

mazda



BRITISH MOTOR
HERITAGE APPROVED



Vitesse

MGB V8 Gearbox Conversion Kit

Fitting Instructions



KIT CONTENTS

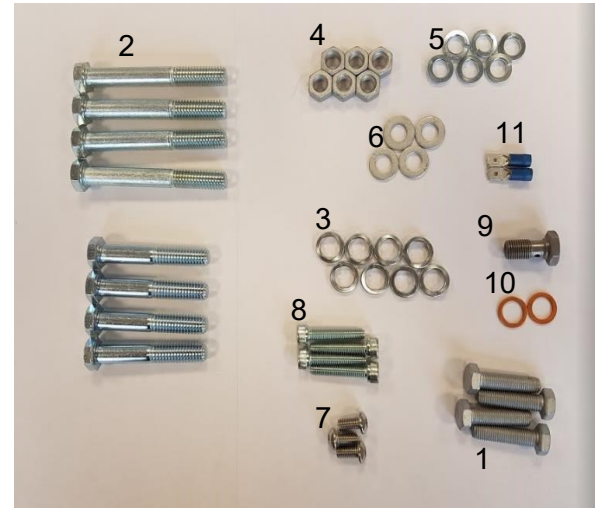
- Mazda MX-5 5 Speed Transmission:
 - Vitesse Gearbox Case
 - Vitesse Bellhousing
 - Vitesse Machined Front Plate
 - Modified rear case to accept Mazda mechanical Speedo Drive
- Bespoke Clutch Friction Plate
- Clutch Cover
- Vitesse Bespoke Shift Lever
- Concentric Slave Cylinder Assembly with feed and bleed pipes
- Concentric Slave Cylinder Spacer Plate
- Prop Shaft
- Spigot Bush with OE needle roller bearing assembly
- Speedo Drive Cable and Angle Drive
- Gearbox Rear Mount Bracket Assembly and Isolator
- Dirt Shield
- Clutch Alignment Tool
- All UNF/UNC fixings- see next page



FIXINGS

- The gearbox, bellhousing, concentric slave cylinder assembly and speedo drive are all pre-assembled, ensuring that the installation to your vehicle is as straightforward as possible.
- The following fixings are all that is required to fit the Vitesse kit to your vehicle:

1. 4X 5/16UNF x 1 ¼" HEX HEAD BOLTS
2. 8X 3/8UNC x 2 ¼" HEX HEAD BOLTS
3. 8X 3/8UNC SPRING WASHERS
4. 6X 5/16UNF NUTS
5. 6X 5/16UNF SPRING WASHERS
6. 4X 5/16UNF WASHERS
7. 3X M6X12mm DOMED CAP SCREWS
8. 4X M6X30mm CAP HEAD SOCKET SCREWS
9. 1X BANJO BOLT
10. 2X COPPER WASHERS
11. 2X SPADE TERMINALS
12. 4X 1/4UNC x ½" HEX HEAD SET SCREWS



VEHICLE AND WORKSHOP PREPARATION

- Ensure you have a clean, safe working environment with enough room around your vehicle.
- We strongly recommend the use of a vehicle lift and an engine hoist with a ratchet winch, so the angle of inclination can be adjusted when removing / refitting the engine and gearbox assembly.
- Use a torque wrench to ensure all fixings are torqued correctly.
- Ensure clutch cable is in the correct orientation for the hand of drive of vehicle.
 - Hold the cable upright over the gearbox.
 - The banjo eyelet should point to the DRIVER'S SIDE FRONT WHEEL if the gearbox were to be installed in the vehicle:
 - For RHD vehicles the banjo eyelet should point to the right front wheel
 - For LHD vehicles the banjo eyelet should point to the left front wheel
- **NOTE** the gearbox comes either pre-filled with oil, or with the oil drained in to bottles for international markets. As there is residual oil in the gearbox there is sufficient oil in the bottles to refill to the specified levels. The main case and shift case have separate oil, and should be filled as follows:
 - OIL GRADE: API Service GL-4 or GL-5
 - OIL VISCOSITY: SAE 75W-90
 - OIL CAPACITY: 2.0L {2.1 US qt, 1.8 Imp qt}
 - SHIFT CONTROL CASE OIL CAPACITY: 290-330ml {17.69—20.13 cu in}
 - OIL SERVICE INTERVAL: Every 5 years or 62,000 miles (100,000km), whichever comes first

DISASSEMBLY

1. Remove bonnet to aid engine bay access, or disconnect bonnet stay so it can be fully opened, and then retain.
2. Drain coolant.
3. Remove alternator.
4. Disconnect choke and throttle cable.
5. Disconnect fuel line from carbs.
6. Loosen all engine mount bolts.
7. Disconnect heater matrix feed from engine block.

LIFT VEHICLE

8. Remove exhaust system.
9. Remove prop shaft.
10. Remove slave cylinder and speedo cable from gearbox.
11. Disconnect starter motor harness.
12. Remove gearbox isolator bolts from crossmember. Leave crossmember fitted to chassis for now to support gearbox.

LOWER VEHICLE

13. Remove gear lever and gaiter.
14. Remove starter motor bolts.

15. Remove distributor cap to allow for more clearance.
16. Fit engine hoist to lifting points on head.
17. Lift engine and gearbox, and remove starter motor when possible.
18. Lift engine and gearbox further and remove from vehicle.
19. Drain clutch lines and remove from master cylinder.
20. Remove gearbox rear bracket / crossmember from vehicle. Your conversion kit does not use this mounting point so the four crossmember mounting bolts can be refitted to retain the plates within the chassis rail.
21. Clean up rear crossmember in preparation for gearbox installation.

ENGINE AND GEARBOX

22. Remove gearbox from engine.
23. Remove clutch cover and clutch disc from flywheel.
24. Remove spigot bush from crank using a slide hammer, or by carefully chiselling it out and removing all swarf.
25. Clean up engine back plate in preparation for gearbox refit.

It is highly recommended that the flywheel and clutch cover are inspected at this point, and a new (or re-ground) flywheel and new clutch cover sourced and fitted if necessary.

ASSEMBLY

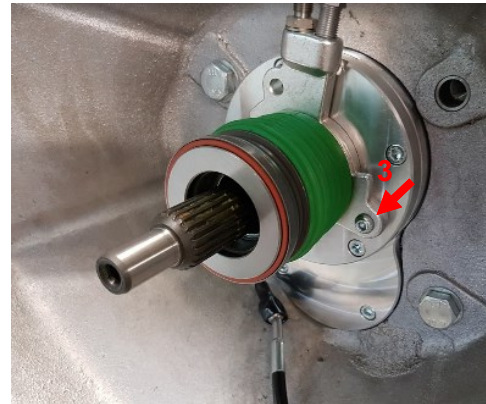
ENGINE AND GEARBOX

Due to the different flywheels fitted to Original MGB GT V8s and conversion V8s/ SD1s, it is necessary to measure the distance from the engine block/ gearbox mounting face to the flywheel friction face.

- If this measures approx. 34mm (1 5/16") then you will need to change to the shorter clutch slave cylinder.
- If this measures approx. 23mm (7/8") then you have the shallow flywheel and will need the longer clutch slave cylinder that is already fitted.

CHANGING THE SLAVE CYLINDER (CSC)

1. Note orientation of clutch feed pipe banjo (see VEHICLE AND WORKSHOP PREPARATION).
2. Undo and remove the clutch feed and bleed pipes from the CSC.
3. Undo and remove 3X M6 Dome Head screws holding CSC to gearbox front plate. Remove CSC.
4. Fit replacement CSC, ensuring O ring is correctly seated to chamfer of front plate.
5. Replace 3X Dome Head screws. Use threadlock and torque to **8lb/ft.**
6. Refit Feed and Bleed pipes, noting orientation of banjo. Use threadlock and torque to **10lb/ft.**



ASSEMBLY

ENGINE AND GEARBOX

The transmission is delivered fully assembled, with the concentric slave cylinder assembly, speedo drive and rear bracket and isolator assembly fitted and ready to be installed to the engine.

1. Fit Spigot Bush assembly in to crank with mallet. Some oil tolerant threadlock may be used if to hand.
2. Assemble the clutch cover and new friction plate to flywheel, using the supplied Mazda clutch alignment tool to ensure correct positioning. Torque clutch cover bolts to **30lb/ft.**
3. Fit gearbox to engine using:
 - 4X 3/8 UNC x 3" HEX HEAD BOLTS
 - 4X 3/8UNC x 2 1/4" HEX HEAD BOLTS
 - 7X 3/8UNC SPRING WASHERS

This is a two-person job. Push the gearbox on to the dowels in the block, and the input shaft should line up with the spigot bush. Fit the nuts with spring washers.

Torque all fixings to **33lb/ft.**

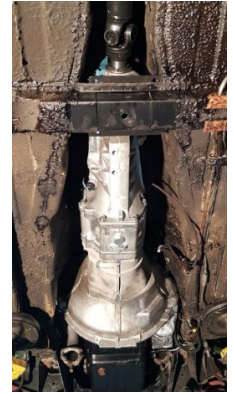
4. Fit Dirt Shield to Bellhousing using:
 - 4X 1/4UNC x 1/2" HEX HEAD SET SCREWS at **8lb/ft.**
5. The earth strap is usually fitted to the gearbox crossmember. As we don't fit this crossmember, it is advised to relocate the earth strap to the clutch pipe bracket on the driver's side of the transmission tunnel and fit to the closest bellhousing bolt.



ASSEMBLY

ENGINE AND GEARBOX

6. Lift engine and gearbox assembly in to vehicle. Ensure rear gearbox bracket is lifted over rear body crossmember.
7. Loosely fit nuts to engine mounts to ensure it is safe. Then lift gearbox up to allow for rear mount top plate to slide under gearbox rear mount and studs can be passed through isolator holes. Use the following to secure mount plate to isolator:
 - 2x 5/16UNF NUTS- Torque to **19lb/ft.**
 - 2x 5/16UNF SPRING WASHERS
8. Fit Prop Shaft slip yoke in to gearbox using a little gearbox oil to lubricate yoke and bush. Fit prop shaft flange to differential, replacing fixings if originals are in poor condition.
9. Due to MGB tunnel variations, we have allowed for some float on the rear mounting. There should be 5-8mm clearance between the prop shaft front knuckle and the transmission tunnel wall. Ensure this measurement is taken at the closest point, and then secure position by fitting the lower cup bracket to crossmember. This then allows sufficient clearance for the gear lever to pass through the standard aperture and for 5th gear to be selected without contacting the tunnel aperture.



ASSEMBLY

ENGINE AND GEARBOX

10. Fit rear mount fixings in rotation:
 - 4X 5/16UNF x 1 ¼" HEX HEAD BOLTS at **19lb/ft**
 - 4X 5/16UNF NUTS
 - 4X 5/16UNF WASHERS
 - 4X 5/16UNF SPRING WASHERS
11. Fit shift lever from inside vehicle using the fixings below. Ensure collar is aligned to recess in shift joint as shown, and points forwards. Ensure all gears can be selected and there is no clash to tunnel aperture. If there is a clash, the rear mount needs to be moved across, maintaining some prop clearance to the tunnel wall.
 - 3x M6x12mm DOMED CAP SCREWS at **8lb/ft**
12. Remove engine mount bolts and lift engine to allow for starter motor refit. Lower engine back on to mounts and fit all mount fixings.
13. Refit alternator.
14. Refit oil cooler pipes and front mounting plate.
15. Refit coolant pipes.
16. Refit fuel line, throttle cable and choke.



ASSEMBLY

ENGINE AND GEARBOX

17. Refit radiator.
18. Remove access hatch behind clutch master cylinder and remove clutch pipe.
19. Fit new clutch pipe to master cylinder with supplied new banjo bolt and copper washers. Use cable ties to retain pipe and keep clear of bonnet hinge.
20. Fill master cylinder with DOT4 brake/ clutch fluid.

21. CLUTCH BLEEDING

- Use an 8mm spanner to undo the bleed pipe $\frac{1}{4}$ of a turn.
- Depress the clutch pedal fully.
- Tighten bleed pipe
- Release clutch pedal

Repeat until resistance is felt through the clutch pedal.

This may take a number of cycles and you must keep an eye on the clutch fluid level in the master cylinder throughout the process to ensure air is not pulled through the system.



ASSEMBLY

ENGINE AND GEARBOX

22. Fit angle drive and speedo cable to speedo drive on gearbox and thread through the bulkhead to the speedometer. The knurled fittings should only be hand tight. The cable is long enough for you to ensure as smooth a path as possible. Use the grommet from the old cable to protect the new one as it passes through the bulkhead.
28. Connect reverse light switch if reverse lights are fitted. The fly leads have been fitted with bullet terminals to be compatible with the existing vehicle wiring.. The fly leads can be extended by bending the clip on the gearbox body out of the way to aid fitment.
29. As an optional safety feature, there is a neutral switch that can be connected in line with the ignition switch. If used, this ensures the engine cannot be started unless the vehicle is in neutral. The neutral switch is the one to the rear of the tailhousing.
22. Fit gaiter and surround to shift lever.
23. Fit shift knob to shift lever.
24. Test drive vehicle and enjoy!

NOTE:

It is likely that the speedometer will need to be re-calibrated to suit the new gearbox. If in the UK, we recommend Speedy Cables (www.speedycables.com) or Speedograph Richfield (www.speedograph-richfield.com) for this work.

