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4/4 EFI

Morgan Owners Handbook

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Foreword

The object of this book is to provide the owner with a clear picture of the car and its needs. Technical terms have been avoided where possible.

Each car is carefully built and tested, but the continued satisfaction of the owner is largely in his own hands. The best cars will not run well unless careful attention is paid to their upkeep.

To gain the maximum pleasure and performance from your Morgan, lubricate regularly, keep all nuts, bolts and screws tight and thereby reduce rattle and unwanted noises, and lastly keep brakes properly adjusted and in good working order. Alterations and adjustments from the standard specification are not recommended but should it seem necessary our Service Department will be pleased to give advice if contacted.

VEHICLE IDENTIFICATION

In all communications with both the Agent and Morgan Motor Company please quote the chassis and engine number. This is particularly important when ordering spare parts.

Chassis number

Stamped on the top of the chassis cross member below the back of the right hand seat. Also on the vehicle identification plate on the top face of the tool box.

Engine number

This is stamped on the rear left-hand side of the engine, on the machine surface directly below the cam cover and above the rear exhaust port.

GENERAL SPECIFICATION

Engine	Ford CVH EFi
Bore of cylinder (mm)	79.96
Stroke (mm)	79.52
Cubic capacity	1597cm^3
Firing order	1, 3, 4, 2
Maximum engine rpm	6000 ***(NEVER EXCEED)***
BHP (Din @ rpm)	100 (74 kw) @ 6000rpm
Torque (Din ft/lbs)	102 (138nm) @ 2800rpm
Valve operation	Single overhead camshaft, belt driven, hydraulic tappets
Valve timing: Inlet	4°BT 30°AB
Exhaust	44°BB 10°AT
Oil capacity: Engine (refill)	3.85 litres including filter/6.8 Imp Pints
Gearbox	1.9 Litres/3.3 Imp Pints
Rear Axle	1.0 Litres/1.75 Imp Pints
Water capacity	11 Litres/20 Imp Pints
Cooling system	Water pump, radiator, thermostat and electric fan
Petrol	**95 or 98 Octane unleaded ONLY.** ***CAUTION*** The use of leaded fuel in a catalyst system will severely affect the operation of the engine and destroy the catalyst.
Tank capacity: 2-seater	50 Litres/11 Imp Gallons
4-seater	45 Litres/10 Imp Gallons

Ignition System

Type	Ford programmed electronic
Ignition timing	10°BTDC (non adjustable)
Spark Plug types	Motorcraft AGPR22CDI/ Champion RC6YC
Spark Plug gap	1.0mm/0.040in
Carburation type	Ford - Weber/Manelli indirect multipoint injection

Front Wheel Alignment and Suspension

	165 Tyres	195 Tyres
Castor angle	4°	4°
Camber	2°	1° NEG ± 0.5°
Kingpin inclination	2°	2°
Toe-in	0 to ⅛" (0 to 3.2mm)	0 to ⅛" (0 to 3.2mm)

Transmission

Clutch	Diaphragm spring mechanical, Single dry plate
Operation:	Cable
Clutch release free play	1/10" (2.54mm)
Rear axle	Three-quarter floating, Hypoid crown wheel and pinion — Ratio 4.1:1
Gearbox	Ford: Five speed and reverse, synchromesh on all forward gears

Gear ratios	Gearbox	Overall
1st	3.65	14.76
2nd	1.97	8.08
3rd	1.37	5.62
4th	1	4.10
5th	0.82	3.36
Reverse	3.66	15.01

Performance date	**(165/15 Tyres)**	
Miles per hour/1,000rpm	5th	22.37
	4th	18.33
	3rd	13.37
	2nd	9.30
	1st	5.09

General Dimensions

(165/15 Tyres)

Wheelbase	8' (244cm)
Track (front)	4' (122cm)
(rear)	4' 1" (124cm)
Ground clearance (unladen)	6" (15cm)
Turning circle	32' (10m)
Tyre size	165/15

Overall Dimensions	*2-seater*	*4-seater*
Length	12' 9" (389cm)	12' 9" (389cm)
Width	4' 9" (150cm)	4' 9" (150cm)
Height (hood erected)	4' 4" (129cm)	4' 6" (135cm)

Body Dimensions	*2-seater*	*4-seater*	Rear Seat
Seat to Hood	3' 1" (94cm)	3' 2" (96cm)	2' 9" (84cm)
Width at Elbows	3' 10" (117cm)	3' 10" (117cm)	3' 9" (114cm)
Height of Seat from Floor	8" (20cm)	10" (25cm)	13" (33cm)
Leg Room	17"-25" (43-63cm)	17"-22" (43-56cm)	19" (48cm)
Door Width at Waistline	2' 3" (68cm)		
Luggage Space:		Accommodation for hood tonneau and sidescreens behind rear seat	
Length	3' 2" (96cm)		
Width	1' 4" (40cm)		
Depth	12" (30cm)		

Weights

Complete with tools and petrol

2-seater	4-seater
1,912lb (868kg)	2,024lb (920kg)

RECOMMENDED LUBRICANTS These recommendations apply to temperate climates where operational temperatures may vary between approximately 0°F (−20°C) and 90°F (32°C). Information on recommended lubricants for use under extreme winter or tropical conditions can be obtained from the Morgan Motor Company or your local distributor.

	CASTROL	MOBILOIL	BP	SHELL	DUCKHAMS	TEXACO
Engine	Castrolite 10W/40 or TXT 10W/40	Super 10W/40 Rally Formula 5W/50	Visco Nova 10W/40	Super II 10W/40 Quadro 10W/40	10W/40 QXR 10W/40	Havoline 10W/40
Gearbox	SMX ONLY					
Rear Axle	Castrol Hypoy EP90	Mobilube HD90 or Mobilube SHC	BP Hypogear 90 EP	Shell Spirax 90 EP	Hypoid 90S	Multigear EP 85W 90
Steering Box	Castrol Hypoy EP90	Mobilube HD90 or Mobilube SHC	B Energrease FGL	Shell Spirax 90EP	LB10	Multigear EP 85W 90
Wheel Bearings	Castrol LM Grease	Mobgrease MP or Mobilgrease Special	BP Energrease L2	Shell Retinax A		Multifak EP2 or Marfak All Purpose
Chassis Grease Points	Castrol MS3 Grease	Mobilgrease MP or Mobilgrease Special	BP Energrease L2	Shell Retinax A		Multifak EP2 or Marfak All Purpose
Oil Can	Engine Oil	Engine Oil	Engine Oil	Engine Oil	Engine Oil	Engine Oil

ANTIFREEZE It is essential that the level of antifreeze should not fall below 40% at any time. Antifreeze is required during winter and summer months to prevent corrosion of the aluminium engine components. The antifreeze used should be of a recommended type suitable for aluminium or mixed metal engines.

INSTRUMENTS AND CONTROLS

Speedometer Indicates the vehicle speed and total mileage. This is fitted with a trip which is cancelled by the knob (base of instrument face) being pressed.

Oil Pressure Gauge This indicates the engine oil pressure when the car is running. The normal oil pressure should be between 40.6 - 75lb/in² (2.8 - 5.2 bar), at 3000rpm when the engine is warm. At idle speed the pressure will fall, but should still register. If no pressure registers when the vehicle is started, check engine oil level. If this is correct, consult your Morgan Dealer immediately.

Caution: Do not run an engine with low or no oil pressure. Have it checked!

Voltmeter This instrument indicates the condition of the battery on a voltmeter principle. A reading above the green sector which continues after 10 minutes running is too high and should be investigated. A reading below the green sector indicates the battery charging system requires attention. To avoid battery discharge, switch off unnecessary electrical equipment when stationary.

Water Temperature Guage This is electrically operated, acting only when the ignition is switched on. The normal reading, when running on the road, should be between 90 and 115°C. The temperature will change when driving conditions vary.

Fuel Gauge Operates only when the ignition is on, the tank capacity is: 2-seater 12.5 gallons; 4-seater 10 gallons.

Caution: The gauge is a guide to fuel level and is affected by the angle of the vehicle. It is advisable to avoid running out of fuel often, as this may damage the fuel pump.

Revolution Counter Shows engine speed in revolutions per minute and is calibrated in divisions of 100. It is of the electric impulse type. The engine safe maximum is 6000rpm.

Caution: Never allow the engine to exceed this speed.

WARNING LIGHT UNIT

(Placed centrally behind steering wheel):

(1) Direction Indicator Monitor The left-hand top indicator glows green when the steering column combination switch is moved to signal left-hand turn; the right-hand indicator operates for a right-hand turn.

(2) Ignition Warning Light (red) This serves the dual purpose of reminding the driver to switch off the ignition before leaving the vehicle and of acting as a no-charge indicator. With the ignition switch 'on', the warning light should be illuminated only when the engine is stopped or turning over very slowly. As the engine accelerates the light should dim and eventually go out at a fairly low engine speed. Failure of the light to behave in this fashion will indicate a broken alternator drive belt or other fault in the charging system.

(3) Headlight Warning Light (blue) Glows when headlights are on main beam, no light when dipped.

(4) Brake Warning Light (red) When the ignition is switched on with the handbrake applied the indicator should glow. Should failure of the front or rear brake lines occur or the brake fluid level be too low, the indicator will also light up.

Caution: Never drive a car with the brake warning light on. Have it checked!

FOOT OPERATED CONTROLS

Accelerator The pedal is connected by a cable to the injection throttle.

Foot Brake Pedal Actuates the brakes on all 4 wheels hydraulically, and also closes the circuit to the rear brake lights. These only operate when the ignition is switched on.

Clutch Press pedal to disengage drive from engine to gearbox. DO NOT REST YOUR FOOT ON PEDAL WHEN DRIVING or hold the clutch out to freewheel as this will CAUSE UNNECESSARY WEAR.

Foot Control Lubricator Front suspension lubrication control. Depress as instructed (see page 22).

HAND OPERATED CONTROLS

Handbrake This is the 'fly-off' type. To operate the handbrake pull backwards, the lever is fixed in the 'on' position by pressing the cap on top of the lever which engages the paul in the ratchet. To release brake pull the lever to the rear and allow to go forward to the full extent. Red warning light shows until handbrake is 'off'. It is advisable to engage 1st gear when the vehicle is parked on inclines. Disengage 1st gear before starting.

Heater Control The heater has three separate controls:

(1) The heater knob is on the left-hand side of the steering column opposite the ignition key. This controls the water flow to the heater radiator. The water flow and heat is turned on by pulling this control OUT.

(2) The air circulation is controlled by the knob on the front of the heater box. This is behind the dashboard, above the gearbox cover. For heat in the footwells, this knob should be pulled out. For heat to the windscreen, the knob should be pushed in.

(3) The fan switch can be used to force warm air around the car. To demist the windscreen, the heat must be on, the circulation knob pushed in and the fan used on the fast speed.

Combined direction indicator, horn, headlamp main beam and headlamp flasher control This antennae control is positioned on the right-hand side of the steering column.

(a) Direction Indicator Control Press the control downwards for right-hand turns and upwards for left-hand turns.

(b) Headlamp Main Beam Control With the headlamps on dipped beam, push the control directly away from the steering wheel for main beam operation. The direction indicators can still be operated with the headlamp main beam in operation.

(c) Headlamp flasher control Press the control towards the steering wheel to flash the headlamps on to main beam. The control is spring-loaded and will return to its original position when released.

(d) Horn control To operate the horn, press the end of the control towards the steering column.

Windscreen Wiper and Wash Control This control is effective only when the ignition is switched on.

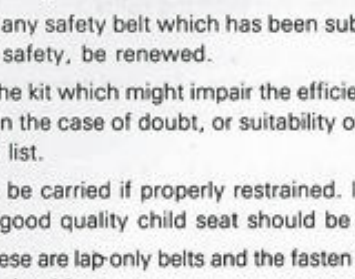
For continuous operation of the two-speed wiper move the control downwards to position '1' for slow speed, or fully downwards to position '2' for high speed operation.

For single wipe action lift the control towards the steering wheel.
To operate the windscreen washers press the knob at the end of the control.

To switch off the wipers return the control to 'O'.

Caution: Should the ignition be switched off while the wiper switch remains in its operating position during severe frost conditions, the wiper blades can become frozen to the windscreen, and when the ignition is switched on to start the engine, the wiper motor could be damaged by overloading. Be sure to switch off the wiper before switching off the ignition. Avoid using wipers on a dry screen.

Gear Lever
Always select neutral position before starting the engine



To select reverse press lever down and move to left then forward.

Do not lift, press, or rest hand on lever when in motion. Select reverse only when car is stationary.

Steering Lock, Ignition and Starter Switch This switch is located on the steering column and has 4 positions.

IMPORTANT: Take note of the key number.

1st position Steering wheel lock in operation and ignition off, key can be extracted in this position.

2nd position Moving clockwise 'garage lock'. Ignition off, but steering unlocked which allows the car to be moved and steered by hand.

3rd position Ignition on.

4th position Is spring loaded and brings in the starter motor

To prevent the starter being operated whilst the engine is running, a safety device is incorporated whereby it is necessary to switch the key back to 'garage lock' position before the starter can be engaged again.

Caution: Never allow the car to move unless the lock is deactivated.

Headlight, Side and Tail Light Switch This is a two position switch. First position side and tail lights together with number plate light and instrument light. Second position as above plus headlights.

Rear Red Fog Lamps These lights will only operate when other lights are switched on. The switch is only lit when the fog lamps are on. DO NOT USE REAR FOG LAMPS IN GOOD WEATHER.

Hazard Switch This switch when depressed operates all direction lights and should only be used when the vehicle is stationary in an emergency situation.

Fan Heater Switch Operates the two speed fan blower motor in the car heater system.

Fog Light Switch Operates both fog lights if required in adverse driving conditions (when fitted).

Instrument Illumination Rheostat Situated behind facia panel below voltmeter. Turn knob clockwise to illuminate the instruments at high intensity and anti-clockwise to reduce the intensity.

Seat Control Two types of seating are available on the Plus 4:
(1) The fixed back type bucket seat
(2) The reclining type seat

Both seats are adjustable for fore and aft movement. The reclining seat has a fine adjustment knurled knob to give varying seat back angles, and also a lever to release the back so that it may be tilted to the fully forward position.

SEAT BELTS

Wearing Never attempt to wear the belt other than as a complete lap and diagonal assembly. Do not try to use the belt to more than one person at a time, even with small children. Ensure that the belt webbing is not twisted when in use, and that the belt is adjusted to the correct tightness.

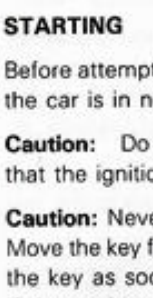


Fig A

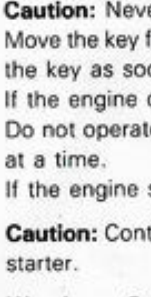


Fig B

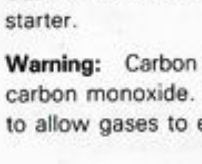


Fig C

Using the harness Take hold of the chrome connecting end, draw over the shoulder and across the chest. Push the tab firmly into the buckle unit nearest to the wearer, until a positive click is heard. Ensure that the harness is safely locked (see fig A). To release the buckle press the red button on the centre unit downward, and make sure the belt retracts into the rear (see fig B).

Adjusting The belts fitted are of the inertia reel type. Adjustment is automatic and the belt will move to allow freedom in the car. Free movement may be restricted when cornering or braking, as the locking mechanism is operated by the pitch of the vehicle. In the event of an accident the belts will lock, preventing forward movement. The lock will release automatically when the car is stationary.

Cleaning the webbing No chemical cleaners should be used on the webbing. If it becomes soiled, sponge with warm water, using a non-detergent soap, and allow to dry naturally, not by artificial heat or direct exposure to the sun.

NEVER ATTEMPT TO EITHER BLEACH OR RE-DYE THE WEBBING.

Warning:

1. Never at any time wear the lap belt loosely as this reduces its protection.
2. Periodically inspect the webbing for abrasion, paying particular attention to the anchorage points and adjusting devices.
3. In the event of an accident any safety belt which has been subject to a shock load should, in the interests of safety, be renewed.
4. Alterations or additions to the kit which might impair the efficiency of the assembly should not be carried out. In the case of doubt, or suitability of a particular model, consult the manufacturers list.
5. Small children should only be carried if properly restrained. If they are too small for a seat belt, a correct, good quality child seat should be used.

Rear Seat Belts (4-Seater) These are lap-only belts and the fasten and release is similar to the front belts, without the shoulder strap.

Adjustment This is not automatic and should be checked if different passengers are carried. The belt is adjusted by moving the strap through the adjusting buckle.

MIRRORS

Caution: Always adjust mirrors before moving off. The image in the mirrors may not be true. Accustom yourself to the type of mirror fitted before driving. The interior mirror gives the best image of vehicles behind.

Interior Mirror This is simply adjusted by moving the head. The position on the screen is set by the Department of Transport.

Exterior Mirror The head can be adjusted by means of the small screw in the rear of the mounting.

Caution: Do not overtighten after adjusting. The height on some mirrors can be adjusted by the nut fitted part-way down the stem.

WINDOWS

These simply slide forward to open, backward to close.

Caution: Do not push the two parts of the window together, this will scratch the lenses. Do not push the screen open when it is frozen, this may break the lenses.

DOOR LOCKS

To open, lift handle upward. It will automatically spring down after operation. To lock, push locking knob upwards, or downwards, depending on the lock type.

Caution: If the lock will not engage, do not force it; it may mean the door is not properly closed.
Never close the door when the lock catch is closed. If it has come down, simply open the handle to lift the catch.

FUEL FILLER CAP

The fuel filler cap is a flip type. To open press in the back part of the latch at the top of the cap. When fitted with a lock, the key must be turned before the catch is opened. The key cannot be removed when the cap is unlocked.

Caution: Never close a locking cap with the key or lock in the locked position, this may bend the lock bar and prevent opening.

Fuel Types The 4/4 EFI must be run on UNLEADED FUEL ONLY — 95 or 98 Octane premium grades.

Caution: The use of ***LEADED FUEL*** or incorrect grades will seriously damage the engine and catalyst.

WARNING: Petroleum Spirit is highly flammable and in confined spaces is toxic and explosive. Never fill the tank with the engine running, or near naked lights or hot surfaces. **Do not** inhale fumes. Have possible fuel leaks checked by experienced personnel. **Do not** use any other fuel than standard petrol. **Do not** over-fill the tank. Always ensure that the filler cap is properly closed before starting the car.

DRIVING INSTRUCTIONS

STARTING

Before attempting to start the car, make certain that the handbrake is fully applied and the car is in neutral.

Caution: Do not operate the accelerator pedal when starting. Turn the key and ensure that the ignition/steering lock is free.

Caution: Never allow the car to move with the steering lock engaged.
Move the key forward to the ignition position and rotate the engine until it starts. Release the key as soon as the engine is running.
If the engine does not start. Release the key, pause for five seconds and try again. Do not operate the accelerator. Do not operate the starter for more than 15 seconds at a time.
If the engine still fails to start. Switch off the ignition and investigate the cause.

Caution: Continued operation of the starter will discharge the battery and damage the starter.

Warning: Carbon Monoxide is dangerous. Do not breathe exhaust gases which contain carbon monoxide. Before starting the car, be sure that there is sufficient ventilation to allow gases to escape.

ENGINE START

When the engine first starts, under certain conditions, the hydraulic tappets may emit a rattling noise. This is due to oil having drained from the hydraulic system when the vehicle was standing.
The level of oil will automatically recharge the tappets and the noise cease after a period of engine running. After the engine has been standing for long periods, or in very cold weather, this noise may last for some minutes. In these cases the car may be driven, but the engine speed should remain below 3,000rpm, until the noise ceases.

STARTING IN COLD CONDITIONS — (10C)

Before operating the starter, depress the clutch. When the engine starts, release the clutch slowly.

Warming up As soon as the engine is running and the instruments are reading correctly, the car may be driven. The tick-over will be adjusted by the fuel injection and may run a little higher than normal while the engine is cold. The tick-over may also fluctuate for a short time when electrical equipment is switched on.

Caution: Avoid harsh acceleration or labouring at all times, but especially when the engine is cold. It is recommended that the car is run carefully until the normal running temperature is reached.
When the vehicle reached normal operating temperature, check that all the instruments are reading correctly.
Under cold conditions, the gearbox may appear stiff whilst the car is cold. Operate the gears carefully, allow time for the clutch to free the box and the lever to travel between the gate.

BRAKES

When first driving a new car, the brakes will require bedding-in. This also applies when brake surfaces have been replaced. During the first 200 miles, avoid heavy or continuous braking.

WARNING

Wet Brakes Driving through deep water, or during heavy rain and slush conditions may reduce braking efficiency. As a result braking will not slow the car as quickly. If heavy rain or deep water are encountered, before braking a light application should be made to clear water from the brake surfaces.

Caution: If discs are wet, the car may not brake in a straight line. Brakes should be cleared as soon as possible, away from other traffic. Always allow a greater distance from other traffic in wet conditions.

Warning: If the brake warning light comes on while the car is in motion, this may indicate a failure in one of the brake circuits. You should stop immediately, braking slowly, as the brake efficiency may be reduced. Investigate the cause, and if satisfied that you may continue, do so, but take great care. Do not brake heavily, and have the car examined at the next available garage. If you are not sure, do not continue, but call for assistance.

Caution: Never drive with the handbrake applied.
Never rest your foot on the brake pedal when not in use.
Take care when descending steep hills — brakes may overheat and reduce efficiency if constant braking is required.

RUNNING IN

During the first 30 hours or so of their working life, the moving parts of a new car require a 'bedding-in' or polishing process, such as is provided by light and medium running. Long trouble-free life, particularly of engine, rear axle and brakes depends on this careful running-in, which can only be achieved by restraint on the part of those who drive the vehicle during its initial time.
The engine may seem to lack power for the first 200 to 300 miles (320-480km) whilst this process is taking place. The power will then improve as the car is used for the first 2,000 miles (3,200km), and this will be accompanied by a corresponding improvement in fuel consumption.

It is suggested that for the first 500 miles (800km) engine speed should not be exceed 3,000rpm.
Both long periods of idling and excessive racing of the engine should be avoided at all times and particularly during warming up from cold.
Do not allow the engine to 'labour' especially when driving up steep hills. At the first sign of this, change down, bearing in mind that changing down too early can result in undesirable racing of the engine.
Vary the rpm occasionally whenever possible, releasing the accelerator now and again to give the engine a better start in life.
As the machined surfaces approach their optimum condition, it becomes necessary to reset the adjustments to suit the more flexible engine. Your Morgan dealer will attend to this when he carries out the first service.
Due to the good power to weight ratio of the Morgan car, complete free running of the engine and other parts may take longer than the initial running-in period. Full engine power may not develop until the vehicle has covered over 5,000 miles.

FIRST SERVICE

After the first few weeks or 1,000 miles, the car should be returned to the supplying dealer for a 'First Service'.
At this time the car will have settled into a normal running pattern and the 'bedding-in' process should be completed.
Your dealer will examine and reset the engine where necessary. At the same time all the oils should be changed, along with the engine oil filter. This will remove any materials released during the 'running-in' process.
Any points you have noticed may prove useful to your dealer and should be mentioned when you deliver the car for service.

ROUTINE MAINTENANCE AND ADJUSTMENTS

Introduction

In this section will be found information necessary to maintain your car in good mechanical condition in a temperate climate. Details of the intervals of service may be found in the schedule at the back of this book. The time between examination is dependent on many things, particularly the type of use and the road conditions. In dusty conditions or regular town journeys the time between services must be reduced. If a car is not in use for long periods, the need for regular attention is as great as for a vehicle in every day use.
The following details, along with services from your Morgan distributor or dealer, will help to prolong the life and enjoyment of your car.

Regular Checks:

1. Front suspension lubrication (every 200 miles or as necessary)
2. Daily checks: Lights
   - Horn
   - Indicators
   - Windscreen wiper and washers
   - Mirrors
   - Brakes operation (foot and hand)
3. Weekly checks (or before long journeys)
   - Engine oil level
   - Engine coolant level
   - Antifreeze
   - Washer bottle level
   - Battery fluid
   - Brake fluid
   - Clutch fluid
   - Tyre pressures and condition
   - Lubricate all locks and hinges (including bonnet hinge)

MAINTENANCE PRECAUTIONS

Warning: The following safety precautions must be observed when the bonnet is open and the engine is running or the ignition is switched on.
Do not work beneath the car with the vehicle lifting jack as the only support. Place suitable stands under the car as a safety precaution.
Keep hands, tools and items of clothing clear of all drive belts, pulleys and operating mechanisms. Beware the cooling fan may operate even though the engine is not running.
Avoid skin contact with all exhaust system components. They may be hot and will burn you.
Do not touch the ignition coil, distributor, ignition cables or connectors, you may receive an electric shock. On vehicles fitted with electronic ignition systems the electric shock could be severe.
Carbon monoxide is a dangerous gas and can cause unconciousness and may even be fatal. Do not breathe exhaust gas because it contains carbon monoxide which by itself has no colour or odour. Never start or leave the engine running in an enclosed, unventilated area.
Keep children and pets clear of the car. Do not allow anyone inside the car unless specifically working to your instructions.
Whenever possible work in the engine compartment with the engine stopped and the battery disconnected.

DANGEROUS SUBSTANCES

Warning: Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should, so far as possible, be kept from contact with the skin. These substances among others include acid, anti-freeze, brake fluid, fuel, windscreen washer additives, lubricants, and various adhesives. Particular care should be taken to avoid unnecessary contact with used engine oil. Always read carefully the instructions printed on labels or stamped on components and obey them implicitly. Such instructions are included for reasons of your health and personal safety. Never disregard them.

Fuel Tank Filling

Warning: Petroleum spirit is highly flammable and in confined spaces is also explosive and toxic. In the event of inadvertent spillage, switch off engine, use no naked flame or light. Do not smoke.
As stated before, the **4/4 EFI MUST BE RUN ON UNLEADED FUEL ONLY — 95 or 98 Octane premium grades.**

Caution: If you are uncertain about the fuel at petrol stations, ask the attendants. The Octane should be to research Octane number (RON) grades. Never use lower grade fuel.

COMPONENTS CONTAINING ASBESTOS

Safety Instructions

Warning: Certain components such as front and rear brake pads, clutch plates, heat shields and certain gaskets fitted to your vehicle may contain asbestos. Inhaling asbestos dust is dangerous to health.
The following safety instructions must therefore be observed when working with these components:
Wear a protective breathing mask suitable for asbestos dust.
Never use an airline to blow dust from components.
Clean friction components using methylated spirit.
Replace worn components with recommended replacements.
Operate if possible out of doors or in a well ventilated place.
Preferably use hand tools or low speed tools equipped, if necessary, with an appropriate dust extraction facility. If high speed tools are used, they should always be so equipped.
If possible, dampen before cutting or drilling.
Dampen dust and place in a properly closed receptacle and dispose of it safely.

Servicing and Adjustments

The importance of regular servicing cannot be over-stressed. Your local dealer can offer the full range of facilities and maintain your car to a high standard.
With the increase in high technology engine management, the level of equipment and method of adjustment for engine running has become more complex. It is essential that the correct equipment is used when re-tuning a Morgan engine. The wrong testing equipment can cause expensive failure in electronic controls and seriously affect the engine workings.

Some of the items in this book may be carried out by the owner, with advice from your Morgan dealer or the factory.

Caution: Never undertake any work you are not certain of. Never make modifications to standard equipment, especially safety related modifications such as brakes, seat belts or steering.

Warning: You are ultimately responsible for the safety of your car. You should always discuss changes to specification with your dealer or the factory.

Slow running and mixture control

The tickover and mixture adjustment are both linked in the fuel injected engine. To obtain the correct adjustment, a gas analyser is required. It is recommended that this is only carried out by an approved garage.
The ignition and injection system on this car will adjust the tickover automatically if the engine is under load, e.g. when the car is first started or the alternator is working hard. As the load reduces the tickover will return to normal. If it remains high, consult your dealer as soon as possible.

Warning: Do not attempt to alter the tickover by adjusting the throttle cable. This can cause problems with the injection system.

LUBRICATION

Engine

Caution: Always use high quality oils of the correct viscosity for topping-up and refilling. Always try to use the same oil for topping-up as was used at the service. Never mix mineral oils with synthetics. See chart at the front of this book for details of oils and grades.

Engine Oil Level

Should be checked every week. Stand the car on level ground when the engine is warm, allow time for the oil to return to the sump and remove dipstick. Clean the stick and replace in the tube by the manifold pipes at right front of the engine. Withdraw the stick again and read the level. The level should fall between the two marks at the bottom of the rod. Do not fill above the 'max' mark.

Warning: The dipstick is situated close to the inlet manifold. When the engine is warm the manifold will be extremely hot. The metal of the dip-stick may also be hot.

Oil change

The engine oil should be changed every 5,000 miles. Run the engine to normal temperature. Switch off the engine and remove drain plug from the right-hand side of the sump. When the oil has drained completely, clean and replace plug. Fit new plug gasket if necessary. Fit a new oil filter (see below) and fill with the correct grade and quantity of oil (see page 5). Replace the filler cap on the left-hand rocker cover and run the engine for a short while. Remove the dip-stick right of engine and wipe clean. Replace stick to full depth and remove again to examine level. The level should be just on the second mark. Never overfill the engine.

Warning: Care should be taken when draining engine oil as it may be very hot. Prolonged exposure to used engine oil can cause serious skin disorders. Avoid excessive contact with skin or use protection.
The radiator fan may operate even when the ignition is switched off. Take care not to work near the fan until engine has cooled sufficiently.

Oil Filter

The filter should always be changed when the engine oil is replaced. The filter cartridge is located below the inlet manifold on the side of the block. To remove, turn the filter anti-clockwise until clear of the thread. Discard the old filter. Clean the thread and face of the mounting with a dust-free cloth, lightly oil the sealing ring on the new filter and screw into place in a clockwise motion. Tighten until the seal is in contact with the face and then make half a turn more. Do not over-tighten. Start engine, check oil pressure and examine for leaks. Be sure to check oil level after filter change.

Gearbox

At every service the gearbox oil level should be checked and if necessary topped up with the correct grade of oil. The filler plug is located on the left-hand side of the box. To reach the plug lift the left side of the material cover, by undoing the lift-a-dots. The access hole is at the front of the cover, near the bulkhead, and at the bottom.
The oil level should be just below the filler hole.

Rear Axle

It is essential to replace the axle oil every 5,000 miles. The special type of gears fitted allow the axle to move freely, but the pressure between the teeth is too high for normal oils. It is most important to use a good quality 'Hypoid' gear oil when refilling.
The axle has a drain plug in the base of the centre casing. This has a square head. When the oil has completely drained and the plug refitted, the axle should be refilled with the correct oil, to the base of the filler hole in the back plate. Again care must be taken when handling hot oil and used oil.

Air Cleaner

The injection system fitted to this car detects the level of air drawn into the engine, and uses this information to control the fuel level. It is most important that the air flow is not restricted. The air cleaner should be changed every 10,000 miles, or more frequently in dusty conditions or regular town use.

The element can be removed by releasing the four clips around the top of the case. The element is free to be removed. When replacing, use the correct specification of element and make certain that it is fitted correctly on the raised areas in the cleaner and on its lid. Be sure the lid is properly secured and the air pipe still attached.
While checking the air cleaner the pipes connecting it to the engine should be examined. It is most important that air does not leak into the system as this will affect the running of the engine. The clips should be checked for tightness and the pipes for damage. If a pipe is damaged be sure to replace it with one of the correct specification.

Catalytic Converters

Vehicles fitted with catalysts are designed to have reduced exhaust emissions. Although the catalysts require no maintenance, the joints around them and the wiring to the oxygen sensor (Lamda Sensor) must be kept tight and in good order.
At each service the emissions should be checked and any adjustments made.
This must be carried out by a qualified person.
After a period of up to 50,000 miles the catalyst units may need replacing. This must be done using the correct specification obtained from your Morgan Dealer.

Caution: The catalysts may be externally hot, as with all exhaust fittings. ***DO NOT TOUCH UNTIL COLD.***

Warning: Never carry out work on the ignition, injection or exhaust system. This will affect emissions and may be illegal.

IGNITION

Spark Plugs

The spark plugs should be checked every 5,000 miles for the correct gap. The electrode and body should be cleaned and examined for damage. If the plug shows any sign of damage or deposits it must be replaced.
When fitting new spark plugs be sure only the correct specification is used and the gap correctly set.

To Remove Plugs

Clean the area around the plugs and then remove the caps. Do not pull them by the leads. Carefully remove the spark plugs with the correct size spanner. Be sure the spanner will not damage the plug insulation.

Warning: Never carry out work on the ignition system with the circuits on! The charges generated by electronic systems can give severe shocks, and discharges may damage the controls.

Warning: While the plugs are out, be certain that no material of any kind enters the holes! Set the gap on each plug to the correct size and clean the insulation. Fit the plug to the spanner and gently place into the tube. Tighten the plug with your fingers or the spanner only. DO NOT tighten if there is any resistance. When the plug is finger tight, tighten by a maximum of one quarter turn only. Do not overtighten. Refit the plug leads in the correct order.

When checking the plugs, always check the plug leads and contact for wear or damage. Always replace with the correct specifications.

Warning: Under no circumstances should any modification to ignition or fuel system be attempted.
The ignition system fitted to this car needs no adjustment by the owner.

Cooling System

Warning: As injury such as scalding could be caused by escaping steam or water, do not remove the pressure relief cap from the expansion tank whilst the system is hot. Wait until the system is cold, use a cloth or glove to protect hands from escaping steam and slowly unscrew the pressure relief cap one complete turn, wait until all pressure is released and remove the cap slowly from the expansion tank.

Engine Coolant

It is essential that the engine is supplied with sufficient water/antifreeze mixture at all times.
In an engine of this type, antifreeze or water additive must be present in the water at all times. Antifreeze should be kept at a minimum of 40% by volume. For details of quantities refer to Page 2.
Whenever the car is serviced and periodically between these times, the coolant must be checked. At the same time it is recommended that all the hose clips and hoses are examined for tightness and damage. Any persistent loss of water should be indicated to your dealer when the car is serviced, or before if the quantity seems high.
It should be noted that when the expansion tank is filled above the marking tag inside, water will be discharged when the engine is hot. It should not be necessary to top up further as the system will reach its own level.

Thermostat

The thermostat controls the flow of water from the engine. It is contained in the housing at the rear of the engine on the right-hand side. The rear hose connects to it. The thermostat should be fully open at 89°C. In extreme temperatures it may prove beneficial to use a lower temperature thermostat. The thermostat should be checked during services and replaced if not operating correctly. Never run the car without a thermostat.

Electric Fan

This fan is positioned behind the radiator and is operated by a temperature switch in the cylinder head. The fan will start to run when the engine temperature reaches 94°C. It will cut out when it reaches 86°C. If the fan appears to run continuously, it should be examined by your Morgan dealer.

Warning: Do not allow tools, hands or clothing to come in contact with the fan. The fan may operate without warning, even with the ignition switched off!

Radiator Cap

The cap on the radiator is of the sealed system type and should only be removed if the radiator has been completely drained and requires a total refill. For normal topping-up the cap on the overflow bottle should be used.

Warning: When the engine is hot removing the radiator or overflow bottle cap may release very hot water. Cover cap before removing, preferably do not remove until cold.

Windscreen Washer Bottle

Is located under the bonnet at the rear of the engine on the opposite side to the steering column and is attached to the metal front. The level must be checked regularly, especially during the winter. In cold weather it is recommended to use an antifreeze and windscreen cleaner, to prevent freezing and aid cleaning.

Caution: Do not use engine coolant antifreeze, only specially prepared solutions for washer systems. Follow manufacturers instructions carefully.

Fuel Pump and Filter

The fuel pump and filter are located under the luggage compartment board. On the four-seater the filter is mounted on the balance in the engine compartment. There is no maintenance required and any problems should be referred to your dealer. Under no circumstances remove the pipes from the pump. It should be noted that the pump only operates when the engine is running, not when the ignition is first switched on.
The filter should be changed every 20,000 miles under normal running conditions.

Warning: When changing the fuel filter, petrol may be left in the filter body or system. Great care must be taken to avoid spillage, and no forms of heat or flame should be near. Petrol vapour and petrol are highly inflammable.

Alternator Drive Belt

The alternator is fitted on the left-hand side of the engine at the front. At every service the belt tension should be checked. The belt should be pressed by the thumb and a movement of no more than ½" should be felt. The belt should also be examined for cuts or rubbing and replaced as necessary.

To adjust or replace the belt:

1. Slacken the retaining bolts on the engine block and the top adjustment bracket.
2. Move the alternator inwards or outwards until the correct tension is obtained.
3. Retighten the mounting bolts.

Warning: Do not overtighten belt as this may cause strain on the alternator. Be sure that the belt is correctly aligned in both pullies.

Camshaft Belt

The condition of the camshaft belt and the tension must be checked at each major service. This is best done by your local dealer. Special equipment is required to adjust the tension correctly. The belt should be free of oil of other contamination. If there is any sign of damage the belt must be changed. The belt should be changed at least ever 30,000 miles.

Warning: Failure of the camshaft belt or incorrect adjustment will cause serious damage to the engine. If in doubt have it checked immediately.

Clutch Cable

The clutch cable is located on the right-hand side of the engine near the bulkhead. At every service the cable must be checked and if necessary adjusted. If lubrication of the cable is required, it is recommended that 'Teflon' or P.T.F.E. lubricant is used. Ordinary oil may affect the nylon lining. All pivots and levers should be greased.

Pedal Assembly

When a service is carried out, the pedal bar should be greased or oiled. The accelerator should be lubricated at the pivot and on the roller. Care should be taken to wipe excess lubricants from the pedal rubbers or surfaces.

Front Suspension

Lubrication of the sliding axles is carried out by the 'one shot' lubrication system. The plunger which operates the system is situated in the top area on the left of the steering column above the drivers clutch foot on the scuttle. The plunger should be depressed every 200 miles (370km), when the engine oil is cold. The plunger should be held down for a few seconds during which time a very small decrease in oil pressure may be noticed on the oil gauge.
The sliding axles are also provided with grease nipples which should be lubricated with grease every 5,000 miles (8,000km). The grease helps to retain the oil supplied by the 'one shot' system.
In addition to lubricating the sliding axles and hubs, the damper blades and shims should be oiled and greased.
The damper blade is the piece of spring steel running from the stub axle to the chassis. This should be cleaned and greased at every service. The fittings should also be checked for tightness. On certain cars which have covered considerable mileage, faults are sometimes noticed in respect of front wheel vibration even though the wheels are correctly balanced. This can be overcome by making sure that the flat spring sheet blade mounted from the stub axle to the chassis side member is secured without any radial movement at the chassis end. This blade should slide inwards and outwards only. Any sideways or radial movement should be reduced to a minimum by adjusting the shims. These shims are locked in place by the two bolts which secure the flat steel clamps to the chassis. It may also be necessary to renew the damper blades if worn edges are apparent.*These blades should be greased regularly. Your dealer will test for this at each service and replace the blades when worn. In bad weather conditions the damper blades should be examined between services.

Warning: The importance of frequent lubrication to the sliding axles cannot be too highly stressed as comfort is to a large extent dependent on the free working of these parts, and neglect will result in tightness which not only makes the springing harsh, but results in excessive wear, necessitating renewal before it should be necessary. Excessive lubrication may contaminate the brake surfaces.

Great care should be taken to ascertain the required level of use for the lubrication system. This will vary according to the level of use of the vehicle and the conditions. If you are concerned at the amount of oil around the base of the suspension, consult your dealer about an increase in the interval between operations.

Steering

At every service the steering joints, stub axles and steering rack must be examined. The level of oil in the steering rack should be checked and topped up as necessary. Any excessive loss of oil should be reported to your dealer. Your dealer will adjust the steering rack if this proves necessary after long periods of use.
The track rods should be checked for tightness and the ball joint rubber for damage. Where necessary the ball joints should be greased.
The stub axles should be greased to allow free movement. Do not overgrease as this may contaminate the brakes. Any excess should be removed.
The universal shaft joints should be examined and if worn the shaft replaced. The pinch bolts should be checked for tightness.
The wheel alignment should be checked at every service and after any work on the front suspension. This should be done with the correct equipment and is best carried out by your dealer.

Shock Absorbers

At every service the shock absorbers should be examined for oil leaks and for operation. The mountings should also be checked for tightness. If found faulty the shock absorbers should be replaced in pairs as the performance of a new one will be different to the original and may affect the handling.

Suspension

Front: At every service and periodically between, the tightness of all suspension fittings should be checked. The front suspension bushes should be checked for wear and wheel bearings for adjustment.

Warning: Front wheel bearings must not be overtightened. They should be tightened until the nut is just tight and then turned back to the first available split pin hole. This is best carried out by your dealer.

Rear: As with the front, at every service all fittings must be checked, especially the tightness of bolts, including the U-bolts and spring shackles.
The rear leaf springs should be lightly treated with engine oil, especially at the tips of the leaves.

Caution: Do not allow oil to come in contact with the rubber bushes, as this will cause the rubber to brake down. If the bushes need lubrication use a rubber safe lubricant such as P.T.F.E.

Chassis

At the same time as the suspension is being checked, the chassis and frame front should be examined for damage and the tightness of fittings. It is recommended that some form of corrosion protection is used regularly to aid that used in production. Old engine oil or modern wax treatments may help extend the already long life of underbody parts.

Warning: Care should be taken in the use of underbody treatments as they may contain harmful solvents. Read instructions carefully.
Never work under a car supported only by a jack. Your dealer will recommend suitable treatments for the underside of your car.

Wheels and Tyres

Tyre Pressures: Tyre pressures should be checked at least every week and at every service. The maximum life and performance will only be obtained by correct maintenance.
For normal use the tyres should be set at 18 PSI or 1.3 BAR on all four road wheels and the spare.
For 195 Tyres 22PSI or 1.5 BAR.
For long term high speed work or competition you should contact your dealer or the factory for alternative pressure settings.

Warning: You are legally required to maintain your tyres to a good servicable standard. You should only use the recommended wheels, wheel fasteners and tyres fitted to the correct standard.
Tyres must be replaced with those of the same specification and quality originally fitted. Do not drive on tyres or wheels showing any sign of wear or damage. Tyres must be replaced as soon as the wear indicator in the tread is level with any part of the tread. Worn tyres are dangerous, especially on a performance car. They may cause changes in the handling, particularly in wet conditions.
Always maintain the correct pressures and wheel alignment. Always check pressure when the tyres are cold.

Valves and Caps

Always refit valve caps and screw down firmly by hand. They prevent dirt entering the valve and help to seal it.

Tyre Care

Check tyres as often as possible, avoid contact with hard objects, i.e. kerbs, pot holes etc. as these may damage the tread or tyre cords. Avoid contact with oil, petrol, paraffin and brake fluid as these may damage the rubber. Always remove flint or sharp objects from the tread as these may work into the tyre and cause damage.

Wear Indicator

The original tyres fitted to your car have wear indicators in the tread pattern. These will appear as a bar across the pattern when 1.5mm of tread is left. The tyre must be replaced when these appear.

Tyre Repairs or Special Uses

Repairs or specialised tyres should only be carried out or supplied by fully qualified personnel from accredited tyre centres. Your Morgan dealer will be able to supply information or arrange the correct services.

Wheels

To remove wheels, jack up the car (see jacking). Be sure the car is on level ground and the brakes are applied. Fit the spanner over the nut at the centre of the wheel and strike with the hammer on the lugs at each side. Once free remove by hand.

Warning: Take great care to avoid hitting hands and arms. Also watch for contact with the bodywork which may deflect the hammer.
The direction in which the nut should be turned to release the wheel is marked on the centre.
To refit the wheel, slide the centre carefully over the splines, if possible apply grease to the splines before fitting. Refit the nut until hand tight by turning in the opposite direction to the 'undo' arrow.

Warning: Be certain that the nut is refitted to the correct side, marked on the centre of the cap. If this is not done the wheel may release in motion.
Refit the spanner to the nut and strike the lug in correct direction to tighten.

Brakes

Warning: The importance of brake maintenance cannot be over-stressed. You are legally required to keep the braking system to a required level.
Brake pads and linings must be renewed in axle sets. Failure to do so will seriously affect the operation of the system.
Any drop in reservoir fluid level or operation standards must be reported immediately to your dealer.
Never make modification to the braking system. Changes must be carried out by trained personnel. It is recommended that all repairs and brake services should be carried out by your dealer.
Care must be taken when handling brake fluid as it may cause skin problems. Follow manufacturers instructions carefully. Use only new brake fluid. Never leave fluid exposed to the air as it will absorb moisture.
Brake fluid will damage paint and other finished surfaces.
Use only Girling Universal brake fluid or equivalents.

Brake Fluid Reservoir

The brake fluid reservoir is situated under the bonnet on the bulkhead on the same side of the car as the driver.
Every 5,000 miles (8,000km) remove the cover and check fluid level in the reservoir. If necessary replenish to within ½" (12mm) of the top with Castrol Girling Universal Brake Fluid. Replace cover ensuring that the rubber sealing ring is in good condition and that the ventilation hole is unblocked.

If significant topping-up is required check the master cylinder, slave cylinders and pipes for leakage; any leakage must be rectified immediately.
After approximately 3 years or 40,000 miles (64,000km) the seals and cups of the hydraulic system should be inspected and if necessary replaced.

Brakes

The brakes will be inspected regularly during normal servicing but should the car be used for competition work, brake wear will be much more rapid and therefore inspection and perhaps replacement of pads or shoes may be necessary during the period in between.
Cleanliness is essential when dealing with brakes, as no method is known of successfully removing grease or oil from brake linings. Always replace with genuine Morgan relined shoes or pads as they will have the correct grade of lining, ground to the correct contour and inspected to conform to the original specification.

Front Brake Pads

Hydraulic disc brakes are fitted to the front wheels and the correct brake adjustment is automatically maintained, no provision is therefore made for adjustment.
Every 5,000 miles (8,000km) (more frequently if used in competition), check the thickness of the brake pads and renew if the minimum thickness is less than ⅛" (3mm). Also check for oil contamination of brake pads and discs.

Removal

1. Jack up front of the car and remove road wheels.
2. Remove hairpin clips and withdraw the pad retaining pins.
3. Withdraw pads complete and anti-rattle springs and damping shims.
4. Measure the linings and if less than ⅛" (3mm) renew pads. If pads are not to be renewed mark each one in order that it may be fitted in its original position.

Replacement

1. Push in the pistons with an even pressure to the bottom of the cylinder bores. Then slide the pads into position, together with the damping shims. Ensure arrow cut-out in shim points in direction of rotation.
2. Refit the anti-rattle springs if included, one on each pad then replace the pad retaining pins, ensuring that the anti-rattle springs are clipped under the pins. Fit new hairpin clips.
3. Pump the foot pedal until a solid resistance is felt. This re-positions the piston and puts the pad in slight frictional contact with the disc.
4. Refit the road wheels, remove car from jack and road test car.

Rear Brake Drums

Hydraulic brake drums are fitted to the rear wheels and should be inspected and checked every 5,000 miles (8,000km) or before if the brake pedal has excessive free movement. To adjust proceed as follows:

1. Jack up rear of vehicle and remove rear wheels (the last operation is not essential but makes the task easier).
2. Turn the adjuster nut in a clockwise direction until the shoes contact the drum and release back one or two notches until the drum is free. The single adjuster is placed facing a forward direction on the backplate.

Rear Brake Shoe Replacement

1. Jack up the car and remove road wheels.
2. Remove the countersunk screw and take off brake drum.
3. Dismantle the brake by prising one shoe out of the groove in the wheel cylinder piston with a large screwdriver. Both shoes and pull-off springs can now be removed, leaving the wheel cylinders and pivot pins in position on the backplate. Do not detach these units from the backplate. To prevent loss of brake fluid, place an elastic band over the wheel cylinder pistons to hold these in place.
4. Clean down backplate and check wheel cylinders for leaks and freedom of motion. It is important that the adjuster is turned back (anti-clockwise) to the full 'off' position and is working freely.
5. To fit replacement shoes, first attach shoe springs (new if possible) to shoes. Be sure that the springs are between the shoe webs and backplate, otherwise shoes will not be flat on backplate. Keep all grease off linings and do not handle linings more than necessary. Place shoes with spring attached against backplate. Shoes have half round slots at one end. Fit these slots to the pivot pin, then insert the other end of the shoe in the wheel cylinder piston. Place the screwdriver under the web of the remaining shoe and against the backplate. Ease the shoes into the grooves on the piston.
6. Refit drums; be sure these are clean and free from grease etc.
7. Tighten up adjusters until the wheel just locks and then slacken off until the wheel spins freely.
8. Refit road wheels, jack down and road test.

The Handbrake

Adjustment of the rear brake shoes automatically re-adjusts the handbrake mechanism. The rods are correctly set before leaving the works and only maladjustment will result from tampering with the mechanism. Cable adjustment may be made by turning the adjuster at the rear of the handbrake cable. The lever compensating mechanism on the rear axle should be kept free and well oiled.

Bleeding the System

Except for periodical inspection of the fluid level in the reservoir chamber and lubrication of the handbrake cables and connections, no attention should be necessary. If, however, a pipe joint is uncoupled at any time, or the wheel cylinder cups are inspected or replaced, the system must be bled in order to expel any air which may have been admitted. Air is compressable, and its presence in the system will affect the working of the brakes.

1. Wipe clean the bleeder nipple of the brake concerned and fit a piece of rubber tube over it, allowing the tube to hang in a clean container partially filled with fluid, so that the end of the pipe is below the level of the fluid.
2. Unscrew the bleeder nipple one complete turn with a suitable spanner. There is only one bleeder nipple to each wheel.
3. The fluid reservoir of the master cylinder must be topped up before commencing the bleeding operation, and must be kept at least half filled during the whole operation, otherwise more air will be drawn into the system via the master cylinder. Always clean the area around the screwed cap before removing it, this will lessen the risk of grit falling into the chamber after removal.
4. Depress the brake pedal quickly and allow it to return without assistance. Repeat this pumping operation with a slight pause between each depression of the pedal. Observe the flow of fluid being discharged into the glass jar and when all air bubbles cease to appear, hold the pedal firmly down and securely tighten the bleeder nipple.

Note: Depending upon the position at which a pipe joint has been uncoupled it will be necessary to bleed the system at either both front or both back wheels. If the pipe was uncoupled at the master cylinder then the system must be bled at all four wheels.

Propshaft

The propshaft is provided with two grease nipples, one in the front and one in the rear. These should be greased at every service. They should be examined more regularly in adverse conditions such as dusty roads.

Warning: Never work near a moving propshaft or onre which could move.

Caution: If the vehicle is to be towed with the rear wheels in contact with the road and the engine not running, the propshaft should be disconnected.

Fuel Filler and Lines

At every service the lock (where fitted); the catch; and the hinge should be oiled. The filler hose and clips must be checked for damage and security of fitting.
While checking the filler hose, examine the tank sender unit for seal, tightness and good electrical connections. Pay particular attention to the earth connection.

Warning: Petroleum spirit is highly inflammable. Never work near the fuel system with any heat source. The vapour is as dangerous as the liquid. Avoid sparks or any action which may ignite the vapour.

Fuel Lines

At every service the fuel lines must be checked for leaks or damage. Any repairs are best carried out by your Agent or a qualified mechanic. Damaged fuel lines are best replaced.

Warning: Never use a vehicle with petrol leaks. Have the vehicle examined by a qualified person before any attempt to start the vehicle or use the electrical equipment.

Electrical Equipment

WARNING: Never make alterations, add equipment or change specifications or electrical equipment. This may cause wiring faults or over-heating and result in fire. If you wish equipment to be added, consult a qualified auto electrician or your Morgan dealer. Never change the rating of the fuse to cure a fault, always have the true problem detected by a qualified person.
Do not modify the ignition circuits or fit any form of ignition cut-out system. This may damage the system and cause high voltage discharge.

Battery

The battery is located under the saddle board behind the seats. It is reached by releasing the two studs at the rear of the carpet, then pulling the carpet forward. Turn the two clips at the front of the board away and lift the board.
On the 4-seater, the battery is also in the rear, but access is through the cover behind the left-hand side in the heel board.
At every service the battery should be carefully checked and cleaned. The terminals must be clean and covered with petroleum jelly. The retaining bolts should always be tight. If the terminals are corroded, they should be cleaned and recovered with petroleum jelly.
Clean the battery top and case, avoid pouring water or other fluids over the battery and wipe case with damp cloth.
The battery should not need topping up between services. The fluid level should not be more than 3mm above the plates.
Should acid contact skin or eyes, wash with cold water immediately and contact a doctor.
Never disconnect battery with engine running.

Fuse Box

The fuse box is mounted under the dashboard, on the metal front, above and to the right of the gear lever. The card next to the fuse box indicates the fuse rates which relate to the numbered slots in the box. Each fuse is individually marked with the correct rating.

Warning: Never use a different rate fuse to repair a circuit. Never attempt to repair fuses with wire or other items.
Control relays are fitted near the fuse box or on the front of the tool box under the bonnet.

Battery Cut-Out Switch

This vehicle is fitted with a battery cut-out switch.
This is positioned between the seats and is operated by the large red key fitted. To activate the switch; seated in the vehicle, turn the key to the left fitting. To switch off turn to the right and remove if the vehicle is to be unattended.

Inertia Switch

The inertia switch is fitted to the side of the tool box under the bonnet. In the event of an accident or heavy impact, this switch is thrown and cuts off power to the fuel pump. The switch can be reset by pushing the button on top of the box down.

Caution: Never reset this switch before all fuel lines, tank, pump and filter have been carefully checked. ***DO NOT MODIFY THIS SYSTEM IN ANY WAY.***

Headlamp Beam Setting

This operation should be carried out every 10,000 miles (16,000km), but is best left in the hands of your garage. They can however be set reasonably accurately as follows:
Place the car 25ft (7.6m) away from a blank wall, taking care that the car stands on a level surface, and that the front of the car is parallel to the wall. The car must be unladen. Do this job at night, or pick a spot which is well shaded, so that the light spots thrown by the lamps can be clearly seen.
When correctly set the light spots from the lamps should be 2½" (63mm) below the centre of the headlamps. The beams should also be parallel with each other. If they require adjustment, remove the moulding surrounding the lamp — and the beam adjustment screws will be exposed.
The top screw controls vertical adjustment and the lower screw the horizontal adjustment. It is preferable to start with the screws well in so that the moulding does not interfere with them when replaced.

Headlights

The headlights are of the Halogen type with H4 12 volt clear bulbs (export yellow). To renew the headlight bulb, remove the screw at the base of the rim and the complete rim. Undo the three crosshead screws and carefully pull the lens forward. Remove the rubber cover and the wiring socket. Unclip the bulb spring and remove the bulb. Do not touch the glass of the new bulb when fitting.

Facia Lights

Illuminated facia panel bulbs. Ensure the correct light bulbs are fitted as follows:

Warning light unit behind steering wheel	12v	2W
Light bulbs in switches	12v	0.9W

CAUTION: Always be certain to use the correct specification of bulb, particularly in dashboard switches and instruments.

Other Lights

The bulbs on indicators, stop and tail lights and reversing lights are removed by undoing the lens screws and removing the lens. The bulbs are a push fit.

Caution: When replacing the lens be sure to avoid pushing the captivated nuts from the light body.

Side Repeater

This bulb is rear fitted. To replace, remove the studs retaining the side mat, inside the car. The rubber back of the holder can then be removed and the bulb replaced.

BODYWORK

Polishing

It is recommended that the paintwork should not be treated with a heavy wax for a period of three months after the car has been painted. This will allow the paintwork to 'breathe' and cure correctly. During this time the car should be cleaned regularly and may be treated with a light polish. The chrome work should be cleaned and waxed every time the car is cleaned.
After this initial period, the surface of the paintwork should be thoroughly cleaned. Any imperfections, such as scratches should be removed, using a fine rubbing compound applied with a soft cloth.

Caution: Polishing compounds must be used carefully as they actually remove the paint surface.
A fine cutting polish, such as Supercut, can be used to polish road film off the paint surface.

Caution: Do not use cutting polishes which contain ammonia, this may bleach some pigments.
After you are happy that the paint is completely clean, a good quality wax polish should be used to finish off.
You should avoid silicone based products and polymer sealers, as these can prevent the paint from 'breathing'.
Use a traditional wax polish which may require a little more effort, but the result is worth it.
After the initial polishing of the car, it is most important to keep the paintwork and chrome work clean and well waxed. A good coating of wax protects the car from harmful deposits, from the atmosphere and the road.
Before cleaning, it is advisable to run a little light oil along the piping between the wings and the body. This will help to keep the wax sealant used fluid and prevent water entering the seams. The excess can be washed off and the car cleaned in the normal way.
The wire wheels fitted to the 4/4 also need regular cleaning and polishing to protect them from corrosion. When polishing or oiling the spokes, particular attention should be paid to the ends. These move while the car is in motion and will corrode very quickly if not protected.

Caution: Be sure not to get polish or oil on to the brakes when cleaning. If oil is used to protect the spokes, be sure if will not damage the tyres.
Your dealer will be happy to provide advice about the best materials to use when cleaning your car.

Leather

The leather upholstery (where fitted) is made of Connolly Bros 1st grade hides. To clean the upholstery, wipe with a damp cloth using Connolly Cleaner Solution or mild hand soap. Do not use detergents. After soaping use a fresh cloth with clean water then dry. After cleaning feed leather with Connolly Hide Food to maintain the supple feel of the leather.

Hood

When erecting the hood, always fix the eyelets in the back curtain over the turn-buttons first and then fix snaps across the top of the windscreen, starting in the centre, making sure the sealing pipe runs along the back of the screen. If secured at the front first some strain will be necessary to pull the eyelets over the turn-buttons, which in time will pull away from the fabric.
However, it is recommended that if the hood is tight when dismantling it is advisable to release it at the turn-buttons, which avoids straining at the eyelets. It is not intended that the tonneau cover over the rear compartment should remain in position when the hood is up as the turn-buttons do not allow for the double thickness, and unnecessary strain is placed on the hood fabric and turn-buttons alike.

Caution: When cleaning trim never use detergents, these will seriously damage the materials used.
During cold weather, hooding not in use may contract and become difficult to fit. If left in a warm atmosphere it will expand and may become easier to fit. Do not expose to direct heat, such as fire or radiators.

Sidescreens

It should be remembered that lenses are easily scratched and soiled, spoiling vision at the sides. When not in use, therefore, do not throw the sidescreens carelessly into the rear compartment or they may move about and become damaged. A small 'tommy bar' is provided to facilitate the tightening of the knurled knob fixing the sidescreens to the car.

Jacking System

The jack is used in the following manner:
First make sure that the car cannot move backwards or forwards by using the brakes or chocking the car firmly.
The jack may be used for lifting front wheels by placing it under the bottom cross axle, care should be taken not to damage the brake pipe.
Rear wheels can be lifted by using the jack directly under the rear chassis box cross members.

Warning: Great care must be taken if the car has to be lifted on cambered surfaces. No work other than changing wheels must take place under the vehicle unless the car is standing on proper supports that are fully capable of withstanding the full weight. No part of a person's anatomy must be under the car when the jack is used for any purposes.

SERVICE

Our Service Department is especially equipped to take care of customers' requirements, and can at all times undertake anything from adjustments to major repairs and complete overhauls, at reasonable charges consistent with expert workmanship.
Parts sent for repairs must be consigned carriage paid and should be clearly labelled with the sender's name and address, along with chassis and engine number.
Instructions should be sent separately whether an estimate is required before putting the work in hand. When it is inconvenient to send repairs to the works an accredited 'Morgan' Dealer should be consulted.

Notification of Sale Cards

The Morgan Motor Company Limited introduced these cards to enable the Company to deal with claims promptly and it is most important that the cards are completed and returned without delay. Failure to return these cards may jeopardize future claims being met.

WARRANTY

The Morgan Motor Company Limited warrants in respect of its vehicles that if any defect shall be revealed in a part manufactured by the Company and which is returned to the Company's premises at Pickersleigh Road, Malvern Link, Worcestershire, within twelve months of delivery to the customer or 12,000 miles whichever shall first occur, that it will examine the same and should any fault due to defective materials or manufacture be found upon such examination, to repair or replace the defective part without charge, at the Company's discretion. The warranty is limited to the delivery to the Purchaser at the Company's premises and in the case of a new part supplied only in exchange for the defective part.
Any part of the vehicle manufactured other than by the Company is protected by the warranty (if any) given by that manufacturer and the Company can accept no responsibility save and except in accordance with any such warranty.
It is a condition of this warranty that the vehicle must not have been neglected, misused, modified or used for racing or rallying and that it has been serviced in accordance with the recommendations of the Company as embodied within this handbook or otherwise defined.
The warranty does not apply to tyres or consumables (e.g. brake pads/shoes, clutch lining, etc.) or to defects arising from the fitting of parts not made by or approved by the Company or by the original manufacturers of any proprietary parts fitted to the vehicle.
Any parts or parts replaced or repaired under this warranty will be covered for the balance of the warranty period.
The warranty is dependent upon compliance by the vehicle owner with the following provisions:

a) The owner shall send to the Company's premises such part or parts as are alleged to be defective promptly on discovery of the claimed defect. Transportation is to be prepaid and the part or parts to be properly packed and clearly marked for identification with the full name and address of the owner and with the car and chassis numbers of the vehicle from which the parts have been taken.
b) The owner shall post to the Company on or before despatch of such parts as are alleged to be defective a full and complete description of the claim and the reasons therefor.
c) In the event of any disagreement the matter shall be referred to the decision of an agreed arbitrator or in the event of failure to agree an arbitrator to be appointed by the President for the time being of The Law Society.

This assurance is in addition to and does not detract from the contractual rights you have under Statute or at common law.

MORGAN SPORTS CAR CLUB

As you are now the possessor of a Morgan Car, you may care to share your enthusiasm with other current or previous owners of Morgan Cars.
To this end, the Club which was founded by a group of enthusiastic owners exist to promote meetings of a social and competitive nature for its members. It is recognised by the RAC for the promotion of such events, and is associated with the Midland Association of Car Clubs.
The President is Mr Peter Morgan, and the Club enjoys a favourable degree of Factory encouragement and support.
Your Annual Membership entitles you to participate in all Club events, which include the entire range of motoring competitions — i.e. Rallies, Driving Tests, Sprints, etc. and every kind of social activity. We also receive many invitations to other Club events, and you will be kept notified of these activities through the Quarterly Miscellany, the Editor of which will be grateful for any contributions in the form of articles, experience or criticisms.
You are also entitled to purchase and display car badges, ties, key fobs, also lapel badges, all bearing the Club emblem and colours.
As a historical fact, the Club was founded in 1951, and has acquitted itself well by winning team awards in National Rallies and Races.
So may we invite your application for Membership, to enable you to share our activities.
All enquiries should be addressed to the Club Secretary

SERVICE SCHEDULE

This schedule is designed to help you maintain your car in optimum condition. By reference to these pages you will be aided in planning your service times or dates. At each service ask your dealer to fill in the details required, to show the service has been completed and where it was carried out.
For the best service for your car, contact your nearest Morgan Dealer or Service Agent.