



**GRANIT**  
QUALITY PARTS



# BALL JOINT

## PRODUCT BENCHMARK

### CUSTOMER INFORMATION

## THE GRANIT BALL JOINT

with part number 38704117 was compared with comparable products from a leading original manufacturer, original equipment manufacturer and identical parts manufacturer.

### COMPARISON OF FEATURES

- » Material testing
- » Hardness test
- » Extraction force test

## TEST RESULTS

### MATERIAL TESTING

This test provides information about the materials used. Selecting the right materials is crucial to ensuring the functionality and durability of the ball joints. The body, joint ball and plain bearing ring material was analysed.

### RESULTS:

GRANIT uses the common 41Cr4 steel for the product's joint ball. The manufacturers of the products compared also use this steel or the comparable 42CrMoS4, which has better machining properties.

The body of the joint ball from GRANIT is forged from high-quality C45 tempered steel, which is ideal for the ball joint's intended use. The comparative products also use this or the equivalent C35 steel.

With the high-quality case-hardened 16MnCr5 steel, GRANIT's focus is on premium quality for the plain bearing ring. The original manufacturer and the identical part manufacturer use the almost equivalent C45 tempered steel here, but the well-known original equipment manufacturer only uses simple S235JR structural steel which cannot withstand the high loads occurring during use.

Material designation	GRANIT	Original	Identical	OEM
Joint ball	41Cr4	42CrMoS4	41Cr4	41Cr4
Body	C45	C35	C35	C45
Plain bearing ring	16MnCr5	C45	C45	S235JR

### CONCLUSION:

The tested ball joint from GRANIT has a high-quality joint ball and body. This makes it comparable with the products of the leading manufacturers on the market with which it was compared. In contrast to the comparable products, the GRANIT plain bearing ring is distinguished by premium quality. The OEM product even failed this test. The structural steel used for this ball joint is not suitable for the intended use and will wear out very quickly.

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Steinbeis-Transferzentrum  
Werkstoff- und Bauteil-  
prüfung (WBP)

This product comparison was carried out on behalf of GRANIT PARTS by the Steinbeis Transfer Center laboratory.

## HARDNESS TEST:

For the hardness test, the joint ball, body and plain bearing ring were divided into samples that allow the hardness to be measured at the edge and in the centre of the respective sample.

## RESULTS:

The hardness test showed that all manufacturers achieve the desired joint ball and body hardness values. The GRANIT part has a hardness of 671 HV1 and 210 HV1 at the edge, and 297 HV1 and 205 HV1 in the centre. The joint ball used in the GRANIT ball joint has the second hardest edge layer.

The plain bearing ring hardness values differ - apart from GRANIT with a value of 636 HV1, only the original manufacturer achieves the desired hardness values. With a value of 583 HV1, the identical part does not demonstrate sufficient edge layer hardness. With a value of just 201 HV1, the product from the original equipment manufacturer demonstrates no significant hardness (as a result of the material used).

Hardness values	Position	GRANIT	Original	Identical	OEM
<b>Joint ball</b>	Edge	671 HV1	713 HV1	636 HV1	660 HV1
	Centre	297 HV1	321 HV1	339 HV1	339 HV1
<b>Body</b>	Edge	210 HV1	214 HV1	201 HV1	210 HV1
	Centre	205 HV1	210 HV1	198 HV1	205 HV1
<b>Plain bearing ring</b>	Edge	636 HV1	686 HV1	583 HV1	201 HV1
	Centre	314 HV1	170 HV1	380 HV1	201 HV1

## CONCLUSION:

With the ball joint from GRANIT you get a product on a par with those from the original manufacturer in terms of hardness. The GRANIT product and the original product adhere well to the desired hardness values.

The product from the identical part manufacturer has an insufficiently hard edge layer, which can result in a reduced service life. Although the hardness values for the original equipment manufacturer's product correspond to the material used, the use of a generally incorrect material is very likely to cause the ball joint to fail.

## EXTRACTION FORCE TEST:

During this test, the force required to pull the joint ball out of the body is measured. The purpose of this test is to check whether the fit and injection of the joint ball in the body is sufficient. This is a comparative test.

## RESULTS:

The forces differed greatly during the test. The ball joint from GRANIT and the product from the original equipment manufacturer achieve very good values here. The GRANIT part achieved a very high value of 99.4 kN. The values achieved by the original part and the identical part (67.8 kN and 61.4 kN respectively) are approximately one third lower than that of the GRANIT product.

	GRANIT	Original	Identical	OEM
<b>Extraction force</b>	99.4 kN	67.8 kN	61.4 kN	102.8 kN

## CONCLUSION:

The injection in the ball joint from GRANIT and the original equipment manufacturer is much better than in the original and identical parts

## CONCLUSION:

- GRANIT ball joints demonstrate consistently high quality. All categories passed with flying colours.
- GRANIT works with the best manufacturers to guarantee consistently high quality and product safety.
- This high quality standard is ensured by numerous independent tests and internal laboratory tests.