

# Mounting and dismounting bearings using hydraulic techniques

SKF invented hydraulic techniques for mounting bearings in the 1940s. Since then, the SKF hydraulic methods have been further developed to become the preferred mounting methods for larger bearings as well as other components. These techniques have helped to simplify bearing arrangements and facilitate correct and easy mounting. Using SKF hydraulic techniques for bearing dismounting reduces the risk of damaging the bearing or its seating. Additionally, greater withdrawal forces can be applied with less effort and maximum control, allowing quick and safe dismounting.

With the SKF hydraulic mounting and dismounting techniques, you can achieve:

- More control, allowing precision, accuracy and repeatability to be maintained
- Minimum risk of damaging the bearings and shafts
- Less manual effort
- Greater operator safety

Makes bearing mounting an easy task

## SKF Oil Injection Method

The SKF Oil Injection Method allows bearings and other components with an interference fit to be fitted in a safe, controllable and rapid manner. The method does not require keyways to be machined on the shaft, saving valuable time and money in materials and production. Interference fits (also known as shrink fits) have long been recognised for their reliability in transmitting large torsional loads. Very often, interference fits offer the only solution when connecting hubs to shafts with intermittent or fluctuating loads.

### Easy, quick and effortless bearing dismounting

When using the SKF Oil Injection Method, the mating surfaces are separated by a thin film of oil injected under high pressure, thereby virtually eliminating the friction between them. The method is versatile as it can be used for dismounting bearings and other components mounted on either cylindrical or tapered seatings. When dismounting bearings mounted on cylindrical seatings, the injected oil can reduce the required pulling forces by up to 90%. Subsequently, the physical effort required when using a puller to remove the bearing from its seating is significantly reduced.

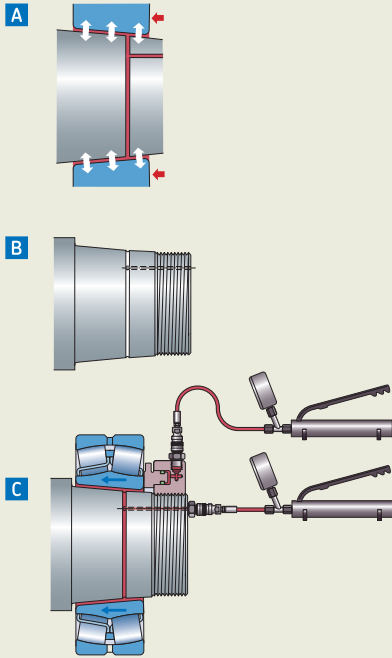
When using the SKF Oil Injection Method to dismount bearings mounted on tapered seatings, the interference fit is completely overcome by the injected oil. The bearing is then ejected from the seating with great force, making the use of a puller unnecessary. In this case, a stop-nut must be used to control the ejection of the bearing. The SKF Oil Injection Method, which is used for many bearing applications, can also be used in other applications, such as:

- Couplings
- Gear wheels
- Railway wheels
- Propellers
- Built-up crankshafts



## Mounting

### Tapered shafts



#### A The concept

Injecting oil between two tapered surfaces creates a thin oil film, which reduces the friction between them, thereby significantly reducing the mounting force required. The thin oil film also minimises the risk of metallic contact when mounting, reducing the risk of component damage.

#### B The preparation

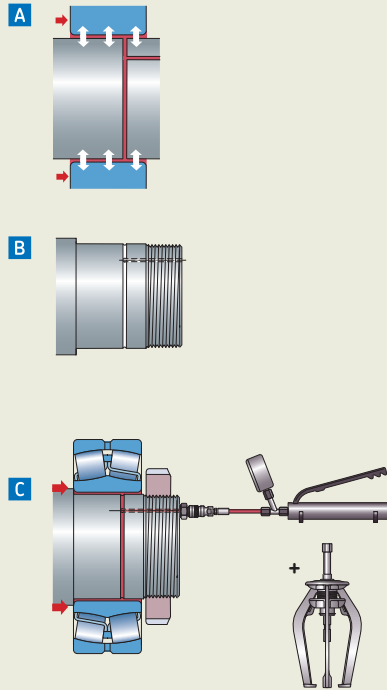
During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

#### C The action

Bearings are mounted by pushing them up the shaft with the aid of an SKF HMV .. E nut. The force to mount the bearing is reduced if oil is injected between the shaft and the bearing. This is often done with larger size bearings.

## Dismounting

### Cylindrical shafts



#### A The concept

By injecting oil of a certain viscosity between two shrink fitted surfaces, the mating surfaces will become separated by a thin oil film. The dismounting force required is thus greatly reduced. The thin oil film also minimises the risk of metallic contact when dismounting, reducing the risk of component damage.

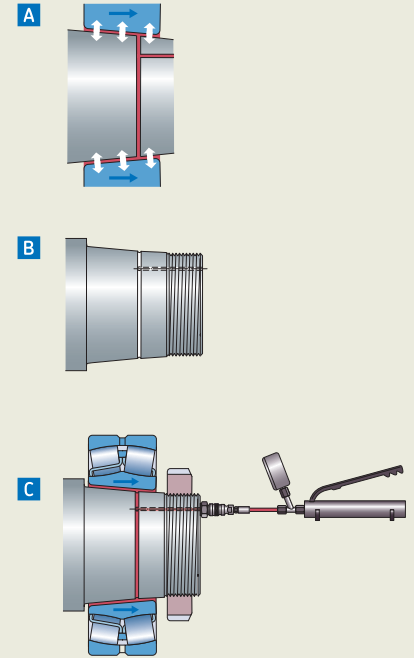
#### B The preparation

During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

#### C The action

Dismounting the bearing is made easier by pumping oil under pressure between the mating surfaces. Once the oil pressure has built up, the component can be removed from the shaft with a minimum of effort.

### Tapered shafts



#### A The concept

Injecting the oil between two tapered surfaces will create a reaction force which could be quite substantial as the oil will also act as a “hydraulic cylinder” which can push the outer component off.

#### B The preparation

During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

#### C The action

Bearings are dismounted by injecting oil between the mating surfaces and when sufficient pressure is reached, the bearing will be pushed off. A nut is required to keep the bearing from sliding off the shaft.

# SKF Drive-up Method



## Accurate mounting of SKF spherical roller and CARB toroidal roller bearings on tapered seatings.

The SKF Drive-up Method is a well-proven method, unique to SKF, of accurately achieving the adjustment of SKF spherical roller and CARB toroidal roller bearings mounted on tapered seatings. The method incorporates the use of an SKF HMV ..E hydraulic nut fitted with a dial indicator, and a high accuracy digital pressure gauge, mounted on the selected pump.

The correct fit is achieved by controlling the axial drive-up of the bearing from a pre-determined starting position, defined by the pressure in the SKF HMV..E hydraulic nut. The second stage is monitored by driving the bearing up a calculated distance on the taper seating.

The starting position pressure and the drive-up distance for many SKF bearings can be determined by using the SKF Drive-up Method PC program, available at [skf.com](http://skf.com) or by downloading the iOS or Android app for smartphones and tablets. In addition, SKF's unique information service for mounting and dismount bearings, [skf.com/mount](http://skf.com/mount), also features the SKF Drive-up Method.

- Reduces the use of feeler gauges
- Greatly reduces the time to mount spherical roller and CARB toroidal roller bearings
- A reliable and accurate method of adjustment
- The only suitable way to mount sealed spherical roller and CARB bearings

### The SKF Drive-up Method



### Products for the SKF Drive-up Method

Designation	Description
HMV ..E (e.g. HMV 54E)	Metric thread hydraulic nut
HMVC ..E (e.g. HMVC 54E)	Inch thread hydraulic nut
HMV ..E/A101 (e.g. HMV 54E/A101)	Unthreaded hydraulic nut
729124 DU (for nuts ≤ HMV 54E)	Pump with digital gauge (MPa/psi)
TMJL 100DU (for nuts ≤ HMV 92E)	Pump with digital gauge (MPa/psi)
TMJL 50DU (all sizes HMV ..E nuts)	Pump with digital gauge (MPa/psi)
THGD 100	Digital gauge only (MPa/psi)
TMCD 10R	Horizontal dial indicator (0–10 mm)
TMCD 5P	Vertical dial indicator (0–5 mm)
TMCD 1/2R	Horizontal dial indicator (0–0.5 in.)

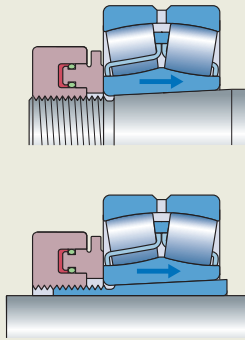
### Technical data – Hydraulic pumps

Designation	729124 DU	TMJL 100DU	TMJL 50DU
Max. pressure	100 MPa (14 500 psi)	100 MPa (14 500 psi)	50 MPa (7 250 psi)
Volume/stroke	0,5 cm <sup>3</sup> (0.03 in. <sup>3</sup> )	1,0 cm <sup>3</sup> (0.06 in. <sup>3</sup> )	3,5 cm <sup>3</sup> (0.21 in. <sup>3</sup> )
Oil container capacity	250 cm <sup>3</sup> (15 in. <sup>3</sup> )	800 cm <sup>3</sup> (48 in. <sup>3</sup> )	2 700 cm <sup>3</sup> (165 in. <sup>3</sup> )
Digital pressure gauge unit	MPa/psi	MPa/psi	MPa/psi

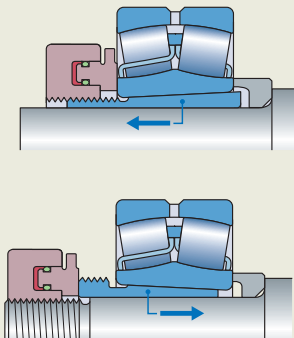
Note: All above pumps are supplied complete with digital pressure gauge, high pressure hose and quick connect coupling.

## Step by step procedure

### One sliding surface



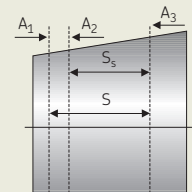
### Two sliding surfaces



1. Determine whether one or two surfaces slide during mounting; see figures.
2. Lightly oil all mating surfaces with a thin oil, e.g. SKF LHM 300, and carefully place the bearing on the shaft.
3. Use the SKF Drive-up Method PC program or app or use [skf.com/mount](http://skf.com/mount) to calculate the required values for the bearing and the mounting arrangement.
4. Drive the bearing up to the starting position by applying the required hydraulic nut pressure. Monitor the pressure using the gauge on the selected pump. SKF Hydraulic Pump 729124 DU is suitable for SKF Hydraulic Nuts  $\leq$  HMV 54E. SKF TMJL 100DU is suitable for SKF Hydraulic Nuts  $\leq$  HMV 92E while SKF TMJL 50DU is suitable for nuts  $\leq$  HMV 200E. As an alternative, the digital pressure gauge THGD 100 can be screwed directly into the hydraulic nut.
5. Drive the bearing up the taper by the required distance  $S_s$ . The axial drive-up is best monitored by a dial indicator. The SKF Hydraulic Nut HMV ..E is prepared for dial indicators. Normally, the bearing is now mounted with a suitable interference on the shaft and a suitable residual clearance.

Patent protected

A<sub>1</sub> Zero position  
A<sub>2</sub> Starting position  
A<sub>3</sub> Final position



For use with previous generation of SKF HMV(C) hydraulic nuts

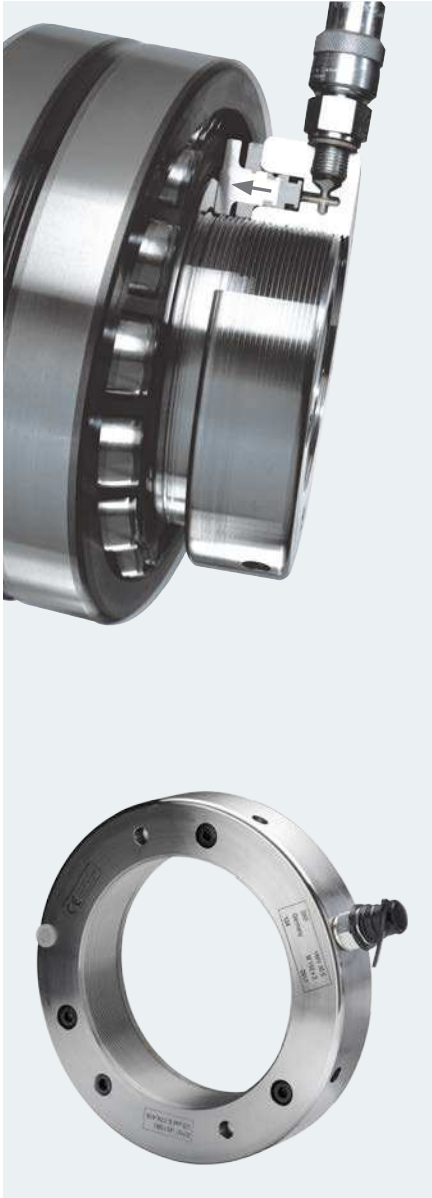
## SKF Hydraulic Nut Drive-up Adapter HMVA 42/200

The SKF Drive-up Method is the preferred method for mounting SKF spherical roller and CARB toroidal roller bearings on tapered seatings. An adapter, used in conjunction with an SKF Dial Indicator, the adapter allows the previous generation of SKF HMV nuts to be used with the SKF Drive-up Method.

The adapter can be used with nuts from size SKF HMV(C) 42 to HMV(C) 200. The adapter is not required for the current generation of SKF HMV(C) ..E nuts.

- One adapter suits the previous generation nuts from SKF HMV(C) 42 up to 200
- Rugged construction
- Easy to attach to the SKF HMV nut using strong magnets
- Used in conjunction with SKF dial indicators

# Hydraulic nuts



Easy application of high drive-up forces

## Hydraulic Nuts HMV ..E series

Mounting bearings on tapered seatings can be a difficult and time-consuming job. Using an SKF Hydraulic Nut facilitates easy and quick application of the high drive-up forces required for mounting bearings. Dismounting bearings mounted on either adapter or withdrawal sleeves is also often a difficult and time-consuming job. These problems can be reduced with the use of an SKF Hydraulic Nut. Oil is pumped into the nut and the piston is pushed out with a force, which is sufficient to free the sleeve. All SKF HMV ..E nuts are supplied with a quick connection coupling to fit the SKF hydraulic pumps.

- Wide size range, covering shaft diameters from 50 to 1 000 mm as standard
- Full range of inch threads available, series HMVC ..E from 1.967 up to 37.410 in.
- Quick connection coupling can be fitted on the face or side of the nut, allowing the nut to be used in areas where space is limited
- A spare set of piston seals and maintenance kit is supplied as standard
- To assist nut threading, a tube of lubricant is supplied with all nuts of size HMV(C) 54E and larger
- To facilitate easy nut threading, all nuts from size HMV(C) 54E are equipped with two tommy bars and four mating holes on their front face
- Nuts from size HMV(C) 94E are equipped with eyebolts, allowing easy handling
- Nuts from size HMV(C) 94E have the starting position of the thread indicated, facilitating easy matching of thread positions on both the nut and mating thread
- Special threads and sizes available on request

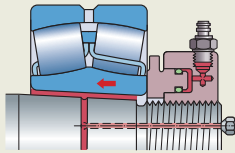
### Maximum working oil pressure with permitted piston displacement of HMV(C)...E nuts:

- HMV(C) 60E and smaller  
80 MPa (11 600 psi)
- HMV(C) 62-100E  
40 MPa (5 800 psi)
- HMV(C) 102E and larger  
25 MPa (3 600 psi)

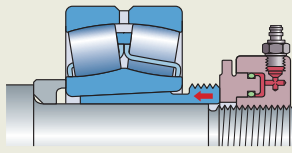
### Technical data – HMV E series (metric)

Designation	HMV E
<b>Thread form</b>	
HMV 10E – HMV 40E	ISO 965/111-1980 tolerance class 6H
HMV 41E – HMV 200E	ISO 2901-1977 tolerance class 7H
<b>Mounting fluid</b>	LHMF 300
<b>Recommended pumps</b>	
HMV 10E – HMV 54E	729124/TMJL 100/728619 E/TMJL 50
HMV 56E – HMV 92E	TMJL 100/728619 E/TMJL 50
HMV 94E – HMV 200E	728619 E/TMJL 50
<b>Quick connection nipple</b>	729832 A (included)
<b>Other types available</b>	
Inch series nuts	HMVC E series
Nuts without threads	HMV...E/A101

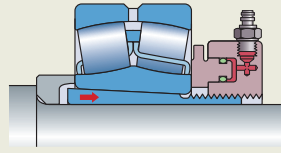
## Mounting



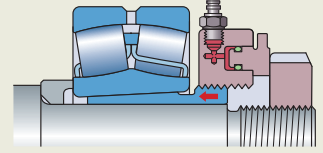
HMV ..E nut for driving the bearing onto a tapered seating.



HMV ..E nut screwed onto the shaft for driving in a withdrawal sleeve.

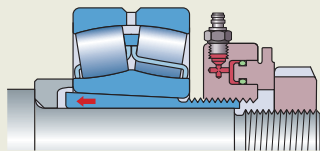


HMV ..E nut for driving the bearing onto an adapter sleeve.

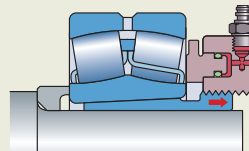


HMV ..E nut and special stop nut for driving in a withdrawal sleeve.

## Dismounting



HMV ..E nut and stop ring in position to press an adapter sleeve free.

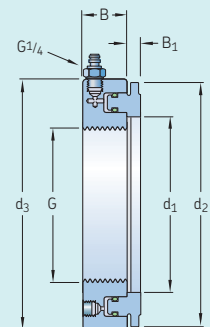
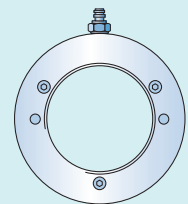


HMV ..E nut used to free a withdrawal sleeve.

### Ordering details and dimensions – HMV E series (metric)

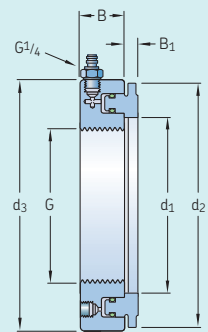
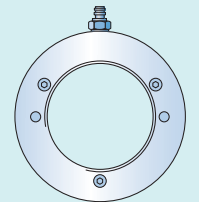
Designation

	G	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	B	B <sub>1</sub>	Permitted piston displacement	Piston area	Weight
	thread	mm	mm	mm	mm	mm	mm	mm <sup>2</sup>	kg
HMV 10E	M50×1,5	50,5	104	114	38	4	5	2 900	2,70
HMV 11E	M55×2	55,5	109	120	38	4	5	3 150	2,75
HMV 12E	M60×2	60,5	115	125	38	5	5	3 300	2,80
HMV 13E	M65×2	65,5	121	130	38	5	5	3 600	3,00
HMV 14E	M70×2	70,5	127	135	38	5	5	3 800	3,20
HMV 15E	M75×2	75,5	132	140	38	5	5	4 000	3,40
HMV 16E	M80×2	80,5	137	146	38	5	5	4 200	3,70
HMV 17E	M85×2	85,5	142	150	38	5	5	4 400	3,75
HMV 18E	M90×2	90,5	147	156	38	5	5	4 700	4,00
HMV 19E	M95×2	95,5	153	162	38	5	5	4 900	4,30
HMV 20E	M100×2	100,5	158	166	38	6	5	5 100	4,40
HMV 21E	M105×2	105,5	163	172	38	6	5	5 300	4,65
HMV 22E	M110×2	110,5	169	178	38	6	5	5 600	4,95
HMV 23E	M115×2	115,5	174	182	38	6	5	5 800	5,00
HMV 24E	M120×2	120,5	179	188	38	6	5	6 000	5,25
HMV 25E	M125×2	125,5	184	192	38	6	5	6 200	5,35
HMV 26E	M130×2	130,5	190	198	38	6	5	6 400	5,65
HMV 27E	M135×2	135,5	195	204	38	6	5	6 600	5,90
HMV 28E	M140×2	140,5	200	208	38	7	5	6 800	6,00
HMV 29E	M145×2	145,5	206	214	39	7	5	7 300	6,50
HMV 30E	M150×2	150,5	211	220	39	7	5	7 500	6,60
HMV 31E	M155×3	155,5	218	226	39	7	5	8 100	6,95
HMV 32E	M160×3	160,5	224	232	40	7	6	8 600	7,60
HMV 33E	M165×3	165,5	229	238	40	7	6	8 900	7,90



**Ordering details and dimensions – HMV E series (metric)**

Designation	G	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	B	B <sub>1</sub>	Permitted piston displacement	Piston area	Weight
	thread	mm	mm	mm	mm	mm	mm	mm <sup>2</sup>	
HMV 34E	M170×3	170,5	235	244	41	7	6	9 400	8,40
HMV 36E	M180×3	180,5	247	256	41	7	6	10 300	9,15
HMV 38E	M190×3	191	259	270	42	8	7	11 500	10,5
HMV 40E	M200×3	201	271	282	43	8	8	12 500	11,5
HMV 41E	Tr205×4	207	276	288	43	8	8	12 800	12,0
HMV 42E	Tr210×4	212	282	294	44	8	9	13 400	12,5
HMV 43E	Tr215×4	217	287	300	44	8	9	13 700	13,0
HMV 44E	Tr220×4	222	293	306	44	8	9	14 400	13,5
HMV 45E	Tr225×4	227	300	312	45	8	9	15 200	14,5
HMV 46E	Tr230×4	232	305	318	45	8	9	15 500	14,5
HMV 47E	Tr235×4	237	311	326	46	8	10	16 200	16,0
HMV 48E	Tr240×4	242	316	330	46	9	10	16 500	16,0
HMV 50E	Tr250×4	252	329	342	46	9	10	17 600	17,5
HMV 52E	Tr260×4	262	341	356	47	9	11	18 800	19,0
HMV 54E	Tr270×4	272	352	368	48	9	12	19 800	20,5
HMV 56E	Tr280×4	282	363	380	49	9	12	21 100	22,0
HMV 58E	Tr290×4	292	375	390	49	9	13	22 400	22,5
HMV 60E	Tr300×4	302	386	404	51	10	14	23 600	25,5
HMV 62E	Tr310×5	312	397	416	52	10	14	24 900	27,0
HMV 64E	Tr320×5	322	409	428	53	10	14	26 300	29,5
HMV 66E	Tr330×5	332	419	438	53	10	14	27 000	30,0
HMV 68E	Tr340×5	342	430	450	54	10	14	28 400	31,5
HMV 69E	Tr345×5	347	436	456	54	10	14	29 400	32,5
HMV 70E	Tr350×5	352	442	464	56	10	14	29 900	35,0
HMV 72E	Tr360×5	362	455	472	56	10	15	31 300	35,5
HMV 73E	Tr365×5	367	460	482	57	11	15	31 700	38,5
HMV 74E	Tr370×5	372	466	486	57	11	16	32 800	39,0
HMV 76E	Tr380×5	382	476	498	58	11	16	33 500	40,5
HMV 77E	Tr385×5	387	483	504	58	11	16	34 700	41,0
HMV 80E	Tr400×5	402	499	522	60	11	17	36 700	45,5
HMV 82E	Tr410×5	412	510	534	61	11	17	38 300	48,0
HMV 84E	Tr420×5	422	522	546	61	11	17	40 000	50,0
HMV 86E	Tr430×5	432	532	556	62	11	17	40 800	52,5
HMV 88E	Tr440×5	442	543	566	62	12	17	42 500	54,0
HMV 90E	Tr450×5	452	554	580	64	12	17	44 100	57,5
HMV 92E	Tr460×5	462	565	590	64	12	17	45 100	60,0
HMV 94E	Tr470×5	472	576	602	65	12	18	46 900	62,0
HMV 96E	Tr480×5	482	587	612	65	12	19	48 600	63,0
HMV 98E	Tr490×5	492	597	624	66	12	19	49 500	66,0
HMV 100E	Tr500×5	502	609	636	67	12	19	51 500	70,0
HMV 102E	Tr510×6	512	624	648	68	12	20	53 300	74,0
HMV 104E	Tr520×6	522	634	658	68	13	20	54 300	75,0
HMV 106E	Tr530×6	532	645	670	69	13	21	56 200	79,0
HMV 108E	Tr540×6	542	657	682	69	13	21	58 200	81,0
HMV 110E	Tr550×6	552	667	693	70	13	21	59 200	84,0
HMV 112E	Tr560×6	562	678	704	71	13	22	61 200	88,0
HMV 114E	Tr570×6	572	689	716	72	13	23	63 200	91,0
HMV 116E	Tr580×6	582	699	726	72	13	23	64 200	94,0
HMV 120E	Tr600×6	602	721	748	73	13	23	67 300	100
HMV 126E	Tr630×6	632	754	782	74	14	23	72 900	110
HMV 130E	Tr650×6	652	775	804	75	14	23	76 200	115
HMV 134E	Tr670×6	672	796	826	76	14	24	79 500	120
HMV 138E	Tr690×6	692	819	848	77	14	25	84 200	127
HMV 142E	Tr710×7	712	840	870	78	15	25	87 700	135
HMV 150E	Tr750×7	752	883	912	79	15	25	95 200	146
HMV 160E	Tr800×7	802	936	965	80	16	25	103 900	161
HMV 170E	Tr850×7	852	990	1 020	83	16	26	114 600	181
HMV 180E	Tr900×7	902	1 043	1 075	86	17	30	124 100	205
HMV 190E	Tr950×8	952	1 097	1 126	86	17	30	135 700	218
HMV 200E	Tr1000×8	1 002	1 150	1 180	88	17	34	145 800	239



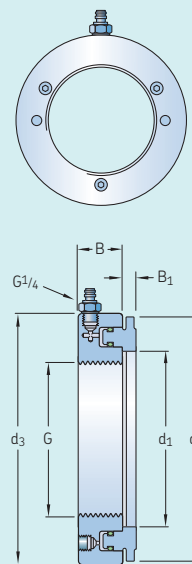


### Technical data – HMVC E series (inch)

Designation	HMVC E
<b>Thread form</b>	
HMVC 10E – HMVC 64E	American National Form Threads Class 3
HMVC 68E – HMVC 190E	ACME General Purpose Threads Class 3 G
<b>Mounting fluid</b>	LHMF 300
<b>Recommended pumps</b>	
HMVC 10E – HMVC 52E	729124 / TMJL 100 / 728619 E / TMJL 50
HMVC 56E – HMVC 92E	TMJL 100 / 728619 E / TMJL 50
HMVC 94E – HMVC 190E	728619 E / TMJL 50
<b>Quick connection nipple</b>	729832A (included)
<b>Other types available</b>	
Inch series nuts	HMVC E series
Nuts without threads	HMV...E/A101

### Ordering details and dimensions – HMVC E series (inch)

Designation	Pitch diameter		Threads	Permitted piston displacement					Piston area	Weight	
	G			d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	B	B <sub>1</sub>			
	in.	in.	in.	in.	in.	in.	in.	in.	in. <sup>2</sup>	lb	
HMVC 10E	1.967	1.9309	18	2.0	4.1	4.5	1.5	0.16	0.20	4.5	6.0
HMVC 11E	2.157	2.1209	18	2.2	4.3	4.7	1.5	0.16	0.20	4.9	6.1
HMVC 12E	2.360	2.3239	18	2.4	4.5	4.9	1.5	0.20	0.20	5.1	6.2
HMVC 13E	2.548	2.5119	18	2.6	4.8	5.1	1.5	0.20	0.20	5.6	6.6
HMVC 14E	2.751	2.7149	18	2.8	5.0	5.3	1.5	0.20	0.20	5.9	7.1
HMVC 15E	2.933	2.8789	12	3.0	5.2	5.5	1.5	0.20	0.20	6.2	7.5
HMVC 16E	3.137	3.0829	12	3.2	5.4	5.7	1.5	0.20	0.20	6.5	8.2
HMVC 17E	3.340	3.2859	12	3.4	5.6	5.9	1.5	0.20	0.20	6.8	8.3
HMVC 18E	3.527	3.4729	12	3.6	5.8	6.1	1.5	0.20	0.20	7.3	8.8
HMVC 19E	3.730	3.6759	12	3.8	6.0	6.4	1.5	0.20	0.20	7.6	9.5
HMVC 20E	3.918	3.8639	12	4.0	6.2	6.5	1.5	0.24	0.20	7.9	9.7
HMVC 21E	4.122	4.0679	12	4.2	6.4	6.8	1.5	0.24	0.20	8.2	10.3
HMVC 22E	4.325	4.2709	12	4.4	6.7	7.0	1.5	0.24	0.20	8.7	10.9
HMVC 24E	4.716	4.6619	12	4.7	7.0	7.4	1.5	0.24	0.20	9.3	11.6
HMVC 26E	5.106	5.0519	12	5.1	7.5	7.8	1.5	0.24	0.20	9.9	12.5
HMVC 28E	5.497	5.4429	12	5.5	7.9	8.2	1.5	0.28	0.20	10.5	13.2
HMVC 30E	5.888	5.8339	12	5.9	8.3	8.7	1.5	0.28	0.20	11.6	14.6
HMVC 32E	6.284	6.2028	8	6.3	8.8	9.1	1.6	0.28	0.24	13.3	16.8
HMVC 34E	6.659	6.5778	8	6.7	9.3	9.6	1.6	0.28	0.24	14.6	18.5
HMVC 36E	7.066	6.9848	8	7.1	9.7	10.1	1.6	0.28	0.24	16.0	20.2
HMVC 38E	7.472	7.3908	8	7.5	10.2	10.6	1.7	0.31	0.28	17.8	23.1
HMVC 40E	7.847	7.7658	8	7.9	10.7	11.1	1.7	0.31	0.31	19.4	25.4
HMVC 44E	8.628	8.5468	8	8.7	11.5	12.0	1.7	0.31	0.35	22.3	29.8
HMVC 46E	9.125	9.0440	8	9.1	12.0	12.5	1.8	0.31	0.35	24.0	31.9
HMVC 48E	9.442	9.3337	6	9.5	12.4	13.0	1.8	0.35	0.39	25.6	35.3
HMVC 52E	10.192	10.0837	6	10.3	13.4	14.0	1.9	0.35	0.43	29.1	41.9
HMVC 54E	10.604	10.4960	6	10.7	13.9	14.5	1.9	0.35	0.47	30.7	45.2
HMVC 56E	11.004	10.8957	6	11.1	14.3	15.0	1.9	0.35	0.47	32.7	48.5
HMVC 60E	11.785	11.6767	6	11.9	15.2	15.9	2.0	0.39	0.55	36.6	56.2
HMVC 64E	12.562	12.4537	6	12.7	16.1	16.9	2.1	0.39	0.55	40.8	65.0
HMVC 68E	13.339	13.2190	5	13.5	16.9	17.7	2.1	0.39	0.55	44.0	69.4
HMVC 72E	14.170	14.0500	5	14.3	17.9	18.6	2.2	0.39	0.59	48.5	78.3
HMVC 76E	14.957	14.8370	5	15.0	18.7	19.6	2.3	0.43	0.63	51.9	89.3
HMVC 80E	15.745	15.6250	5	15.8	19.6	20.6	2.4	0.43	0.67	56.9	100
HMVC 84E	16.532	16.4120	5	16.6	20.6	21.5	2.4	0.43	0.67	62.0	110
HMVC 88E	17.319	17.1990	5	17.4	21.4	22.3	2.4	0.47	0.67	65.9	119
HMVC 92E	18.107	17.9870	5	18.2	22.2	23.3	2.5	0.47	0.67	69.9	132
HMVC 96E	18.894	18.7740	5	19.0	23.1	24.1	2.6	0.47	0.75	75.3	139
HMVC 100E	19.682	19.5620	5	19.8	24.0	25.0	2.6	0.47	0.75	79.8	154





### Ordering details and dimensions – HMVC E series (inch)

Designation	Pitch diameter		Threads	Dimensions					Permitted piston displacement	Piston area	Weight
	G			d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	B	B <sub>1</sub>			
	in.	in.		in.	in.	in.	in.	in.			
HMVC 106E	20.867	20.7220	4	20.9	25.4	26.4	2.7	0.51	0.83	87.1	174
HMVC 112E	22.048	21.9030	4	22.1	26.7	27.7	2.8	0.51	0.87	94.9	194
HMVC 120E	23.623	23.4780	4	23.7	28.4	29.4	2.9	0.51	0.91	104.3	220
HMVC 126E	24.804	24.6590	4	24.9	29.7	30.8	2.9	0.55	0.91	113.0	243
HMVC 134E	26.379	26.2340	4	26.5	31.3	32.5	3.0	0.55	0.94	123.2	265
HMVC 142E	27.961	27.7740	3	28.0	33.1	34.3	3.1	0.59	0.98	135.9	298
HMVC 150E	29.536	29.3490	3	29.6	34.8	35.9	3.1	0.59	0.98	147.6	322
HMVC 160E	31.504	31.3170	3	31.6	36.9	38.0	3.1	0.63	0.98	161.0	355
HMVC 170E	33.473	33.2860	3	33.5	39.0	40.2	3.3	0.63	1.02	177.6	399
HMVC 180E	35.441	35.2540	3	35.5	41.1	42.3	3.4	0.67	1.18	192.4	452
HMVC 190E	37.410	37.2230	3	37.5	43.2	44.3	3.4	0.67	1.18	210.3	481

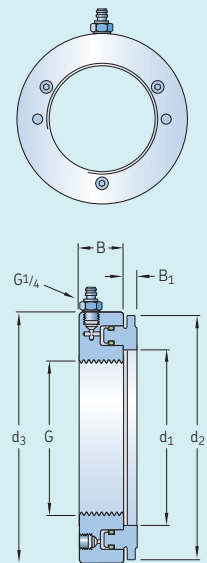


### Technical data – HMV E/A101 series (unthreaded)

Designation	HMV E/A101
Mounting fluid	LHMF 300
Recommended pumps	729124 / TMJL 100 / 728619 E / TMJL 50 TMJL 100 / 728619 E / TMJL 50 728619 E / TMJL 50
Quick connection nipple	729832 A (included)

### Ordering details and dimensions – HMV E/A101 series (unthreaded)

Designation	Bore diameter		Designation	Bore diameter		Designation	Bore diameter	
	G			G			G	
	mm	in.		mm	in.		mm	in.
HMV 10E/A101	46,7	1.84	HMV 41E/A101	200,2	7.88	HMV 86E/A101	424,7	16.72
HMV 11E/A101	51,1	2.01	HMV 42E/A101	205,2	8.08	HMV 88E/A101	434,7	17.11
HMV 12E/A101	56,1	2.21	HMV 43E/A101	210,2	8.28	HMV 90E/A101	444,7	17.51
HMV 13E/A101	61,1	2.41	HMV 44E/A101	215,2	8.47	HMV 92E/A101	454,7	17.90
HMV 14E/A101	66,1	2.60	HMV 45E/A101	220,2	8.67	HMV 94E/A101	464,7	18.30
HMV 15E/A101	71,1	2.80	HMV 46E/A101	225,2	8.87	HMV 96E/A101	474,7	18.69
HMV 16E/A101	76,1	3.00	HMV 47E/A101	230,2	9.06	HMV 98E/A101	484,7	19.08
HMV 17E/A101	81,1	3.19	HMV 48E/A101	235,2	9.26	HMV 100E/A101	494,7	19.48
HMV 18E/A101	86,1	3.39	HMV 50E/A101	245,2	9.65	HMV 102E/A101	503,7	19.83
HMV 19E/A101	91,1	3.59	HMV 52E/A101	255,2	10.05	HMV 104E/A101	513,7	20.22
HMV 20E/A101	96,1	3.78	HMV 54E/A101	265,2	10.44	HMV 106E/A101	523,7	20.62
HMV 21E/A101	101,1	3.98	HMV 56E/A101	275,2	10.83	HMV 108E/A101	533,7	21.01
HMV 22E/A101	106,1	4.18	HMV 58E/A101	285,2	11.23	HMV 110E/A101	543,7	21.41
HMV 23E/A101	111,1	4.37	HMV 60E/A101	295,2	11.62	HMV 112E/A101	553,7	21.80
HMV 24E/A101	116,1	4.57	HMV 62E/A101	304,7	12.00	HMV 114E/A101	563,7	22.19
HMV 25E/A101	121,1	4.77	HMV 64E/A101	314,7	12.39	HMV 116E/A101	573,7	22.59
HMV 26E/A101	126,1	4.96	HMV 66E/A101	324,7	12.78	HMV 120E/A101	593,7	23.37
HMV 27E/A101	131,1	5.16	HMV 68E/A101	334,7	13.18	HMV 126E/A101	623,7	24.56
HMV 28E/A101	136,1	5.36	HMV 69E/A101	339,7	13.37	HMV 130E/A101	643,7	25.34
HMV 29E/A101	141,1	5.56	HMV 70E/A101	344,7	13.57	HMV 134E/A101	663,7	26.13
HMV 30E/A101	146,1	5.75	HMV 72E/A101	354,7	13.96	HMV 138E/A101	683,7	26.92
HMV 31E/A101	149,8	5.90	HMV 73E/A101	359,7	14.16	HMV 142E/A101	702,7	27.67
HMV 32E/A101	154,8	6.09	HMV 74E/A101	364,7	14.36	HMV 150E/A101	742,7	29.24
HMV 33E/A101	159,8	6.29	HMV 76E/A101	374,7	14.75	HMV 160E/A101	792,7	31.21
HMV 34E/A101	164,8	6.49	HMV 77E/A101	379,7	14.95	HMV 170E/A101	842,7	33.18
HMV 36E/A101	174,8	6.88	HMV 80E/A101	394,7	15.54	HMV 180E/A101	892,7	35.15
HMV 38E/A101	184,8	7.28	HMV 82E/A101	404,7	15.93	HMV 190E/A101	941,7	37.07
HMV 40E/A101	194,8	7.67	HMV 84E/A101	414,7	16.33	HMV 200E/A101	991,7	39.04



# Hydraulic pump and oil injector selection guide

Selection guide					
Max. working pressure	Pump	Type	Oil container capacity	Connection nipple	Application examples <sup>1)</sup>
30 MPa (4 350 psi)	THAP 030E	Air-driven pump	Separate container	G <sup>3</sup> / <sub>4</sub>	SKF OK Coupling hydraulic chamber
50 MPa (7 250 psi)	TMJL 50	Hand operated pump	2 700 cm <sup>3</sup> (165 in. <sup>3</sup> )	G <sup>1</sup> / <sub>4</sub>	All HMV ..E (dismounting with sleeves only) SKF OK Coupling hydraulic chamber
100 MPa (14 500 psi)	729124	Hand operated pump	250 cm <sup>3</sup> (15 in. <sup>3</sup> )	G <sup>1</sup> / <sub>4</sub>	≤ HMV 54E (dismounting with sleeves only) Oil injection for small bearings
	TMJL 100	Hand operated pump	800 cm <sup>3</sup> (48 in. <sup>3</sup> )	G <sup>1</sup> / <sub>4</sub>	≤ HMV 92E (dismounting with sleeves only) Oil injection for medium bearings
150 MPa (21 750 psi)	THAP 150E	Air-driven pump	Separate container	G <sup>3</sup> / <sub>4</sub>	Bolt tensioners, propellers Oil injection for large bearing seatings
	728619 E	Hand operated pump	2 550 cm <sup>3</sup> (155 in. <sup>3</sup> )	G <sup>1</sup> / <sub>4</sub>	All HMV ..E nuts (dismounting with sleeves only) Oil injection for bearing seatings
300 MPa (43 500 psi)	THAP 300E	Air-driven oil injector	Separate container	G <sup>3</sup> / <sub>4</sub>	OK Couplings Large pressure joints Oil injection for large gears and railway wheels
	226400 E	Hand operated oil injector	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	G <sup>3</sup> / <sub>4</sub>	OK Couplings Oil injection for gears and railway wheels Pressure joints
	729101/300MPA	Oil injection kit	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	Several	OK Couplings Oil injection for gears and railway wheels Pressure joints Complete kit suitable for many applications
	THKI 300	Oil injection set	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	Several	Oil injection for gears and railway wheels Pressure joints Complete set suitable for many applications
400 MPa (58 000 psi)	THAP 400E	Air-driven oil injector	Separate container	G <sup>3</sup> / <sub>4</sub>	OK Couplings Large pressure joints Oil injection for large gears and railway wheels
	226400 E/400	Hand operated oil injector	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	G <sup>3</sup> / <sub>4</sub>	OK Couplings Oil injection for gears and railway wheels Pressure joints
	729101/400MPA	Oil injection kit	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	Several	OK Couplings Oil injection for gears and railway wheels Pressure joints Complete kit suitable for many applications
	THKI 400	Oil injection set	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	Several	Oil injection for gears and railway wheels Pressure joints Complete set suitable for many applications

<sup>1)</sup> The interference fit and application size may mean that a pump / injector with a higher pressure and/or container volume is required.

TMJL 50



i 62

729124



i 62

TMJL 100



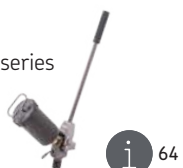
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728619 E



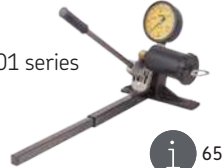
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226400 E series



i 64

729101 series



i 65

THKI series



i 65

THAP E series



i 66

# Hydraulic pumps



50 MPa (7 250 psi)

## SKF Hydraulic Pump TMJL 50

The SKF TMJL 50 is mainly intended for larger SKF Hydraulic Nuts and SKF OK Coupling hydraulic chambers, but is also suitable for applications where a maximum pressure of 50 MPa (7 250 psi) is required.

- Large oil container capacity 2 700 cm<sup>3</sup> (165 in.<sup>3</sup>)
- Over pressure valve and connection port for a pressure gauge
- Packed in a sturdy protective case

### Applications

- SKF OK Coupling hydraulic chambers
- All sizes SKF Hydraulic Nuts
- Oil injection applications where the maximum pressure is 50 MPa (7 250 psi)



100 MPa (14 500 psi)

## SKF Hydraulic Pump 729124

The SKF 729124 is mainly intended for SKF Hydraulic Nuts ( $\leq$  HMV 54E) to mount bearings or components where a maximum pressure of 100 MPa (14 500 psi) is required.

- Oil container capacity 250 cm<sup>3</sup> (15 in.<sup>3</sup>)
- Fitted with a pressure gauge
- Packed in a sturdy protective case

### Applications

- SKF Hydraulic Nuts  $\leq$  HMV 54E
- Oil injection applications where the maximum pressure is 100 MPa (14 500 psi)
- For applications where space does not permit the use of a quick connect coupling and nipple, such as AOH sleeves, a special pump design is available (SKF 729124 A)

Technical data				
Designation	TMJL 50	729124	TMJL 100	728619 E
Maximum pressure	50 MPa (7 250 psi)	100 MPa (14 500 psi)	100 MPa (14 500 psi)	150 MPa (21 750 psi)
Oil container capacity	2 700 cm <sup>3</sup> (165 in. <sup>3</sup> )	250 cm <sup>3</sup> (15 in. <sup>3</sup> )	800 cm <sup>3</sup> (48 in. <sup>3</sup> )	2 550 cm <sup>3</sup> (155 in. <sup>3</sup> )
Volume/stroke	3,5 cm <sup>3</sup> (0.21 in. <sup>3</sup> )	0,5 cm <sup>3</sup> (0.03 in. <sup>3</sup> )	1,0 cm <sup>3</sup> (0.06 in. <sup>3</sup> )	1st stage: 20 cm <sup>3</sup> below 2,5 MPa (1.2 in. <sup>3</sup> below 362 psi) 2nd stage: 1 cm <sup>3</sup> above 2,5 MPa (0.06 in. <sup>3</sup> above 362 psi)
Length of pressure hose fitted with quick connection coupling	3 000 mm (118 in.)	1 500 mm (59 in.)	3 000 mm (118 in.)	3 000 mm (118 in.)
Connection nipple (included)	G <sup>1</sup> / <sub>4</sub> quick connection	G <sup>1</sup> / <sub>4</sub> quick connection	G <sup>1</sup> / <sub>4</sub> quick connection	G <sup>1</sup> / <sub>4</sub> quick connection
Weight	12 kg (26 lb)	3,5 kg (8 lb)	13 kg (29 lb)	11,4 kg (25 lb)

All SKF Hydraulic Pumps are filled with SKF Mounting Fluid and are supplied with an extra litre of fluid.



Large oil container 100 MPa (14 500 psi)

## SKF Hydraulic Pump TMJL 100

The SKF TMJL 100 pump is mainly intended for use with hydraulic nuts ( $\leq$  HMV 92E) to mount bearings or components where a maximum pressure of 100 MPa (14 500 psi) is required.

- Oil container capacity 800 cm<sup>3</sup> (48 in.<sup>3</sup>)
- Fitted with a pressure gauge
- Packed in a sturdy protective case

### Applications

- SKF Hydraulic Nuts  $\leq$  HMV 92E
- Oil injection applications where the maximum pressure is 100 MPa (14 500 psi)
- Suitable with SKF Hydraulic Assisted Pullers TMHP series



150 MPa (21 750 psi)

## SKF Hydraulic Pump 728619 E

The SKF 728619 E is a two-stage pump suitable for use with SKF Supergrip Bolts and to mount bearings or components where a maximum pressure of 150 MPa (21 750 psi) is required.

- Oil container capacity 2 550 cm<sup>3</sup> (155 in.<sup>3</sup>)
- Two stage pressure pumping
- Fitted with a pressure gauge
- Packed in a sturdy protective case

### Applications

- SKF Supergrip Bolts
- Oil injection applications where the maximum pressure is 150 MPa (21 750 psi)
- All sizes SKF Hydraulic Nuts



### SKF Mounting Fluid LHMF 300 and SKF Dismounting Fluid LHDF 900

SKF mounting and dismounting fluids are suitable for use with SKF hydraulic equipment, including hydraulic pumps, HMV ..E nuts and oil injection tools in mounting and dismounting jobs. All SKF Hydraulic Pumps are filled with SKF Mounting Fluid LHMF 300 and are supplied with an extra litre of fluid.

For more information, see page 73

# Oil Injectors

To enable the SKF Oil Injection Method to be used, a range of oil injectors, kits and sets are available. Depending on the model chosen, working pressures up to 400 MPa (58 000 psi) can be achieved. In addition, a comprehensive range of high pressure accessories such as pipes, connection nipples, extension pipes and plugs permit the use of SKF Oil Injectors for many different applications.



300 and 400 MPa (43 500 and 58 000 psi)

## SKF Oil Injector 226400 E series

The 226400 E series is suitable for many applications using the SKF Oil Injection Method. The injector is supplied with an oil reservoir in a compact carrying case.

The injector can be mounted directly onto the work piece or connected to an adapter block to make a floor standing model, making it easy to connect pressure gauges and high-pressure pipes. For applications where 400 MPa (58 000 psi) is required, the SKF 226400 E/400 is available.

- Easy to operate
- Compact carrying case
- When the pressure is released, the unused oil is automatically returned to the reservoir, minimizing the risk of oil leakage to the environment
- Oil container capacity 200 cm<sup>3</sup> (12.2 in.<sup>3</sup>)
- Can be used with a wide range of accessories, such as:
  - Adapter block
  - Pressure gauges
  - High pressure pipes
  - Connecting nipples

### Technical data

Designation	226400 E 729101/300MPa	226400 E/400 729101/400MPa	THKI 300	THKI 400
Maximum pressure	300 MPa (43 500 psi)	400 MPa (58 000 psi)	300 MPa (43 500 psi)	400 MPa (58 000 psi)
Volume per stroke	0,23 cm <sup>3</sup> (0.014 in. <sup>3</sup> )	0,23 cm <sup>3</sup> (0.014 in. <sup>3</sup> )	0,23 cm <sup>3</sup> (0.014 in. <sup>3</sup> )	0,23 cm <sup>3</sup> (0.014 in. <sup>3</sup> )
Oil reservoir capacity	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )	200 cm <sup>3</sup> (12.2 in. <sup>3</sup> )
Connecting threads	G <sup>3</sup> / <sub>4</sub>	G <sup>3</sup> / <sub>4</sub>	G <sup>3</sup> / <sub>4</sub>	G <sup>3</sup> / <sub>4</sub>



300 and 400 MPa (43 500 and 58 000 psi)

## SKF Oil Injection Kits 729101 series

The 729101 series of SKF Oil Injection Kits are suitable for many applications using the SKF Oil Injection Method. Each kit contains an SKF Oil Injector complete with a high pressure pipe, pressure gauge, adapter block and a range of connection nipples.

- Injector can be used directly on the application or by connecting to the accessories provided
- All items packed in a sturdy, compact carrying case especially suitable for field use
- When the pressure is released, the unused oil is automatically returned to the reservoir, minimizing the risk of oil leakage to the environment
- Oil container capacity 200 cm<sup>3</sup> (12.2 in.<sup>3</sup>)



300 and 400 MPa (43 500 and 58 000 psi)

## SKF Oil Injection Set THKI series

The SKF THKI series is used for the mounting and dismounting of pressure joints of all sizes and applications such as rolling bearings, couplings, gears, flywheels and railway wheels. The set consists of a stand-mounted oil injector complete with a high pressure pipe, pressure gauge and a range of connection nipples.

- Designed to be especially suitable for workshop use
- When the pressure is released, the unused oil is automatically returned to the reservoir, minimizing the risk of oil leakage to the environment
- Oil container capacity 200 cm<sup>3</sup> (12.2 in.<sup>3</sup>)
- Can be used for applications requiring a maximum pressure of up to 400 MPa (58 000 psi)

### Contents list

Designation	729101/300MPA	729101/400MPA	THKI 300	THKI 400
Oil injector	226400 E	226400 E/400	THKI 300	THKI 400
Adapter block	226402	226402	227957 A	227957 A/400 MP
Pressure gauge	1077589	1077589/3	1077589	1077589/3
High pressure pipe (G <sup>3/4</sup> -1/4)	227957 A	227957 A/400 MP	227957 A	227957 A/400 MP
Connection nipple (G <sup>1/4</sup> -1/8)	1014357 A	-	1014357 A	-
Connection nipple (G <sup>1/4</sup> -1/2)	1016402E	1016402E	1016402E	1016402E
Connection nipple (G <sup>1/4</sup> -3/4)	228027E	228027E	228027E	228027E
Mounting fluid	-	-	LHMF 300/1	LHMF 300/1
Carrying case	Yes	Yes	Yes	Yes