

# Pressing Axles into Wire Wheel Hubs for the MG TC

## 265-140 & 265-150 Wire Wheel Hub, Rear

## 453-210 Axle Shaft & 453-185 Axle Shaft, Nitrided

### Introduction

It is hard to find a machinist with experience pressing axle shafts into the wire wheel hubs for the MG TC. The actual procedure was never covered in the factory workshop manual, and as far as we know it is not covered in any of the restoration books on the TC. In the last couple of years we have had requests for guidance, and the consequences of doing this incorrectly are expensive. We consulted with the T-Series specialists at O'Connor Classics for some tips on this procedure and we are grateful for their help. Let there be no confusion: we suggest you take this information to the best machinist you know. Make it clear that you want him to follow the instructions given for the preparation of the parts and the actual pressing. Moss Motors will not accept any warranty claims for axles or hubs that have been damaged during assembly.

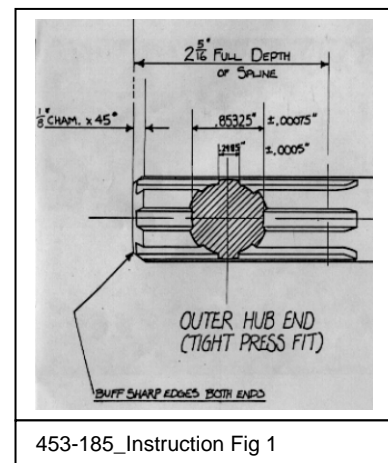
### Inspection

We have the original factory blueprints for both parts. On the axle, the distance across the crests or raised flats is 1.0" +0.0" -0.015". The corresponding point (the root or groove) in the hub is 1.02", + / - 0.010". The table below uses the tolerances to determine the minimum and maximum dimensions for the parts.

Specifications	Nominal	( + )	( - )	Min	Max
Axle (crest)	1.0000	0.0000	(0.0150)	0.9850	1.0000
Hub (root)	1.0200	0.0100	(0.0100)	1.0100	1.0300
Total Gap				0.0250	0.0300
Gap at one side				0.0125	0.015

Two facts to consider:

- 1) The gap between the crest on the axle and the root on the hub should be between 5 and 23 thousandths of an inch. That gap is intentional and it is the source of the oil that seeps past the axle into the outer cup in the hub. More about that later.
- 2) The "groove" in the axle is 0.85325" + / - 0.00075, and the corresponding area in the hub is 0.850" +0.004", + 0.0025". The axle is "too large" and therefore has to be pressed into the hub.



453-185\_Instruction Fig 1

### Inspection of the Parts Removed from Your Car

Look at the wear pattern on the end of the axle that rides in the differential gear. If the axle was not far enough into the splines of the differential gear, this must be taken into account when determining how far the new axle is to be pressed into the new hub. If everything looks OK, you will use the old axle/hub assembly to determine the length of the axle sticking out of the backside of the hub.

Using a tape measure, measure the length of the old axle from the back side of the hub (Fig 2) to the end of the shaft (Fig 3).

Record the measurement and mark the new shaft so that when the new axle is pressed into the hub, the length of the exposed axle is the same as the axle removed from the car.



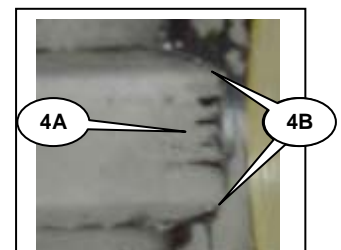
453-185\_Instruction Fig 2



453-185\_Instruction Fig 3

### Preparation of the Axle

The axles, especially the hardened axles, are much harder than the hub. The axle splines are sharp and they can damage the splines in the hub. We are going to ensure that that does not happen. The top edge of the splines on the axle are chamfered or beveled to make it easier to get it started in the hub (4A) and to reduce the chance of cutting into the hub. To ensure that the vertical edges of the splines (4B) do not cut into the hub, they should be chamfered as well for the first 1/8" to 1/4".



453-185\_Instruction Fig 4

## Preparation of the Hub

The hub should be inspected and cleaned. We already know that the shaft is bigger than the hole in the hub. To make it easier to press the shaft into the hub you will need to heat the hub in an oven at 400 degrees Fahrenheit for 45 minutes.

## Lubrication

Standard practice for press fit components calls for some lubrication. The 2000 edition of the Machinery Handbook calls for "lard oil" which is a cutting oil made from animal fats, usually mixed with mineral oils to reduce the cost and improve its properties. Some shops use a "Press Oil" designed for this purpose. Mike Allison has been quoted as saying the press will take 2,000 to 15,000 pounds; there are no factory figures for this operation.

Please note: In every case we are aware of where the axle was pressed dry, galling of the splines in the hub has occurred. In some cases the hub is so badly damaged it cannot be used (Fig 5).



453-185\_Instruction Fig 5

## Reassembly Tips

*Note: This document does not replace the workshop manual.*

The wheel bearings in the TC have more to do with broken axles than many people think. If you are replacing the axles, consider replacing the bearings. Pay particular attention to the way the bearings fit- they must be a light press fit; if the bearings are loose you will need to fix that problem before you replace the axles. Assuming the bearing fit properly, there is another issue: When the hub is bolted to the rear bearing carrier the lip on the inside edge of the hub presses against the wheel bearing, holding the bearing in place. To ensure that the hub does press against the bearing, test fit the assembly without the gasket. With the axle/hub assembly pushed home, measure the gap between the hub and the bearing flange with a feeler gauge. If the gaskets is about 0.010" thick, compressing to about 0.005" when the nuts are tightened, you're looking for a gap of about 0.005". If there is no gap, it means the gasket will hold the hub away from the bearing when finally assembled and you will need to fabricate a shim to ride between the bearing and the hub. This is critical. It was covered by the factory in Service Information Sheet 60, which covered the SA, TA & VA, but was omitted from the TC workshop manual. Without attending to this detail, there will be too much play in the wheel and too much stress on the axle as a result. For more on this point see pages 106-177 in Sherrell's book TCs Forever.

About that leak. As previously noted, there is a gap between the crest on the axle and the root on the hub that is inherent in the design of the hub. There are several solutions that people have come up with, including stuffing a tennis ball inside the hub, or smearing a bead of silicone sealant on where the axle disappears into the back of the hub. Malcolm Green describes a fix in his book MG T Series Restoration Guide on page 39 which can be summarized: Degrease the inside of the hub. Cut a piece of cardstock to fit inside the hub. Squirt RTV silicone sealant down inside the hub and press the disc of cardstock down onto the silicone and let it cure. Malcolm acknowledges the grease fitting (it screws into the tapped hole 7B) is there, but he feels the amount of oil getting to the bearing makes the grease fitting redundant.



453-185\_Instruction Fig 7



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