ANCHOR BOLT TECHNICAL DATA

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WITH EITHER THE **JAKEBOLT** OR **VECTOR BOLT**, THE MEANS THROUGH WHICH CONCRETE FAILURE OCCURS INVOLVES THE SHEARING-OUT CONE SHAPED SECTION. SEE FIGURES 1 & 2.

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IN ORDER TO ASSURE THAT THE BOLT FAILS FIRST , IT IS NORMAL TO DESIGN THE ANCHOR IMBEDMENT DEPTH USING A FACTOR OF 2 ON THE ALLOWABLE SHEAR-STRESS APPLIED TO THE SURFACE OF THE CONE. KNOWING THE CROSS SECTIONAL AREA OF THE BOLT AND THE ULTIMATE TENSILE STRENGTH OF THE MATERIAL FROM WHICH IT IS MADE, IT IS POSSIBLE TO CALCULATE THE LOAD AT WHICH THE BOLT WILL FAIL HIGHER TENSILE VECTOR BOLTS REQUIRE DEEPER EMBEDMENTS TO DEVELOP FULL HOLDING POWER BEFORE CONCRETE FAILURE.

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FIGURE 1 : JAKEBOLT SHEAR CONE

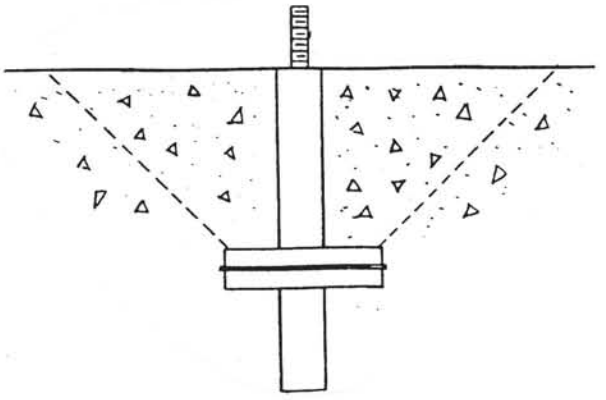
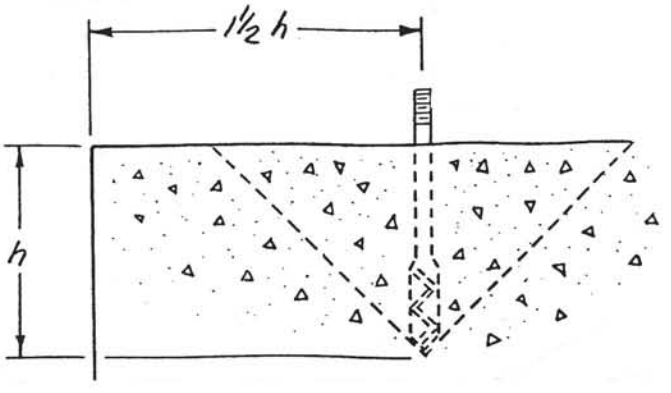


FIGURE 2 : VECTOR BOLT SHEAR CONE



ANCHOR BOLT TECHNICAL DATA

HEAVY DUTY JAKEBOLTS : MATERIAL 90,000 PSI

MINIMUM EMBEDMENT AND FAILURE LOAD FOR - JAKEBOLTS *

NOMINAL SIZE	FAILURE LOAD LBS.	CALCULATED MINIMUM DEPTH	RECOMMENDED MINIMUM DEPTH
1/2"	13,500	4.0 "	4.5 "
5/8"	22,000	4.0 "	5.0 "
3/4"	32,000	4.5 "	5.5 "
7/8"	44,600	5.5 "	6.5 "
1"	58,000	6.5 "	8.0 "
1-1/4"	90,800	8.0 "	9.5 "
1-1/2"	130,000	10.0 "	11.5 "

* = JAKEBOLTS - 90,000 PSI TENSILE

VECTOR BOLTS : MATERIAL 78,000 PSI

MINIMUM EMBEDMENT AND FAILURE LOAD FOR - VECTOR BOLTS **

NOMINAL SIZE	FAILURE LOAD LBS.	CALCULATED MINIMUM DEPTH	RECOMMENDED MINIMUM DEPTH
12 MM	11,000	4.0 "	5.0 "
16 MM	20,200	5.0 "	6.0 "
20 MM	31,700	6.5 "	7.5 "
24 MM	45,600	8.0 "	9.0 "
30 MM	72,300	9.5 "	11.0 "
36 MM	105,000	11.5 "	13.5 "

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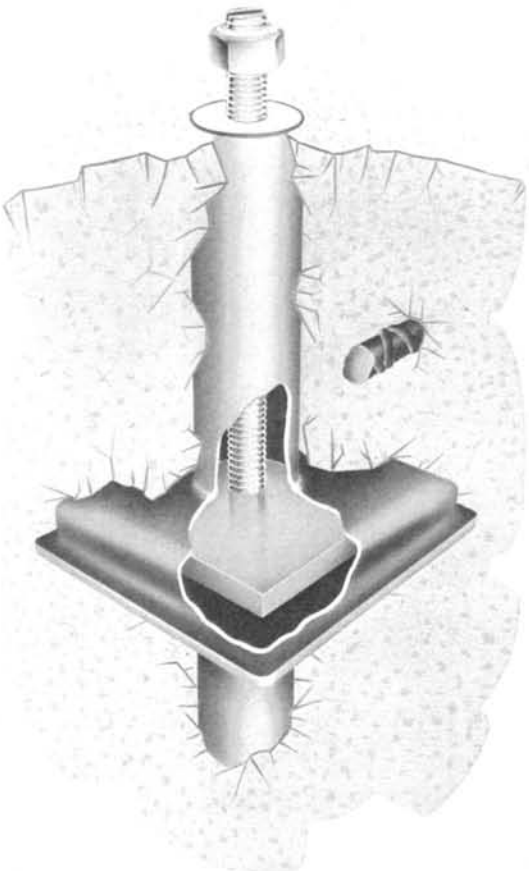
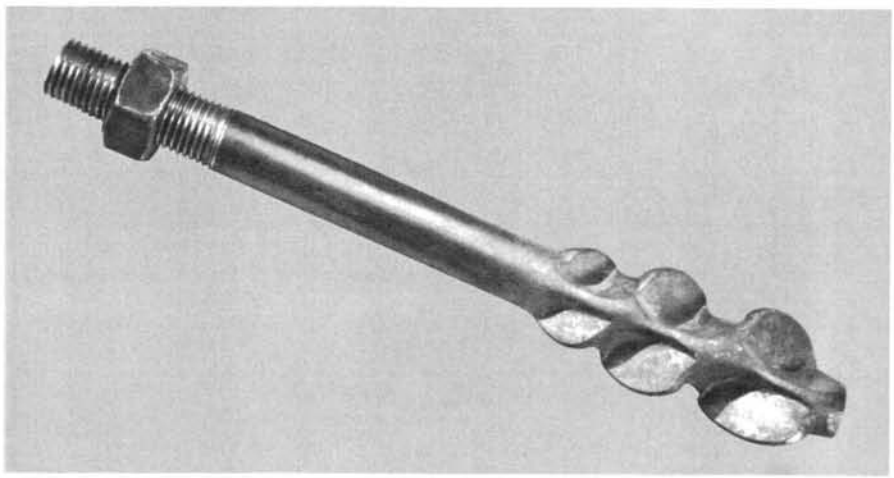
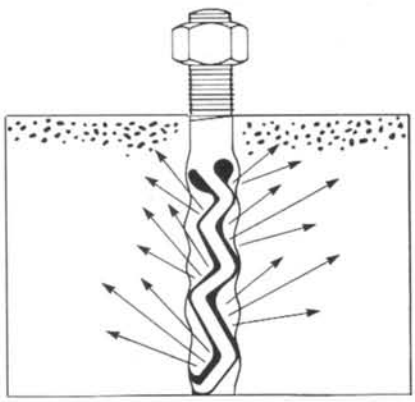
ANCHORS

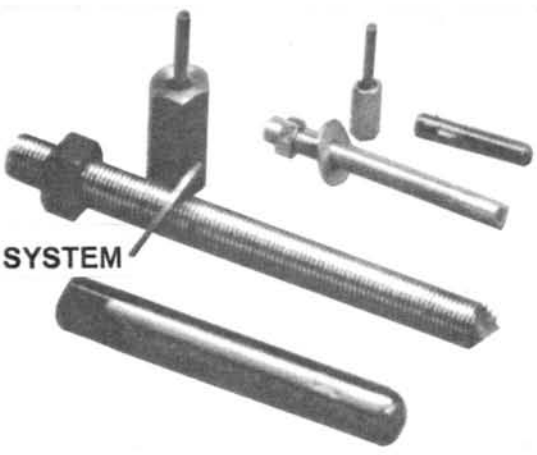


The Heavy Duty Jakebolt is designed to be cast in place during foundation construction.



Vector Anchor Bolts





UNISORB CAPSULE ANCHOR SYSTEM

PRODUCT CODES

VECTOR BOLTS

DESCRIPTION	PRODUCT CODE
EM12 1/2 X 6	450030
EM12 1/2 X 8	450050
EM16 5/8 X 6	450140
EM16 5/8 X 8	450120
EM16 5/8 X 10	450130
EM16 5/8 X 12	450160
EM16 5/8 X 14	450150
EM20 3/4 X 8	450210
EM20 3/4 X 10	450220
EM20 3/4 X 12	450230
EM20 3/4 X 14	450240
EM20 3/4 X 16	450250
EM20 3/4 X 18	450260
EM24 15/16 X 12	450410
EM24 15/16 X 14	450420
EM24 15/16 X 16	450440
EM24 15/16 X 18	450430
EM30 1-3/16 12	450510
EM30 1-3/16 14	450530
EM30 1-3/16 18	450520
EM30 1-3/16 24	450540
EM36 1-7/16 X 16	450670
EM36 1-7/16 X 24	450680

HEAVY DUTY JAKE BOLTS

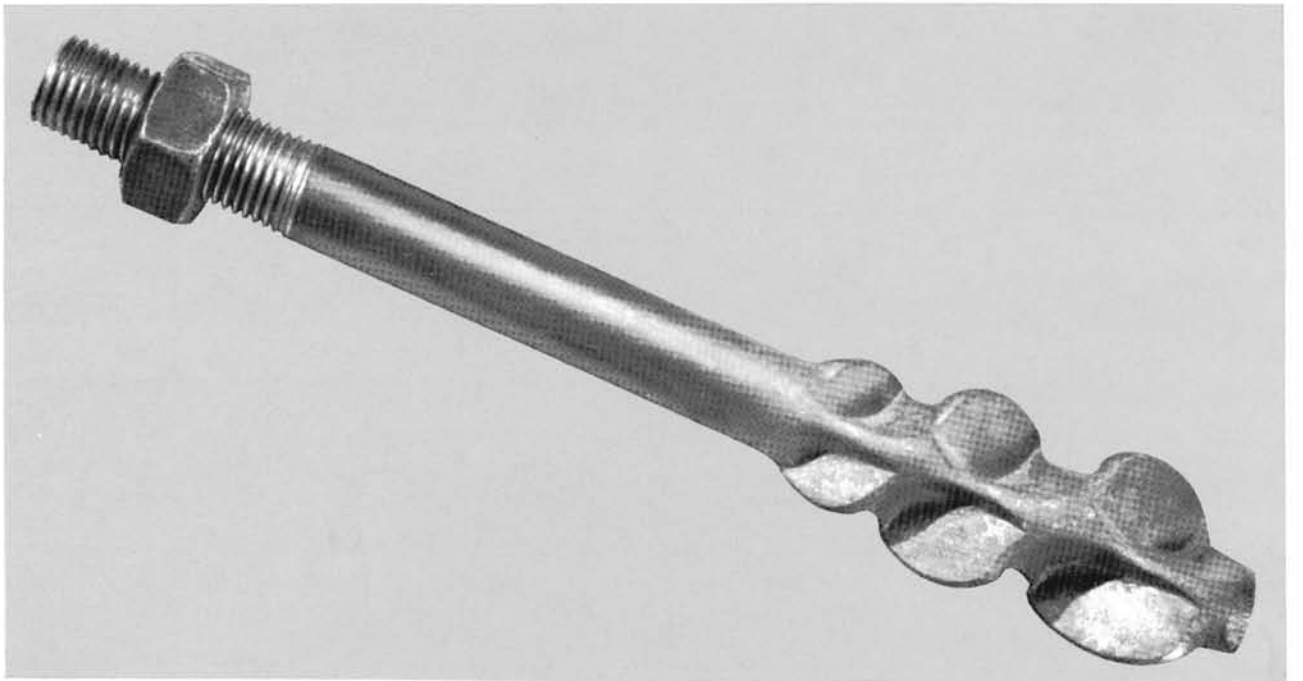
DESCRIPTION	PRODUCT CODE
1/2 X 6	420400
5/8 X 6	421400
5/8 X 12	421500
3/4 X 6	422400
3/4 X 12	422500
7/8 X 6	423400
7/8 X 12	423500
1 X 6	424400
1 X 12	424500
1-1/4 X 6	426400
1-1/4 X 12	426500
1-1/2 X 6	427400
1-1/2 X 12	427500
1-3/4 X 6	428400
1-3/4 X 12	428500
2 X 6	429400
2 X 12	429500

CAPSULE ANCHOR SYSTEM

DESCRIPTION	PRODUCT CODE
CAPSULES - (Sold in full pkgs only)	
C-38 10/PKG	521038
C-12 10/PKG	521012
C-58 10/PKG	521058
C-34 10/PKG	521034
C-78 10/PKG	521078
C-100 10/PKG	521100
C-114 5/PKG	521114
STUD ASSEMBLIES - (Longer studs available)	
S-38 X 5-1/8	523038
S-12 X 6-1/2	523012
S-58 X 7-5/8	523058
S-34 X 9-1/2	523034
S-78 X 10-1/4	523078
S-100 X 12	523100
S-114 X 15	523114
DRIVE UNITS - (Straight Shank Type)	
D-38	525038
D-12	525012
D-58	525058
D-34	525078
D-78	525100
D-100	525114
D-114	523114
INTERNALLY THREADED INSERTS	
3/8" I.d. x 3-1/2"	527038
1/2" I.d. x 4-1/4"	527012
5/8" I.D. x 5"	527058
3/4" I.D. x 6-5/8"	527034

(Use with complete system)

VECTOR ANCHOR BOLTS



VECTOR ANCHOR BOLTS

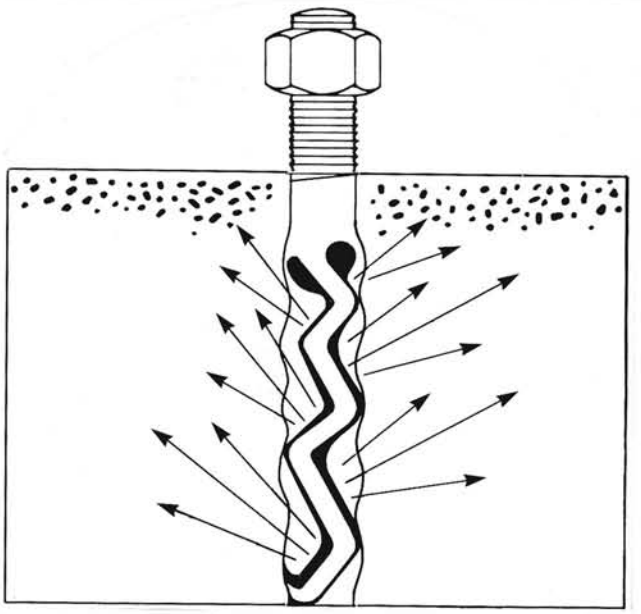
Vector Anchor Bolts are designed to generate - exceptional holding power. Made of high quality forged steel, vector bolts have a series of angular facets which resolve vertical stress forces into a cone shaped pressure pattern. This unique design greatly increases the contract area between the bolt and grout.The wedge shaped design on the bottom of the bolt transfers the tensile load of the stud into a lAteral compressional load in the foundation assuring maximum pull outstrength.

The tensile strength of the standard grade bolt is a minimum of 78,000 PSI. Higher strength bolts are available.

Vector Anchor Bolts are available in 10 diameter sizes with lengths from 3" to 40".

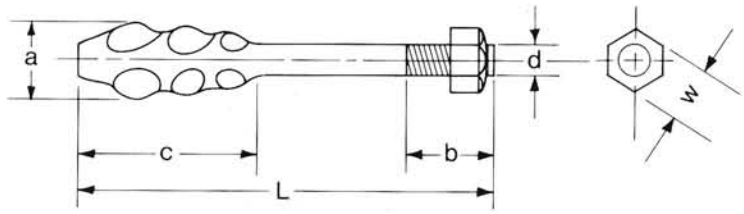
CORE DRILL SIZES FOR VECTOR BOLTS:

Vector bolt Size MM	Min. Dia. Hole For V-1 Grout	Min. Dia. Hole V-100 Epoxy Grout
EM--10	2"	1-1/2"
EM--12	3"	1-1/2"
EM--16	3"	1-1/2"
EM--20	3-1/2"	2"
EM--22	3-1/2"	2"
EM--24	4"	2"
EM--30	5"	2-1/2"
EM--36	6"	3"
EM--42	7"	3-1/2"
EM--48	8"	4"



EXCEPTIONAL HOLDING POWER

SPECIFICATIONS



MAXIMUM TENSILE STRENGTH

Commercial Grade — 78,000 psi.
Heavy Duty Grade — 100,000 psi.

TYPE	INCH MM	BASIC DIMENSIONS d	b	a	c	w	STANDARD LENGTH L"						
EM — 10	mm	10	25	20	55	17	150	200	250	300			
	inch (Ref.)	3/8"	1"	3/4"	2 1/8"	5/8"	6"	8"	10"	12"			
EM — 12	mm	12	30	24	70	19	75	100	125	150	180	200	230
	inch (Ref.)	1/2"	1 3/16"	1"	2 3/4"	3/4"	3"	4"	5"	6"*	7"	8"*	9"
EM — 16	mm	16	40	32	90	24	100	150	200	250	300	360	400
	inch (Ref.)	5/8"	1 5/8"	1 1/4"	3 1/2"	.94"	4"	6"*	8"*	10"*	12"	14"*	16"
EM — 20	mm	20	50	40	100	30	150	200	250	300	360	400	460
	inch (Ref.)	3/4"	2"	1 1/2"	4"	1.2"	6"	8"*	10"*	12"*	14"*	16"	18"*
EM — 22	mm	22	55	44	115	32	180	200	250	300	360	400	
	inch (Ref.)	7/8"	2 1/8"	1 3/4"	4 1/2"	1.3"	7"	8"	10"	12"	14"	16"	
EM — 24	mm	24	60	48	135	36	250	300	360	400	460	500	600
	inch (Ref.)	1 5/16"	2 3/8"	1 7/8"	5 3/8"	1.4"	10"	12"*	14"*	16"*	18"*	20"	24"
EM — 30	mm	30	75	60	150	46	320	400	460	500	600	720	800
	inch (Ref.)	1 3/16"	3"	2 3/8"	6"	1.8"	12 1/2"*	16"	18"*	20"	24"	28"	32"
EM — 36	mm	36	90	72	180	55	400	500	600	720	800	920	
	inch (Ref.)	1 7/16"	3 1/2"	2 7/8"	7"	2.2"	16"*	20"	24"*	28"	32"	36"	
EM — 42	mm	42	105	85	260	65	500	600	720	800	920	1000	
	inch (Ref.)	1 5/8"	4 1/8"	3 3/8"	10 1/4"	2.6"	20"	24"	28"	32"	36"	40"	
EM — 48	mm	48	120	98	260	75	720	800	920	1000			
	inch (Ref.)	1 7/8"	4 3/4"	3 7/8"	10 1/4"	2.9"	28"	32"	36"	40"			

* Standard Stock Sizes

VECTOR BOLT SELECTION & GROUT USE

VECTOR BOLT SELECTION & GROUT USE

DETAIL	EM-12 .47 in.	EM-16 .63 in.	EM-20 .79 in.	EM-24 .94 in.	EM-30 1.18 in.	EM-36 1.42 in.
Min. Hole Depth (Calculated in.)	4	5	6.5	8	9.5	11.5
Failure Load (lbs.)	11,000	20,200	31,700	45,600	72,300	105,000
V-1 MACHINERY GROUT						
Recommended Hole Diameter (in.)	3	3	3.5	4	5	6
Cubic Inches Per Inch of Depth	7.1	7.1	9.7	12.6	19.7	28.3
Grout Use For Recommended Hole in Cubic Inches	33	41	73	116	215	374
V-100 EPOXY GROUT STANDARD FORMULA						
Recommended Hole Diameter (in.)	1.5	1.75	2	2.5	3.5	4
Cubic Inches Per Inch of Depth	1.8	2.4	3.2	4.9	9.6	12.6
Grout Use For Recommended Hole in Cubic Inches	8	14	24	45	105	166

Calculation Notes

1. Determine diameter of Vector Bolt to be used.
2. Add the following: machine base thickness, mount height, hole depth and thread length.
3. Select correct standard length Vector Bolt.
4. Multiply the number of holes by grout use per hole (15% safety factor is included).
5. V-1 Grout supplied in 48 lb. bags (yield = 690 cu. in.).
6. V-100 Epoxy Grout supplied in kits: 1-1/4 lb., 11 lb., 25 lb., 55 lb. (yield = 16.5 cu. in./lb.).

VECTOR BOLT MATERIAL SPECIFICATIONS

MATERIAL SPECIFICATIONS FOR VECTOR ANCHOR BOLTS

Chemical Composition:	"C"	=	0.42 to 0.50%
	"Si"	=	0.15 to 0.35%
	"Mn"	=	0.50 to 0.80%
	"P"	=	0.045% max.
	"S"	=	0.045% max.
Physical Properties: (for 5/8" to 2" Dia.)	Tensile	=	93,000 to 109,000 psi
	Yield	=	58,000 to 67,000 psi
	Elong.	=	14% to 18% within 5 D min.

Material Grade: C - 45 (German)

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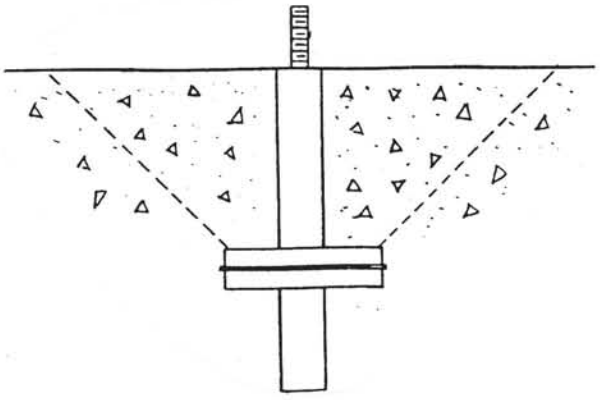
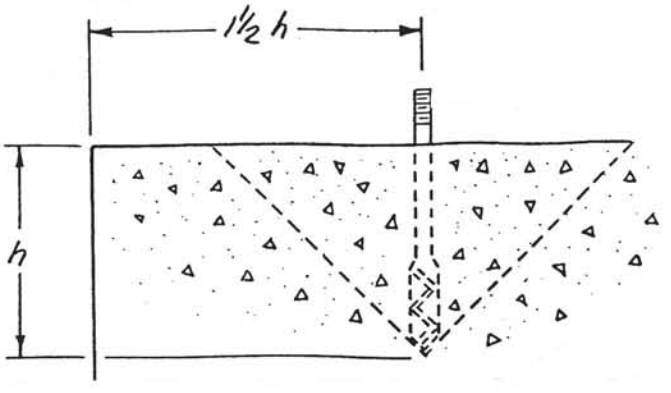


FIGURE 2 : VECTOR BOLT SHEAR CONE



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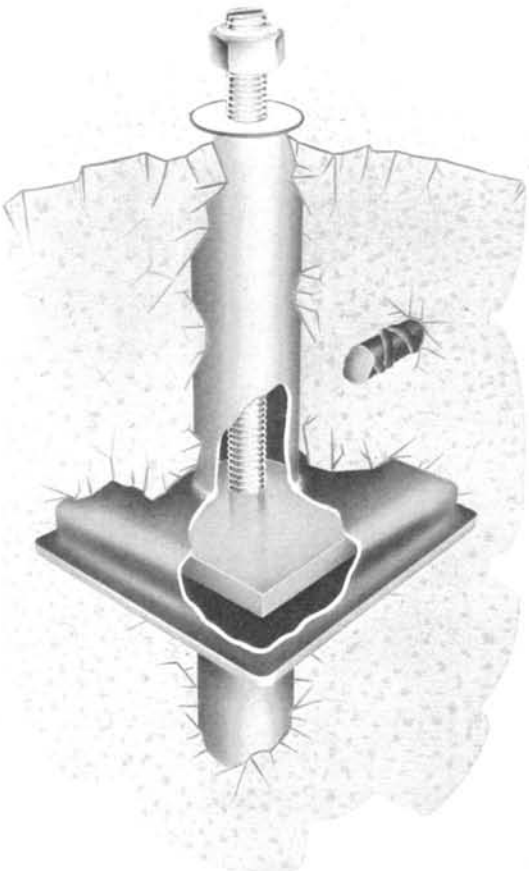
ANCHORS



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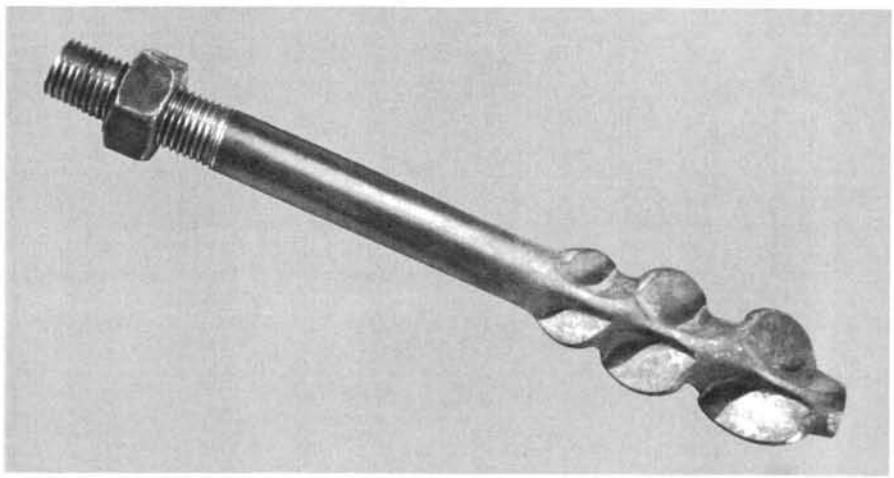
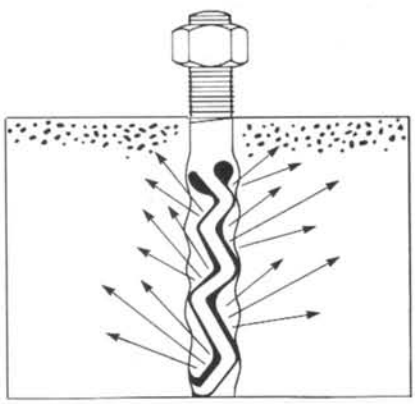
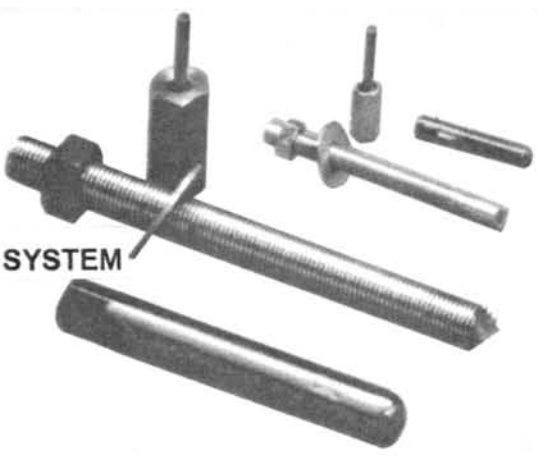


Vector Anchor Bolts





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EM16 5/8 X 14	450150
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EM20 3/4 X 12	450230
EM20 3/4 X 14	450240
EM20 3/4 X 16	450250
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EM30 1-3/16 24	450540
EM36 1-7/16 X 16	450670
EM36 1-7/16 X 24	450680

HEAVY DUTY JAKE BOLTS

DESCRIPTION	PRODUCT CODE
1/2 X 6	420400
5/8 X 6	421400
5/8 X 12	421500
3/4 X 6	422400
3/4 X 12	422500
7/8 X 6	423400
7/8 X 12	423500
1 X 6	424400
1 X 12	424500
1-1/4 X 6	426400
1-1/4 X 12	426500
1-1/2 X 6	427400
1-1/2 X 12	427500
1-3/4 X 6	428400
1-3/4 X 12	428500
2 X 6	429400
2 X 12	429500

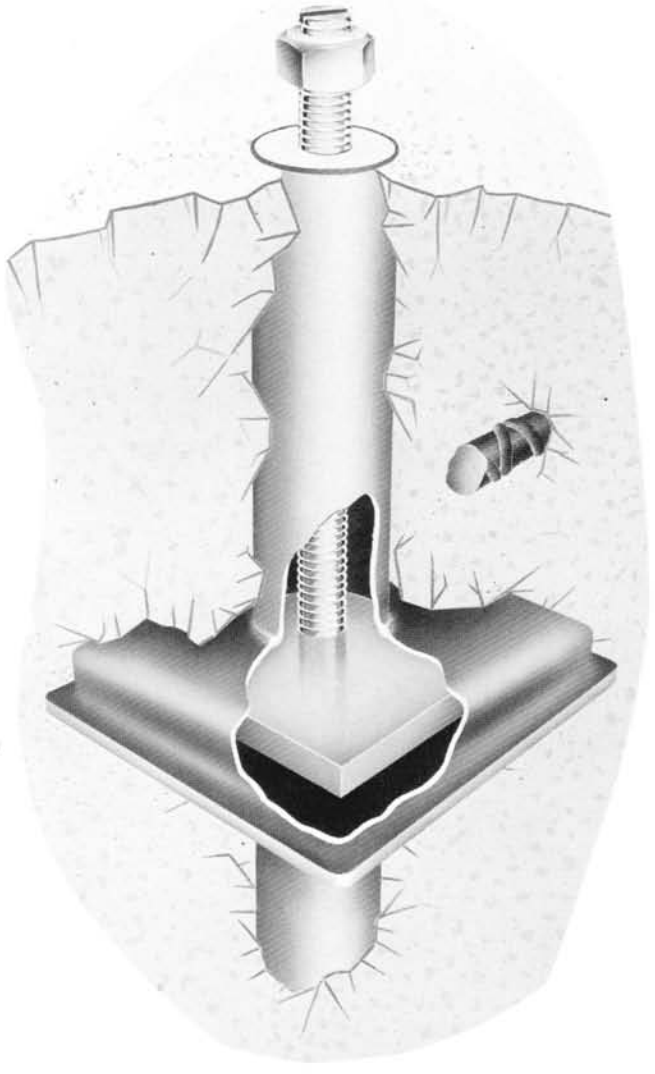
CAPSULE ANCHOR SYSTEM

DESCRIPTION	PRODUCT CODE
CAPSULES - (Sold in full pkgs only)	
C-38 10/PKG	521038
C-12 10/PKG	521012
C-58 10/PKG	521058
C-34 10/PKG	521034
C-78 10/PKG	521078
C-100 10/PKG	521100
C-114 5/PKG	521114
STUD ASSEMBLIES - (Longer studs available)	
S-38 X 5-1/8	523038
S-12 X 6-1/2	523012
S-58 X 7-5/8	523058
S-34 X 9-1/2	523034
S-78 X 10-1/4	523078
S-100 X 12	523100
S-114 X 15	523114
DRIVE UNITS - (Straight Shank Type)	
D-38	525038
D-12	525012
D-58	525058
D-34	525078
D-78	525100
D-100	525114
D-114	523114
INTERNALLY THREADED INSERTS	
3/8" I.d. x 3-1/2"	527038
1/2" I.d. x 4-1/4"	527012
5/8" I.D. x 5"	527058
3/4" I.D. x 6-5/8"	527034

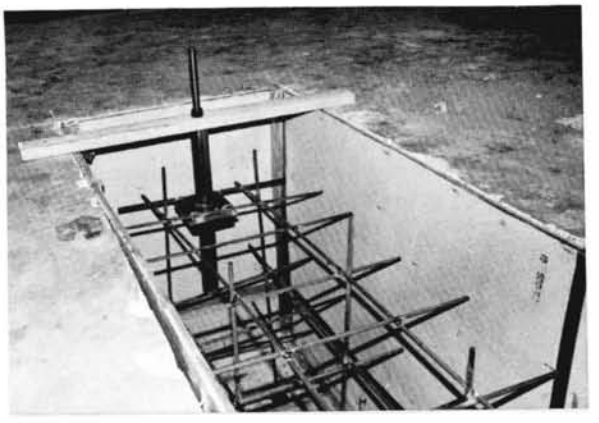
(Use with complete system)

HEAVY DUTY JAKEBOLTS™

Toughest, most durable, most advanced anchor bolts available for installation - at the time of foundation construction.



The - All Steel Jakebolt - is designed to be - cast in place- during foundation construction.



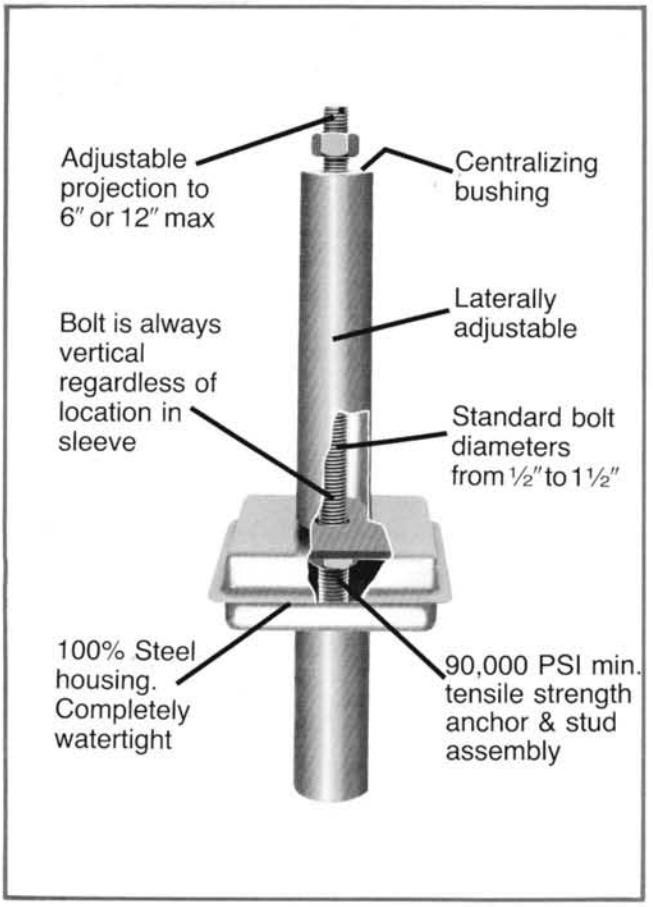
JAKEBOLT™ ANCHORS

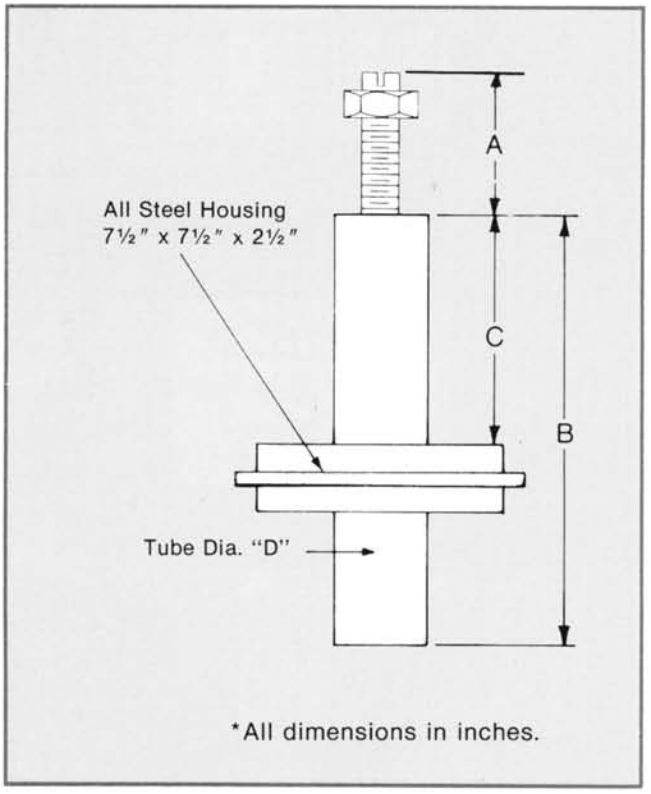
A large metalworking facility involved in the manufacturing of oil field equipment installed their machines on FIXATORS® and Heavy Duty JAKEBOLT® ANCHORS. JAKEBOLTS® are installed when the foundations are poured. This approach offered the following advantages over conventional methods:

- No expertise in grouting principles are required by the installation crew.
- The foundation does not require special preparation such as pre-cast holes and pre-wetting.
- There is no time delay to allow the grout to cure when setting machines.

Several machines have been installed successfully using this method and the company has been very satisfied with the results. Use of all-steel Heavy Duty JAKEBOLTS® with FIXATORS® has become the standard installation method for this company.

ALL STEEL JAKEBOLTS





Heavy Duty JAKEBOLTS® offer a truly cost effective way to provide strong, problem-free, high quality anchors for virtually any application. They are designed to be hung from a template or welded directly to reinforcing steel, then cast in place during new foundation construction.

Constructed entirely of steel, the Heavy Duty JAKEBOLTS® are tough, durable, MIG welded watertight to prevent contamination of internal components during installation. Each JAKEBOLT® comes supplied with a centralizing bushing which doubles as a seal and protects against contamination during grouting. JAKEBOLTS® are manufactured with retractable studs to allow a "Clear Floor" condition at any time. Anchor studs can be adjusted to project above the floor from 0 to 6″ or from 0 to 12″, depending on the bolt specified for the installation. The entire internal anchor assembly can be adjusted laterally as well as vertically to compensate for normal construction variances in both hole location and machine foot thickness.

The Heavy Duty JAKEBOLT® incorporates 90,000 psi tensile strength steel in the bolts. The all-steel anchor assembly is designed for service under the most severe conditions. Special versions of the Heavy Duty JAKEBOLT® are available

SPECIFICATIONS

Model Bolt Size	Projection Above Floor "A"	Over-All Length "B"	Top Tube Length "C"	Tube Dia. "D"	Bolt Centerline Movement
½ x 6	0-6	20	11½	2½	1¾
⅝ x 6	0-6	20	11½	2½	1½
¾ x 6	0-6	20	11½	2½	1½
⅞ x 6	0-6	20	11½	2½	1¼
1 x 6	0-6	20	11½	2½	1¼
1¼ x 6	0-6	20	11½	2½	1
1½ x 6	0-6	20	11½	2½	¾
1¾ x 6	0-6	26½	18	3½	1¾
2 x 6	0-6	26½	18	3½	1½
⅝ x 12	0-12	25¾	11½	2½	1½
¾ x 12	0-12	25¾	11½	2½	1½
⅞ x 12	0-12	25¾	11½	2½	1¼
1 x 12	0-12	25¾	11½	2½	1¼
1¼ x 12	0-12	25¾	11½	2½	1
1½ x 12	0-12	25¾	11½	2½	¾
1¾ x 12	0-12	32¼	18	3½	1¾
2 x 12	0-12	32¼	18	3½	1½

Foundation Connections. Once an adequate foundation has been established, the next task is to secure the machine to the foundation, making the machine structure and foundation integral. To achieve this, a connection of adequate rigidity must be provided. For most machine tools, a means of adjusting the relationship of the machine base to the foundation is also a prime requirement. The following approaches may be considered.

Anchor bolts and shims, *Figure* 2, offer a moderately rigid connection between machine and foundation. This approach, however, may not be adequate for high precision machinery because the large number of interfaces under load compromise the rigidity. Another drawback to this method is that precise alignments are often difficult to achieve.

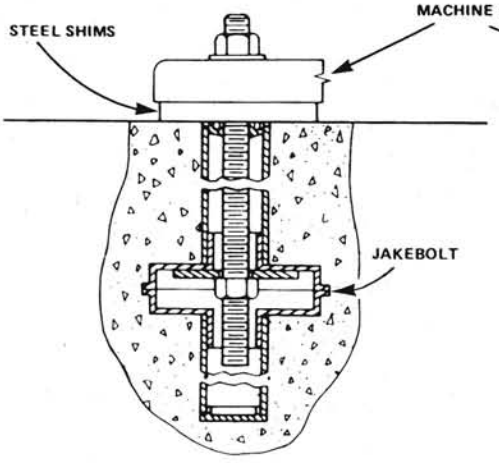
Leveling screws, *Figure* 3, permit faster adjustment than the shimming method. However, more frequent realignments are generally necessary. Also, precise alignments are difficult.

Anchor bolts in grout, *Figure* 4, provide a strong, continuous, and rigid support between a machine and its foundation. Grouting assures that the voids between the machine base and foundation surface are completely filled with a load-bearing material. A nonshrinking grout should be used to assure that critical alignments are maintained and maximum rigidity achieved.

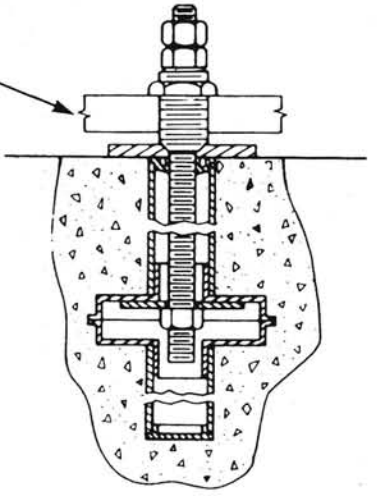
Leveling wedges, *Figure* 5, provide a firmer and stiffer support than either the shim pack or leveling screw. The most basic leveling wedge is a simple two-piece device which permits vertical adjustments by moving one wedge against the other with an adjusting screw. A more effective technique is to employ a three-piece wedge, with the third (upper) wedge member remaining stationary. With this design, horizontal motion is not transmitted to the machine as vertical adjustments are being made.

Mount systems are available which combine a three-piece wedge with a spherical seat arrangement in the upper wedge. This compensates for misalignment between the floor surface and the base of the machine. The system provides rigid support, easy adjustment, and a cost effective means of installing precision machinery.

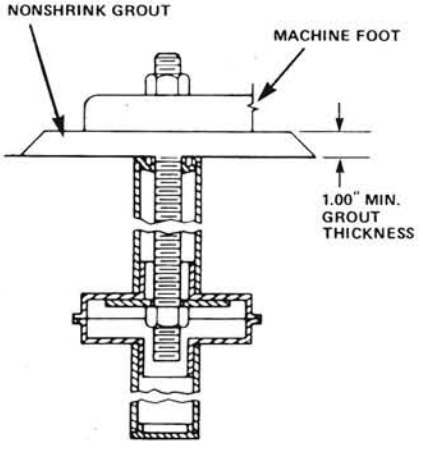
FOUNDATION CONNECTIONS



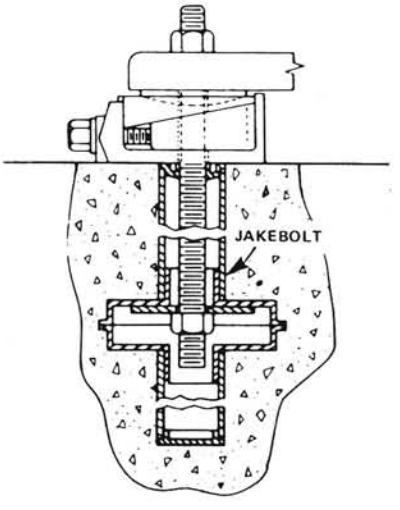
2. ANCHOR BOLTS and shims offer a moderately rigid connection between machine and foundation, but may not be adequate for precision machines.



3. LEVELING SCREWS permit faster adjustment than shimming method (Figure 2), but may require more frequent realignment.



4. BOLTS IN GROUT provide a strong, continuous, and rigid support between machine tools and their foundations.



5. LEVELING WEDGES, with adjusting screw, provide a firmer and stiffer support than shim packs (Figure 2) or leveling screws (Figure 3).

ANCHOR BOLT TECHNICAL DATA

THE ANCHOR BOLT PLAYS AN IMPORTANT PART AS PRIMARY ELEMENT IN THE MACHINE - TO - FOUNDATION CONNECTION. THE FUNCTION OF THE BOLT IS TO TRANSFER LOAD FROM THE MACHINE TOOL BASE TO THE FOUNDATION. TO DO THIS ,THE ANCHOR BOLT MUST BE FIRMLY ANCHORED INTO THE CONCRETE FOUNDATION AND CAPABLE OF SUSTAINING SIGNIFICANT TENSION LOADINGS IN THE UPWARD DIRECTION.

SINCE CONCRETE IS NOT CAPABLE OF WITHSTANDING TENSILE LOADINGS, THE ANCHOR BOLT MUST RESOLVE THE TENSILE LOAD APPLIED TO IT INTO COMPRESSION LOADING IN THE FOUNDATION.

THE **JAKEBOLT** TRANSFERS THE TENSILE LOAD IN THE UPWARD DIRECTION ON THE FOUNDATION THROUGH THE BEARING PLATE.

IN THE **VECTOR BOLT** , THE WEDGE SHAPE DESIGN ON THE BOTTOM OF THE BOLT ACCOMPLISHES THE SAME FUNCTION

WITH EITHER THE **JAKEBOLT** OR **VECTOR BOLT**, THE MEANS THROUGH WHICH CONCRETE FAILURE OCCURS INVOLVES THE SHEARING-OUT CONE SHAPED SECTION. SEE FIGURES 1 & 2.

IT CAN BE PROVEN MATHEMATICALLY THAT THE MOST IMPORTANT FACTOR IN CALCULATING LOAD ON AN ANCHOR BOLT IS THE DEPTH OF THE EMBEDMENT ONCE. THE DEPTH OF INBEDMENT IS KNOWN , IT IS POSSIBLE TO CALCULATE THE MAXIMUM LOAD WHICH MAY BE APPLIED TO AN ANCHOR BOLT.

IN PRACTICE,IT IS MORE DESIRABLE **TO HAVE THE ANCHOR BOLT FAIL BEFORE THE CONICAL SECTION IS PULLED FROM THE CONCRETE.** IN THE CASE OF THE **JAKEBOLT**,THIS FACILITATES THE REPLACEMENT OF THE STUD WITH A MINIMUM OF PROBLEMS. WITH THE **VECTOR BOLT**,THE FOUNDATION DAMAGE WILL BE LIMITED SO THAT THE BOLT CAN SIMPLY BE CORED OUT AND A NEW ONE GROUTED IN ITS PLACE.

IN ORDER TO ASSURE THAT THE BOLT FAILS FIRST , IT IS NORMAL TO DESIGN THE ANCHOR IMBEDMENT DEPTH USING A FACTOR OF 2 ON THE ALLOWABLE SHEAR-STRESS APPLIED TO THE SURFACE OF THE CONE. KNOWING THE CROSS SECTIONAL AREA OF THE BOLT AND THE ULTIMATE TENSILE STRENGTH OF THE MATERIAL FROM WHICH IT IS MADE, IT IS POSSIBLE TO CALCULATE THE LOAD AT WHICH THE BOLT WILL FAIL HIGHER TENSILE VECTOR BOLTS REQUIRE DEEPER EMBEDMENTS TO DEVELOP FULL HOLDING POWER BEFORE CONCRETE FAILURE.

THE USE OF REINFORCING STEEL IN ANY FOUNDATION , INCREASES THE FACTOR OF SAFETY AGAINST THE SHEAR CONE TYPE FAILURE AND IS HIGHLY RECOMMENDED.

ALSO,THE PLACEMENT OF THE ANCHOR BOLT SHOULD BE FAR ENOUGH AWAY FROM ANY WALLS TO PERMIT A FULL SHEAR CONE TO DEVELOP .**FAILURE TO DO THIS CAN RESULT IN SERIOUS REDUCTION OF THE ANCHOR BOLTS' HOLDING POWER. A GOOD GUIDE IS TO HAVE THE ANCHOR BOLT NO CLOSER TO THE EDGE THAN 1-1/2 TIMES THE EMBEDMENT DEPTH.**

IN THE CASE OF THE VECTOR BOLT ,THE USE OF GROUT TENDS TO INCREASE THE FACTOR OF SAFETY., SINCE GROUT IS A VERY HIGH STRENGTH MATERIAL COMPARED TO CONCRETE.THE GROUT SERVES THE FUNCTION OF SPREADING THE HIGH UNIT LOADS SEEN NEAR THE ANCHOR BOLT FLUTES OVER A MUCH LARGER AREA.

FIGURE 1 : JAKEBOLT SHEAR CONE

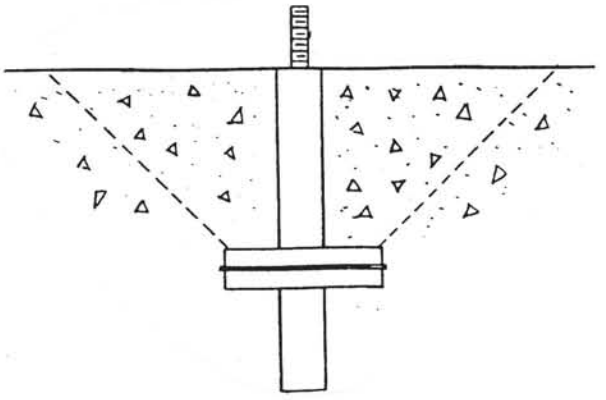
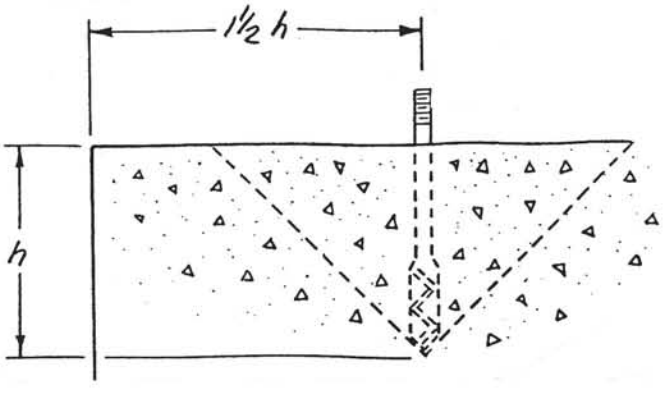


FIGURE 2 : VECTOR BOLT SHEAR CONE



ANCHOR BOLT TECHNICAL DATA

HEAVY DUTY JAKEBOLTS : MATERIAL 90,000 PSI

MINIMUM EMBEDMENT AND FAILURE LOAD FOR - JAKEBOLTS *

NOMINAL SIZE	FAILURE LOAD LBS.	CALCULATED MINIMUM DEPTH	RECOMMENDED MINIMUM DEPTH
1/2"	13,500	4.0 "	4.5 "
5/8"	22,000	4.0 "	5.0 "
3/4"	32,000	4.5 "	5.5 "
7/8"	44,600	5.5 "	6.5 "
1"	58,000	6.5 "	8.0 "
1-1/4"	90,800	8.0 "	9.5 "
1-1/2"	130,000	10.0 "	11.5 "

* = JAKEBOLTS - 90,000 PSI TENSILE

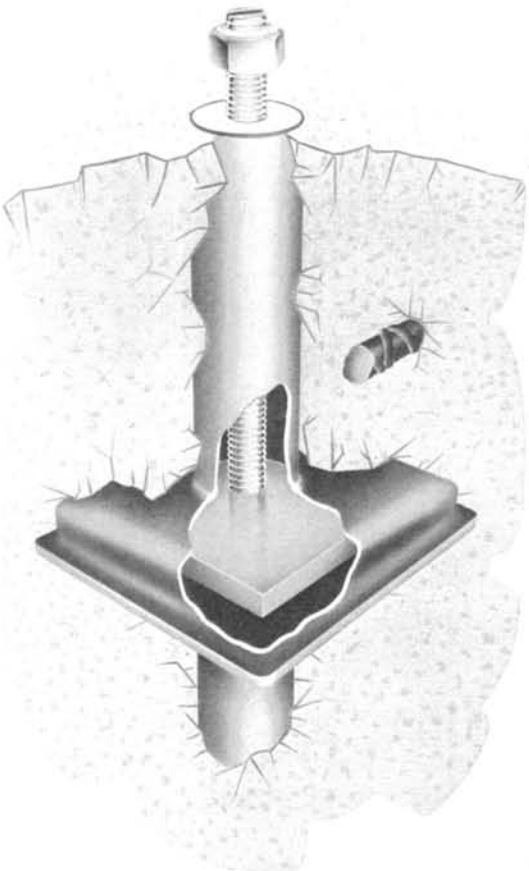
VECTOR BOLTS : MATERIAL 78,000 PSI

MINIMUM EMBEDMENT AND FAILURE LOAD FOR - VECTOR BOLTS **

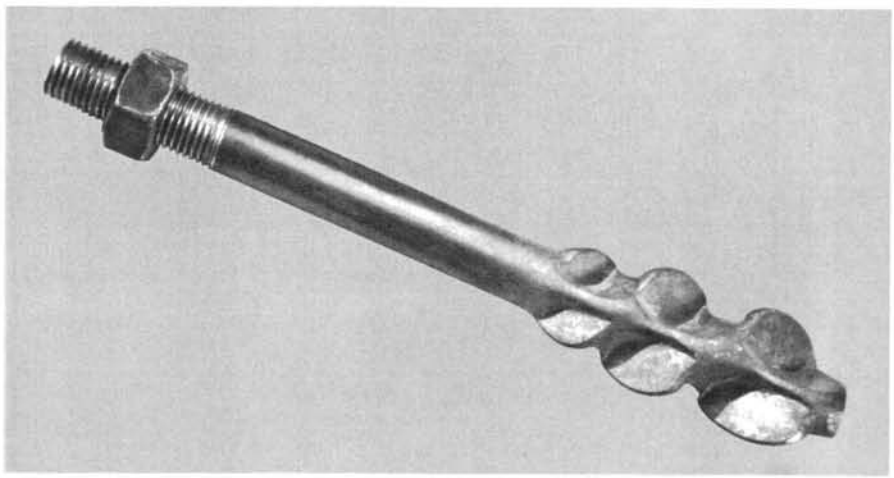
NOMINAL SIZE	FAILURE LOAD LBS.	CALCULATED MINIMUM DEPTH	RECOMMENDED MINIMUM DEPTH
12 MM	11,000	4.0 "	5.0 "
16 MM	20,200	5.0 "	6.0 "
20 MM	31,700	6.5 "	7.5 "
24 MM	45,600	8.0 "	9.0 "
30 MM	72,300	9.5 "	11.0 "
36 MM	105,000	11.5 "	13.5 "

** = VECTOR BOLTS - 78,000 PSI TENSILE

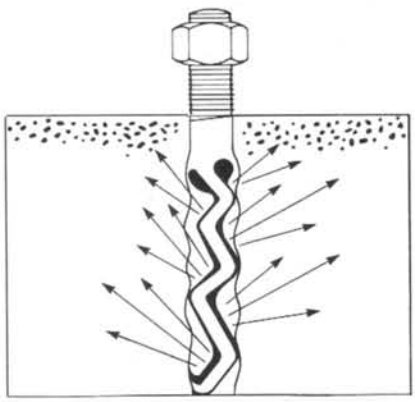
ANCHORS

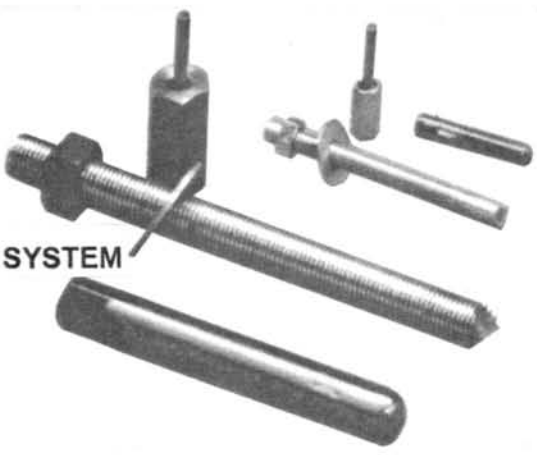


The Heavy Duty Jakebolt is designed to be cast in place during foundation construction.



Vector Anchor Bolts





UNISORB CAPSULE ANCHOR SYSTEM

PRODUCT CODES

VECTOR BOLTS

DESCRIPTION	PRODUCT CODE
EM12 1/2 X 6	450030
EM12 1/2 X 8	450050
EM16 5/8 X 6	450140
EM16 5/8 X 8	450120
EM16 5/8 X 10	450130
EM16 5/8 X 12	450160
EM16 5/8 X 14	450150
EM20 3/4 X 8	450210
EM20 3/4 X 10	450220
EM20 3/4 X 12	450230
EM20 3/4 X 14	450240
EM20 3/4 X 16	450250
EM20 3/4 X 18	450260
EM24 15/16 X 12	450410
EM24 15/16 X 14	450420
EM24 15/16 X 16	450440
EM24 15/16 X 18	450430
EM30 1-3/16 12	450510
EM30 1-3/16 14	450530
EM30 1-3/16 18	450520
EM30 1-3/16 24	450540
EM36 1-7/16 X 16	450670
EM36 1-7/16 X 24	450680

HEAVY DUTY JAKE BOLTS

DESCRIPTION	PRODUCT CODE
1/2 X 6	420400
5/8 X 6	421400
5/8 X 12	421500
3/4 X 6	422400
3/4 X 12	422500
7/8 X 6	423400
7/8 X 12	423500
1 X 6	424400
1 X 12	424500
1-1/4 X 6	426400
1-1/4 X 12	426500
1-1/2 X 6	427400
1-1/2 X 12	427500
1-3/4 X 6	428400
1-3/4 X 12	428500
2 X 6	429400
2 X 12	429500

CAPSULE ANCHOR SYSTEM

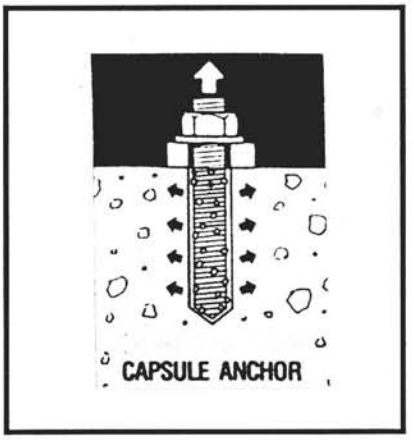
DESCRIPTION	PRODUCT CODE
CAPSULES - (Sold in full pkgs only)	
C-38 10/PKG	521038
C-12 10/PKG	521012
C-58 10/PKG	521058
C-34 10/PKG	521034
C-78 10/PKG	521078
C-100 10/PKG	521100
C-114 5/PKG	521114
STUD ASSEMBLIES - (Longer studs available)	
S-38 X 5-1/8	523038
S-12 X 6-1/2	523012
S-58 X 7-5/8	523058
S-34 X 9-1/2	523034
S-78 X 10-1/4	523078
S-100 X 12	523100
S-114 X 15	523114
DRIVE UNITS - (Straight Shank Type)	
D-38	525038
D-12	525012
D-58	525058
D-34	525078
D-78	525100
D-100	525114
D-114	523114
INTERNALLY THREADED INSERTS	
3/8" I.d. x 3-1/2"	527038
1/2" I.d. x 4-1/4"	527012
5/8" I.D. x 5"	527058
3/4" I.D. x 6-5/8"	527034

(Use with complete system)

CAPSULE ANCHOR SYSTEM

THE CAPSULE ANCHOR is a non-expanding chemical anchor that achieves greater load bearing capabilities and allows more versatility than conventional mechanical anchors.

CONVENTIONAL EXPANSION ANCHOR

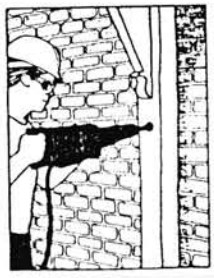


CAPSULE ANCHOR

CAPSULE ANCHOR SYSTEM

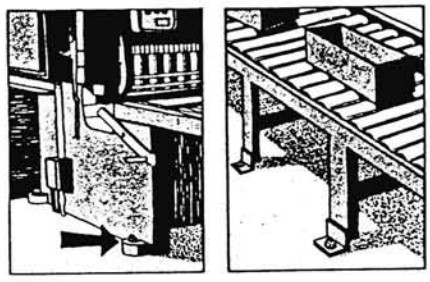
CAPSULE ANCHORS OFFER THESE UNIQUE ADVANTAGES :

NO EXPANSION STRESS PLACED ON CONSTRUCTION MATERIALS



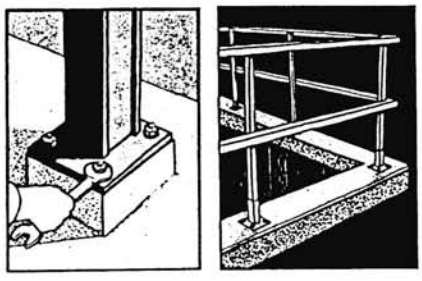
Driving the stud breaks the capsule, and the resultant chemical interaction between the resin,agregate,crushed glass,and the hardener forms a thick synthetic mortar which bonds the stud to the material - even lightweight block.

CAN BE USED FOR DYNAMIC LOADS



Chemical bonding,unlike expansion fastening , will not "work loose" under shock or vibration conditions.

MINIMAL CENTER-TO-CENTER TO-EDGE DISTANCE



Because no expansion stress is placed on the concrete,the capsule anchor can be set much closer to the edges than mechanical anchors.

CAN BE SET IN MOST WEATHER CONDITIONS

The polyester resin is practically unaffected by water or corrosives and actually seals the stud from the elements.

Stainless steel studding is available for corrosive environment and under water applications.

EXTREMELY HIGH PULL-OUT LOADS

The components are thoroughly mixed during installation to form a complete bond between the stud and hole - along the entire length of the hole.

CORRECT DOSAGE OF COMPONENTS ASSURED

Unlike grouts or epoxies,the capsule anchor's aggregate,resin and hardener are pre-measured and then sealed.

This prevents jobsite mixing errors and thus provide greater dependability.

CAPSULE ANCHOR SYSTEM

APPLICATIONS OF CAPSULE ANCHOR SYSTEM

- Air Conditioners
- Conveyors
- Grinders
- Jib Cranes
- Motors
- Printing Presses
- Refrigeration Equipment
- Compressors
- Crane Rails
- Hand Rails
- Machine Tools
- Presses
- Pumps
- Robots

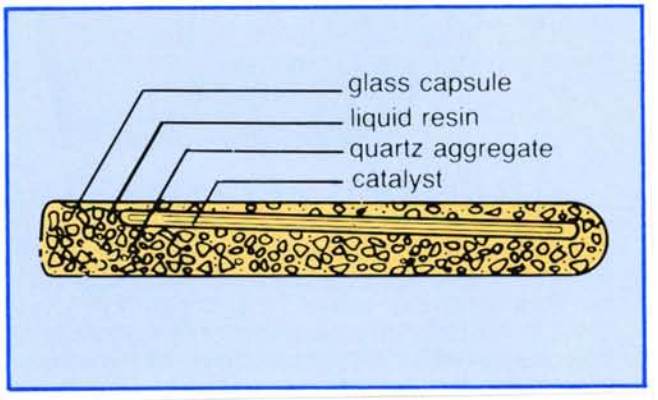
The CAPSULE ANCHOR SYSTEM is a new method of heavy duty anchoring using a high strength urethane adhesive to retain a threaded rod and other materials such as re-bar, in concrete or other masonry material. The system consists of a glass capsule containing the proper proportion of base resin, hardener and aggregate for the anchor. An appropriate length stud with washer and nut and an adapter/driver to allow the stud to be inserted into a standard hammer drill, are also included.

To install the anchor a clearance hole is prepared and a capsule is inserted. The stud is driven into the hole with a standard rotary hammer drill using the driver adapter included in the capsule kit. This action breaks the glass capsule and mixes the pre-measured components. At room temperature the anchor nuts may be torqued down within approximately 30 minutes.

Extensive testing and field trials have proven the UNISORB® CAPSULE ANCHOR SYSTEM to be one of the most dependable anchor systems available, far superior to expansion type anchoring systems. The CAPSULES may be used in wet or damp locations including under water and can be used horizontally or overhead without special measures to retain the capsule contents.

In addition to general purpose construction applications and installation of machinery, the anchor system is also commonly used in tough-to-hold applications, such as installation of dock bumpers and doweling of concrete.

UNISORB® CAPSULE ANCHOR SYSTEMS offer tremendous holding power which is stronger than the concrete itself. A graded blend of quartz aggregate transfers the pullout forces into the concrete. Since there are no expansive forces from the anchor systems, they can be placed near the foundation edges, chip troughs, coolant trenches or wireways. High anchor-to-concrete strengths are developed which allow smaller anchor holes and smaller studs to be used than is possible with conventional expanding anchor type systems.



CAPSULE ANCHOR SYSTEM

ANCHOR SIZE	CAPSULE NUMBER	DRILL DIAMETER	HOLE* DEPTH	ANCHOR NO. AND LENGTH	ULTIMATE TENSILE LOAD†	ULTIMATE SHEAR LOAD†
3/8	C-38	7/16	3½	S-38 x 5⅛	6,580 lbs.	4,063 lbs.
½	C-12	9/16	4¼	S-12 x 6½	12,015 lbs.	6,815 lbs.
5/8	C-58	¾	5	S-58 x 7⅝	18,117 lbs.	11,988 lbs.
¾	C-34	⅞	6⅝	S-34 x 10¼	26,425 lbs.	17,000 lbs.
⅞	C-78	1	6⅝	S-78 x 10¼	33,200 lbs.	25,400 lbs.
1	C-100	1¼	8¼	S-100 x 12	40,213 lbs.	29,900 lbs.
1¼	C-114	1½	10¼	S-114 x 15	70,467 lbs.	49,133 lbs.

All dimensions in inches.

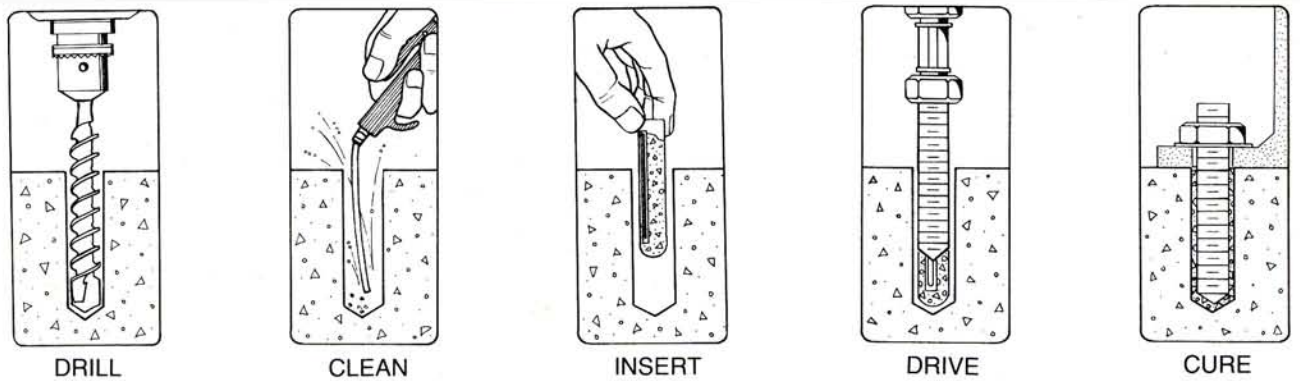
†ULTIMATE TENSILE LOAD TEST DATA

Test results using 4,000 PSI concrete are given as a guide only. It is recommended that tests to simulate actual conditions be carried out to determine the suitability of Capsule Anchors for particular applications.

MINIMUM CURE TIME

CONCRETE TEMPERATURE	CURE TIME
Over 68°F (20°C)	10 Min.
50° to 68°F (10° to 20°C)	20 Min.
32° to 50°F (0° to 10°C)	1 Hour
23° to 32°F (−5° to 0°C)	5 Hours

INSTALLATION



1. Drill a clearance hole for the stud using a rotary hammer drill. The chart below shows the proper diameter and depth for each anchor size. If using high tensile strength studs, it will be necessary to drill deeper to develop the necessary holding strength. Also, deeper holes should be drilled when they are located near the foundation edge, chip troughs or have extremely close spacing.
2. Thoroughly clean the holes. For best results blow out the concrete dust using compressed air. Excessive dust will reduce the adhesive qualities of the anchor.
3. Insert the capsule anchor. Two or more may be used when deeper holes are encountered.
4. Assemble the drive unit into the hammer drill and stud. Drive the pointed end of the stud into the adhesive capsule anchor. This action will break the glass tube and completely mix all components. Turn the drill off immediately when the stud is completely inserted.
5. Remove the driver with a wrench, being careful not to disturb the anchor during the initial set. Allow the anchor to set undisturbed during the minimum cure time. The anchor is now ready for use.

SEE HAMMER DRILL SECTION FOR DRILLS AND BIT SELECTION

CAPSULE ANCHOR SYSTEM

UNISORB CAPSULE ANCHOR SYSTEM

PULL-OUT STRENGTH AND TORQUE VALUES

The Unisorb Capsule Anchor System provides quick, easy and high strength anchoring for equipment, machine tool and construction applications at a low cost and with short down time. Attached are tables with important capsule anchor data.

Allowable Torque Calculations

$T_{allowed} = K F_{ult} d$

Where $T_{allowed}$ = Allowable torque in ft-lbs

F_{ult} = Pull out strength in lbs.

d = Anchor bolt diameter in ft.

K = Torque coefficient

A generally accepted value of K for lubricated threaded fasteners is 0.20.

For these calculations a safety factor of 2 will be used, therefore, we have:

$$T_{allowed} = \frac{0.20\ F_{ult}\ d}{2}$$

Sample Calculation

For 1/2" fasteners using pull-out strength from attached table:

$$T_{allowed} = \frac{0.20\ (12{,}015\ \text{lbs.})(1/2")\ \frac{1\ \text{ft.}}{12\ \text{ft.}}}{2}$$

$$T_{allowed} = 50.1\ \text{ft.-lbs.}$$

SPECIFICATIONS

UNISORB CAPSULE ANCHOR SYSTEM

DIAMETER INCHES	MODEL NO	HOLE DEPTH INCHES	• MAXIMUM ALLOWED TORQUE ON NUT FT-LB	RECOMMENDED TORQUE ON NUT FT-LB
3/8	C-38	3-1/2	22	15
1/2	C-12	4-1/4	42	30
5/8	C-58	5	91	65
3/4	C-34	6-5/8	157	110
7/8	C-78	7	280	185
1	C-100	8-1/4	441	300
1-1/4	C-114	10-1/4	617	425

• BASED ON SAFETY FACTOR OF TWO USING LUBRICATED THREADED FASTENERS. FOR NON-LUBRICATED FASTENERS, ALLOWABLE TORQUE INCREASES SUBSTANTIALLY.

STUD	ULTIMATE LOAD TENSILE LBS	ULTIMATE LOAD SHEAR LBS	RECOMMENDED SAFE WORKING LOAD TENSILE LBS
3/8	6,580	4,063	1,120 TO 1,460
1/2	12,015	6,815	1,890 TO 2,480
5/8	18,117	11,988	3,105 TO 4,070
3/4	26,425	17,000	5,010 TO 6,550
7/8	33,200	25,400	5,750 TO 7,540
1	40,213	29,900	7,490 TO 9,810
1-1/4	70,467	49,133	11,310 TO 14,810

CAPSULE ANCHOR SYSTEM

SPECIFICATIONS * / STUD ASSEMBLIES

CAPSULE #	C-38	C-12	C-58	C-34	C-78	C-100	C-114
STUD DIAMETER	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"
THREAD SIZE	3/8 - 16	1/2 - 13	5/8 - 11	3/4 - 10	7/8 - 9	1 - 8	1-1/4 - 7
ROD LENGTH	5"	6-1/4"	7-1/2"	10-1/4"	10-1/4"	11-3/4"	14-1/8"
DRILL SIZE	7/16"	9/16"	11/16"	7/8"	1"	1-1/4"	1-1/2"
HOLE DEPTH	3-1/2"	4-1/4"	5"	6-5/8"	7"	8-1/4"	10-1/4"
MORTAR VOLUME REQUIRED PER INCH EMBEDMENT	.085	.110	.230	.285	.335	.650	.820
TIGHTENING TORQUE FT - LBS	10	25	45	80	120	165	365
MAXIMUM TORQUE FT - LBS	20	50	90	160	200	300	600

* SPECIFICATIONS OF SAE J429 - GRADE 2 ALL THREADED STUDS IN 4000 PSI CONCRETE

SPECIFICATIONS / CAPSULES

CAPSULE #	C-38	C-12	C-58	C-34	C-78	C-100	C-114
CAPSULE DIAMETER	.430"	.500"	.665"	.850"	.850"	1.000"	1.310"
CAPSULE LENGTH	3 - 3/8"	3 - 3/4"	3 - 3/4"	4 - 5/8"	6 - 1/4"	8 - 1/4"	9 - 3/4"
MORTAR VOLUME CUBIC INCHES	0.37	0.55	0.90	2.07	3.20	6.53	12.20

SPECIFICATIONS / REINFORCING BAR *

REBAR SIZE	DRILL SIZE	HOLE DEPTH	CAPSULE	MORTAR VOLUME REQUIRED PER INCH EMBEDMENT
#3 (3/8)	1/2'	3-1/2"	C-38	.106 CUBIC INCHES
#4 (1/2)	5/8"	4-1/2"	C-12	.137 CUBIC INCHES
#5 (5/8)	3/4'	5"	C-58	.169 CUBIC INCHES
#6 (3/4)	7/8"	6"	C-34	.212 CUBIC INCHES
#7 (7/8)	1"	7"	C-34	.243 CUBIC INCHES
#8 (1)	1-1/8"	8"	C-78	.280 CUBIC INCHES
#9 (1-1/8)	1-3/8"	9"	C-100	.578 CUBIC INCHES
#10 (1-1/4)	1-1/2"	10"	C-100	.599 CUBIC INCHES
#11 (1-3/8)	1-3/4"	11"	C-114	.956 CUBIC INCHES

* MINIMUM YIELD STRENGTH OF GRADE #60 REBAR
IN 4000 PSI NORMAL WEIGH COMPRESSIVE STRENGTH CONCRETE

SPECIFICATIONS / SMOOTH ROUND BAR *

BAR DIAMETER	DRILL SIZE	HOLE DEPTH	CAPSULE	MORTAR VOLUME REQUIRED PER INCH EMBEDMENT
3/8"	7/16'	4"	C-38	.060 CUBIC INCHES
1/2"	9/16"	5"	C-12	.074 CUBIC INCHES
5/8"	11/16"	6"	C-58	.173 CUBIC INCHES
3/4"	7/8"	7"	C-34	.208 CUBIC INCHES
7/8"	1"	8"	C-34	.239 CUBIC INCHES
1"	1-1/8"	9"	C-78	.285 CUBIC INCHES
1-1/4"	1-1/2"	10-1/2"	C-100	.643 CUBIC INCHES
1-1/2"	1-3/4"	12-1/2"	C-114	.756 CUBIC INCHES

* MINIMUM TENSILE STRENGTH OF LOW CARBON STEEL BAR (ASTM A307)
IN 4000 PSI NORMAL WEIGH COMPRESSIVE STRENGTH CONCRETE

SPECIFICATIONS / COIL ROD *

COIL ROD SIZE	DRILL SIZE	HOLE DEPTH	CAPSULE	MORTAR VOLUME REQUIRED PER INCH EMBEDMENT
1/2"	9/16"	4-1/4"	C-12	.132 CUBIC INCH
3/4"	7/8"	6-1/2"	C-34	.344 CUBIC INCH
1"	1-1/8"	10"	C-100	.530 CUBIC INCH
1-1/4"	1-3/8"	12"	C-114	.663 CUBIC INCH

* COIL ROD / CONTINUOUS THREADED LAG STUD/FORMING ROD -MIN YIELD 90 KSI TENSILE
IN 4000 PSI NORMAL WEIGH COMPRESSIVE STRENGTH CONCRETE

CAPSULE ANCHOR SYSTEM

ENGINEERING - LOADING DATA SHEET

CAPSULE #	C-38	C-12	C-58	C-34	C-78	C-100	C-114
STUD DIAMETER	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"
HOLE DIAMETER	7/16"	9/16"	11/16"	7/8"	1"	1-1/4"	1-1-/2"
HOLE DEPTH = MINIMUM EMBEDMENT	3-1/2"	4-1/4"	5"	6-5/8"	7"	8-1/4"	10-1/4"
BMT MIN BASE MATERIAL THICKNESS	5-1/2"	6-1/4"	7-1/8"	8-1/2"	9"	10-1/2"	12-1/2"
ANCHOR LENGTH	5"	6-1/4"	7-1/2"	10-1/4"	10-1/4"	11-3/4"	14-1/8"
MAXIMUM FASTENED THICKNESS	1"	1-1/2"	1-3/4"	2-3/4"	2-1/4"	2-1/2"	2-1/2"
MIN. - MAX TORQUE FOOT POUNDS	10-20	25-50	45-90	80-160	120-200	165-300	365-600
ULTIMATE TENSION CARRYING LOAD IN POUNDS (NOTE #4)	5,735	10,500	16,724	24,716	27,720	36,360	58,140
ULTIMATE SHEAR CARRYING LOAD IN POUNDS (NOTE #5)	3,441	6,300	10,034	14,829	16,632	21,816	34,884
C=SPACING REQUIRED TO OBTAIN MAX WORKING LOAD (TENSION OR SHEAR)	3"	4"	5"	6"	7"	8"	10"
C MIN = MINIMUM ALLOWABLE SPACING BETWEEN ANCHORS (#1)	1-1/2'	2"	2-1/2"	3"	3-1/2"	4"	5"
E=EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD (TENSION OR SHEAR)	4-1/2"	6"	7-1/2"	9"	10"	12"	15"
E MIN = MIN ALLOWABLE EGDE DISTANCE (#2 &#3) (TENSION OR SHEAR)	1-1/2'	2"	2-1/2"	3"	3-1/2"	4"	5"

#1 WHEN USING C MINIMUM, REDUCE THE WORKING LOAD 30%

#2 WHEN USING E MINIMUM AND THE LOAD IS DIRECTED TOWARD THE EDGE, REDUCE THE WORKING LOAD 50%

#3 WHEN USING E MIMIMUM AND THE LOAD IS NOT DIRECTED TOWARDS THE EDGE, REDUCE WORKING LOAD 40%

#4 LOAD VALUES BASED ON MIN TENSILE STRENGTH OF SAE J429 GRADE 2 THREAD STEEL BARS.

#5 LOAD VALUES BASED ON MIN SHEAR STRENGTHS OF SAE J429 GRADE 2 THREADED STEEL BARS (60% OF TENSILE VALUES)

(CALCULATIONS BASED ON THREAD TENSILE STRESS AREA)

CAPSULE ANCHOR SYSTEM
INSTALLATION INSTRUCTIONS FOR SHALLOW EMBEDMENT

When encountering capsule anchor applications with less than standard embedment, please refer to the following in addition to the standard instructions:

1. Shallow embedment is allowable only in floor applications. It is not to be used in wall or ceiling applications.
2. Evaluate the strength of the top surface of the concrete. This is the most likely element to fail.
3. Use only the capsule indicated for anchor size. The contents of the capsule must be contained in the hole prior to mixing.
4. Place mark on the stud indicating the minimum embedment. This will be a visual indicator to assure that the stud is fully driven into the hole.
5. Ultimate loads of SAE Grade 2 studs in 4000 PSI concrete are shown below for information only. In all cases, tests should be performed, simulating the exact conditions of the installation.

FOR FURTHER INFORMATION: CONTACT ACORN TOLL-FREE AT 1-800-523-5474

ANCHOR SIZE	CAPSULE NUMBER	DRILL DIAMETER	MINIMUM EMBEDMENT	ULTIMATE* TENSILE	ULTIMATE* SHEAR
3/8	C-38	7/16	2"	2,860 lbs.	3,020 lbs.
1/2	C-12	9/16	2-1/4"	5,250 lbs.	5,540 lbs.
5/8	C-58	3/4	2-1/2"	8,360 lbs.	8,820 lbs.
3/4	C-34	7/8	3-1/2"	12,400 lbs.	13,000 lbs.
7/8	C-78	1	3-3/4"	13,900 lbs.	14,600 lbs.
1	C-100	1-1/4	4-1/4"	18,200 lbs.	19,200 lbs.
1-1/4	C-125	1-1/2	5-1/4"	29,100 lbs.	30,700 lbs.

*Use safety factor to obtain working load (4:1 or 5:1 is typical)

CAPSULE ANCHOR SYSTEM

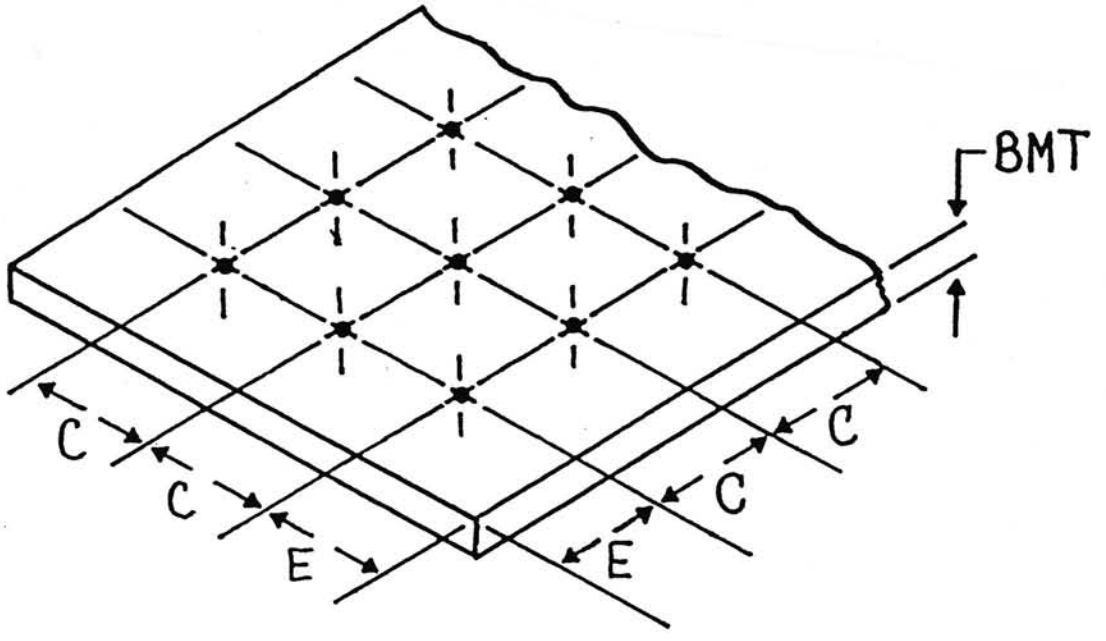
GENERAL DESIGN NOTES:

All factoring of Engineering data to be completed before applying factors of safety for safe working load.

Load factors are cumulative.

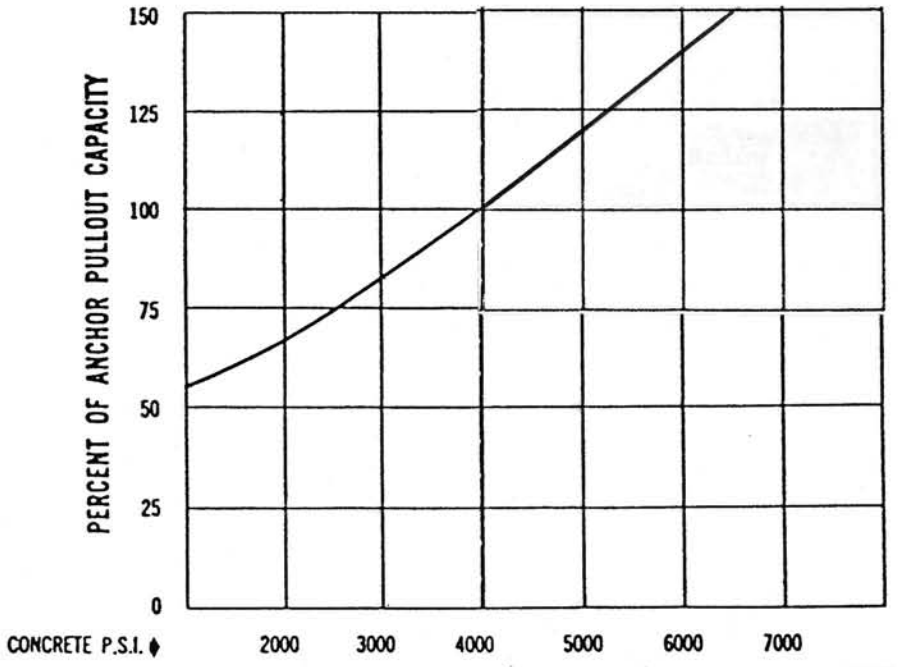
Linear interpolation between minimum/maximum values may be performed.

General industry practice for static loads is to use a safety factor of 4:1 to obtain working loads.



DISTANCE BETWEEN ANCHOR (C) AND DISTANCE FROM EDGE (E)

PULLOUT STRENGTH VS. CONCRETE P.S.I.



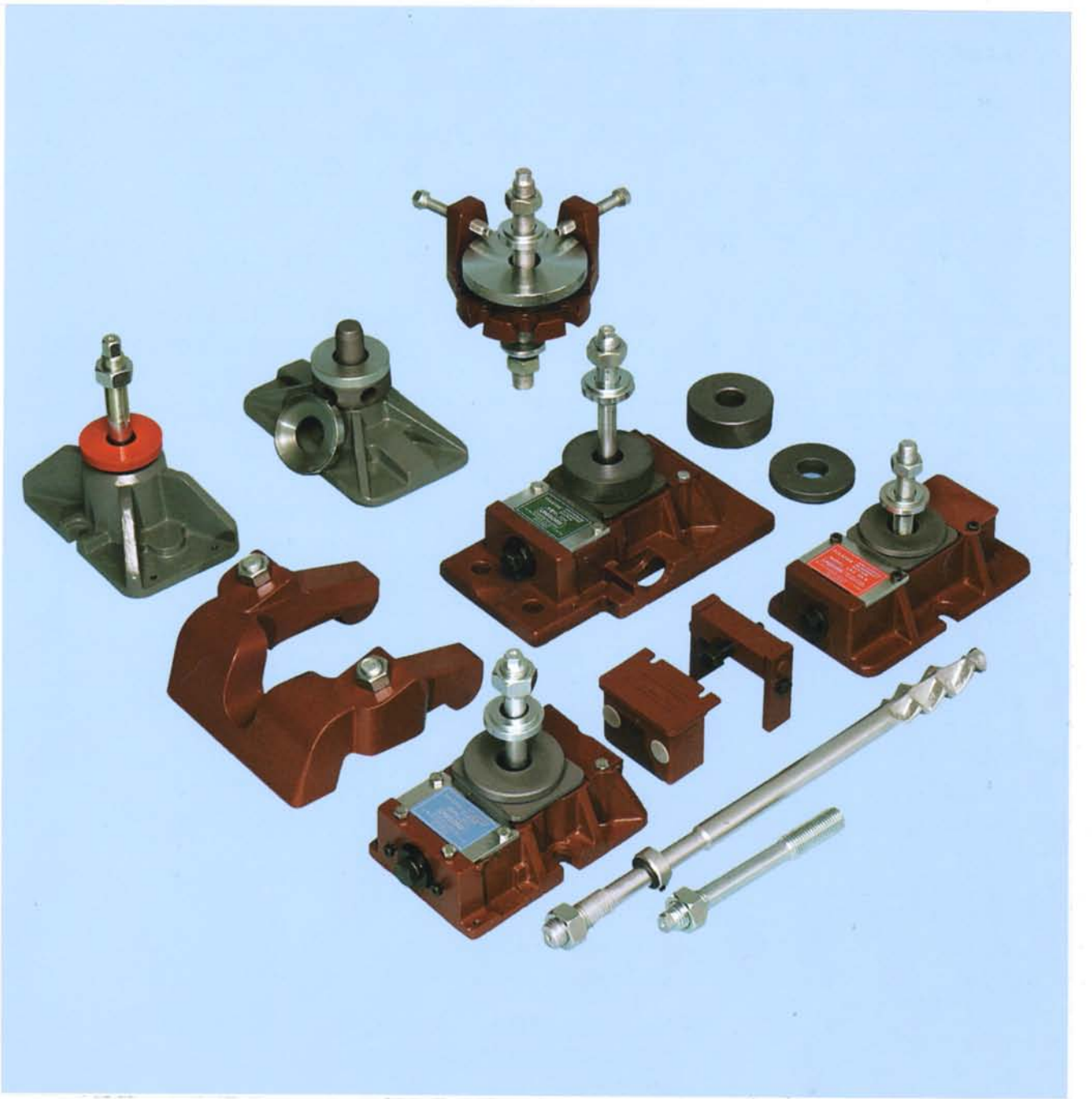
NOTE: This graph is only applicable for stone aggregate.

EXAMPLE: 1/2" diameter Anchor in 3,000 P.S.I. concrete at minimum embedment:

Pullout value	10,500 lbs.
% from graph	x 82%
Pullout strength in 3,000 P.S.I. concrete	8,610 lbs.

In stronger concrete (greater P.S.I.), anchor pullout strength may be increased if anchor rod material strengths are increased, as long as the weaker of the two elements is used for factoring a safe working load.

FIXATOR® SYSTEMS



RK FIXATOR® INTRODUCTION

INTRODUCTION

This UNISORB® FIXATOR® publication presents detailed performance and product selection data covering the FIXATOR® models and sizes available for precision alignment of support critical machinery. Among the Data included are detailed specifications, pictorial representations of available optional accessories, installation instructions and standard drawings illustrating various FIXATOR® application configurations. It is our intent to provide you with sufficient information for you to have a complete understanding of the particular FIXATOR® SYSTEM recommended by UNISORB®'s Engineers.

UNISORB® FIXATOR® SYSTEMS have been carefully designed to provide optimum performance and ease of installation, even in the most demanding of circumstances.

The UNISORB® engineering staff and field representatives are readily available to provide design and on-site assistance with your projects to assure that maximum product performance is achieved.

In any machinery installation, the question must be asked "is this machine support critical?" In other words, does it require support from its foundation to maintain critical alignments between machine elements? A few examples of machines that typically fall within this category are long bed lathes (over 48"), long bed grinders (over 48"), large horizontal boring mills, etc. Some helpful criteria may include any machine with rapid changes in load caused by motion of any element, machines which are equipped with leveling devices by the builder, most machines working with parts over 50 lbs. in weight, and any machine whose installation instructions call for alignment at installation.

The UNISORB® RK FIXATOR® SYSTEM is the finest anchoring/alignment product in the world. It makes support critical machinery installations fast and simple. Each application is engineered by UNISORB®'s Engineers to assure successful implementation and results.

Not only are anchoring/alignment installations fast and easy, but realignments can be achieved without loosening the anchor nut, and can be done whenever necessary. Unlike conventional leveling methods that require repeated trial and error jacking and tightening during machine installation, the RK FIXATOR® SYSTEM permits alignment adjustments to be made after anchor nuts are tight. The only tool required to adjust the FIXATOR® is a small hand wrench.

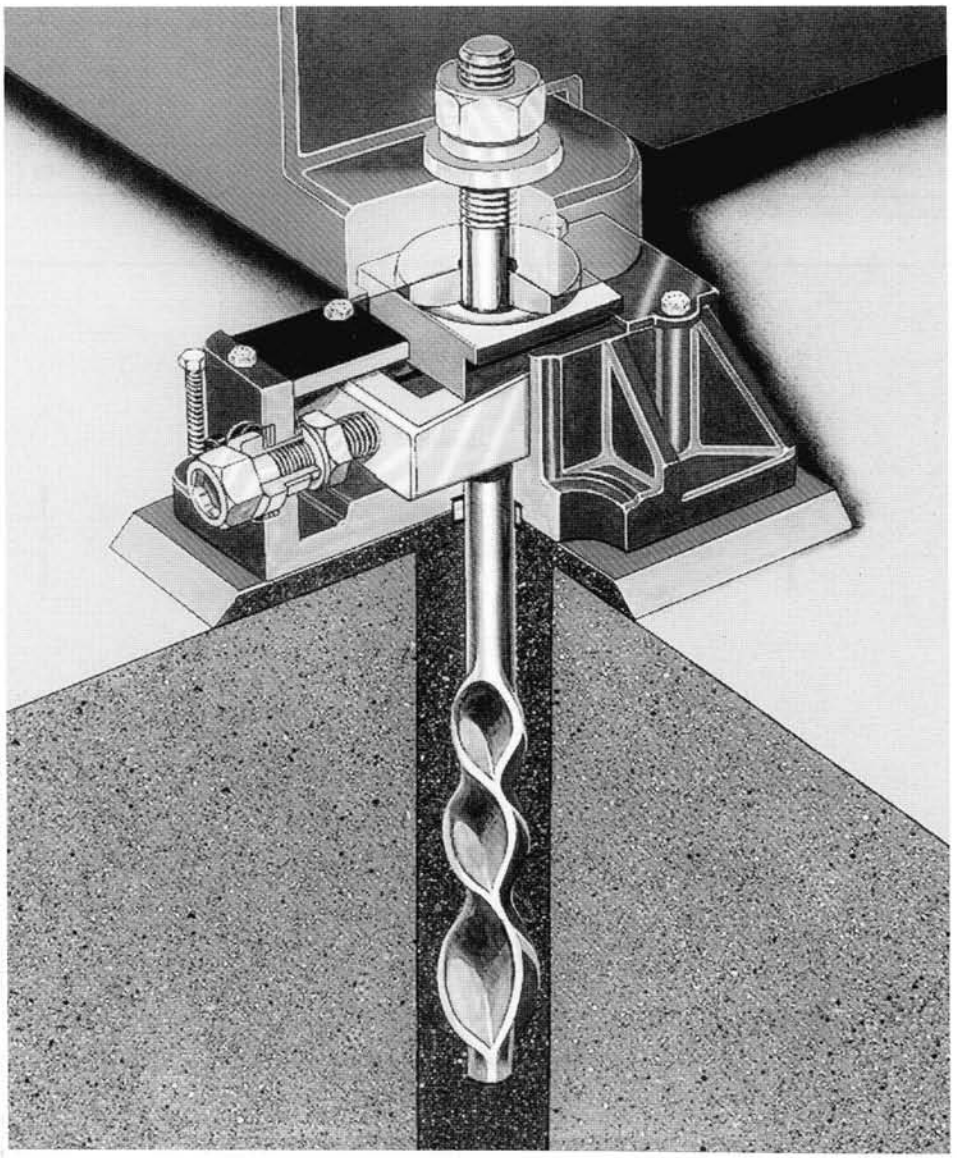
The patented RK FIXATOR® SYSTEM levels and aligns machinery to tenths (.0001") tolerances. Finely machined Molykoted surfaces, limited backlash and high mechanical advantage make it possible to vary height adjustments at anytime, even under maximum loads. The time-consuming work and production losses usually associated with aligning are eliminated. Machines remain in service, and machine life is prolonged.

Other important benefits include built-in compensation for uneven areas in

foundations or machine bases, and true vertical lift (made possible by a 3-piece wedge design) to eliminate lateral forces as machines are raised or lowered. The RK FIXATOR® SYSTEM also affords the most rigid machine-to-foundation connection available. RK FIXATOR® SYSTEMS are available in five sizes with a wide choice of optional equipment that adapt the system to meet any installation required.

The RK FIXATOR® Basic Units are rustproofed at manufacture and require no further treatment for normal machine tool applications. All load-bearing surfaces are Molykoted at manufacture and require no further attention during the life of the unit. Under normal circumstances, the adjusting bolt should move easily under any loading, requiring only the use of a small hand wrench. The anchor bolts supplied with the FIXATORS® are of special design to allow stretching with no reduction in strength or anchoring power.

The above listed advantages of the UNISORB® RK FIXATOR® SYSTEM have been consistently found to outweigh any additional expense necessary to purchase the units.

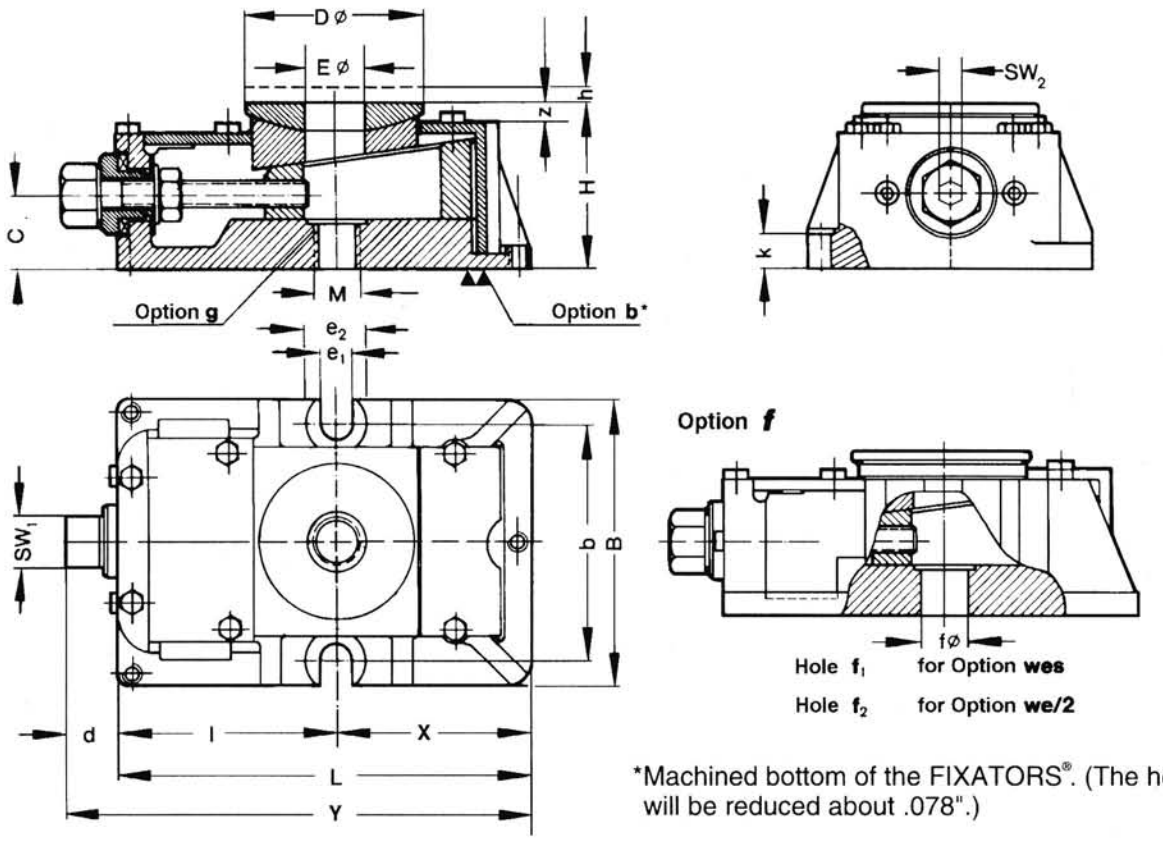


RK FIXATOR® TECHNICAL SPECIFICATIONS

DESCRIPTION	Dim.	RK I	RK II	RK III	RK IV	RK V
Recommended machine dead weight	lbs.	Contact Factory	4,400	8,800	13,200	26,400
Maximum allowable lifting load per FIXATOR®	lbs.	Contact Factory	26,500	53,000	80,000	155,000
Spring constant	lb./in.	Contact Factory	22,800,000	37,100,000	45,700,000	79,900,000
Vertical adjustment per revolution of height adjusting screw	in.	0.010	0.010	0.012	0.014	0.017
Maximum vertical adjustment	in.	0.20	0.20	0.24	0.32	0.40
Approximate torque required to turn adjusting screw	ft. lb./1000 lbs. load	1.0	1.0	1.3	1.5	1.8
Maximum allowable torque on adjusting screw	ft. lb.	22	29	73	117	294
Thread dimensions	M x S metric	16 x 2 mm	20 x 2.5 mm	24 x 3 mm	30 x 3.5 mm	36 x 4 mm
Approximate torque on anchor bolt nut at yield point of bolt	ft. lb.	116	217	376	723	1300
Approximate tension on anchor bolt at yield point	lbs.	Contact Factory	19,800	28,600	44,000	66,000
Weight of Basic Unit	lbs.	8.8	12.1	25.3	46.2	92.4

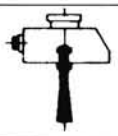
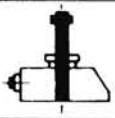
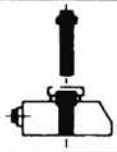
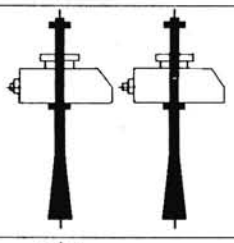
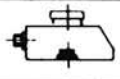
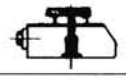
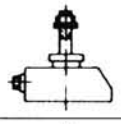
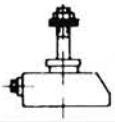
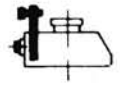
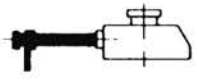
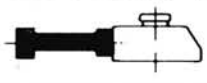
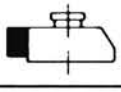
DIMENSIONS*																					
SIZE RK	M	L	B	H	DØ	SW_1	SW_2	EØ	d	c	z	h	l	b	e_1	e_2	k	x	Y	f_1Ø	f_2Ø
I	M12	6.89	4.13	2.17	2.36	19 mm	—	.80	.63	.93	.39	.20	3.62	3.54	.55	1.02	.55	3.27	7.52	.67	.75
II	M20	6.89	4.72	2.95	2.95	19 mm	—	1.00	.63	1.30	.51	.20	3.66	3.94	.55	1.02	.59	3.23	7.52	.83	.98
III	M24	8.66	5.91	3.74	3.54	24 mm	—	1.25	.81	1.61	.55	.24	4.63	5.12	.71	1.26	.91	4.03	9.47	.98	1.22
IV	M30	10.83	7.09	4.53	4.33	32 mm	17 mm	1.55	1.26	2.09	.71	.32	5.61	6.30	.94	1.50	1.10	5.22	12.09	1.22	1.46
V	M36 M42	13.58	9.06	5.31	5.91	36 mm	19 mm	1.80	1.38	2.52	.79	.40	7.09	8.07	1.10	1.81	1.50	6.49	14.96	1.46 1.73	1.73 —

*CASTING DIMENSIONS MAY VARY



*Machined bottom of the FIXATORS®. (The height H will be reduced about .078".)

RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

FIXATOR® OPTIONS			
	Basic Unit	Basic Unit with Spherical Seat including Option **g** (internal threads for Option **ste**)	
	Option **b**	**Machined Base**	For attachment to floor plates or other machined surfaces
	Option **c**	**Side Anchor Bolts** for connecting FIXATOR® to Foundation	For use with Option **ste** and **ste/2**
	Option **ste**	**Normal or Long Center Hold Down Stud** for attaching the FIXATOR® to the machine	Connection between FIXATOR® and machine is made by a high tensile stud screw
	Option **ste/2**	**Two-Piece Center Hold Down Stud** for attaching the FIXATOR® to the machine	Connection between FIXATOR® and machine by high tensile stud screw (two pieces) where there are access problems
	Option **wes** Option **we/2**	**Through Type Anchor/Hold Down Stud** for the direct connection of the machine to the foundation **Two-Piece Anchor/Hold Down Stud** for the direct connection of the machine to the foundation	Used in place of Options **c** and **ste**
	Option **f**	**Housing Clearance Hole** for Option **wes**	Required when Option **wes** is specified
	Option **mon**	**Locking System** for the top spherical washer	Used for set-up tooling
	Option **p**	**Spherical Washer Set** for non-parallel bearing surfaces	Corrects for angular misalignment to prevent line contact
	Option **r**	**Oversized Spherical Washer Set** for non-parallel bearing surfaces	Provides greater bearing area when machine base opening is excessively large
	Option **d**	**Lateral Adjuster** for adjusting machine location	For lateral adjustment of the machine. Requires side anchor bolts unless FIXATOR® embedded to resist imposed forces
	Option **le**	**Adjustment Extension** for adjusting FIXATORS® which are located in hard to reach places under machines	The height adjustment is done via an extension shaft from beyond the rim of the machine
	Option **les**	**Enclosed Adjustment Extension** for adjusting FIXATORS® which are located in hard to reach places under machines	Facilitates height adjustment via an extension shaft from beyond the rim of the machine when FIXATOR® is embedded in foundation
	Option **m**	**Adjustment Bolt Enclosure** for use with recessed FIXATORS®	Permits adjustment when FIXATOR® is embedded in foundation

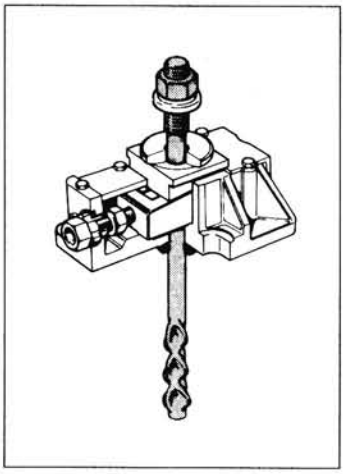
RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

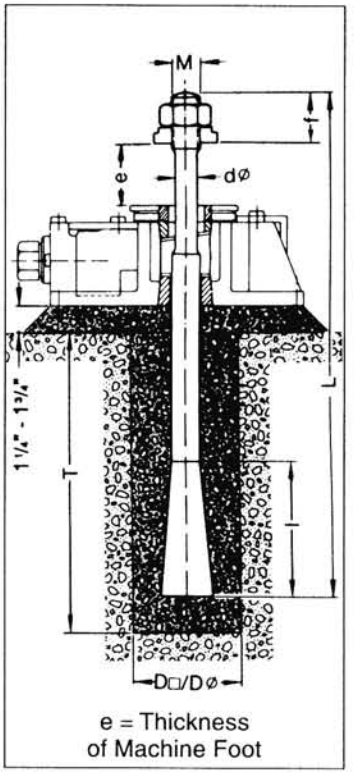
wes

Through Type Anchor/Hold Down Stud for the direct connection of the machine to the foundation.

Note:
Specify "f_1" (Basic Model Option) in your order.

Sizes II, III and IV permit the use of the next size larger anchor bolt to improve safety under extremely high tensile loads. When selecting the anchor, however, the maximum allowable load must never be exceeded.





e = Thickness of Machine Foot

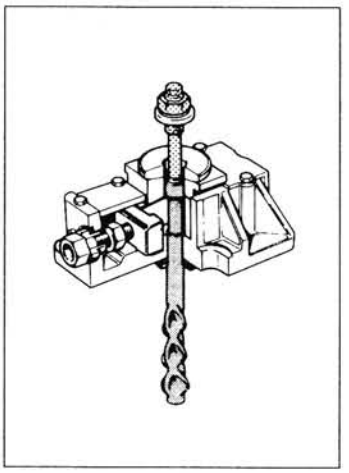
DIMENSIONS										
SIZE RK	M	L	l	f	dØ	e from	e to	Foundations D	Foundations T	Approx. Clamping Force lbs.
I	M16	12.99	3.54	1.18	.51	.79	2.36	3.00	9.00	Contact Factory
II	M20	15.75	4.33	1.57	.63	.79	3.54	3.50	10.75	19,800
III	M24	19.69	5.12	1.97	.75	1.18	3.94	4.00	13.50	28,600
IV	M30	23.62	5.91	2.17	.94	1.38	5.31	5.00	16.25	44,000
V	M36	31.50	7.09	2.56	1.14	1.57	5.91	6.00	22.50	66,000
	M42	39.37	10.24	2.95	1.38	1.57	7.87	7.00	30.00	94,000

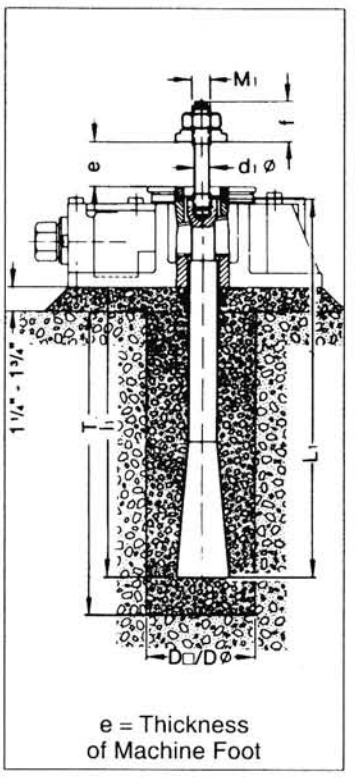
Note: Hole sizes and grout dam heights based on using UNISORB® V-1® Grout.

we/2

Two-Piece Anchor/Hold Down Stud for the direct connection of the machine to the foundation.

Note:
Specify "f_2" (Basic Model Option) and dimension "e" (thickness of machine foot) in your order.





e = Thickness of Machine Foot

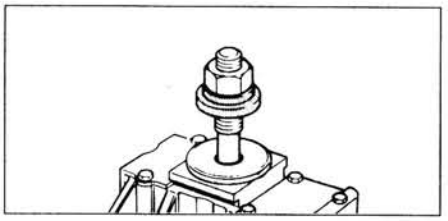
DIMENSIONS										
SIZE RK	M_1	L_1	l_1	f_1	d_1Ø	e from	e to	Foundations D	Foundations T	Approx. Clamping Force lbs.
I	M16	7.48	5.91	1.18	.51	.79	2.36	3.50	9.00	Contact Factory
II	M20	10.83	8.66	1.57	.63	.79	3.94	4.00	10.75	19,800
III	M24	14.17	11.42	1.97	.75	1.18	4.72	5.00	13.50	28,600
IV	M30	17.72	14.17	2.36	.94	1.38	5.31	6.00	16.25	44,000
V	M36	23.62	19.69	2.95	1.14	1.57	5.31	7.00	22.50	66,000

Note: Hole sizes and grout dam heights based on using UNISORB® V-1® Grout.

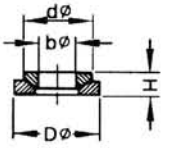
RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

p

Spherical Washer Set for non-parallel bearing surfaces.



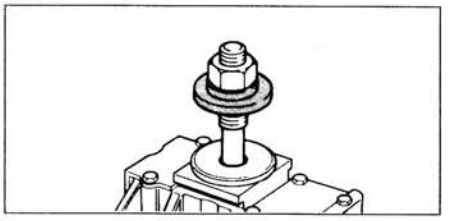
DIMENSIONS				
SIZE RK	DØ	H	dØ	bØ
I	1.55	.34	1.16	.67
II	1.73	.39	1.42	.83
III	2.20	.51	1.73	.98
IV	2.68	.63	2.20	1.22
V M36	3.07	.79	2.68	1.46
V M42	3.94	1.02	3.54	1.81



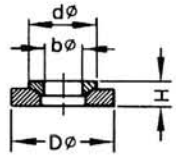
Max. 10° Angle Correction

r

Oversized Spherical Washer Set for non-parallel bearing surfaces.



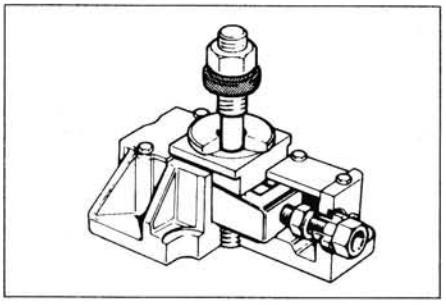
DIMENSIONS				
SIZE RK	DØ	H	dØ	bØ
I	1.73	.39	1.42	.67
II	2.20	.51	1.73	.83
III	2.68	.63	2.20	.98
IV	3.07	.79	2.68	1.22
V M36	3.94	.79	2.68	1.46
V M42	4.92	1.02	3.54	1.81



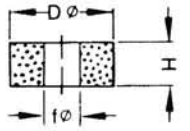
Max. 10° Angle Correction

z

Foam Centering Bushing for the concentric location of the anchor bolts in the machine foot holes.



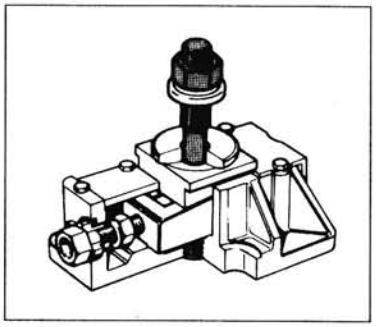
DIMENSIONS			
SIZE RK	fØ	DØ	H
I	.62	1.25	1.00
II	.81	1.56	1.00
III	.96	1.75	1.00
IV	1.19	2.13	1.00
V M36	1.44	2.38	1.00
V M42	1.69	2.75	1.00

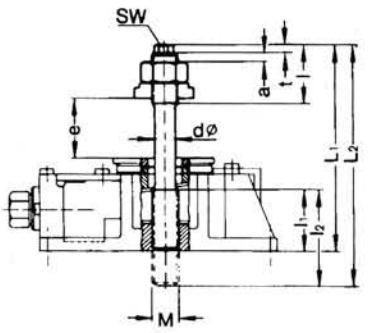


RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

ste

Normal or Long Center Hold Down Stud for attaching the FIXATOR® to the machine.



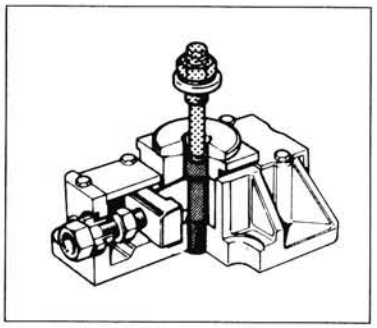


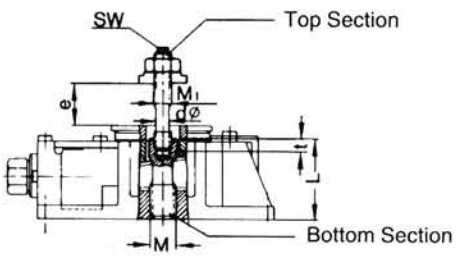
"a" = approx. 0,33 x M (roughly 1/3 x thread diameter)
Specify dimension "e" in your order!

DIMENSIONS														
SIZE RK	M	dØ	Width a/f SW	t	l	Normal L_1	Normal l_1	e from	e to	Long L_2	Long l_2	e from	e to	Approx. Clamping Force lbs.
I	—	—	—	—	—	—	—	—	—	—	—	—	—	—
II	M20	.63	13 mm	.28	1.38	6.89	2.17	.79	2.17	8.07	2.17	1.97	3.35	19,800
III	M24	.75	17 mm	.31	1.97	8.46	2.76	.79	2.76	10.24	2.76	2.56	4.53	28,600
IV	M30	.94	19 mm	.31	2.17	10.24	3.35	1.18	3.35	12.20	3.35	3.15	5.31	44,000
V	M36	1.14	24 mm	.39	2.56	12.40	4.13	1.57	4.13	14.17	4.13	3.94	5.91	66,000

ste/2

Two-Piece Center Hold Down Stud for attaching the FIXATOR® to the machine.



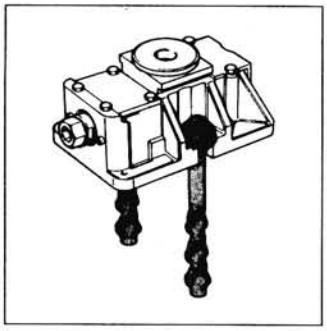


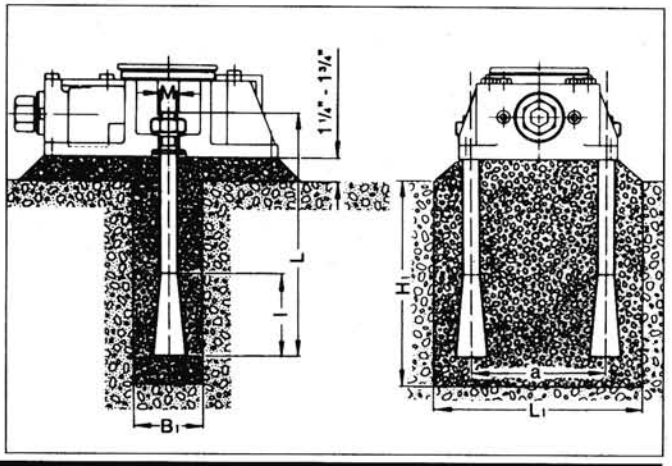
Specify dimension "e" in your order!

DIMENSIONS									
SIZE RK	M	L	t	M_1	dØ	Width a/f SW	e from	e to	Approx. Clamping Force lbs.
I	—	—	—	—	—	—	—	—	—
II	M20	2.17	.63	M16	.51	10 mm	.79	3.94	13,200
III	M24	2.76	.79	M20	.63	13 mm	1.18	4.72	19,800
IV	M30	3.35	.94	M24	.75	17 mm	1.38	5.31	28,600
V	M36	4.13	1.18	M30	.94	19 mm	1.57	5.31	44,000

c

Side Anchor Bolts for connecting FIXATOR® to Foundations.



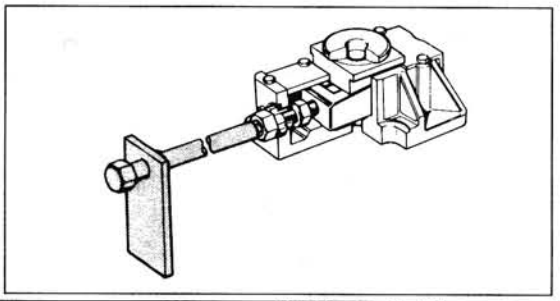


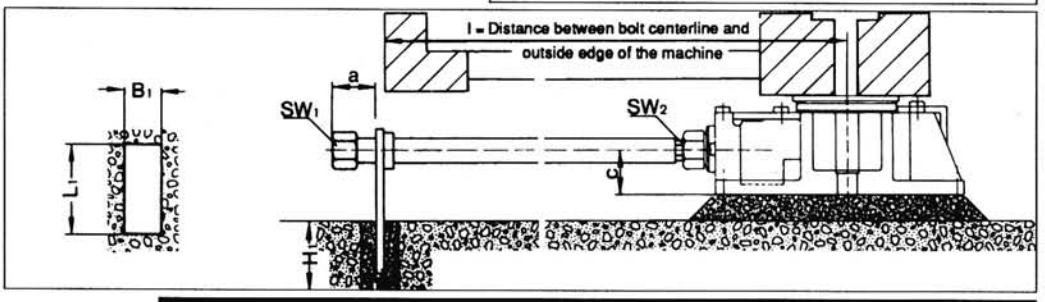
DIMENSIONS								
SIZE RK	M	L	l	a	Foundations L_1	Foundations B_1	Foundations H_1	Approx. Clamping Force lbs.
I	M12	5.91	2.76	3.54	5.50	2.50	5.50	14,600
II	M12	5.91	2.76	3.94	6.25	2.50	5.50	14,600
III	M16	9.84	3.54	5.12	8.00	2.75	9.50	26,900
IV	M20	11.81	3.94	6.30	9.50	3.25	11.50	42,700
V	M24	13.78	5.31	8.07	12.00	4.00	13.75	61,800

Note: Hole sizes and grout dam heights based on using UNISORB® V-1® Grout.

le

Adjustment Extension for adjusting FIXATORS® which are located in hard to reach places under machines.





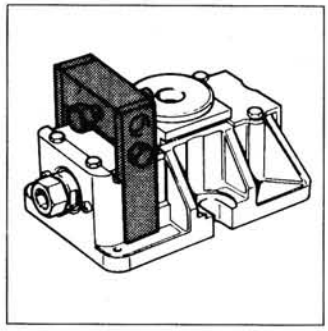
DIMENSIONS									
SIZE RK	a	c	SW_1	SW_2	Min. Dim. l	Tube	Foundations L_1	Foundations B_1	Foundations H_1
I	1.97	.93	.87	.55	5.51	.94 x .16	3.25	1.50	2.75
II	1.97	1.30	.87	.55	5.51	.94 x .16	3.25	1.50	2.75
III	1.97	1.61	.94	.55	7.09	.94 x .16	3.25	1.50	3.50
IV	1.97	2.09	1.26	.67	8.27	.94 x .16	3.25	1.50	4.00
V	1.97	2.52	1.42	.75	9.84	1.34 x .24	4.00	2.00	4.50

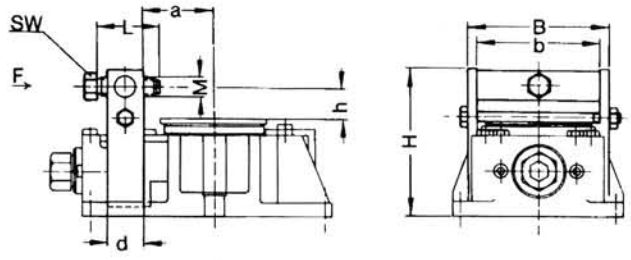
Note: Hole sizes and grout dam heights based on using UNISORB® V-1® Grout.

RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

d

Lateral Adjuster for adjusting machine location. (The use of option c is recommended along with option d.)



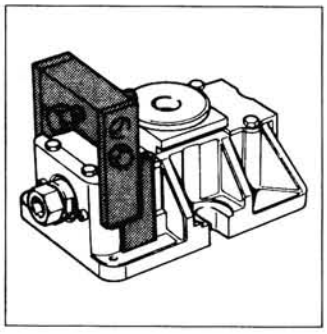


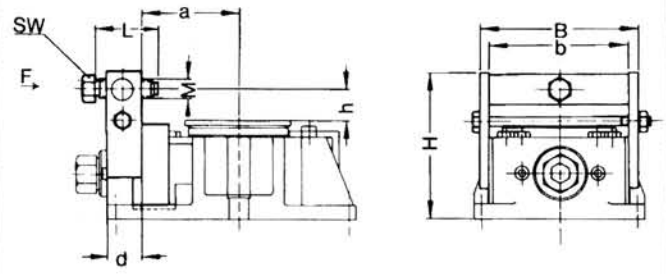
F→ = Maximum Horizontal Force Available

DIMENSIONS										
SIZE RK	M	L	Width a/f SW	H	B	b	d	a	h	F→ lbs.
I	M12	1.97	.67	2.95	3.39	2.76	.98	1.46	.47	Contact Factory
II	M16	2.36	.75	4.17	4.02	3.39	1.18	1.77	.63	5,500
III	M16	2.36	.75	5.08	5.08	4.29	1.38	2.17	.63	7,700
IV	M20	2.76	.94	6.30	5.91	5.12	1.57	2.76	.79	8,800
V	M24	3.15	1.18	7.56	7.83	6.89	1.77	3.54	.94	13,200

dz

Offset Lateral Adjuster for adjusting machine location. (The use of option c is recommended along with option dz.)





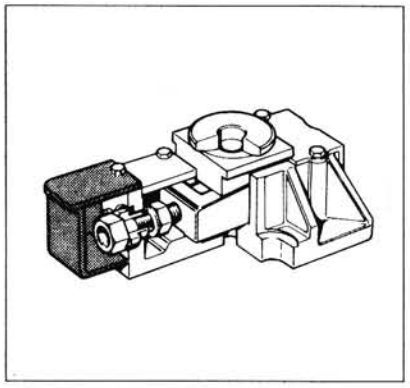
F→ = Maximum Horizontal Force Available

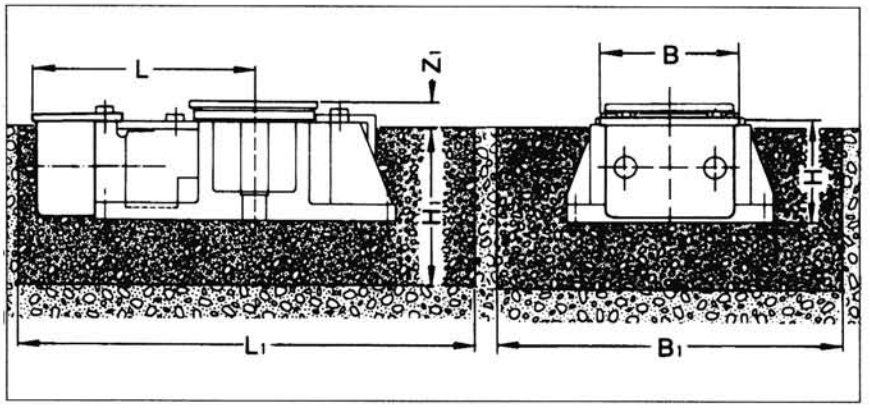
DIMENSIONS										
SIZE RK	M	L	Width a/f SW	H	B	b	d	a	h	F→ lbs.
I	M12	1.97	.67	2.95	4.02	3.39	.98	2.24	.47	Contact Factory
II	M16	2.36	.75	4.17	4.65	4.02	1.18	2.64	.63	5,500
III	M16	2.36	.75	5.08	5.87	5.08	1.38	3.15	.63	7,700
IV	M20	2.76	.94	6.30	6.69	5.91	1.57	3.94	.79	8,800
V	M24	3.15	1.18	7.56	8.78	7.83	1.78	4.84	.94	13,200

RK FIXATOR® OPTIONS & OPTION SPECIFICATIONS

m

Adjustment Bolt Enclosure for use with recessed FIXATORS®.

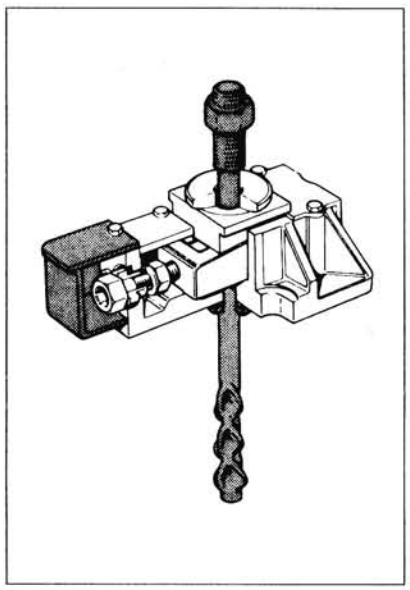


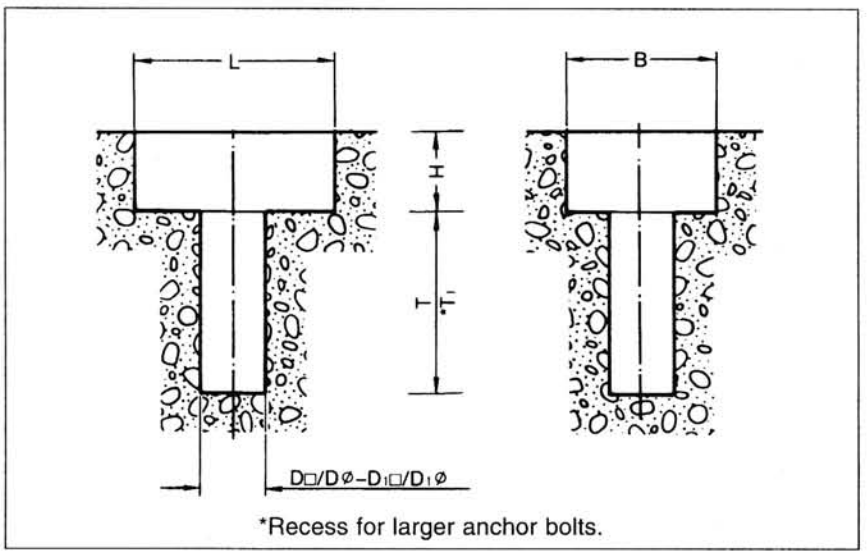


DIMENSIONS							
SIZE RK	L	B	H	Z_1	Foundations		
					B_1	H_1	L_1
I	5.16	3.23	1.81	.79	6.25	2.75	12.25
II	5.20	3.23	2.25	.98	8.00	3.25	12.25
III	6.46	4.13	3.00	1.18	10.00	4.00	13.75
IV	7.80	4.84	3.69	1.38	12.00	4.75	17.75
V	9.65	5.91	4.81	1.57	13.00	5.50	20.50

Note: Hole sizes based on using UNISORB® V-1® Grout.

Recesses In Foundations for Options m + wes combined.





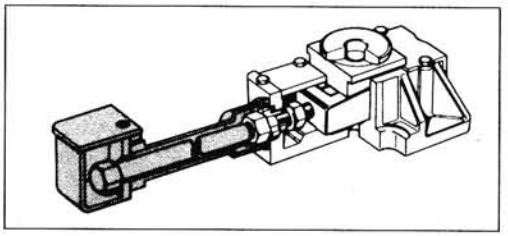
*Recess for larger anchor bolts.

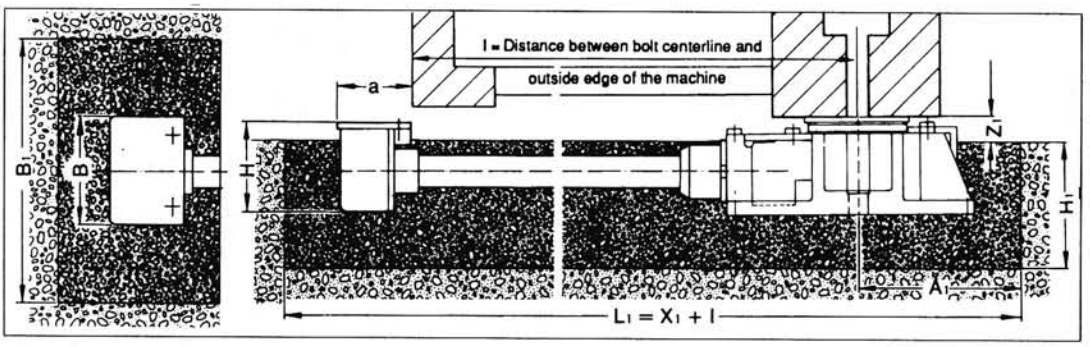
DIMENSIONS							
SIZE RK	L	B	H	D	T	$*D_1$	$*T_1$
I	12.25	6.50	2.75	3.00	9.50	3.50	9.00
II	12.25	8.00	3.25	3.50	10.75	4.00	14.25
III	13.75	10.00	4.00	4.00	13.50	5.00	17.00
IV	17.75	12.00	4.75	5.00	16.25	6.00	23.25
V	20.50	13.00	5.50	6.00	22.50	7.00	30.00

Note: Hole sizes based on using UNISORB® V-1® Grout.

les

Enclosed Adjustment Extension for adjusting recessed FIXATORS® which are located in hard to reach places under machines.



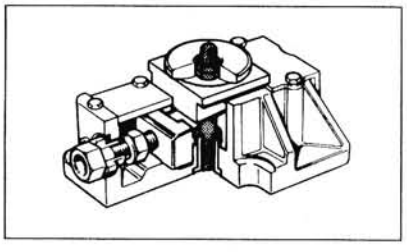


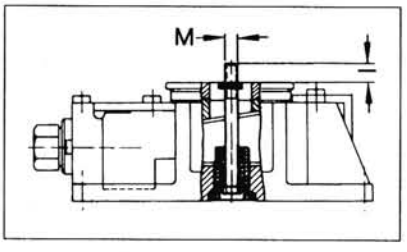
DIMENSIONS									
SIZE RK	a	B	H	Min. Dim. l	Min. Dim. A_1	Z_1	Foundations B_1	Foundations H_1	Foundations X_1
I	2.56	3.23	1.97	5.51	5.12	.79	6.25	2.75	9.00
II	2.56	3.23	2.44	5.51	5.51	.98	6.25	3.25	9.50
III	2.76	4.13	3.11	6.69	6.30	1.18	8.50	4.00	10.75
IV	3.54	4.84	3.58	7.87	7.87	1.38	10.00	4.75	12.75
V	3.94	5.91	4.17	9.84	9.06	1.57	12.00	5.50	14.75

Note: Hole sizes based on using UNISORB® V-1® Grout.

frot

Connection for mobile application.

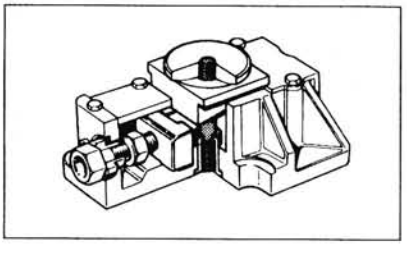


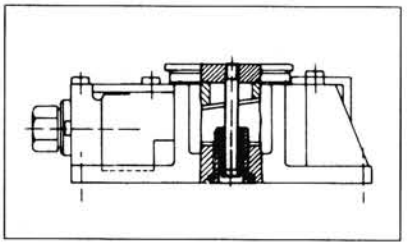


DIMENSIONS		
SIZE RK	M	l
I	.24	.31
II	.24	.31
III	.31	.31
IV	.31	.31
V	.31	.31

mon

Locking System for the top spherical washer.





OVERVIEW

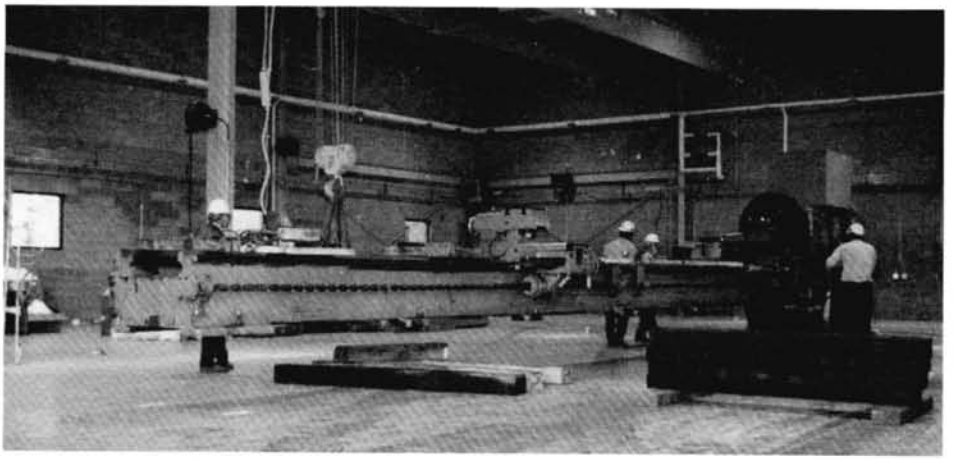
The machine to be installed is moved to its approximate position, supported with temporary blocks, and the FIXATORS® with their options are prehung from the machine base. The machine base is then moved into final position on the foundation. The FIXATORS® with their anchors suspended from the base are positioned and lowered into previously prepared grout cavities. The machine is rough aligned and permanently grouted into place. When the grout has cured sufficiently, the temporary blocks are removed. The anchor bolts are tightened and the machine is then precisely leveled and aligned with the FIXATOR® adjusting wedges. This approach eliminates the need for precise presetting of the mounts and results in substantial time savings.

STEP-BY-STEP

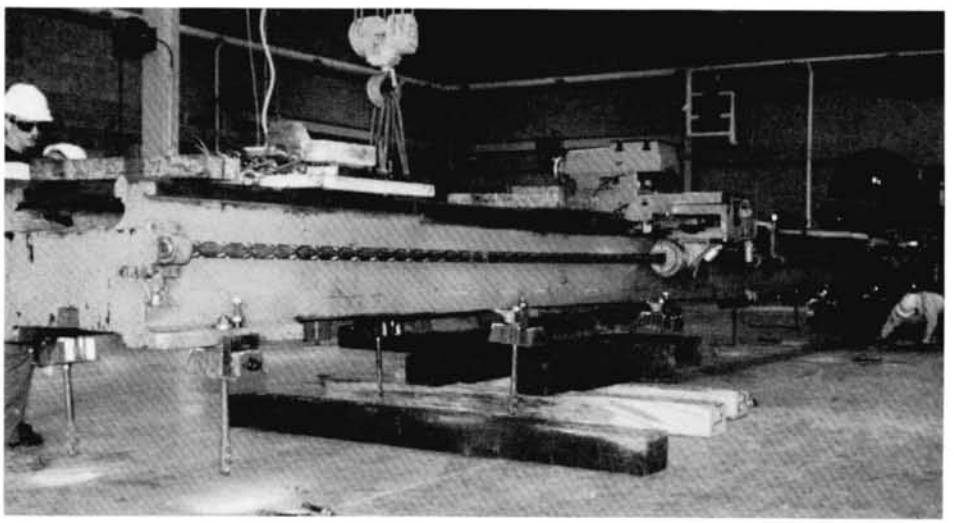
1. **FOUNDATION PREPARATION**—Prepare the foundation in accordance with accepted civil engineering practices. Grout cavities for the FIXATOR® base and anchor bolts may be provided by precasting them or by core drilling after pouring concrete. The best core drilling results can be obtained while the foundation is green (approximately 48 hours). Anchor bolt holes shall be in accordance with UNISORB® Drawing No. 469900-02. Grout cavities for recessed FIXATOR® mounting shall be in accordance with UNISORB® Drawing No. 469900-07.

2. **POSITION MACHINE**—When the concrete is cured sufficiently to support machine loads, prepare the machine for installation in accordance with the manufacturer's instructions and move into position on the foundation. The machine is supported temporarily on blocks with the anchor holes over the previously prepared grout cavities. Note: Temporary blocks should be high enough to permit assembly of FIXATOR® units to the machine base.

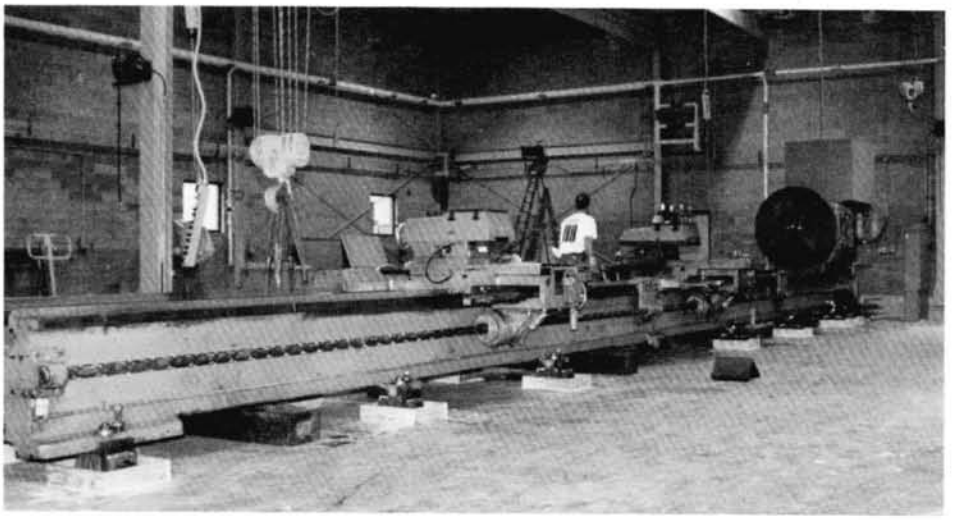
3. **ATTACH FIXATORS®**—Turn the FIXATOR® alignment and leveling adjustment screw fully counterclockwise to assure that the full travel of the wedge will be available during the alignment phase. Assemble the FIXATOR® with the anchor bolt and spherical washer set to the machine base. (Refer to the installation drawing included in this manual for proper assembly.) Position the "O" ring and set collar provided with the anchor bolt against the bottom of the FIXATOR®, securing it with the set screw provided. The anchor nut should be positioned so that three threads are exposed and only tightened sufficiently to hold the FIXATOR® unit in contact with the machine base.



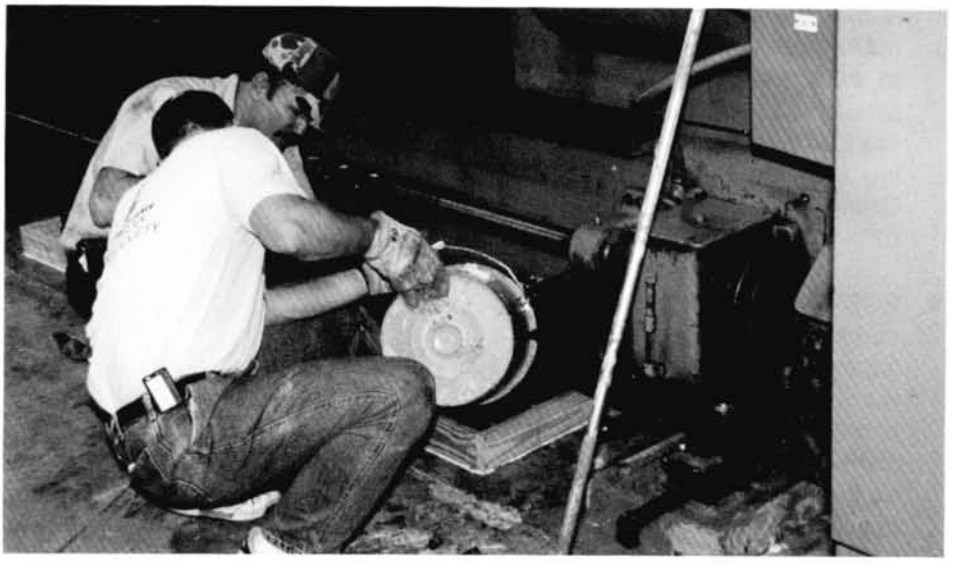
4. **LOWER MACHINE**—Lower the machine into final position, again supported by temporary blocks with the FIXATOR® projected into the grout cavities. The machine should now be rough aligned to a value of plus or minus 1/16". Note: Minimum clearance between the FIXATOR® base and the foundation for grout placement must be 1/2" for UNISORB® Standard V-100® Epoxy Grout Formula and 1-1/2" for UNISORB® V-1® cementitious grout. The three small presetting screws in the FIXATOR® base flange may be used to level the FIXATOR® to the foundation, if desired. Do not attempt to support the machine weight with these three screws.



5. **PREPARE GROUT FORMS**—Apply butyl tape around the bottom flange of grout form. Leave release paper on. Clean the floor thoroughly with oil free compressed air. Remove paper from butyl tape and press form securely to the floor for about 30 seconds to create a secure seal.



6. **POUR GROUT**—Prepare and pour UNISORB® Grout in accordance with grouting instructions provided with the material. Pour grout to cover FIXATOR® base flange as shown on UNISORB® Drawing No. 469900-02 for surface mounting or UNISORB® Drawing No. 469900-07 for recessed mounting. Grout forms used for surface mounting may be removed after grout has set. (See page G1 for instructions.)



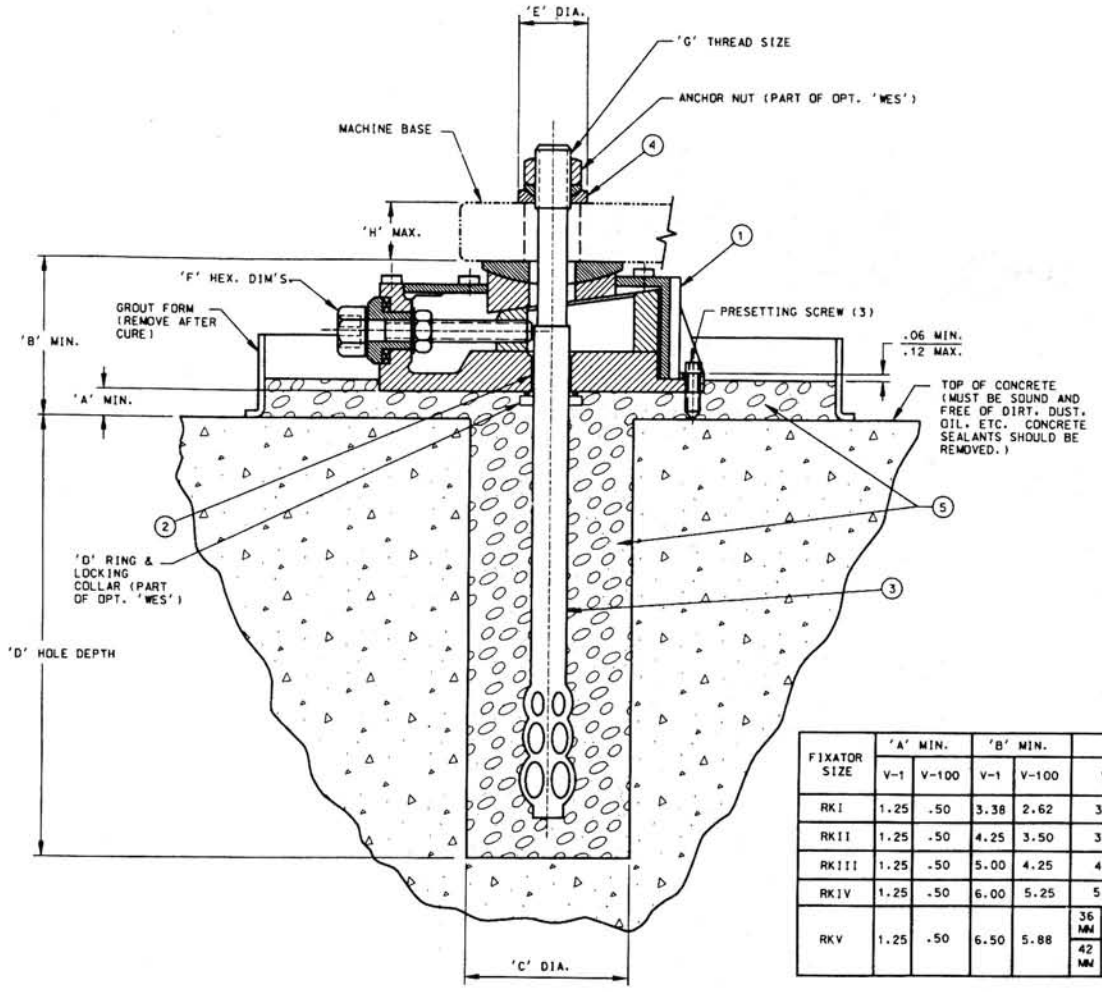
7. **ADJUST FIXATORS®**—After grout cures and with anchor nuts loose, remove the temporary blocks. Snug anchor nuts with a small hand wrench and turn each adjusting screw two full turns. This action applies final tension to the anchor bolts and prepares the machine and the foundation. When raising the machine, adjust all FIXATORS® in sequence, starting at one end or the middle and working toward each end. Do not skip any units.

8. **FINAL MACHINE ALIGNMENT**—Any reliable alignment measuring system may be used. We suggest however that optical or electronic systems are far superior to bubble-level technology in that they respond much faster, thus allowing installers to take full advantage of the quick installation characteristics offered by the FIXATOR® system.

   Align the machine by locating the high spot and raising the remainder of the machine to match. The anchor nuts will remain tightened during this operation. If it becomes necessary to lower an individual FIXATOR® during final alignment do not exceed one full turn. If more than one turn is required the unit should be backed off until the anchor nut loosens; the nut is re-snugged, and the unit is raised to the desired adjustment. This is necessary to assure that the minimum anchor bolt tension is achieved. When final level and alignment is achieved, the machine may be placed into operation. Note: The base may be realigned at any time, if required. Simply adjust the FIXATOR® units, again raising the low points. The anchor nuts need not be loosened to accomplish the realignment.

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTION 'WES'



BILL of MATERIALS

ITEM	QTY	DESCRIPTION
1	1	FIXATOR BASIC UNIT
2	1	OPT. 'F' CLEARANCE HOLE
3	1	OPT. 'WES' ANCHOR/HOLD DOWN STUD
4	1	OPT. 'P' SPHERICAL WASHER SET
		OPT. 'R' OVERSIZE SPHERICAL WASHER SET
5	A/R	V-1 NON-SHRINK GROUT
		STANDARD V-100 EPOXY GROUT

FIXATOR SIZE	'A' MIN.		'B' MIN.		'C' DIA.				'D' HOLE DEPTH		'E' DIA.				'F' HEX. DIM'S.		'G' THREAD SIZE	'H' MAX.
	V-1	V-100	V-1	V-100	V-1		V-100				OPT. 'P'		OPT. 'R'		OUTSIDE MM/(IN.)	INSIDE MM		
RKI	1.25	.50	3.38	2.62	3.00		1.50		9.00		1.57		1.73		22/(.88)	——	16MM	2.38
RKII	1.25	.50	4.25	3.50	3.50		2.00		10.50		1.73		2.20		22/(.88)	——	20MM	4.00
RKIII	1.25	.50	5.00	4.25	4.00		2.50		13.50		2.20		2.68		24/(.94)	——	24MM	4.75
RKIV	1.25	.50	6.00	5.25	5.00		3.00		16.25		2.68		3.07		32/(1.25)	17	30MM	5.25
RKV	1.25	.50	6.50	5.88	36 MM	6.00	36 MM	3.50	36 MM	22.50	36 MM	3.07	36 MM	3.94	36/(1.42)	19	36MM	6.00
					42 MM	7.00	42 MM	4.00	42 MM	30.00	42 MM	3.94	42 MM	4.92			42MM	7.88

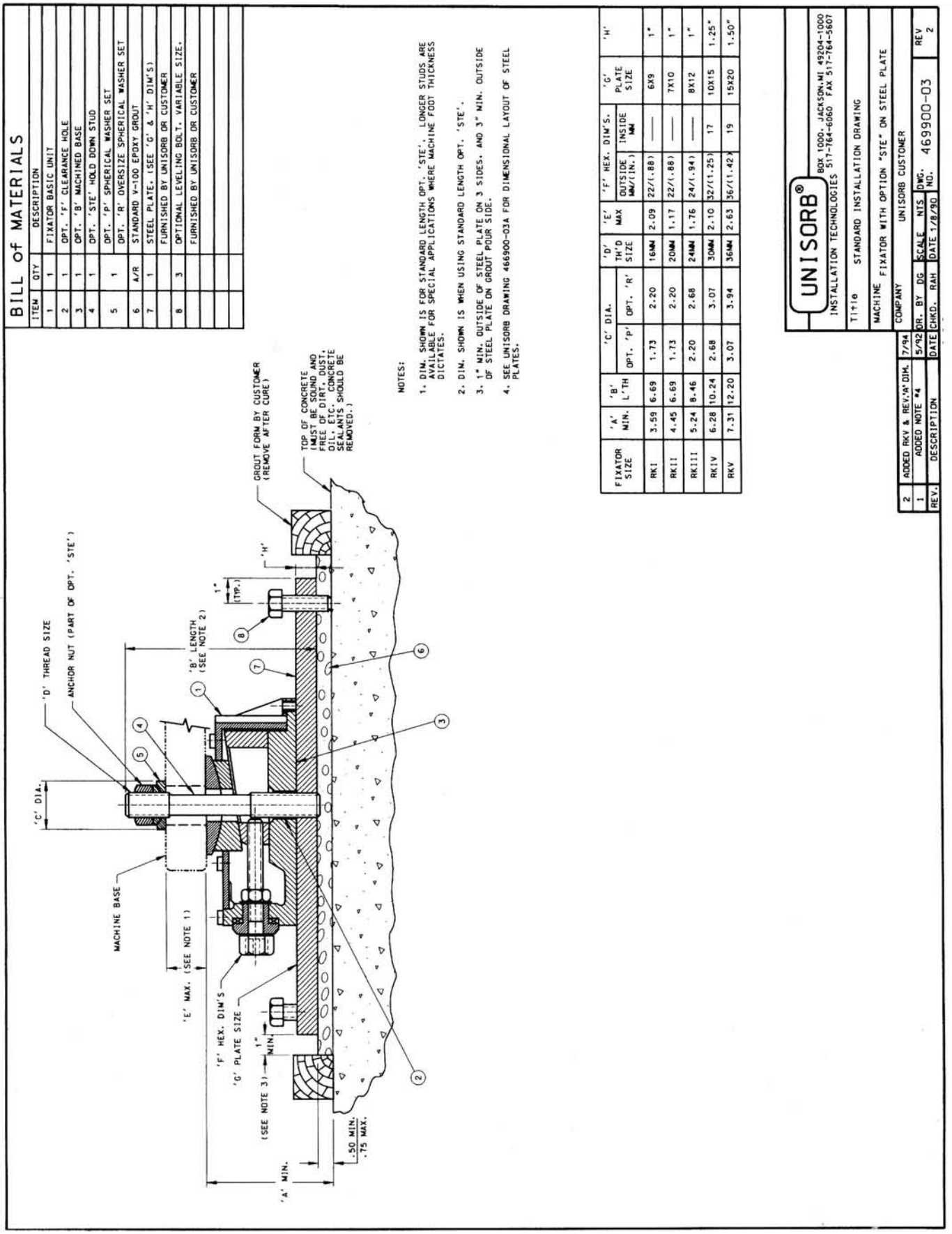
UNISORB®
INSTALLATION TECHNOLOGIES
BOX 1000, JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

Title	STANDARD INSTALLATION DRAWING
MACHINE	FIXATOR WITH OPTION "WES"
COMPANY	UNISORB CUSTOMER

REV.	DESCRIPTION	DATE	CHKD.	SCALE	DWG. NO.	REV
1	REVISED DIAMETERS OF V-100 CORE HOLES	6/97	DR. BY DG	NTS	469900-02	1
			CHKD. RAH	DATE 1/2/90		

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTION 'STE' ON STEEL PLATE

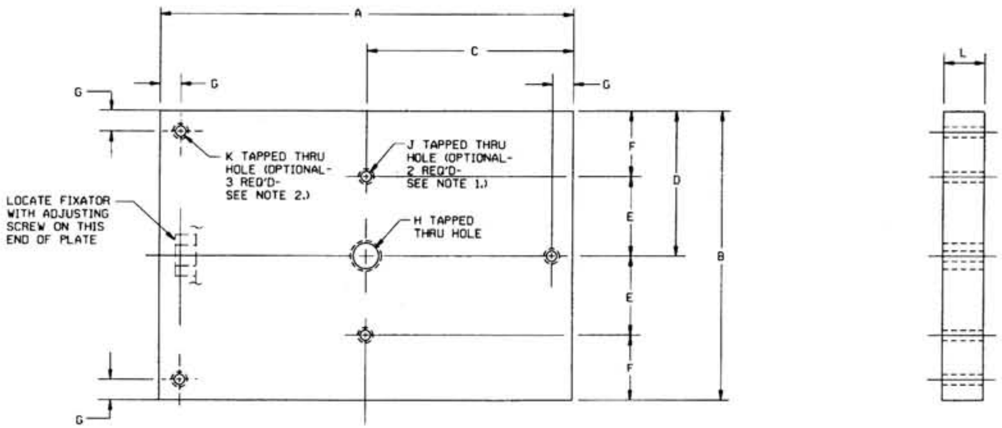


RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
STEEL PLATES FOR USE WITH RK FIXATORS® AND OPTION 'STE'

BILL of MATERIALS

ITEM	QTY	DESCRIPTION



STEEL PLATE

FIXATOR SIZE	A	B	C	D	E	F	G	H	J	K	L
RKI	9.00	6.00	4.50	3.00	1.81	1.19	.50	16MM	3/8-16	1/4-20	1.00
RKII	10.00	7.00	5.00	3.50	2.00	1.50	.50	20MM	3/8-16	1/4-20	1.00
RKIII	12.00	8.00	6.00	4.00	2.62	1.38	.50	24MM	1/2-13	1/4-20	1.00
RKIV	15.00	10.00	7.50	5.00	3.18	1.82	.50	30MM	3/4-10	1/4-20	1.25
RKV	20.00	15.00	10.00	7.50	4.04	3.47	.75	36MM	1-8	3/8-16	1.50

BOLTS FOR TAPPED HOLES

FIXATOR SIZE	J (2) HOLES	K (3) HOLES
RKI	3/8-16 X 1.50 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKII	3/8-16 X 1.50 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKIII	1/2-13 X 1.75 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKIV	3/4-10 X 2.25 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.25 LONG HEX. HEAD
RKV		

NOTES:

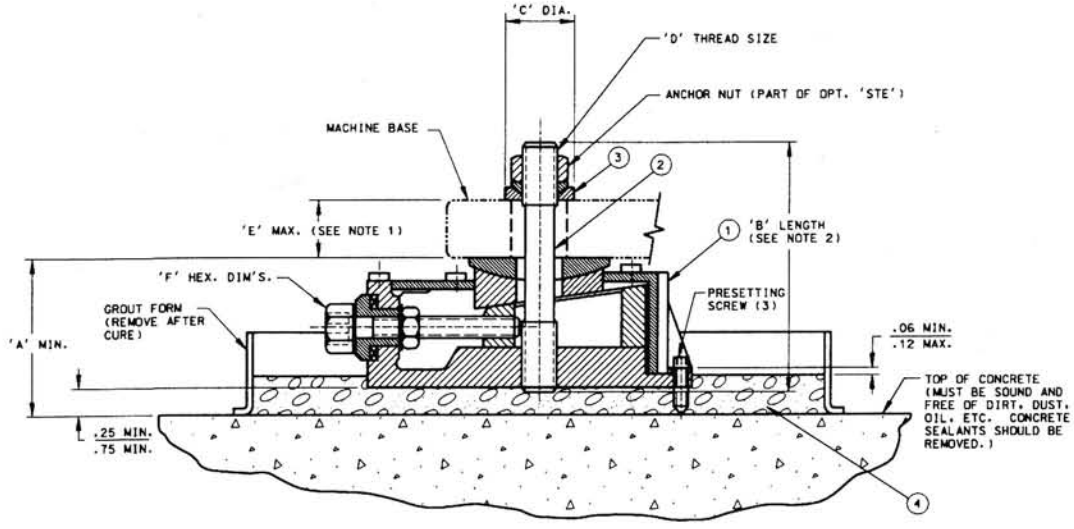
1. TAPPED HOLES 'J' WILL ONLY BE REQ'D. WHEN OPT. 'D' LATERAL STABILIZER IS USED.
2. TAPPED HOLES 'K' WILL ONLY BE REQ'D IF CUSTOMER IS GOING TO USE PRE-LEVELING BOLTS.
3. FOR FIXATOR INSTALLATION DRAWING UTILIZING STEEL PLATES SEE UNISORB DRAWING 469900-03.

UNISORB® INSTALLATION TECHNOLOGIES	BOX 1000, JACKSON, MI 49204-1000 517-764-6060 FAX 517-764-5607		
Title	DIMENSIONAL LAYOUT		
MACHINE	STEEL PLATES FOR USE WITH FIXATORS & OPT. "STE"		
COMPANY	UNISORB CUSTOMER		
DR. BY DG	SCALE NTS	DWG. NO. 469900-03A	REV 1
CHKD. RAH	DATE 5/11/92		

REV.	DESCRIPTION	DATE
1	ADDED RKV	7/94

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTION 'STE'



BILL of MATERIALS

ITEM	QTY	DESCRIPTION
1	1	FIXATOR BASIC UNIT
2	1	OPT. 'STE' HOLD DOWN STUD
3	1	OPT. 'P' SPHERICAL WASHER SET
		OPT. 'R' OVERSIZE SPHERICAL WASHER SET
4	A/R	STANDARD V-100 EPOXY GROUT

NOTES:

1. DIM. SHOWN IS FOR STANDARD LENGTH OPT. 'STE'. LONGER STUDS ARE AVAILABLE FOR SPECIAL APPLICATIONS WHERE MACHINE FOOT THICKNESS DICTATES.
2. DIM. SHOWN IS WHEN USING STANDARD LENGTH OPT. 'STE'.

FIXATOR SIZE	'A' MIN.	'B' L'TH	'C' DIA.		'D' TH'D SIZE	'E' MAX.	'F' HEX. DIM'S.	
			OPT. 'P'	OPT. 'R'			OUTSIDE MM/(IN.)	INSIDE MM
RKI	—	—	—	—	—	—	—	—
RKII	3.20	6.69	1.73	2.20	20MM	2.17	22/(.88)	—
RKIII	4.01	8.46	2.20	2.68	24MM	2.76	24/(.94)	—
RKIV	4.78	10.24	2.68	3.07	30MM	3.35	32/(1.25)	17
RKV	5.56	12.20	3.07	3.94	36MM	4.13	36/(1.42)	19

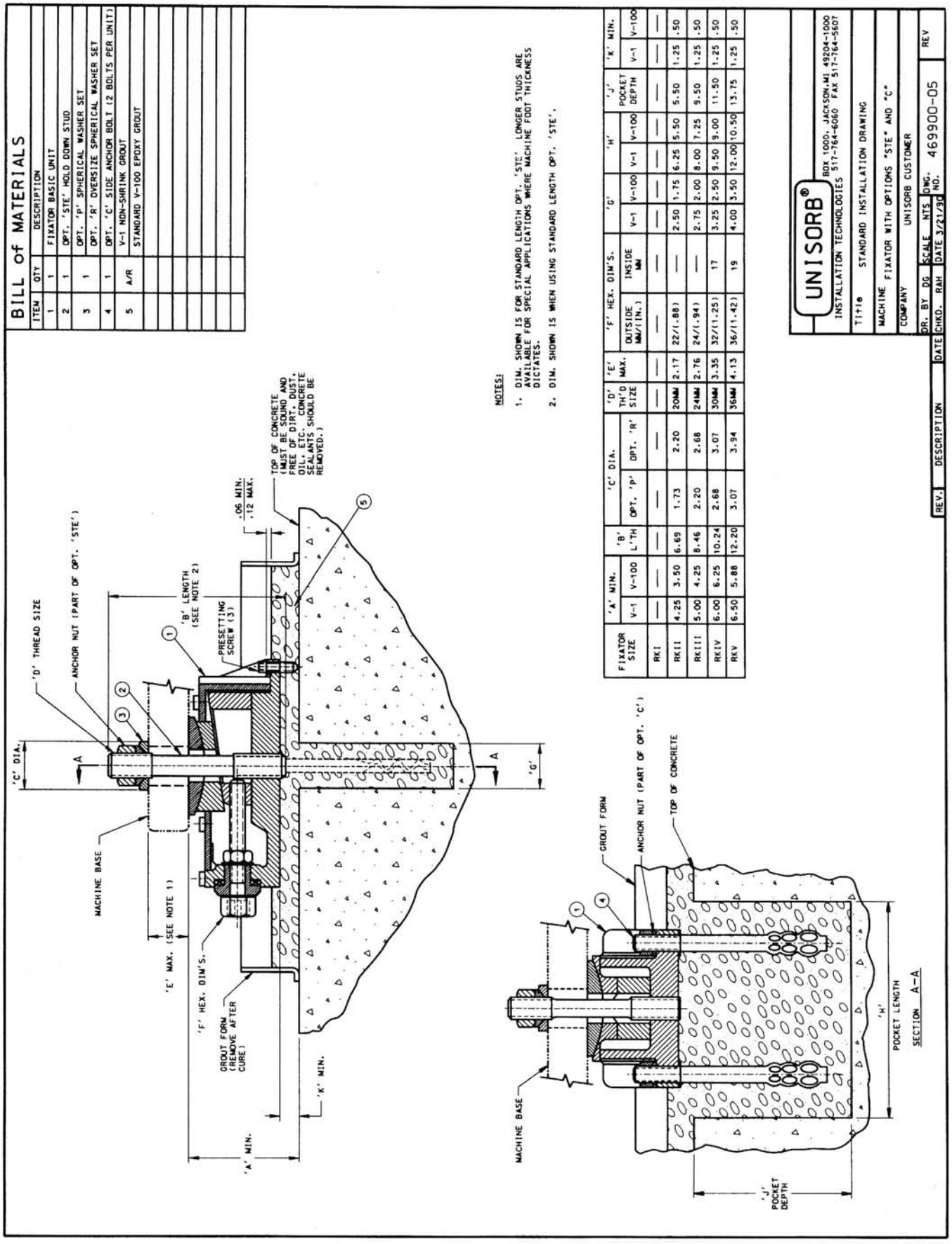
UNISORB® INSTALLATION TECHNOLOGIES
BOX 1000, JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

Title	STANDARD INSTALLATION DRAWING
MACHINE	FIXATOR WITH OPTION "STE"
COMPANY	UNISORB CUSTOMER

REV.	DESCRIPTION	DATE	DR. BY DG / CHKD. RAH	SCALE NTS / DATE 3/8/90	DWG. NO. 469900-04	REV

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

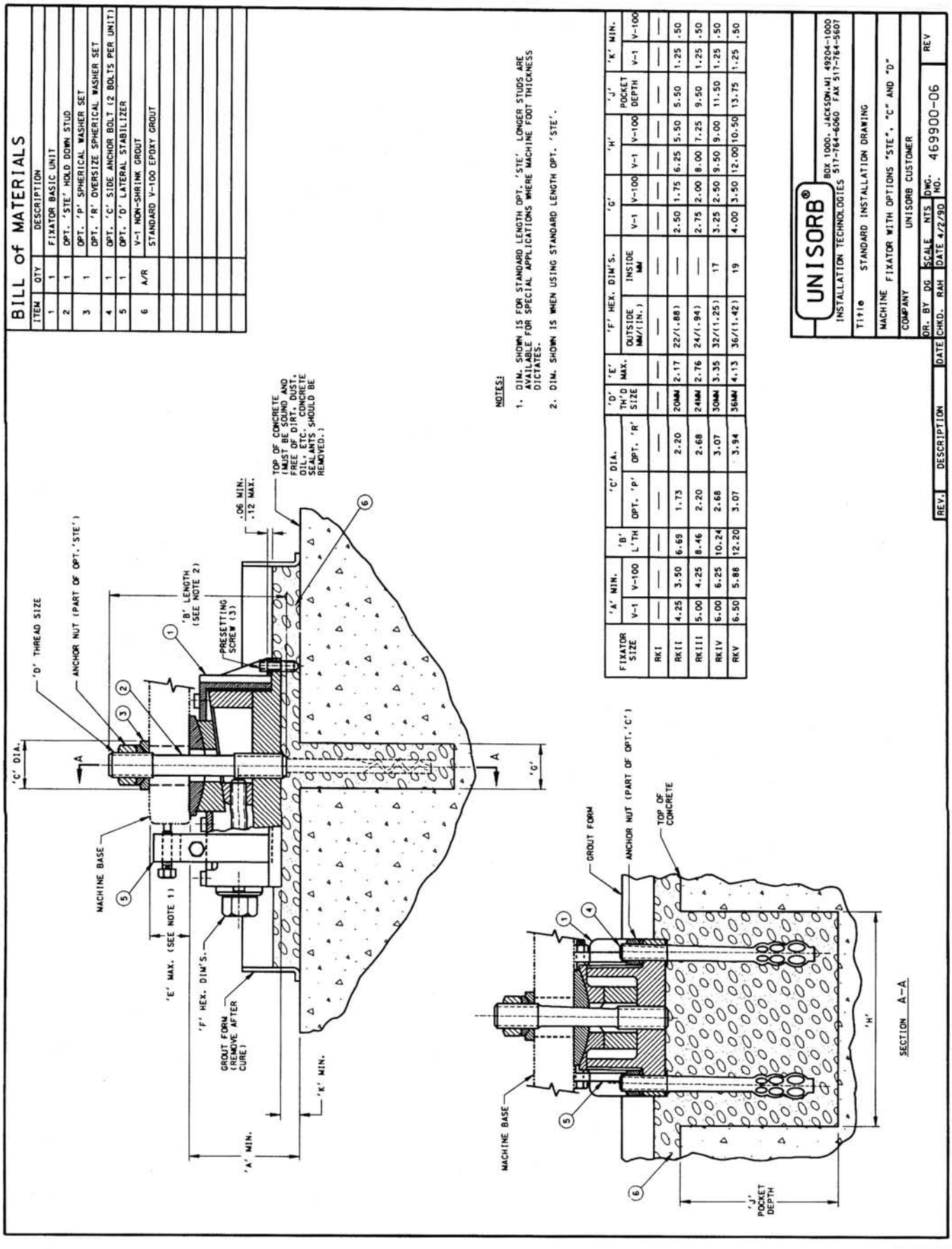
STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'STE' AND 'C'



FIXATOR SIZE	'A' MIN. V-1	'A' MIN. V-100	'B' L'TH	'C' DIA. OPT. 'P'	'C' DIA. OPT. 'R'	'D' TH'D SIZE	'E' MAX.	'F' HEX. DIM'S. OUTSIDE MM/(IN.)	'F' HEX. DIM'S. INSIDE MM	'G' V-1	'G' V-100	'H' V-1	'H' V-100	'J' POCKET DEPTH	'K' MIN. V-1	'K' MIN. V-100
RKI	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RKII	4.25	3.50	6.69	1.73	2.20	20MM	2.17	22/(.88)	—	2.50	1.75	6.25	5.50	5.50	1.25	.50
RKIII	5.00	4.25	8.46	2.20	2.68	24MM	2.76	24/(.94)	—	2.75	2.00	8.00	7.25	9.50	1.25	.50
RKIV	6.00	6.25	10.24	2.68	3.07	30MM	3.35	32/(1.25)	17	3.25	2.50	9.50	9.00	11.50	1.25	.50
RKV	6.50	5.88	12.20	3.07	3.94	36MM	4.13	36/(1.42)	19	4.00	3.50	12.00	10.50	13.75	1.25	.50

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

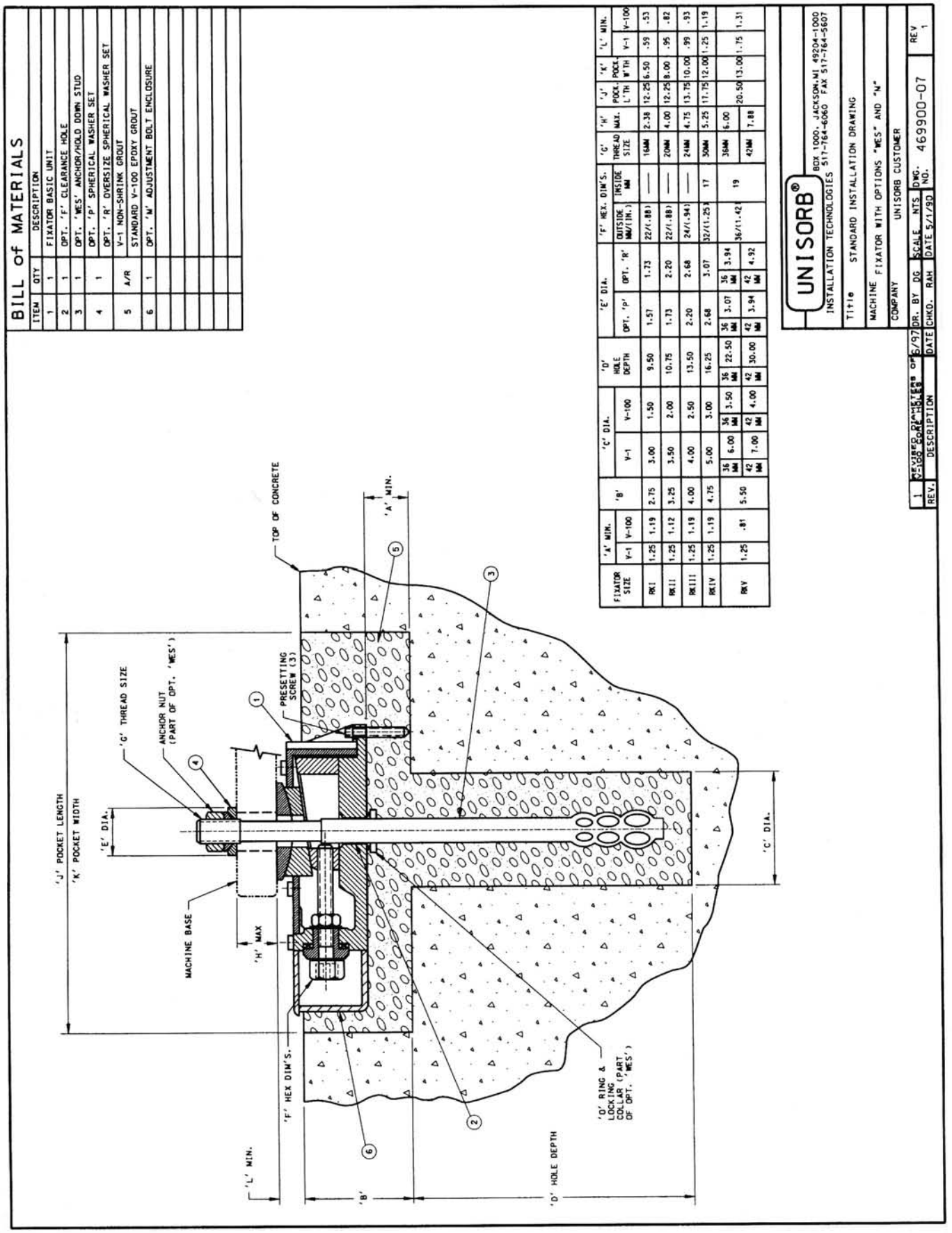
STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'STE', 'C' AND 'D'



FIXATOR SIZE	'A' MIN. V-1	'A' MIN. V-100	'B' L'TH	'C' DIA. OPT. 'P'	'C' DIA. OPT. 'R'	'D' TH'D SIZE	'E' MAX.	'F' HEX. DIM'S. OUTSIDE MM/(IN.)	'F' HEX. DIM'S. INSIDE MM	'G' V-1	'G' V-100	'H' V-1	'H' V-100	'J' POCKET DEPTH	'K' MIN. V-1	'K' MIN. V-100
RKI	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RKII	4.25	3.50	6.69	1.73	2.20	20MM	2.17	22/(.88)	—	2.50	1.75	6.25	5.50	5.50	1.25	.50
RKIII	5.00	4.25	8.46	2.20	2.68	24MM	2.76	24/(.94)	—	2.75	2.00	8.00	7.25	9.50	1.25	.50
RKIV	6.00	6.25	10.24	2.68	3.07	30MM	3.35	32/(1.25)	17	3.25	2.50	9.50	9.00	11.50	1.25	.50
RKV	6.50	5.88	12.20	3.07	3.94	36MM	4.13	36/(1.42)	19	4.00	3.50	12.00	10.50	13.75	1.25	.50

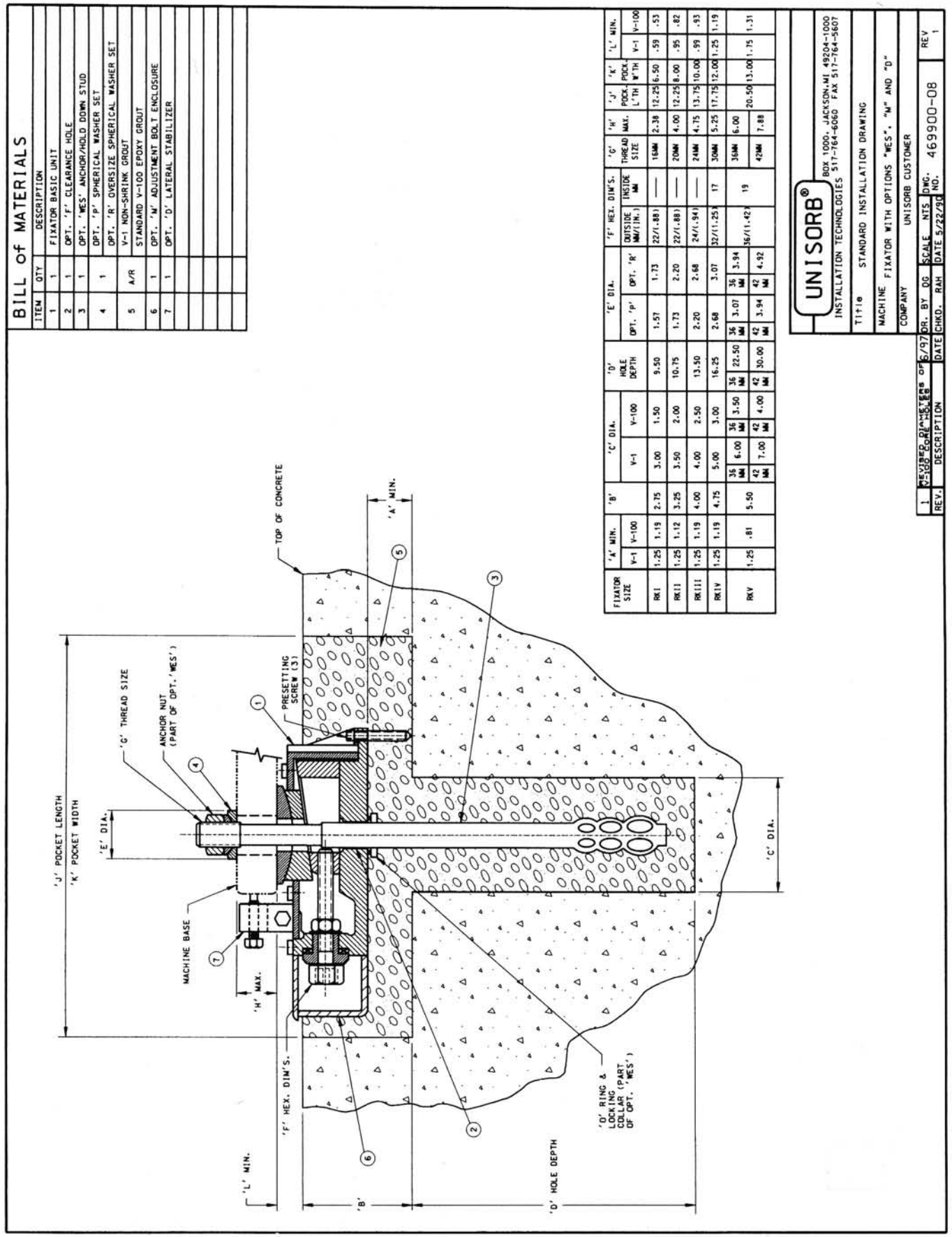
RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'WES' AND 'M'



RK FIXATOR® STANDARD INSTALLATION DRAWINGS

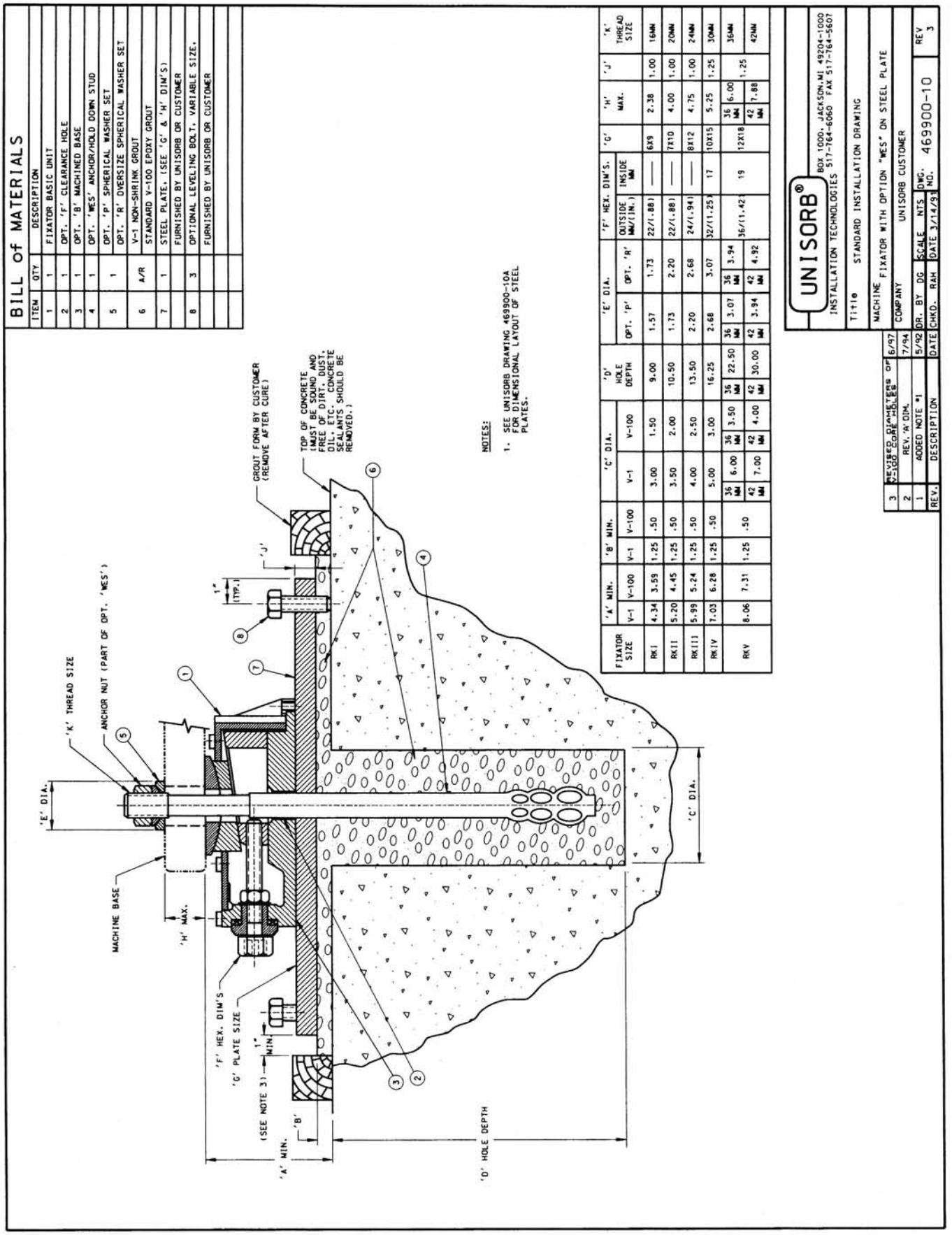
STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'WES', 'M' AND 'D'



FIXATOR SIZE	'A' MIN. V-1	'A' MIN. V-100	'B'	'C' DIA. V-1	'C' DIA. V-100	'D' HOLE DEPTH	'E' DIA. OPT. 'P'	'E' DIA. OPT. 'R'	'F' HEX. DIM'S. OUTSIDE MM/(IN.)	'F' HEX. DIM'S. INSIDE MM	'G' THREAD SIZE	'H' MAX.	'J' POCK. L'TH	'K' POCK. W'TH	'L' MIN. V-1	'L' MIN. V-100
RKI	1.25	1.19	2.75	3.00	1.50	9.50	1.57	1.73	22/(.88)	—	16MM	2.38	12.25	6.50	.59	.53
RKII	1.25	1.12	3.25	3.50	2.00	10.75	1.73	2.20	22/(.88)	—	20MM	4.00	12.25	8.00	.95	.82
RKIII	1.25	1.19	4.00	4.00	2.50	13.50	2.20	2.68	24/(.94)	—	24MM	4.75	13.75	10.00	.99	.93
RKIV	1.25	1.19	4.75	5.00	3.00	16.25	2.68	3.07	32/(1.25)	17	30MM	5.25	17.75	12.00	1.25	1.19
RKV	1.25	.81	5.50	36 MM 6.00	36 MM 3.50	36 MM 22.50	36 MM 3.07	36 MM 3.94	36/1.42	19	36MM	6.00	20.50	13.00	1.75	1.31
				42 MM 7.00	42 MM 4.00	42 MM 30.00	42 MM 3.94	42 MM 4.92			42MM	7.88				

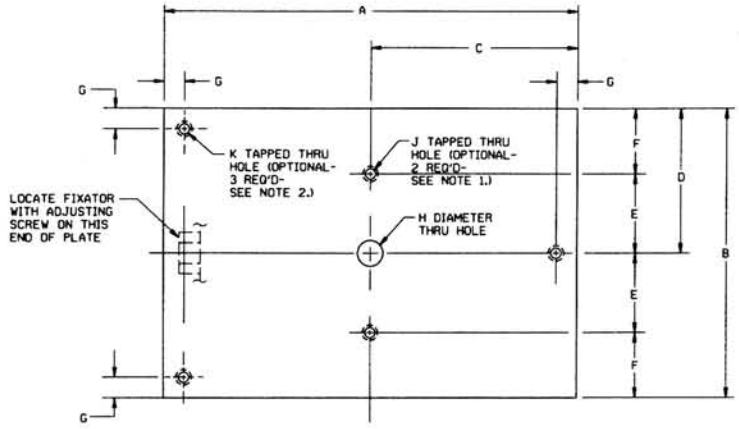
RK FIXATOR® STANDARD INSTALLATION DRAWINGS

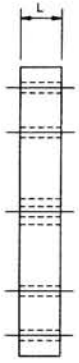
STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTION 'WES' ON STEEL PLATE



RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
STEEL PLATES FOR USE WITH RK FIXATORS® AND OPTION 'WES'





STEEL PLATE

FIXATOR SIZE	A	B	C	D	E	F	G	H		J	K	L
RKI	9.00	6.00	4.50	3.00	1.81	1.19	.50	16MM		3/8-16	1/4-20	1.00
RKII	10.00	7.00	5.00	3.50	2.00	1.50	.50	20MM		3/8-16	1/4-20	1.00
RKIII	12.00	8.00	6.00	4.00	2.62	1.38	.50	24MM		1/2-13	1/4-20	1.00
RKIV	15.00	10.00	7.50	5.00	3.18	1.82	.50	30MM		3/4-10	1/4-20	1.25
RKV	20.00	15.00	10.00	7.50	4.03	3.47	.75	36MM	1.50	1-8	3/8-16	1.50
								42MM	1.75			

BOLTS FOR TAPPED HOLES		
FIXATOR SIZE	J (2) HOLES	K (3) HOLES
RKI	3/8-16 X 1.50 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKII	3/8-16 X 1.50 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKIII	1/2-13 X 1.75 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.00 LONG HEX. HEAD
RKIV	3/4-10 X 2.25 LONG HEX. HEAD WITH FLAT WASHER	1/4-20 X 2.25 LONG HEX. HEAD
RKV	1-8 X 2.25 LONG HEX. HEAD WITH FLAT WASHER	3/8-16 X 2.50 LONG HEX. HEAD

BILL of MATERIALS

ITEM	QTY	DESCRIPTION

NOTES:

1. TAPPED HOLES 'J' WILL ONLY BE REQ'D. WHEN OPT. 'D' LATERAL STABILIZER IS USED.
2. TAPPED HOLES 'K' WILL ONLY BE REQ'D IF CUSTOMER IS GOING TO USE PRE-LEVELING BOLTS.
3. FOR FIXATOR INSTALLATION DRAWING UTILIZING STEEL PLATES SEE UNISORB DRAWING 469900-10.

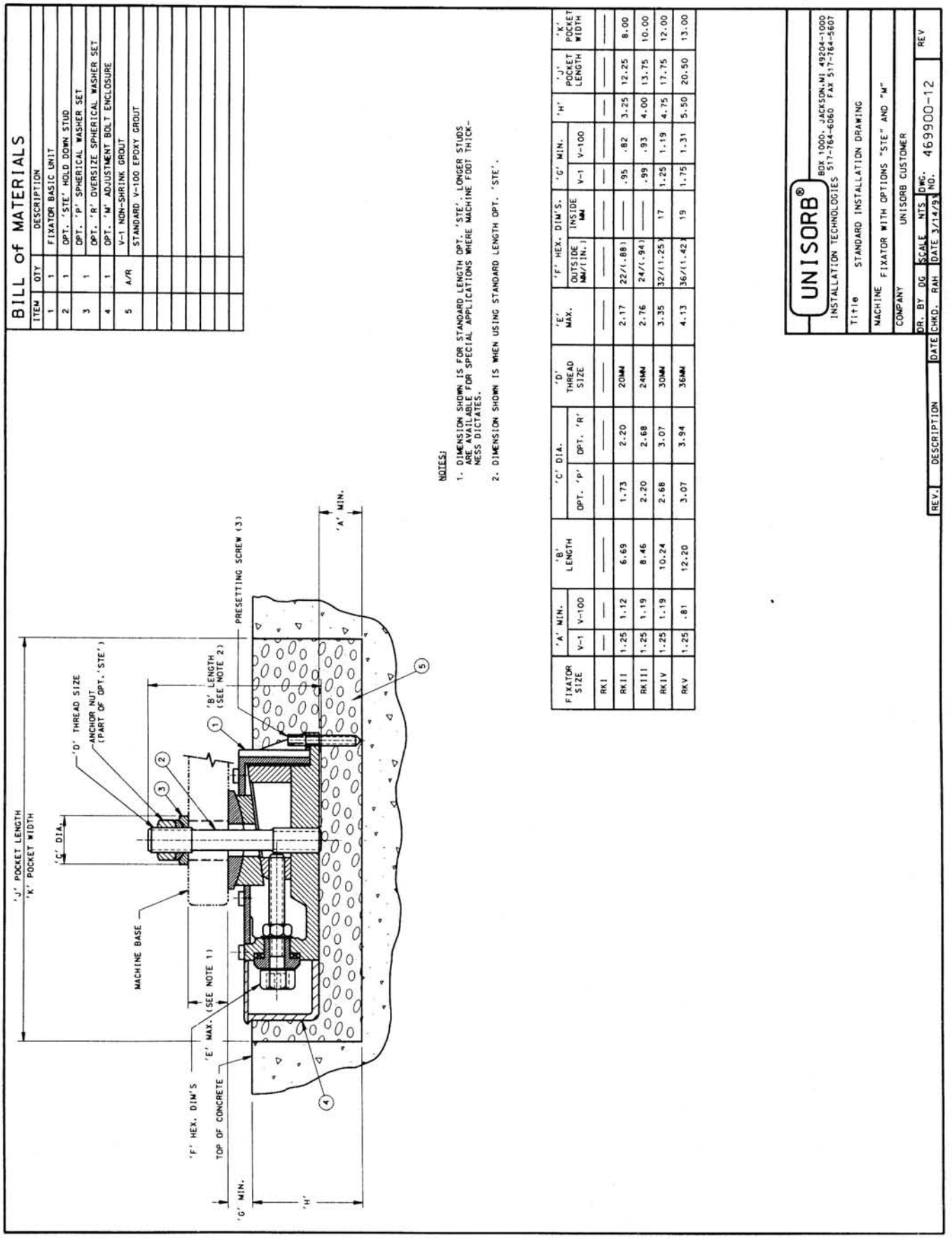
UNISORB®
INSTALLATION TECHNOLOGIES
BOX 1000, JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

Title	DIMENSIONAL LAYOUT
MACHINE	STEEL PLATES FOR USE WITH FIXATORS & OPT. "WES"
COMPANY	UNISORB CUSTOMER

REV.	DESCRIPTION	DATE				REV
1	REV. RKV DIMENSIONS	7/94	DR. BY DG	SCALE NTS	DWG. NO. 469900-10A	1
			CHKD. RAH	DATE 5/11/92		

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

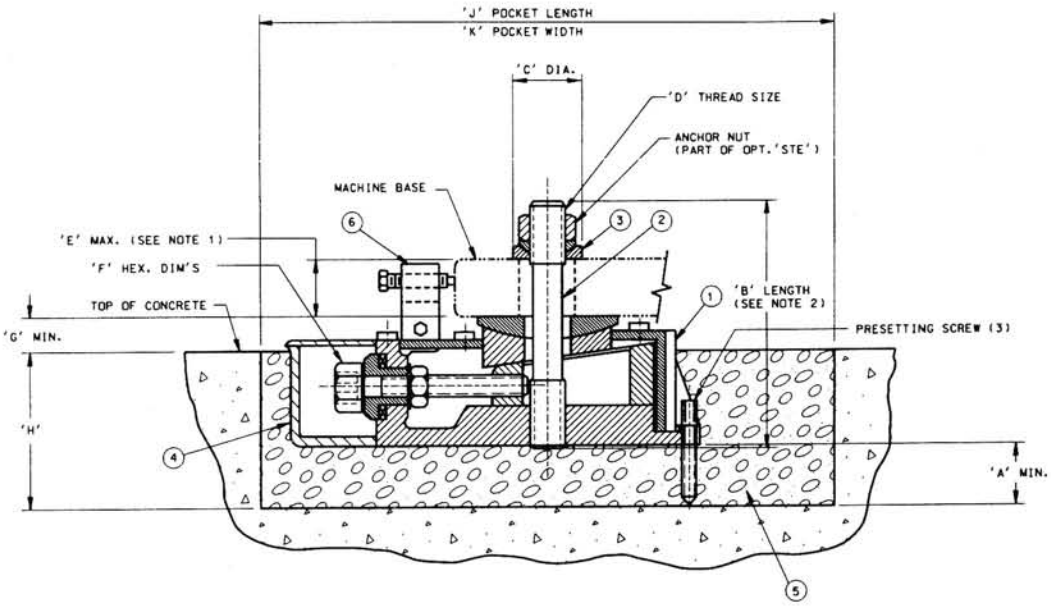
STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'STE' AND 'M'



FIXATOR SIZE	'A' MIN. V-1	'A' MIN. V-100	'B' LENGTH	'C' DIA. OPT. 'P'	'C' DIA. OPT. 'R'	'D' THREAD SIZE	'E' MAX.	'F' HEX. DIM'S. OUTSIDE MM/(IN.)	'F' HEX. DIM'S. INSIDE MM	'G' MIN. V-1	'G' MIN. V-100	'H'	'J' POCKET LENGTH	'K' POCKET WIDTH
RKI	—	—	———	———	———	———	———	———	———	———	———	—	———	———
RKII	1.25	1.12	6.69	1.73	2.20	20NN	2.17	22/(.88)	———	.95	.82	3.25	12.25	8.00
RKIII	1.25	1.19	8.46	2.20	2.68	24NN	2.76	24/(.94)	———	.99	.93	4.00	13.75	10.00
RKIV	1.25	1.19	10.24	2.68	3.07	30NN	3.35	32/(1.25)	17	1.25	1.19	4.75	17.75	12.00
RKV	1.25	.81	12.20	3.07	3.94	36NN	4.13	36/(1.42)	19	1.75	1.31	5.50	20.50	13.00

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'STE', 'M' AND 'D'



BILL of MATERIALS

ITEM	QTY	DESCRIPTION
1	1	FIXATOR BASIC UNIT
2	1	OPT. 'STE' HOLD DOWN STUD
3	1	OPT. 'P' SPHERICAL WASHER SET
		OPT. 'R' OVERSIZE SPHERICAL WASHER SET
4	1	OPT. 'M' ADJUSTMENT BOLT ENCLOSURE
5	A/R	V-1 NON-SHRINK GROUT
		STANDARD V-100 EPOXY GROUT
6	1	OPT. 'D' LATERAL STABILIZER

NOTES:

1. DIMENSION SHOWN IS FOR STANDARD LENGTH OPT. 'STE'. LONGER STUDS ARE AVAILABLE FOR SPECIAL APPLICATIONS WHERE MACHINE FOOT THICKNESS DICTATES.
2. DIMENSION SHOWN IS WHEN USING STANDARD LENGTH OPT. 'STE'.

FIXATOR SIZE	'A' MIN.		'B' LENGTH	'C' DIA.		'D' THREAD SIZE	'E' MAX.	'F' HEX. DIM'S.		'G' MIN.		'H'	'J' POCKET LENGTH	'K' POCKET WIDTH
	V-1	V-100		OPT. 'P'	OPT. 'R'			OUTSIDE MM/(IN.)	INSIDE MM	V-1	V-100			
RKI	—	—	——	——	——	——	——	——	——	—	——	—	——	——
RKII	1.25	1.12	6.69	1.73	2.20	20MM	2.17	22/(.88)	——	.95	.82	3.25	12.25	8.00
RKIII	1.25	1.19	8.46	2.20	2.68	24MM	2.76	24/(.94)	——	.99	.93	4.00	13.75	10.00
RKIV	1.25	1.19	10.24	2.68	3.07	30MM	3.35	32/(1.25)	17	1.25	1.19	4.75	17.75	12.00
RKV	1.25	.81	12.20	3.07	3.94	36MM	4.13	36/(1.42)	19	1.75	1.31	5.50	20.50	13.00

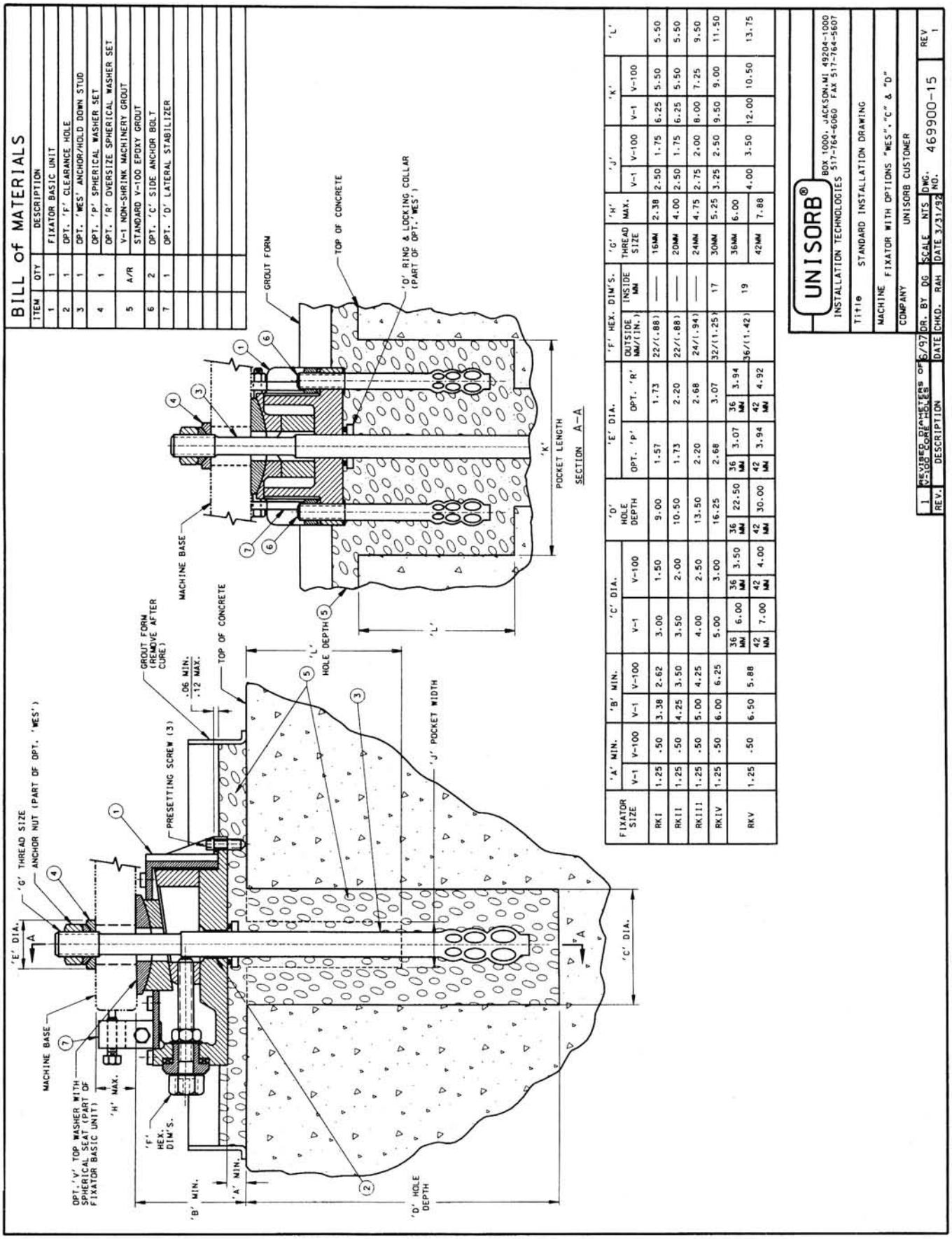
UNISORB®
INSTALLATION TECHNOLOGIES
BOX 1000, JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

Title	STANDARD INSTALLATION DRAWING
MACHINE	FIXATOR WITH OPTIONS "STE", "M" & "D"
COMPANY	UNISORB CUSTOMER

REV.	DESCRIPTION	DATE	DR. BY DG	SCALE NTS	DWG. NO. 469900-14	REV
			CHKD. RAH	DATE 3/14/91		

RK FIXATOR® STANDARD INSTALLATION DRAWINGS

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTIONS 'WES','C' AND 'D'



FIXATOR SIZE	'A' MIN.		'B' MIN.		'C' DIA.		'D' HOLE DEPTH	'E' DIA.		'F' HEX. DIM'S.		'G' THREAD SIZE	'H' MAX.	'J'		'K'		'L'
	V-1	V-100	V-1	V-100	V-1	V-100		OPT. 'P'	OPT. 'R'	OUTSIDE MM/(IN.)	INSIDE MM			V-1	V-100	V-1	V-100	
RKI	1.25	.50	3.38	2.62	3.00	1.50	9.00	1.57	1.73	22/(.88)	——	16MM	2.38	2.50	1.75	6.25	5.50	5.50
RKII	1.25	.50	4.25	3.50	3.50	2.00	10.50	1.73	2.20	22/(.88)	——	20MM	4.00	2.50	1.75	6.25	5.50	5.50
RKIII	1.25	.50	5.00	4.25	4.00	2.50	13.50	2.20	2.68	24/(.94)	——	24MM	4.75	2.75	2.00	8.00	7.25	9.50
RKIV	1.25	.50	6.00	6.25	5.00	3.00	16.25	2.68	3.07	32/(1.25)	17	30MM	5.25	3.25	2.50	9.50	9.00	11.50
RKV	1.25	.50	6.50	5.88	6.00 (36 MM)	3.50 (36 MM)	22.50 (36 MM)	3.07 (36 MM)	3.94 (36 MM)	36/(1.42)	19	36MM	6.00	4.00	3.50	12.00	10.50	13.75
					7.00 (42 MM)	4.00 (42 MM)	30.00 (42 MM)	3.94 (42 MM)	4.92 (42 MM)			42MM	7.88					

REV.	DESCRIPTION	DATE	CHKD.	DR. BY
1	REVISED DIAMETERS OF V-100 CORE HOLES	6/97	DG	RAH

UNISORB®
INSTALLATION TECHNOLOGIES
BOX 1000, JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

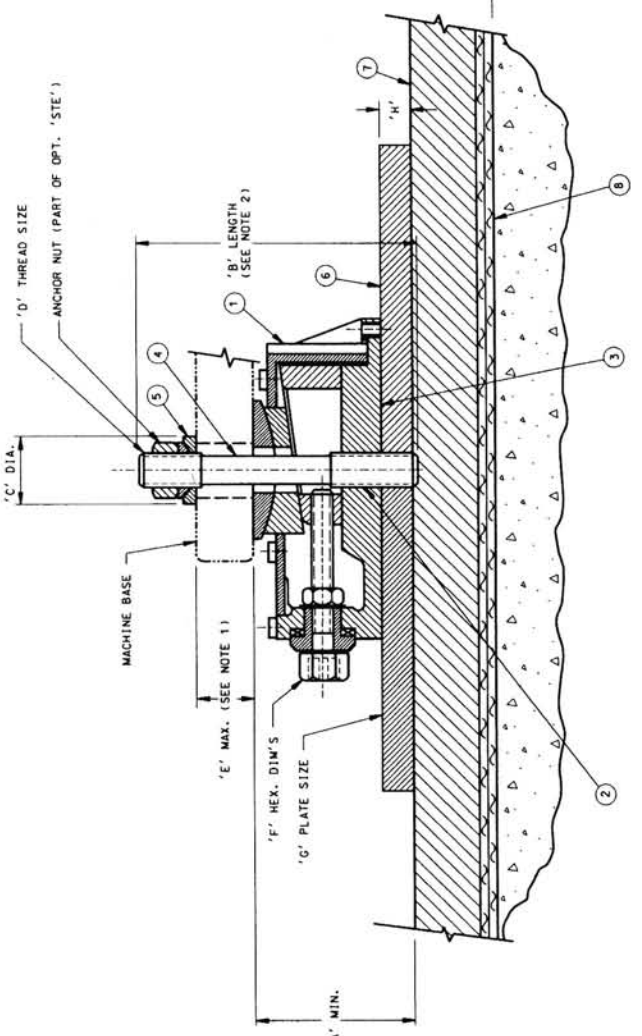
TITLE STANDARD INSTALLATION DRAWING
MACHINE FIXATOR WITH OPTIONS "WES", "C" & "D"
COMPANY UNISORB CUSTOMER

SCALE NTS | DWG. NO. 469900-15 | REV 1
DATE 3/31/93

STANDARD INSTALLATION DRAWING
RK FIXATOR® WITH OPTION 'STE' ON STEEL PLATE
USED WITH STEEL BASEPLATES AND IB-500-B1 PADS

BILL of MATERIALS

ITEM	QTY	DESCRIPTION
1	1	FIXATOR BASIC UNIT
2	1	OPT. 'F' CLEARANCE HOLE
3	1	OPT. 'B' MACHINED BASE
4	1	OPT. 'STE' HOLD DOWN STUD
5	1	OPT. 'P' SPHERICAL WASHER SET OPT. 'R' OVERSIZE SPHERICAL WASHER SET
6	1	STEEL PLATE. (SEE 'G' & 'H' DIM'S)
		FURNISHED BY UNISORB OR CUSTOMER
7	1	STEEL BASEPLATE (BY CUSTOMER)
8	A/R	IB-500-B1 BASE ISOL. MAT'L (DOUBLE THICK)
		(LAYOUT DEPENDS ON APPLICATION)



NOTES:

1. DIM. SHOWN IS FOR STANDARD LENGTH OPT. 'STE'. LONGER STUDS ARE AVAILABLE FOR SPECIAL APPLICATIONS WHERE MACHINE FOOT THICKNESS DICTATES.
2. DIM. SHOWN IS WHEN USING STANDARD LENGTH OPT. 'STE'.
3. SEE UNISORB DRAWING 466900-03A FOR DIMENSIONAL LAYOUT OF STEEL PLATES.
4. THICKNESS OF BASEPLATE VARIES DEPENDING ON APPLICATION.
5. STEEL PLATE UNDER FIXATOR MAY BE EITHER BOLTED OR WELDED TO STEEL BASEPLATE.

FIXATOR SIZE	'A' MIN.	'B' L'TH	'C' DIA. OPT. 'P'	'C' DIA. OPT. 'R'	'D' TH'D SIZE	'E' MAX.	'F' HEX. DIM'S OUTSIDE MM/(IN.)	'F' HEX. DIM'S INSIDE MM	'G' PLATE SIZE	'H'
RKI	3.09	6.69	1.73	2.20	16MM	2.09	22/(.88)	——	6 x 9	1"
RKIII	3.95	6.69	1.73	2.20	20MM	1.17	22/(.88)	——	7 x10	1"
RKIII	4.74	8.46	2.20	2.68	24MM	1.76	24/(.94)	——	8 x 12	1"
RKIV	5.78	10.24	2.68	3.07	30MM	2.10	32/(1.25)	17	10 x 15	1.25"
RKV	6.81	12.20	3.07	3.94	36MM	2.63	36/(1.42)	19	15 x 20	1.50"

UNISORB®
INSTALLATION TECHNOLOGIES
BOX 1000. JACKSON, MI 49204-1000
517-764-6060 FAX 517-764-5607

Title STANDARD INSTALLATION DRAWING

MACHINE RK FIXATOR WITH OPT. 'STE' ON STEEL PLATE. USED WITH STEEL BASEPLATES AND IB-500-B1 PADS

COMPANY UNISORB CUSTOMER

REV.	DESCRIPTION	DATE	CHKD.	DATE	DR.	BY	SCALE	DWG. NO.	REV
1	REVISED PICTURE OF ITEM 8	7/97	DR.	DG	SCALE	NTS	DWG. NO.	469900-17	1
REV.	DESCRIPTION	DATE	CHKD.	RAH	DATE	3/31/92			

RK FIXATOR® GROUT CHART

SUGGESTED GROUT QUANTITIES

Cubic Ft. of Grout Per Fixator

GROUT TYPE	FIXATOR MODEL NO.	OPTIONS					
		BASIC UNIT	WES*	C*	LE*	M	LES
V-1	RKI 9" Grout Form	.11	.15	.15	.12	.12	0.16 / **.02
V-100		.05	.06	.09	.06		
V-1	RKII 11" Grout Form	.16	.22	.20	.17	.18	0.22 / **.02
V-100		.07	.09	.10	.08		
V-1	RKIII 11" Grout Form	.16	.26	.28	.17	.32	0.39 / **.03
V-100		.07	.11	.15	.08		
V-1	RKIV 12" x 15" Grout Form	.23	.41	.44	.24	.59	0.71 / **.05
V-100		.10	.15	.25	.11		
V-1	RKV 12" x 15" Grout Form	.23	36mm = .60 42mm = .90	.61	.24	.85	1.04 / **.06
V-100		.10	36mm = .19 42mm = .27	.39	.11		

Yields for Grout:

V-1	48# Bag	=	.40 cu. ft.
V-100	11# Kit	=	.10 cu. ft.
	22# Kit	=	.21 cu. ft.
	55# Kit	=	.53 cu. ft.

* Includes Basic Unit grout (above concrete).

** Add this amount per inch in specified length of Option LES.

NOTES:

1. V-1 Grout for Basic Unit (above concrete) is figured @ 2-1/4" thick.
2. V-100 Grout for Basic Unit (above concrete) is figured @ 1" thick.
3. Options M & LES refer to either V-1 or V-100 (no grout above surface of concrete).
4. Option LES includes grout quantity for Option M.

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

MATERIAL SPECIFICATIONS FOR ANCHOR BOLTS FURNISHED WITH FIXATOR MODELS RKI, RKII and RKIII

Chemical Composition:

"C" = 0.42 to 0.50%

"Si" = 0.15 to 0.35%

"Mn" = 0.50 to 0.80%

"P" = 0.045% max.

"S" = 0.045% max.

Physical Properties:
(for 5/8" to 2" Dia.)

Tensile = 93,000 to 128,000 psi min.

Yield = 58,000 to 68,300 psi min.

Elong. = 14% to 18% within 5 D min.

Red.o.Area = 35% to 40% min.

Material Grade: C - 45 (German)

DIN - Standard: DIN 17,200 (German)

Material Nr.: 1 0503 (German)

CAST-IN-PLACE BEAMS VS. FIXATORS

Beams:

Concrete Preparation:

- Requires accurate machine drawings to fabricate beams.
- Requires accurate machine drawings to position beams for future machine match.
- Requires locating beams in three planes when the reference point is quite a distance away.
- Secure beams so fluid concrete does not push them out of position.
- Requires drilling of vent holes in beams so fluid concrete does not trap air under flange.
- requires use of concrete additives to reverse normal shrinkage to assure flanges are fully supported.
- Often requires post cure pressure grouting to secure flange.

Placement:

- Position Machine over beams.
- Attach anchor/levelers.
- Use machine as template and weld into position.
- (Provides connection to beam, but must still be leveled and aligned.)

Level:

- Adjust leveling screws to achieve level.
- Tighten anchor nuts.
- Verify level.
- Repeat until level.

Fixators:

Concrete Preparation:

- Finish concrete flat.
- Snap chalk lines per machine anchor bolt drawings.
- Core drill anchor holes.

Placement:

- Position Machine over cores.
- Attach Fixators.
- Rough Level.
- Grout into Place.
- (Simultaneously sets anchor and provides grout shim for initial level.)

Level:

- Snug anchor nuts.
- Pretension (Two full turns on Adjusting screw.)
- Level (Raise low points to match high point.)

Cast-in-Place Beams vs. Fixators

Features/Benefits

Beams	Fixators
• Connection to foundation consists of anchor stud, plate, welded to beam. • Anchor is only as stiff as the top flange of the beam. • Stiffness is reduced as the anchor is located closer to the edge of the flange.	• Single anchor goes from concrete embedment through machine foot. • Grouting rigidly secures each anchor and fixator base.
♦ Connection to the concrete is 'neutral'. ♦ As dynamic forces are encountered, the concrete is placed under alternating compressive and tensile forces. (Concrete design properties are compressive, not tensile.) ♦ Alignment procedure may result in different torque required to achieve level. (More frequent re-alignments.)	♦ Alignment procedure tensions anchor bolt, placing concrete in compression. ♦ Dynamic forces place concrete in more or less compression, but not into tension. ♦ Alignment procedure places each anchor in nearly identical tension. (Less frequent re-alignments.)
• Inaccurate machine drawings, and/or beam fabrication and placement will result in costly delays and rework.	• Inaccurate machine drawings result filling core with grout and coring in proper position with little impact on cost or installation time schedule.
♦ In transfer lines, future station changes will require substantial foundation rework.	♦ In transfer lines, additional stations can be added with no foundation rework.
⇒ Success depends on accuracy of machine drawings, field measurements, accuracy of placing beams, and concrete placing techniques. Final alignment can be time consuming, and re-alignments more frequent.	⇒ Success depends on grouting techniques, Final alignments are fast and re-alignments are infrequent.

FIXATOR LEVELING PROCEDURES

1. Lower the machine on the temporary shims or Fixators.

2. Use the temporary shims or Fixators to pre-align before grouting to within .002 in./ft.

3. After the grout cures remove the temporary shims or Fixators.

4. Use an ordinary hex head wrench to tighten the anchor bolt nuts to specified torque by hand (see table in Fixator Manual).

5. In half to full turn amounts, give all Fixator adjustment screws two right-hand turns to obtain extra anchor bolt prestress. The adjustment screws must also be turned if a higher prestressing force should be required in the anchor bolts (see table in Fixator Manual).

6. After determining the high position, level the machine to final precision, taking care to make upward adjustments to the high position. This will prevent the loss of anchor bolt prestress.

7. If the machine should need re-leveling at a later date, repeat the upward adjustment.

8. If the "upward" leveling of the machine should be impractical (if only one point must be leveled downwards, for instance), proceed as follows:

    a) Use the adjustment screws to pull the Fixators down, thus producing a visible gap between the spherical washer and machine bed sole.

    b) Use the anchor bolt nuts to push the machine bed down and beyond the level to be obtained.

    c) Again, use the adjustment screws to raise the Fixator until the desired level has been reached.

Note: When pulling the machine bed down, make sure to avoid excessive tension in the anchor bolts. A torque wrench should be used for this work. If the yield point of the anchor bolt material is exceeded, adjacent Fixators will also have to be readjusted in the manner described so that several anchor bolts will be engaged in the downward thrust.

The permissible clamping force and torque values can be taken from the table in the Fixator Manual.

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

FIXATORS UNDER TRANSFER MACHINERY

Each of these types of equipment require precision alignment not only to maintain repeatability of machining operation, but also to properly transfer the workpiece.

Pallet, shuttles and gantry systems require this precision alignment to assure correct workpiece location.

Equipment required:

- Several .0005 in./ft. spirit levels
- Parallel bars
- 1, 2, 3 spacing blocks
- Transit or laser
- Piano wire
- 4" x 4" shim stock in various thicknesses (1/32", 1/16", 1/8", 1/4", 1/2", 1", 2", 3", 4")
- Toe Jacks
- Hydraulic Jacks
- Come-along bars
- Temporary Fixators

NOTE: Mark all level locations with grease pencil.

1. Calibrate all levels daily.

2. Establish a benchmark height requirement via use of transit or laser. Mark target locations on foundation.

3. Establish center wire with column measurements.

4. Place 1st station. Height and location must be verified because Station #1 will become your reference point for the rest of the installation.

5. Level station #1.

6. Secure station #1 with mechanical holding blocks.

7. Add any sequential stations and level, maintaining reference to station #1.

8. When assembly of machine is complete, recheck levels at previous location. Run final center wire. This will allow you to verify height and location at each station. Recheck levels.

9. Grout.

10. Final level procedure.

FIXATOR CHECK LIST
FOR TRANSFER LINES

____ 1. Preset locking collar on anchor bolt to allow 1/4" of thread to show above anchor nut.

____ 2. Check Fixator height adjustment visually by removing spherical seat and top wedge and then reassemble. (All units should be two full turns from bottom.)

____ 3. Attach Fixator with spherical seat on bottom of machine foot and spherical washer set on top of machine foot--snug anchor bolt.

____ 4. Check Fixator position under machine making sure it is level and adjustment screw is accccessible.

____ 5. Lower machine base on temporary mounts and shim plates. Maintain proper minimum clearance between Fixator and floor for grout (1-1/2" for V-1 and 1/2" for V-100 Standard).

____ 6. Cut grout form down one side with razor knife. Place the grout form in position. Duct tape back side of cut grout form to create seal.

____ 7. Align machine to center wire.

____ 8. Use hydraulic jacks to rough level and shim temporary Fixators into adjustment range. Level base using temporary Fixators.

NOTE: IF TORQUE REQUIREMENTS INCREASE ON ADJUSTMENT BOLT, MAXIMUM HEIGHT MAY HAVE BEEN REACHED AND FURTHER TURNING WILL CAUSE BREAKAGE.

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

FIXATOR ALIGNMENT SYSTEM WITH HEAVY DUTY JAKEBOLT ANCHOR INSTALLATION PROCEDURE

The Fixator and Heavy Duty Jakebolt are used in combination whenever pre-set anchor bolts and precision alignment are a requirement. The Jakebolt allows the anchor to be located in the new foundation yet allows for lateral movement to compensate for normal construction variances. It features a fully retractable stud which remains in the housing until needed. This allows a "clear floor" condition whenever required yet the stud is in place with full thread engagement ready for use.

The Fixator is Unisorb's state-of-the-art alignment system. It offers precise alignment in a minimum amount of time and greatly reduces the frequency of realignments. This brochure provides the machine tool installer with information on the proper use of the Fixator Alignment System and the Jakebolt anchor bolt.

GENERAL NOTES

The Fixator System includes a number of options for anchor bolts. When used with the Jakebolt anchor, it is necessary to provide an adequate clearance hole through the base. Be sure to specify option "F" to obtain this clearance hole.

The chart below shows which size Heavy Duty Jakebolt to use in conjunction with the various Fixator basic units.

FIXATOR MODEL	HEAVY DUTY JAKEBOLT MODEL
RK-I	5/8" x 12" Heavy Duty Jakebolt
RK-II	3/4" x 12" Heavy Duty Jakebolt
RK-III	1" x 12" Heavy Duty Jakebolt
RK-IV	1-1/4" x 12" Heavy Duty Jakebolt
RK-V	1-1/2" x 12" Heavy Duty Jakebolt

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

HEAVY DUTY JAKEBOLT INSTALLATION

The Heavy Duty Jakebolts must be positioned accurately. If the machine is not available for precise measurements, use only "certified" or "as built" floor plans to locate the anchors.

A template may be prepared to simulate the machine base. The Jakebolts are hung from the template, projecting into the foundation. After rebar isolation material and other foundation considerations are in order, the concrete may be poured. Be sure that the template is rigid enough to prevent shifting as the concrete flows around the Jakebolts. It is helpful to attach the Jakebolts to the rebar cage to prevent them from shifting to the side. Any part of the Jakebolt stud which is exposed should be greased heavily to prevent concrete from adhering to the threads or filling the screwdriver slot.

PREPARATIONS FOR FIXATOR INSTALLATION

Build forms for grouting. The height will vary depending on the grout being used and the amount of slope of the foundation. Typically, a 1-1/2" grout pad will be used with V-1 grout and a 1/2" grout pad with V-100 Epoxy Grout. Dimensions of the grout dams are as follows.

FIXATOR MODEL	INSIDE DIMENSIONS
RK-I	7" x 10"
RK-II	7" x 10"
RK-III	10" x 12"
RK-IV	11" x 14"
RK-V	12" x 16"

Check the Fixator to assure that all components are present. The base washer and spherical washer sets should be located. Double-check the position of the wedge by turning the adjusting screw fully counter clockwise. This will assure that the full travel of the wedge is available for adjustment. Also turn the three set screws in the base of the Fixator so there is no projection below the base.

Locate a foam bushing around the Jakebolt stud to prevent grout from casting it into position. Ethafoam or other products which will compress and expand are acceptable. The thickness is dependent on the desired grout pad thickness.

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

LOCATE THE FIXATORS

Place the Fixators over the Jakebolts and orient them so the adjusting screw will be accessible after the equipment is in position. Place the grout dam over the Fixator, providing the larger clearance on the side from which the grout will be poured. Be sure to caulk between the dam and the concrete and secure the form in place. Allow the caulk to cure before grouting.

Raise the Jakebolt stud to project through the Fixator. This will make it easier to raise the Jakebolt stud through the machine.

NOTE: If the machine base is not designed so that a screwdriver can be inserted through the anchor hole to raise the stud, the stud can be raised high enough to go through the machine base at this time.

LOCATE THE MACHINE

Lift the machine into position and carefully lower it. Support it on temporary blocks to provide about a 1-1/2" clearance between the top of the Fixator and the underside of the machine (provide 1/2" of clearance if using V-100 Epoxy Grout).

Rough level the machine using shims under the temporary blocks. A carpenter's level is adequate for this procedure. The machine should be level within 1/8" or better.

RK FIXATOR® ADDITIONAL TECHNICAL INFORMATION

PREPARE THE GROUT

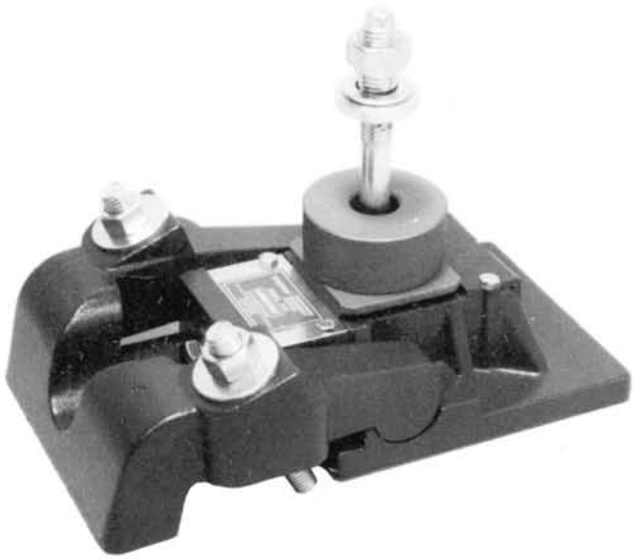
Raise the Fixators so they are tight against the machine by turning the three set screws in the Fixator base. This will provide the desired grout clearance under the Fixator. Do not attempt to support the machine weight on these screws. Raise the Jakebolt stud far enough through the machine foot to add the washer and nut. Do not tighten at this time.

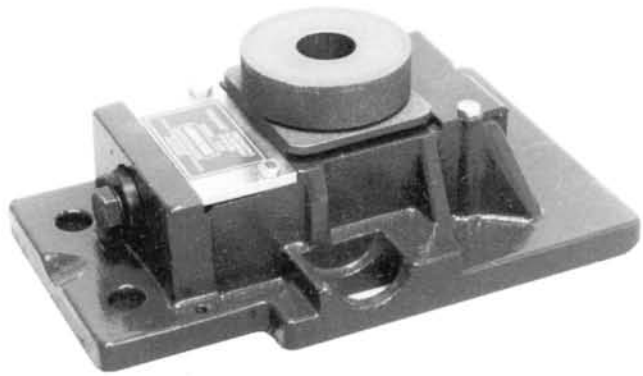
Assure that the Fixators are in the proper position, the grout dams are secure and the caulk is cured. Check also that the foam strip has expanded enough to provide a seal to keep the grout from the Jakebolt stud and correct if necessary.

Mix and pour the grout according to the instructions provided with product. Pour from only one side and allow the grout to flow under the Fixator to the other side. Pour the grout slightly up the side of the Fixator base flange.

After the grout has cured the nuts may be hand tightened on the Jakebolt and the temporary blocks removed. Refer to the machine alignment procedures in the Fixator manual for further instructions.

AK FIXATOR® DESCRIPTION





UNISORB®'S Model AKII Agile Fixator® Mount has been developed specifically to meet industry's demand for a cost effective, truly "agile," machinery installation system.

The AKII Agile Fixator® Mount is intended for use in anchorless or anchored applications and offers the capability to be quickly converted from one to the other without disturbing or removing the machine base. The system can be used with resilient pads of varying stiffness and thickness to produce the vibration isolation load deflection characteristics required by the machine builder or user.

The AKII Agile Fixator® Mount's basic design incorporates the well-proven adjusting mechanism and clamping nut torque retention system of the Fixator® into an updated overall mount design that permits installation in any of six fundamentally different ways. See Figures 1 thru 6

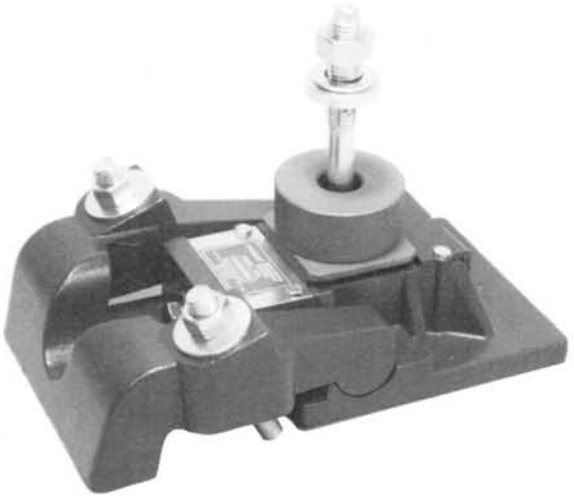
The system may be easily converted to an anchored variation if required at a later date by the simple application of one of the three available anchoring techniques.

Pre-layout or core drilling is not required as the anchor holes are simply drilled through the mount base after installation. The use of the optional toggle clamp permits this to be accomplished even when overhanging machine components prevent access to the center or side anchor locations.

- *No special foundation requirements.*
- *Final installation approach may be determined on the job site.*
- *The necessity for anchor layout drawings is eliminated.*
- *Core drilling is eliminated (unless preferred).*
- *Anchored and non-anchored locations may be intermixed where necessary and are served by the same mounting system. Only one system needs to be specified.*

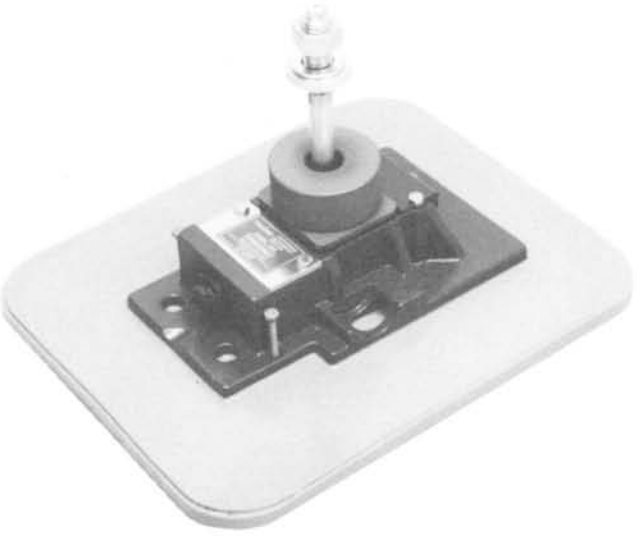
UNISORB AKII AGILE FIXATOR® - APPLICATION METHODS

TOGGLE CLAMP WITH CAPSULE ANCHOR STUDS



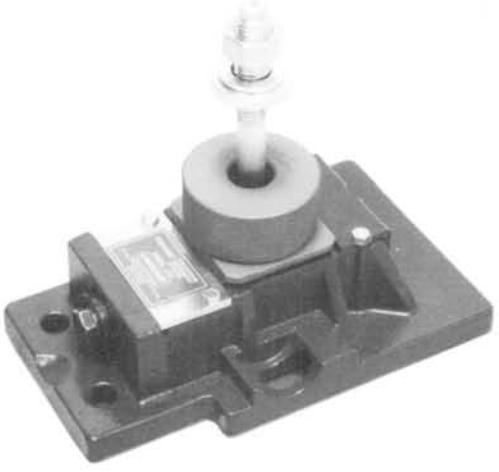
See Figure 4

"WES" CENTER ANCHOR STUD



See Figure 6

"STE" CENTER BOLT - FREE STANDING
"STE" CENTER BOLT - GLUE DOWN
CENTER CAPSULE ANCHOR STUD



See Figures 1, 2 & 5

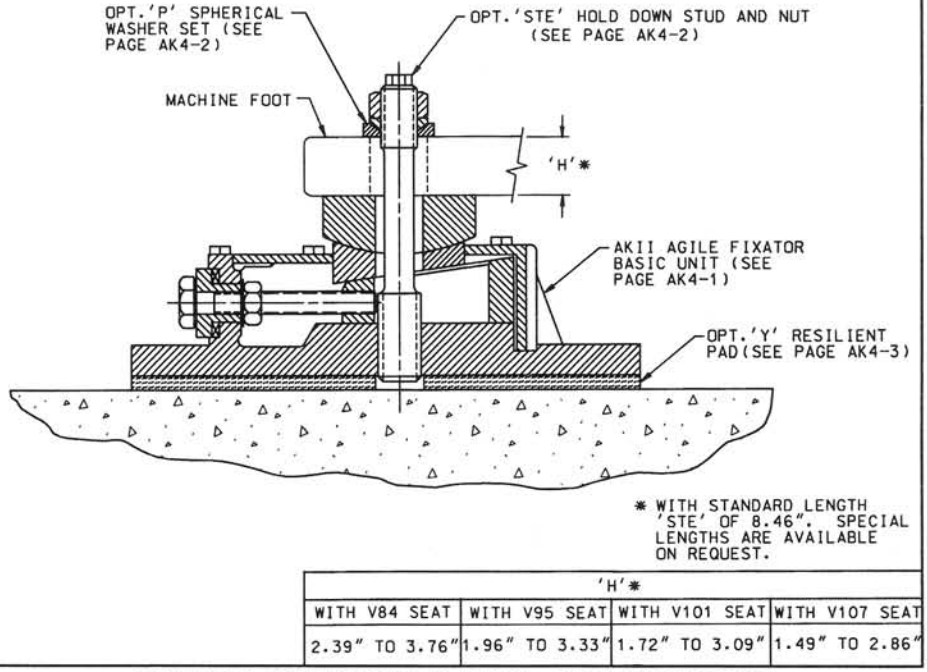
SIDE CAPSULE ANCHOR STUDS

See Figure 3

AKII AGILE FIXATOR® SYSTEM SPECIFICATIONS	
Description	**Dimensions**
Recommended machine dead weight	4,400 lbs.
Maximum allowable lifting load per Fixator®	26,500 lbs.
Spring Constant	22,800,000 lb./in.
Minimum available overall height	3.31 in.
Approximate torque required to turn adjusting screw	1 ft. lb./1000 lbs. load
Maximum allowable torque on adjusting screw	29 ft. lb.
Vertical adjustment per revolution of height adjusting screw	0.010 in.
Maximum vertical adjustment	0.200 in.
Minimum height with v = 84 Spherical Seat	3.31 in.
Minimum height with v = 95 Spherical Seat	3.74 in.
Minimum height with v = 101 Spherical Seat	3.98 in.
Minimum height with v = 107 Spherical Seat	4.21 in.
Total overall height range with standard components	1.10 in.
Base area of basic unit	59.4 sq. in.
Weight of basic unit	19.2 lbs.
Weight of Toggle Clamp	13.4 lbs.
Approximate torque on anchor bolt nut at yield point of bolt	217 ft. lbs.
Approximate tension on anchor bolt at yield point	19,800 lbs.
Anchor specifications with uplift resistance:	
With side anchors	19,800 lbs.
With Toggle Clamp	12,000 lbs. max.
With 'wes' center anchor	19,800 lbs.
With 'wcs' center anchor	12,000 lbs.
Resilient pad specifications:	
Stiffness with 6 mm thick pad	2,000,000 lbs./in. min.
Stiffness with 2 mm thick pad	6,000,000 lbs./in. min
Coefficient of friction	>0.7
Internal damping coefficient	>0.15

Figure 1.

This method of installation simply sets the AKII Agile Fixator® on the Opt. 'Y' Resilient Pad. The pad has a coefficient of friction of approximately .70 which will quite effectively prevent the Fixator® from walking. The pad is available in either a 2 mm or 6 mm thickness. The standard pad is supplied in 90 durometer, but different durometers are available on a special order basis (contact Unisorb Engineering). An Opt. 'STE' Hold Down Stud is used to secure the Fixator® to the machine foot. This method should be used when some degree of vibration isolation is desired, and when extremely close tolerances are not a consideration.

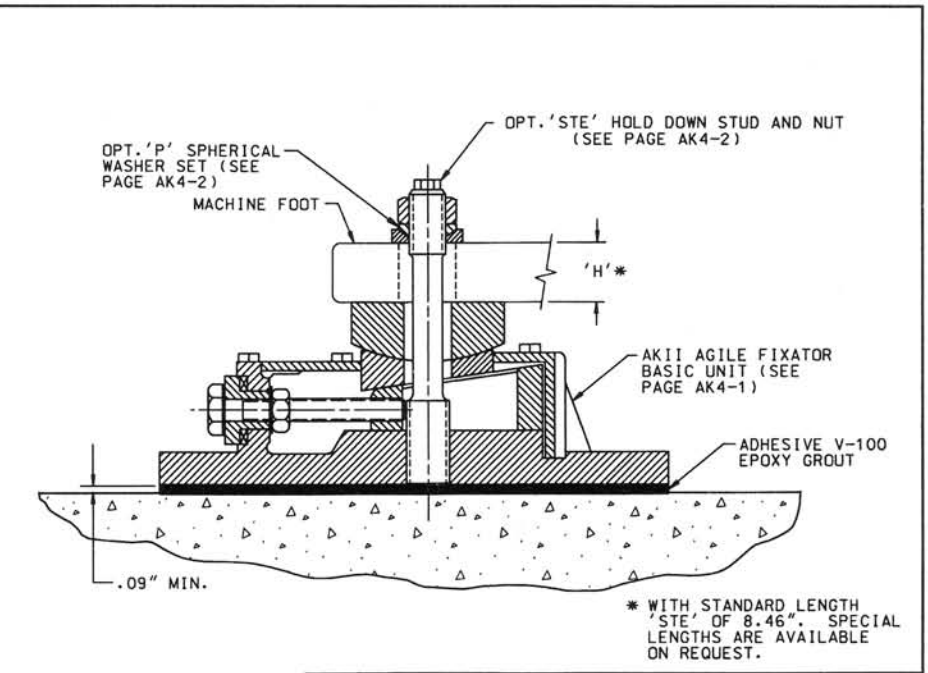


'H'*			
WITH V84 SEAT	WITH V95 SEAT	WITH V101 SEAT	WITH V107 SEAT
2.39" TO 3.76"	1.96" TO 3.33"	1.72" TO 3.09"	1.49" TO 2.86"

FIGURE 1. 'STE' CENTER BOLT - FREE STANDING

Figure 2.

This method of installation utilizes Unisorb® Adhesive V-100 Epoxy Grout applied beneath the Fixator®. Please note that a minimum thickness of .09" is recommended. This method also uses the Opt. 'STE' Hold Down Stud. This stud is capable of stretching to allow adjustment after the anchor nut is tightened. This method provides a simple and inexpensive, relatively secure installation without disturbing the floor. Please note that this method provides no option for vibration isolation.



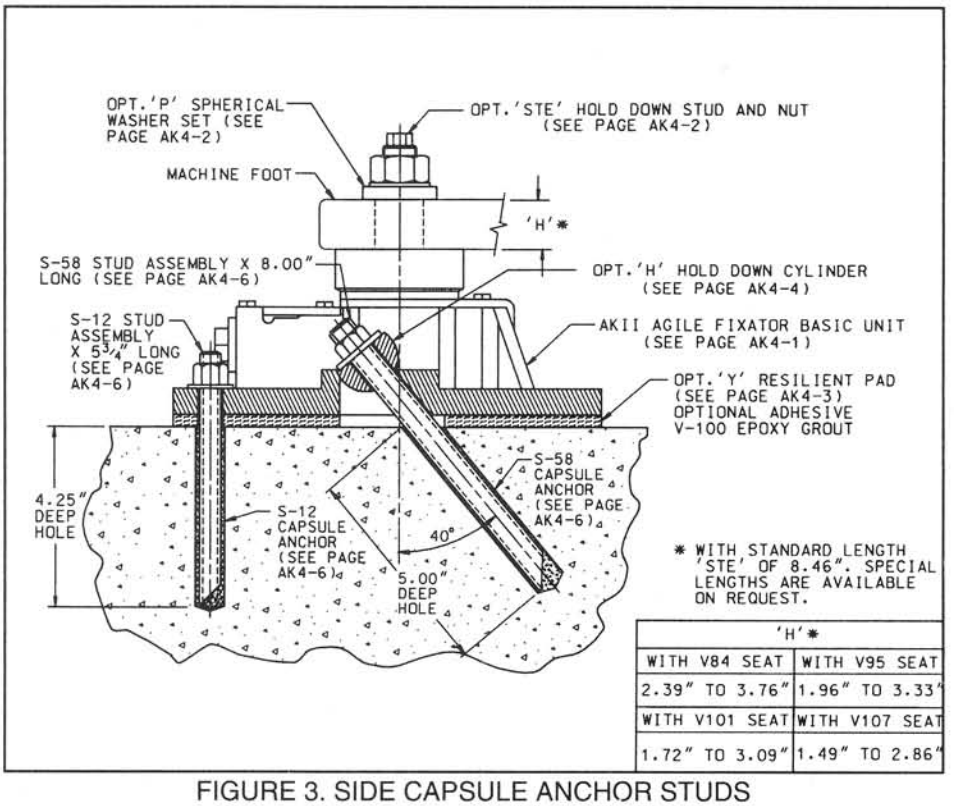
'H'*			
WITH V84 SEAT	WITH V95 SEAT	WITH V101 SEAT	WITH V107 SEAT
2.39" TO 3.76"	1.96" TO 3.33"	1.72" TO 3.09"	1.49" TO 2.86"

FIGURE 2. 'STE' CENTER BOLT - GLUE DOWN

AK FIXATOR® INSTALLATION METHODS

Figure 3.

This method of installation utilizes four (4) Unisorb® Capsule Anchors and Stud Assemblies with two (2) located on each side of the Fixator®. The anchors may be installed after the Fixator® is in place. See instructions on installing these anchors. This method also uses the Opt. 'STE' Hold Down Stud, and may use either the Opt. 'Y' Resilient Pad or the Adhesive V-100 Epoxy Grout beneath the Fixator®.

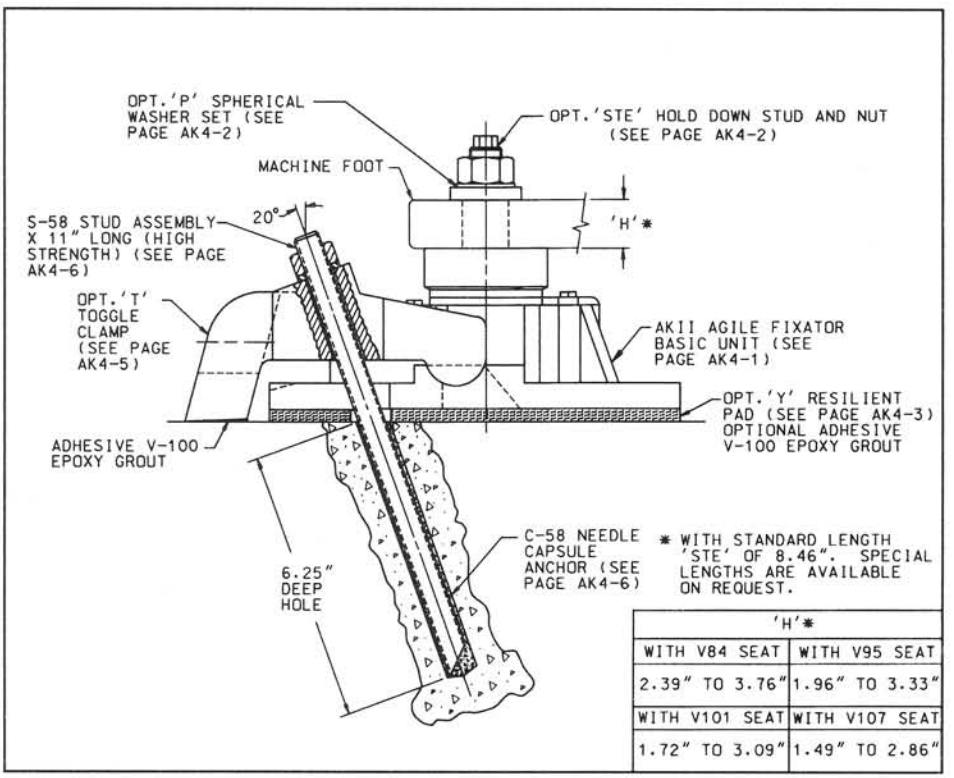


'H'*	
WITH V84 SEAT	WITH V95 SEAT
2.39" TO 3.76"	1.96" TO 3.33"
WITH V101 SEAT	WITH V107 SEAT
1.72" TO 3.09"	1.49" TO 2.86"

FIGURE 3. SIDE CAPSULE ANCHOR STUDS

Figure 4.

This method of installation utilizes the Unisorb® Toggle Clamp to hold down the Fixator®. The Toggle Clamp is held down with two (2) Unisorb® Capsule Anchors and Stud Assemblies, one located on each side. See instructions on installing these anchors. This method also uses the Opt. 'STE' Hold Down Stud, and may use either the Opt. 'Y' Resilient Pad or the Adhesive V-100 Epoxy Grout beneath the Fixator®.



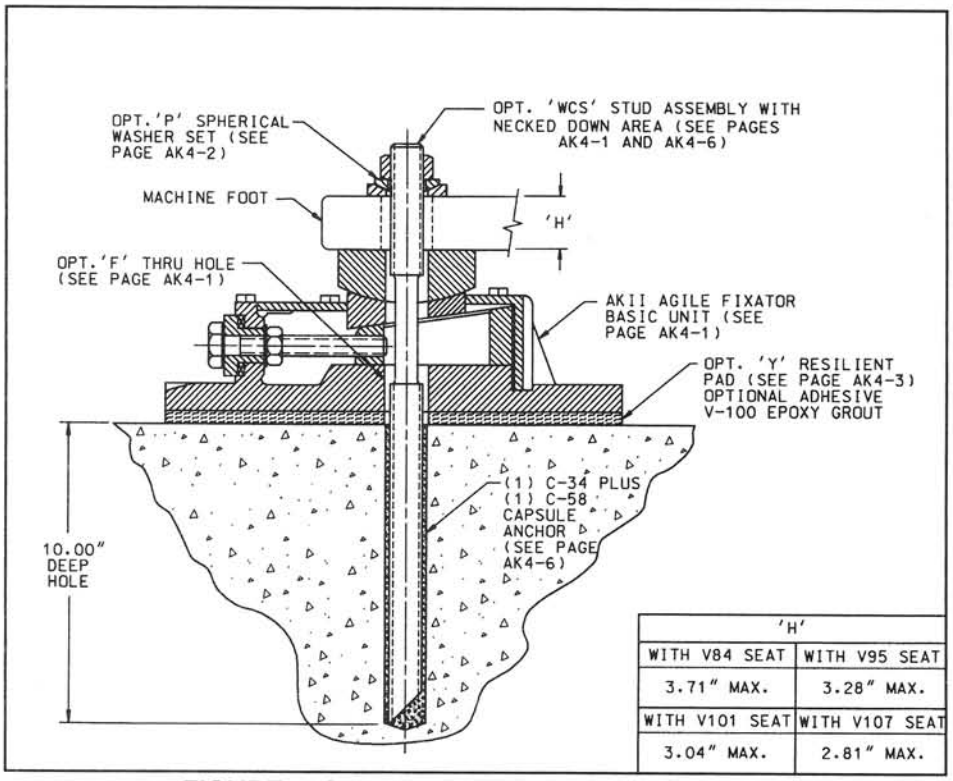
'H'*	
WITH V84 SEAT	WITH V95 SEAT
2.39" TO 3.76"	1.96" TO 3.33"
WITH V101 SEAT	WITH V107 SEAT
1.72" TO 3.09"	1.49" TO 2.86"

FIGURE 4. TOGGLE CLAMP WITH CAPSULE ANCHOR STUDS

AK FIXATOR® INSTALLATION METHODS

Figure 5.

This method of installation utilizes a single, center mounted Unisorb® Capsule Anchor and Stud Assembly to securely fasten the Fixator® to the floor. The Capsule Anchor and Stud Assembly may be installed either before or after the Fixator® is in place. The recommended practice, however, is to install the anchor prior to placing the Fixator®. This installation method utilizes either the Opt. 'Y' Resilient Pad or the Adhesive V-100 Epoxy Grout and may be utilized only if access to the center stud anchoring location is available.

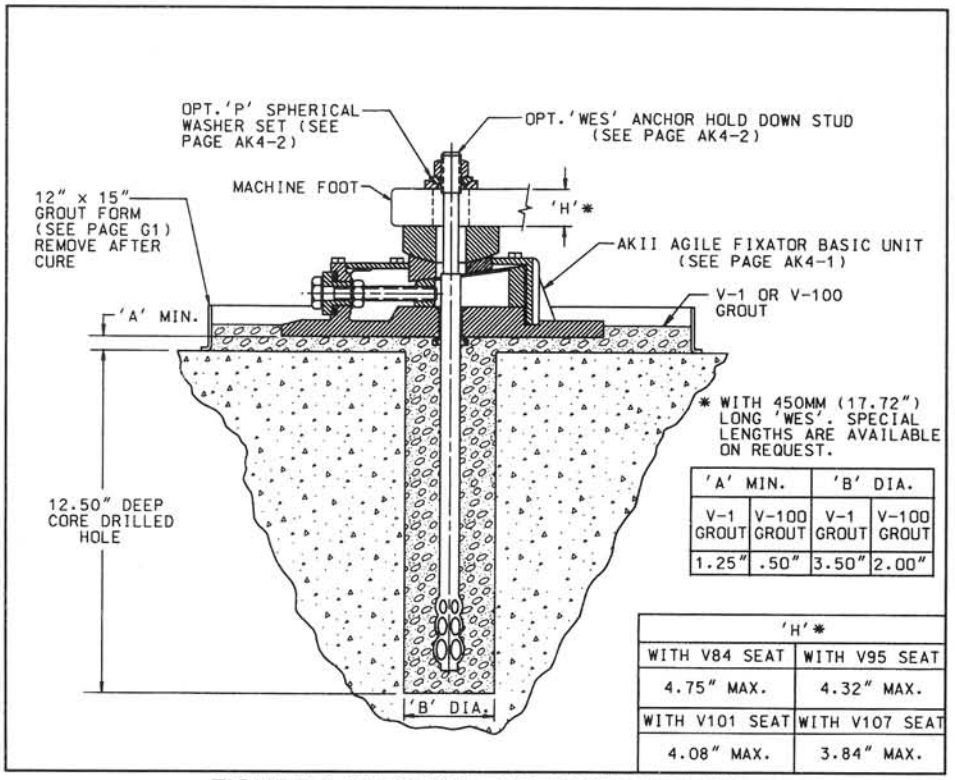


'H'	
WITH V84 SEAT	WITH V95 SEAT
3.71" MAX.	3.28" MAX.
WITH V101 SEAT	WITH V107 SEAT
3.04" MAX.	2.81" MAX.

FIGURE 5. CENTER CAPSULE ANCHOR STUD

Figure 6.

This method of installation utilizes a single, center mounted Unisorb® Opt. 'WES' Anchor Hold Down Stud. This stud is placed into a core drilled hole and secured with either Unisorb® V-1 cementitious or Standard V-100 Epoxy Grout. A Unisorb® 12" x 15" Grout Form is used with this configuration. This method provides the most secure anchoring of all, and is recommended when very close tolerances are required to be held, and when access to the center anchoring location is available. Please note that this method provides no option for vibration isolation.

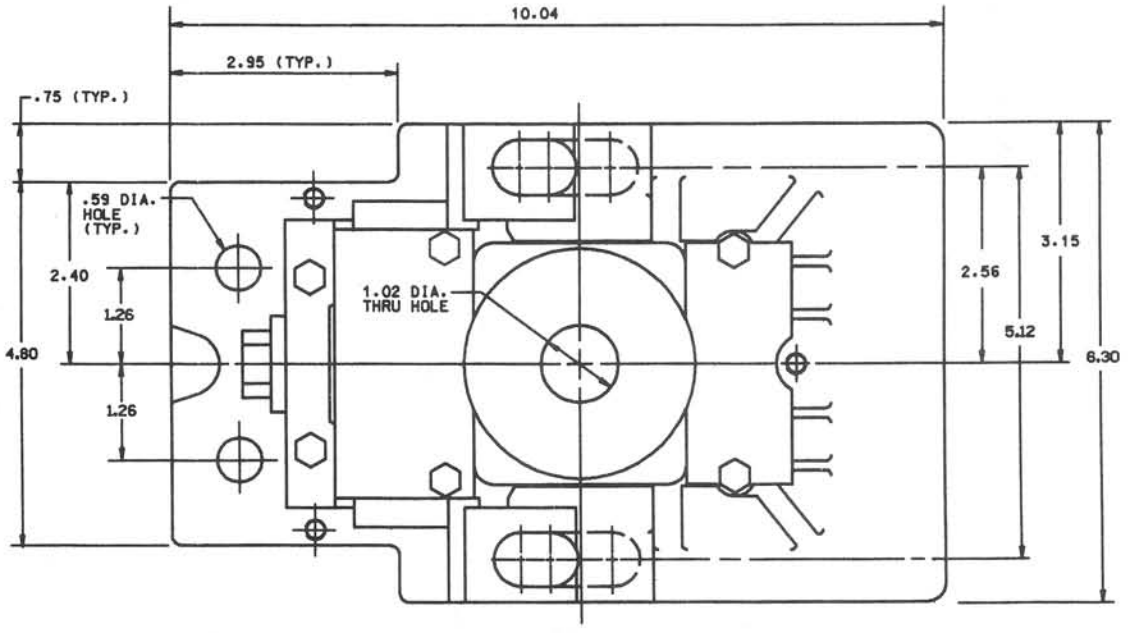


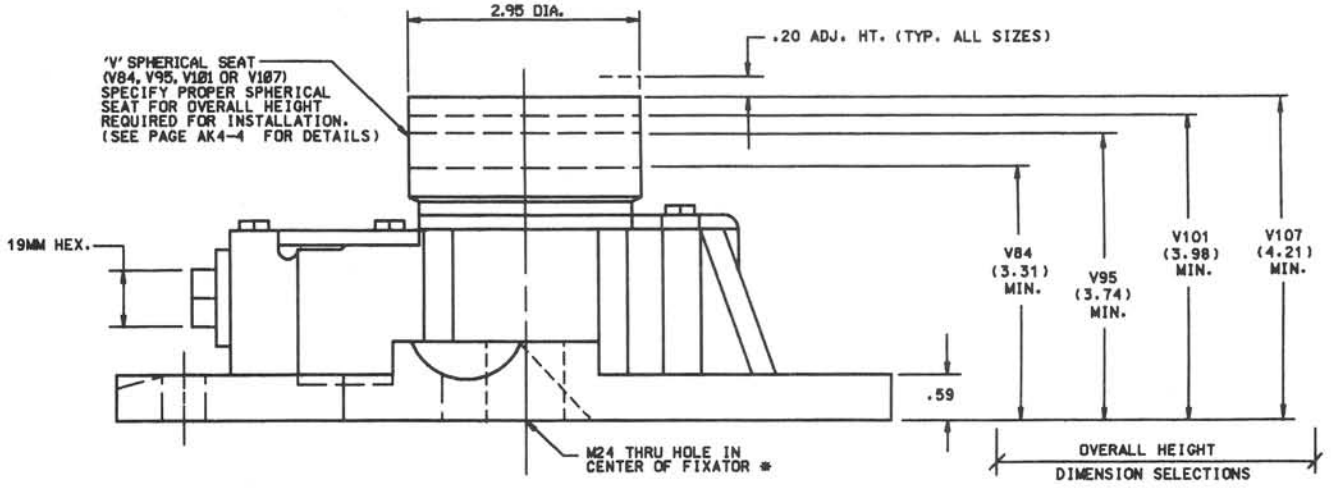
'A' MIN.		'B' DIA.	
V-1 GROUT	V-100 GROUT	V-1 GROUT	V-100 GROUT
1.25"	.50"	3.50"	2.00"

'H'*	
WITH V84 SEAT	WITH V95 SEAT
4.75" MAX.	4.32" MAX.
WITH V101 SEAT	WITH V107 SEAT
4.08" MAX.	3.84" MAX.

FIGURE 6. 'WES' CENTER ANCHOR STUD

AK FIXATOR® OPTION DETAIL



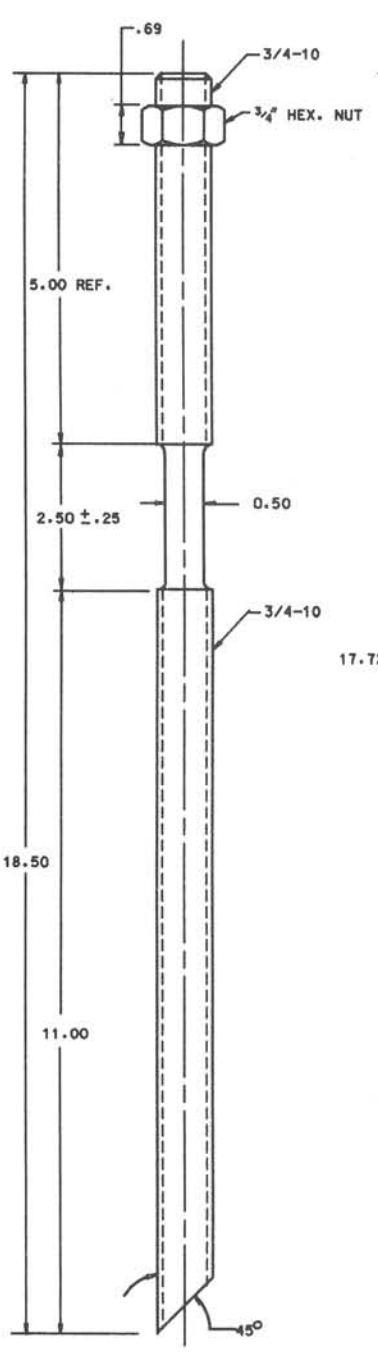


* OPT. 'F' (.94 DIA. THRU HOLE)
TO BE USED FOR CONFIGURATION
SHOWN IN FIGURE 5.

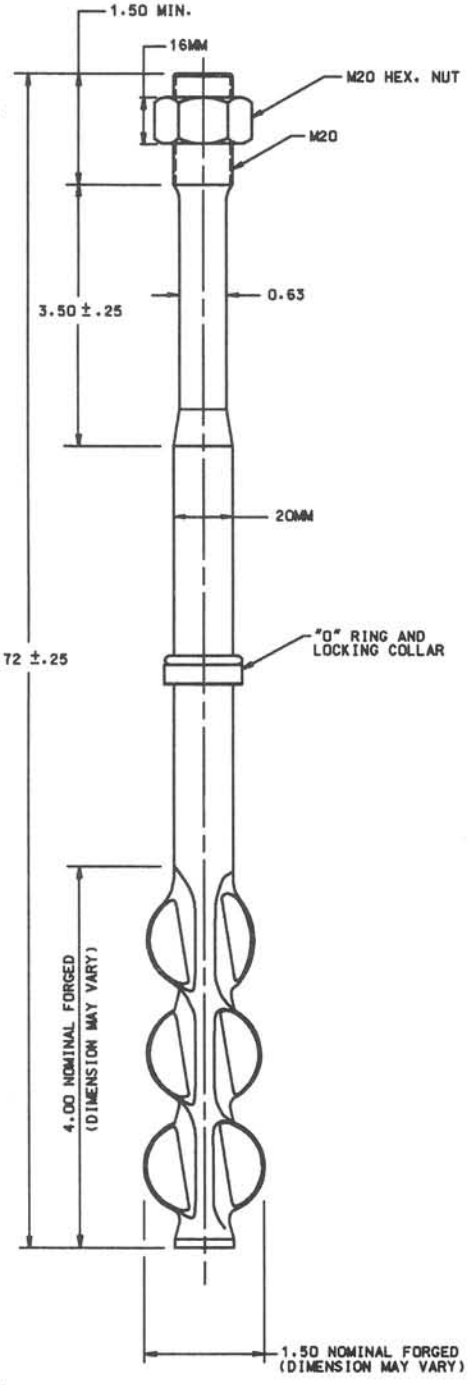
AKII AGILE FIXATOR BASIC UNIT

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED.

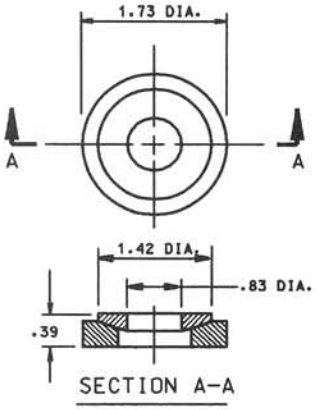
AK FIXATOR® OPTION DETAIL



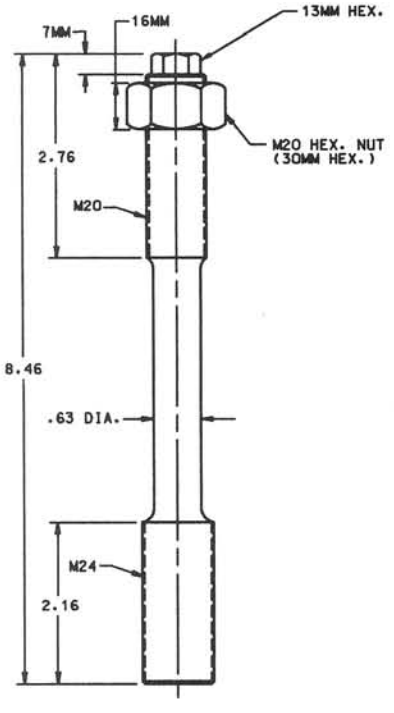
OPTION S-34 STUD ASSEMBLY
WITH NECKED DOWN AREA



OPTION 'WES'
ANCHOR HOLD DOWN STUD



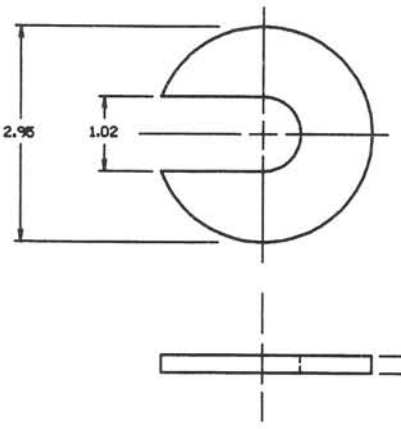
OPTION 'P'
SPHERICAL WASHER SET



OPTION 'STE'
HOLD DOWN STUD

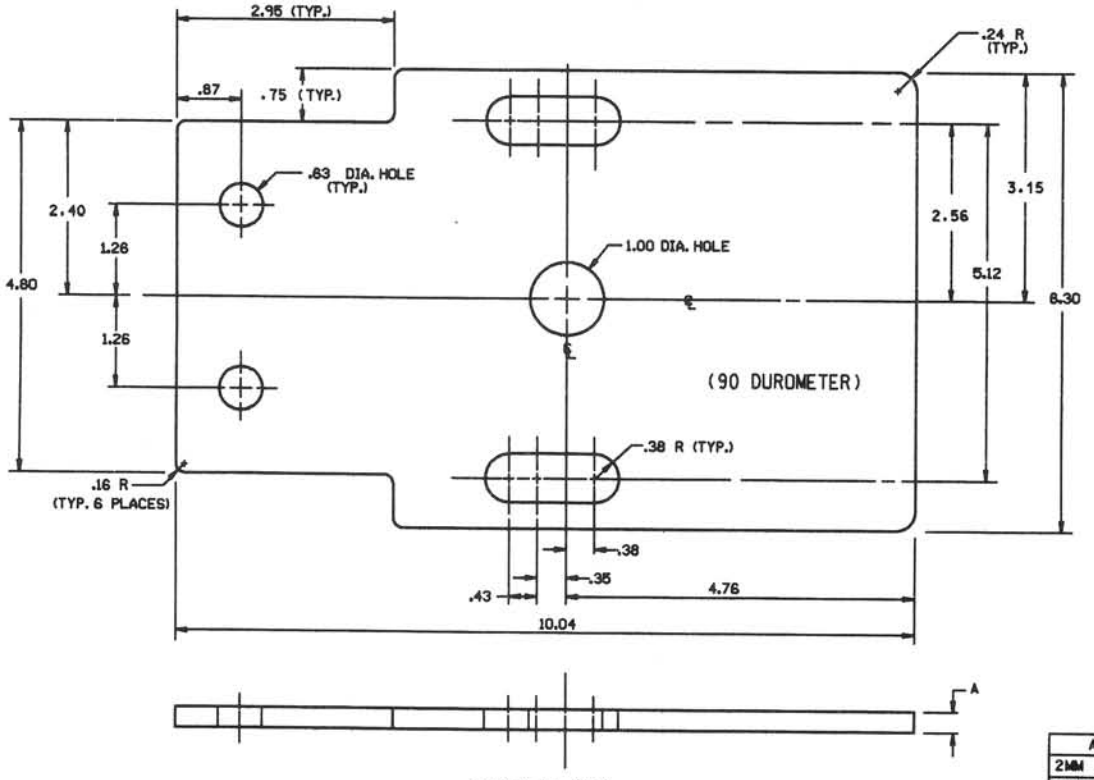
DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED.

AK FIXATOR® OPTION DETAIL



** SHIMS TO BE USED WHERE NECESSARY TO ADJUST OVERALL HEIGHT. CUSTOMER SHOULD ORDER APPROPRIATELY FOR PROJECT SIZE.

OPTION 'Q'
SHIM **



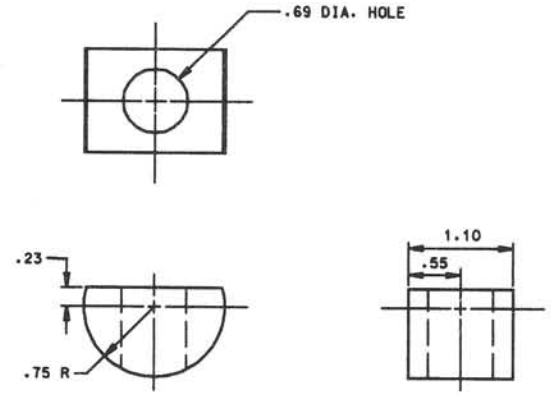
A *
2MM (.08")
6MM (.24")

* SPECIFY REQUIRED THICKNESS

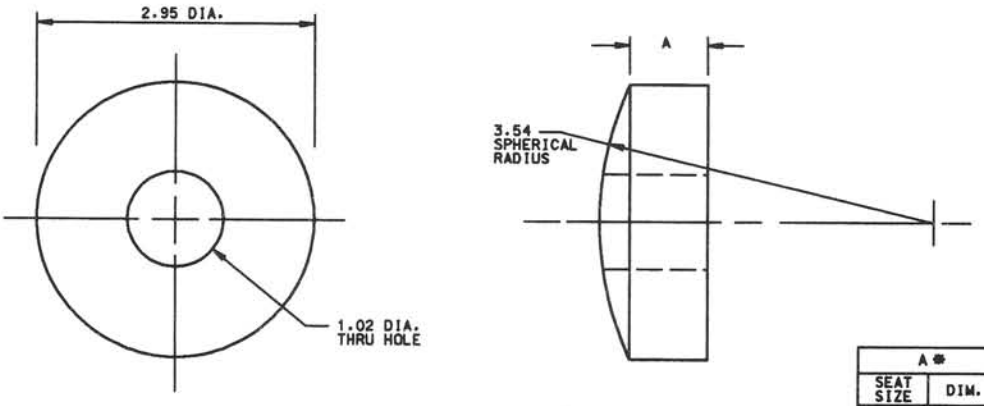
OPTION 'Y'
RESILIENT PAD

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

AK FIXATOR® OPTION DETAIL



OPTION 'H'
HOLD DOWN CYLINDER



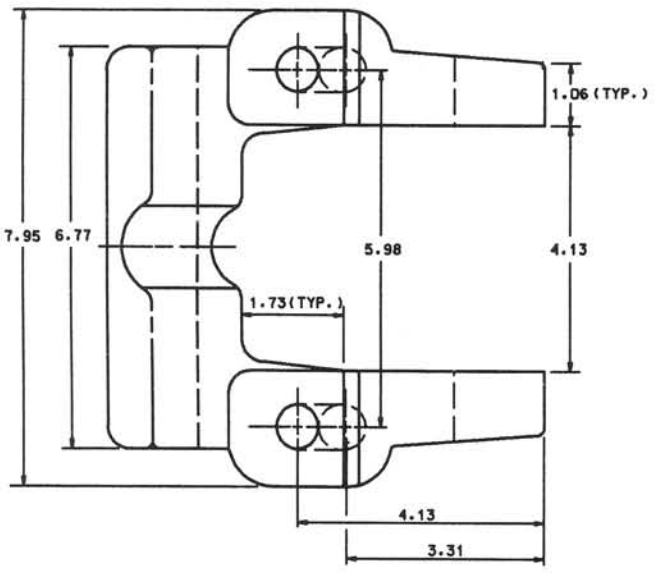
OPTION 'V'
SPHERICAL SEAT

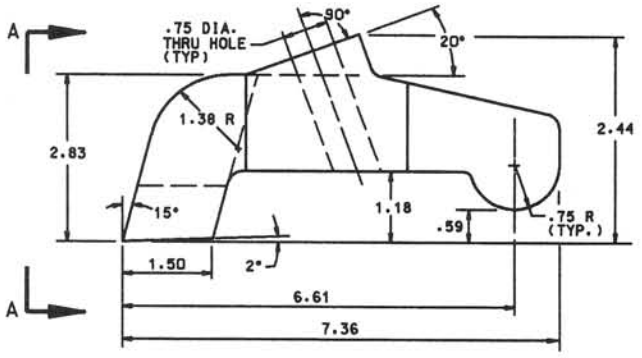
A *	
SEAT SIZE	DIM.
V84	.50
V95	.83
V101	1.07
V107	1.31

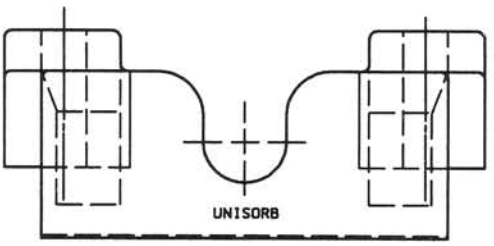
* SPECIFY PROPER SPHERICAL SEAT FOR OVERALL HEIGHT REQUIRED FOR INSTALLATION. (SEE PAGE AK FOR ASSEMBLY)

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

AK FIXATOR® OPTION DETAIL







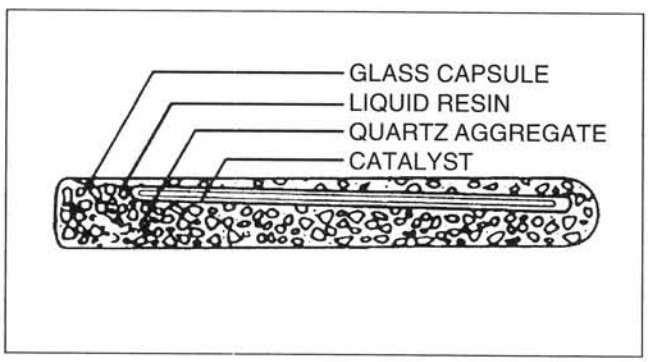
VIEW A–A

OPTION 'T'
TOGGLE CLAMP

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED.

UNISORB® CAPSULE ANCHOR SYSTEMS
WITH STUD ASSEMBLY

The Unisorb® Capsule Anchor with Stud Assembly offers tremendous holding power which is stronger than the concrete itself. A graded blend of quartz agregate transfers the pullout forces into the concrete. Since there are no expansive forces from the anchor systems, they can be placed near the foundation edges, chip troughs, coolant trenches or wireways. High anchor-to-concrete strengths are developed which allow smaller anchor holes and smaller studs to be used than is possible with conventional expanding anchor type systems.



SPECIFICATIONS						
ANCHOR SIZE*	CAPSULE NUMBER	DRILL DIAMETER*	HOLE DEPTH*	ANCHOR NO. & LENGTH*	†ULTIMATE TENSILE LOAD	ULTIMATE SHEAR LOAD
3/8	C-38	7/16	3 1/2	S-38x5 1/8	7,820 lbs.	6,480 lbs.
1/2	C-12	9/16	4 1/4	S-12x6 1/2	13,435 lbs.	11,120 lbs.
5/8	C-58	11/16	5	S-58x7 5/8	20,585 lbs.	17,650 lbs.
5/8	C-58**	11/16	6 1/4	S-58x11***	34,780 lbs.	17,650 lbs.
3/4	C-34	7/8	6 5/8	S-34x9 1/2	27,400 lbs.	27,385 lbs.
7/8	C-78	1	7	S-78x10 1/4	35,090 lbs.	36,065 lbs.
1	C-100	1 1/4	8 1/4	S-100x12	47,800 lbs.	53,135 lbs.
1 1/4	C-114	1 1/2	10 1/4	S-114x15	70,100 lbs.	68,000 lbs.

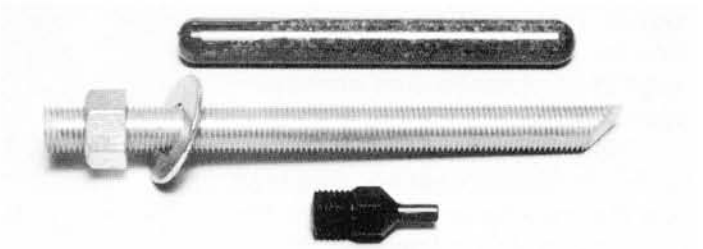
*All dimensions in inches. **Needle Capsule ***High Strength Stud

MINIMUM CURETIMES	
CONCRETE TEMPERATURE	CURE TIME
Over 68°F (20° C)	20 Minutes
50°F to 68°F (10° to 20° C)	30 Minutes
32°F to 50°F (0° to 10° C)	1 Hour
23°F to 32°F (-5° to 0° C)	5 Hours

†ULTIMATE TENSILE LOAD TEST DATA

Test results using 4,000 PSI concrete are given as a guide only. It is recommended that tests to simulate actual conditions be carried out to determine the suitability of Capsule Anchors for particular applications.

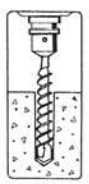
To order specify capsule, stud and drive unit.



The Unisorb® Capsule Anchor with Stud Assembly is a superior method of heavy duty anchoring using a high strength adhesive to retain a threaded rod and other materials such as rebar, in concrete and other masonry material. The system consists of a glass capsule containing the proper proportion of base resin, hardener and aggregate for the anchor, appropriate length stud with washer and nut, and a drive unit to allow the stud to be installed with a standard hammer drill.

INSTALLATION INSTRUCTIONS

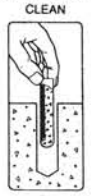
1. Drill a clearance hole for the insert using a rotary hammer drill or core drilling equipment. Refer to the chart for proper diameter and depth for each anchor size and standard stud material (50,000 psi). Drill deeper holes when using high tensile strength studs or when close to the foundation edge, chip troughs or have extremely close spacing.


DRILL

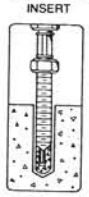
2. Thoroughly clean the holes. Excessive dust will reduce the holding power of the anchor. For best results blow out the concrete dust using compressed air or flush out with water. The strength of the bond will not be affected by wet or damp holes.


CLEAN

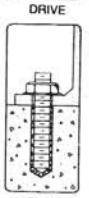
3. Insert the capsule anchor.


INSERT

4. Assemble the drive unit into the hammer drill. Thread the nut onto the stud about one diameter and insert the stud into the drive unit. The drive unit should shoulder on the nut for ease of removal. Drive the point end into the capsule. This action will break the glass tube and mix the components. Turn the drill off immediately when the stud is fully inserted.


DRIVE

5. Allow the anchor to cure about 1 1/2 minutes without disturbing the drive unit. Two or more drive units may be convenient for larger jobs. Remove the drill unit by placing a wrench on the drive unit and another on the nut. Loosen, being careful not to disturb the stud. Allow the anchor to cure for the minimum time before using.


CURE

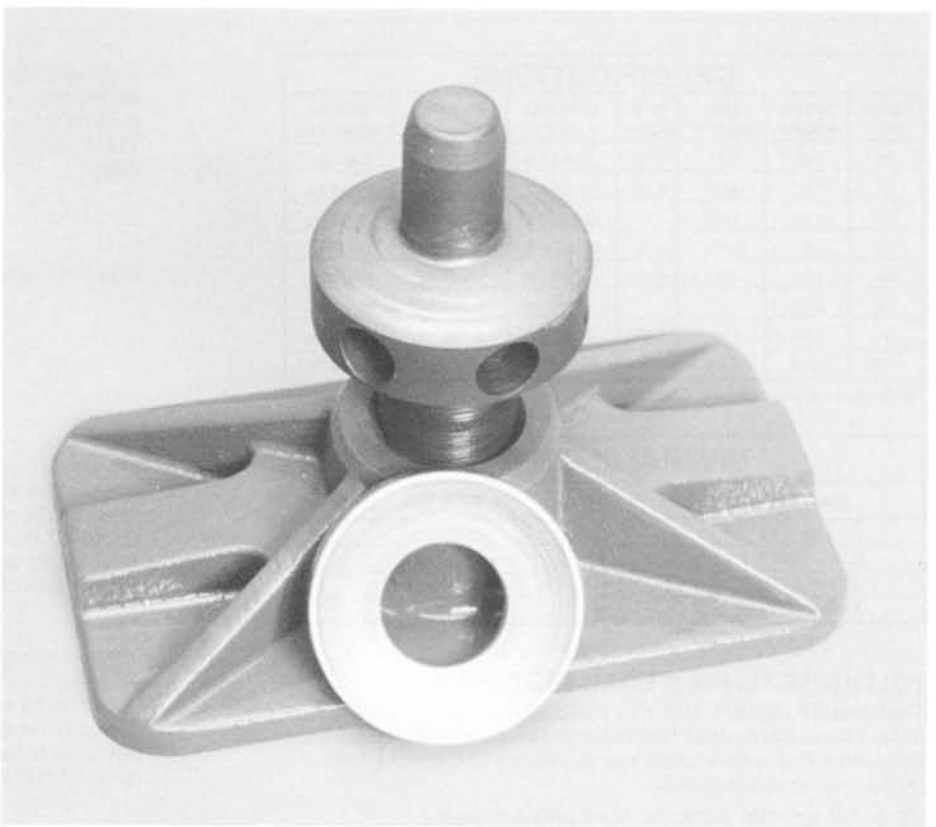
DS FIXATOR® DESCRIPTION & DIMENSIONS

MODEL DS FIXATOR®

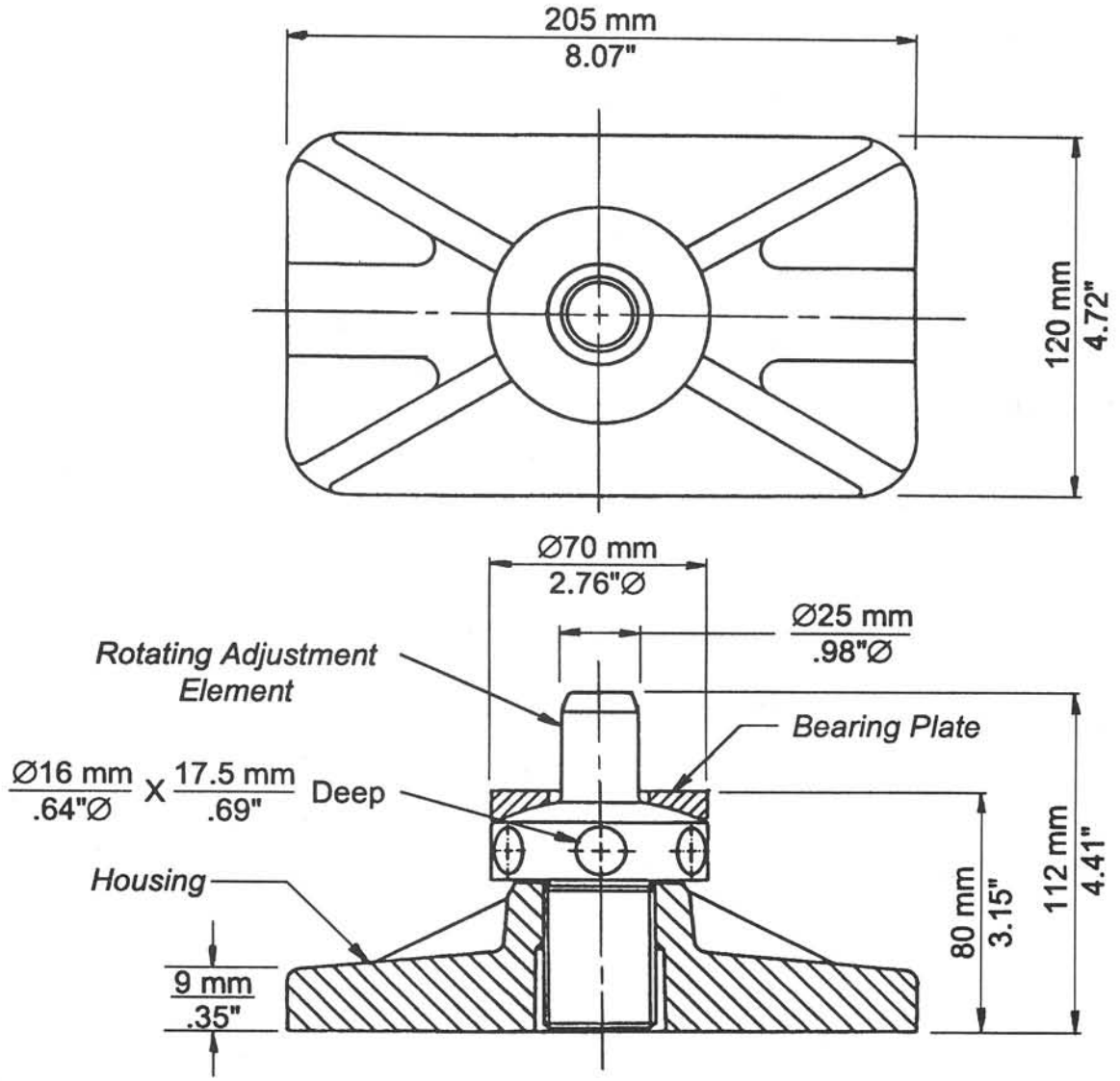
The Model DS Fixator® is designed to be used as a leveling device for machinery which require a large leveling range, and where pinpoint accuracy is not required.

The DS Fixator has a round rotating adjustment element, threaded into the housing below it, and a top plain stud which is intended to protrude into the mounting hole of the machine foot. The adjustment element has six holes for inserting a steel rod for adjustment from the side of the machine, under the mounting foot. The top portion of the adjustiment element has a spherical seat, and a bearing plate with a spherical bottom surface is placed on top of it. This spherical seat design corrects for out-of-level conditions on the machine foot.

The device acts as a free-standing leveling jack, and can be equipped with an anti-vibration pad if required.



DS FIXATOR® DESCRIPTION & DIMENSIONS



TECHNICAL SPECIFICATIONS

MAXIMUM ALLOWABLE LOAD	25 KN	/	5,620 LBS.
LEVELING TORQUE	40 Nm/to	/	13.4 FT. LBS. / 1000 LBS.
VERTICAL ADJUSTMENT PER TURN	1,5 mm	/	.06"
MAXIMUM VERTICAL ADJUSTMENT	30 mm	/	1.18"
WEIGHT	ca.4 Kg	/	8.8 LBS.

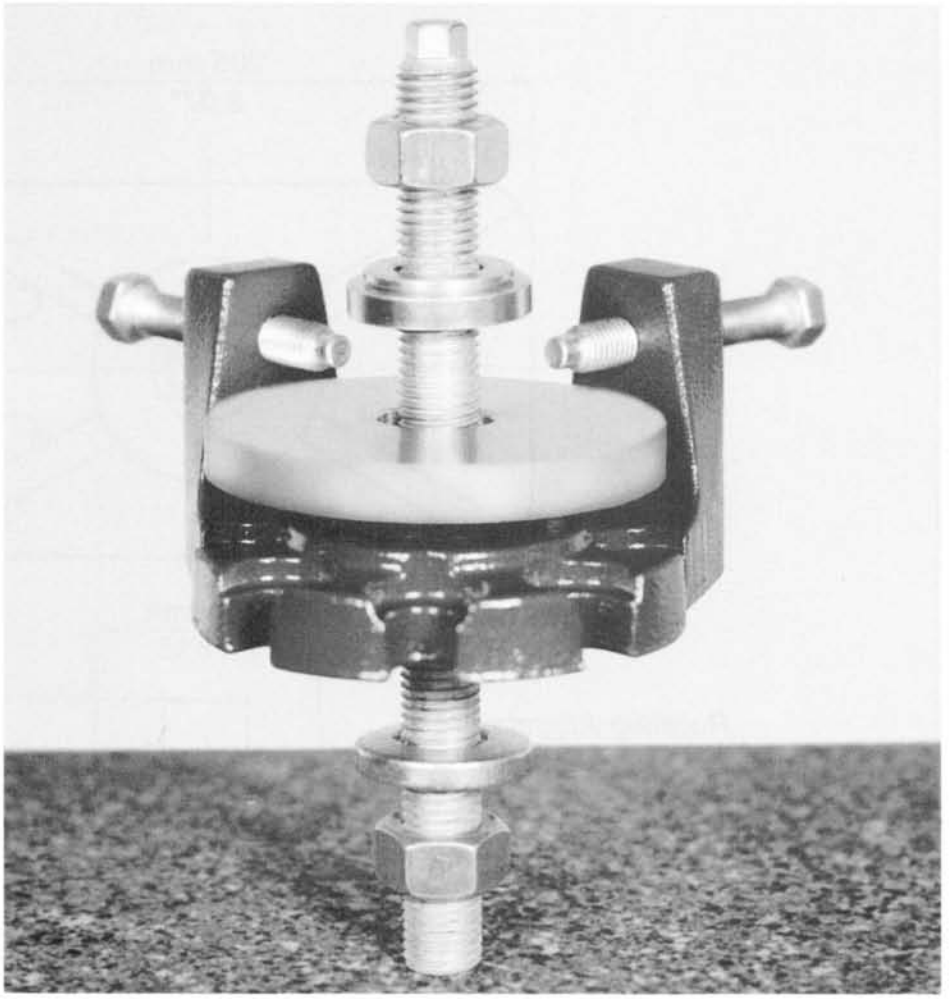
MS FIXATOR® DESCRIPTION & DIMENSIONS

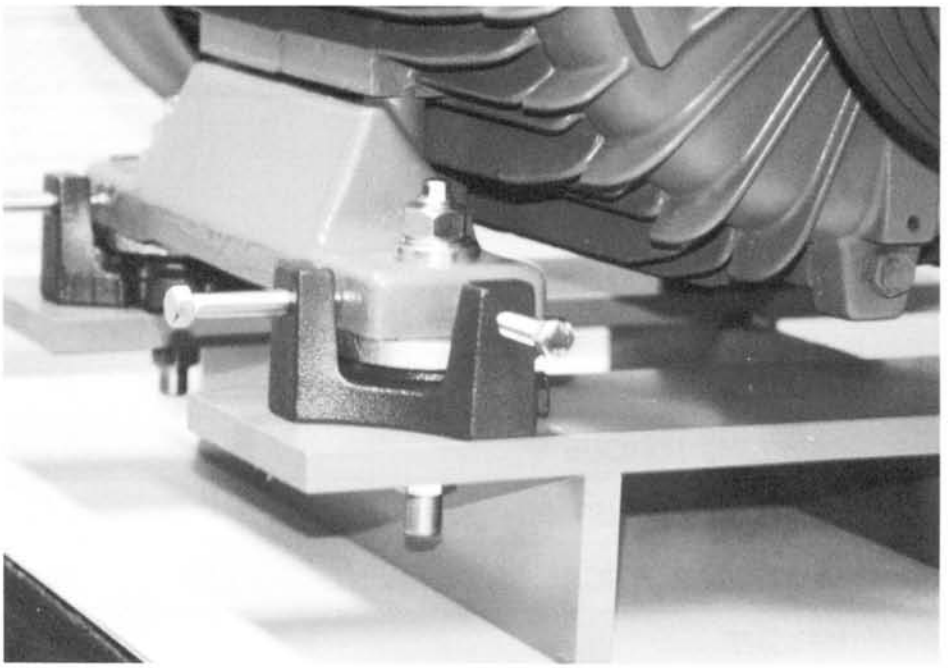
MODEL MS FIXATOR®

The Model MS Fixator® is designed for vertical and lateral alignment and anchoring of electric motors, pumps, compressors, cooling apparatus and many other applications.

The MS Fixator® comes in five sizes: MSIa40, MSIIa60, MSIIa80, MSIIIa110, and MSIIIa150 as shown in the chart on the next page. It has two lateral adjusters providing positive horizontal positioning. Vertical alignment is accomplished from the top with a threaded element. To ensure positive support the bearing plate incorporates a spherical seat.

Normally the Model MS Fixator® will be fastened to the steel base frames of such machines as described above. It can also be adapted to concrete pedestal installations.

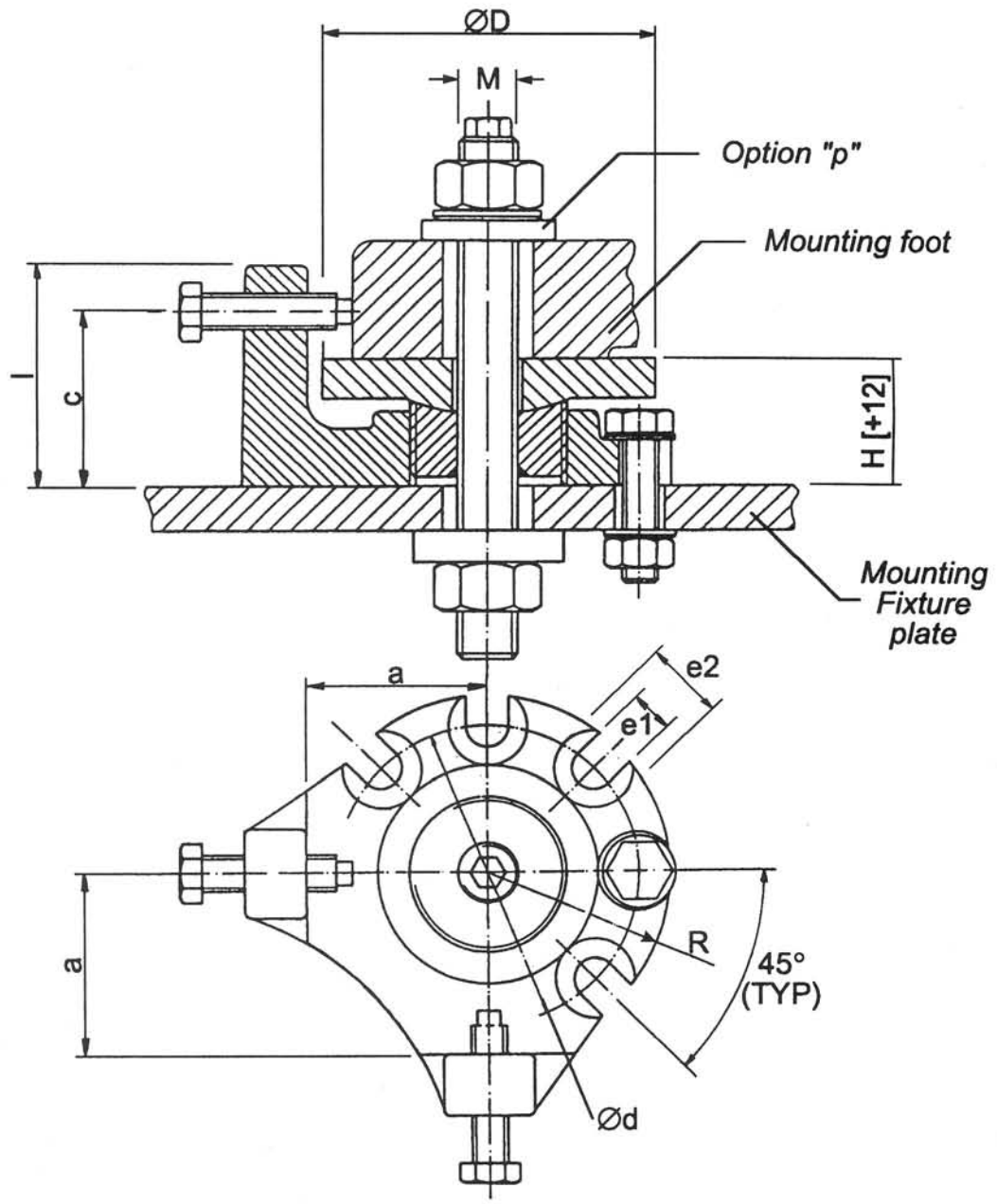




ALIGNMENT PROCEDURES

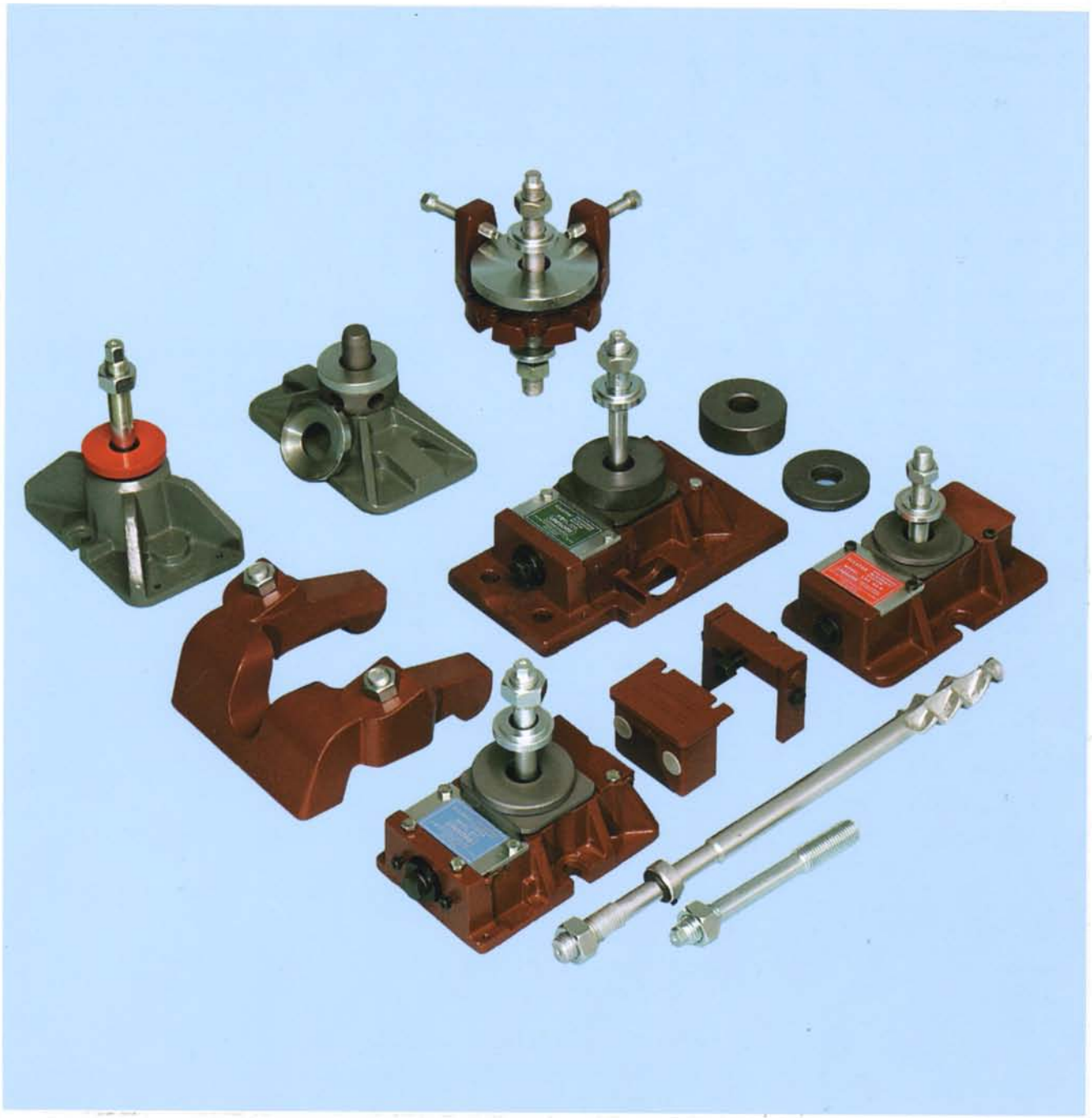
1. Lower the motor or machine onto the MS Fixator®.
2. Align first in the vertical direction (without tightening nuts at the leveling bolt.)
3. Tighten the lower nut on the anchor bolt or stud against the base frame.
4. Align the machine in the lateral direction.
5. Tighten the upper nut to secure the motor or machine.
6. Check the alignment.

MS FIXATOR® DESCRIPTION & DIMENSIONS



MS		a	ØD	H	M			l	c	Ød	R	e1	e2
Ia40	mm	40	70	40	12	16	20	68	56	85	50	12	23
	in.	1.58	2.76	1.58	.47	.63	.79	2.68	2.20	3.35	1.97	.47	.91
IIa60	mm	60	110	40	16	20	24	75	58	100	60	14	26
	in.	2.36	4.33	1.58	.63	.79	.94	2.95	2.28	3.94	2.36	.55	1.02
IIa80	mm	80	150	40	16	20	24	75	58	100	60	14	26
	in.	3.15	5.91	1.58	.63	.79	.94	2.95	2.28	3.94	2.36	.55	1.02
IIIa110	mm	110	210	50	24	30	36	80	60	140	80	18	32
	in.	4.33	8.27	1.97	.94	1.18	1.42	3.15	2.36	5.51	3.15	.71	1.26
IIIa150	mm	150	210	50	24	30	36	80	60	140	80	18	32
	in.	5.91	8.27	1.97	.94	1.18	1.42	3.15	2.36	5.51	3.15	.71	1.26

FIXATOR® SYSTEMS



LK FIXATOR® DESCRIPTION & SPECIFICATIONS

MODEL LK FIXATOR®

Model LK Fixators® were developed to complement the Model RK Fixators®, and to provide features that would make the use of Fixators® feasible where the RK Fixators® could or would not be used.

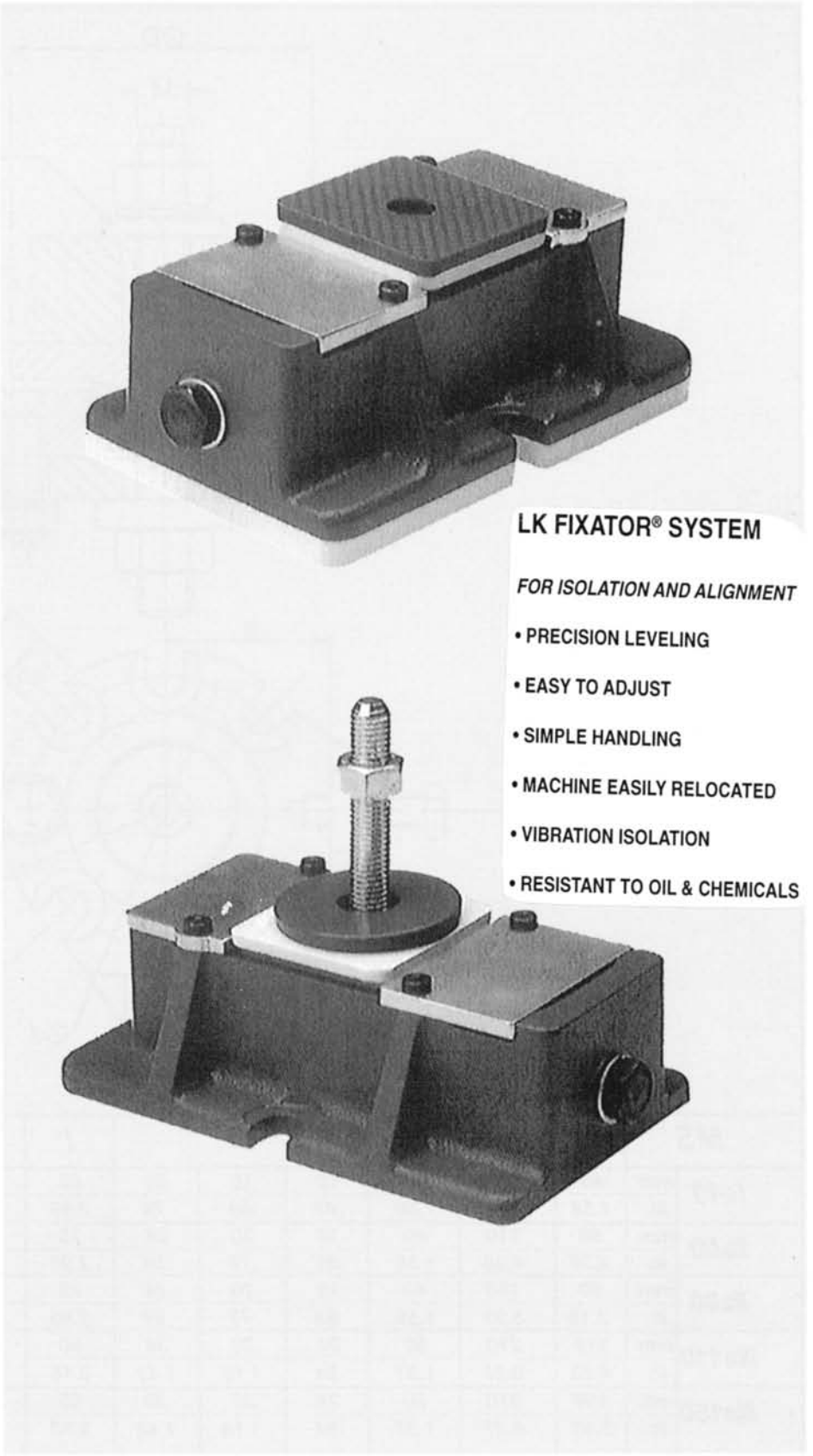
One of the features of the LK Fixator® is the option of having either a spherical top washer or a flat plastic square top plate for resting under the machine foot. These two design options are shown in the picture on the right, with the Model GA-D shown above, and Model GA-K shown below.

A non-skid vibration pad made of Polyurethane is available for attaching to the bottom of either model. This pad will serve to reduce vibrations as well as help fill in for rough or uneven concrete floor surfaces.

Another feature of the LK Fixators® is their economy. The LK Fixator® comes in three sizes, LKI, LKII, and LKIII. All three sizes are less expensive than their RK Fixator® counterparts.

Another advantage is that the height adjustment of the LK Fixator® exceeds that of the RK. For instance, the RKI maximum height adjustment is .20 inches, while the LKI height adjustment is .47 inches.

Unlike the RK Fixator®, however, the LK cannot be adjusted with the anchor nut tightened. It must be adjusted loosely, and then the nut must be securely tightened. The anchor bolts are not intended to be stretched, such as with the Model RK. This means that the leveling tolerances cannot be held as closely as with the RK. In applications where very precision leveling is not required, this Fixator® makes a good choice. The LK Fixator® is also good for mounting situations were no anchoring is desired, when used with the Polyurethane pad on the bottom.



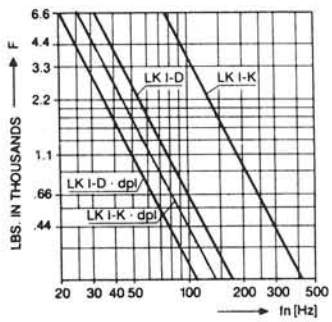
DESCRIPTION		Dim.	LK I	LK II	LK III
Recommended static load per mount (approx.)		lbs.	4,400	8,800	13,200
Maximum allowable lifting load per FIXATOR®		lbs.	6,600	12,100	18,700
Torque at Leveling Screw	Maximum	ft. lb.	16	28	45
	Recommended	ft. lb.	6	8	10
Vertical Adjustment per Screw Turn		in.	.016	.019	.017
Weight of the Basic Unit		lbs.	6.6	12.2	21.0

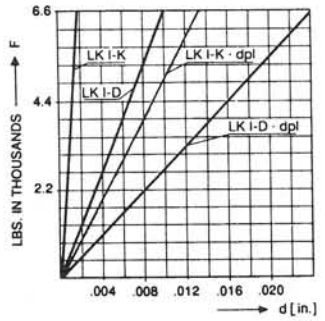
***IMPORTANT:** Do not level the LK FIXATORS® with anchor bolts already tightened.*

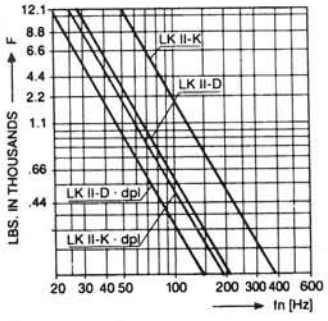
DETERMINING FIXATOR® SIZES

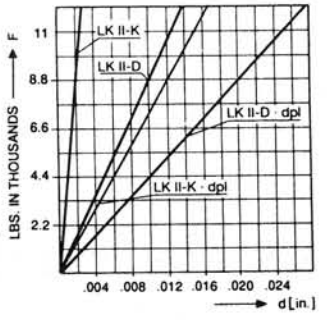
Divide the total load (machine weight and workpiece) by the number of mounting points to determine the average load per mount. Select a mount size with an equal or greater recommended static load. If exact weight distribution is known, refer to the maximum total allowable load rating for mount sizing.

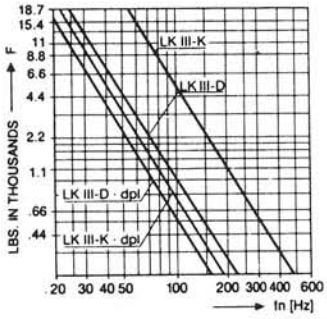
LOAD/DEFLECTION AND MOUNT NATURAL FREQUENCY DATA FOR FIXATORS® WITH ISOLATION PADS

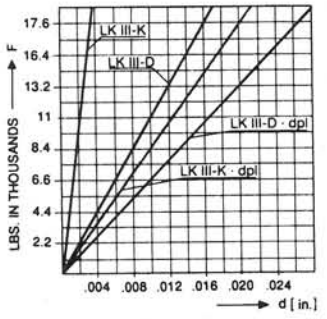












These curves are a result of static tests with Shore 87A hardness pads.

$$fn = \frac{3.13}{\sqrt{d}} \text{ Hz}$$

fn=natural frequency of the FIXATOR® and pad combination.

d=static deflection (in inches).

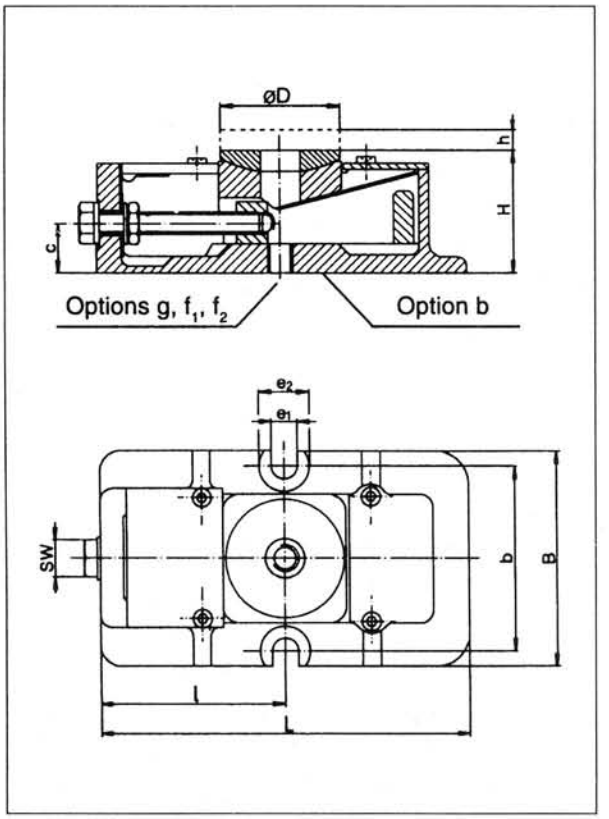
Consult UNISORB® Engineering for technical assistance and to discuss your individual application.

Manufacturer reserves the right to improve product without notice of technical modifications.

LK FIXATOR® DIMENSIONS

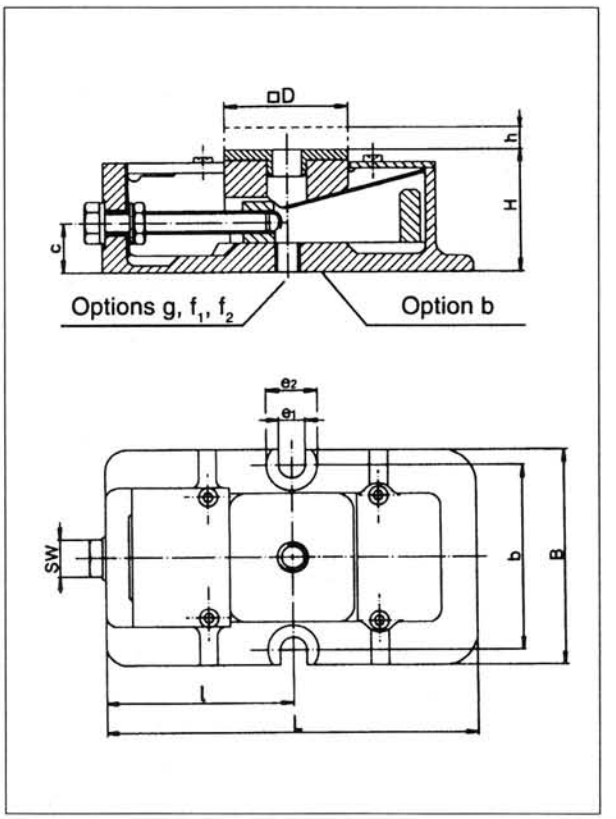
MODEL GA-K

Round, Spherical Top Seat



MODEL GA-D

Square, Flat Seat with Pad



DIMENSIONS												
SIZE LK	L	B	H	øD	□D	SW	h	l	b	e_1	e_2	c
I	6.69	3.94	2.28	2.17	2.28	.67	.47	3.35	3.35	.47	.91	.95
II	8.07	4.72	2.76	2.76	2.64	.75	.47	3.94	3.94	.55	1.02	1.10
III	9.45	5.51	3.15	3.54	3.54	.95	.47	4.84	4.72	.55	1.02	1.42

Option g, f_1, f_2

DIMENSIONS			
SIZE LK	g	$øf_1$	$øf_2$
I	M12	.51	.67
II	M16	.67	.75
III	M20	.83	.98

Option b

Machined bottom of the FIXATORS®. (The height H will be reduced about .078".)

Option f

Housing clearance hole.

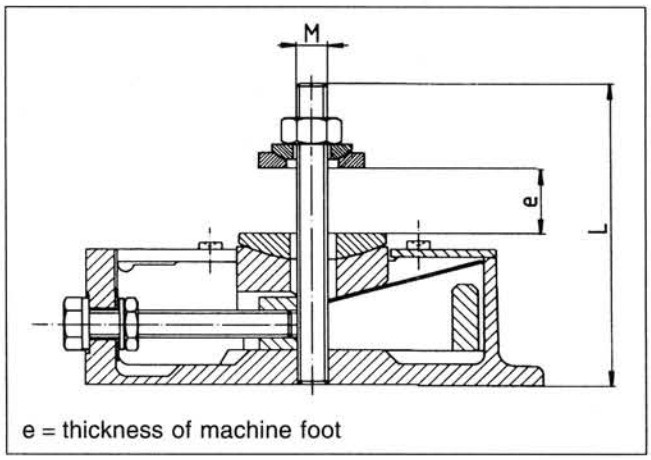
Option g

Tapped hole (standard).

Option ste

Stud Bolt for attaching the FIXATOR® to the machine. Specify dimension "e" in your order.

DIMENSIONS					
SIZE LK	M	L	e	Torque ft. lb.	Load lbs.
I	M12	5.12	1.58	24	2,200
II	M16	5.91	1.58	48	3,300
III	M20	6.89	1.97	80	5,500

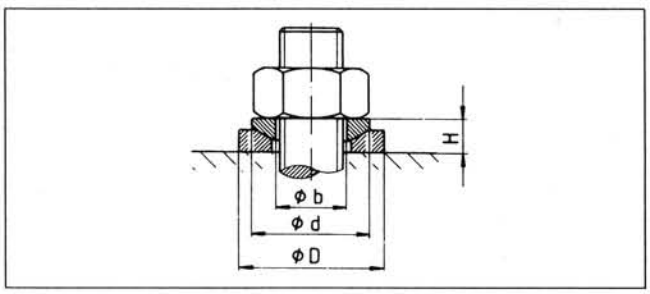


e = thickness of machine foot

Option p

Spherical Washer Set for non-parallel bearing surfaces.

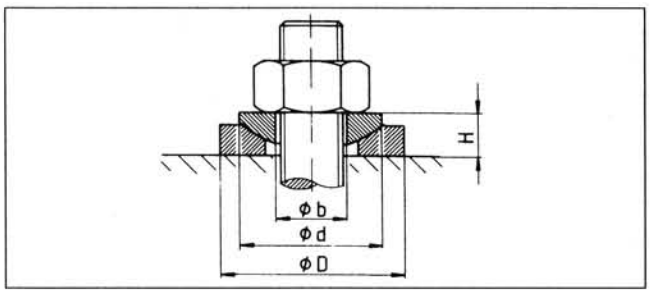
DIMENSIONS				
SIZE LK	øD	H	ød	øb
I	1.58	.35	1.18	.51
II	1.58	.39	1.18	.67
III	1.73	.39	1.42	.83



Option r

Oversized Spherical Washer Set for non-parallel bearing surfaces.

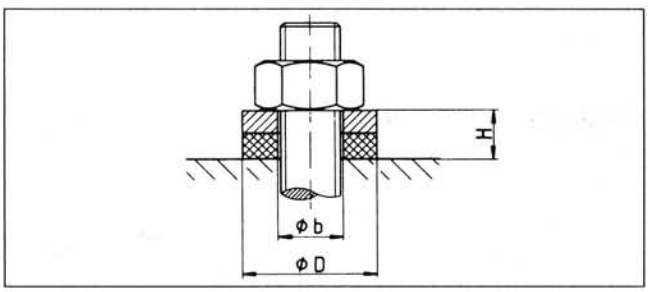
DIMENSIONS				
SIZE LK	øD	H	ød	øb
I	N/A	N/A	N/A	N/A
II	1.73	.39	1.42	.67
III	2.21	.51	1.73	.83



Option i

Anchor Bolt Isolation

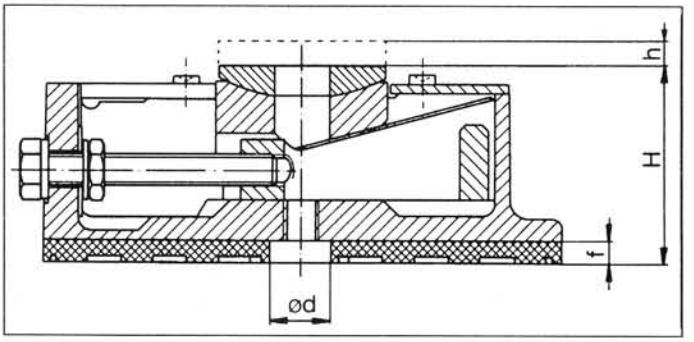
DIMENSIONS			
SIZE LK	øD	H	øb
I	1.18	.47	.51
II	1.58	.47	.67
III	1.73	.55	.83



Option dpl

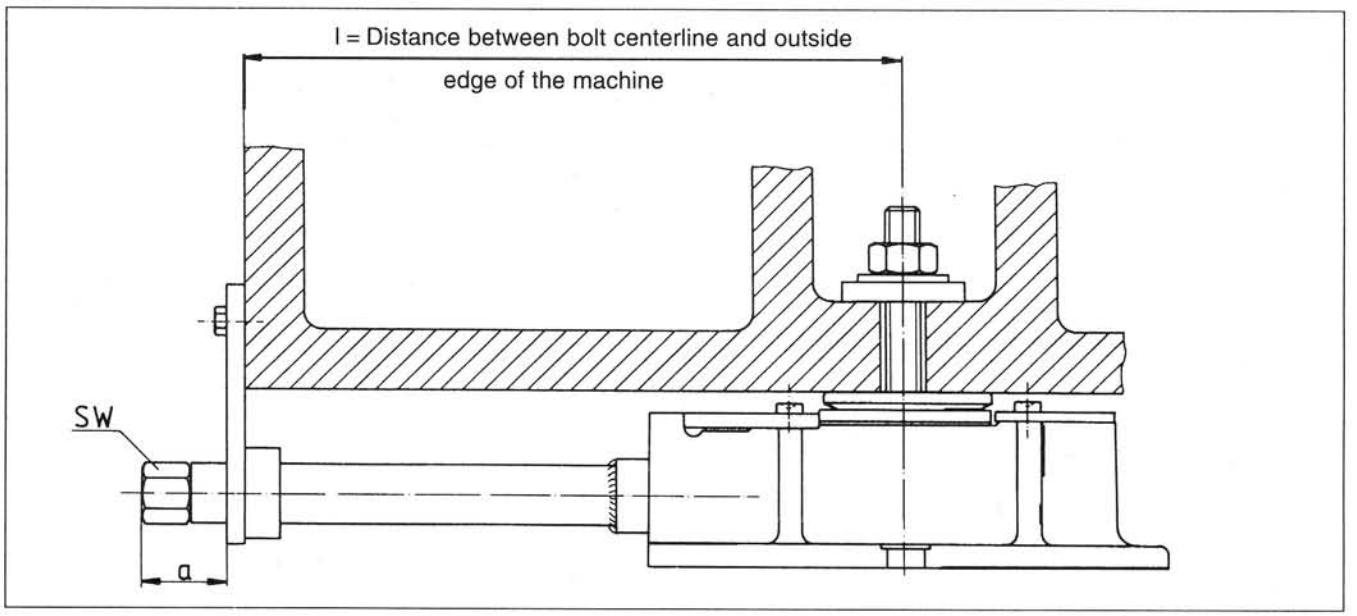
Non-skid Vibration Pad made of Polyurethane.

DIMENSIONS				
SIZE LK	H	f	ød	h
I	2.56	.28	.79	.47
II	3.03	.28	.87	.47
III	3.43	.28	.98	.47



Option le

Adjustment extension for adjusting FIXATORS® when recessed under machine.



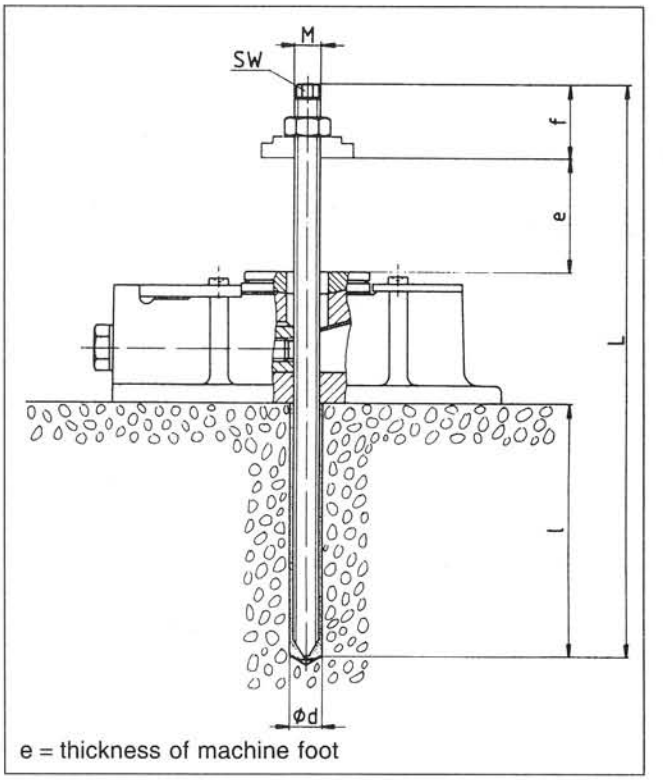
DIMENSIONS				
SIZE LK	a	SW	Minimum Dimension	Tube Size
I	1.97	.87	5.51	24 x 4
II	1.97	.87	5.91	24 x 4
III	1.97	.87	6.69	24 x 4

Option due

Center Capsule Anchor System consisting of a capsule and a stud.

Requires option f_1 and specification of dimension "e".

DIMENSIONS								
SIZE LK	M	L	f	ød	l	SW	Torque ft. lbs.	Load lbs.
I	M12	9.84	1.18	.55	4.33	.31	24	2,200
II	M16	11.81	1.38	.71	4.92	.39	39	3,300
III	M20	13.78	1.58	.98	6.69	.39	65	5,500

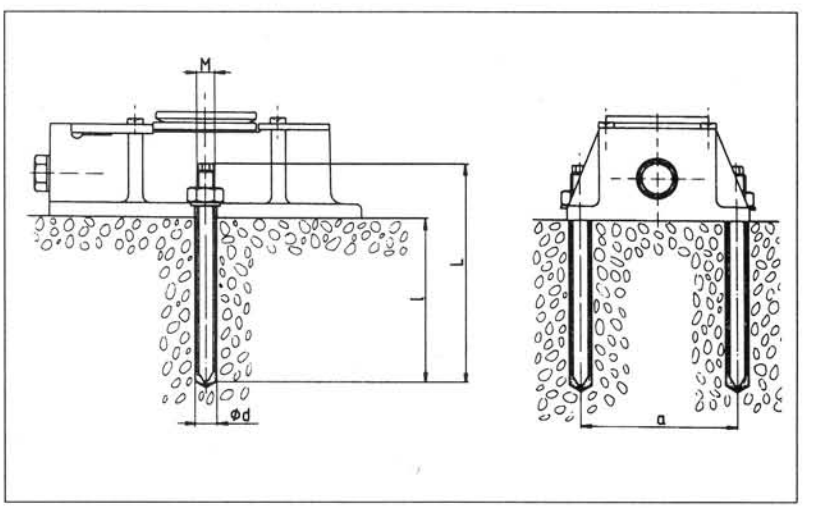


e = thickness of machine foot

Option ca

Side Capsule Anchor System consisting of 2 capsules and 2 studs.

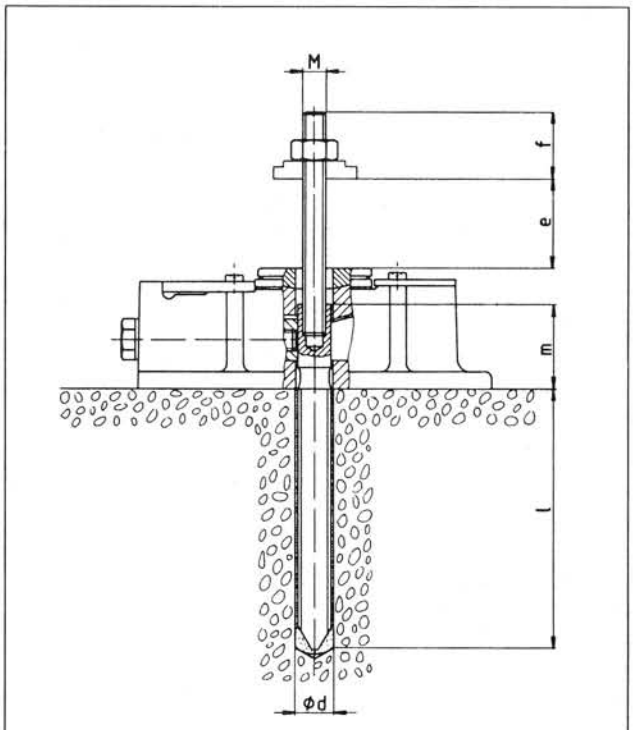
DIMENSIONS					
SIZE LK	M	L	a	l	ød
I	M10	4.72	3.35	3.54	.47
II	M12	5.91	3.94	4.33	.55
III	M12	5.91	4.72	4.33	.55



Option due/2

Center Two Piece Capsule Anchor System
consisting of a capsule and a split stud.
Requires option f_2 and specification of dimension "e".

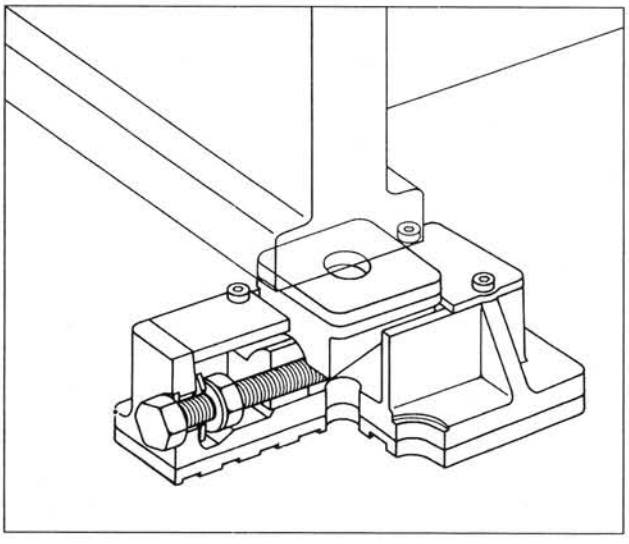
DIMENSIONS							
SIZE LK	M	m	l	ød	f	Torque ft. lbs.	Load lbs.
I	M12	1.58	4.92	.71	1.18	20	2,200
II	M16	1.58	4.92	.71	1.38	39	3,300
III	M20	1.97	6.69	.98	1.58	65	5,500



e = thickness of machine foot

COMBINATIONS AND APPLICATIONS

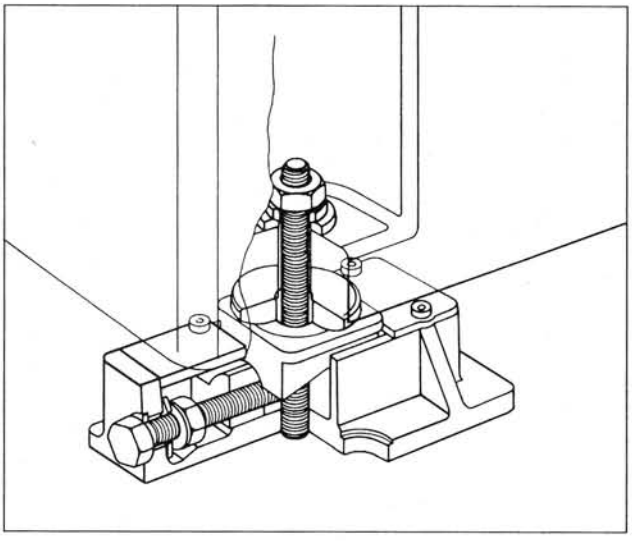
Combination 1



Order Specification,
e. g. **LK (x*), GA-D, f_1, dpl**

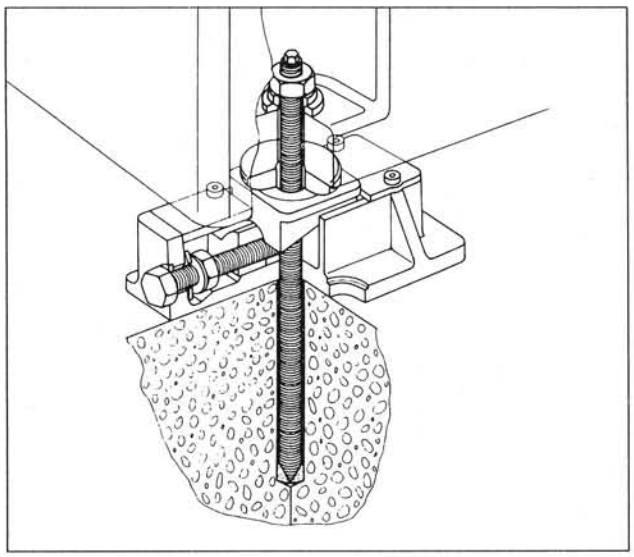
(x*) = Size of FIXATOR®

Combination 2



Order Specification,
e. g. **LK (x*), GA-K, g, p, ste**

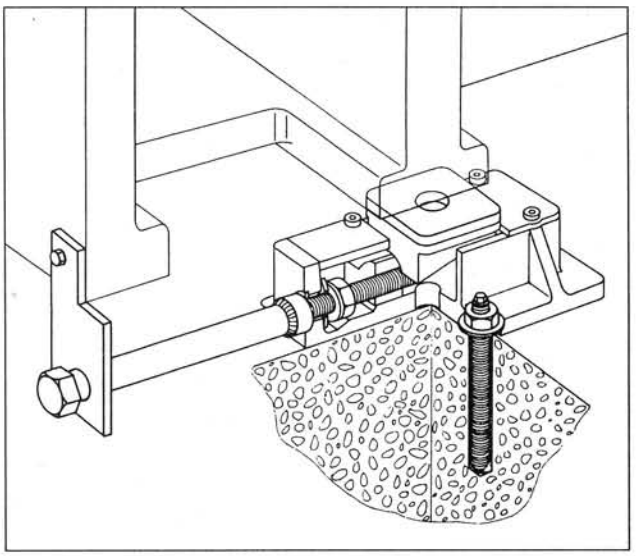
Combination 3



Order Specification,
e. g. **LK (x*), GA-K, f_1, p, due**

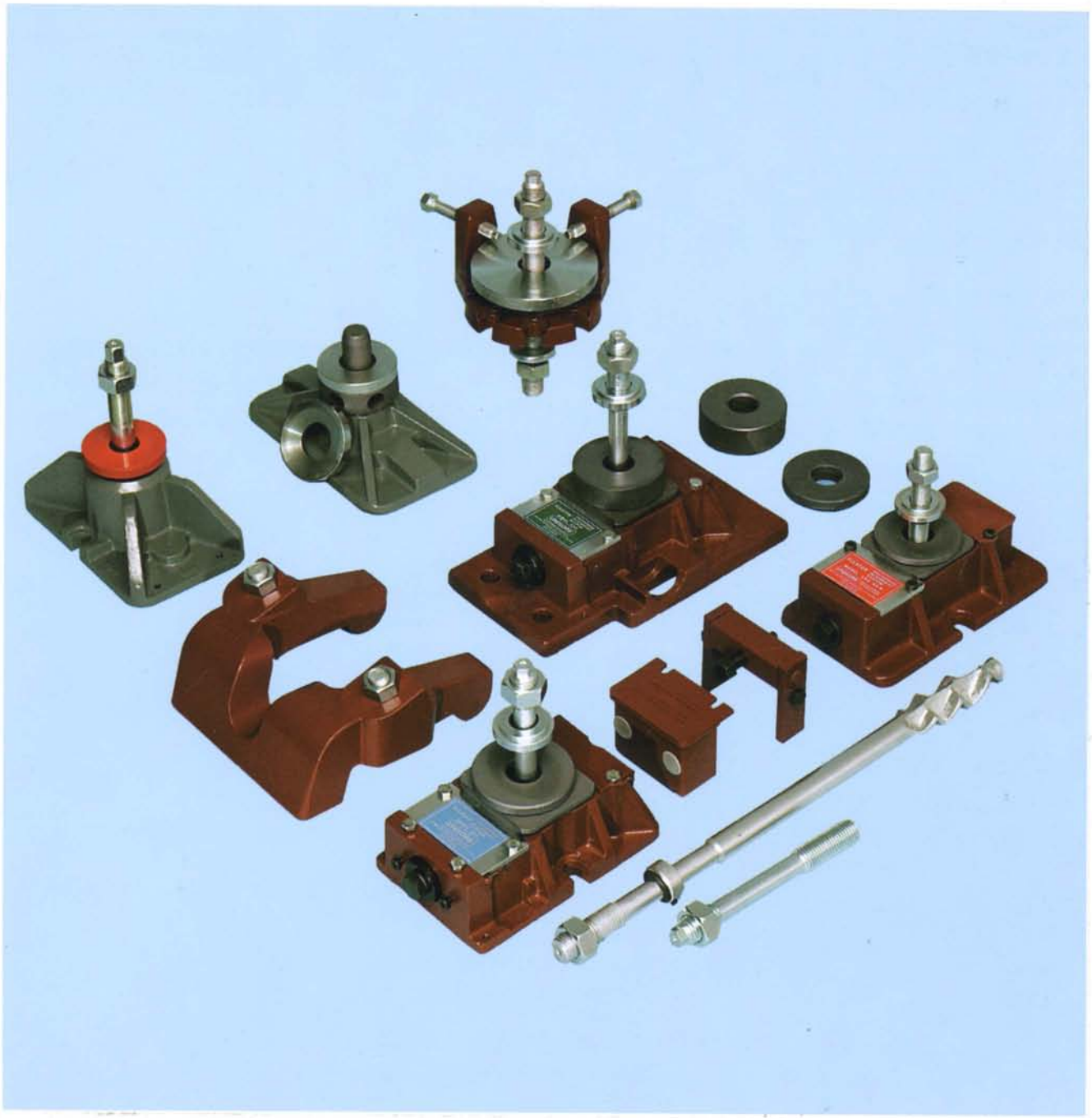
(x*) = Size of FIXATOR®

Combination 4



Order Specification,
e. g. **LK (x*), GA-D, f_1, ca, le**

FIXATOR® SYSTEMS



S FIXATOR® DESCRIPTION & DIMENSIONS

The Model S Fixator® is designed to complement the Model RK system. The Model S features a vertical bolt type adjustment and is used particularly in cases when leveling adjustment must be done from above where the Model RK cannot be used. Specific applications include floor plates, layout tables and similar situations.

The unit is comprised of a high density cast iron housing equipped with a captive mounted free turning adjusting and hold-down bolt combination. This high tensile bolt has at its lower half a spline shaped body structure. The upper end has a rolled thread to accept the hold-down nut, with a hex. head end for height adjustment.

The spline end section of the adjusting bolt engages with a precision matching spline pattern in the adjusting sleeve that is threaded into the base of the housing. The adjusting sleeve is guided by the upper portion of the housing to prevent lateral movement. A support plate with a precision machined concave surface mates with the convex spherical surface of the adjusting sleeve to assure equal load distribution over the entire bearing surface and compensate for any angular difference between machine and Fixator®.

An additional spherical washer set (option P) may be provided to compensate for any angular differences on the top surface of the machine bed.

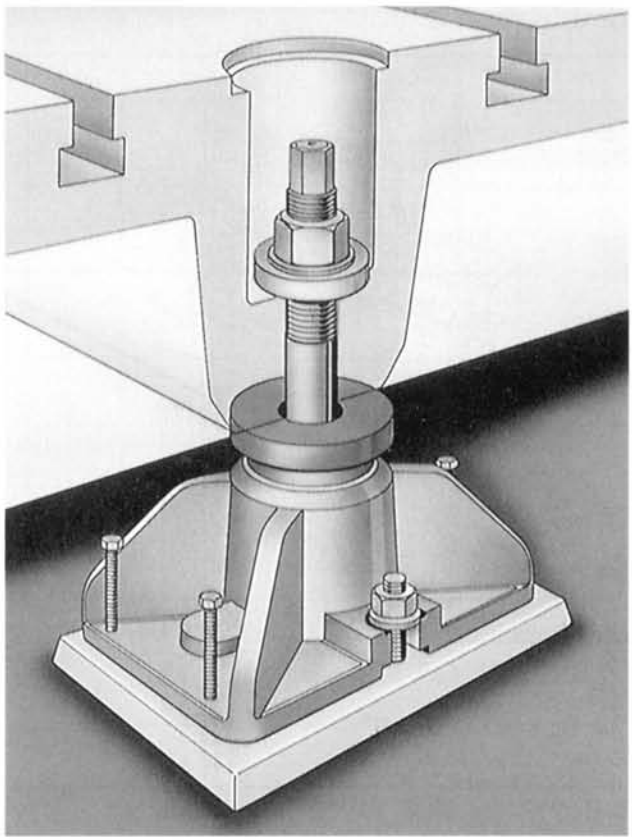
The adjusting mechanism is totally enclosed and all machined surfaces have been treated with a high pressure lubricant to reduce friction and prevent corrosion.

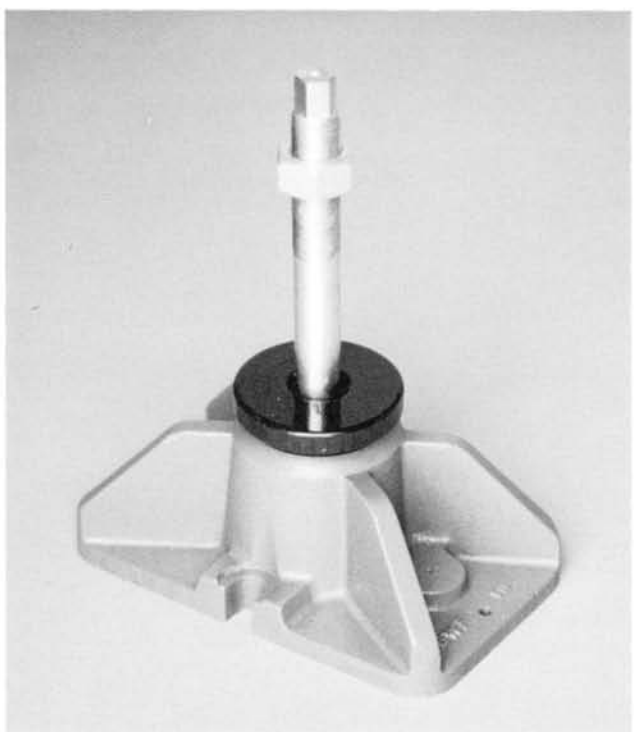
The Model S Fixator® may be completely embedded into the foundation.

In addition, this unit is equipped with three auxiliary preleveling screws to rough level the base prior to pouring grout. When the unit is mounted on the top of a foundation, two side located anchor bolts (option C) secure the leveler to the foundation using the grouting method.

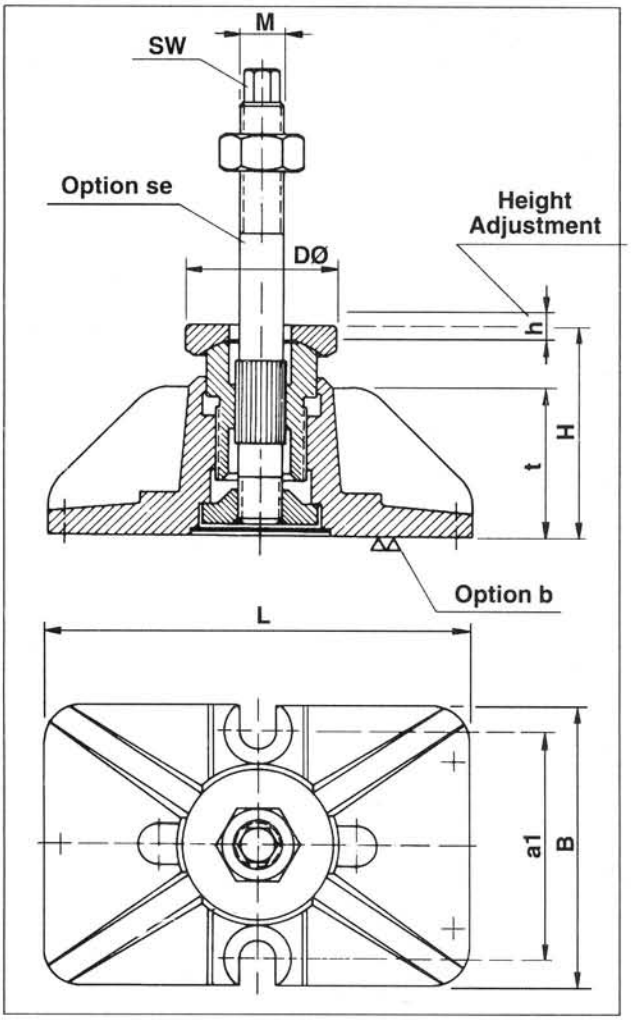
The leveling is accomplished by the following sequence: After securing the Model S Fixator® to the machine and foundation the upper hold-down nut is loosened and the adjustment accomplished by turning the adjusting bolt at its hex. head, thus causing vertical leveling through the movement of the inner adjustment sleeve. After the leveling is completed, the hold-down nut is tightened, acting as a jam nut to prevent creeping of the inner adjusting sleeve due to vibration.

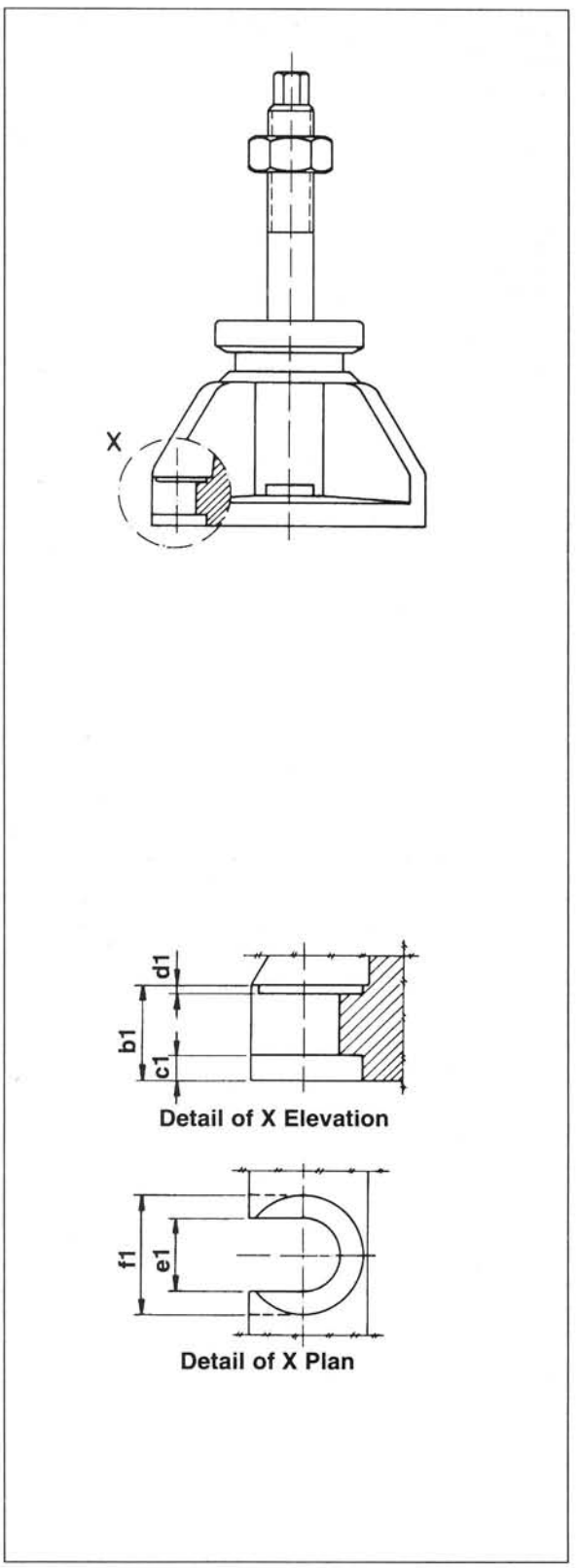
As an additional feature, option D cover plates are available in several outside diameters to cover and seal the access openings usually provided to accommodate the hold-down/adjusting bolt and nut mechanism, for the adjusting of the Fixator®.





S FIXATOR® DESCRIPTION & DIMENSIONS





DIMENSIONS								
SIZE S	M	L	B	H	DØ	SW	t	h
I	M16	6.61	4.13	3.15	2.24	.47	2.36	.32
II	M20	7.48	4.53	3.74	2.76	.59	2.68	.39
III	M24	8.66	5.51	4.45	3.23	.75	3.27	.47
IV	M30	11.02	7.28	5.51	3.94	.95	3.82	.63
V	M36	12.99	8.86	6.54	4.80	1.18	4.72	.79

DIMENSIONS						
SIZE S	a1	b1	c1	d1	e1	f1
I	3.47	.63	.16	—	.47	.87
II	3.94	.79	.20	.08	.55	1.02
III	4.72	.98	.24	.08	.71	1.26
IV	5.91	1.26	.32	.08	.95	1.50
V	7.09	1.50	.32	.08	1.10	1.81

S FIXATOR® TECHNICAL SPECIFICATIONS

DESCRIPTION		DIM.	SI	SII	SIII	SIV	SV
Recomended machine dead weight per Fixator® *		Lbs.	2,200	4,400	8,800	13,000	22,000
Maximum allowable lifting load per Fixator® **		Lbs.	20,008	26,500	53,000	80,000	133,000
Spring Constant		Lbs./In.	8,550,000	11,400,000	14,250,000	17,100,000	22,800,000
Approximate Torque Required To Turn Adjusting Screw		$\frac{\text{Ft. Lbs.}}{\text{1000 Lbs.}}$	1.2	1.5	1.7	2.0	2.3
Maximum Allowable Torque On Adjusting Screw		Ft. Lbs.	90	175	350	700	1,500
Maximum Torque at the Hold Down Nut		Ft. Lbs.	45	88	176	350	700
Weight of Basic Unit		Lbs.	7.2	11.2	18.5	33.7	60.7
Maximum Tension On Anchor Bolt	Option se	Lbs.	11,650	17,820	25,300	40,040	58,300
	Option c	Lbs.	9,900	14,300	26,400	41,800	60,500

Vertical Adjustment per Screw turn: .079 inches for all sizes.

***Standard approach for determination of Fixator® size.**

****Maximum allowable is the total of the following.**

a) **Proportional Machine Load.**

b) **Tensile Force Exerted by Anchor Bolt.**

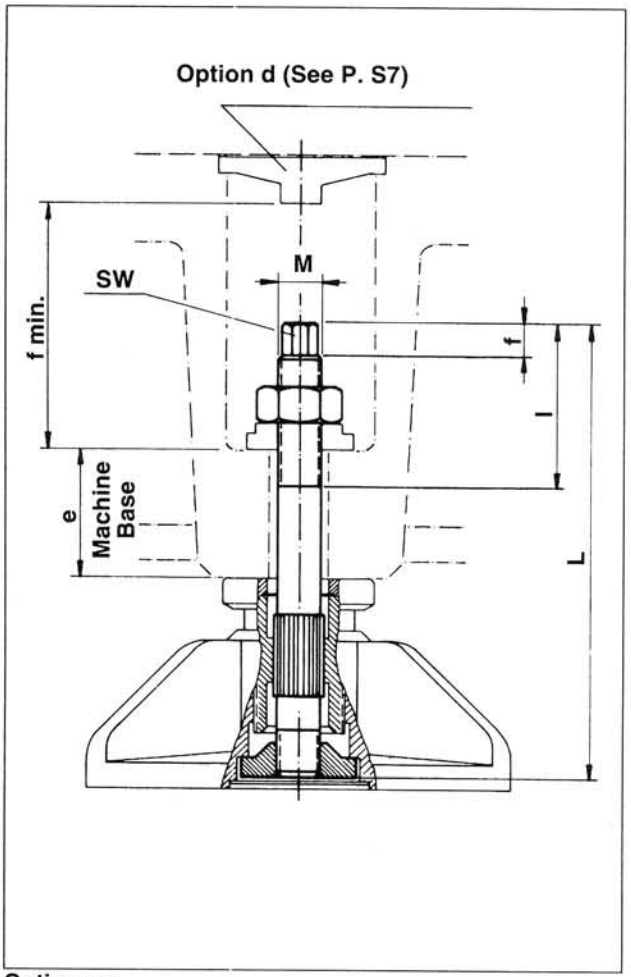
c) **Dynamic (Acceleration) Forces.**

d) **Changing Loads (moving machine parts or workpieces).**

S FIXATOR® OPTIONS

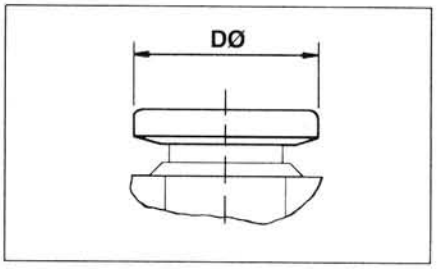
Options	The basic design can be modified by the following versions to adapt it to any type of machine or building construction feature.
b 	Base surface of S FIXATORS® machined.
se 	High tensile hold-down and adjusting bolt.
p 	Spherical washer set.
r 	Oversized spherical washer set.
v 	Enlarged spherical support washer.
c 	Two side anchor bolts for securing the S FIXATORS® to the foundation.
sew 	Center anchor hold-down stud.
d 	Access opening cover.

S FIXATOR® Detailed Option Specifications Non-Anchored Installations

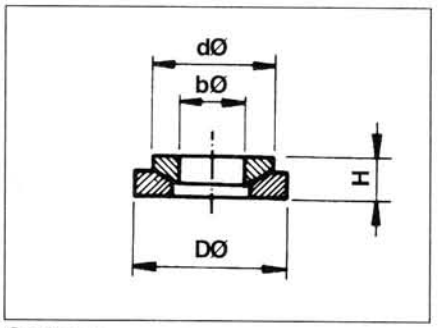


Option se

DIMENSIONS	
SIZE S	DØ
I	2.76
II	3.15
III	3.94
IV	4.72
V	5.91



Option v

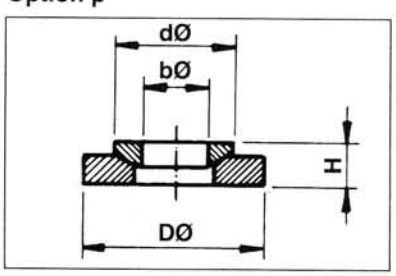


Option r

DIMENSIONS				
SIZE S	DØ	H	dØ	bØ
I	1.73	.39	1.42	.67
II	2.20	.51	1.73	.83
III	2.68	.63	2.21	.98
IV	3.07	.79	2.68	1.22
V	3.94	.79	2.68	1.46

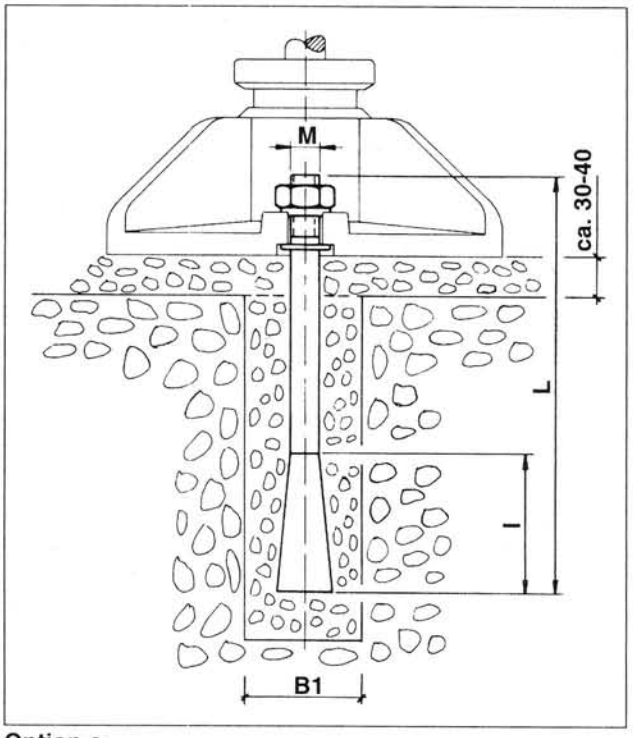
DIMENSIONS											
SIZE S	M	l	SW	t	f	L	e from	e to	L	e from	e to
I	M16	2.56	.47	.47	3.15	6.69	.79	1.58	7.48	1.58	2.36
II	M20	2.95	.89	.59	3.54	7.28	.79	1.58	8.07	1.58	2.36
III	M24	3.54	.75	.75	4.13	9.65	1.38	2.36	10.43	2.36	3.15
IV	M30	4.33	.95	.95	4.92	12.21	2.36	3.54	—	—	—
V	M36	5.12	1.18	1.18	6.30	14.96	2.76	4.33	—	—	—

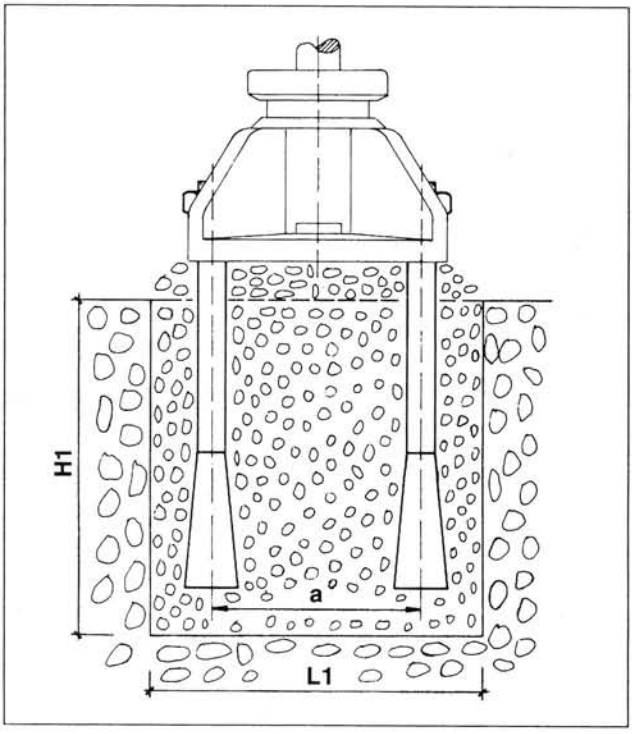
Option p



DIMENSIONS				
SIZE S	DØ	H	dØ	bØ
I	1.58	.35	1.18	.67
II	1.73	.39	1.42	.83
III	2.21	.51	1.73	.98
IV	2.68	.63	2.21	1.22
V	3.07	.79	2.68	1.46

S FIXATOR® Detailed Option Specifications Anchored Installations



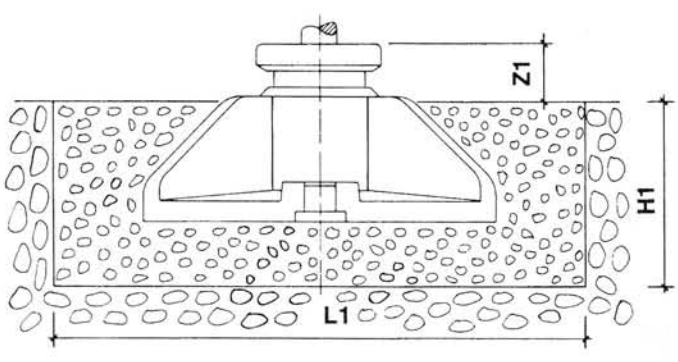


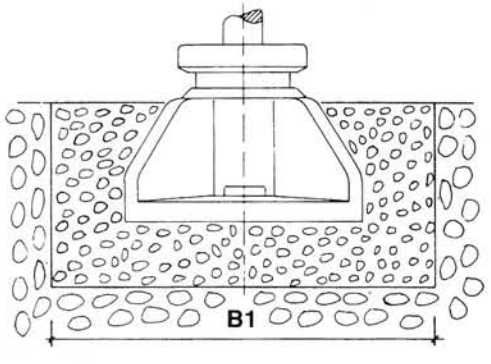
Option c

DIMENSIONS				
SIZE S	M	L	l	a
I	M10	4.92	2.17	3.47
II	M12	5.91	2.76	3.94
III	M16	9.84	3.54	4.72
IV	M20	11.81	3.94	5.91
V	M24	13.78	5.32	7.09

DIMENSIONS				
SIZE S	L1	B1	H1	Z1
I	11.81	6.30	3.94	1.18
II	12.99	7.87	4.33	1.38
III	13.78	9.45	5.51	1.58
IV	17.72	11.81	6.30	1.77
V	19.69	12.60	7.48	1.97

DIMENSIONS			
SIZE S	L1	B1	H1
I	5.32	1.97	4.72
II	6.30	2.30	5.51
III	7.87	2.76	9.45
IV	9.84	3.15	11.42
V	13.78	3.94	13.78



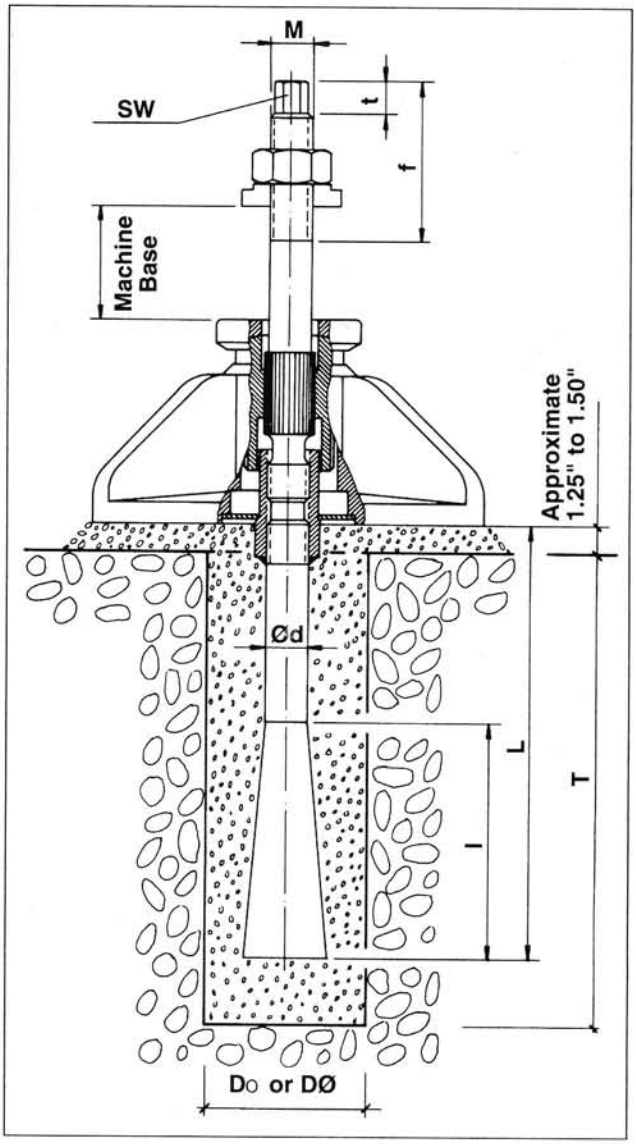


S FIXATOR® Detailed Option Specifications Anchored Installations

Option sew

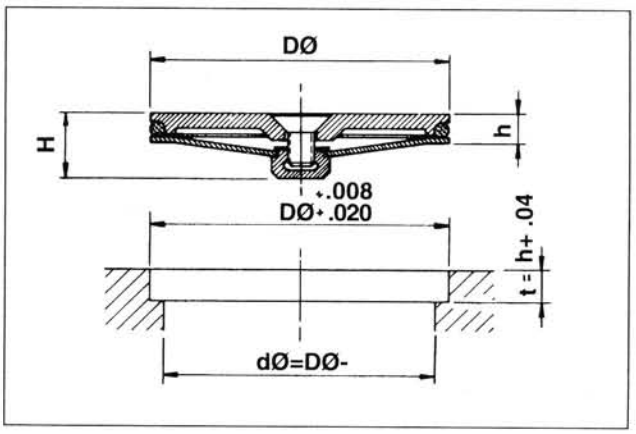
DIMENSIONS							
S	M	f	SW	t	dØ	L	l
I	M16	2.56	.47	.47	.63	5.91	3.54
II	M20	2.95	.59	.59	.79	7.87	3.94
III	M24	3.54	.75	.75	.95	10.63	5.32
IV	M30	4.33	.95	.95	1.18	12.60	5.91
V	M36	5.12	1.18	1.18	1.42	13.72	7.09

DIMENSIONS		
S	D	T
I	2.76	7.09
II	3.15	9.84
III	3.94	12.60
IV	4.72	14.96
V	5.91	20.47



Option d

DIMENSIONS								
D	63	80	90	110	130	150	200	250
H	1.26	1.26	1.26	1.26	1.26	1.26	1.69	1.69
h	.43	.43	.43	.43	.43	.43	.45	.45
DØ	2.48	3.15	3.54	4.33	5.12	5.91	7.87	9.84



S FIXATOR® INSTALLATION INSTRUCTIONS

Clean the concrete foundation or floor thoroughly,

Clean the bottom surface of the machine or worktable.

The S Fixators® must be adjusted to the same height. Standard adjustment at delivery: 1/8" above the lowest point.

The S Fixators® are protected against corrosion (therefore do not grease them).

When grouting in the anchor bolts, the specifications of this Fixator® publication must be carefully complied with.

Attach the S Fixators® to the worktable or machine feet and lower onto temporary auxiliary wedges.

Align the worktable or machine feet by using the auxiliary wedges, making certain that dimension between the worktable or machine feet and foundation is adhered to.

Fill the grout pocket with grout.

After proper grout cure the auxiliary wedges may be removed and the worktable or machine may be aligned.

Tighten the nuts on the SE hold down bolts. The installation is now complete.