

AUSTIN
freeway

MARK II

WOLSELEY
24/80
MARK II

WORKSHOP MANUAL SUPPLEMENT



THE BRITISH MOTOR CORPORATION (Australia) PTY. LIMITED

T.P. 725

REVISED GENERAL DATA

The following revisions should be read in conjunction with the General Data section of the Austin Freeway/Wolseley 24/80 Workshop Manual.

Engine

Compression Ratio	:	8.2 : 1
Capacity of Combustion Chamber (Valves fitted)	:	42.5 - 43.5 cc.
B. H. P.	:	85 at 4,400 r. p. m. gross
B. M. E. P.	:	32 p. s. i. gross at 1600 r. p. m.
Torque	:	130 lbs. ft. gross at 1600 r. p. m.

Valves and Valve Gear

Seat Angle	- Inlet	:	45 $\frac{1}{2}$ ⁰
	- Exhaust	:	45 $\frac{1}{2}$ ⁰
Head Diameter	- Inlet	:	1.560 - 1.570
	- Exhaust	:	1.340 - 1.350
Stem Diameter	- Inlet	:	.3420 - .342
	- Exhaust	:	.341 - .002
Valve Stem to Guide Clearance	- Inlet	:	.001 - .002
	- Exhaust	:	.002 - .003

Valve Guides

Fitted Height above Head	:	.625 - .609
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Ignition System

Distributor Centrifugal Advance	:	At 1950 r. p. m. camshaft 14 ⁰ -16 ⁰
	:	At 1475 r. p. m. camshaft 11 $\frac{1}{2}$ ⁰ -13 $\frac{1}{2}$ ⁰
	:	At 1000 r. p. m. camshaft 9 ⁰ -11 ⁰
	:	At 700 r. p. m. camshaft 5 ⁰ - 7 ⁰
	:	At 400 r. p. m. camshaft 1 ⁰ - 3 ⁰
		No advance below 175 r. p. m.
Distributor Vacuum Advance	:	Advance commences at 4" Hg. finishes at 14" Hg, with 8 ⁰ advance.
Timing	:	T. D. C. at 500 r. p. m.

Clutch

Type	:	Diaphragm spring strap drive.
Facing Material	:	Veeloc 1133C

REVISED GENERAL DATA (Cont'd.)

Rear Suspension

Length between eye laden : 48"
Deflection at given load : 5"
Deflection at full bump : Delete
Laden camber : .94" negative
Number of Leaves : 2 off 1.75 x .281
3 off 1.75 x .250

Shock Absorbers

Front Blow-off - Rebound : 1500 in. lbs. \pm 150
Compression : 1000 in. lbs. \pm 100
Leak - Rebound : 150 in. lbs. \pm 30
Compression : 150 in. lbs. \pm 30
Rear Blow-off - Rebound : 1300 in. lbs. \pm 130
Compression : 800 in. lbs. \pm 80
Leak - Rebound : 100 in. lbs. \pm 20
Compression : 100 in. lbs. \pm 20

Brakes

Servo Unit Make and Type : P. B. R. VH-44B
Crack Point : 35 p. s. i. input
Knee Point : 950 p. s. i. output at 450 p. s. i.
input at 20" Hg.
Line Pressure Valve : 4 p. s. i. maximum.

Windscreen Wiper

Type : 10RW Self-Switching.

BRAKING SYSTEM

Section M. 8

POWER BRAKING

The 'Hydropower' vacuum servo assists the pressure created physically in the master cylinder by utilising engine vacuum and atmospheric pressure and transfers the combined pressures to the brake system.

The unit is mounted on the right-hand front wing valance within the engine compartment, and is connected by lines to the inlet manifold, master cylinder and hydraulic circuit.

Construction.

The unit consists of three major components :

- (a) Vacuum power cylinder
- (b) Hydraulic slave cylinder
- (c) Control valve

(a) Vacuum Power Cylinder

The vacuum power cylinder is built up from two metal dished shells joined together by a clamp ring, in which a rubber diaphragm is interposed to form two separate chambers. The larger shell constitutes the vacuum power chamber (which also acts as a reservoir). Air is evacuated or vacuum is admitted through a one-way check valve.

The opposite shell or vacuum control chamber is directly connected by a metal tube to the control valve lower compartment.

(b) Hydraulic Slave Cylinder

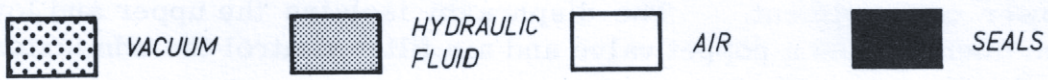
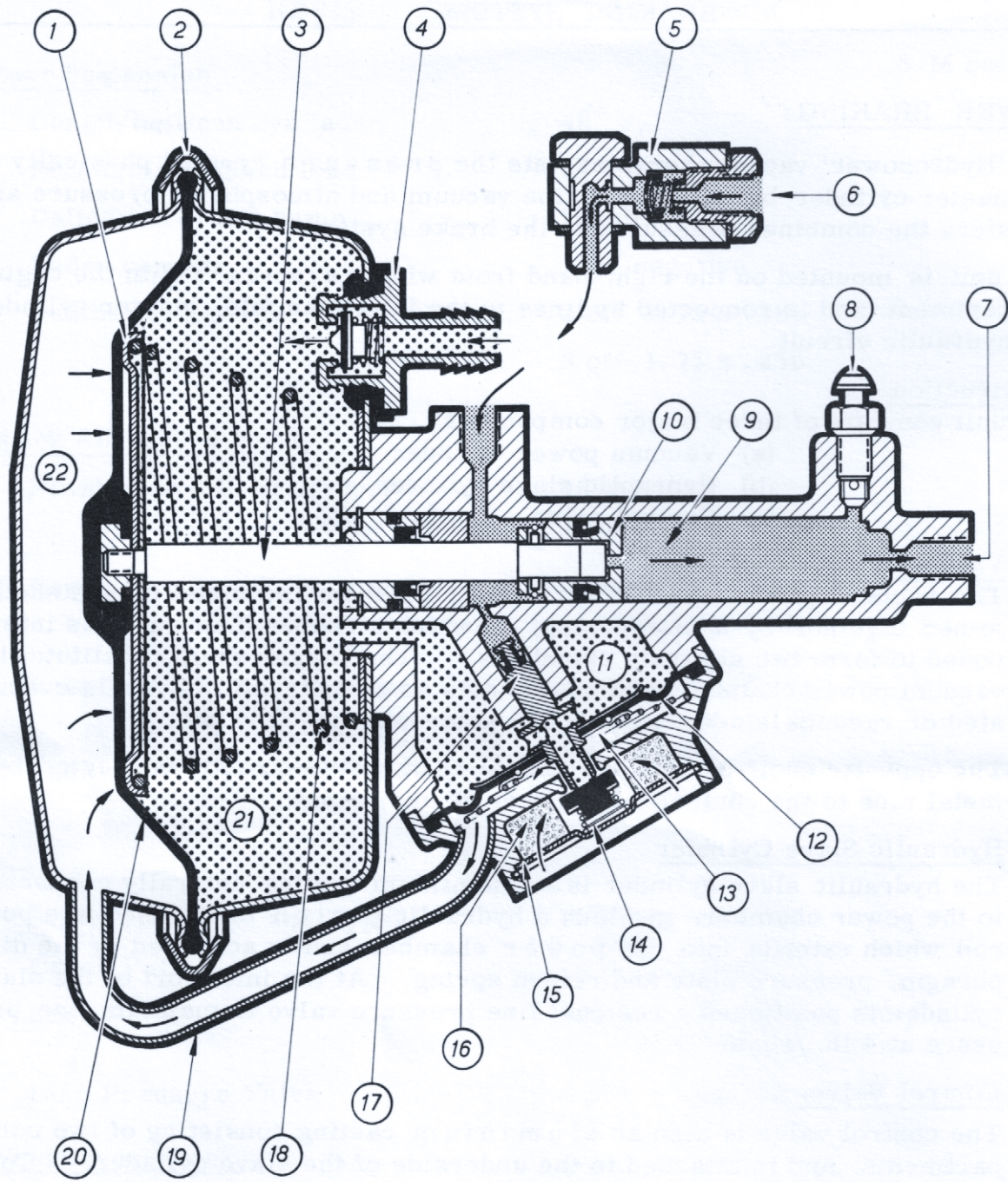
The hydraulic slave cylinder is an aluminium casting centrally connected to the power chamber, in which a hydraulic piston is attached to a push rod which extends into the power chamber and is activated by the diaphragm, pressure plate and return spring. At the inlet port of the slave cylinder is positioned a residual line pressure valve to maintain line pressure at 4 lb. /sq. in.

(c) Control Valve.

The control valve is also an aluminium casting consisting of two compartments, and is attached to the underside of the slave cylinder. Contained within the upper compartment is a hydraulically activated piston attached to a hollow push rod which protrudes through a diaphragm into the lower compartment. The diaphragm isolates the upper and lower compartments, and a poppet valve and air filter control the admission of atmospheric pressure.

OPERATION - APPLYING.

Brake fluid under pressure from the master cylinder flows through the residual line pressure valve through a drilling into the slave cylinder bore, and also on to the head of the control valve piston, which can resist pressure up to 30 p. s. i.



KEY TO COMPONENTS

- | | |
|-------------------------------------|---|
| 1. Diaphragm pressure plate | 12. Control valve diaphragm |
| 2. Clamp ring | 13. Control valve diaphragm return spring |
| 3. Slave Cylinder push rod | 14. Poppet valve and return spring |
| 4. Check valve | 15. Air intake cover plate |
| 5. Residual line pressure valve | 16. Air intake filter |
| 6. Inlet port | 17. Control valve piston |
| 7. Outlet port | 18. Diaphragm return spring |
| 8. Bleeder valve | 19. Interconnecting pipe |
| 9. Hydraulic fluid | 20. Diaphragm |
| 10. Slave cylinder piston | 21. Vacuum power chamber |
| 11. Control valve upper compartment | 22. Vacuum control chamber |

BRAKING SYSTEM

Operation - Applying (Cont'd.)

Vacuum from the inlet manifold is transmitted through the check valve into the vacuum power chamber and through a passage into the upper compartment of the control valve body, through the hollow piston rod to the lower compartment, then on into the vacuum control chamber through the interconnecting pipe. The power control chambers are void of pressure and the rubber diaphragm is vacuum suspended.

When pedal application increases, the hydraulic fluid line pressure is increased and transmitted through the slave cylinder to the wheel cylinders. An increase in pressure moves the control valve piston and hollow piston rod downward until the rod seats on top of the poppet valve, isolating admission of vacuum from the upper control body compartment into the vacuum control chamber. Further movement of the piston and rod opens the poppet valve and allows atmospheric pressure to be communicated through the air cleaner into the lower control valve compartment, and into the vacuum control chamber. Atmospheric pressure now helps to destroy the vacuum in the vacuum control chamber, and pressure difference on the diaphragm moves the slave cylinder push rod forward to trap fluid in the slave cylinder, thus exerting additional line pressure to the wheel cylinders. e. g. The sum of the pressure developed by the 'Hydropower' unit plus the pressure from the master cylinder.

When all of the vacuum in the vacuum control chamber is destroyed by atmospheric pressure, the maximum exertion on the slave cylinder piston is reached. Any future increase in hydraulic output is supplied by master cylinder pressure only.

A safety feature provided by the unit is that the brakes can be applied in the conventional manner in the event of loss of vacuum power, in that fluid from the master cylinder passes directly through the slave cylinder to the wheel cylinders.

OPERATION - RELEASING

When pedal effort is removed and the line pressure drops, the energy in the control valve piston return spring raises the piston and hollow piston rod to the released position, allowing the poppet valve to return to its seat, thus closing off the intake of atmospheric pressure. The vacuum control chamber is now placed in communication with the vacuum power chamber via the hollow piston control rod and drilling. Air contained within the vacuum control chamber is exhausted by this communication through the check valve into the inlet manifold. Vacuum is readmitted into the vacuum control chamber, allowing the slave cylinder push rod to return to the released position by the action of the return spring.

BRAKING SYSTEM

Section M. 9

MAINTENANCE

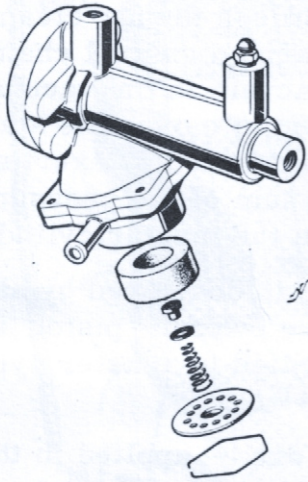
The air filter element must be removed and cleaned every 12,000 miles, or earlier if operating in dusty conditions.

To Remove Air Cleaner.

Remove the snap ring which retains the filter cover plate situated on the under side of the control valve body. Remove cover plate and filter element.

Note:- This operation may dislodge the poppet valve and return spring.

Wash element in soapy water, and replace when dry or renew element.



Air Intake Filter and
Poppet Valve Components.

To Replace Air Cleaner

Reverse the above procedure, ensuring that the poppet valve is correctly positioned.

To Remove Power Brake Unit

1. Remove battery earth strap.
2. Remove flexible hose from the power cylinder block fluid outlets.
3. Remove hydraulic lines at the residual line pressure valve and slave cylinder outlet port.
4. Remove two bolts holding the rear support bracket to the left-hand valve.
5. Remove the nut retaining the power cylinder to the front bracket.
6. Remove the assembly.

To Replace Power Brake Unit.

Reverse the above procedure, ensuring that the outlet port points approx. $\frac{1}{4}$ " upward. This will prevent air locking in the unit when bleeding.

BRAKING SYSTEM

Section M. 10

BLEEDING

It is recommended that a Pressure Bleeder be used for bleeding operations. If this equipment is not available, the following method should be used :-

1. Fill master cylinder reservoir with Brake Fluid, and do not allow level to fall below half full during bleeding operations.
2. Attach bleeder tube to bleeder valve on Power Brake Unit by pushing end of tube over bleeder valve.
3. Submerge other end of tube in a receptacle containing a small amount of brake fluid.
4. Loosen bleeder valve $\frac{3}{4}$ turn and depress brake pedal slowly to floor.
5. Lock bleeder screw. Repeat until all air is expelled from Power Brake Unit, and then close bleeder valve while pedal is depressed.
6. Bleed Brakes in accordance with Workshop Manual.

Section M. 11

SERVICE DIAGNOSIS

WHEEL BRAKE TESTS: Road test vehicle by making brake applications at 20 m. p. h. Brake defects will be evident in one or more ways as listed below and may be easily diagnosed.

HEAVY PEDAL

<u>Possible Source of Trouble</u>	<u>Remarks</u>
1. Vacuum Failure due to :-	
(a) Restricted vacuum line.	(a) Replace damaged vacuum hose. Inspect vacuum for leaks.
(b) Faulty check valve.	(b) Replace check valve.
(c) Low engine manifold vacuum.	(c) Fit vacuum gauge to vacuum source. Vacuum should not be less than 15"-16" of vacuum at engine idle.

BRAKING SYSTEM

2. Power Brake Trouble due to :-

- | | |
|--|---|
| <p>(a) Faulty poppet valve.</p> <p>(b) Fractured control valve diaphragm (air continues to run through air cleaner), when pedal is depressed.</p> <p>(c) Damaged main diaphragm during brake application (air continues to flow through air cleaner), when pedal is depressed.</p> | <p>(a) Air flows through air cleaner while engine is running, with brake in "off" position.</p> <p>(b) Inspect control valve diaphragm, and replace if necessary.</p> <p>(c) Examine main diaphragm and replace if necessary.</p> |
|--|---|

EXCESSIVE BRAKE PEDAL TRAVEL.

With the engine stopped and transmission in neutral, apply the brake several times to destroy all vacuum in the unit. If pedal has a "spongy" feel, this indicates existence of air in the hydraulic system. Hold foot pressure on brake pedal and if pedal moves toward the floor, a leak is indicated in the hydraulic system or faulty master cylinder main cup.

<u>Possible Source of Trouble</u>	<u>Remarks</u>
<p>1. Air in Power Brake Unit due to:- Outlet of slave cylinder pointed downwards.</p>	<p>Reposition unit with slave cylinder pointed up (approx. $\frac{1}{4}$"). Bleed slave cylinder at Bleeder Valve.</p>
<p>2. Faulty Residual Line Valve:-</p>	<p>Open bleeder screw on unit, if small amount of fluid is not emitted, faulty residual line valve is indicated or leak in system.</p>
<p>3. Excessive Movement of Brake Shoes:-</p> <p>(a) Brakes need adjustment.</p> <p>(b) Cracked drum.</p>	<p>(a) Make necessary adjustment.</p> <p>(b) Replace with new drum.</p>

LOSS OF BRAKE FLUID

Test Procedure: Check master cylinder fluid level and top up. Hold foot pressure on brake pedal. If pedal moves toward the floor, a hydraulic leak is indicated. Repeat test three times and inspect fluid level in master cylinder.

- | | |
|---|---|
| <p>1. Brake Trouble due to:-</p> <p>(a) Grease or brake fluid on brake linings.)</p> <p>(b) Scored drums.)</p> <p>(c) Anchor pins bound up.)</p> | <p>) Clean or replace linings, or make
) brake adjustments.</p> |
| <p>2. Power Brake Trouble -
All four wheels grab.</p> | <p>Defective control valve is indicated. Remove unit and inspect control valve piston for excessive friction.</p> |

Section N. 27

WINDSCREEN WIPER - SELF PARKING.

Normally the windscreen wiper will not require any servicing apart from the occasional renewal of the rubber blades.

Checking Switching Mechanism

If the wiper fails to park or parks unsatisfactorily, the limit switch in the gear box cover should be checked. Unless the limit switch is correctly set, it is possible for the wiper motor to overrun the open-circuit position and continue to draw current.

Resetting the Limit Switch.

Slacken the four screws securing the gearbox cover and observe the projection near the rim of the limit switch. Position the pip on the dome cover in line with the central groove in the gearbox cover.

Should any trouble be experienced, first check for loose connections, worn insulation, etc., before dismantling the motor.

1. To detach the cable rack from the motor and gearbox.

Unscrew the pipe union nut.
Remove the gearbox cover.
Remove the split pin and washer from the crankpin and final gear wheel.

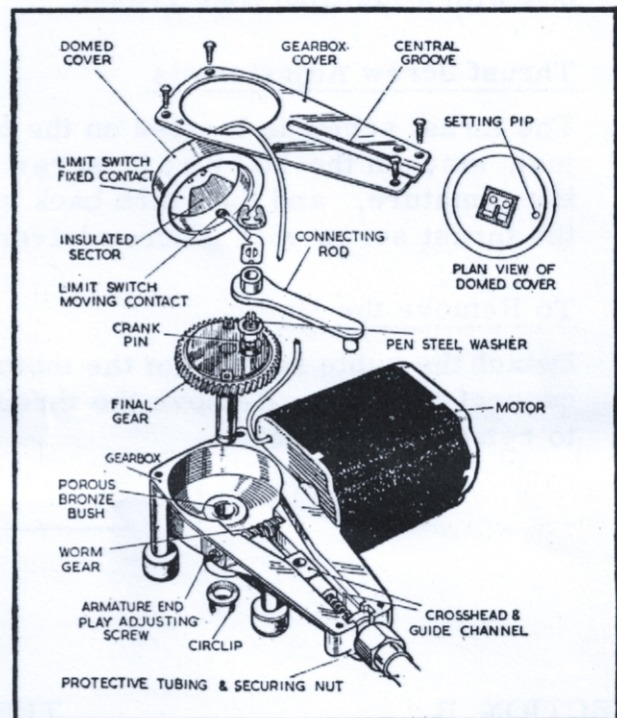
Lift off the connecting link.

2. Commutator dirty.

Remove the connecting leads to the terminals and withdraw the three screws securing the cover at the commutator end. Lift off the cover. Clean the commutator with a cloth moistened with petrol and carefully remove any carbon dust from between the commutator segments.

3. Brush lever stiff or brushes not bearing on Commutator.

Check that the brushes bear freely on the commutator. If they are loose and do not make contact, a replacement tension spring is necessary. The brush levers must be free on their pivots. If they are stiff, they should be freed by working them backwards and forwards by hand and by applying a trace of thin machine oil. Packing shims are fitted beneath the legs of the brush to ensure that the brushes are central and that there is no possibility of



Exploded view of Wiper gearbox

ELECTRICAL EQUIPMENT

the brush boxes fouling the commutator. If the brushes are considerably worn, they must be replaced by new ones.

4. Motor operates but does not transmit motion to spindles.

Remove the cover of the gearbox. A push-pull motion should be transmitted to the inner cable of the flexible rack. If the cross-head moves sluggishly between the guides, lightly smear a small amount of medium-grade engine oil in the groove formed in the die-cast housing.

When overhauling, the gear must be lubricated by lightly packing the gearbox with a multipurpose grease.

5. Thrust Screw Adjustments.

The thrust screw is located on the top of the cross-head housing. To adjust, slacken the locknut, screw down the thrust screw until it contacts the armature, and then turn back until end float is .008" - .012". Hold the thrust screw with a screwdriver and tighten the locknut.

6. To Remove the Motor.

Detach the cable rack from the motor and gearbox as detailed above. Disconnect the lead. Remove the three screws securing the mounting bracket to remove the motor.

SECTION R.

THE BODY.

Dimensional Check for Mark II figures as per Key to Diagram, Page R. 23.

A. 20. 13/16"	F. 100. 9/32"	L. 2. 53/64"
B. 20. 13/16"	G. 23"	M. 5"
C. 21. 11/32" \pm 1/64"	H. 24. 5/16"	N. 5. 35/64"
D. 21. 7/8" \pm 1/64"	J. 41. 3/16"	P. 1. 5/64"
E. 77. 9/32"	K. 40. 3/8"	R. 43/64"
