



Driveline Limited

R. TYPE OVERDRIVE UNIT

PART NUMBER 119520/00/KT

PARTS LIST

FITTING INSTRUCTIONS

SERVICE INSTRUCTIONS

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FOR R TYPE OVERDRIVE FITMENT

**BEFORE FITTING THE OVERDRIVE MAKE A NOTE OF THE UNIT
NUMBER FOR THE WARRANTY DOCUMENT.**

- **Read all the FITTING INSTRUCTIONS**

- Tools required page 2

- Notes on CLEANLINESS page 3

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- Fitting GASKETS page 9-10

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- Fill in WARRANTY /

**BEFORE DRIVING READ
THE OPERATING INSTRUCTIONS**

10/10/02
Bearmach.

**LIST OF TOOLS REQUIRED FOR FITTING THE
OVERDRIVE TO A VEHICLE**

- **1.5mm Allen key**
- **3mm Allen key**
- **6mm Allen key with slave driver suitable to fit the torque wrench.**
- **Torque wrench 20-50Nm.**
- **13mm socket spanner to fit torque wrench**
- **22mm Across Flats box spanner**
- **Small electrical screwdriver**
- **Suitable heater (Hair Dryer) to heat the shrink wrap.**
- **Automatic Transmission Fluid.**

INTRODUCTION

The Overdrive is an additional gear unit between the gearbox and the transfer box. When in operation it provides a higher overall gear ratio on 3rd, 4th and 5th through the transfer box to all the four drive wheels.

The object of an overdrive is to provide an extra drive ratio between the 3rd, 4th and 5th gears, giving open road cruising on 5th gear at an engine speed lower than it would be in normal top gear. This reduced engine speed gives a reduction in petrol/diesel consumption, lower noise levels inside the vehicle and an increase in engine life.

An inhibitor switch is fitted in the electrical circuit to prevent the overdrive operating at unsuitable road speeds. The overdrive will automatically disengage when the road speed drops below approximately 30 mph. And will not engage until the road speed is 30 mph. plus.

The overdrive is operated by an electric solenoid controlled by a switch, mounted on the customised gear lever knob. Also incorporated in the gear knob is an LED, which indicates that the unit cannot be used, i.e. the inhibitor box has 'latched-out' the Overdrive. To clear this condition the Overdrive operating switch on the gear knob should be switched off. The Overdrive can then be used as normal. When the ignition is first switched on the gear knob LED illuminates for 1 sec to check the electronics and then switches off. If the Overdrive switch has been left switched on the LED will illuminate for 1 second and then flash. If the LED flashes when the vehicle is in motion and switched into Overdrive the solenoid circuit should be checked.

The overdrive can be engaged or disengaged at any road speed, above that controlled by the inhibitor, without using the clutch pedal and at any throttle opening in 4th and 5th gear because the unit is designed to be engaged and disengaged when transmitting full power. When changing into/out-of Overdrive in 3rd gear, and when coasting or over-running, driving experience may indicate that the clutch could be disengaged to give a smooth change.

The only other precaution necessary is to avoid disengaging overdrive at too high a road speed, particularly when using it in 3rd and 4th gears, since this would cause excessive engine revolutions.

LUBRICATION SYSTEM

This unit is completely oil splash lubricated, an oil thrower being used to direct oil to a catcher on the planet carrier and to the planet bearing via the hollow planet bearing pins.

CLEANLINESS

Scrupulous cleanliness must be maintained throughout all fitting and maintenance operations connected with the overdrive. Even minute particles of dust, dirt or lint from cleaning cloths may cause damage or interfere with the correct operation.

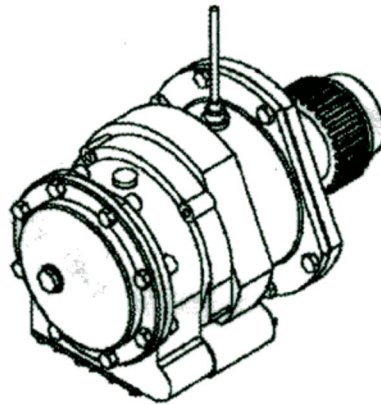
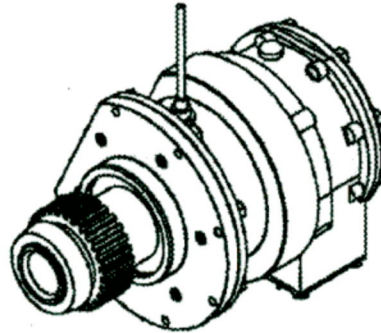
Great care must be taken to avoid the entry of dirt when topping up or re-filling with oil.

For cleaning parts externally or internally use petrol or paraffin ONLY otherwise damage may occur to oil seals and other parts of the unit.

On no account should water be used during cleaning operations, as this will also affect the operation of the overdrive.

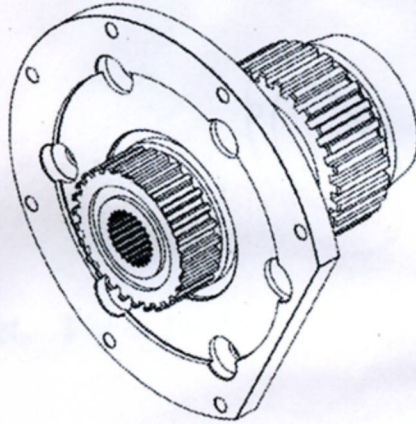
GKN Overdrive unit, Part number 119520/00/00

This unit will fit on the Land Rover vehicle type Defender 110 and 90.

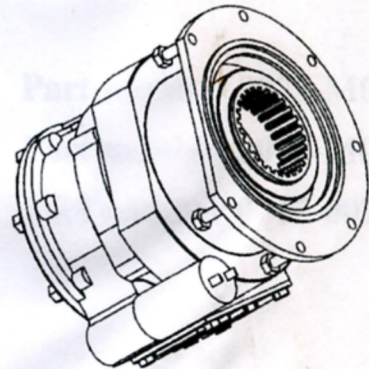
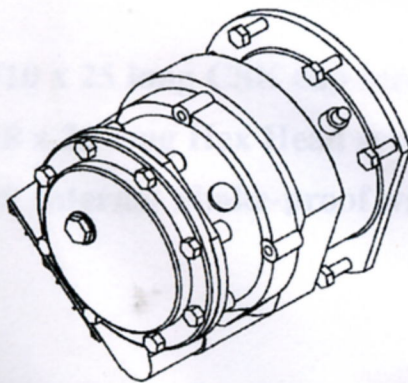


Box Component List:-

Adaptor Plate Assembly, Fig 1. ✓

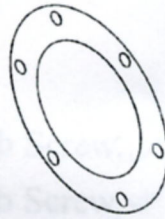


Main Body, Fig 2. ✓



FITTING KIT PART NUMBER 119410/00/RF

Transfer Box / Adaptor Plate Gasket, Fig 3. Part number 119414/00/00 ✓



Main Body Gasket, Fig 4. Part number 119476/00/00 ✓



6-off M10 x 25 long CSK cap screws. ✓

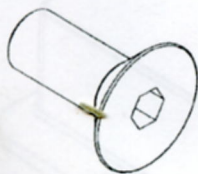
Part number 0073-M0042/12

7-off M8 x 20 long Hex Head screws. ✓

Part number 0073-M0053/88

7-off M8 Internal Shake-proof washers. ✓

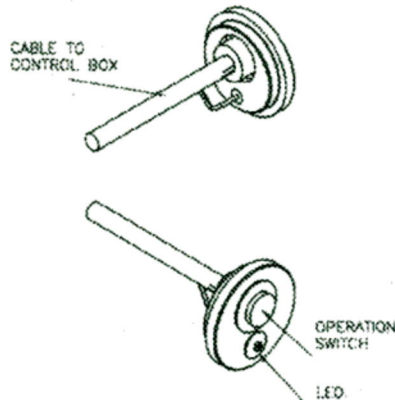
Part number 0075-007



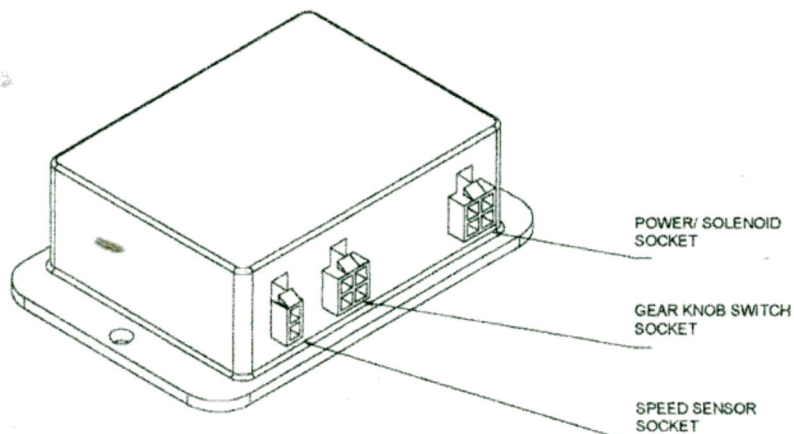
ELECTRICAL FITTING KIT PART NUMBER 119520/00/RF
LIST OF ELECTRICAL FITTINGS

- | | |
|---|---------------------------|
| 1 off Electronic Control Box, ✓ | Part number 119508/00/00 |
| 1 off Short wiring loom, ✓ | Part number 119464/00/00 |
| 1 off Medium wiring loom, ✓ | Part number 119465/00/00 |
| 1 off Multiple wiring loom, ✓ | Part number 119466/00/00 |
| 1 off Gear Knob Body, ✓ | Part number 119411/00/00 |
| 1 off M3 x 3mm long Allen Grub Screw, ✓ | Part number 0073-M0054/12 |
| 1 off M5 x 6mm long Allen Grub Screw, ✓ | Part number 0073-M0032/12 |
| 1 off Speed sensor, ✓ | Part number 119509/00/00 |

Gear Knob Lid, complete with switch, 1-off LED and Wiring Connector.
Part number 119416/00/00 ✓

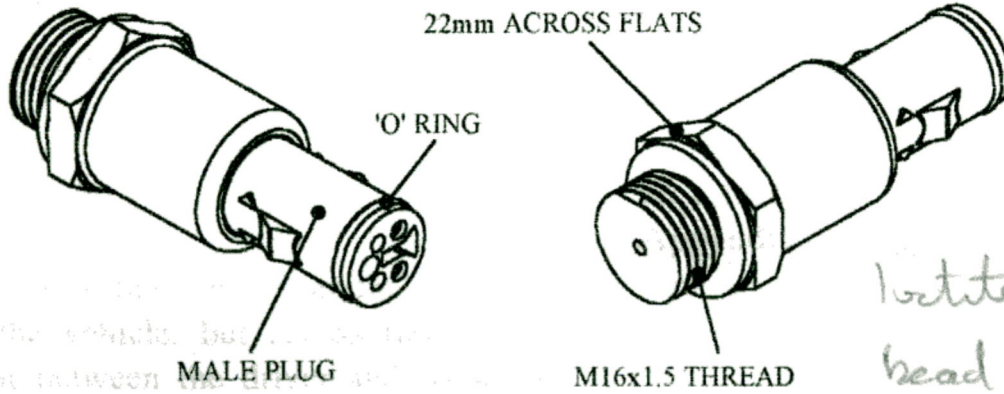


Electronic control box. Part number 119508/00/00 ✓



SPEED SENSOR.

Part number 119509/00/00 ✓



*white threads
head of nylon
on base*

Check the list of parts with those parts present in the box.

Fitting Instructions

This Overdrive replaces the power take off position on the Transfer gearbox.

To fit this unit carry out the following procedure.

It is advisable to disconnect the battery before fitting.

The unit is best fitted from the under side of the vehicle, but access through the floor between the driver and passenger seats will be required so this should be cleared before starting.

Blocks should be placed in front and behind a wheel to stop any vehicle movement.

Approximately 600-700ml of approved Automatic transmission fluid will be required for the overdrive unit.

The oil in the transfer box need not be drained.

First, remove the cover from the power takeoff position. 6-M10 Hex. Head set screws.

Depending on the vehicle model, there could be 2 off M10 countersunk screws to remove.

The bearing support plate can now be removed. This support plate could be a tight fit in the transfer box so a lever may have to be inserted between the plate and the transfer box.

This lever should be moved around the plate so that it is removed evenly without damaging the unit face.

When the bearing support plate has been removed, the Transfer box gear can be withdrawn; the propshaft may have to be turned slightly, to facilitate this. See **Appendix A.** Page 20. for gear information.

The two inner bearing races on the transfer box gear are not required for the overdrive fitment.

All parts removed from the vehicle should be carefully stored.

Carefully clean the mating face of the transfer box making sure that all traces of gasket and seal compound are removed.

The assembly as shown in Fig. 1a should be now fitted. See page 10.

To fit this part, use **part number 119410/00/RF fitting Kit.** The 6 off M10 x 25 long countersunk set screws and the **Main Gasket, part number 119414/00/00,** will be required, also the 6 mm Allen key with a square driver and a suitable torque wrench to fit the square driver.

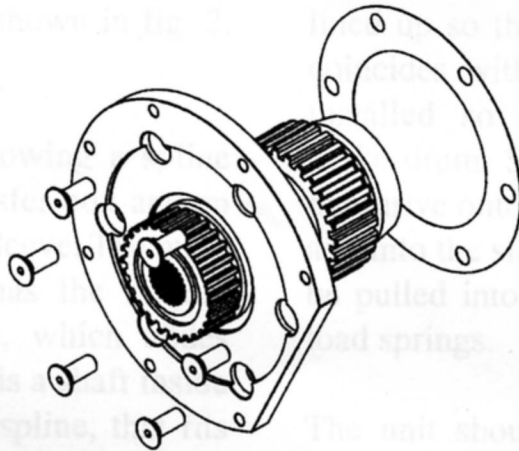


Fig. 1a

First, check that the assembly is complete and as shown in Fig. 1 (p.5), and there is an internally splined sleeve inside the assembly.

This assembly fits on to and inside the transfer box, and the gear on the shaft replaces the gear removed from the transfer box. The half bearing on the end of the shaft, which is held in position with a Circlip, replaces the half bearing removed with the existing gear.

Mating surfaces on the transfer box and the assembly as fig.1 should be lightly covered with a Gasket sealant, and the **Transfer Box Gasket, part number 119414/00/00** should be placed on the mating surface on assembly fig.1.

The assembly fig.1a should now be offered into the transfer box, the bearing

and gear have to pass by other components in the transfer box. The square spline in the sleeve has to mate to the gearbox output shaft inside the transfer box, to facilitate this the propshaft may have to be turned slightly backwards and forwards. The cutout in the components allows the unit to pass by the hand brake drum. Before the unit reaches the mating surface there will be a slight resistance due to the load washer pre-loading the bearing. Align the holes up between the two units.

Using a recommended thread sealant only (Loctite 542) fit the 6-off countersunk bolts, and tighten evenly, to the required torque. **40Nm**. Check that the two mating faces are correctly fitted and the gasket is clamped in position.

The main body of the Overdrive can now be fitted. This is as shown in fig. 2, Page 5.

The unit will now be showing a spline on the outside of the transfer box and an internal spline inside the sleeve. The main body of the overdrive has the mating spline on the gear head, which slides over this spline and there is a shaft inside the Annulus head with a spline, that fits inside the sleeve.

The **Gasket, part number 119476/00/00** is required to seal the faces between the transfer box fitting and the main body. Make sure that the two mating faces are clean and apply a thin layer of Gasket sealant to both faces. Fit the Gasket to the mating face on the part fitted to the transfer box.

To fit the main body of the overdrive the **7-off M8 hexagon head set screws x 20 long, part number 0073-M0042/120** will be required,
Complete with **Shake proof washers, part number 0075-007.**

A 13mm socket and a suitable Torque wrench are required for these screws.



The main overdrive unit should be lined up so that the cutout in the flange coincides with that on the part already installed so that it misses the hand brake drum. Slide the main body of the overdrive onto the spline, in the Annulus, and into the sleeve spline the last 3mm to be pulled into position with the bolts to load springs.

The unit should now clamp into place using the M8 hexagon head set screws with shake proof washers fitted. **These 7 screws must be tightened uniformly to allow the spigot to enter into the mating part straight, square and evenly, this is very important.** The torque setting should be **24Nm.**

Check that the two mating faces are correctly fitted and the seal is clamped in place.

Ensure that the vehicle is on level ground. The oil filler/level plug is on the rear of the unit. Remove the filler plug, approved Automatic transmission fluid should be added until the level plug is reached approx. 600-700ml. Refit the level plug.

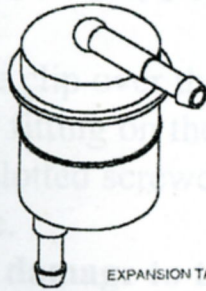
Check that there are no oil leaks around the unit.

VENTING KIT FOR R TYPE OVERDRIVE

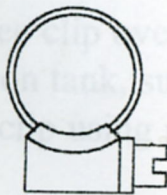
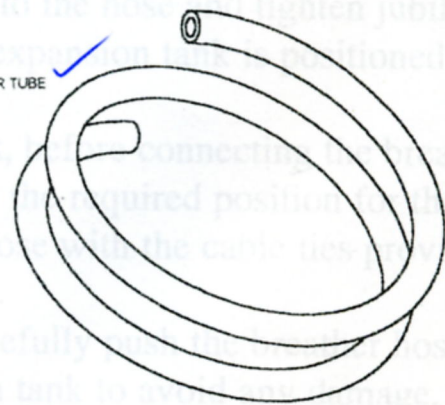
THIS VENTING KIT MUST BE FITTED TO THE OVERDRIVE BEFORE USE ON THE VEHICLE

The Venting Kit consists of:

- Expansion Tank, shown below ✓
- One 1.75-metre length of Tubing. ✓
- Two Jubilee clips, shown below ✓
- A number of Cable Ties *in garage*



BREATHER TUBE ✓

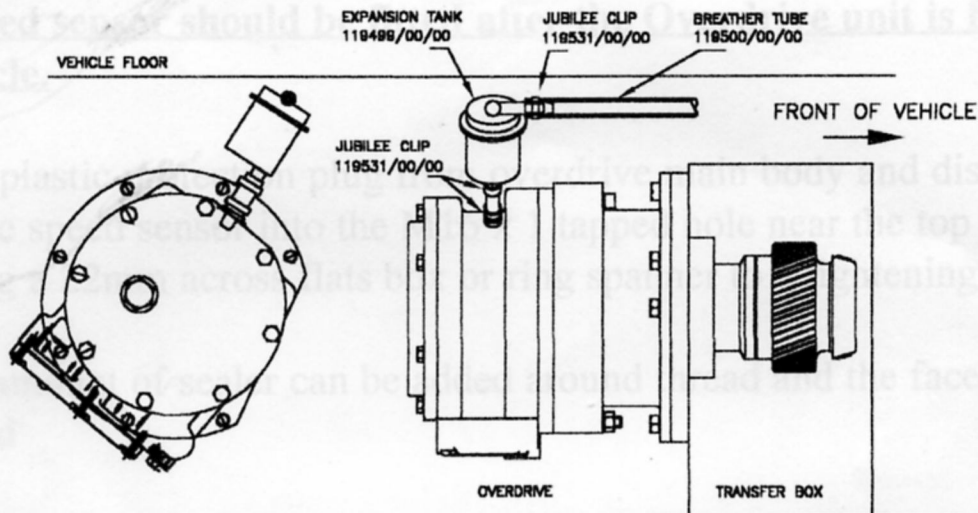


JUBILEE CLIP ✓
x3 ✓

CHECK AND VERIFY THAT THERE ARE NO OIL LEAKS AT THE JOINTS, IF THERE ARE, TIGHTEN THE CLIPS FURTHER USING PLAIN SLOTTED SCREWDRIVER.

Fitting the Venting Kit.

The outlet of the expansion tank must face towards the front of the vehicle



Do not apply any type of bending force to the inlet or outlet of this unit

Slip a jubilee clip over the short hose protruding from the main unit. Fit the bottom male fitting on the expansion tank into the hose and tighten jubilee clip using plain slotted screwdriver. Ensure that expansion tank is positioned as shown above.

To stop any damage to the expansion tank, before connecting the breather hose to the expansion tank, route the hose to the required position for the expected water line if wading. Support the hose with the cable ties provided.

Slip a jubilee clip over the long hose and carefully push the breather hose onto the expansion tank, supporting the expansion tank to avoid any damage. Tighten the jubilee clip using plain slotted screwdriver.

CHECK AFTER RUNNING THAT THERE ARE NO OIL LEAKS AT THE JOINTS, IF THERE ARE, TIGHTEN THE CLIPS FURTHER USING PLAIN SLOTTED SCREWDRIVER.

Fitting the Controls and Electronics

Fitting the Speed Sensor. Part number 119509/00/00.

The speed sensor should be fitted after the Overdrive unit is fitted to the vehicle.

Remove plastic protection plug from overdrive main body and discard. Screw the speed sensor into the M16 x 1 tapped hole near the top of the unit using a 22mm across flats box or ring spanner to a tightening torque of 20Nm.

A small amount of sealer can be added around thread and the face above the thread

Do not add any type of washer between speed sensor and overdrive body, as this will interfere with correct operation.

Care should be used when fitting this unit as the end of the sensor is fragile

This unit counts the speed of the Annulus inside the Overdrive by counting the number of times two holes in the Annulus pass by it. To operate correctly the distance from the face of the Annulus to the sensor must be set accurately. This distance is set accurately by screwing the Sensor down to the face and tightening to the correct torque.

Wiring Diagram

GKN Drivelive Overdrive Controller

Supplier/solenoid connector

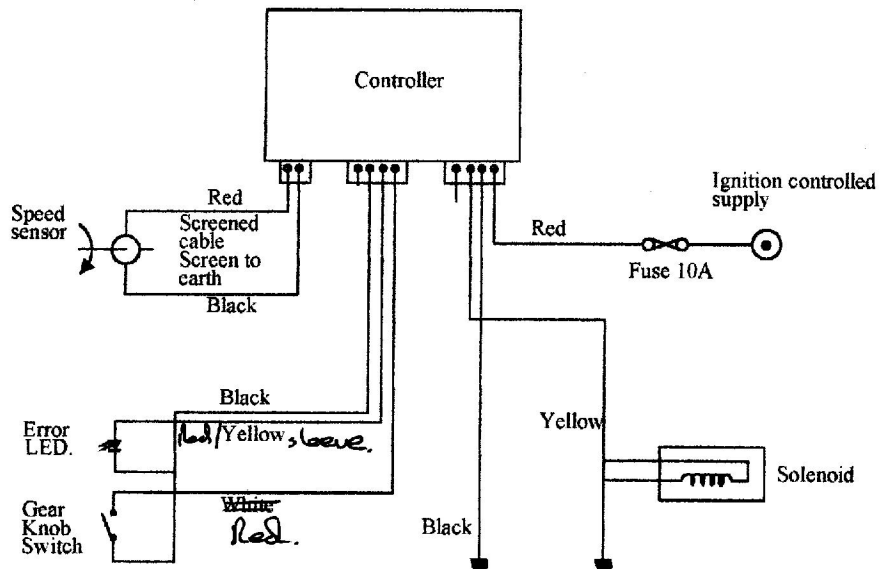
- Pin 1 Not used
- Pin 2 Solenoid Yellow
- Pin 3 Ground Black
- Pin 4 +12V supply via fuse and ignition switch Red

Gear lever connector

- Pin 1 Not used
- Pin 2 Common Black
- Pin 3 Error LED Yellow
- Pin 4 Switch White

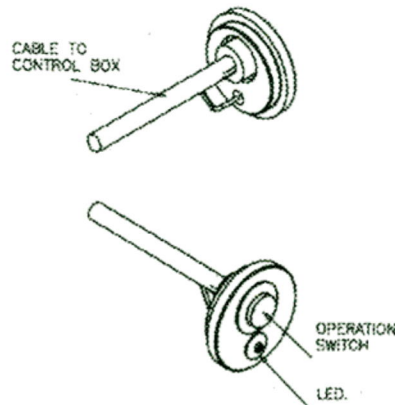
Sensor connection screened cable

- Pin 1 Signal high Black
 - Pin 2 Signal ground Red
- Screen to ground

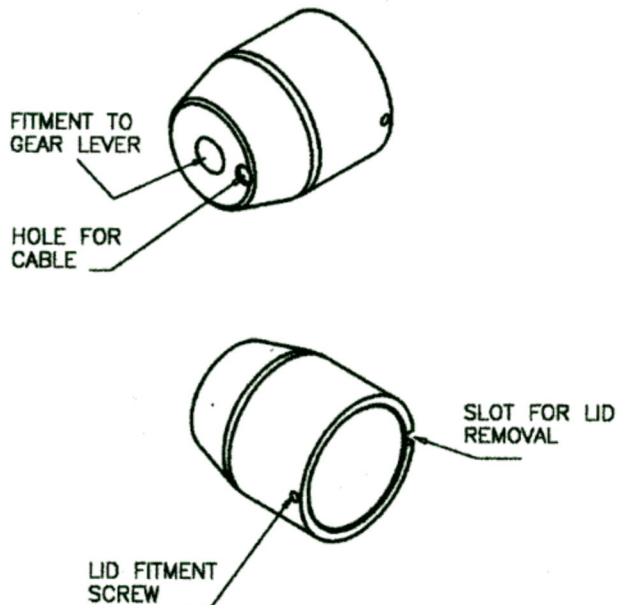


Polarity of wires on Solenoid is **not** important.

Gear Knob Lid.



Gear Knob Body.



Electronic Control Box see page 7

The Control Box can be fitted where required. Bearing in mind that the vehicle could be used for wading in water, in this case it should be fitted above the expected upper water level inside the vehicle i.e. in the bottom of the parcel shelf or on the dash board. Other than connecting the three plugs

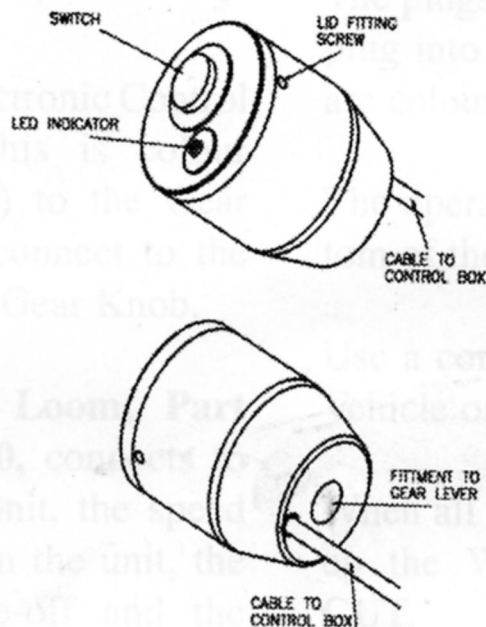
there will be no need to access this control box when the Overdrive is fitted.

Electrical Power Take off

A convenient after ignition spare fuse position in the fuse box should be used.

Note: The wiring loom provided contains a fuse holder with a 10amp quick blow fuse fitted.

FITTING THE GEAR KNOB.



Equipment required fitting the gear lever knob

- A 3mm and 1.5mm Allen Key.
- A small electrical screwdriver.
- A suitable heater (Hair dryer) to heat the Shrink wrap.

Remove the original gear knob from the gear lever; store in a safe place. Loosen the Boot Clamps on the Gear Lever.

Place the Heat Shrink onto the gear lever and Screw the main body of the new gear knob onto the gear lever.

Tighten the M6 Grub screw to hold the Gear Knob Body in position, to stop it turning.

NOTE:
Do NOT cut the Wiring Looms to length.

Connect the short wiring loom, Part number 119464/00/00, to the connection block on the Gear Lever Knob Lid. The wires are colour coded.

Pass the wiring, out through the offset hole in the bottom of the Gear knob body and inside the Heat Shrink into the Gear Lever Boot.

Wire Loom 1194465/00 should now be fitted.

This runs from the Electronic Control Box central plug, this is colour coded, (already sited) to the Gear Lever boot, to plug connect to the wiring loom from the Gear Knob.

The Main Wiring Loom, Part number 119446/00/00, connects to the solenoid on the unit, the speed sensor (see page 8) on the unit, the electrical power take-off and the Vehicle ground. Depending on the position of the Control Box, the Wiring Loom should be fitted to the vehicle via a convenient route.

The plugs on the Main Wiring Loom plug into the electronic Control box are colour coded.

The operating solenoid is at the bottom of the overdrive unit.

Use a convenient earth point on the Vehicle or Overdrive Unit.

When all connections are made, tidy up the Wiring Looms, **DO NOT CUT.**

Heat the heat shrink to wrap onto the gear lever.

Refit gear lever boot at stem over wire.

Fit the lid onto the Gear Lever Knob, and tighten the M3 grub screw to hold it into place.

Parts List and Fitting Instruction (Part Number 119520/00/FI)
for the GKN R TYPRE Overdrive Unit. Page 19 of 22

Badge Kit, Part number 119410/00/BK

Included in the box is a Kit with the following:

- ✓ 1-Gear Lever Motif. As the original gear knob has been removed with its gear-shift pattern on top, this motif should be placed on a convenient surface in view of the driver. **Do not obscure any instruments.**
- ✓ ~~2~~ GKN OVERDRIVE self-adhesive raised badges to fit on the outside of the vehicle.
- ✓ 1-OVERDRIVE graphic for the rear of the vehicle.

Appendix A

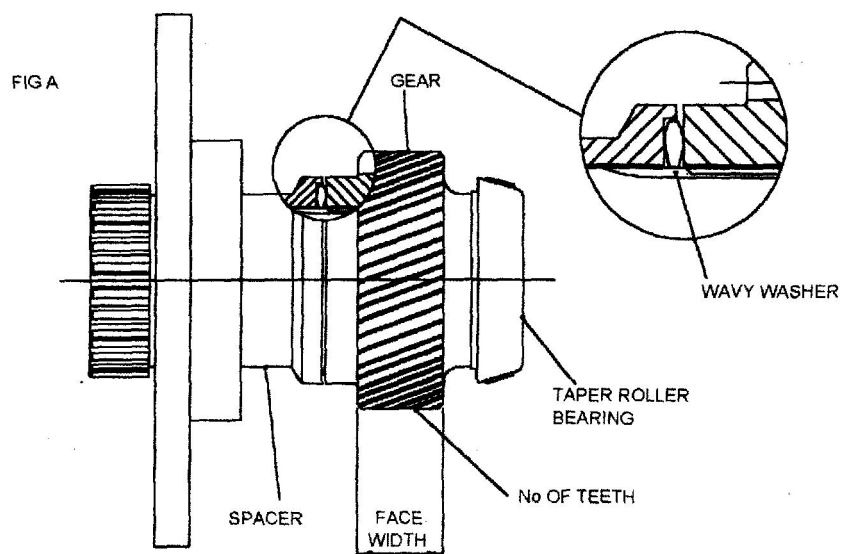
When the Transfer Box gear has been removed check the following,
See Fig.A

- 1 The number of teeth on the gear removed from the Transfer Box is the same as that on the Overdrive unit.
- 2 The gear face widths (the width along the teeth) are the same.

If both of the above conditions are correct, continue with the installation.

If either of the above conditions are not correct, contact GKN Driveline on 00 44 (0)121 313 1661 and the correct gear will be sent by carrier.

To fit the new gear carry out the following procedure before continuing with the installation. See Fig. A



Appendix A

Refer to Fig A.

- 1 Remove the Gear from the splines. This may need tapping lightly. Take care not to damage the splines or bearing.
- 2 Ensure that wavy washer is correctly seat as shown in fig A.
- 3 Fit the new gear, with the bearing already fitted. Ensure that gear and bearing has been correctly fitted as shown in fig A. This may need tapping slightly. Take care not to damage the splines or bearing.
- 4 Proceed with fitting instructions.

SERVICE INSTRUCTIONS

Oil Changes:

- First Oil Change 1500 km.
- Subsequent Oil Changes 55000 km intervals.

- Equipment required: Automatic transmission fluid.
 13mm Spanner.
 11mm Spanner.
 Petrol or Paraffin to clean filter.
 Torque wrench.
 Container to drain oil into.

- Method: Place container under unit to catch oil, with the unit fitted to the vehicle on level ground.
 Remove 6-Hex head bolts holding sump plate (11mm spanner.)
 Remove Sump plate and mesh filter, take care not to damage gasket
 Allow oil to drain.
 Clean Filter in Petrol or Paraffin, Clean Sump Plate, take care not to damage gasket and mating face and remove any debris from magnet on the back of the Sump Plate.
 Re-fit Filter and Sump Plate, make sure gasket is flat and in place
 Tighten 6-Hex head bolts evenly to a torque of 12-14Nm.
 Remove filler/level plug from end of unit (13mm spanner)
 Fill with oil up to level (approx 600-700ml)
 Replace oil plug
 Check oil level after running.

Remove the venting tube for the unit and clean out any oil.
Refit as described in fitting Venting Unit, see pages 11-13