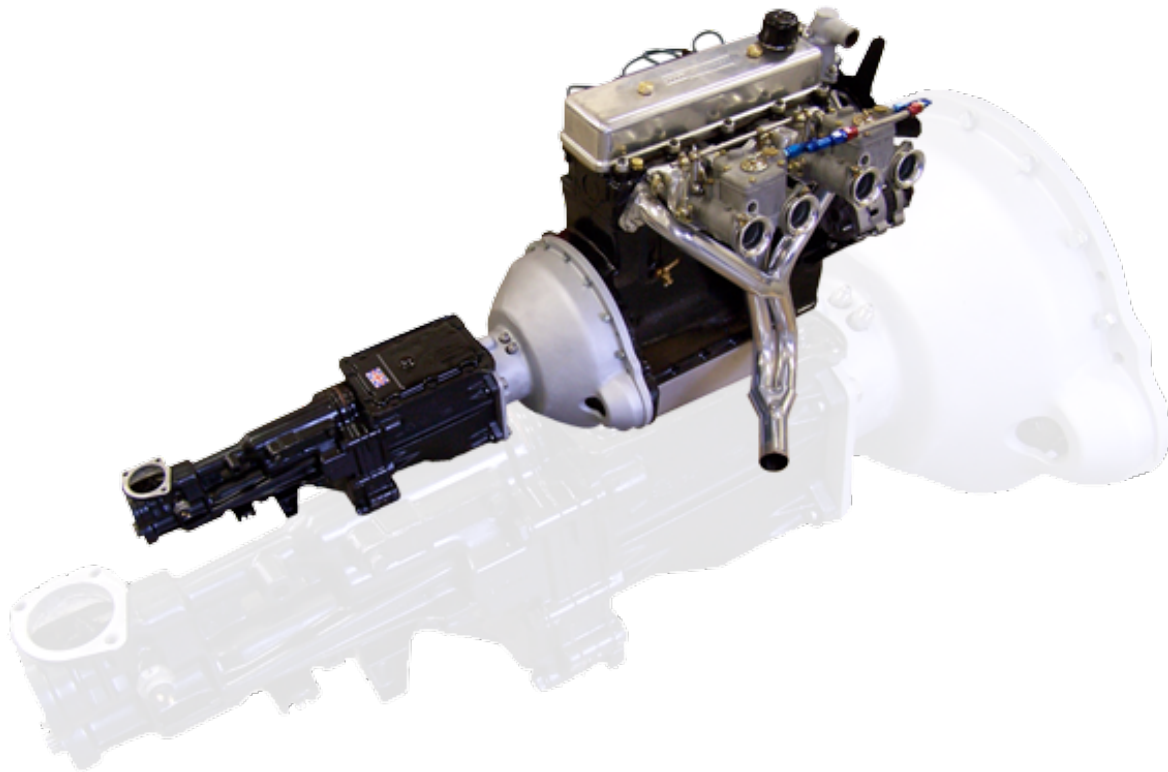




Morgan Spares Ltd.

*Your Direct Connection To The Morgan Motor Co.*

## Instruction Manual For The +4 Morgan 5 Speed Conversion



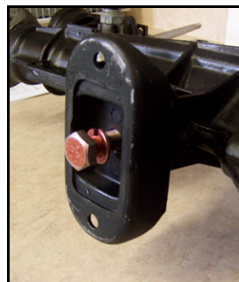
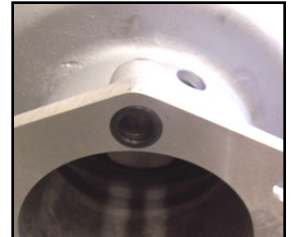
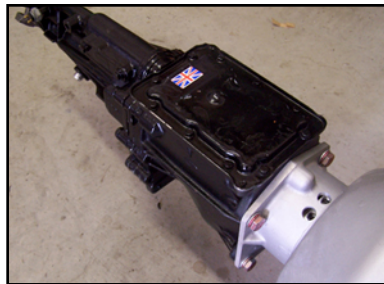
This kit has been designed to have the least amount of intrusion into the originality of the Morgan. It would be possible to reinstall the original moss gearbox with hardly any evidence of having had the 5 speed installed. This transmission upgrade makes the car far more pleasing to drive on today's high speed roads. With a .82 overdrive the 3.73 rear axle in most production +4's will become a 3.08 in overdrive. This lowers the engine speed 750 RPM. 1st, 2nd and 3rd ratio's are within 2% of the original Moss box. It takes an average of about 3-4 hours of time after the engine has been removed to make the modification to install this kit. No special tools are required.

Section One: Removing and assembling the engine, bell-housing, transmission as a unit.  
Section Two: Modifications to the structure of the car.  
Section Three: Installing and hooking up the engine, transmission unit in the car.

## Section One: Removing and assembling the engine, bell-housing and 5 speed.

- Remove the engine/transmission assembly from the car.
- Separate the bell-housing from the engine.
- Remove the pressure plate and clutch disc.
- Remove the flywheel.
- Remove the pilot bushing but save it for later use.
- *It is suggested at this point to have the flywheel/pressure plate balanced.*
- Install the new pilot bushing using the old one to hammer in the new one.
- Install the flywheel.
- Install the new clutch disc using the alignment tool supplied.
- Bolt the new bell-housing to the block.

- Install the o-ring in the top groove of the bell-housing.
- Slide the clutch slave cylinder onto the input shaft with the two fluid holes pointing up.
- Bolt the transmission to the bell-housing.
- Install the new rear transmission mount.



- If necessary use a small screwdriver to align the the slave cylinder holes with the holes in the bell-housing. Install the two fittings making sure that the shorter one is on the left and the longer one on the right and that they are tight.



## Section Two: Modifications to the structure of the car.

- Remove the left front floor board.
- Remove the pedal assembly by removing the mount nuts and plates on the front of the cross-member and the brake master cylinder clevis pin in the brake pedal.
- On disc brake cars remove the brake master cylinder reservoir line from the master cylinder and remove the reservoir.
- Remove the brake line from the brake master cylinder to the chassis union.
- Remove the brake master cylinder and the aluminum spacer block.
- Now would be a good time to clean the chassis if needed.
- Use the supplied bolts and the old tabs to fill the old pedal mount holes.
- Temporally mount the new dual master cylinder spacer block with one of the supplied bolts in the old spacer block hole.
- Mark out the right circle on the chassis, tape works good to trace on Mark the center of the hole and drill a 3/4 inch hole.





- Reinstall the spacer block and drill the upper right and center hole through the chassis.

- Lay the new pedal assembly on the chassis.

- *Please note the following 3 points \**

- (1) The pedal assembly needs to be pushed up against the back edge of the cross-member.

- (2) The pedals need to be tightly held together between the two alloy mount blocks.

- (3) The pedal connection points to the master cylinder push-rods needs to be centered with the 2 large push rod holes in the chassis.

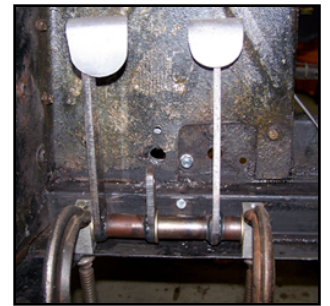
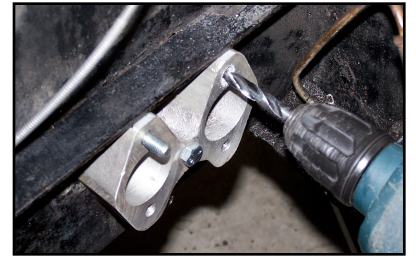
- Clamp the pedal assembly down and drill the four mount holes.

- Remove the pedal assembly and grease the shaft that runs through the pedals.

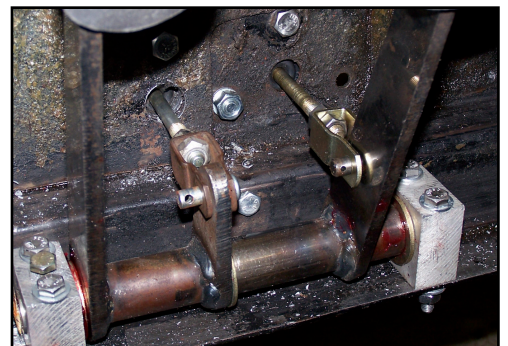
- Install the pedal assembly in the car with the hardware provided.

- Mount the master cylinder spacer block and the two master cylinders making sure that the 5/8 ".625" bore cylinder with the built in reservoir is set up for the clutch and the 3/4 ".750" bore cylinder for the brake.

- Install the brake master cylinder line as shown so that it does not interfere with the clutch feed line or the chassis. Reinstall the reservoir can and the feed line to the brake master cylinder.



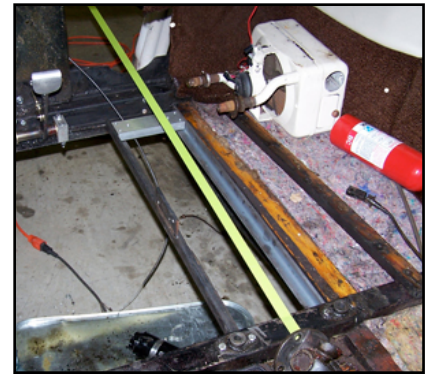
- Hook the push-rods to the pedals with the clevis pins and insert the cotter pins. Adjust the clutch pedal so that the top edge of the clutch pedal is **4 1/2 to 4 3/4 inches from the firewall**. Adjust the brake pedal in the same manner. Tighten the lock nuts behind the two clevis.



- Mark the centerline of the chassis, tape or string works good.

- Lay out the two angle iron rails with the alloy transmission mount bracket between them making sure that the rail with the hand brake bracket is on the left side of the car.

- After making sure that the two rails are spaced apart the width of the mount block and centered equal distance from the centerline of the chassis clamp them and drill the four mounting holes through the first and second cross-member floor board flanges. Mount them to the car.



- Mark the driver's floor board and cut out for clearance around the new pedal assembly. Reinstall the floor board.

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### **Section Three:** Installing and hooking up the engine, transmission unit in the car.

- Lower the engine unit back into the car allowing the rear transmission mount to sit on the mount bracket. Hook up the two front motor mounts.

- Bolt the transmission mount to the alloy bracket

- Drill the four holes in the alloy pad through the two angle iron rails and bolt it to the rails. Unless you have an angle drill it is easier to clamp the alloy pad to the rails, remove the two 5/16 bolts and slide the transmission from side to side in order to drill the 4 holes.

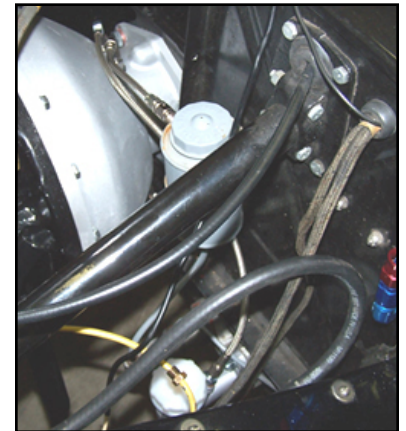


- Install the two clutch lines. The feed line from the master cylinder goes to the fitting on the passenger or right side and the bleed line goes to the driver or left side. The flat metal tab that the bleed line is attached to bolts to the second through bolt on the center panel.



- Mount the H/B ratchet from the old bell-housing onto the new H/B bracket.

- Mount the H/B bracket to the bracket on the angle iron.



- Mount the H/B lever on the new H/B bracket using the original bolt, spring washer and flat washer.

- Either cut the cable right behind the brass end or unsolder it from the cable. Remove the clevis and the old through bolt that was used in the Moss transmission.



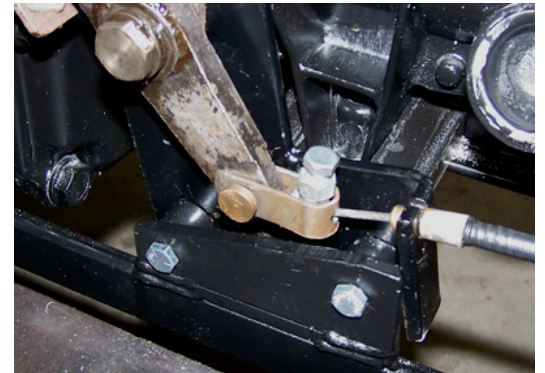
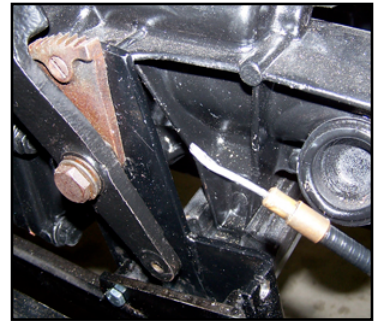
- Reattach the cable at the rear axle

- Put the new cable retainer in the clevis and pass the cable through the clevis and cable retainer.

- Attach the clevis to the H/B lever with the clevis pin and with the lever in the off position pull the cable through the retainer until it is tight. If the end of the cable hits the H/B lever then some of the cable will need to be cut off. When the cable can be pulled tight then clamp the retainer bolt down hard to lock the cable in place.

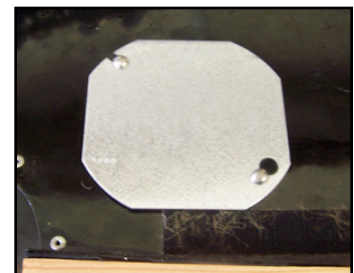
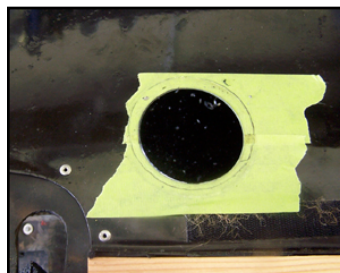
- You will now need to remove the H/B lever in order to insert the cotter pin in the clevis pin that holds the cable to the lever. Reinstall the hand-brake lever and adjust as needed with the adjuster that is in the rear axle.

- Install the new drive-shaft making sure to lubricate the flange surface of the transmission end.

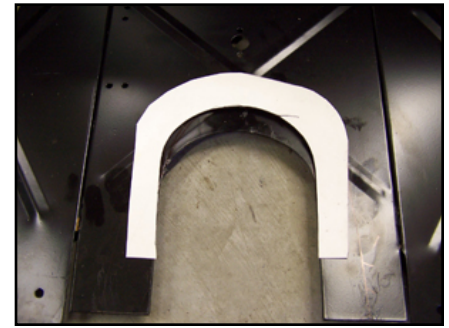


- Fill the transmission with 80-90 gear oil. It takes 42 ounces.

- Install the spacer wood strips to raise the front of the transmission cover so that it does not hit the gearbox. The thick end goes to the front. Attach the two strips with four #6 wood screws.

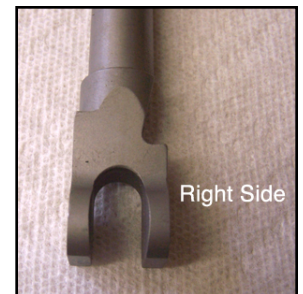


- This next step is optional. The Ford transmissions used in the Kent based engines in the UK have no drain plugs. So there is no easy way to change the gearbox oil. The fill plug can be reached from underneath the car and the fluid level checked. If one wishes to put an access hole in the transmission cover then a cover plate is provided with the kit. The center of the hole is 5 1/2 inches from the front edge and 3 inches from the bottom edge not including the wood strip that was installed. A 3" hole is sufficient.



- Mark out a new curved opening in the firewall center panel 1" above the original opening and cut out. Install the center panel.
- To install the new speedo cable do the following. Attach the angle drive adapter with the snap ring included. Screw the angle drive to the adapter. Attach the cable to the angle drive.
- This step can be done when the car is finished. In order for the speedometer to read properly it will have to be re-calibrated for the new transmission drive. Before attaching the speedo cable to the speedometer the car needs to be rolled 52 feet 9 and 1/2 inches with the cable revolutions counted. The easiest way to do this is to put a piece of tape on the speedometer end of the cable and count the revolutions as the car is rolled the proper distance. The revolutions are needed for the gauge re-builder to re-calibrate the gauge. Cars with a 3:73 rear axle and std. 165x15 tires should have 8 7/8 turns in 52 feet 9 1/2 inches.

- Install the transmission cover.
- Install the new gear lever assembly making sure the notched side goes to the right.
- Bleed the clutch and brake system.
- Finish putting the car back together and enjoy your new overdrive!



## Hardware list:

### All bolts are coarse thread unless noted otherwise

Master cylinder clevis pin and cotter pin  
Flywheel bolt and washers or bolts and lock tabs

Application	Bolt size & length	Washers	Nuts	Notes
Transmission mount to alloy bracket	2- 5/16 x 1 1/2	4 Flat	2 nylocks	
Alloy transmission bracket to angle iron	4- 1/4 x 1 1/2	8 flat	4 nylocks	

Angle iron to chassis	2- 1/4 x 1	2 flat	2 nylocks	Front holes
	2- 1/4 x 1 1/4	2 Flat	2 Nylocks	Rear holes
H/B bracket to angle iron	2- 1/4 x 1 1/2	4 flat	2 nylocks	
H/B pawl to H/B bracket	1- 1/4 x 3/4	Flathead Machine Screw	1 nylock	
Pedal assembly to chassis	3- 1/4 x 2 1/4	3 flat	3 nylocks	
	1- 1/4 x 2 1/2	1 flat	1 nylock	LF Hole
Old Pedal Holes	4- 1/4 x 2	4 lock	4 nuts	
Master cylinders and spacer to chassis	2- 5/16 x 2 1/4	2 lock	2 nuts	
	1- 5/16 x 1 3/4	1 lock	1 nut	
	2- 5/16 x 3/4	2 lock		Lower Holes
Wood shim retaining screws	4- #6 x 1/2	Flathead Machine Screw		
Longer Transmission cover screws	2- #10 x 1	Roundhead Machine Screw		Back Hole
	2- #10 x 1 3/4	Roundhead Machine Screw		Middle Hole
	2- #10 x 1 1/2	Roundhead Machine Screw		Front Hole
Bell-housing	9- 5/16 x 1	9 lock		