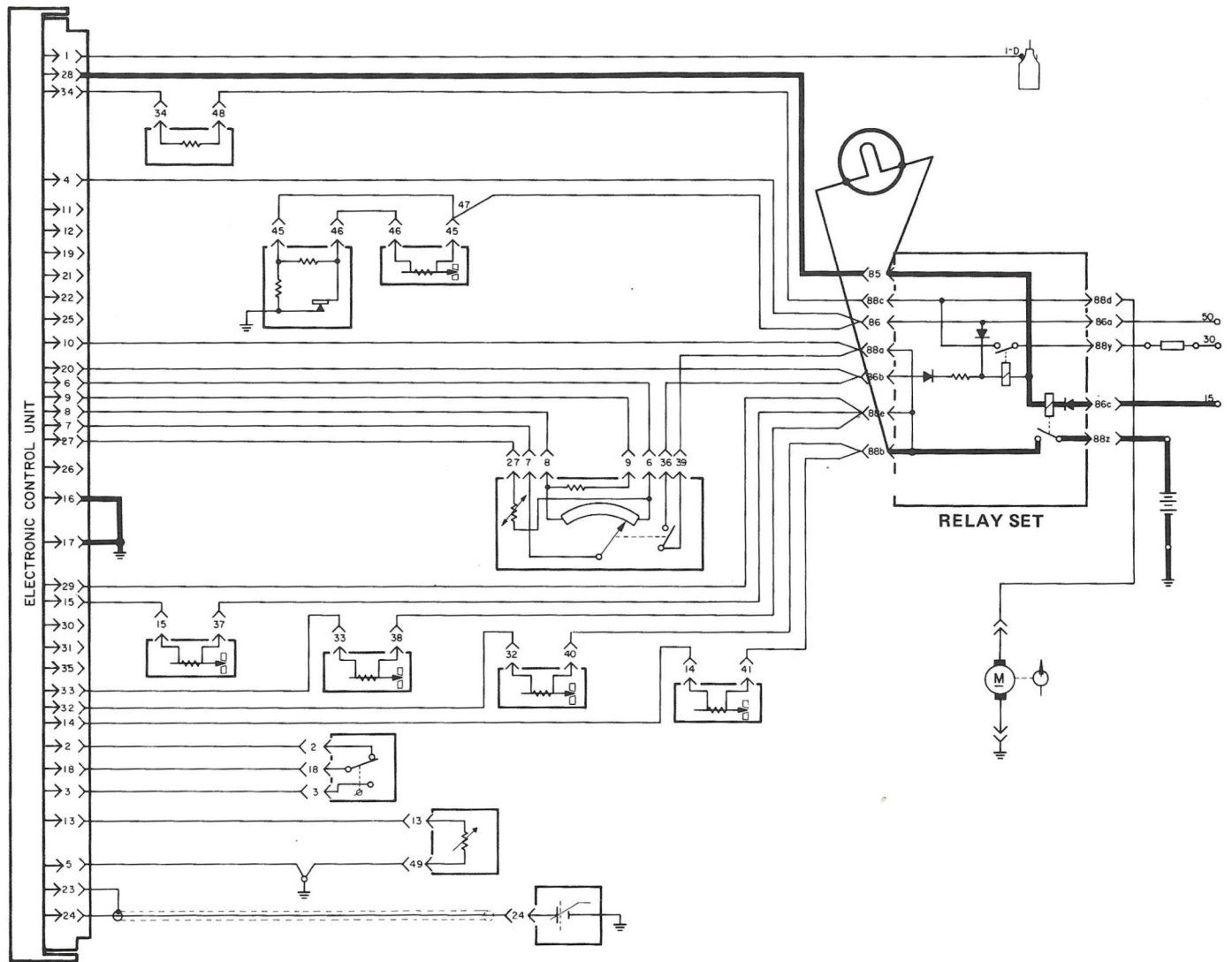
ELECTRICAL DIAGRAM 12

CHECK OUTPUT VOLTAGE FROM CONTROL RELAY OF RELAY SET



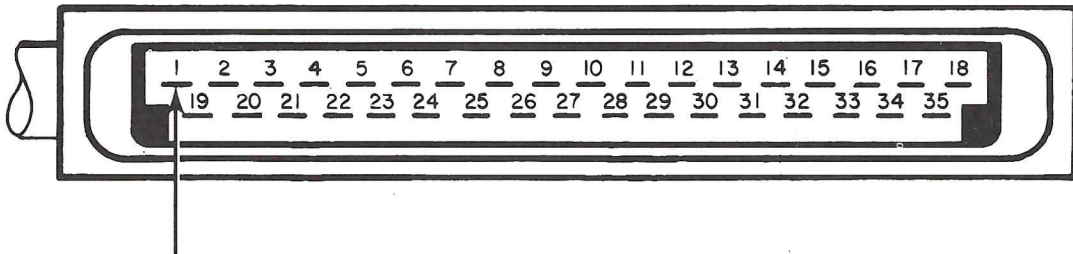
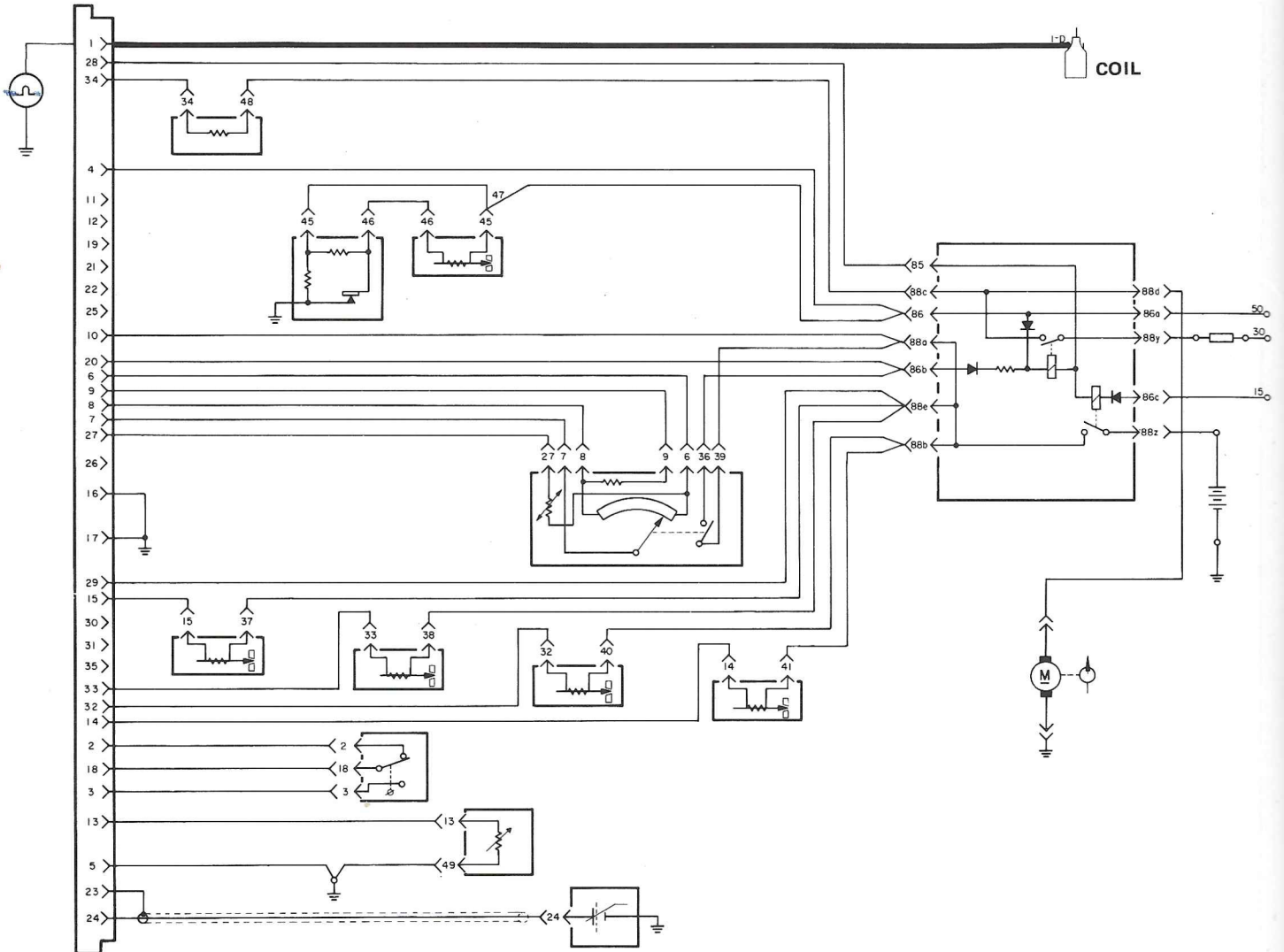
ELECTRICAL DIAGRAM 13

CHECK OUTPUT VOLTAGE FROM CONTROL RELAY OF RELAY SET



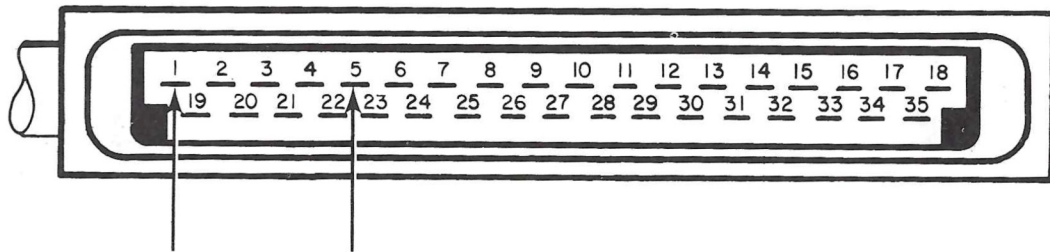
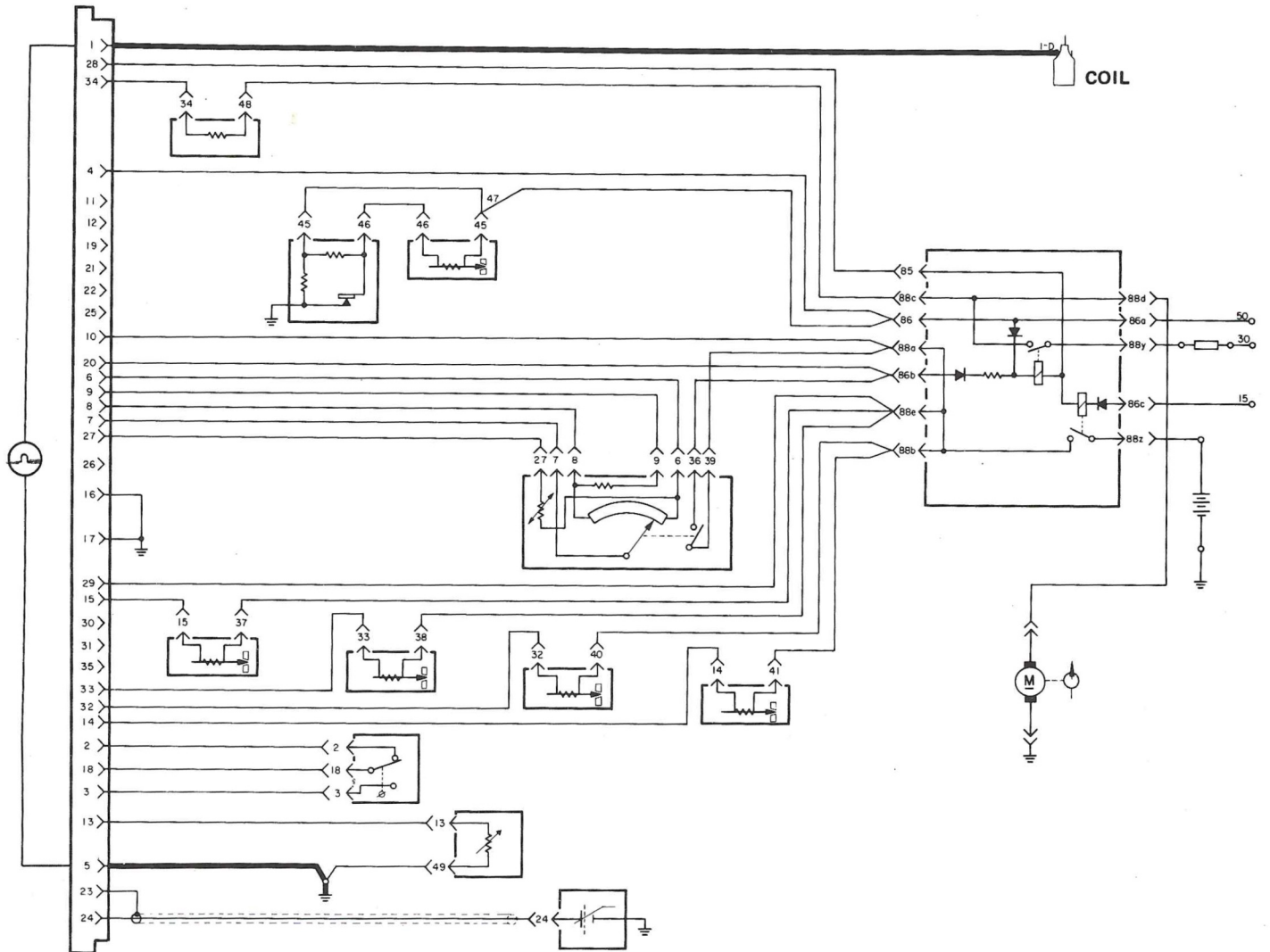
ELECTRICAL DIAGRAM 14

CHECK VOLTAGE SIGNAL FROM COIL TO CONTROL UNIT



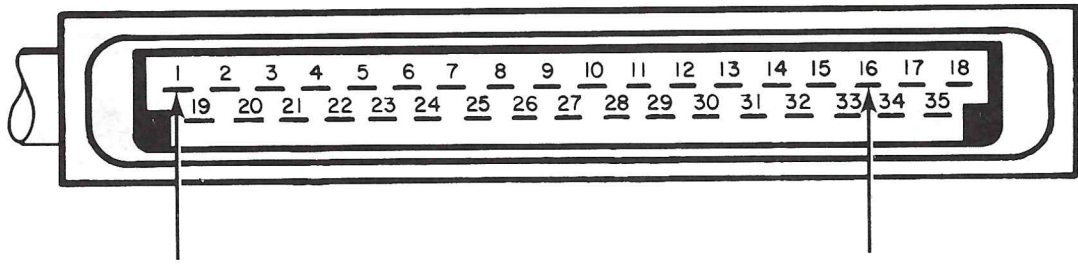
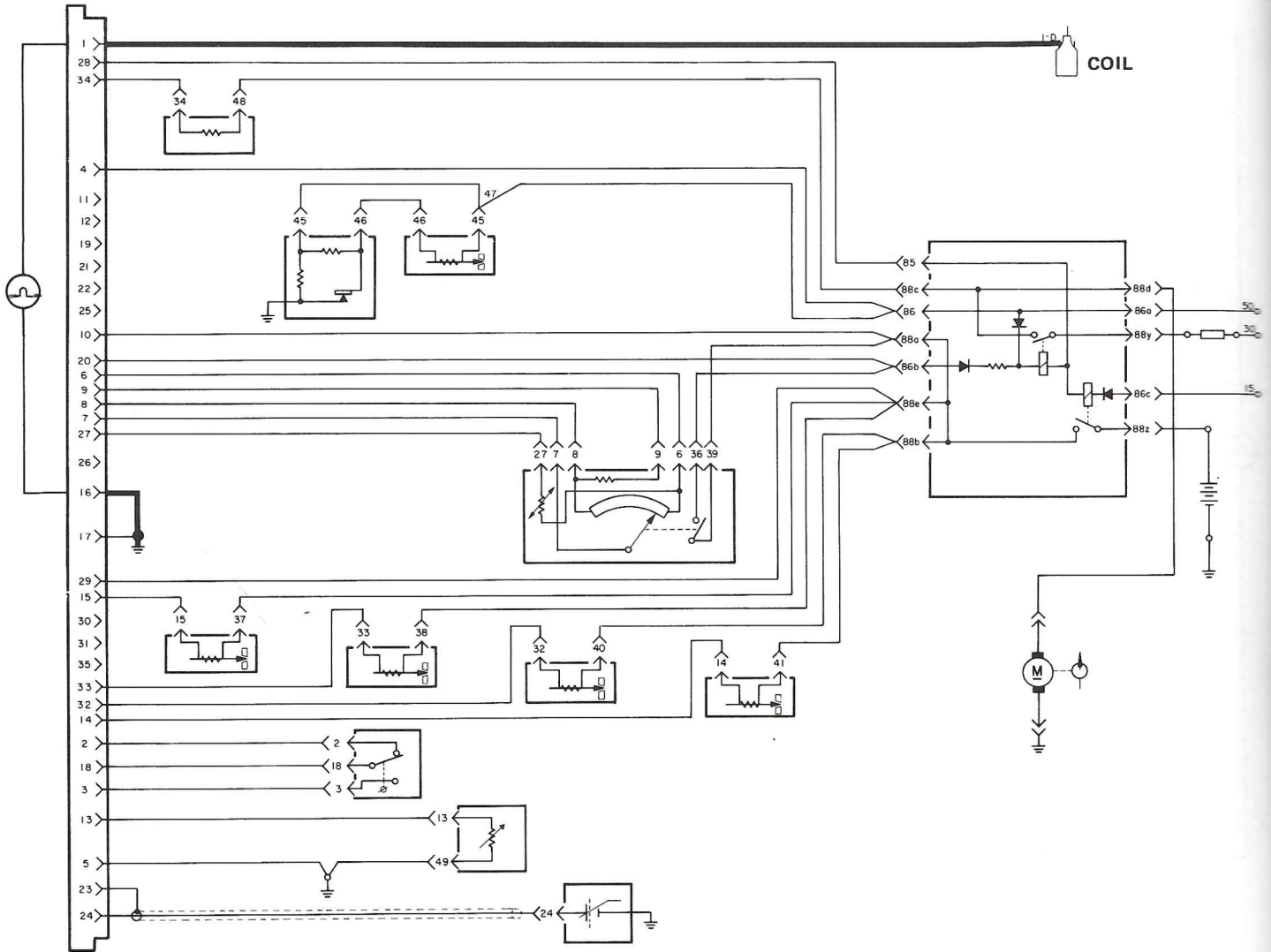
ELECTRICAL DIAGRAM 15

CHECK GROUND CIRCUIT FOR CONTROL UNIT



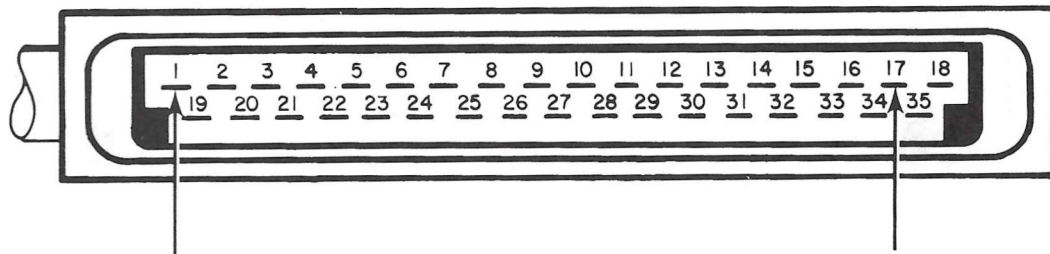
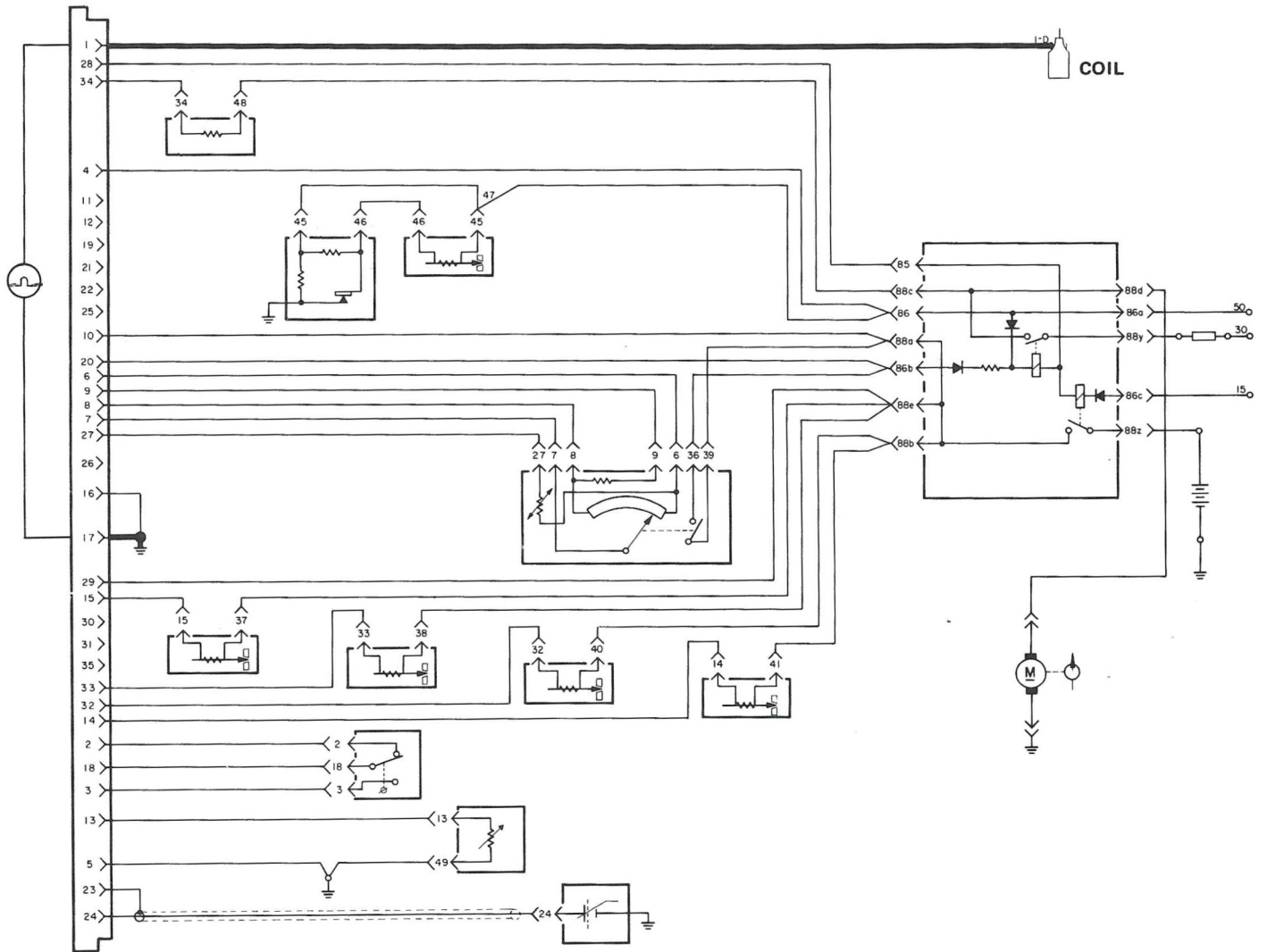
ELECTRICAL DIAGRAM 16

CHECK GROUND CIRCUIT FOR CONTROL UNIT



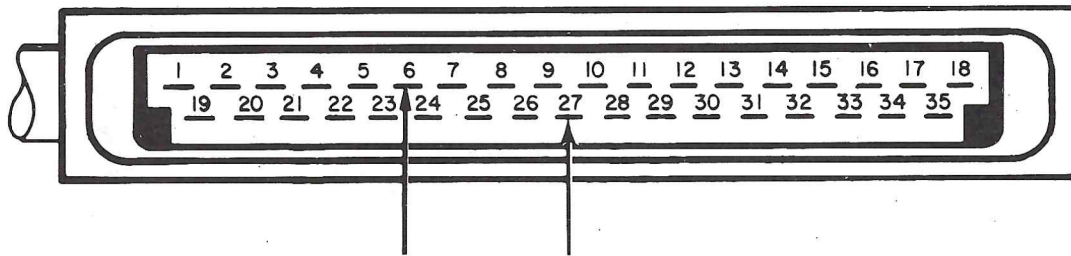
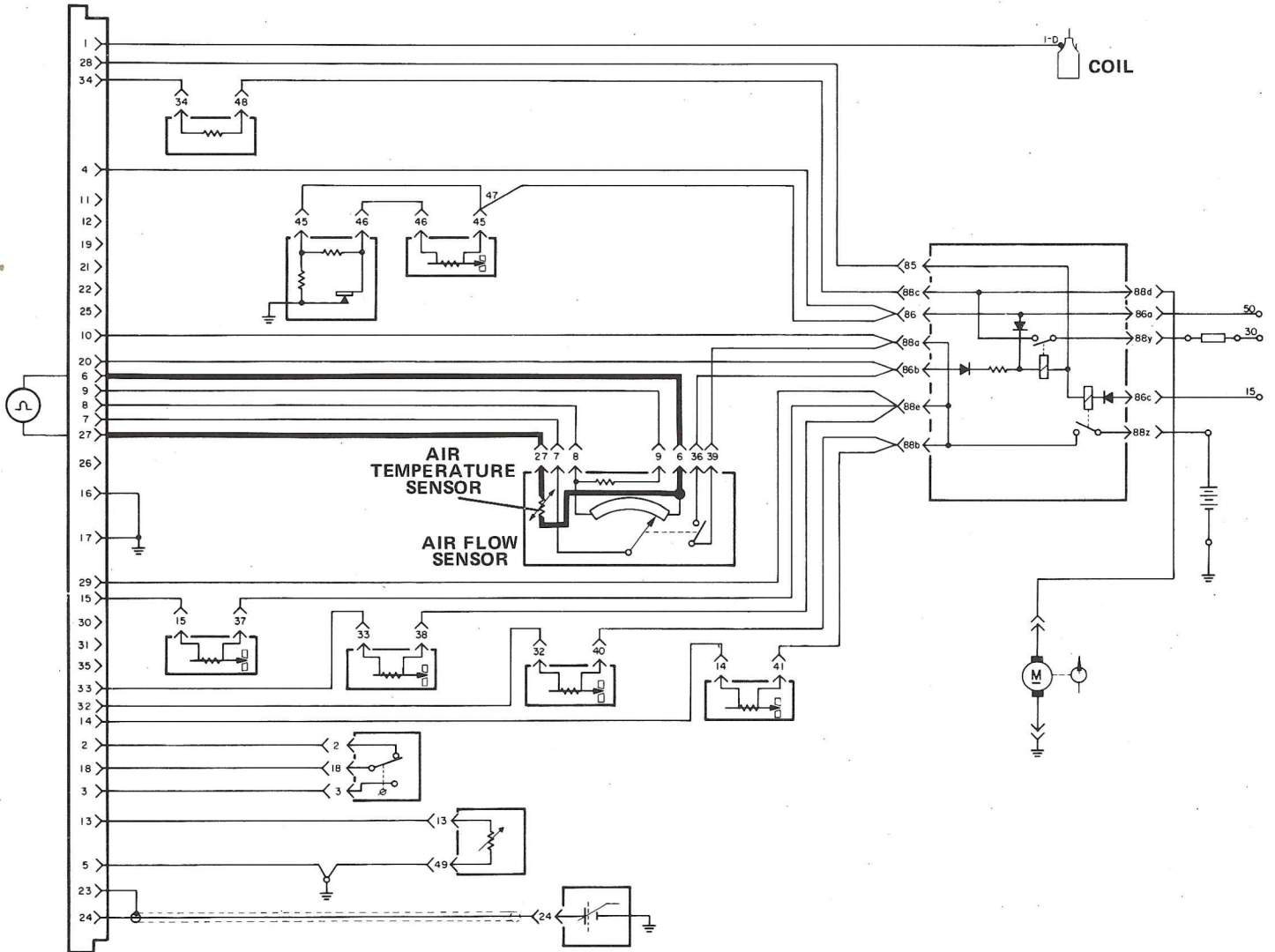
ELECTRICAL DIAGRAM 17

CHECK GROUND CIRCUIT FOR CONTROL UNIT



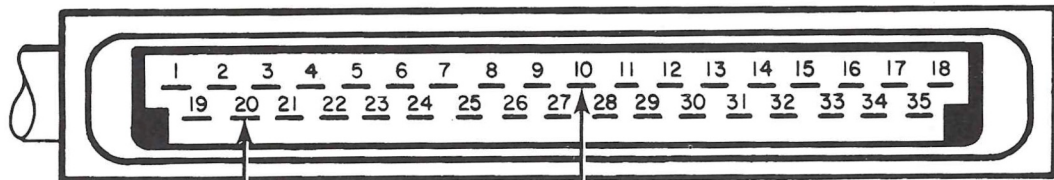
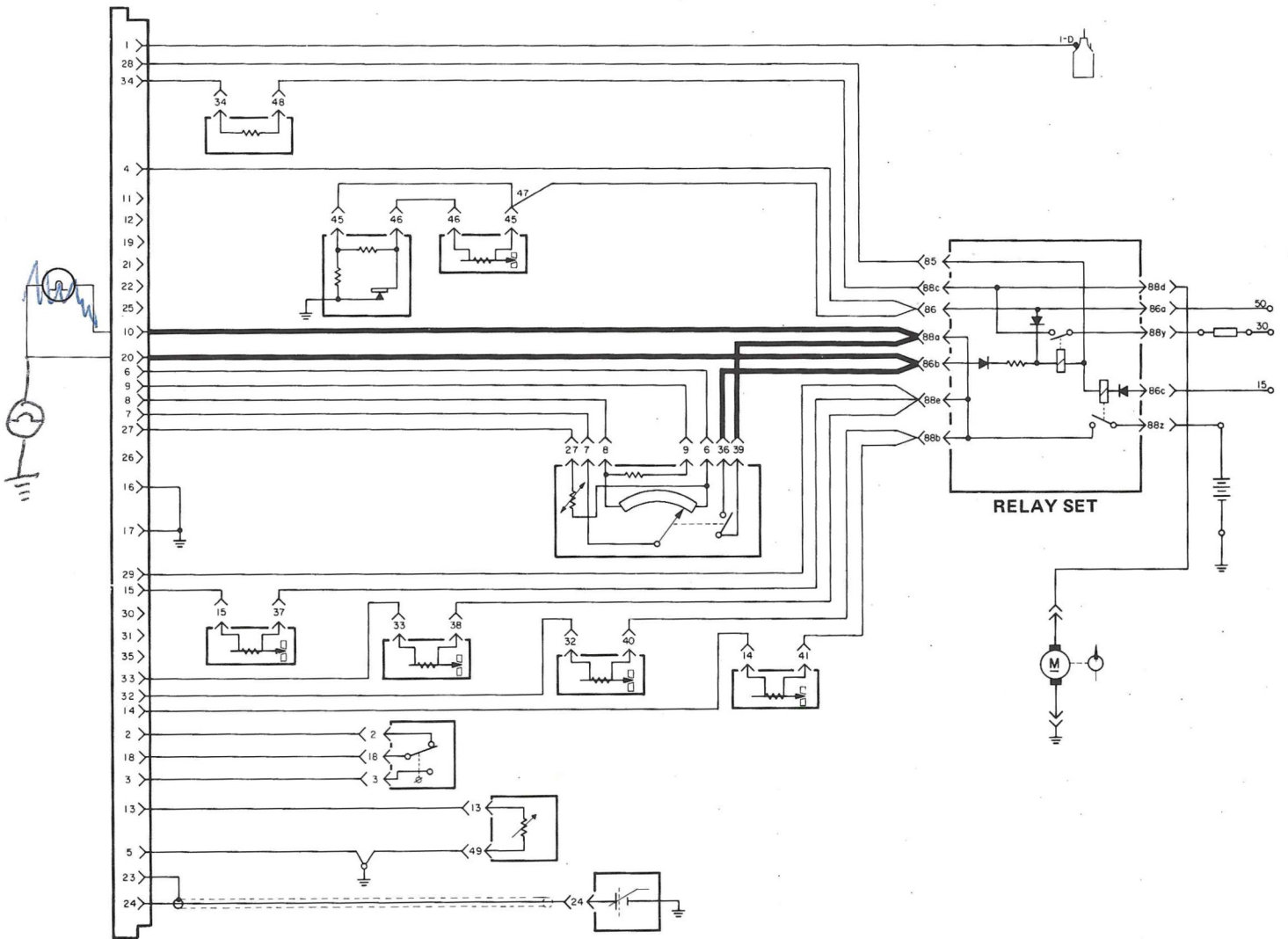
ELECTRICAL DIAGRAM 18

CHECK AIR TEMPERATURE SENSOR RESISTANCE



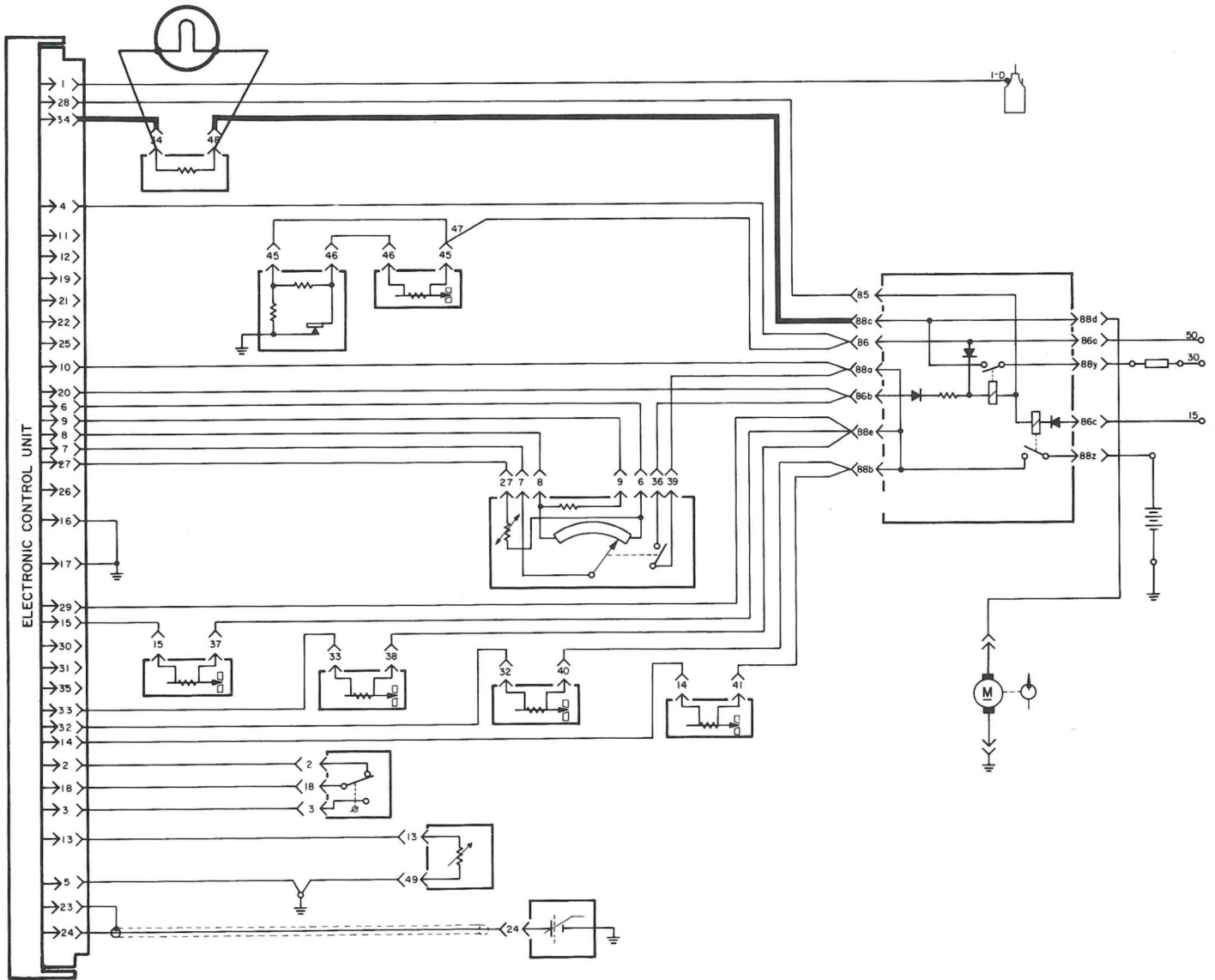
ELECTRICAL DIAGRAM 19

CHECK INPUT TO FUEL PUMP RELAY OF RELAY SET



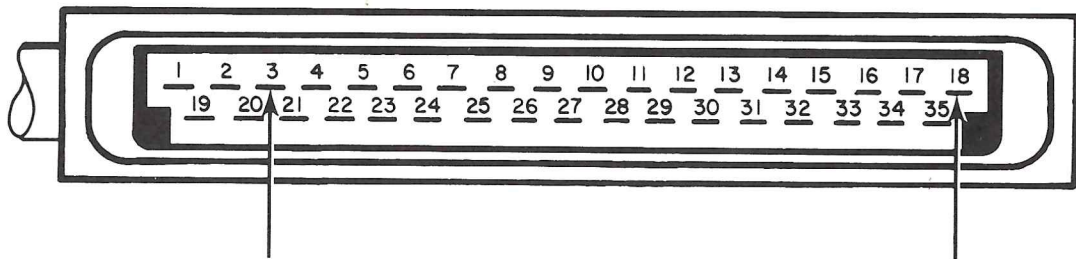
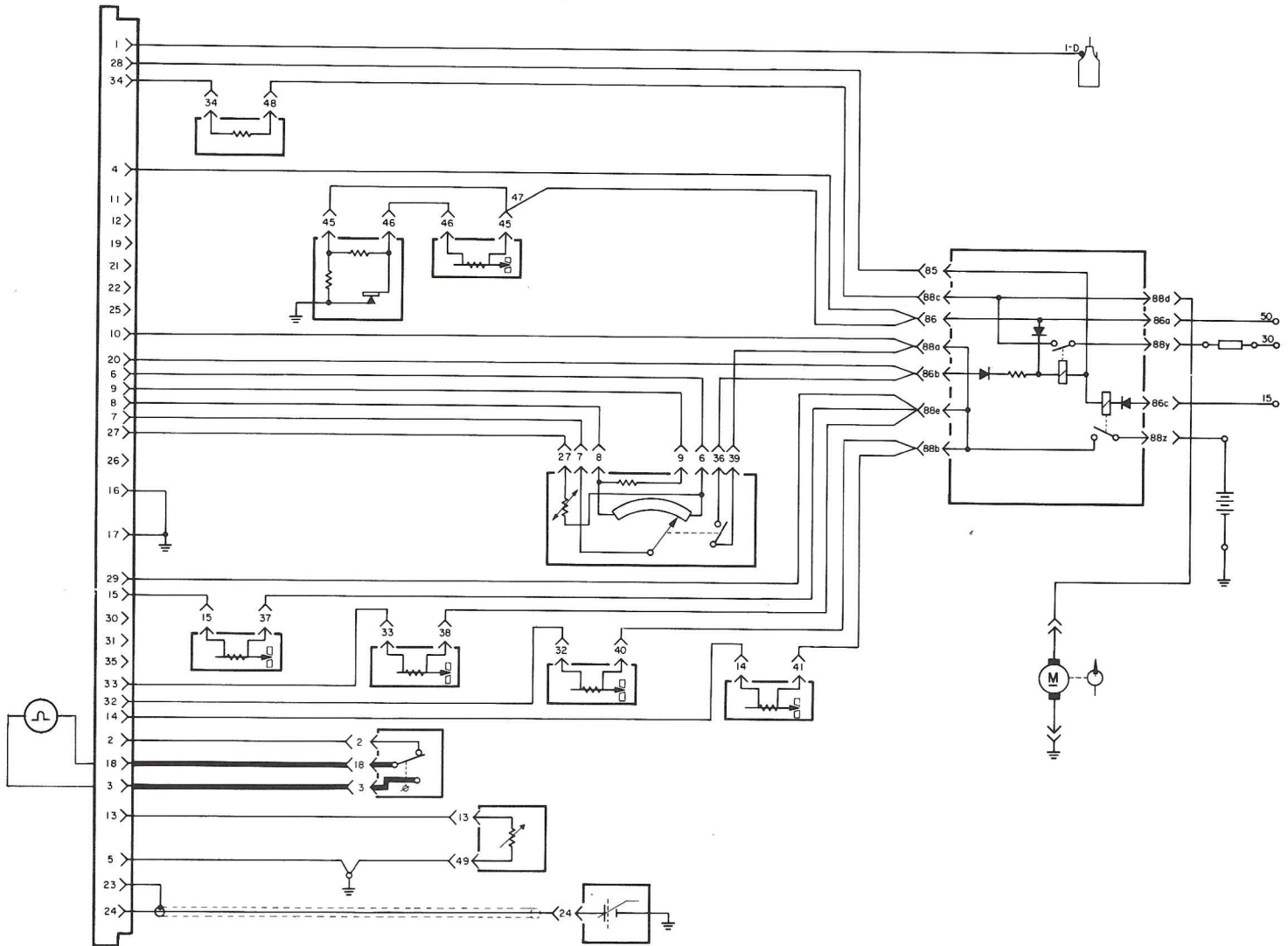
ELECTRICAL DIAGRAM 20

CHECK VOLTAGE AT AUXILIARY AIR REGULATOR



ELECTRICAL DIAGRAM 21

CHECK FULL THROTTLE CONTACTS OF THROTTLE PLATE SWITCH



IDLE SPEED ADJUSTMENT

- a. Run engine until it reaches normal operating temperature.

NOTE: Engine is at normal operating temperature when cooling fan has operated twice.

- b. Connect a tachometer.

NOTE: Idle speed adjustment must be made with cooling fan off. If cooling fan comes on during adjustment, stop the adjustment until fan stops. Do not disconnect fan.

- c. On cars with automatic transmission apply hand brake and place gearshift lever in "D."

- d. Turn idle speed adjustment screw in all the way.

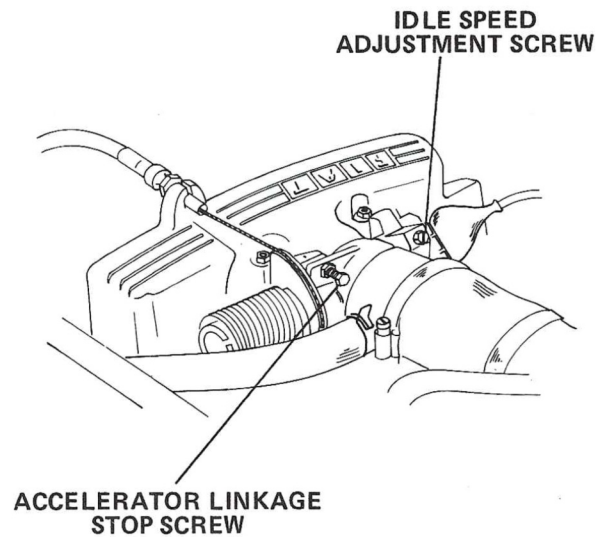
- e. Loosen the lock nut on the accelerator linkage stop screw. Adjust stop screw to obtain the following idle speeds.

Manual Transmission	700 to 800 RPM
Automatic Transmission	600 to 700 RPM

- f. Back the idle speed adjustment screw out to obtain the following idle speeds.

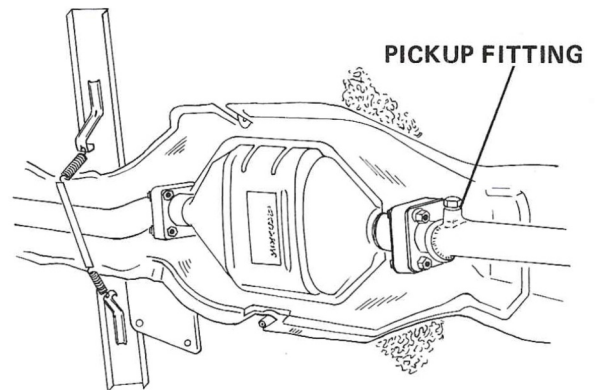
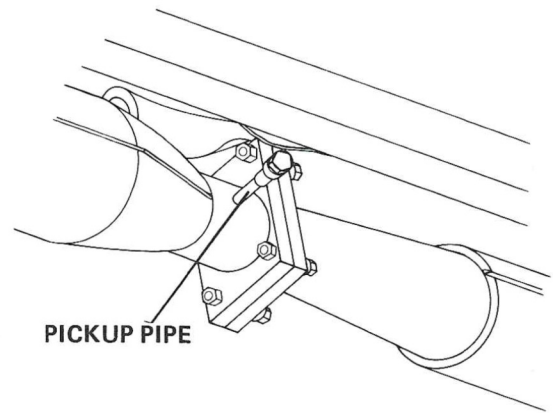
Manual Transmission	800 to 900 RPM
Automatic Transmission	700 to 800 RPM

- g. Hold the throttle linkage stop screw and tighten the lock nut.

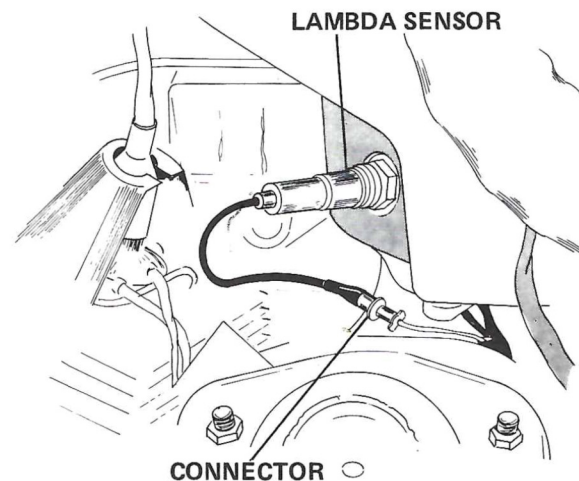


IDLE CO ADJUSTMENT

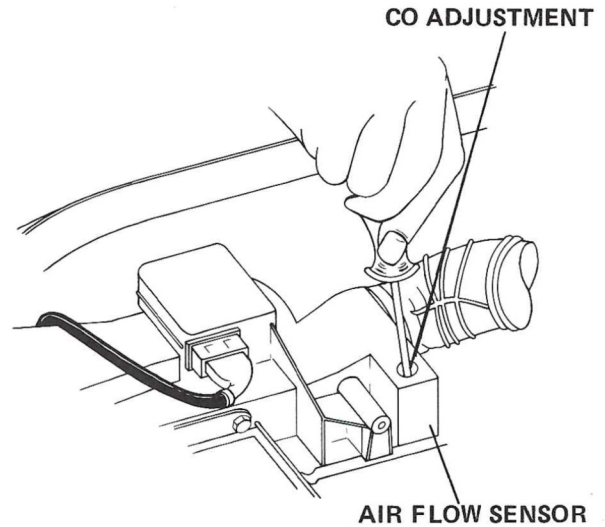
- a. Make sure there is no air leaking into the intake air system.
- b. Make sure idle speed is set correctly.
- c. Unscrew plug on pickup pipe or fitting near catalytic converter. Insert CO analyzer probe in pickup pipe.



- d. Turn analyzer on and set it up according to manufacturer's instructions.
- e. Disconnect wire from lambda sensor. Make sure neither wire can ground out.
- f. Run engine until normal operating temperature is reached.

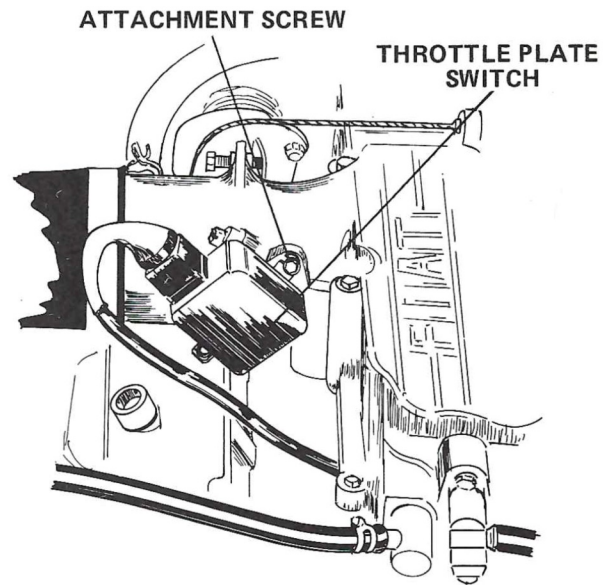


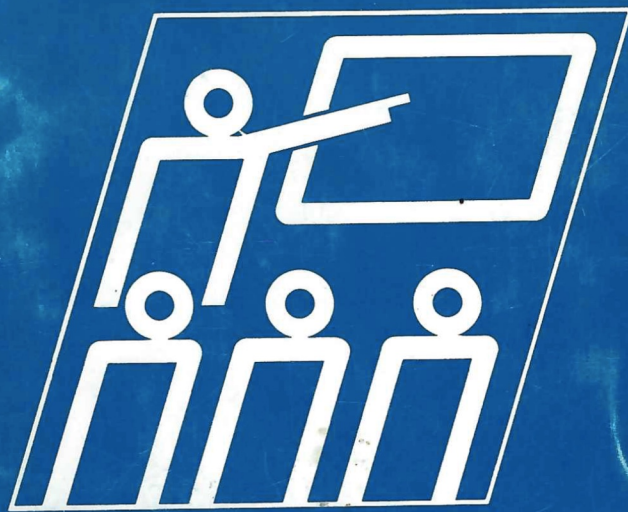
- g. Remove plastic plug from air flow sensor.
- h. Turn CO adjustment screw to set CO to 0.7%.
- i. Ground wire for lambda sensor and check reading. CO reading should be at least 1.5%.
- j. Connect wire to lambda sensor and check reading. CO readings must be between 0.4 and 0.6%.
- k. If reading is not correct, readjust idle speed and CO.
- l. If reading is correct, remove analyzer probe and install plug in pickup pipe.
- m. Install plastic plug in air flow sensor.



THROTTLE PLATE SWITCH ADJUSTMENT

- a. Make sure idle speed is correct.
- b. Disconnect connector from throttle plate switch. Connect an ohmmeter between terminals 2 and 18 of the switch.
- c. Start engine and run at 1200 RPM steady. *.025 Blade*
NOTE: Do not use the idle speed nor throttle linkage adjustment screws to maintain 1200 RPM.
- d. Loosen two screws holding throttle plate switch.
- e. With engine running at 1200 RPM, rotate switch clockwise until ohmmeter indicates closed circuit.
- f. Slowly rotate switch counter clockwise until ohmmeter indicates open circuit.
- g. At the exact point ohmmeter indicates open circuit, tighten the two screws holding the switch.
- h. Check the calibration again.
- i. Release accelerator. Connect connector to throttle plate switch.
- j. Check engine idle speed and adjust if necessary.





Association of Fiat Service Technicians