Section K8

Fault diagnosis

Symptoms	Possible cause
Fuel pumps - Pierburg	
1. Engine will not start due to no fuel being delivered at the carburetters or engine cuts out due to fuel starvation.	
(i) Quiet buzzing or light whine (i.e. pump operating but not delivering fuel).	(i) (a) Electrical connections reversed. (b) Pump not priming due to air lock, caused by insufficient fuel in tank. (c) With the pump inhibit system overriden, if the pump motor can be heard or felt to be running, then either: (i) The pump has seized and broken the magnetic drive coupling, or (ii) The internal pressure relief valve has failed.
(ii) No buzzing (i.e. pump inoperative).	(ii) (a) Faulty leads or terminal connections. (b) Faulty electrical feed to pump. (c) Blocked filter in the pump.
(iii) Loud buzzing (i.e. pump operating but not delivering fuel).	(iii) (a) Inlet and outlet filter adapters (⅜ in. **In**, 5/16 in. **Out**) reversed (b) Blockage in pipes, etc. (c) Pump inlet and outlet pipes reversed (d) Feed and return pipes at the carburetters reversed (5/16 in. Feed, ⅜ in. Return). (e) Non-return valve the incorrect way around.
Fuel pumps - S.U.	
1. Fuel pumps fail to operate.	1. (a) Faulty fuel pumps. (b) Faulty or obstructed float chamber needle valves. (c) Blocked carburetter filters. (d) Faulty electrical circuit. (e) Dirty or incorrectly set contact points. (f) Obstruction in the pipe between fuel tank and pump. (g) If all the preceding points fail to locate the fault, stiffening of the diaphragm or abnormal friction in the rocker 'toggle over' mechanism should be suspected.
2. Reduced fuel flow with rapid operation of the fuel pump.	2. Air leak on the suction side of the pump.
3. Fuel pump operates without fuel delivery.	3. (a) Serious air leak on the suction side of the pump. (b) Dirt lodged under one of the valves; particularly the inlet valve.

Symptoms	Possible cause
4. Noisy pump operation.	4. Air leak in suction line.
5. Fuel flow initially correct, then reducing rapidly resulting in slow pump operation.	5. (a) Insufficient fuel tank ventilation (Inadequate ventilation of the fuel tank causes a slow power stroke with resultant excessive burning of the contact points). (b) Restriction on the suction side of the pump.

Carburetters - S.U. HIF7
For information relating to cars destined for Australia, Canada, Japan and U.S.A. refer to the appropriate section of Chapter U.

1. Engine will not start. (Starter motor operating).	1. (a) Ignition circuit broken. (b) Failed anti 'run-on' solenoid or failure of electrical supply circuit. (c) Ignition system faulty. (d) Damaged or contaminated ignition high tension circuit. (e) Blocked fuel feed line, fouled float chamber filters. (f) Faulty choke bi-metal coil. (g) Choke solenoid inoperative. (h) Faulty choke fast-idle mechanism. (i) Air leak into induction system. (j) Faulty hot idle mixture compensator. (k) Weakening device filter blocked, weakening device air intake non-return valve failed or blockage in rubber connecting hoses. (l) Faulty weakening device cut-off solenoid or failure of electrical supply circuit. (m) Faulty weakening device control switch or failure of electrical supply circuit. (n) Dislodged venturi in weakening device. (o) Flooding of carburetter float chamber or jet.
2. Engine idles very roughly.	2. (a) Ignition system faulty. (b) Fouled sparking plugs. (c) Damaged or contaminated ignition high tension circuit. (d) Air leak into induction system. (e) Faulty hot idle compensator. (f) Weakening device filter blocked, weakening device air intake non-return valve failed or blockage in rubber connecting hoses. (g) Badly worn or damaged carburetter control linkage. (h) Flooding of carburetter float chamber or jet. (i) Sticking carburetter piston. (j) Incorrect operation of carburetter jet compensation. (k) Fouled carburetter float chamber or jet. (l) Incorrect operation of temperature controlled air intake system.

Symptoms	Possible cause
3. Engine stalls.	3. (a) Ignition circuit broken. (b) Failed anti 'run-on' solenoid or failure of electrical supply circuit. (c) Ignition system faulty. (d) Damaged or contaminated ignition high tension circuit. (e) Blocked fuel feed line, fouled float chamber filters. (f) Air leak into induction system. (g) Faulty hot idle mixture compensator. (h) Weakening device filter blocked, weakening device air intake non-return valve failed or blockage in rubber connecting hoses. (i) Badly worn or damaged carburetter control linkage. (j) Flooding of carburetter float chamber or jet. (k) Sticking carburetter piston. (l) Incorrect operation of carburetter jet compensation. (m) Fouled carburetter float chamber or jet.
4. (i) Engine shows signs of power loss evident at high speeds and loading. (ii) Engine misfires particularly on hard acceleration from low speed.	4. (a) Ignition system faulty. (b) Fouled sparking plugs. (c) Damaged or contaminated ignition high tension circuit. (d) Blocked fuel feed line or fouled float chamber filters. (e) Choke system operation incorrect. (f) Sticking carburetter piston. (g) Fouled carburetter float chamber or jet.
5. Engine hesitates or misfires under light load.	5. (a) Failed anti 'run-on' solenoid or failure of electrical supply circuit. (b) Ignition system faulty. (c) Fouled sparking plugs. (d) Damaged or contaminated ignition high tension circuit. (e) Blocked fuel feed line or fouled float chamber filters. (f) Air leak into induction system. (g) Faulty hot idle mixture compensator. (h) Weakening device filter blocked, weakening device air intake non-return valve failed or blockage in rubber connecting hoses. (i) Dislodged venturi in weakening device. (j) Flooding of carburetter float chamber or jet. (k) Incorrect operation of carburetter jet compensation. (l) Fouled carburetter float chamber or jet. (m) Incorrect operation of temperature controlled air intake system.

Symptoms	Possible cause
6. Increase in fuel consumption.	6. (a) Ignition system faulty. (b) Faulty choke bi-metal coil. (c) Choke system operation incorrect. (d) Air leak into induction system. (e) Faulty hot idle mixture compensator. (f) Weakening device filter blocked, weakening device air intake non-return valve failed or blockage in rubber connecting hoses. (g) Faulty weakening device cut-off solenoid or failure of electrical supply circuit. (h) Faulty weakening device control switch or failure of electrical supply circuit. (i) Air leak in mixture weakening system. (j) Flooding of carburetter float chamber or jet. (k) Sticking carburetter piston. (l) Incorrect operation of carburetter jet compensation. (m) Incorrect purge flow rate.
7. Engine 'backfires' on overrun.	7. (a) Ignition system faulty. (b) Air leak into induction system. (c) Faulty hot idle mixture compensator.
8. Sudden increase in engine idle speed.	8. (a) Faulty choke fast-idle mechanism. (b) Failed carburetter overrun valve.

Carburetters - Solex 4A1

1. Unsatisfactory cold start.	1. (a) Throttle valve incorrectly set. (b) Choke strangler flap not closing. (c) Blockage of primary stage discharge tube or primary stage riser discharge tube.
2. Engine stops upon cold start.	2. (a) Fuel mixture too rich or too lean.
3. Engine stops when engaging gear (engine cold)	3. (a) Fast-idle speed too low. (b) Incorrectly set choke gap.
4. Engine stops during warm-up period.	4. (a) Fast-idle speed too low. (b) Choke bi-metal cover inadequately preloaded. (c) Vacuum operated throttle stop incorrectly set.
5. Unsatisfactory idling speed.	5. (a) Idling jets blocked. (b) Faulty anti 'run-on' solenoid valve(s). (c) Incorrectly set idle CO.
6. Increased idling speed.	6. (a) Choke strangler flap not opening completely. (b) Incorrectly set idle CO. (c) Throttle valve lever does not return to idling speed stop. (d) Vacuum operated throttle stop set to high or leak in the vacuum signal hose.
7. Flats spots or poor acceleration (primary stage).	7. (a) Insufficient or no fuel injection from acceleration pumps.

Symptoms	Possible cause
8. Flat spots or poor acceleration (secondary stage).	8. (a) Loss of secondary stage air flaps spring tension. (b) Leak on air flaps vacuum damping. (c) Secondary stage air flaps binding. (d) Secondary stage riser passages blocked.
9. High fuel consumption.	9. (a) Choke not opening completely. (b) Incorrectly set idle CO. (c) Secondary stage air flaps binding. (d) Secondary stage throttle butterflies binding.
10. Engine hunting.	10. (a) Vacuum operated throttle stop incorrectly set. (b) Incorrectly set idle CO.
11. Hesitation when opening the secondary stage throttles (short duration).	11. (a) Loss of secondary stage throttle butterflies return spring tension due to relaxation of the spring.
12. Severe loss of power when the secondary stage throttles are opened (long duration).	12. (a) Loss of secondary air flaps return spring tension due to breakage of the spring or loss of spring tension due to the locking screw becoming loose.
13. Very poor idle quality accompanied by the emission of black smoke from the tailpipe; possibly corrected if the engine is switched off and then restarted.	13. (a) Failure of the secondary stage throttles to close properly due to loss of tension of the return spring.