



FITTING INSTRUCTIONS FOR

**MFK650G3**

**CHEVY/HOLDEN LS1 V8**

**TO**

**TOYOTA R151 5-SPEED TRANSMISSION**

Thank you for purchasing a product manufactured by Marks 4WD Adaptors. The following instructions are intended as a guide. We recommend that you purchase a service manual pertaining to your vehicle for specific torque values, wiring diagrams and other related information.

**When replacing a Toyota V6 the following applies.**

**If a V8 is being fitted the gearbox and transfer case will need to be shifted rearward to do this a cross member from a 4-cylinder 4 door 4-Runner can be used. The drive shafts will also require altering or replacing with the 4-cylinder version.**

When fitting the LS engine it is mandatory that you use the smaller 153-tooth flywheel as the larger 168-tooth version will not fit inside the new bellhousing.

Our heavy duty pressure plate is the only clutch we recommend and will bolt directly to our new 153-tooth flywheel.

### **Engine Removal**

1. Remove the bonnet from vehicle and tie back the hinges.
2. Disconnect and label all of the hoses and wiring attached to the old engine.
3. Remove the air-conditioning compressor and lines (if fitted).
4. Drain the power steering fluid and remove the power steering lines and reservoir (if fitted).
5. Remove the complete exhaust system from the vehicle.
6. Drain the radiator and engine of all fluids.
7. Remove the radiator and discard, as it is too small.
8. If you plan to use a different grade fuel, drain the fuel tank and fuel lines.
9. Remove the slave cylinder from the original bellhousing.

10. Support the transmission using a jack stand and remove the complete engine assembly using suitable engine lifting equipment. Do not discard the old engine as some parts are still used for the conversion.
11. Remove the oil pressure and temperature adaptors from the Toyota engine.
12. Remove the bellhousing from the gearbox. Do not discard the bellhousing at this stage, as some of the bellhousing components are still required for the conversion.
13. If the original engine fitted is a 3Y, 4Y or V6 grind both passenger and driver side engine mount posts off the chassis as these are no longer needed. A new pair of posts will need to be welded onto the chassis. Refer to engine mount set up for more information. If your vehicle was originally fitted with diesel or 22R engine, the standard chassis posts and rubbers are retained.

## **Engine Mountings**

**Note: The engine mount rubber locating pin needs to be cut off flush with the metal cover. This will allow the engine rubber to be fitted with the locating pins down.**

### **Chevy V8 and Holden V8**

When fitting Chevy V8 and Holden V8 engines in place of a diesel or 22R Toyota engine the original chassis posts and rubbers are reused. They stay in their original location.

When fitting Chevy V8 and Holden V8 engines in place of a 4 cylinder 3Y, 4Y or V6 Toyota engine the original chassis mountings are removed and replaced with new ones supplied in the kit.

### **Chevy V6 and Holden V6**

When fitting Buick V6 or Chevy V6 engines in place of the diesel or 22R Toyota engines, the original chassis posts will require relocation rearwards.

When fitting Buick V6 or Chevy V6 engines in place of the 3Y or 4Y Toyota engines leaf or independent front suspension, you will need to replace the chassis posts. A set of diesel chassis posts can be used or alternatively use a set of Marks 4WD Adaptors replacement chassis posts part number MFK676.

If you are replacing a Toyota V6 engine with independent front suspension a set of new chassis brackets are required. **NOTE:** The engine must be moved back to allow enough room for the radiator and fan.

The most accurate way to determine the exact location of the posts is to trial fit the new GM engine to the transmission.

1. Bolt the engine mount brackets to the block.
2. Loosely fit the original Toyota engine mount rubbers to our engine mount adaptors. **NOTE.** The locating pin on the Toyota engine mount will need to be ground flush with the metal shroud that fits over the rubber.
3. Loosely fit the new chassis posts to the original Toyota rubbers.
4. Lower the engine into position and if satisfied with the engine positioning, tack weld the new mounts into location.
5. Remove the engine by undoing the rubbers and finish welding the posts onto the chassis. paint the welded area.

## **New Bellhousing Preparation**

1. Fit the new bellhousing to the gearbox using the original dowels and bolts. **Note:** Cut 10 mm off each of the original bellhousing to gearbox bolts so they don't bottom out in the holes in the gearbox.
2. The bellhousing has been designed to accept the standard 5-speed petrol pressed metal clutch fork, pivot, and thrust bearing carrier, slave cylinder and push rod. When replacing a diesel engine, the petrol Hilux slave cylinder and push rod will need to be purchased either new or second hand the clutch fork and pivot can be used.

2a. Remove the above components from the original bellhousing.

3. Fit the new thrust bearing to the thrust bearing adaptor, (you may have 2 thrust bearing adaptors in your kit. Use the most suitable. ) You will need to refer to the diagram attached to determine the clearance/travel required for clutch operation. Fit it to the original thrust bearing carrier (cast iron version). **Note:** You can't use the thrust-bearing carrier that comes with the pressed metal fork. Make sure that the thrust-bearing carrier you have allows the removal of the old bearing. Marks 4WD Adaptors now manufacture a cast carrier replacement part number MFK1734. Read the following instructions to make correct measurements.
4. Fit the pivot to the bellhousing .
5. Fit the clutch fork.
6. Fit the slave cylinder and pushrod using the original bolts. **NOTE 1:** Shim the slave cylinder with washers to align the pushrod. **NOTE 2:** "WARNING" If the pushrod is at an angle in relation to the centre line of the slave cylinder premature cylinder wear will result. No warranty will be given if the cylinder is worn on one side.
7. Fit the thrust bearing assembly, apply a smear of grease inside the grease groove of the carrier, the nose cone, the fork fingers and pivot.
8. Push the thrust bearing carrier hard back, toward the gearbox and take the measurement between the thrust bearing and the bellhousing face as per the following diagram.
9. If everything measures OK then proceed, if not make the necessary adjustments.
10. Fit the two retaining clips.
11. Fit the new clutch fork boot to the bellhousing.
12. Fit the new spigot bearing and the adaptor ring to the rear of the crankshaft. **Note:** Check the crank depth and the position of the spigot bearing. This can be done by measuring the position of the input shaft spigot with a straight edge across the new bellhousing and by measuring from the block face to the inside of the new spigot bearing. There should be 2 or 3 mm difference (clearance). This will insure that there is no pressure on the spigot bearing.
13. Fit the clutch assembly to the flywheel using a suitable clutch aligning tool. The preferred clutch set up is a new clutch kit MCK488.

### **Engine Installation**

Before the new engine is installed, there is some clearance problems that need to be addressed before final installation.

a. When fitting V8 engines to the Hilux a modified sump is required in order to achieve the necessary sump to front differential clearance. Marks 4WD Adaptors manufacture special sumps and pickups to suit. Leaf spring Hilux/4Runner sump part number is MES387. **NOTE:** We do not manufacture a sump to suit the IFS models.

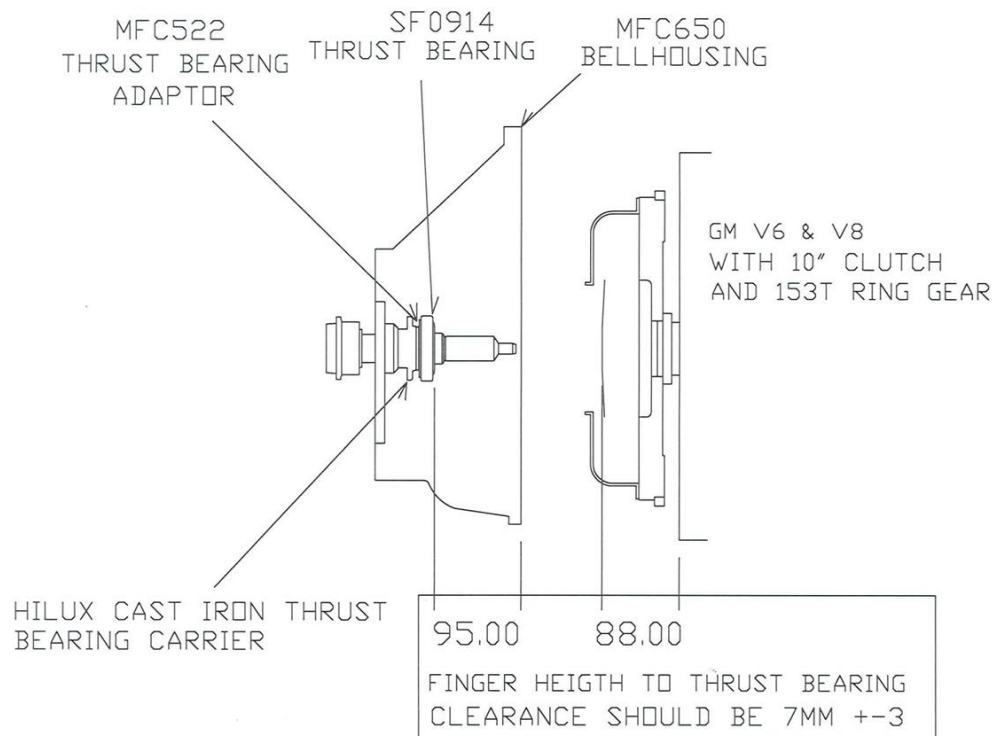
b. The cast aluminium handbrake, pulley bracket located near the brake booster will foul on the rear of the cylinder head. Marks 4WD Adaptors manufacture a special handbrake, relocation kit (MFK035). It places the bracket and pulley on the inside of the firewall under the dash thus solving the clearance problem.

c. When fitting Holden V8 engines, the passenger side, cylinder head, due to the offset will foul on the firewall. A dent may need to be made into the firewall using a rubber mallet. This is best determined by trial fitting the engine before undertaking any modifications.

d. Chevy V8 engines must be fitted with a short type, water pump. They also require a larger radiator, with the limited size engine bay, a small mechanical fan will need assistance from an electric fan.

1. Put the gearbox in 4th gear and raise one of the rear wheels off the ground.

2. Guide the engine into place and rock the rear wheel backward and forward to help with the spline alignment into the clutch plate. Once aligned fit the bellhousing bolts.



3. Check the clutch operation.
4. Adjust the clutch so that you have the required amount of free-play. The best way to adjust the clutch so that you have the full amount of throw is to do the following:
5. Push the pushrod into the slave cylinder as far as it will go.
6. Adjust the length of the pushrod so that you have at least 10mm of free-play in the clutch fork. This will allow for clutch plate wear.

**NOTE.** If the clutch does not seem to disengage, more travel may be required at the slave cylinder. This can be achieved by adjusting the pedal height and push rod length at the master cylinder.

Some push rod free play is required. If there is no free play, the fluid will not return to the master cylinder reservoir. The pressure in the line will hold the thrust bearing permanently against the pressure plate and prematurely wear the thrust bearing and the fingers on the clutch diaphragm.

8. Guide the engine over the mounts fit the bolts and tighten.
9. Fit the new cover plate on the bellhousing. Secure it using the bolts and washers supplied. **NOTE:** Seal around the cover plate with silastic to prevent water and mud from entering.
10. Fit the temperature and oil pressure senders into the GM engine using the oil and temperature sender adaptors in the kit.
11. When fitting carbie model GM engines, an accelerator cable from a V8 commodore can be used. A small spacer will need to be fabricated for the firewall end, this will take up the slack.
12. A heavy-duty holden radiator is required for adequate cooling. It will need to have the side tanks modified to enable the radiator to sit low enough to allow the bonnet to fit. Modifications to the radiator support panel are also required.
13. A fan shroud is recommended and will have to be fabricated to suit the fan you have fitted to the engine.

14. Fit the heater and radiator hoses.
15. Complete the wiring.
16. Complete the exhaust system. **NOTE:** When fitting the exhaust system you must make sure that a heat shield is fitted to prevent the clutch slave cylinder from damage due to excessive heat.
17. Check all fluid levels and fill fuel tank with required grade of fuel.
18. Start the engine and check for-  
Fuel leaks.  
Oil leaks.  
Water leaks.  
Exhaust leaks.
19. Allow the engine to warm up and recheck above.
20. Refit the bonnet.

The components supplied in the kit are designed for specific type conversions. Modifications to any components without the written consent from Marks 4WD Adaptors will void any possible warranty or return privileges. Should you have any further questions that are not covered in the instruction sheet, please contact our sales department for assistance.

Remember an inexpensive phone call can save a costly mistake!

Proudly Manufactured by:

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