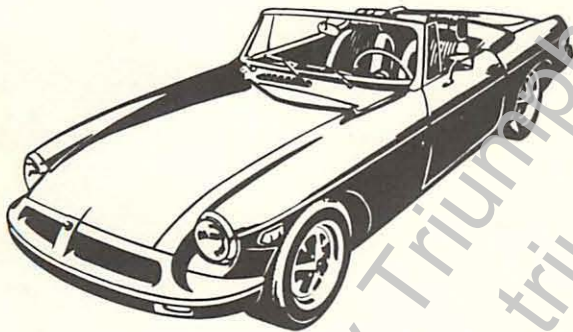




PRE-DELIVERY INSPECTION

EMISSION CONTROL RELATED CHECKS



Vehicles Built To
North American And
Californian
Specifications
1978 Model Year



Provided Courtesy Triumph Wedge Owners Association
<http://www.triumphwedgeowners.org>

© British Leyland Motors Inc. 1970

CONTENTS

	Page
ENGINE SPECIFICATIONS	1
SYSTEM/MODEL APPLICATION CHART	2
SYSTEM CHECKS:	
Anti-Run-On Valve	3
Transmission Controlled Spark Advance	3
E.G.R. Valve	4
Gulp Valve	5
Vacuum Retard and Advance Capsules	5
Divertor Valve	7
Closed Loop Fueling	7
ENGINE SETTING PROCEDURE	
M.G.B.	8
Midget & Spitfire	8
TR7 & TR8	9
Jaguar 6 Cylinder	10
Jaguar 12 Cylinder	10

Provided Courtesy of Triumph Wedge Owners Association
<http://www.triumphwedgeowners.org>

ENGINE SPECIFICATIONS — 1978 MODEL YEAR

MODEL	PARAMETERS	CALIFORNIA	FEDERAL
Spitfire/Midget	Idle speed rpm	800 ± 100	800 ± 100
	Ignition timing at 800 rpm	2° ± 2° ATDC	10° ± 2° BTDC Vac Off
	Idle CO% Air Off at 800 rpm	0.5 — 6.0 (Nominal 3.0)	0.5 — 6.5 (Nominal 3.0)
	Idle HC ppm Air Off at 800 rpm	250 ppm	280 ppm
MGB	Idle speed rpm	850 ± 100	850 ± 100
	Ignition timing at 1500 rpm	10° ± 2° BTDC	10° ± 2° BTDC
	Idle CO% at 850 rpm Air Off	5.5% ± 1%	5.5% ± 1%
	Idle HC ppm at 850 rpm Air Off	250 ppm	250 ppm
TR7	Idle speed rpm	800 ± 100	800 ± 100
	Ignition timing at 800 rpm	2° ± 2° ATDC	10° ± 2° BTDC Vac Off
	Idle CO% Air Off at 800 rpm	5% ± 2%	5% ± 2%
	Idle HC ppm Air Off at 800 rpm	300 ppm	300 ppm
TR8	Idle speed rpm	800 (+) 100 (-) 50	800 (+) 100 (-) 50
	Ignition timing at 800 rpm	5° ATDC ± 2°	5° ATDC ± 2%
	Idle CO% at 800 rpm Air Off	4% ± 1½%	5% ± 2%
	Idle HC at 800 rpm Air Off	300 ppm	300 ppm
Jaguar 6 Cylinder	Idle speed	: 800 ± 50 rpm	800 ± 50 rpm
	Ignition timing at 800 rpm	: 4 ± 2° BTDC	4 ± 2° BTDC
	Idle CO% at 800 rpm (open loop operation)	: 0.5% — 1.5%	0.5% — 1.5%
	Idle HC% ppm at 800 rpm (open loop operation)	: 250 ppm	250 ppm
Jaguar V12	Idle speed rpm	750 ± 25	750 ± 25
	Ignition timing at 750 rpm	4° ± 2° ATDC	10° ± 2° BTDC
	Idle CO% at 750 rpm Air Off	1 — 2%	1 — 2%
	Idle HC ppm at 750 rpm Air Off	500 ppm	500 ppm

NOTE: REFER TO EMISSION LABEL

EMISSION RELATED P.D.I. OPERATIONS 1978 MODEL YEAR SYSTEM/MODEL APPLICATION CHART

MARKET		FEDERAL						CALIFORNIA							
SYSTEM	MODEL	SPITFIRE	MIDGET	MGB	TR 7	TR 8	XJ 6	XJ 12 & XJS	SPITFIRE	MIDGET	MGB	TR 7	TR 8	XJ 6	XJ 12 & XJS
	1) Anti-Run on Valve — Check Operation														
2) Transmission Controlled Spark Advance — Check Operation				●							●				
3) E.G.R. Valve — Check Operation		●	●	●	●	●		●	●	●	●	●	●		●
4) Gulp Valve — Check Operation				●						●					
5) Vacuum Advance and/or Retard Capsule — Check Operation						●		●	●		●	●			●
6) Diverter Valve — Check Operation							●								●
7) Closed Loop Fueling Control — Check Operation							●							●	

IGNITION TIMING CHECK AND ADJUST

— IDLE CO/HC CHECK AND ADJUST

ALL MODELS

SYSTEM 1 – ANTI–RUN–ON VALVE–CHECK OPERATION

1. The following checks should be carried out with the engine running at normal idle speed.
 - a. Engine idling at normal operation temperature, remove feed wire to anti-run-on valve; colored slate grey/purple for MG vehicles and red/brown for Triumph vehicles.
 - b. Energize valve by using an electrical supply from a convenient source. Engine should stall.
 - c. As the oil pressure drops, note the audible indication of the anti-run-on valve solenoid returning to the de-energized position.
 - d. Disconnect electrical supply and reconnect feed wire.

CORRECTIVE ACTION

1. If the engine fails to stop and the valve is heard to de-energize:
 - a. Check the connections of the associated pipe work for security or leaks – rectify as necessary.
 - b. Check that a vacuum is being applied to the anti-run-on valve via signal pipe from manifold when the engine is running. If no vacuum signal available, check pipe and manifold fitting for blockage or leaks and rectify as necessary.
 - c. Check for air leaks, via dipstick, rocker cover, etc. into crankcase ventilation systems, and rectify as necessary.
2. If engine fails to stop and the valve is NOT heard to de-energize:
 - a. Check electrical connection including ground continuity to anti-run-on valve and oil pressure switch – rectify as necessary.
 - b. Remove anti-run-on valve from vehicle and check electrical function on bench.
 - c. If valve is functional, replace in vehicle, reconnect all pipe work and electrical feed only. Connect second pin of anti-run-on valve to ground.
 - d. Start engine. Repeat check operation (a), (b) or (c). If engine stops oil pressure switch faulty – change. If engine does not stop, the ignition switch and electrical supply from the switch to the valve is suspect – check and rectify.

SYSTEM 2 – TRANSMISSION CONTROLLED SPARK ADVANCE – CHECK OPERATION

MGB ONLY

NOTE:

1. The following checks should be carried out with the engine running at normal idle speed.
 - a. Depress and hold down clutch pedal.
 - b. Select each gear in turn, including reverse.
 - c. Observe increase in engine rpm when '4' is selected. No other gear selection should cause the rpm to increase.

- d. Observe drop in engine rpm when gear selector is moved out of '4'.

CORRECTIVE ACTION

1. If no increase in rpm takes place in '4', carry out the following checks:
 - a. Ensure all vacuum pipe connectors are secure at distributor, solenoid and gulp valve sensing pipe tee.
 - b. Disconnect feed wire from solenoid, color coded yellow/red and connect an electrical power supply to the solenoid.
 - c. With engine running at idling speed, disconnect vacuum pipe from distributor advance capsule and check for vacuum signal at pipe. Also note if engine rpm drops. Presence of vacuum and rpm dropping indicates correct functioning of vacuum system and solenoid.
 - d. If no vacuum signal is present, reconnect vacuum pipe to distributor. Disconnect vacuum pipe from top of solenoid, i.e. inlet, and again check for vacuum at pipe. If vacuum is present, check vacuum line for leaks and blockage – rectify as necessary.
 - e. If check (c) denotes system is functioning, check electrical connection to and function of gearbox switch – rectify as necessary.

SYSTEM 3 – EGR VALVE – CHECK OPERATION

ALL MODELS EXCEPT JAGUAR

1. Raise engine rpm to approximately 2500 and return to idle. Note rise and fall of valve stem during this operation.

CORRECTIVE ACTION

1. If no movement of valve stem is seen during initial and subsequent throttle operations, remove signal pipe from valve and check for a vacuum signal when throttle is operated. If signal is present, change EGR valve.
 - a. If no signal is present, check pipe and carburetor tapping for blockage or leaks – rectify as necessary.

JAGUAR V12 ONLY

1. With engine fully warm and running, open throttle by 1/8" at the turret, 2 seconds after which the EGR valves should be heard to open, as detected by a slight roar in the air cleaner pipe on both banks of the engine, or . . .
2. With the engine fully warm, the ignition on, but the engine not running, open throttle by 1/8" at the turret, 2 seconds after which the EGR valves should be heard to open.

CORRECTIVE ACTION

1. If valve does not operate, check as follows:
 - a. Check that throttle switch has been adjusted correctly, i.e. that closed throttle contact is made.

- b. Check wiring connections to both valves and to throttle switch.
- c. *Disconnect* the wires from each valve in turn and connect a 12v 6w bulb across the 2 wires.
- d. With the ignition switched on, the lamp should glow with throttle at idle. As the throttle is opened 1/8", the lamp will go out 2 seconds later and come on again at wide open throttle.
- e. If the lamp check is satisfactory, change EGR valve.
- f. If the lamp check is not satisfactory, change EGR control unit.

SYSTEM 4 – GULP VALVE – CHECK OPERATION

MGB ONLY

NOTE:

1. The following checks are carried out with the engine running at normal idle speed:
 - a. Remove sensing pipe between manifold and gulp valve, from valve.
 - b. Engine speed will alter slightly then stabilize.
 - c. Reconnect sensing pipe. Engine will falter, almost stalling, then will stabilize to normal idling speed if the gulp valve functions correctly.

CORRECTIVE ACTION

1. If the above operation does not have desired effect, carry out the following:
 - a. Remove sensing pipe and check for presence of manifold vacuum with engine running. If no vacuum is present, check pipe and manifold for blockage. Rectify as necessary.
 - b. Remove air delivery pipe between air pump and gulp valve, from valve. Check for air supply with engine running. If no air supply is present, check pipe for blockage and air pump for function. Rectify if necessary.
 - c. If (a) and (b) are satisfactory, replace gulp valve.

SYSTEM 5 – VACUUM RETARD CAPSULE – CHECK OPERATION

1. The following checks are carried out with the engine running at normal idle speed:
 - a. With engine idling normally and retard capsule connected, note ignition timing and engine speed.
 - b. Remove the vacuum pipe from capsule and note the change in ignition timing and engine speed. Ignition timing should advance by approximately 12° – 16° and the engine speed should increase.
 - c. Reconnect vacuum pipe and observe return to normal idling condition.

CORRECTIVE ACTION

1. If no change to timing and speed is observed, check as follows:
 - a. Ensure that the vacuum line from capsule to carburetor is intact.

- b. Remove vacuum pipe from capsule and check for presence of a vacuum with engine running. If no vacuum is present, check pipe and carburetor for blockage. Rectify if necessary. If vacuum is present, change retard capsule.

VACUUM ADVANCE CAPSULE

TR8 ONLY

1. Vacuum Advance Capsule – Check operation. Increase engine rpm to approximately 1500 rpm, disconnect signal line at distributor and blank. Engine revs should decrease (by approximately 400 rpm) and ignition timing will retard approximately 6°.

CORRECTIVE ACTION

1. If no change in engine rpm is observed, check as follows:
 - a. Ensure that vacuum line from capsule to carburetor is intact and that a secure connection is made to the carburetor.
 - b. Check for presence of vacuum with the engine running. If no vacuum is present, check pipe and carburetor tapping for blockage. Rectify as necessary. If a vacuum is present, change advance capsule.

JAGUAR V12 – CALIFORNIA ONLY

1. With engine cold and idling normally, disconnect vacuum advance signal pipe from throttle body and with the aid of an extension tube, connect to a manifold vacuum source. The ignition timing should remain at 4° ATDC.
2. With the distributor system connections as at (a) allow engine to warm up. As the coolant temperature reaches 76° C, the ignition timing should advance to 18° BTDC approximately and the engine speed should increase.
3. Reconnect the vacuum advance throttle edge signal pipe to the throttle body and disconnect manifold vacuum signal pipe to vacuum operated switch at manifold and blank manifold tapping. Ignition timing should retard to 10° BTDC approximately and idle speed should decrease. There should be no vacuum on either side of the distributor capsule.
4. Reconnect manifold vacuum signal pipe and observe return to normal idle speed and ignition timing of 4° ATDC.

CORRECTIVE ACTION

1. If ignition timing advances at (1) when vacuum is applied, either the thermo vacuum valve is faulty or it is connected incorrectly. Rectify as necessary.
 - a. If ignition timing fails to advance at (2), either the thermo vacuum valve is faulty or it is connected incorrectly. Alternatively there could be an air leak into the signal line or the distributor capsule could be faulty.
 - b. If ignition timing only advances to 4° BTDC approximately in (2), the vacuum operated switch could be failing to open port A to atmosphere or alternatively the restrictor in the manifold vacuum signal pipe could have been omitted.

SYSTEM 6 – DIVERTOR VALVE – CHECK OPERATION

1. The following checks are carried out with engine running at normal idle speed:

JAGUAR V12 – FEDERAL ONLY

- a. Remove cap from valve noting flow of air from ports in valve body. This can usually be detected audibly as well as by feel. Replace cap after check.

JAGUAR V12 – CALIFORNIA ONLY

- b. Remove tube from top of valve and blank tube with suitable stud or screw noting flow of air from ports in valve body. This can usually be detected audibly as well as by feel. Replace tube after check.

CORRECTIVE ACTION

1. If no air blows through ports, check as follows:
 - a. Remove signal pipe from divertor valve and check for vacuum with engine running. If no vacuum is present, check pipe for leaks and pipe and manifold for blockage. Rectify as necessary.
 - b. If a signal is present and divertor valve does not divert, replace valve.
2. If air flows through ports continuously, check as follows:
 - a. Renew cap on top of valve. This must be a perfect seal for valve not to divert.
 - b. If valve still diverts air, replace it.

SYSTEM 7 – CLOSED LOOP FUELING CONTROL

OPERATION CHECK:

1. This check should be carried out after setting open loop idle mixture to between 0.5% and 1.5% CO.
 - a. With the engine idling and fully warm, observe the downpipe CO emission. (The sample pipes from each downpipe should be 'T'd together before the analyzer.) The emission should be between 0.5% and 1.0% CO. (The engine should have run at least one minute immediately before this check, to ensure that closed loop operation has been initiated.)
 - b. Blank and disconnect the inlet manifold vacuum signal pipe from the fuel pressure regulator.
 - c. Observe the downpipe CO emission again. This should stabilize between 0.5% and 1.0% CO. In the event of a closed loop system malfunction, the CO level will stabilize above 2% CO.
 - d. Reconnect the inlet manifold vacuum signal pipe to the fuel pressure regulator.

CORRECTIVE ACTION

1. If a closed loop system malfunction is indicated, check as follows:
 - a. Check that the oxygen sensor electrical connection is made.

- b. If the sensor is connected, make the following check on the oxygen sensor signal lead:
- c. Disconnect the harness from the ECU in the trunk.
- d. Check continuity of the signal lead between the connector spade at the oxygen sensor end and pin 24 in the harness socket.
- e. Check for a signal to screen fault (pin 23 to 24 at the harness socket).
- f. Check for a signal to ground fault.
- g. If the system is electrically satisfactory, replace the oxygen sensor.
- h. If the malfunction persists, replace the ECU.

ENGINE SETTING PROCEDURES

PROCEDURE FOR MGB 1978 MODEL YEAR

1. FEDERAL AND CALIFORNIA SPECIFICATION

With engine at normal operating temperature:

- a. Record idle speed as received.
- b. Check ignition timing at specified speed and record as received.
- c. Adjust if necessary and record reset value.
- d. Clamp off pipe, air pump to air rail, disconnect float chamber vent pipe, insert probe into tail pipe and adjust idle speed. Record CO and HC once a stable reading has been reached.
- e. Reset mixture and idle speed if necessary and record CO and HC as in (d).
- f. Remove probe from tail pipe, unclamp air pipe. Reconnect float chamber vent pipe and allow engine to idle.
- g. Reset and record idle speed.
- h. All carburetor tuning values should be checked without the electric fans in operation. It may be necessary to temporarily disconnect the fans during actual measurement, i.e. Sect. (d) – (g). Ensure engine does not overheat.

PROCEDURE FOR MIDGET/SPITFIRE 1978 MODEL YEAR

1. FEDERAL SPECIFICATION

With engine at normal operating temperature:

- a. Record idle speed as received.
- b. Check ignition timing at specified speed with vacuum advance disconnected and record as received.
- c. Adjust if necessary and record reset value.
- d. Clamp off pipe – air pump to check valve. Insert probe into tail pipe. Adjust idle speed if necessary and record CO and HC as received.
- e. Reset mixture and idle speed if necessary and record reset CO and HC value.

- f. Remove probe from tail pipe. Unclamp air pipe and allow engine to idle.
- g. Reset idle speed if necessary and record.

2. CALIFORNIA SPECIFICATION

- a. Record idle speed as received.
- b. Check ignition timing at specified speed, with vacuum retard connected and record as received.
- c. Adjust if necessary and record reset value.
- d. NOTE: If timing is approximately 12° BTDC, check for a break in the vacuum retard line before carrying out any alterations to timing. See System 5 – Vacuum Retard Capsule Check.
- e. Clamp off pipe – Air pump to check valve. Insert probe into tail pipe, reset idle speed if necessary. Record CO and HC as received.
- f. Reset mixture and idle speed if necessary and record reset CO and HC value.
- g. Remove probe from tail pipe. Unclamp air pipe, allow engine to idle.
- h. Reset idle speed if necessary.

PROCEDURE FOR TR7 & TR8 – 1978 MODEL YEAR

1. FEDERAL AND CALIFORNIA SPECIFICATION

With engine at normal operating temperature and air conditioning turned off:

- a. Record idle speed as received.
- b. Check ignition timing at specified speed and record as received.
- c. Adjust if necessary and record reset value.
- d. Check carburetor balance. Reset if necessary.
- e. Clamp pipe between air pump and air rail. Insert probe into tail pipe. Adjust idle speed if necessary and record CO and HC as received.
- f. Reset mixture and idle speed, if necessary, and record CO and HC reset value.
- g. Remove probe from tail pipe, remove clamp and allow engine to idle.
- h. Reset idle speed if necessary.
- j. All carburetor tuning values should be checked without the electric fans in operation. It may be necessary to temporarily disconnect the fans during actual measurement, i.e. Sect. (d) – (h). Ensure that the engine does not overheat.

2. CALIFORNIA SPECIFICATION

With engine at normal operating temperature and air conditioning turned off:

- a. Record idle speed as received.
- b. Check ignition timing at specified speed with vacuum retard connected and record as received.

- c. Adjust if necessary and record reset value.
- d. Check carburetor balance. Reset if necessary.
- e. Clamp pipe between air pump and air rail. Insert probe into tail pipe. Adjust idle speed if necessary and record CO and HC as received.
- f. Reset mixture and idle speed, if necessary, and record CO and HC reset values.
- g. Remove probe from tail pipe. Remove clamp and allow engine to idle.
- h. Reset idle speed if necessary.
- j. All carburetor tuning values should be checked without the electric fans in operation. It may be necessary to temporarily disconnect the fans during the actual measurement, i.e., Sect. (a) – (h). Ensure that the engine does not overheat.

ENGINE SETTING PROCEDURE FOR 1978 – 6 CYLINDER JAGUAR

1. FEDERAL AND CALIFORNIA SPECIFICATION

NOTE: This operation is carried out with transmission selector lever in 'PARK' position.

- a. Ensure that engine is fully warm with vehicle temperature gauge needle between 'O' and 'L' of NORMAL band, with all accessories off.
- b. Ensure fuel gauge shows a positive reading.
- c. Record idle speed as received. If engine has been running for less than 15 minutes, clamp air supply pipe to extra air valve before recording idle speed. Adjust if necessary and record reset value.
- d. Check ignition timing at specified speed and record as received value. Adjust if necessary and record reset value.
- e. Disconnect oxygen sensor signal lead from oxygen sensor.
- f. Allow engine to idle for a minimum of 20 seconds.
- g. Run engine up to 2000 rpm for 10 seconds and close throttle.
- h. Allow engine to idle for a minimum of 15 seconds before taking a steady state exhaust emission reading.
- j. Connect probe to downpipes and record CO and HC once a stable reading has been established.
- k. If CO and HC are outside specified values, adjust as necessary and repeat steps (g) – (j).
- l. Reconnect oxygen sensor signal lead to oxygen sensor.

ENGINE SETTING PROCEDURES FOR 1978 12 CYLINDER JAGUARS

1. FEDERAL AND CALIFORNIA SPECIFICATION

NOTE: This operation is carried out with transmission selector lever in 'PARK' position.

- a. Ensure that engine is fully warm with vehicle temperature gauge needle between

'O' and 'L' of 'NORMAL' band and that all accessories are off.

NOTE: On XJS vehicle's temperature indicated by needle should be 'N'.

- b. Ensure fuel gauge shows a positive reading.
- c. Set up throttle rods as follows:
- d. Disconnect rods from turret and ensure that right angle lever on end of plenum chambers is against the stop and also that lever on throttle body butts up to adjusting screw. Rectify as necessary.
- e. Reconnect rods at turret and adjust if necessary so that turret returns easily to the closed throttle stop and also so that both throttle butterflies begin to open together as soon as turret is rotated, i.e. eliminate lost motion, but without propping throttles off the stops.
- f. Record idle speed as received and reset if greater than 850 rpm.
- g. Check ignition timing and record as received value. Adjust if necessary and record reset value.
- h. Remove rubber cap from divertor valve (Federal) or remove tube from top of divertor valve (California) and blank tube with suitable stud or screw.
- j. Run engine up to 2000 rpm for 10 seconds and close throttle.
- k. Allow engine to idle for a minimum of 15 seconds before taking a steady state reading, but no more than 2 minutes. (If an idle of more than 2 minutes is required, return to step (j)).
- l. Insert probe up tail pipe and record CO and HC once a stable reading has been established.
- m. Repeat from step (k) on the second tail pipe,
- n. If CO and HC results are outside specified values, adjust as necessary and repeat steps (j) through (m).
- o. If CO balance from the two tail pipes is unacceptable, balance throttles by opening or closing the appropriate throttle butterfly on the adjusting screw. Care must be taken not to open either throttle to the point where the canister purge connection on the throttle body starts to see a depression.
- p. If adjustment is necessary at (o), repeat steps (c), (d) and (e) to reset the throttle rods.
- q. Replace rubber cap or tube on divertor valve and record final idle speed.