5-Speeder fuel pump replacement

Ian Brett & Andrew Warren (2nd Edition – April 2020)

This is a step-by-step guide to take you through replacement of the in-tank fuel pump in the Morgan M3W (5 Speeder). If all materials are to hand then it should not take any longer than 2 or 3 hours.

Introduction

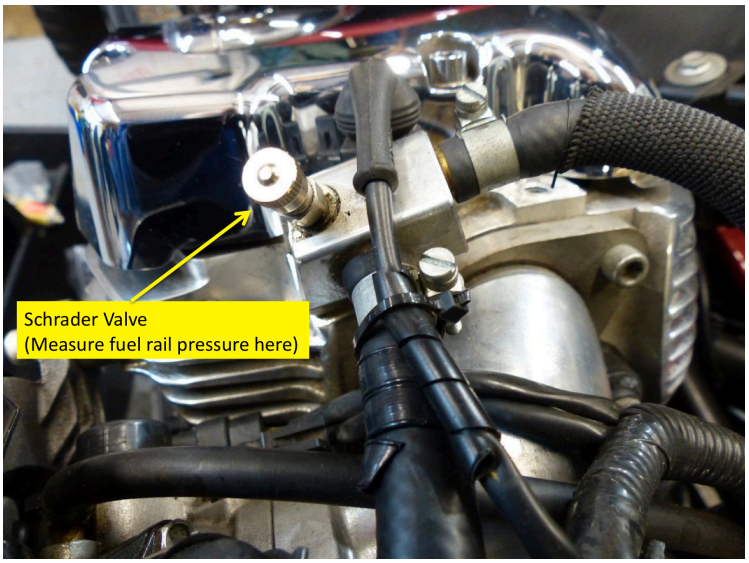
The standard fuel injection pump module for the 5 Speeder is a late 1990s Land Rover Discovery V8 EFi part (p.n. WFX101020) which costs upwards of £200. It requires a bit of modification to remove the contents sender. The S&S engine book says that the fuel supply for the fuel injection system should be 58psi and a minimum of 45 Litres Per Hour. The Discovery pump exceeds the fuel flow requirement by a big margin at 190 LPH but this doesn't seem to be a problem as long as the pressure is 58psi. The excess flow returns to the tank.

These fuel pumps have failed a few times on 5 Speeders and frequently on the Discovery if the Land Rover forums are believed. There are a number of alternative replacement pumps suggested on the LR forums but many have high flow rates and matching high electrical power requirements. One that seems to get good reviews for performance, reliability, low electrical current and most importantly, the right dimensions to be an almost direct replacement, is a Walbro GSS342.

Tip: Beware of cheap pumps on eBay as counterfeit items are commonplace. Genuine Walbro GSS342 pumps have metal internal gears unlike the fakes. A reliable supplier in the UK for the Walbro components is Glencoe Ltd in Staines.

By using the Walbro pump module you should be able to complete the job for around half of the cost of using a replacement Discovery assembly whilst ending up with a top quality & more reliable setup.

This guide will assume that the fuel filter is to be replaced as part of the procedure. I have replaced two filters now, each after approx 10k miles and a significant amount of grey sludge came out of each one when emptied! In any case, replacement is recommended every 15,000 miles. In addition, over time, galvanic corrosion can occur between the filter canister and it's mounting bracket ultimately resulting in fuel leaks. You have been warned!



There is a fuel rail pressure test point on the RH fuel injection nozzle, a Schrader type connector. If you have the Urban Cooling Kit you will need to lift it for access. With the pump running, the pressure should be 58 psi.

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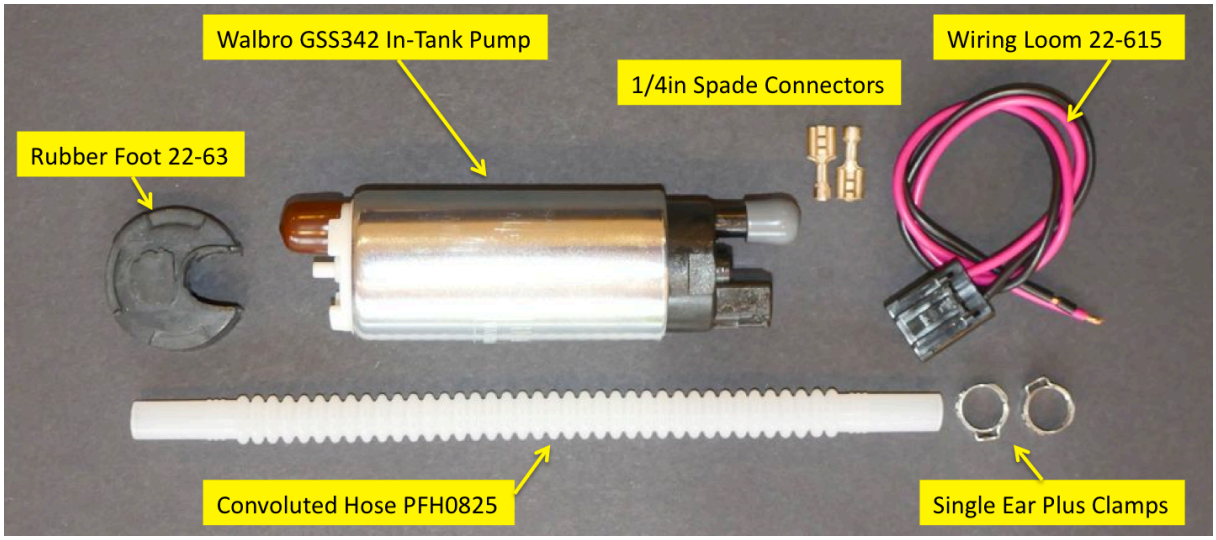


Parts required

- Walbro GSS342 In Tank Pump
- Walbro Rubber Foot for new pump, p.n. 22-63
- 210mm Convoluted Plastic Hose, p.n. PFH0825
- Wiring loom for Walbro Pump, p.n. 22-615
- 2x 1/4in Spade connectors – preferably without plastic sleeves
- 2x 'Single Ear Plus' Stainless Steel Clamps, size 10.5 or 11.3.

☞ *Different assemblies may require different size clamps. Therefore it's worth having a selection of different sizes to hand in the range of 10-13mm.*

- Replacement Fuel Filter: Mahle KL167 (BMW p.n. 6754016; Landrover p.n.WFL000021)
- If your locking ring is very corroded you may need to replace it. It is a BMW part (p.n.6762417) and can usually be obtained for under £15 on eBay.

Tools required

- Large drift or flat blade screwdriver & hammer
- Crimp tool (for the 1/4in spade connectors)
- Long sharp knife
- End cut pliers (needed to crimp single eared clamps if used)
- Recommended: Knipex Small/Mini Plier Wrench 125mm

Other recommended bits & pieces:

- Brake cleaning aerosol spray
- Paper roll & clean-up rags
- Cotton tipped applicators for cleaning nooks & crannies
- Air Duster – preferably an air-line but aerosol if it's not available
- Petroleum jelly (eg. Vaseline)
- Masking tape
- 55mm Plastic sleeve or insulating tape (for fuel filter)
- A vice
- Aluminium foil, approx 20x20cm
- Anti-seize compound (graphite grease, copper grease or similar)
- Petroleum compatible rubber gloves & safety spectacles

Safety Precautions

Before working on the fuel system, disconnect the battery and remove any possible source of ignition.

Ensure the fuel pressure has dissipated before breaking into the system - this can take several hours.

Ensure the area in which you are working is well ventilated.

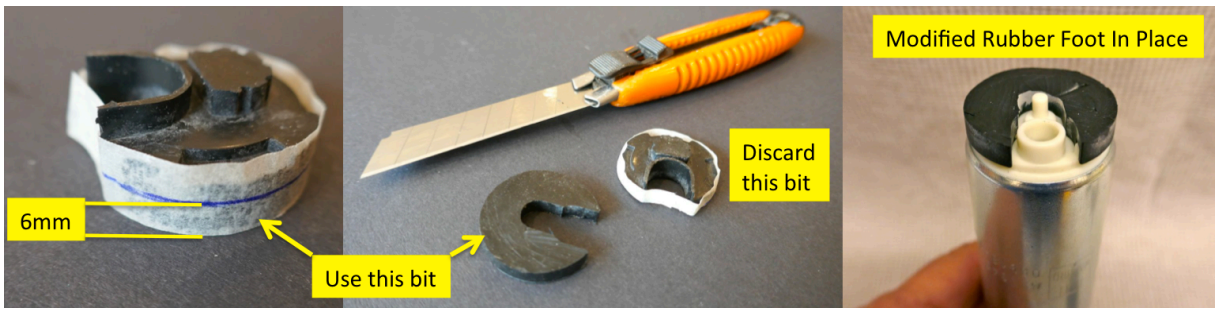
You should wear rubber gloves and safety goggles when there is a likelihood of being exposed to petroleum.

Preparation

Prepare a clean work area. A flattened cardboard box is ideal. An area approx 60x40cm should suffice.

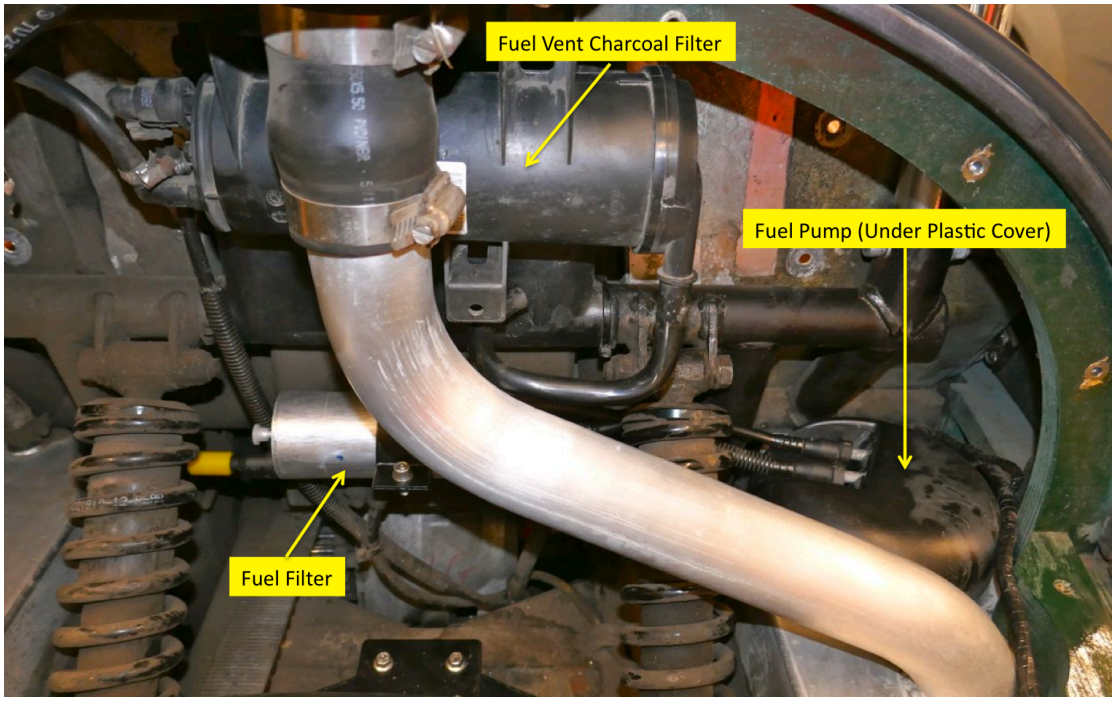
Fit the crimp connectors to the new pump lead. The wires are usually supplied over-length and can safely be trimmed to around 24cm.

The new rubber foot needs to be cut down to suit this application. Wrap it in masking tape and mark a line 6mm from the flat end of the foot. Hold in a vice and carefully use the sharp knife to slice the rubber along the 6mm line.



Procedure:

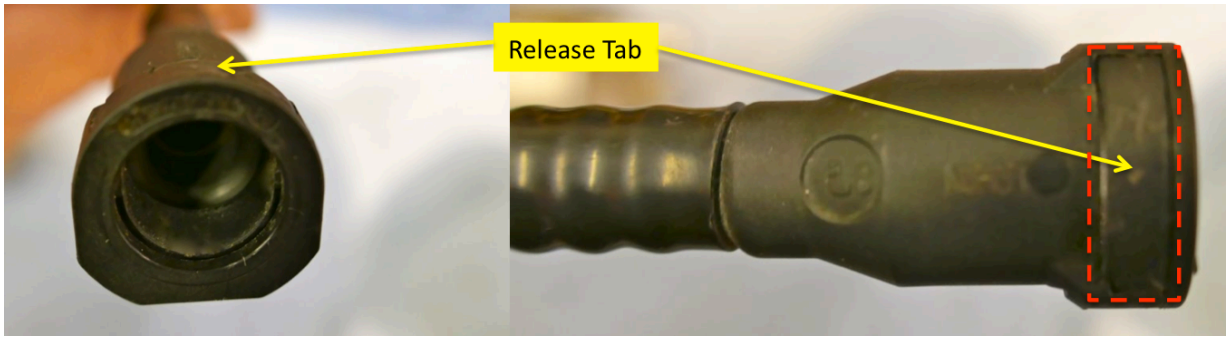
- Remove the luggage tray and familiarise yourself with the various fuel supply components.



- Scrupulously clean the area above and around the pump, fuel lines & connectors to prevent dirt getting into the tank. Also clean the fuel filter & surrounding area.

☞ *Take some photos at this stage so as to have something to refer to when it all goes back together.*

- Remove the bolt from the fuel filter clamp and ease the clamp jaws apart.
- Unscrew the black plastic fuel vent charcoal filter (located above the fuel filter) and wriggle it to the left hand side. This is necessary to provide clearance when removing the pump assembly.
- Two hoses go to the pump assembly. Mark them and disconnect the rather fiddly connectors, they will come off if you press the release tab. It sometimes helps to slightly twist the connector while pressing the tab.



☞ *The Knipex 125mm adjustable mini wrench has narrow jaws so is ideal for pressing the fuel pipe release tabs. It's also a beautifully made and versatile little tool that's a*

worthwhile addition to any M3W tool kit! Alternatively you may find that a small flat bladed screwdriver may do the job.

- Slide the fuel filter to the left and (after positioning a rag or old towel to catch any fuel spillage) mark and disconnect the lower fuel line. The short fuel line between the filter and pump may be left attached and removed later on the bench. Remove the fuel filter and drain it's contents into a suitable container in a well ventilated area.
- There is a two-part plastic cover over the pump assembly that may be siliconed into place, remove it carefully and clean up the area that was previously covered. Watch out for a tiny crosshead screw holding the two cover pieces together.
- Disconnect the electrical plug. Check it's condition as corroded terminals have been known.
- Using the drift and hammer, gently tap the large retaining ring (that holds the pump assembly in place) anti-clockwise.

☞ *Hopefully the ring had had some anti-seize applied on assembly and isn't too corroded. However some rings may be so far gone that they have to be cut off. Therefore, it's worth having a spare on the shelf just in case. See Parts Required section.*

- The pump module may now be lifted out of the tank. Once again, drain the residual fuel into a suitable container. Place the pump assembly on your pre-prepared clean bench area.
- Have a look in the tank and check for debris, some people have reported metal swarf from build in the tanks.
- Wipe around the tank seal mating surface to remove any contaminants and then seal off the tank using the aluminium foil.
- Once the module is out on the bench, vent any residual fuel and take some more photos.
- Clean up the upper surface of the assembly around the electrical connectors and pipes. The cotton tipped applicators & air line help here.

☞ *There appears to be some variation in pump assemblies. All have two convoluted hoses, and these are usually, but not always of different diameters.*

- Cut through the convoluted hose that connects to the pump itself. If your hoses are different diameters, this will be the smaller one. It will be replaced.

!!! DO NOT CUT THROUGH THE OUTER (usually larger) CONVOLUTED HOSE !!!

- Record which way the electrical loom connects and remove it.
- Release the 4 tabs on the side of the collector pot.

☞ *There are four tabs that need to be released simultaneously which can be tricky to achieve! Once one tab is released, keep the gap open by inserting a piece of electrical cable (around 3mm diameter). Then keep working the cable around the slot as each tab is released in turn. Alternatives to the electrical cable include matchsticks & thick string/cord.*

- Once released, swing the collector pot out of the way in the direction of the outer/larger convoluted hose. The old pump and attachments can now be removed.

☞ *The collection pot/pump portion of the assembly is sprung loaded w.r.t. the upper flange. Pushing the upper face of the collector pot towards the upper flange will provide more clearance for removing the pump module.* *See photo on page 8*

- Remove the small rubber grommet from the old pump outlet. Place it somewhere safe as it will be reused.
- Also, remove the pump intake filter & associated white plastic standoff. The rubber foot between the pump and standoff can be removed and placed to one side. I'm told that it's possible to modify the old rubber foot to suit the Walbro pump but if you have obtained a new rubber foot (p.n. 22-63) the old one may be disposed of.
- The filter will probably be covered in contaminants and thus will need a good clean. An air-line is ideal for this.

- Clean up all the other parts including the inner surface of the collector pot.
- Remove the clamp and old (previously cut) convoluted hose from the upper flange spigot.
- Remove the blanking plug from the old fuel filter canister and transfer it to the new one. Transfer the short hose from the old filter to the new one.

☞ *This is a good time to wrap the portion of the fuel filter that contacts the mounting bracket with sleeving or tape. This will prevent future galvanic corrosion occurring.*

Reassembly

- Place the rubber grommet over the outlet of the new pump.
- Also, loosely place a single eared plus clamp over the outlet spigot.

☞ *It seems that, as standard, no clamp is fitted at the pump end of the convoluted hose but I would recommend fitting one anyway. The single eared plus clamps are just narrow enough for this purpose.*

- Put the kettle on, have a cup of tea and then put some boiling water in a cup and take it to the garage.
- Dip around 30mm of one end of the convoluted hose into the hot water for around 40 seconds to soften it.
- Quickly push the tube over the pump spigot, through the clamp & rubber grommet so that the end of the tube buts up against the pump body.
- Using the side cutter pliers, crimp the clamp into place in the orientation shown.

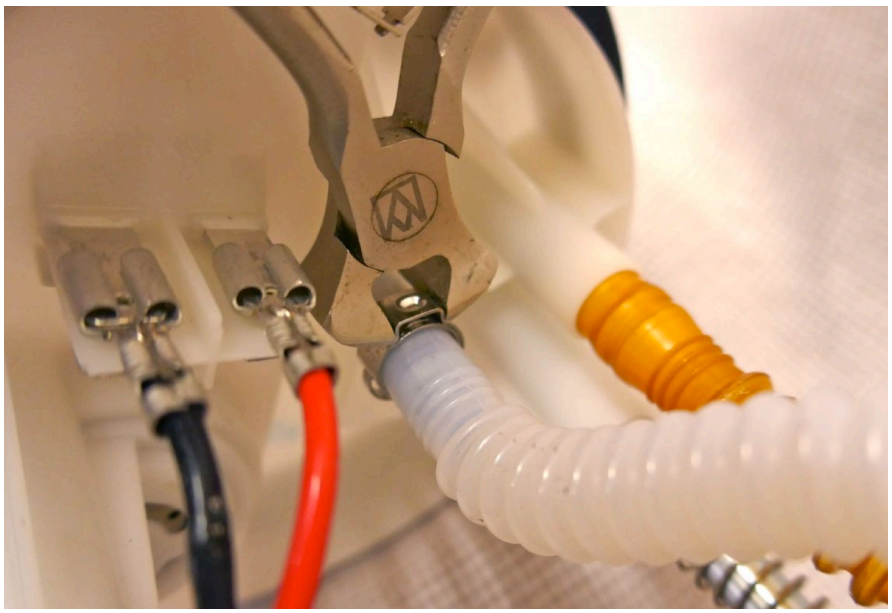
- On the other end of the pump module, fit the pre-prepared rubber foot, white plastic stand off and inlet filter in the orientation shown.

Reassemble the pump and collector pot.

Remember that the whole thing is spring loaded which helps to get everything in the right place when refitting the collector pot bowl.

Ensure that the standoff feet (either side of the filter) are correctly located in the mouldings on the bottom of the collector pot.

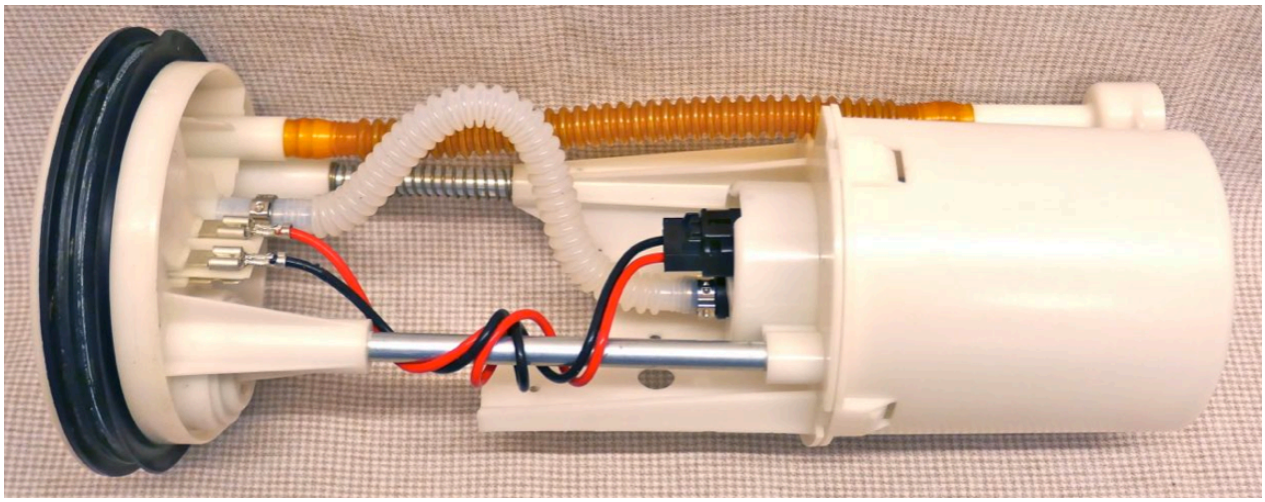
- Heat the other end of the new convoluted hose in the very hot water, **slip a single eared clamp over the end** and push it fully onto the upper flange spigot. Crimp the clamp.



- Fit the wiring loom to the pump, twist the new loom around the module ‘leg’ like the original and connect the spade connectors.

☞ *The colours of the old wiring harness are white & black whereas the new harness will probably be red and black. Just make sure that the black wire is on the same terminal as before.*

- Apply a smear of petroleum jelly to the pins of the electrical plug on the outside upper surface. This should help ward off corrosion in the future.



The pump assembly is now complete and it can be refitted into the tank.

- Make sure that the rubber seal and its mating surfaces are clean.
- Orient the inlet & outlet pipes on the upper surface so that the pipes will pass neatly between the shock absorber and the adjacent chassis rail.
- Your locking ring should be clean and largely free of corrosion. Smear a little anti-seize compound around the inside of the ring and reaffix, taking care not to cross thread it. Give it a few taps (clockwise) with the drift and hammer to fix it firmly into position.
- Refit the electrical plug then the plastic cover. Siliconing the cover in place is optional however, most people choose not to.
- Re-attach the fuel vent charcoal filter and then the fuel filter and all the hoses (referring to the photos you took earlier).
- Reconnect the battery.
- Cycle the ignition (without starting the engine) a few times to operate the new pump and purge the air from the system.
- Leak check all the disconnect points.
- If you have the equipment to do so, pressure check at the fuel rail test point for 58psi.
- If all the checks are good, start the engine and road test it.

The Walbro GSS342 pump will sound slightly different to the original but should be more reliable if the Discovery guys have got it right.

Note: If your pump has failed and you had an engine management light come on, the adaptive maps may have tried to compensate for the lower fuel pressure before total failure. If this is the case it is possible to use S&S Pro Tune II to reset the adaptive maps and fault codes in the ECU.

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Obtaining the parts

In the UK, I would recommend obtaining the Walbro pump and associated rubber foot from Glencoe Ltd. All other parts may also be obtained from Glencoe or from eBay.

The 'single ear plus' stainless steel clamps are ideal for this application.

They are easy to fit and grip the pipe evenly.

They are single-use and can be removed by simply prising up the tab using a small screwdriver.

The size used on the my original assembly was 11.3 but I found the 10.5 size to be a better fit. Some people find that they need larger ones.

Make sure that you get the stainless steel variety. These are less than £1 each on eBay.

Variations

This photo shows a pump assembly where both convoluted hoses are the same size. It's not clear how many are configured this way as most have a small feed pipe (from the pump to the upper flange) and a larger return one (from the flange to the collector pot).