

**mazda**



BRITISH MOTOR  
HERITAGE APPROVED



**Vitesse**

# MGA 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
- Mazda MX-5 OE Clutch Friction Plate with Spacers
- Vitesse Bespoke Shift Lever
- Concentric Slave Cylinder Assembly with feed and bleed pipes
- Prop Shaft
- Spigot Bush with OE needle roller bearing assembly
- Speedo Drive Cable
- Gearbox Rear Mount Bracket Assembly and Isolator
- Clutch Alignment Tool
- All required 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. 5X 5/16UNF X 3" HEX HEAD BOLTS
  2. 2X 5/16UNF X 2 ½" HEX HEAD BOLTS
  3. 7X 5/16UNF NUTS
  4. 7X 5/16UNF WASHERS
  5. 7X 5/16UNF SPRING WASHERS
  6. 10X M8X20mm FLANGE BOLTS
  7. 6X M8 FLANGE NUTS
  8. 3X M6X12mm DOMED CAP SCREWS
  9. 1X BANJO BOLT
  10. 2X COPPER WASHERS
  11. 6X CLUTCH COVER SPACERS

# 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
- Two modifications are required to allow this gearbox kit to be fitted- the removal of the existing gearbox mounts, and the enlarging of the tunnel aperture. Refer to the relevant section for details of the modifications.
- **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.

## ENGINE AND GEARBOX

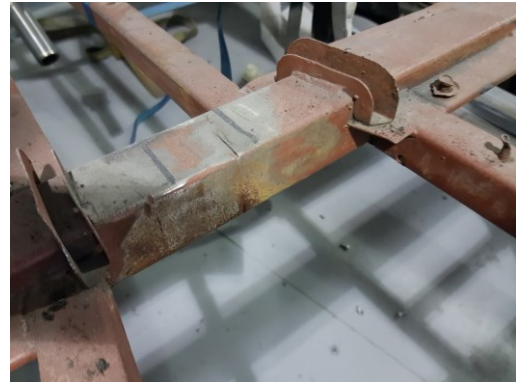
20. Remove gearbox from engine.
21. Remove clutch cover and clutch disc from flywheel.
22. Remove spigot bush from crank using a slide hammer, or by carefully chiselling it out and removing all swarf.
23. Clean up engine back plate in preparation for gearbox refit.

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.

# VEHICLE MODIFICATION

## GEARBOX MOUNT REMOVAL

1. Once the vehicle has been stripped down, the gearbox mounts can be removed. Use an angle grinder to remove the mounts, and then clean up the area to ensure no sharp edges or burrs remain. The new gearbox mount is bolted to this crossmember, so it needs to be cleaned up before fitting.
  2. Repaint crossmember to ensure it will not rust in future.
- NOTE replacement brackets are supplied ready for re-welding to the chassis if the original gearbox is to be re-fitted in future.



# ASSEMBLY

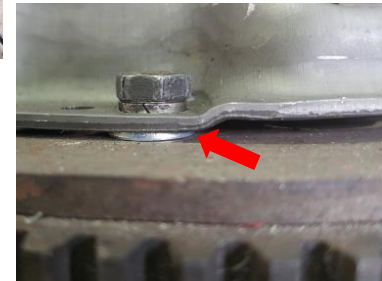
## ENGINE AND GEARBOX

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.

Engine and gearbox can be reinstalled separately to vehicle if a transmission jack is available. It can be easier to install in this way only if the required equipment is available.

The following assumes only an engine crane is to hand, so is more suited to a home installation.

1. Fit Spigot Bush assembly in to crank with mallet. Knurled section should be a tight fit in to the crank. If slightly loose, apply threadlock and refit.
2. Assemble the clutch cover and new friction plate to flywheel, using the supplied Mazda clutch alignment tool to ensure correct positioning. Due to the extra thickness of the Mazda clutch plate, fit the 6 stainless spacers under the clutch cover fixings-see image.



# ASSEMBLY

## ENGINE AND GEARBOX

5. Lift gearbox assembly in to vehicle. Ensure rear gearbox bracket is lifted over rear body crossmember. Support gearbox with a jack or similar.
6. Drop engine in to place, and loosely fit one bolt and nut through each engine mount point to ensure it is safe.
7. Line up input shaft to crank, and fit gearbox to engine using:
  - 5X 5/16UNF x 3" HEX HEAD BOLTS
  - 2X 5/16UNF x 2 1/2" HEX HEAD BOLTS
  - 7X 5/16UNF NUTS
  - 7X 5/16UNF WASHERS
  - 7X 5/16UNF SPRING WASHERS
9. Due to MGA tunnel variations, we have allowed for some float on the rear mounting. There should be 5-8mm clearance between the gearbox and the right hand side of the tunnel. Ensure this measurement is taken at the closest point, and then secure position by tightening the crossmember. This then allows sufficient clearance for the gear lever to pass through the standard aperture and for all gears to be selected without contacting the tunnel aperture.

Fit the fixings, with nuts and spring washers on the engine side and washers on the bolt side.

Fit and hand-tighten the top-right and bottom-left nuts & bolts first to ensure alignment of the rest of the fixings (these are the locators), then fit remaining fixings and torque all to **19lb/ft.**

- **CARE POINT:** Attach a socket to the front pulley bolt and turn the engine over, to ensure the assembly is turning freely
6. Lift gearbox up with a trolley jack or similar to allow for rear mount assy to be fitted.
  7. Fit engine restrictor on left hand engine mount.
  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.

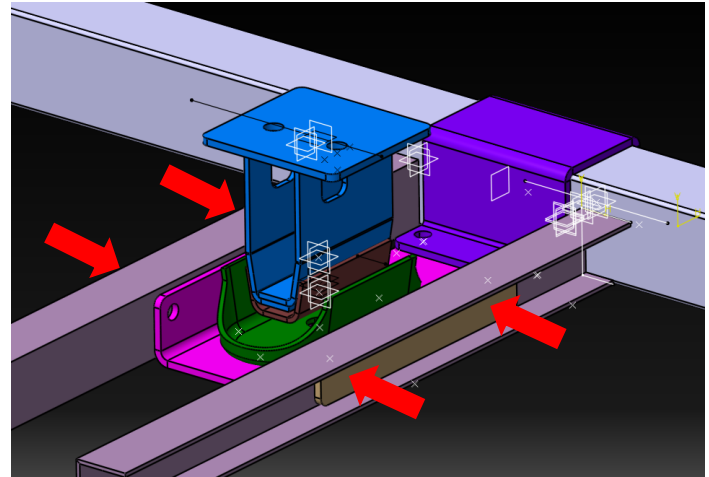




# ASSEMBLY

## ENGINE AND GEARBOX

10. Drill four 9mm holes in the chassis rails to match the rear mount hole positions, highlighted in the image on the right. Paint to protect from rust.
11. Position support plates as shown.
12. Fit rear mount fixings in rotation:
  - 10X M8X25mm FLANGE BOLTS AT **19lb/ft**
  - 6X M8 FLANGE NUTS
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. Refit tunnel top.
13. Remove engine mount bolts and lift engine to allow for starter motor refit. Lower engine back on to mounts and fit all mount fixings.
14. Refit alternator.
15. Refit oil cooler pipes and front mounting plate.
16. Refit coolant pipes.
17. 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 speedo cable to speedo drive on gearbox and thread through the bulkhead to the speedometer. 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.
23. Connect reverse light switch if reverse lights are fitted. Two male spade terminals are included to adapt the vehicle harness. The reverse light switch has BLACK connectors (highlighted). The fly leads can be extended by bending the clip on the gearbox body out of the way to aid fitment.
24. Fit gaiter and surround to shift lever.
25. Fit shift knob to shift lever.
26. 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](http://www.speedycables.com)) or Speedograph Richfield ([www.speedograph-richfield.com](http://www.speedograph-richfield.com)) for this work.

