Technical Information

TI No. WL 80-48 E April 1999

FAG
Rolling Bearings

FAG Mechanical Extractors

Small rolling bearings with bore diameters of up to about 100 mm which have an interference fit on the shaft or in the housing are usually dismounted by means of mechanical extractors. The bearings can be dismounted without getting damaged if the device is applied at the tightly fitted bearing ring.

With FAG mechanical extractors, the extraction force is usually applied by means of threaded spindles. Hydraulic pressure tools make the job easier in some cases. Larger bearings are usually dismounted using the hydraulic method or induction heating devices.

In this TI the fields of application and the operation of the FAG mechanical extractors are described. Apart from two-, three- and four-arm extractors and a hydraulic pressure tool, special extractors are described.

Contents

Two-Arm Extractor 54

Application

– For extracting complete rolling bearings of all types or tightly fitted inner rings as well as other parts, e.g. gearwheels, that are gripped from inside or outside.

– Good radial and axial accessibility of the bearing location, possibly slots, required

Operation

Depending on bearing size and mounting conditions, the extractor with the suitable dimensions is selected. The extraction arms are adjusted on the cross arm until they have the right span. When the spindle is screwed in, a self-locking mechanism prevents the arms from slipping off.

Rolling bearing rings that are extracted correctly remain undamaged. Complete bearings where the extraction force is transmitted through the rolling elements usually become unserviceable.

Programme

Order designation Two-arm extractor	Span mm	Depth mm	Weight ≈ kg
ABZIEHER54.100	80	100	0.75
ABZIEHER54.200	120	125	0.9
ABZIEHER54.300	160	150	2.3
ABZIEHER54.400	200	175	2.5
ABZIEHER54.500	250	200	3.45
ABZIEHER54.600	350	250	4.4
ABZIEHER54.SET *)			15.5

*) consists of a holder (W x D x H) 215 x 235 x 475 mm, complete with the 6 extractors listed above

Two-Arm Bearing Extractor 47

Application

– For extracting complete rolling bearings or tightly fitted inner rings

– Bearing rings may be fitted against a surface, i.e. slots are not required

Operation

Depending on bearing size and mounting conditions, the extractor with the suitable dimensions is selected. By means of the tightening shackle the ring to be extracted can be wedged loose by means of the specially shaped arms. The wedging and centering on the shaft are important for dismounting bearings without damage.

Rolling bearing rings that are extracted correctly do not get damaged. Complete bearings where the extraction force is transmitted through the rolling elements usually become unserviceable.

Programme

Order designation	Span	Depth	Weight ≈
Two-arm extractor	mm	mm	kg
ABZIEHER47.100	45	65	0.55
ABZIEHER47.200	90	100	1.45

Three-Arm Extractor 52

Application

– For extracting complete rolling bearings or tightly fitted inner rings

– Good radial and axial accessibility of the bearing location, possibly slots, required

– Big extractors (spans 390 and 640 mm) can be equipped with a hydraulic spindle

Operation

Depending on bearing size and mounting conditions, the extractor with the suitable dimensions is selected. The span can be adjusted by shifting the lever system on the cylinder. During the extraction process the lever system causes self-locking of the arms and ensures a good grip.

Rolling bearing rings that are extracted correctly remain undamaged. Complete bearings where the extraction force is transmitted through the rolling elements usually become unserviceable.

Programme

Order designation Three-arm extractor	Span mm	Depth mm	Weight ≈ kg
ABZIEHER52.085	85	65	0.36
ABZIEHER52.130	130	105	2.4
ABZIEHER52.230	230	150	5.4
ABZIEHER52.295	295	235	6.2
ABZIEHER52.390	390	270	12.3
ABZIEHER52.640	640	300	15.8

Three-Arm Extractor 53

Application

– For extracting complete rolling bearings or tightly fitted inner rings as well as similar parts

– Good radial and axial accessibility of the bearing location, possibly slots, required

Operation

Depending on bearing size and mounting conditions, the extractor with the suitable dimensions is selected. The span can be adjusted by turning the knurled disk above the upper star. The two stars move on the cylinder symmetrically to each other so that the entire spread range can be covered with just a few rotations. The arms are locked during the extraction process so that they cannot be opened accidentally.

Rolling bearing rings that are extracted correctly do not get damaged. Complete bearings where the extraction force is transmitted through the rolling elements usually become unserviceable.

The availability of hydraulically assisted larger extractors will be indicated on inquiry.

Programme

Order designation Three-arm extractor	Span	Depth	Weight ≈
	mm	mm	kg
ABZIEHER53.130	130	105	1.9
ABZIEHER53.230	230	150	4
ABZIEHER53.295	295	235	5.1
ABZIEHER53.390	390	270	10
ABZIEHER53.640	640	300	13.8

Hydraulic Pressure Tool 44

Application

The pressure tool is usually used to loosen tightly fitted parts in conjunction with mechanical extractors.

Operation

The hydraulic pressure tool generates an axial force of 80 or 150 kN, respectively, thus making the job considerably easier. The spindle thread of the mechanical extractor is not unduly stressed as the main extraction force acts on static thread flanks.

The pressure tool 44.150 features a hydraulic resetting mechanism, i.e. when the thrust bolt is reversed the hydraulic system automatically returns to its normal position.

The hydraulic pressure tool is applied between shaft end and extractor spindle. Then the spindle is applied. The hydraulic system is actuated by screwing in the thrust bolt. The axial force generated will loosen the part. The part can then be extracted in the usual manner with the mechanical spindle.

For safety reasons, the minimum spindle diameter and the maximum torque (see table) must be observed.

Programme

Order designation Hydraulic pressure tool	Axial force	Stroke	Section height	Spindle diameter min.	Torque max.	Weight ≈
	kN	mm	mm	mm	N m	kg
ABZIEHER44.080	80	7	35	M22	25	0.6
ABZIEHER44.150	150	10	85	M30	50	1.74

Ball Bearing Extractor 56

Application

– For extracting complete radial ball bearings

– For ball bearings with a tightly fitted outer ring

– For bearings that are radially not accessible

– As the extraction hooks are applied at the outer ring and the threaded spindle is applied at the shaft, the extraction force is transmitted via the rolling elements, rendering the bearing unserviceable.

Operation

The extractor claws grasp the raceway edge of the outer ring between the balls and are supported by the inner ring. The bearing is extracted by means of a threaded spindle.

Depending on the bearing size, one of three extractor sizes and one of 13 sets of claws (see table on page 9) is selected. The number of arms required, and their arrangement, depends on the number of balls in the bearing.

Complete extractor sets consist of one extractor, three or five sets of claws and a wrench with T-shaped handle in a box, see table below.

Programme

Order designation Ball bearing extractor set	Depth mm	with claws nos.	Wrench with T-shaped handle	Weight ≈ kg
ABZIEHER56.020.SET	65	01, 02, 03	SW14	2.1
ABZIEHER56.120.SET	90	1, 2, 3, 4, 5	SW22	3.45
ABZIEHER56.220.SET	150	7, 11, 16, 17, 23	SW22	4.15