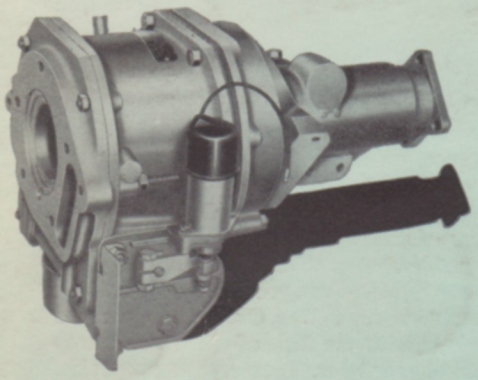
how

Laycock
De Normanville
Overdrive



can

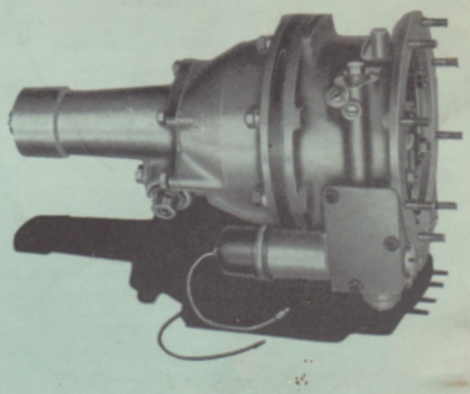
improve

the

performance

of

your



AUSTIN-HEALEY 3000

. . . at the flick of a switch

LAYCOCK ENGINEERING LIMITED
MILLHOUSES · SHEFFIELD 8

member of the Birfield Group

THE

LAYCOCK
DE NORMANVILLE
OVERDRIVE

WHAT IT DOES...

The axle ration of every car is a compromise, designed to give flexibility in top gear. This compromise is imposed by the need to obviate too frequent gear changing and, instead, to obtain the increased force or horse-power required simply by opening the throttle.

The result, however, is that when cruising at the higher road speeds, the engine is rotating unnecessarily fast. When in direct gear, the propeller shaft is rotating at the same speed as the engine.

An overdrive gear is a means of driving the propeller shaft faster than the engine, in other words, of reducing the engine speed for the same road speed.

Saves Engine Wear, Saves Petrol

By substantially reducing your engine revolutions, it is evident that the Overdrive will substantially reduce wear, giving you longer engine life. At the same time it gives you substantial petrol savings. For instance, supposing you were cruising at 40 m.p.h. with your engine at 2400 r.p.m. By flicking the switch—no declutching or loss of acceleration—you go into Overdrive top. Now, for the same road speed your engine revs. drop down to 1890! Obviously, you are going to use less petrol. It is high revs. that cause stress. Laycock de Normanville Overdrive, by reducing revs., reduces stress—on your car engine and on your pocket.

Greater Flexibility—Less Driver Fatigue

By providing additional gears for your car, the Laycock de Normanville Overdrive gives it greater flexibility. And because of its effortless ease of operation, it reduces driver fatigue. For instance, on a long incline that is just too steep to take in top, but not nearly steep enough to need third, all you need to do is to flick into Overdrive third. No effort. *No loss of road speed*, but lower engine revs. and consequent *petrol saving*. The same applies going downhill, where the Overdrive can provide engine braking without excessive engine revs. The Overdrive gives you power-sustained changes at the flick of a switch without touching the clutch or gear lever. It represents the perfect compromise between one gear and another.

Smoother, Quieter Motoring

At least 50% of the changes you make will be between top and overdrive, and it is in overdrive top that you derive the greatest benefit. A benefit, not only in terms of economy, but also in driving comfort. The moment you flick into overdrive your engine revolutions are reduced by 22% and you will sense the immediate improvement in smoothness and silent running. Furthermore, although the Overdrive is not necessarily intended to give higher road speed than top gear, in practice the cruising speed is invariably increased.

This is of special importance now for, with the advent of the new motorways, the overdrive comes into its own as never before, with smoother, quieter, more economical and faster cruising on long runs.

HOW TO USE IT...

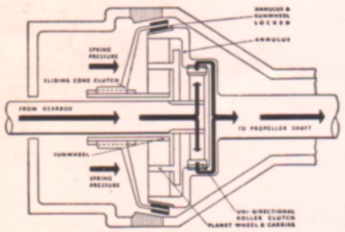
The Laycock de Normanville Overdrive is operated by an electric solenoid controlled by a switch mounted on the steering column or fascia board. The electrical circuit is so arranged as to provide its application to two or more gears according to the car model.

The Overdrive can be engaged or disengaged at will at any speeds above, say, 20 m.p.h. in second and 30 m.p.h. in direct gear, dependent on circumstances. It should be operated without using the clutch pedal, and with the accelerator at least partially depressed. The unit is designed to be operated when transmitting full power.

Normal usage would be to start the car in first gear, change up to second (or third) gear, then engage overdrive at any speed between 20 and 40 m.p.h. as desired. If the Overdrive is left in, a normal gear shift can be made from Overdrive second (or third) to Overdrive top. If, then, acceleration is desired, the Overdrive can be switched out, giving normal top gear. Alternatively, when making the shift from Overdrive second (or third), the Overdrive can be switched out simultaneously but not before the clutch is depressed for the normal change, so giving direct gear. Conversely, changes down can be made from Overdrive top to Overdrive second (or third).

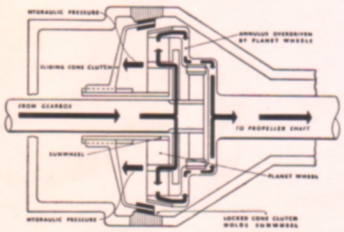
In other words, the Overdrive can be switched in or out at will, without foot movement, to suit the varying conditions, the only precaution necessary being not to change from Overdrive into normal second (or third) gear at speeds above 40–45 m.p.h. otherwise the engine is likely to be over-revved. The Overdrive divides the step between the second (or third) and top gears, providing with its power changes a most useful gear for overtaking or hill climbing.

HOW IT WORKS



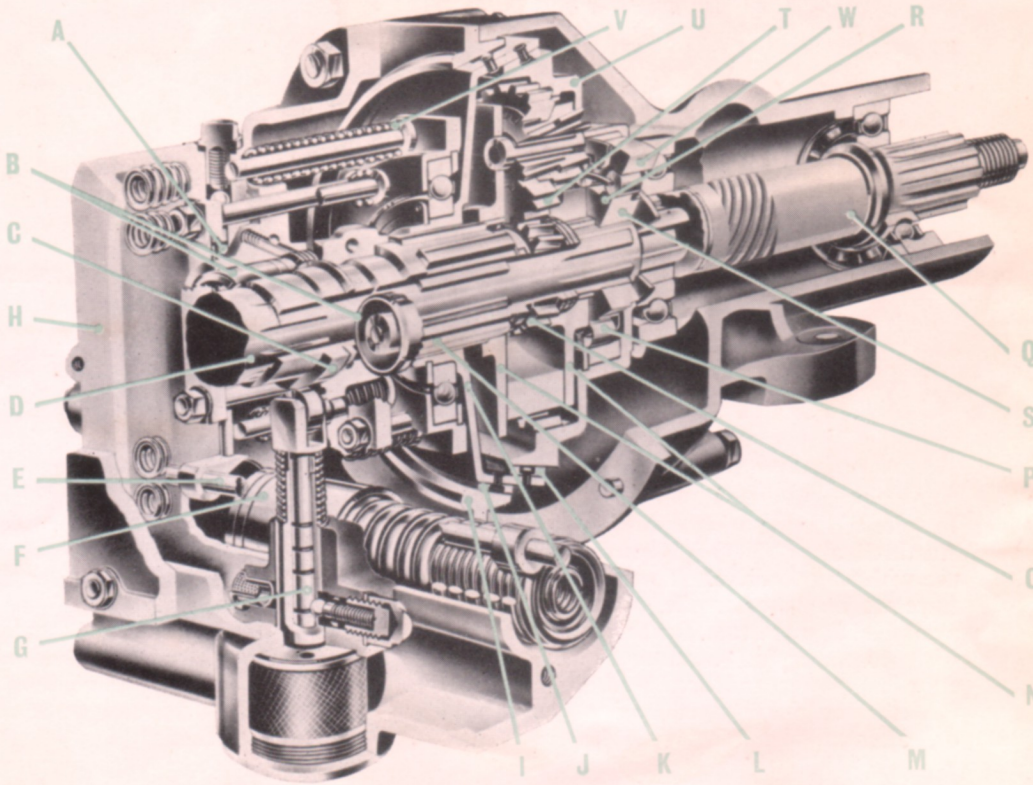
IN DIRECT DRIVE

The Overdrive passes the engine power to the propeller shaft through a uni-directional roller clutch, the gear train being inoperative. A sliding splined cone clutch holds the sunwheel and annulus together by means of spring pressure, locking the gear train solid. In this way engine braking is available, a most important safety feature. This cone clutch also drives the car in reverse.



IN OVERDRIVE

Hydraulic pressure opposes the spring pressure on the splined cone clutch, causing it to engage with the conical brake ring built into the main casing. As the sunwheel and cone clutch are integral, the former is now held stationary and the annulus is driven at a higher speed than the gear box shaft.



DETAILED DESCRIPTION

Power Input

This enters the unit through shaft D and by means of cam C operates the plunger-type hydraulic pump G. This, in turn, builds up pressure against the spring-loaded piston F in the accumulator cylinder placed across the bottom of the main casing.

The Sunwheel

O is made integral with the splined sleeve M which is free to rotate on the input shaft. Immediately behind the sunwheel and splined to shaft D, is the planet carrier N in which are mounted the three planet wheels T.

The Uni-directional Clutch

Operating from the input shaft, the inner member S is splined on to this. The other parts of the clutch are the rollers P and the outer member W which is attached to the combined annulus U and output shaft Q. The drive is transmitted from the input shaft through the clutch inner member and the rollers which are forced up the inner member's inclined faces R, wedging the whole clutch solid. The clutch then drives the annulus output shaft.

The Cone Clutch

K is mounted on splined sleeve M on which it is free to slide. It is kept in direct drive position by the cone clutch springs V which hold the inner lining L in contact with the corresponding cone of the annulus U, thus preventing a free-wheel condition when the car tries to over-run the engine. Engine braking is, therefore, always available. In addition the clutch KLU drives the car when in reverse gear, which obviously the Uni-directional roller clutch cannot do.

The Hydraulic Operation

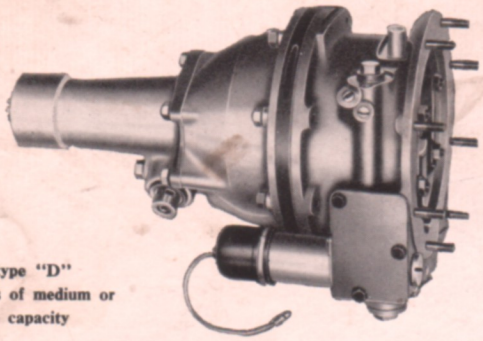
The Overdrive is brought into operation by a slight rotation of the operating shaft E. This lifts the operating valve A, allowing the stored hydraulic pressure in the accumulator to be applied to two pistons B. The pistons move the clutch K forward away from the annulus U, overcoming the springs V. During the forward movement of the clutch K, the drive from the engine to the wheels is maintained by the roller clutch.

The Overdrive Operation

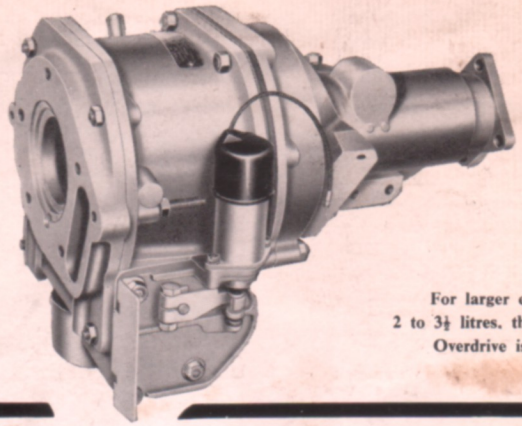
The hydraulic operation causes the outer lining J of the cone clutch K to contact the brake ring H, bringing the sunwheel O and sleeve M to rest. This action is affected without shock, as the clutch KJH is oil immersed. The input drive now passes from shaft D to the planet carrier N, and the rotation of the planet wheels T round the stationary sunwheel causes annulus and output shaft UQ to be driven faster than input shaft D. In this condition, the outer member W of the roller clutch over-runs the inner member S. Because the sunwheel can move neither backwards nor forwards, there is always engine braking available in Overdrive gear.

Return to Direct Drive

To change down to direct gear for acceleration, the accelerator pedal is held depressed and valve A released. This cuts off the hydraulic pressure to pistons B, and springs V again take charge, breaking the contact of clutch KJH.



This is the type "D" Overdrive for cars of medium or small engine capacity



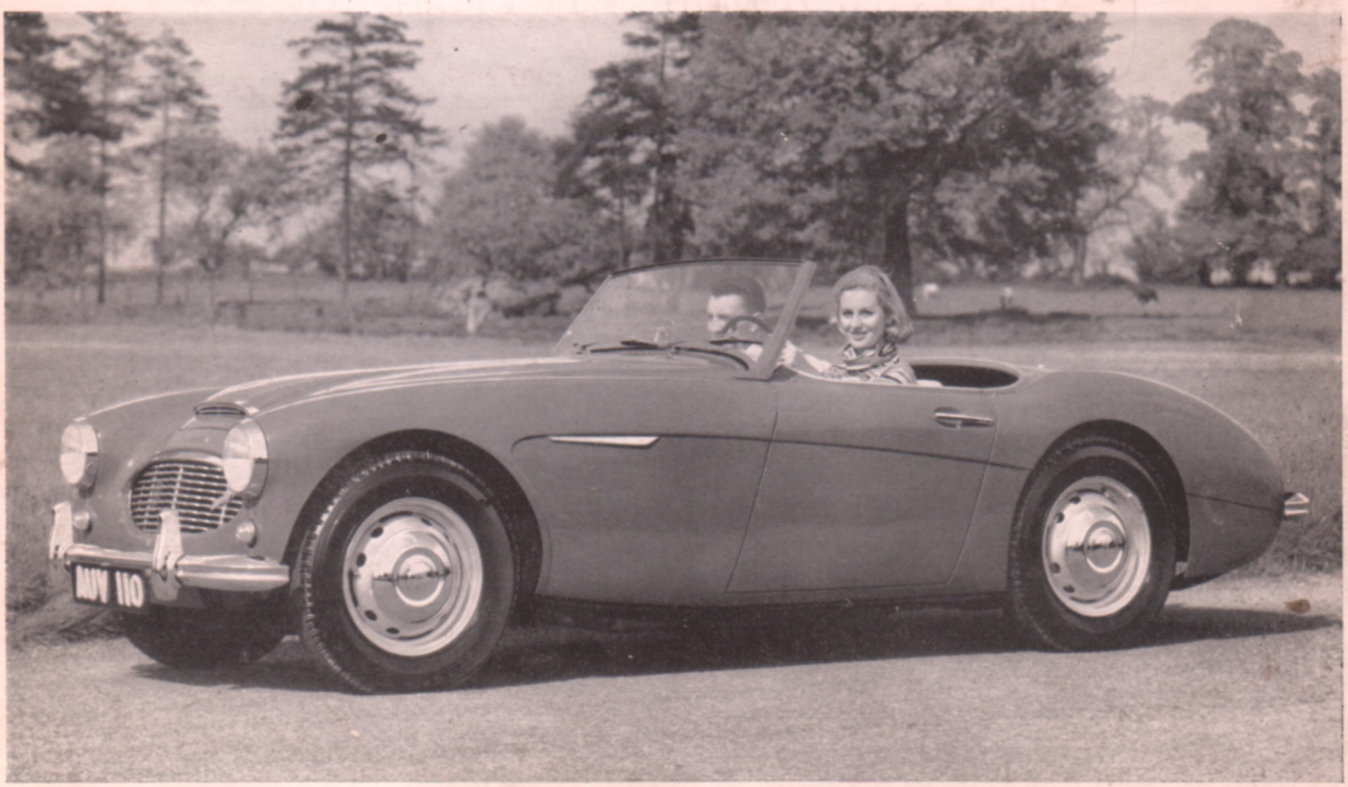
For larger engines, 2 to 3½ litres, the type "A" Overdrive is fitted

For your Austin-Healey 3000 . . .

In spite of having a high power-to-weight ratio, the Austin-Healey " 3000 " is particularly suitable for use with an overdrive. To this end the type " A " Laycock de Normanville overdrive is optionally available, at extra cost, for the benefit of those who wish to take full advantage of the " 3000's " effortless power and breath-taking performance.

With overdrive engaged, engine speed is reduced—or, alternatively, road speed is increased. For instance, at 1,000 r.p.m. in top gear, road speed is raised from 19 to 23 m.p.h., while from overdrive third at the same r.p.m. a speed of 18 m.p.h. is obtained.

Clearly this spells reduced engine wear and less fuel consumption, allied to enhanced pleasure at the wheel of your Austin-Healey " 3000 "—with no more inconvenience than the flick of a switch on the fascia!



Printed in England

Publication No. 1833