

EBW 547

MGB Ford Sierra Gearbox Conversion

Fitting Instructions

This gearbox conversion kit is designed for adapting the 5-speed Ford Type 9 gearbox, as fitted to the Ford Sierra 1983-1987, to the MGB. This gearbox is referred to as 'N' type in Haynes Owner's Workshop Manual for Ford Sierra.

Safety

There is considerable work required underneath the MGB when fitting this conversion. Consequently the use of a vehicle inspection pit or vehicle lift is recommended. If these are not available the car will need raising front and back to give sufficient space to work safely and comfortably under the engine/gearbox/propshaft areas. To accomplish this, support the car front and rear with properly sized and located axle stands. Do not use vehicle or trolley jacks for permanent support, only for raising and lowering the car.

The conversion kit comprises the following parts.

1. Cast Aluminium Alloy Bell Housing. Four fixing bolts/washers.
2. Machined aluminium alloy clutch release lever pivot, 2 fixing bolts/washers.
3. Clutch release lever pivot bolt, nut and washer.
4. Gasket. Bell housing to gearbox.
5. Spigot bush (extended). 2 X ¼ UNF set screws to extract spigot bush if required.
6. Gearbox mounting, two fixing bolts, distance pieces, washers and nuts. One central fixing bolt and spring washer.
7. Replacement crossmember (gearbox support). Four fixing bolts and washers. **FOUR CLAMP WASHERS** for cross member.
8. Modified gear lever assembly, 3 securing screws / spring washer.
9. Propshaft c/w Sierra gearbox nose piece.
10. Speedo cable / circlip
11. LOCTITE

General Philosophy

The cast aluminium alloy bell housing replaces the Ford cast iron bell housing from the Sierra application. The MGB clutch release lever and clutch slave cylinders are re-used on the new bell housing.

An extended spigot bush is a force fit into the rear of the crankshaft and this bush supports the shorter Sierra gearbox primary shaft in the correct position.

The MGB clutch cover assembly, driven plate and carbon thrust bearing are re-used if in good condition. It is a good policy to re-new them if in any doubt.

A new gearbox mounting and cross member is used to support the gearbox. The new crossmember is fixed to the vehicle in the same way as the original pressed steel crossmember, which is not reused. The engine restraint rod fitted to rubber bumper cars is not reused. The engine anti-surge plate on R/L engine mounting on chrome bumper cars is left in place.

A new, balanced propeller shaft complete with Sierra gearbox splined nosepiece is supplied which replaces the original shaft.

A new speedometer cable is supplied which adapts the Sierra gearbox speedo drive to the MGB instrument, which must be re-calibrated to suit the new gearbox speedo drive ratios.

A modified, extended gear lever is supplied, which puts a new MG replica chrome gear lever into the exact position as originally, using the same gear lever gaiter and gear knob.

Sierra gearbox preparation

1. Remove the Sierra bell housing and clutch release mechanism from gearbox and discard.
2. At the front of the gearbox remove the four bolts and withdraw the clutch release bearing guide sleeve, note the orientation of the guide sleeve base. The small protuberance on the base points towards the bottom of the gearbox.
3. Carefully, using a hacksaw, saw off the sleeve at the base leaving approximately 1 cm of sleeve on the base. De-burr and remove filings, clean oil seal thoroughly. The sleeve is not required.
4. Lubricate oil seal and shaft and replace base in correct position on gearbox. Replace cork gasket if damaged, again noting orientation, with the gasket cut out at the bottom. Replace and tighten bolts. 7-8 lb. ft (9-11 Nm).

Vehicle Preparation.

1. Remove MGB Engine, gearbox and propeller shaft from the car as per the MGB workshop manual, observing relevant safety precautions.
2. Separate engine and gearbox (if removed as a unit).
3. Remove the clutch slave cylinder from MGB gearbox.
4. Remove the clutch release lever and carbon thrust bearing from the MGB gearbox.
5. Remove the MGB speedometer drive cable from car.
6. Remove the MGB clutch cover and driven plate. If cover plate is to be re-used mark flywheel and cover plate before removal and re-use in the same position to preserve engine balance.
7. Examine the vehicle chassis rails which run on each side of the vehicle, particularly at the gearbox crossmember mounting position. If there is corrosion around these areas it is important to rectify and renew metal in order to preserve strength.

Assembling the new bell housing

1. Clean the four 12 mm bell housing attachment bolts in solvent to remove oil/grease. Similarly clean the four 12 mm threaded attachment holes on the Sierra gearbox.
2. Remove all paint from the mounting face of the gearbox, and around the guide sleeve base. Remove any protruding cork gasket from around the guide sleeve base with a sharp knife. **THIS IS IMPORTANT.**
3. Assemble the bell housing and gearbox together, with supplied gasket between. Apply LOCTITE (supplied) to the threads of the attachment bolts and gearbox attachment hole threads. Using the spring washers with the 12 mm bolts torque them to 55 lb. ft each (75 Nm).

4. Bolt the aluminium alloy clutch release lever pivot into position using the M8 bolts and spring washers supplied, clean all threads and apply LOCTITE as in (1) above, torque the bolts to 15 lb. ft.(20 Nm)
5. Assemble the original MGB clutch release lever and carbon thrust bearing into position, secure the release lever with the pivot bolt supplied, fit washer, locknut and tighten. Apply a little engine oil to the pivot bolt/ bearing. Do not over-tighten, and lock the release lever.
6. Remove the original spigot bush from the rear of crankshaft, ensure that the vacated hole is smooth and without damage.
7. Position the new spigot bush into the hole in the rear of the crankshaft and drive it in as far as it will go. This is an interference fit into the crankshaft. Use an aluminium or copper drift or a hide mallet to drive it in without damage. The new spigot bush can be removed using the 2 X ¼ UNF set screws as extractors, supplied with the kit.
8. Apply a little grease to the centre hole of the spigot bush to lubricate.
9. Assemble the clutch cover plate/ new driven plate in the normal way. (use a Sierra clutch alignment tool if available.)
10. At this point it is a good idea to assemble the gearbox/ bell housing to the engine to see if all is well. Bolt gearbox/ bell housing to the engine using original bell housing bolts.
11. Fit gear lever assembly with attachment bolts.
12. Remove engine sparking plugs, rotate engine and verify that all gears can be obtained and everything rotates freely and easily.
13. Remove bell housing / gearbox assembly from engine, remove gear lever assembly.

Fitting Gearbox to Car

1. Place a support under the car below the position of the gearbox and place the gearbox / bell housing in position as far back as possible, with the tail end above the fixed crossmember.
2. Replace the engine in position, and carefully guide the gearbox input shaft into the clutch assembly on the engine., When engaged, bring engine / bell housing together and bolt together. Bolt up engine mountings.
3. As an alternative to 1. and 2. above, the engine and gearbox assembly can be bolted up as in 10. above before installing in car and installed as a complete unit. Then bolt up engine mountings, supporting gearbox from underneath.
4. Bolt new gearbox mounting onto gearbox extension casing "v" mounting point with M12 bolt / spring washer supplied using LOCTITE. Torque to 37 lb. ft (50 Nm)
Note: the highest side of mounting should be towards the front of car.
5. Lower gearbox tail end until it is possible to offer up crossmember to contact the bottom of the rubber mounting.
6. Line up holes in crossmember with rubber mounting, and from the top fit the long retaining bolts, distance pieces(lateral safety stop) with bolt heads uppermost. Fit washers and nuts.
7. Raise up gearbox tail end until new crossmember just contacts side of chassis rails.
Do not continue raising tail end as this will damage rubber mounting. Fit clamp plates to the ends of the crossmember with 3/8" UNF setscrews and spring washers and lightly bolt in place.

8. Fit new propshaft. Lubricate spline and outer surface of nose piece with gearbox oil before pushing into place through oil seal. Bolt up rear flange as before - use new locknuts.

9.

Torque

up crossmember bolts to 35 lb. ft (47 Nm). Torque up the two 5/16" gearbox mountings retaining bolts to 20 lb. ft (27 Nm).

Fitting Speedo Cable:

10. The speedo cable takes the same route as the original. The gearbox termination is secured with a circlip. You will need a fine pair of internal circlip pliers. This is not easy to fit.

Gear Lever and Gaiter:

11. Fit new gear lever through hole in tunnel deck and fit M8 security set screws and lock washers. A small ratchet 13 mm socket will be useful here, one screw may need to be tightened from below as access is difficult.
12. Refit original gaiter. Check movement and gear selection. Check all gears can be obtained with good gear lever clearance in the hole.
13. Fill gearbox with Ford synthetic oil (Part No 5 015 547) Fill to level hole on LH side of gearbox. Access is only from underneath.
14. Ensure all engine services/ parts are correctly installed.
15. Fit clutch slave cylinder, push rod clevis pin /split pin. Renew push rod clevis pin if worn.
16. Attach flexible hydraulic pipe.
17. Bleed clutch system - test.
18. Check car for roadworthiness.
19. Road Test
20. The speedometer will need re-calibrating to the new gearbox. A data sheet is enclosed for Speedy Cables who can do this work. Any competent instrument company can do this.
21. After 100 miles (160 km), recheck tightness of all newly installed bolts / nuts.
22. At normal service intervals, lubricate propshaft as per vehicle service manual, and always check and replenish gearbox oil level as necessary.

SPECIAL NOTE

The propeller shaft supplied with this kit is manufactured to the original manufacturer's specification:

Torque rating (short duration) 570 Nm MAXIMUM (422 lb. f.ft)

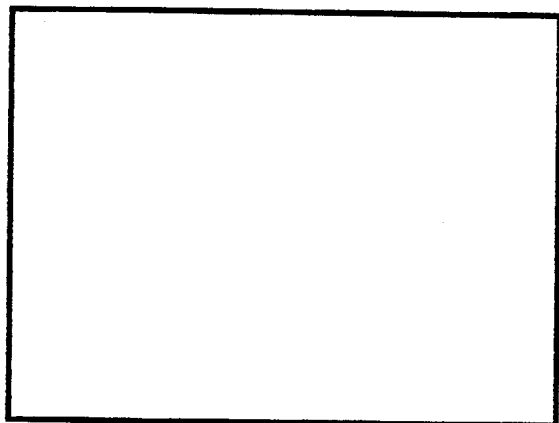
Rpm rating of propeller shaft: 7000 rpm. MAXIMUM

This corresponds to an engine speed of 5740 rpm in 5th gear (ratio 0.82:1), or an engine speed of 7000 rpm in 4th gear (ratio 1:1).

For higher torque or speed applications, Hi-Gear Engineering Ltd. can refer customer to manufacturer.

In case of any problems

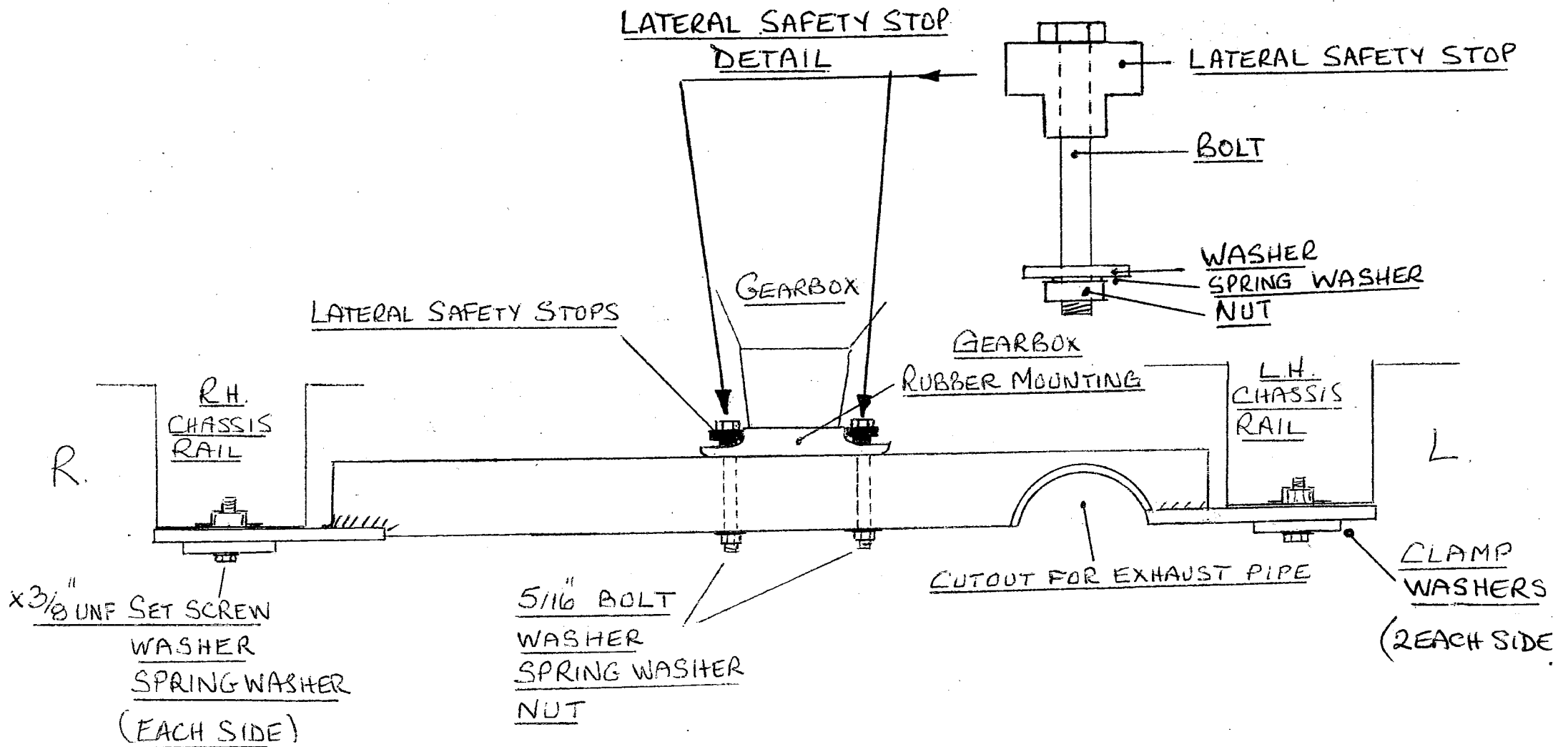
contact your supplier:



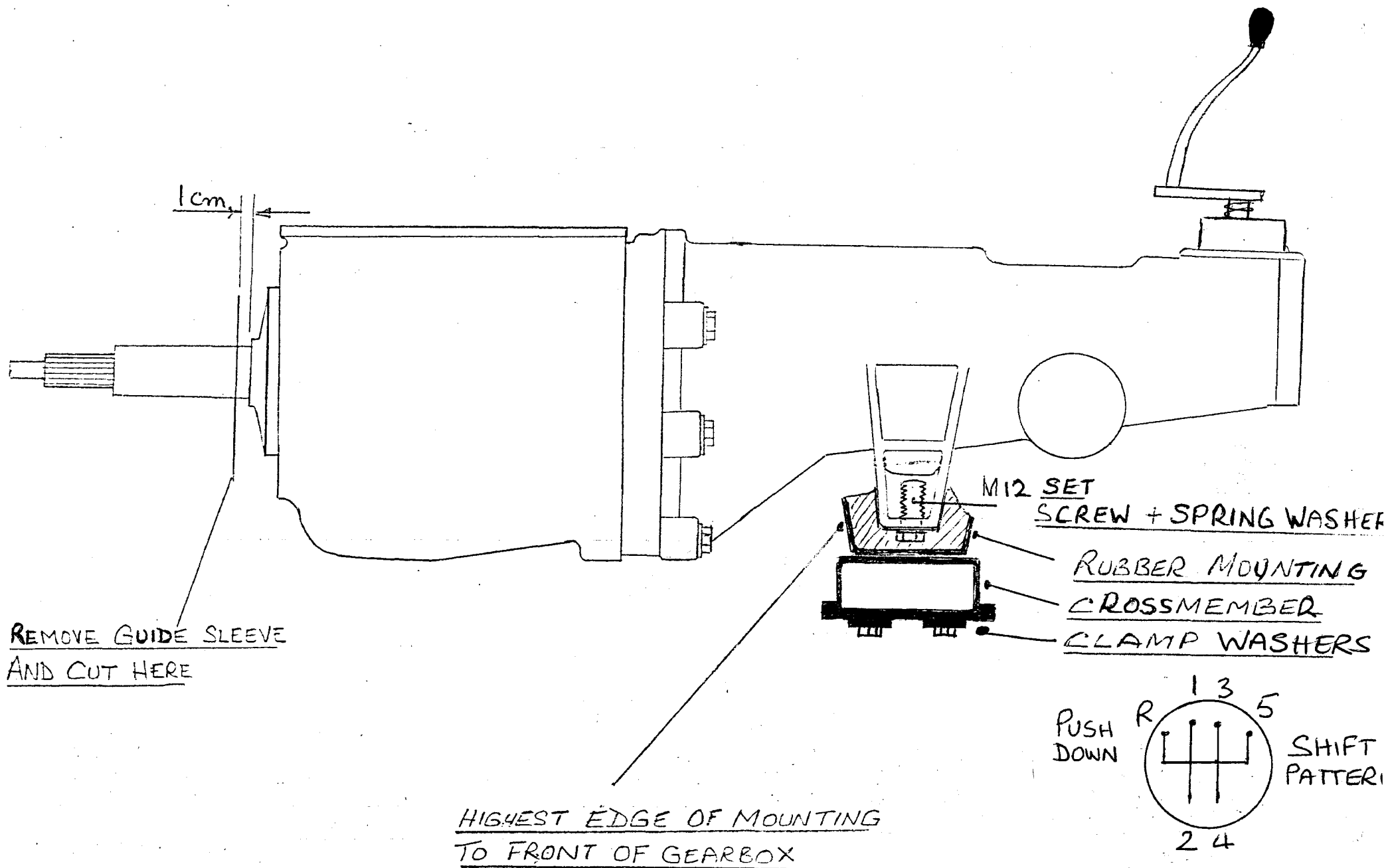
or the manufacturer:

**Hi-gear Engineering Ltd.
82 Chestnut Avenue
Mickleover
Derby DE3 5FS
ENGLAND**

Tel/Fax: 00 44 (0)1332 514503



CROSSMEMBER ASSEMBLY
VIEW TOWARDS REAR OF CAR



GEARBOX PREPARATION DETAILS

MGB.(EARLY)

Hi-Gear Engineering Ltd.

Registered Office
82 Chestnut Ave
Mickleover
Derby DE3 9FS
Tel/Fax 01332 514503

Registered in England
No 3503082

Director
P.D. Gamble

VAT No 705 9363 27

OILS FOR FORD TYPE 9

Ford synthetic part no. 5015547

Castrol SYNTRAX 75W-90

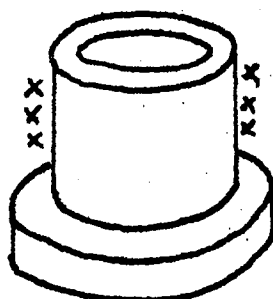
Castrol SYNTEC gear oil 75W-90 (UK)

Castrol SYNTEC gear oil 75W-90(USA)

Mobil 1 SHC gear oil 75W-90

Spigot Bush

Apply bearing Loctite to hole in rear of crankshaft and also to spigot bush around outside of smaller diameter. (***)



Fit bush into hole in crankshaft. Drive in firmly and squarely until the flange is hard against crankshaft and will go no further.

Do not use a hammer directly on the face.

The best way is to interpose an aluminium round bar between bush and hammer or suitable softer material which keeps bush in line whilst being driven in.

For MGB 5 Bearing engines ensure that the flywheel bolt locktabs do not obstruct spigot bush flange.

Speedograph Richfield

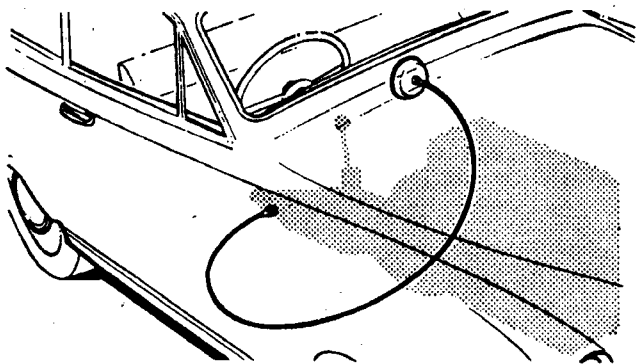
Speedograph Richfield Ltd., Rolleston Drive, Arnold, Nottingham NG5 7JR

Telephone: **44 (0)115 926 4235. Fax: **44 (0)115 920 9912

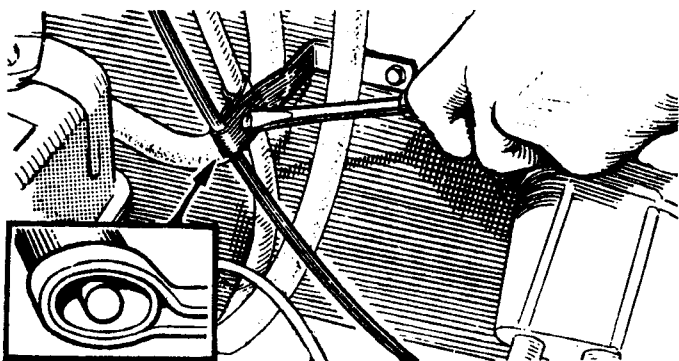
Service Information on Flexible Drives

The condition of the flexible drive to a great extent controls the performance of the speedometer or revolution indicator, and poor installation or subsequent damage to the flexible drive will be shown up as an apparent instrument fault. It is, therefore, important that the flexible drive be correctly fitted and properly maintained.

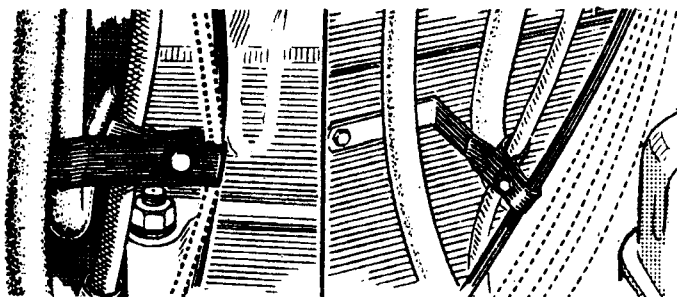
The following illustrations give general information for fitting and maintaining your flexible drive.



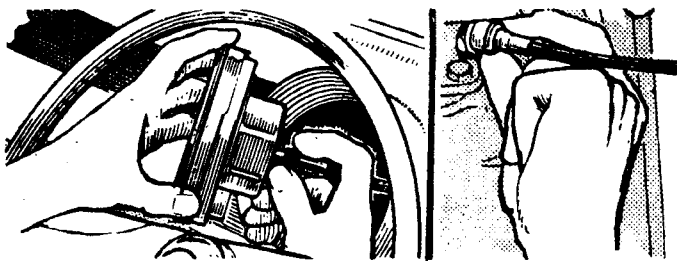
1 Smooth Run Run of flexible drive must be smooth. Minimum bend radius 6". No bend within 2" of connections.



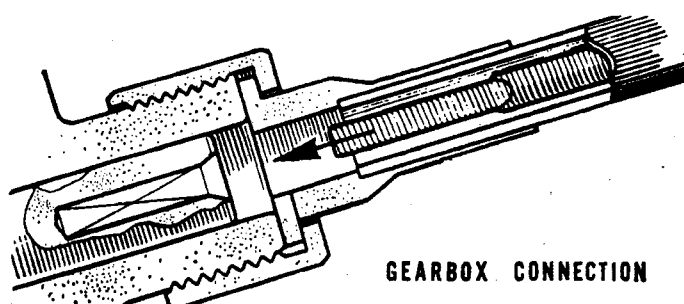
2 Securing Avoid crushing flexible drive by over-tightening clip. Flex can be crushed between moving components.



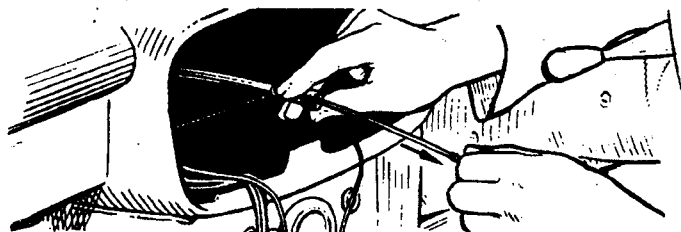
3 Securing Avoid sharp bends at clips. If necessary alter position of clips. Excessive free movement of the flexible drive should be avoided. Fit extra clips if necessary.



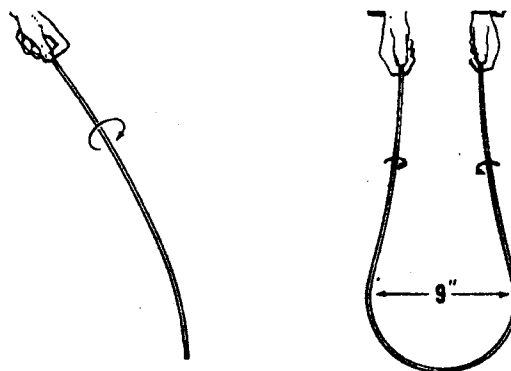
4 Connection Ensure that threaded end connections are secure with no looseness of the outer casing end collars. Connecting nuts should be tightened by hand. Spanner or pliers should not be used. It is important that the drive to which the flexible drive connects is free from dirt and grit.



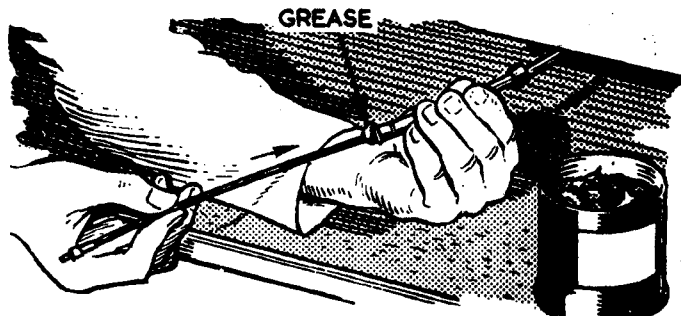
5 Connection of Inner Flex Where possible, slightly withdraw inner flex and connect outer casing first to point of drive. Then slide inner flex into engagement from the other end. It may be necessary to rotate flex.



6 Removal of Inner Flex Most inner flexes can be removed by disconnecting instrument end and pulling out flex. Some must be removed from point of drive end after first taking off C washer at instrument end. Broken inner flex will have to be withdrawn from both ends.



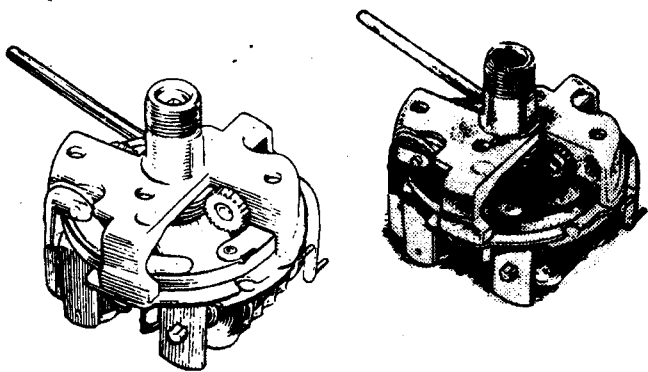
7 Check for Inner Flex Lay out flex straight on flat clean table and roll. Any 'kinks' or obvious signs of damage will be seen. Then take an end in each hand allowing flex to hang in a loop of approximately 9" diameter. Rotate it slowly with the fingers. A satisfactory flex will turn smoothly without 'snatch'.



8 Lubrication of Replacement Inners Apply grease sparingly to replacement flex. Feed flex back into its casing. Then withdraw approximately 8" and wipe off surplus grease. Use SHELL SB2628 GREASE. Do NOT use oil.

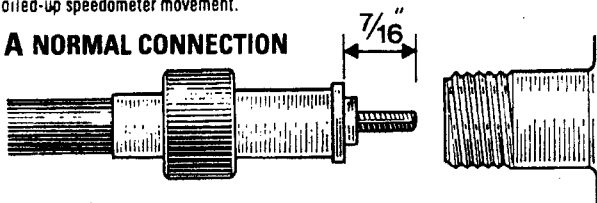
It has been found that the replacement of an inner flex does not always solve the problem of erratic speedometer or rev. counter performance, and in many instances it will be necessary to fit a new complete flexible drive. When the time for renewal of flex drive comes the following points should be considered.

On a car covering 12,000 miles a year the number of turns of the inner flex is approximately 12,000,000 and even with proper maintenance a certain amount of wear is inevitable. If the inner flex needs replacing it is correct to assume that the outer flex will also need replacing as a corresponding amount of internal wear will have taken place, especially on the curve of an outer flex with an awkward run. Concentric rotation of the inner flex is essential for accurate readings and long service; and the insertion of a new inner in an internally worn outer flex does not lend itself to this. The only answer is to fit a complete new flexible drive.

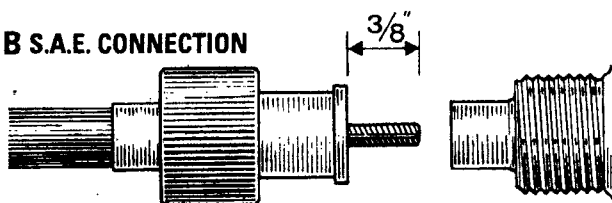


9 Excessive Lubrication Avoid excessive lubrication. If oil appears in flexible drive, suspect faulty oil-seal at point of drive. If this condition exists, it is necessary to replace oil seal at point of drive before fitting a new flexible drive. Illustration shows oiled-up speedometer movement.

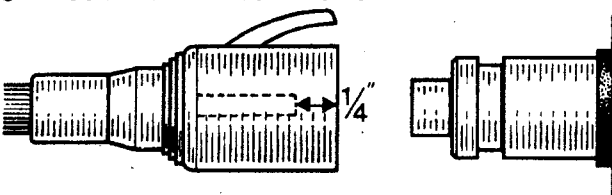
A NORMAL CONNECTION



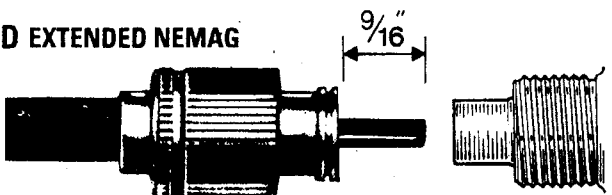
B S.A.E. CONNECTION



C TRIGGER RELEASE CONNECTION



D EXTENDED NEMAG



10 Inner Projection

A) Check that there is approximately 7/16" of inner projection beyond outer casing of instrument.

B) Check that there is approximately 3/8" of inner projection beyond outer casing of instrument.

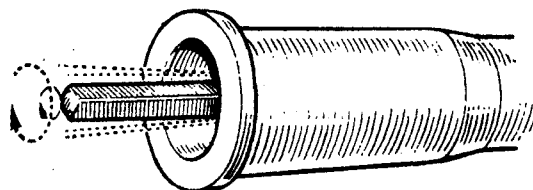
C) With the inner flex properly seated its projection from the outer casing should be approximately 1/4" short of the plastic trigger release connection.

D) Check that there is a maximum of 9/16" of inner projection beyond outer casing of instrument.

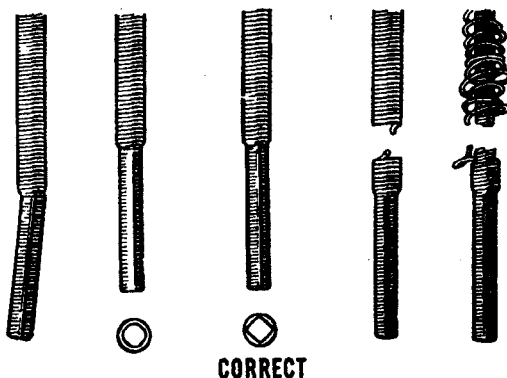
If inner flex does not seat properly, check at the gearbox end to ensure that no obstruction to its proper engagement is evident.

Should the protrusion still exceed the above dimensions, advice can be obtained from Speedograph Richfield Ltd. Failure to observe the above procedure may cause damage to the speedo head, with subsequent malfunction.

N.B. Any instrument damaged in this manner is not covered by any Speedograph Richfield Ltd. warranty.

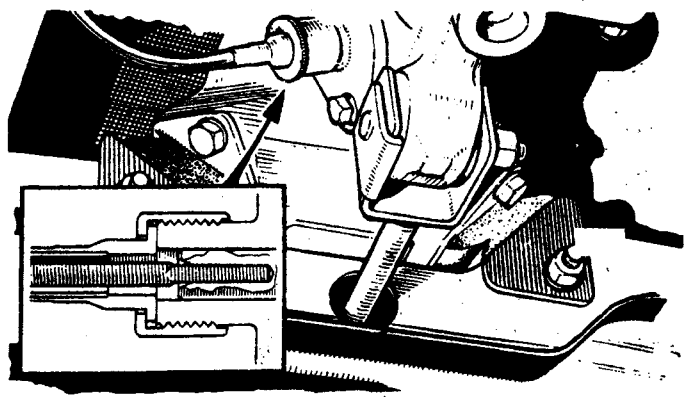


11 Concentric Rotation Check that inner flex rotates concentrically when fitted in outer casing, and not eccentrically, as shown by the dotted lines.



CORRECT

12 Damaged Inner Flex Examine inner flex ends for wear or other damage. Before fitting new inner flex ensure instrument main spindle is free.



13 Damaged Drive End Connections Examine point of drive for dirt or possible damage. Check driving key to ensure tightness between it and its gear in gearbox.

Speedograph Richfield

Speedograph Richfield Ltd.
Rolleston Drive, Arnold, Nottingham NG5 7JR
Telephone: 0044 (0)115 926 4235
Facsimile: 0044 (0)115 920 9912
email: info@speedograph-richfield.co.uk

Our instrument service offers an unparalleled combination of expertise and experience for the refurbishment of vehicle instruments regardless of age, type or condition. Our speedometer flex drive, brake cable and control cable manufacturing plants offer a versatility second to none in the UK, supplying in volume to the motor industry, but still having time to spare to produce the one-off cable for small builder and enthusiast. The minimum quantity we will manufacture is one.

SPEEDOMETER RECALIBRATION

To have a speedometer recalibrated, the following little exercise is all you require to do to supply the information we need.

1. Disconnect Flexible Drive from instrument end.
2. Jack up 1 (one) driving wheel. (Do not jack up both driving wheels!)
3. Mark tyre with chalk line, masking tape, or similar.
4. Mark body or chassis with a line corresponding to the line on the tyre.
5. Turn driving wheel exactly 20 times whilst an assistant counts the number of turns the inner speedometer cable makes, to the nearest 1/8 of a turn. (To facilitate ease of counting a cardboard arrow can be made and pressed into the end of the inner cable.)
6. Note make and size of driving wheel tyre.

We need to know: a) Number of turns of inner cable for 20 turns of drive wheel.
b) Make and size of drive wheel tyre.
c) Make and part number of speedometer.

Please complete:

N. B. Please also ensure to tell us if the vehicle has limited slip dif fitted.

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TACHOMETER JUSTIERUNG

Um Ihren Tachometer richtig justieren zu können, brauchen wir einige Informationen von Ihnen. Bitte führen Sie dafür die folgenden Schritte aus:

1. Trennen Sie die Tachowelle vom Tachometer.
2. Bocken sie ein Antriebsrad hoch (bitte nur eins!)
3. Markieren Sie einen Punkt am Reifen (z. B. mit Kreide).
4. Markieren Sie in derselben Linie einen Punkt am Chassis.
5. Drehen sie nun das Achsrads genau 20 mal während jemand anders die Anzahl der Umdrehungen der Tachowelle zählt, zu dem nächsten Achtel einer Umdrehung.
6. Marke und Größe des Achsrades und Reifens notieren.

Wir müssen wissen: a) Anzahl der Umdrehungen der Tachowelle bei 20 Umdrehungen des Achsrades.
b) Marke und Größe des Achsrades und Reifens.
c) Marke und Seriennummer des Tachometers.

WICHTIG: Bitte teilen Sie uns mit, ob Ihr Fahrzeug ein Sperrdifferenzial hat.

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KILOMETER CALIBRATIE

Om een snelheidsmeter te recalibreren, moet U het volgende doen:

1. Maak de kilometerkabel aan het eind van de snelheidsmeter los.
2. Krik één aandrijfwiel op (niet beide!).
3. Markeer de band met een krijtje, tape of iets dergelijks.
4. Markeer body of chassis met een streep die overeenkomt met die van de band.
5. Draai wiel precies 20 keer rond, terwijl een assistent het aantal omwentelingen telt die de binnen-kilometerkabel maakt, met een nauwkeurigheid van 1/8 draai. (Om het tellen te vergemakkelijken kunt U een kartonnen pijl maken en die aan het eind van de binnenkabel vastdrukken.
6. Noteer het merk en de maat van de band.

Wij moeten weten: a) Het aantal omwentelingen van de binnenkabel als het wiel 20 keer gedraaid is.
b) Het merk en de maat van de band.
c) Het merk en onderdeel/serie-nummer van de snelheidsmeter.

Invullen a. u. B.

N. B. Vermeld ook of in uw auto een beperkte slip dif is geïnstalleerd.

To enable us to identify your requirements and advise our best quotations, please provide as much information as possible and forward with the instrument.

CUSTOMER _____ FAX NO _____
_____ TEL NO _____
_____ 'E' MAIL _____

Instrument _____ Speedo/ Tacho/ Time Clock/ Dual Gauge/ Fuel/ O-Temp/ O-Press/ W-Temp

Instrument Code _____

Car _____ Make _____ Type _____
Year _____ non o/d / o/d auto _____

Does customer believe instrument is correct for vehicle YES/NO If not, make correct
YES/NO

Is a MPH/KPH conversion required YES/NO
to vehicle spec YES/NO
to original instrument spec YES/NO

Calibration - Customer advises required details YES/NO

Mileage - Retain existing/ zero

Instrument layout

Face Replace / clean / reprint
Glass Flat / Convex
Pointer Replace / clean / reprint
Bezel Rechrome / replace / leave as is / paint black
Case Replate / paint black / leave as is

Brackets/ Nuts/ Bulbs & Holders With instrument/ to be supplied/ kept by customer

Customer requires

- 1) Full Restoration to correct code for above vehicle
Including reprint dial, replate case - make as new 1998 spec
- 2) Clean adjust and calibrate to correct code for above vehicle
- 3) Other

Please reply to ☐

HEAD OFFICE & CABLE DIVISION

Unit 14 Merchant Drive Hertford SG13 7AZ
Tel: 01992 581600 • Fax: 01992 589800



Please reply to ☐

INSTRUMENT DIVISION

Abercrave Swansea SA9 1SQ
Tel: 01639 732213 • Fax: 01639 732238



1. Let us have the measurement from the centre of the hub of a drive wheel to the ground, with the tyre pumped to normal pressure.

ANSWER: _____ inches.

2. Disconnect speedometer and place a cardboard arrow on the end of the protruding inner speedo cable.

3. Put a chalk mark at the bottom of the measured wheel. Push the car straight forward with gear in neutral counting exactly 6 revolutions of the wheel, whilst a partner counts the number of times that the arrow on the cable revolves. **DO NOT DO THIS BY JACKING UP THE WHEEL AS THIS GIVES A COMPLETELY FALSE RESULT.**

ANSWER: turns.

Please be as careful as possible with the information you supply in order that we can carry out an accurate re-calibration.

Specialist Supplier & Repairer of Automotive Cables, Instrumentation & Sensors