

Von Ruden Manufacturing, Inc.



- General Overview 1-4
- Model 15 5-7
 - Dimensions/Configurations
 - HP Ratings
 - Industry Comparisons
- Model 25 8-10
 - Dimensions/Configurations
 - HP Ratings
 - Industry Comparisons
- Model 27 11-12
 - Dimensions/Configurations
 - HP Ratings
- Model 2711 13-15
 - Dimensions/Configurations
 - HP Ratings
 - Industry Comparisons
- Model 2725 16-18
 - Dimensions/Configurations
 - HP Ratings
 - Industry Comparisons
- Model 2726 19-20
 - Dimensions/Configurations
 - HP Ratings
- Model 33 21-22
 - Dimensions/Configurations
 - HP Ratings
- Model 40 23-24
 - Dimensions/Configurations
 - HP Ratings
- Model 90 25-26
 - Dimensions/Configurations
 - HP Ratings
- Model 93 – Standard 27-28
 - Dimensions/Configurations
 - HP Ratings
- Model 93 – Hydraulic Motor Driven 29
- Model 110 30-31
 - Dimensions/Configurations
 - HP Ratings
- Model 113 32-33
 - Dimensions/Configurations
 - HP Ratings
- Industry Master Cross Reference ... 34-35
- Gear Comparisons & Shimming 36
- Service Ratings 37
- Thermal Capacities & Lubrication 38

All information is subject to change without notice. Always confirm with us that you are working with the most current data.

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Bevel Gear Boxes – Sourcing Guide

A GENERAL OVERVIEW

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



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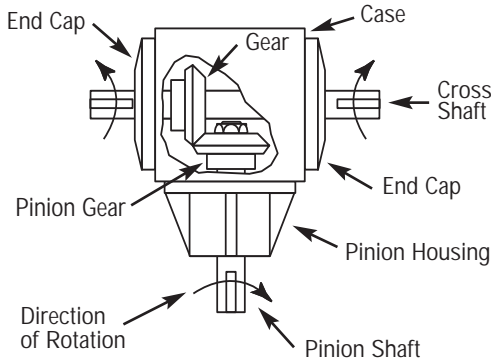
Any discussion of **Bevel Gear Boxes** must first clarify the definition of **Beveled Gears**.

A bevel gear is made in the shape of a cone. Deployed in pairs, they are used to connect intersecting shafts. Normally they are mounted on shafts that are at 90° to each other (hence the term “right angle” bevel gears). However, they are not restricted to 90° mounting.



Typical set of bevel gears meshed at 90°

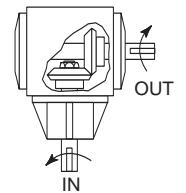
Nomenclature of a Typical Bevel Gear Box.



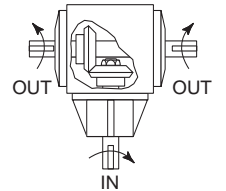
Primary Purposes:

The primary purposes of bevel gear boxes are illustrated here. Two or more purposes are frequently accomplished simultaneously. For example: To transmit power at 90° AND decrease speed/increase torque.

Transmitting Power At 90°

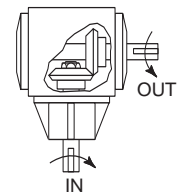


Splitting Power



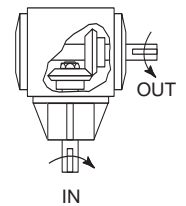
Decreasing Speed & Increasing Torque

IN: 200 rpm & 500 lb-inches
OUT: 100 rpm & 1000 lb-inches
2:1 Reduction

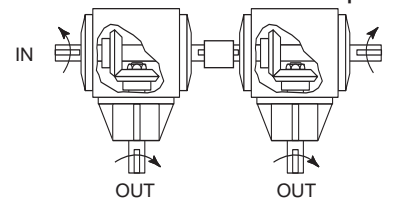


Increasing Speed & Decreasing Torque

IN: 200 rpm & 500 lb-inches
OUT: 400 rpm & 250 lb-inches
1:2 Speed-Up



Functioning as a Power Take-off Device with the Cross-shaft as a Common Input



Von Ruden Standard Bevel Gear Box Overview

Model	Pinion Shaft Diameter (inches)	Maximum Input speed (rpm)	Maximum Input Horsepower	Available Gear Reduction Ratios	Available Speed UP Ratios	Gear Types Available
15	.625	3000	18	1:1 1.5:1 2:1	1:1.5 1:2	Straight Cut Spiral
25	.75	3000	36	1:1 1.5:1 2:1	1:1.5 1:2	Straight Cut Spiral
27	1.0	3000	32	1:1 1.5:1 2:1 3:1	1:1.5 1:2 1:3	Straight Cut Spiral
33	1.0	3000	69	1:1 1.5:1 2:1	1:1.5 1:2	Forged Straight Cut Spiral
40	1.0	3000	69	1:1 1.5:1 2:1	1:1.5 1:2	Forged Straight Cut Spiral
90	1.25	2800	87	1:1 1.5:1 2:1	1:1.5 1:2	Forged Straight Cut Spiral
93	1.375	2500	149	1:1 1.5:1 2:1	1:1.5 1:2 1:3	Forged Straight Cut Spiral
110	1.5	1750	175	1:1 1.5:1 2:1	1:1.5	Forged Straight Cut Spiral
113	1.75 (2.0 opt)	1750	202	1:1 1.5:1 2:1 3:1	1:1.5 1:2 1:3	Forged Straight Cut Spiral

Bevel Gear Boxes – Sourcing Guide

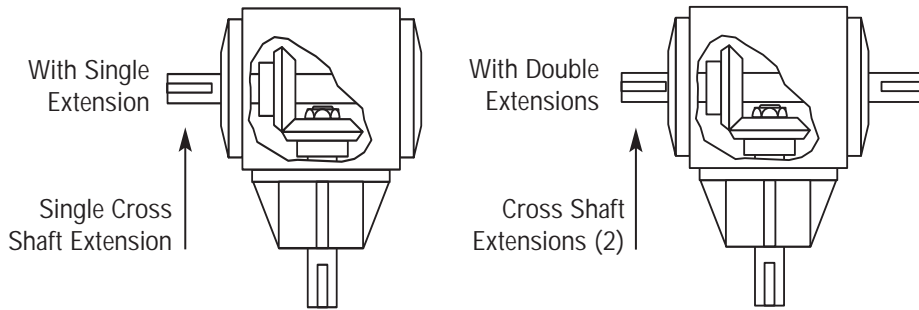
A GENERAL OVERVIEW

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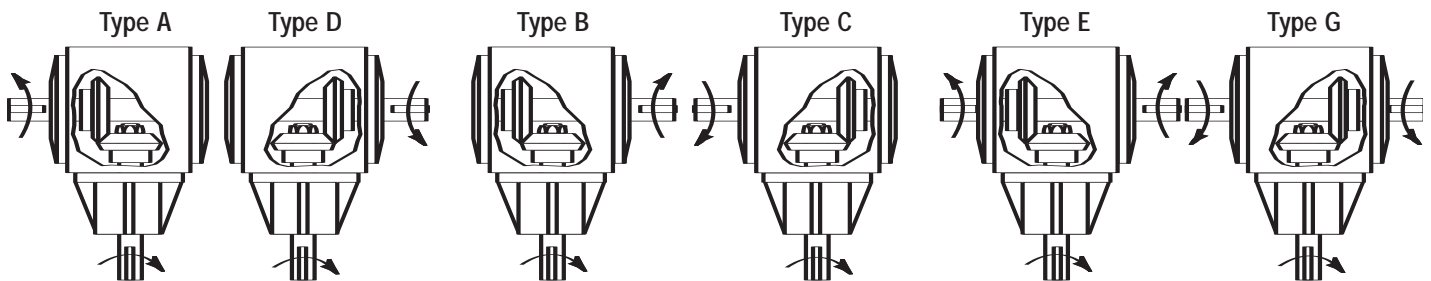
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Cross Shaft Extensions



Experience Leads to Innovation...
Like this blade drive gearbox for commercial outfront, zero-turn, lawnmowers

Cross Shaft Direction of Rotation

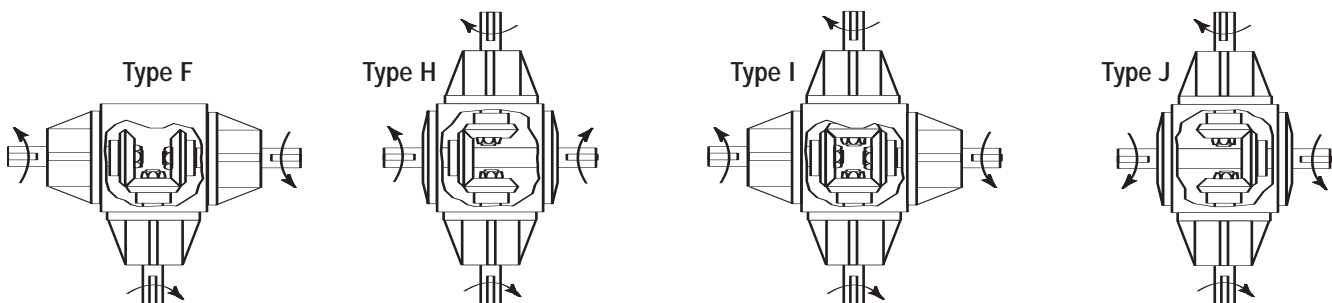


Types A and D are the same gear box turned over. Note the gear is **next** to the cross shaft extension (causing CCW rotation of the cross shaft).

Types B and C are the same gear box turned over. Note the gear is **opposite** to the cross shaft extension (causing CW rotation of the cross shaft).

Types E and G are also the same gear box turned over. In some cases (for higher reduction ratios) the cross shaft extension nearest the gear will be smaller in diameter than the other extension. This is to accommodate gear installation.

Other Configuration Possibilities



Gear Reduction Ratio

The term "gear reduction" applies to **speed**. A 2:1 reduction means that the speed will be reduced by a factor of two, or in other words, to 50%.

Obviously, if the the gear reduction reduces speed by 50%, the resulting torque will be **doubled**.

Example:

Gear Ratio	2:1
Input Speed	150 rpm
Output Speed	$150/2 = 75$ rpm
Input Torque	1000 lb.-inches
Output Torque	$1000 \times 2 = 2000$ lb.-inches

In all current VonRuden bulletins, the ratio is determined from the pinion shaft to the cross shaft.

The cross shaft can be used as the input shaft. In such cases the ratio would be simply reversed. A 2:1 reducer would become a 1:2 speed increaser.

Bevel Gear Boxes – Sourcing Guide

A GENERAL OVERVIEW

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Tailored to the Needs of a Design Engineer.

Selection:

- Models up to 200 hp.
- Choices of gear types and ratios.
- Speed reducing and increasing models.
- Direction of rotation options.
- Hydraulic motor input flange option.
- Configuration options.

Extended Working Life

- Press-fit gears and bearings for superior rigidity and maximum performance.
- Properly shimmed gears and bearings for consistent backlash.
- No paper or plastic shims. Metal shims used throughout.
- Tapered roller (not ball) bearings throughout.
- Aluminum end caps and pinion housings on most models for improved heat dissipation.
- High strength steel alloys – gears cut from 8620 steel, the carburized and hardened.
- Improved shaft seals – spring loaded double lip design. One lip seals in the oil, the other seals out dirt. All shafts are specially ground/burnished at the seal area for extended life.

Maintenance and Repair

- End caps and piston housings remove easily. (No need for a special access cover.) Only locking nuts or locking tab washers used internally. Threads are not staked.

Organized to Earn Your Confidence:

Every member of the VonRuden team works for you to provide a quality product, delivered on-time with the best possible service both before and after the sale. This company-wide commitment assures you:

- Very competitive prices.
- Improved delivery via flexible production schedules.
- Complete technical assistance from our global network of local representatives and our own engineering department.
- Direct support for your own customers when you request it.
- “Specials” will always be considered and usually built.

Over a Half-Century of Expertise

For over 50 years, VonRuden manufacturing has built its reputation around quality products, designed and built in modern, well-tooled facilities. Though our products and processes have certainly evolved over the decades our 21st Century commitment to superior products, competitive prices, and unexcelled service remains unchanged.



Custom Angle Boxes...

Unique configurations are available to meet your special needs and to solve difficult problems. Contact your factory representative -- we're always willing to work with you.

Bevel Gear Boxes – Sourcing Guide

A GENERAL OVERVIEW

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Because we've been producing bevel gear boxes for over 50 years, Von Ruden brings substantial problem-solving experience to the table. Whether your goal is to blend, blow or bottle – you need to crank, cut or convey – or the task is to press, propel or raise, we welcome the opportunity to put our experience with all these industries to work for you.

Industrial Applications

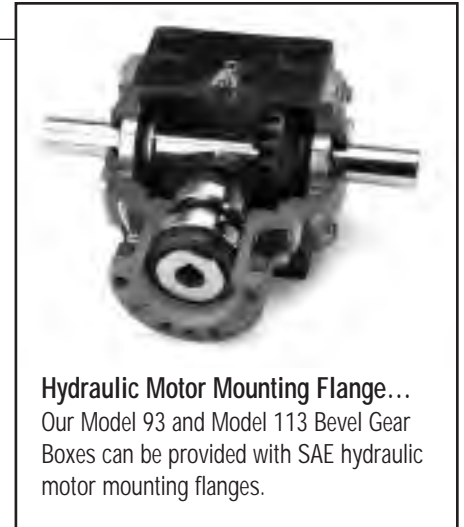
Printing Presses
Plastic Extruders
Sewage Augers
Bonding Equipment
Metering Augers
Sewage Agitators
Newspaper Conveyors
Bottling Equipment
Material Handling
Web Finishing
Paper Conveying
Conveyors
Cardboard Box Equipment
Packaging
Antennas
Gate Valve Actuators
Business Form Presses
Feed Screw Drives
Sewage Conveyors
Collating Machinery
Mixing Equipment
Conveyor Drives
Film Processors
Pottle Packaging Equipment
Lifts/Hoists/Jacks
Food Processing
Robotics
Rubber Processing
Wrapping Machines
Solar Panels

Mobile & Other Applications

Commercial Mowers
Street Sweepers
Dual Steering
Bulkhead Door Openers
Scissors Lifts
Pump Drives
Misc. Conveyors
Sand Spreaders
Residential Mowers
Car Wash Curtains
Snow Blowers
Fan/Blower Drives
Mining Equipment
Cranes

Agricultural Applications

Augers/Elevators
Grain Wagons
Harvesters
Forage Harvesters/Blowers
Manure Spreaders
Fertilizer Spreaders
Grain Bin Augers
Grinders/Mixers
Tillers
Fans
Feed Mills/Blenders
Hay Balers
Tub Grinders
Grain Dryers
Rotary Mowers/Cutters
Power Rakes
Rock Pickers
Food Handling



Hydraulic Motor Mounting Flange...
Our Model 93 and Model 113 Bevel Gear Boxes can be provided with SAE hydraulic motor mounting flanges.

Specials

Yes, Von Ruden will manufacture "specials" to satisfy unique customer requirements. Different shaft lengths, gear ratios and housing configurations can all be provided. These are examples of the hundreds of atypical configurations we've provided in the past.



Indeed, we might already have produced a custom design very similar to what you need. Please contact your factory representative for data on existing Von Ruden specials and a proposal for your application.

Bevel Gear Boxes – Sourcing Guide

Model 15 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



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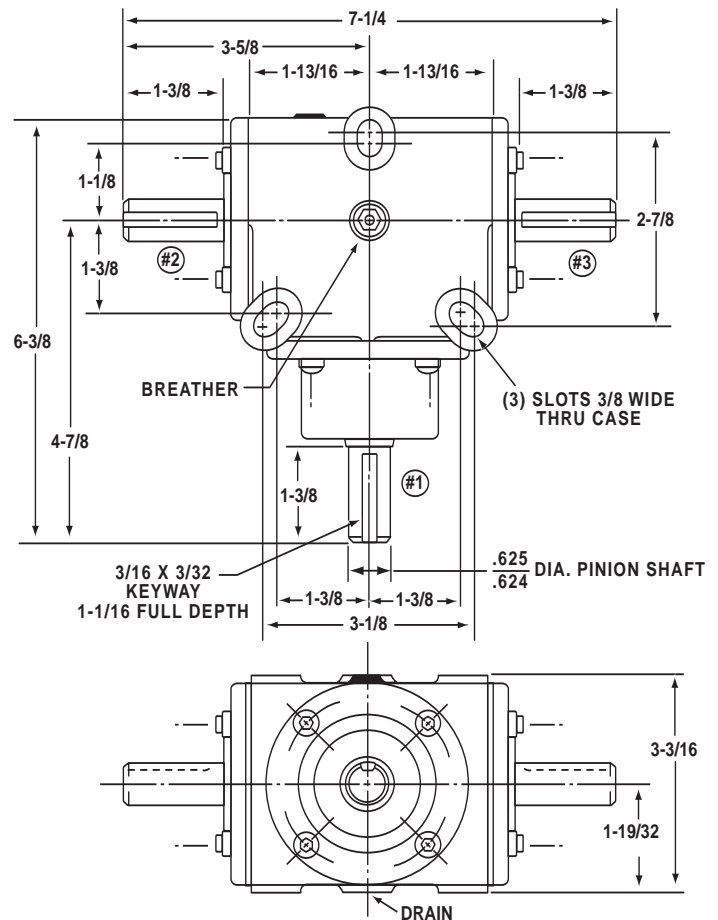
- Lightweight, High Strength Cast Aluminum Housing.
- Weight = 5 lbs. (approx.)
- Oil Capacity = 4 oz. (approx.)

CROSS SHAFT

Type E 1:2 Ratio Only	Type G 1:2 Ratio Only
Shaft #2 .500/.498" Dia	Shaft #3 .500/.498" Dia.
All other types & ratios .625/.624" Dia.	

KEYWAYS

.500/.498" dia. Shafts	.625/.624" dia. Shafts
1/8" x 1/16" 1-1/16" Full Depth	3/16" x 3/32" 1-1/16" Full Depth



Model 15-73 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Straight Cut	1:1 Reduction	15-00	15-04	15-04	15-00	15-16	15-16
	1.5:1 Reduction	15-01	15-05	15-05	15-01	15-17	15-17
	2:1 Reduction	15-03	15-07	15-07	15-03	15-19	15-19
Straight Cut	1:1.5 Speed Up	15-02	15-06	15-06	15-02	15-18	15-18
	1:2 Speed Up	15-53	15-54	15-54	15-53	15-56	15-56
Spiral	1:1 Reduction	15-69	15-70	15-70	15-69	15-73	15-73
	1.5:1 Reduction	15-218	15-219	15-219	15-218	15-222	15-222
	2:1 Reduction	15-225	15-226	15-226	15-225	15-229	15-229

Bevel Gear Boxes – Sourcing Guide

Model 15 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



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Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Straight Cut 1:1 Reduction	Gear Strength	.10	.60	1.8	3.0	4.1	5.9	7.1	10.4	14.8	17.8
	1000 hr. L ₁₀	*	*	*	3.0	4.1	5.9	7.1	10.4	14.4	16.4
	5000 hr. L ₁₀	*	*	*	2.9	3.6	4.7	5.3	6.9	8.9	10.1
Straight Cut 1.5:1 Reduction	Gear Strength	.06	.20	.70	1.2	1.7	2.5	3.0	4.3	6.2	7.4
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
Straight Cut 2:1 Reduction	Gear Strength	.02	.20	.60	1.0	1.3	2.0	2.3	3.4	5.0	6.0
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
Straight Cut 1:1.5 Speed Up	Gear Strength	.04	.40	1.2	2.0	2.7	3.9	4.7	6.9	9.8	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	9.2	**
Straight Cut 1:2 Speed Up	Gear Strength	.03	.30	.90	1.5	2.1	3.1	3.7	5.4	7.7	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
	5000 L ₁₀	*	*	*	*	*	*	*	*	*	**
Spiral 1:1 Reduction	Gear Strength	.05	.50	1.6	2.6	3.7	5.2	6.3	9.2	13.1	15.7
	1000 hr. L ₁₀	*	*	*	*	3.6	4.5	5.2	7.0	9.0	10.0
	5000 hr. L ₁₀	*	*	1.2	1.7	2.2	2.8	3.2	4.2	5.4	6.0
Spiral 1.5:1 Reduction	Gear Strength	.10	.30	1.0	1.7	2.3	3.4	4.0	5.9	8.4	10.0
	1000 hr. L ₁₀	*	*	*	*	*	*	*	5.2	6.6	7.6
	5000 hr. L ₁₀	*	*	.90	1.3	1.7	2.2	2.5	3.2	4.1	4.7
Spiral 2:1 Reduction	Gear Strength	.02	.20	.50	1.0	1.2	2.0	2.2	3.2	4.6	5.5
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	5.3
	5000 hr. L ₁₀	*	*	*	*	*	1.5	1.7	2.2	3.0	3.3

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 15 – REFERENCE DATA

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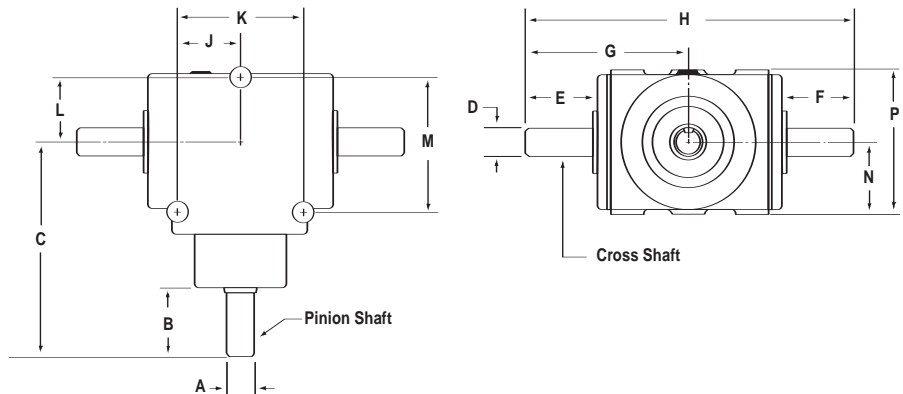
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Cross Reference Information:

Drawing dimensions shown here should be used for initial comparison only. Use dimensions on a model-specific drawing once initial comparisons have been made. In addition to dimensions, other issues must be considered when comparing gear boxes.

These issues include:

- HP, torque and speed ratings
- Rotational direction of each shaft
- Lubrication fittings (if any)
- Drain port and breather locations
- Beveled gear type (forged, spiral, etc.)



Important: Bevel gear boxes are often made with “special” modifications. This is especially true with shaft lengths and diameters. Always measure the actual dimensions on the box you are replacing.

CROSS REFERENCE CHART (1:1 only)

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E**	F**	G	H	J	K	L	M	N	P
Von Ruden	15	0.625	1.375	4.875	0.625	1.375	1.375	3.625	7.250	1.325*	2.750*	1.125*	2.500*	1.593	3.187
	15	"	"	"	"	"	"	"	"	1.562*	3.125*	1.562*	2.875*	"	"
Hub City	M2	"	1.500	4.562	"	#	#	3.750	7.500	1.562	"	"	"	"	"
Browning	3H	"	"	"	"	1.500	1.500	"	"	"	"	"	"	"	"
Boston Gear	RA6	0.374	0.593	2.753	0.374	0.593	0.593	1.973	3.953	0.656	1.312	0.656	1.312	0.625	1.250
	RA10	0.625	1.500	4.750	0.625	1.500	1.500	3.625	7.250	0.937	1.875	0.937	1.875	1.000	2.000
	RA15	0.750	2.000	7.000	0.750	2.000	2.000	5.000	10.00	1.500	3.000	1.500	3.000	1.500	3.000

* Von Ruden Model 15 has mounting slots (see photo on page 5). Mounting bolt pattern varies as indicated.

**Dimensions E and F are to end caps.

No dimension given in catalog.

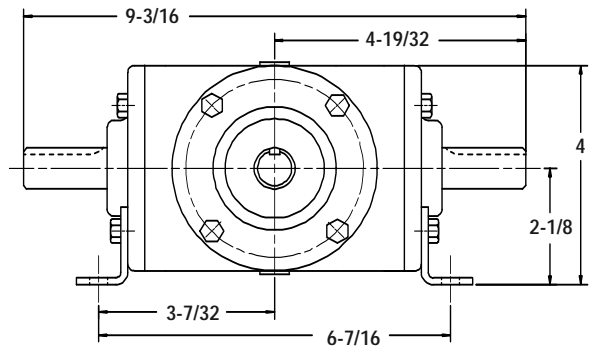
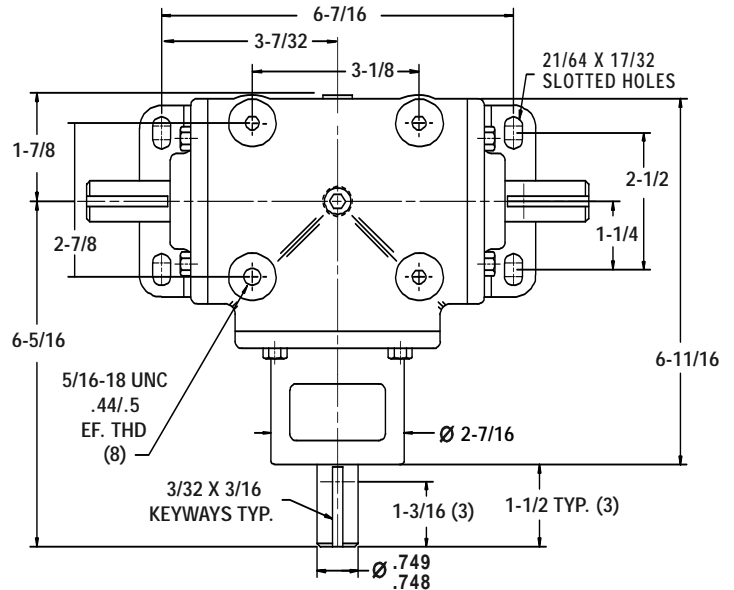
Bevel Gear Boxes – Sourcing Guide

Model 25 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



- Lightweight, High Strength, Cast Aluminum Housing.
- Weight = 9 lbs. (approx.)
- Oil Capacity = 8 oz. (approx.)



Model 25-144 Shown Above

CROSS SHAFT

All Types 1:2 Ratio Only	All Other Types and Ratios
.625/.624" Dia	.749/.748" Dia.

KEYWAYS

3/16 x 3/32"
1-3/16" Full Depth

SHAFT ARRANGEMENT AND ROTATION

MODEL NUMBERS	Gear Type	Gear Ratio	Type A	Type B	Type C	Type D	Type E	Type G
Straight Cut	1:1 Reduction		25-00	25-03	25-06	25-09	25-12	25-16
	1.5:1 Reduction		25-01	25-04	25-07	25-10	25-13	25-17
	2:1 Reduction		25-68	25-69	25-70	25-71	25-72	25-74
Straight Cut	1:1.5 Speed Up		25-02	25-05	25-08	25-11	25-14	25-18
	1:2 Speed Up		25-126	25-127	25-130	25-131	25-115	25-132
Spiral	1:1 Reduction		25-138	25-139	25-140	25-141	25-142	25-144

Bevel Gear Boxes – Sourcing Guide

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Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Straight Cut 1:1 Reduction	Gear Strength	.10	1.2	3.7	6.2	8.7	12.5	15.0	21.9	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	21.2	**	**
	5000 hr. L ₁₀	*	*	*	5.4	6.9	8.8	10.1	13.1	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	.10	.80	2.6	4.3	6.0	8.5	10.2	15.0	21.3	25.6
	1000 hr. L ₁₀	*	*	*	*	*	*	*	14.7	19.0	21.5
	5000 hr. L ₁₀	*	*	*	3.8	4.8	6.2	7.0	9.1	11.7	13.3
Straight Cut 2:1 Reduction	Gear Strength	.10	.50	1.4	2.4	3.4	4.8	5.8	8.5	12.1	14.6
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	5.4	7.1	9.0	10.3
Straight Cut 1:1.5 Speed Up	Gear Strength	.10	1.0	3.2	5.3	7.5	10.7	12.8	18.7	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	5.2	6.6	8.4	9.6	12.5	**	**
Straight Cut 1:2 Speed Up	Gear Strength	.10	.70	2.2	3.7	5.2	7.4	8.9	13.0	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	12.2	**	**
Spiral 1:1 Reduction	Gear Strength	.10	1.2	3.6	6.0	8.4	12.0	14.4	20.3	30.0	36.0
	1000 hr. L ₁₀	*	*	*	5.3	6.8	8.7	10.0	13.1	16.7	19.0
	5000 hr. L ₁₀	*	1.1	2.3	3.3	4.2	5.4	6.2	8.1	10.3	11.7

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

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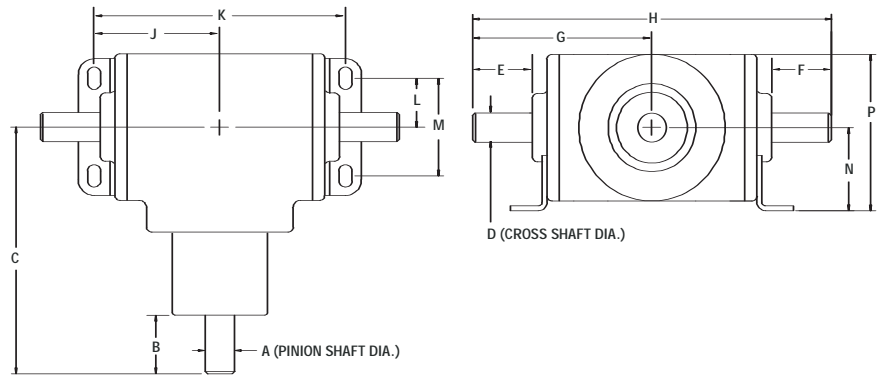
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- Drain port and breather locations
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CROSS REFERENCE CHART (1:1 only)

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E*	F*	G	H	J	K	L	M	N	P
Von Ruden	25	0.725	1.500	6.312	0.750	1.500	1.500	4.593	9.187	3.218	6.437	1.250	2.500	2.125	4.000
Von Ruden	2725	0.750	1.937	6.313	0.750	1.938	1.938	4.954	9.188	3.219	6.469	1.250	2.500	2.125	3.938
Von Ruden	2711	1.000	1.750	6.125	1.000	1.968	1.969	4.609	9.219	3.297	6.469	1.125	2.250	2.563	4.375
Hub City	11	1.000	1.750	6.125	1.000	#	#	4.671	9.218	3.171	6.468	1.125	2.250	2.562	4.625

*Dimensions E and F are to end caps.

No dimension given in catalog.

Bevel Gear Boxes – Sourcing Guide

Model 27 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



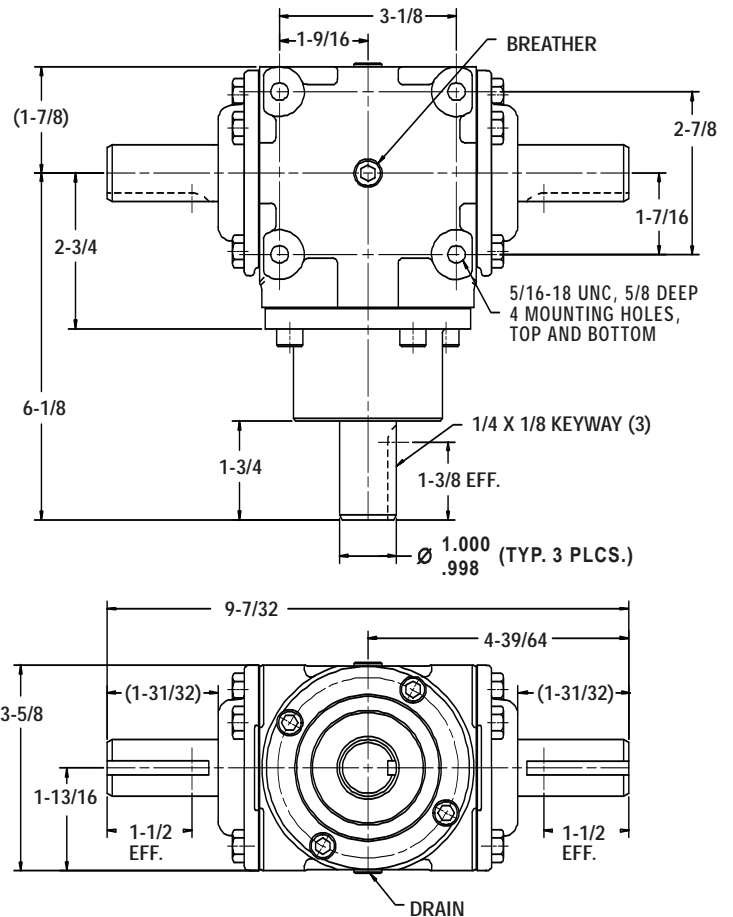
- Rugged Cast Iron housing.
- Weight = 12 lbs. (approx.)
- Oil Capacity = 6 oz. (approx.)

SHAFT SIZE

3:1 Ratio Only
.750/.748" Diameter

KEYWAY SIZE

3:1 Ratio Only
3/16" x 3/32" Full Depth



Model 27-117 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio	1	1	1	1	1	1
Straight Cut	1:1 Reduction	27-100	27-101	27-101	27-100	27-102	27-102
	1.5:1 Reduction	27-103	27-104	27-104	27-103	27-105	27-105
	2:1 Reduction	27-106	27-107	27-107	27-106	27-108	27-108
Straight Cut	1:1.5 Speed Up	27-109	27-110	27-110	27-109	27-111	27-111
	1:2 Speed Up	27-112	27-113	27-113	27-112	27-114	27-114
Spiral	1:1 Reduction	27-115	27-116	27-116	27-115	27-117	27-117
	3:1 Reduction	27-118	27-119	27-119	27-118	27-120	27-120

Bevel Gear Boxes – Sourcing Guide

Model 27 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	540	700	1000	1200	1750	2500	3000
Straight Cut 1:1 Reduction	Gear Strength	0.12	1.2	3.6	5.9	8.3	11.8	14.1	20	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	0.08	0.8	2.5	4.2	5.9	8.3	10.0	15	21	25
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	9.6	12	16	18
Straight Cut 2:1 Reduction	Gear Strength	0.05	0.5	1.4	2.4	3.4	4.8	5.7	8	12	14
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	*	13
Straight Cut 1:1.5 Speed up	Gear Strength	0.11	1.1	3.2	5.4	7.5	10.7	12.8	19	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1:2 Speed up	Gear Strength	0.07	0.7	2.2	3.7	5.1	7.3	8.7	13	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	0.11	1.1	3.3	5.9	7.7	10.9	13.1	19	27	32
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	5.6	7.1	9.1	10.4	14	17	20
Spiral 3:1 Reduction	Gear Strength	0.02	0.2	0.5	1.0	1.3	1.8	2.1	3	4	5
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	0.9	1.1	1.4	1.6	2.0	2.5	3.0

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

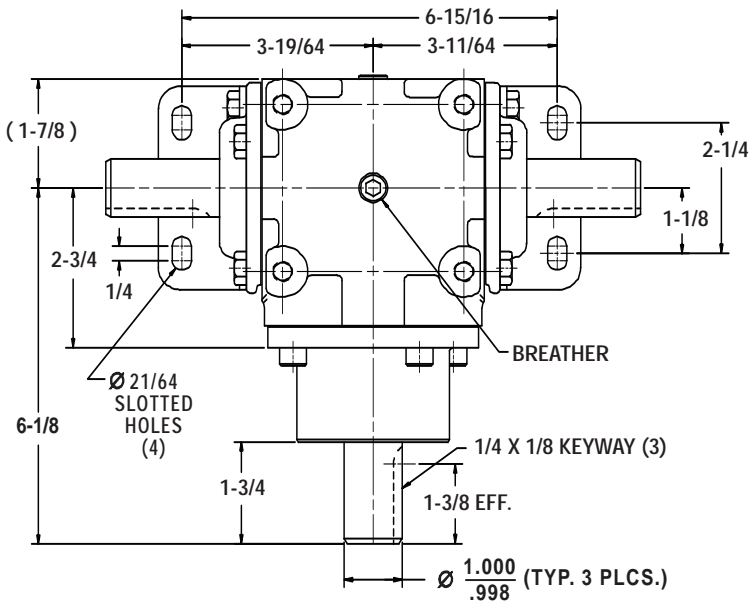
Bevel Gear Boxes – Sourcing Guide

Model 2711 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



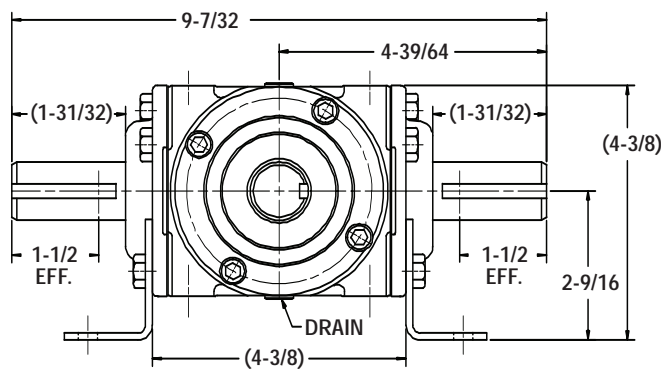
- Rugged Cast Iron Housing.
- Weight = 12 lbs. (approx.)
- Oil Capacity = 6 oz. (approx.)

SHAFT SIZE

3:1 Ratio Only
.750/.748" dia

KEYWAYS

3:1 Ratio Only
3/16" x 3/32" full depth



Model 2711-117 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Straight Cut	1:1 Reduction	2711-100	2711-101	2711-101	2711-100	2711-102	2711-102
	1.5:1 Reduction	2711-103	2711-104	2711-104	2711-103	2711-105	2711-105
	2:1 Reduction	2711-106	2711-107	2711-107	2711-106	2711-108	2711-108
Straight Cut	1:1.5 Speed Up	2711-109	2711-110	2711-110	2711-109	2711-111	2711-111
	1:2 Speed Up	2711-112	2711-113	2711-113	2711-112	2711-114	2711-114
Spiral	1:1 Reduction	2711-115	2711-116	2711-116	2711-115	2711-117	2711-117
	3:1 Reduction	2711-118	2711-119	2711-119	2711-118	2711-120	2711-120

Bevel Gear Boxes – Sourcing Guide

Model 2711 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Straight Cut 1:1 Reduction	Gear Strength	0.12	1.2	3.6	5.9	8.3	11.8	14.1	20	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	0.08	0.8	2.5	4.2	5.9	8.3	10.0	15	21	25
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	9.6	12	16	18
Straight Cut 2:1 Reduction	Gear Strength	0.05	0.5	1.4	2.4	3.4	4.8	5.7	8	12	14
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	*	13
Straight Cut 1:1.5 Speed up	Gear Strength	0.11	1.1	3.2	5.4	7.5	10.7	12.8	19	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1:2 Speed up	Gear Strength	0.07	0.7	2.2	3.7	5.1	7.3	8.7	13	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	0.11	1.1	3.3	5.9	7.7	10.9	13.1	19	27	32
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	5.6	7.1	9.1	10.4	14	17	20
Spiral 3:1 Reduction	Gear Strength	0.02	0.2	0.5	1.0	1.3	1.8	2.1	3	4	5
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	0.9	1.1	1.4	1.6	2.0	2.5	3.0

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

Intermittent operation may be allowed - call factory for evaluation and ratings.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 2711 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



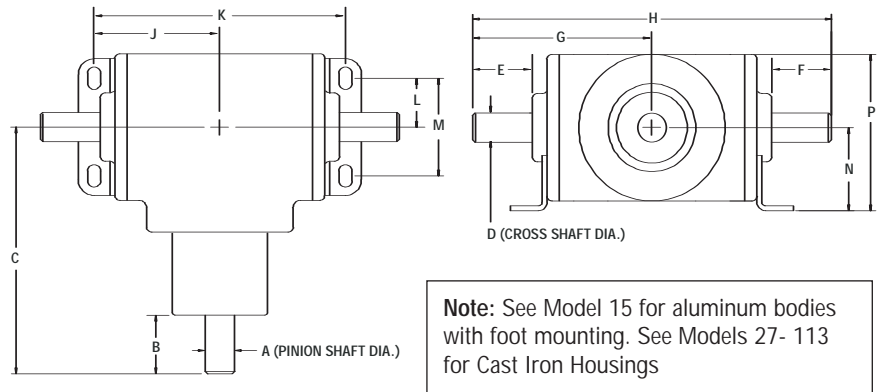
11.05.C

Cross Reference Information:

Drawing dimensions shown here should be used for initial comparison only. Use dimensions on a model-specific drawing once initial comparisons have been made. In addition to dimensions, other issues must be considered when comparing gear boxes.

These issues include:

- HP, torque and speed ratings
- Rotational direction of each shaft
- Lubrication fittings (if any)
- Drain port and breather locations
- Beveled gear type (forged, spiral, etc.)



Important: Bevel gear boxes are often made with “special” modifications. This is especially true with shaft lengths and diameters. Always measure the actual dimensions on the box you are replacing.

CROSS REFERENCE CHART

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E*	F*	G	H	J	K	L	M	N	P
Von Ruden	25	0.725	1.500	6.312	0.750	1.500	1.500	4.593	9.187	3.218	6.437	1.250	2.500	2.125	4.000
Von Ruden	2711	1.000	1.750	6.125	1.000	1.968	1.968	4.609	9.218	3.296	6.937	1.125	2.250	2.562	4.375
Von Ruden	2725	0.750	1.937	6.312	0.750	1.937	1.937	4.953	9.187	3.218	6.437	1.250	2.500	2.125	4.000
Hub City	11	1.000	1.750	6.125	1.000	#	#	4.671	9.218	3.171	6.468	1.125	2.250	2.562	4.625

*Dimensions E and F are to end caps.

No dimension given in catalog.

Bevel Gear Boxes – Sourcing Guide

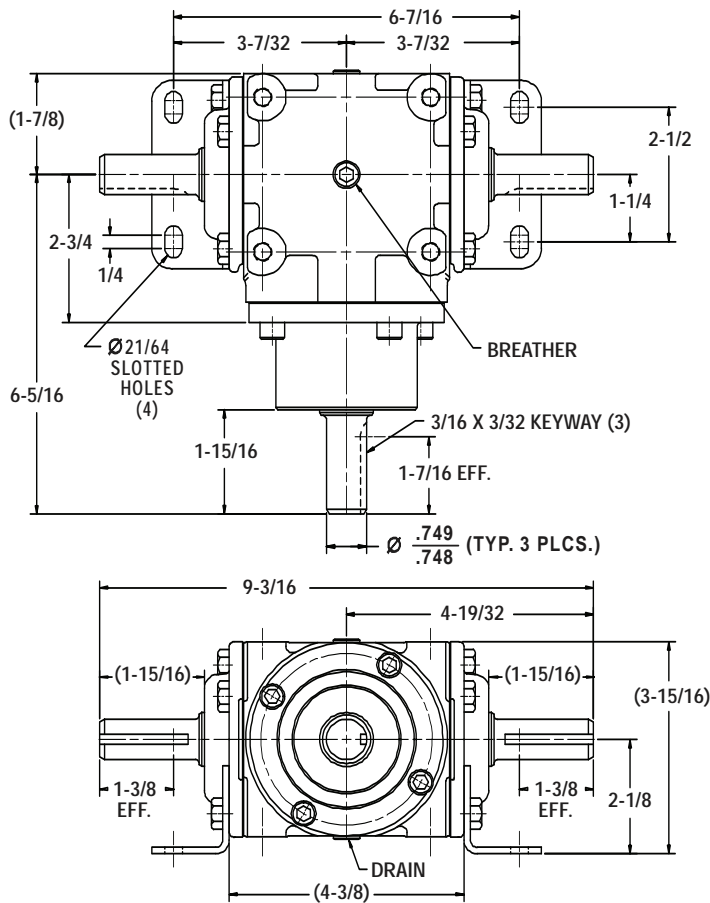
Model 2725 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

- Rugged Cast Iron housing. • Weight = 12 lbs. (approx.) • Oil Capacity = 6 oz. (approx.)



Model 2725-117 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Straight Cut	1:1 Reduction	2725-100	2725-101	2725-101	2725-100	2725-102	2725-102
	1.5:1 Reduction	2725-103	2725-104	2725-104	2725-103	2725-105	2725-105
	2:1 Reduction	2725-106	2725-107	2725-107	2725-106	2725-108	2725-108
Straight Cut	1:1.5 Speed Up	2725-109	2725-110	2725-110	2725-109	2725-111	2725-111
	1:2 Speed Up	2725-112	2725-113	2725-113	2725-112	2725-114	2725-114
Spiral	1:1 Reduction	2725-115	2725-116	2725-116	2725-115	2725-117	2725-117
	3:1 Reduction	2725-118	2725-119	2725-119	2725-118	2725-120	2725-120

Bevel Gear Boxes – Sourcing Guide

Model 2725 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Straight Cut 1:1 Reduction	Gear Strength	0.12	1.2	3.6	5.9	8.3	11.8	14.1	20	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	0.08	0.8	2.5	4.2	5.9	8.3	10.0	15	21	25
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	9.6	12	16	18
Straight Cut 2:1 Reduction	Gear Strength	0.05	0.5	1.4	2.4	3.4	4.8	5.7	8	12	14
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	*	13
Straight Cut 1:1.5 Speed up	Gear Strength	0.11	1.1	3.2	5.4	7.5	10.7	12.8	19	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1:2 Speed up	Gear Strength	0.07	0.7	2.2	3.7	5.1	7.3	8.7	13	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr L ₁₀	*	*	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	0.11	1.1	3.3	5.9	7.7	10.9	13.1	19	27	32
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	5.6	7.1	9.1	10.4	14	17	20
Spiral 3:1 Reduction	Gear Strength	0.02	0.2	0.5	1.0	1.3	1.8	2.1	3	4	5
	1000 hr L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr L ₁₀	*	*	*	0.9	1.1	1.4	1.6	2.0	2.5	3.0

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

Intermittant operation may be allowed - call factory for evaluation and ratings.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 2725 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



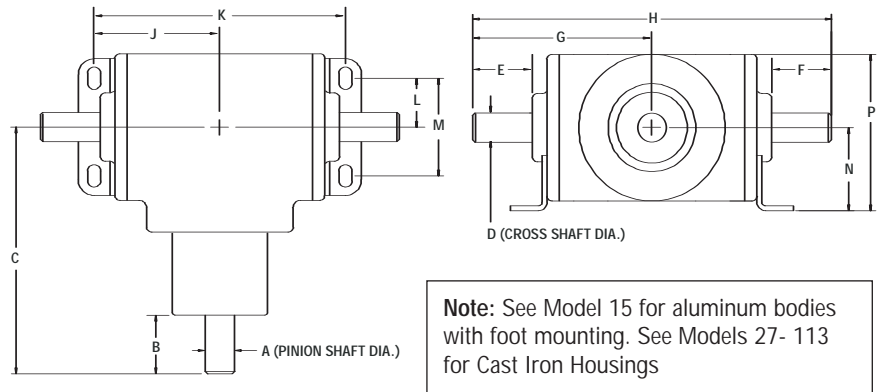
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Cross Reference Information:

Drawing dimensions shown here should be used for initial comparison only. Use dimensions on a model-specific drawing once initial comparisons have been made. In addition to dimensions, other issues must be considered when comparing gear boxes.

These issues include:

- HP, torque and speed ratings
- Rotational direction of each shaft
- Lubrication fittings (if any)
- Drain port and breather locations
- Beveled gear type (forged, spiral, etc.)



Important: Bevel gear boxes are often made with “special” modifications. This is especially true with shaft lengths and diameters. Always measure the actual dimensions on the box you are replacing.

CROSS REFERENCE CHART

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E*	F*	G	H	J	K	L	M	N	P
Von Ruden	25	0.725	1.500	6.312	0.750	1.500	1.500	4.593	9.187	3.218	6.437	1.250	2.500	2.125	4.000
Von Ruden	2711	1.000	1.750	6.125	1.000	1.968	1.968	4.609	9.218	3.296	6.937	1.125	2.250	2.562	4.375
Von Ruden	2725	0.750	1.937	6.312	0.750	1.937	1.937	4.953	9.187	3.218	6.437	1.250	2.500	2.125	4.000
Hub City	11	1.000	1.750	6.125	1.000	#	#	4.671	9.218	3.171	6.468	1.125	2.250	2.562	4.625

*Dimensions E and F are to end caps.

No dimension given in catalog.

Bevel Gear Boxes – Sourcing Guide

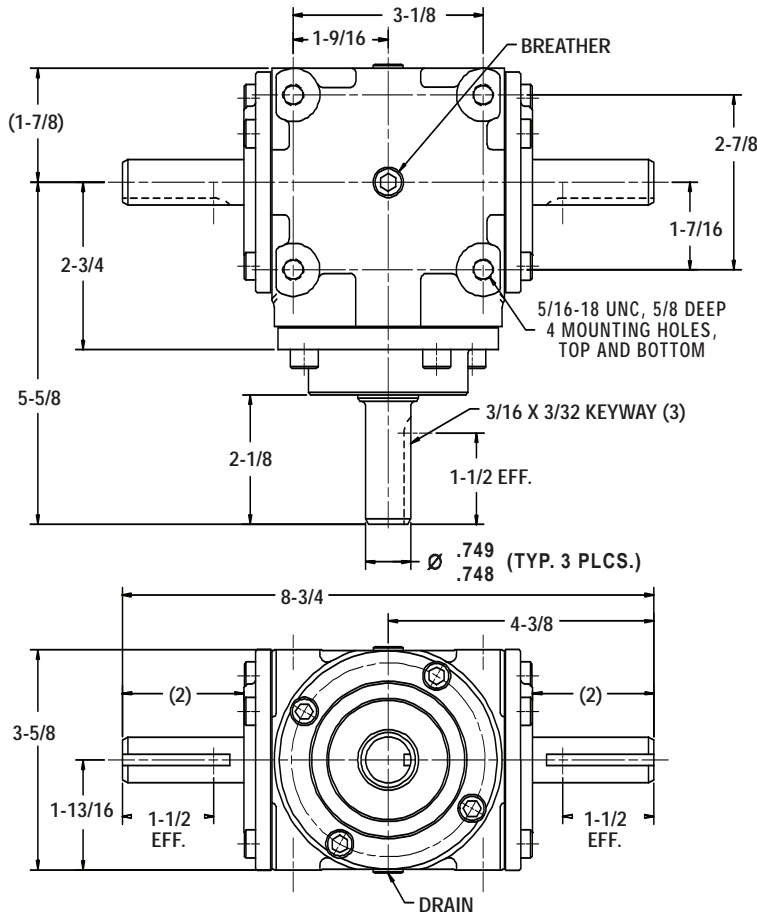
Model 2726 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

- Rugged Cast Iron housing. • Weight = 12 lbs. (approx.) • Oil Capacity = 6 oz. (approx.)



Model 2726-117 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Straight Cut	1:1 Reduction	2726-100	2726-101	2726-101	2726-100	2726-102	2726-102
	1.5:1 Reduction	2726-103	2726-104	2726-104	2726-103	2726-105	2726-105
	2:1 Reduction	2726-106	2726-107	2726-107	2726-106	2726-108	2726-108
Straight Cut	1:1.5 Speed Up	2726-109	2726-110	2726-110	2726-109	2726-111	2726-111
	1:2 Speed Up	2726-112	2726-113	2726-113	2726-112	2726-114	2726-114
Spiral	1:1 Reduction	2726-115	2726-116	2726-116	2726-115	2726-117	2726-117
	3:1 Reduction	2726-118	2726-119	2726-119	2726-118	2726-120	2726-120

Bevel Gear Boxes – Sourcing Guide

Model 2726 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		10	100	300	540	Input RPM		1000	1200	1750	2500
Straight Cut 1:1 Reduction	Gear Strength	0.12	1.2	3.6	5.9	8.3	11.8	14.1	20	**	**
	1000 hr L ₁₀	*	*	3.1	4.3	5.4	6.8	7.8	10	**	**
	5000 hr L ₁₀	*	0.8	1.8	2.5	3.2	4.0	4.5	6	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	0.08	0.8	2.5	4.2	5.9	8.3	10.0	15	21	25
	1000 hr L ₁₀	*	*	1.8	2.5	3.2	4.0	4.5	6	7	8
	5000 hr L ₁₀	*	0.5	1.0	1.5	1.8	2.3	2.6	3.4	4.3	4.9
Straight Cut 2:1 Reduction	Gear Strength	0.05	0.5	1.4	2.4	3.4	4.8	5.7	8	12	14
	1000 hr L ₁₀	*	*	1.3	1.8	2.2	2.8	3.2	4	5	6
	5000 hr L ₁₀	*	0.3	0.7	1.0	1.3	1.6	1.9	2.4	3.1	3.5
Straight Cut 1:1.5 Speed up	Gear Strength	0.11	1.1	3.2	5.4	7.5	10.7	12.8	19	**	**
	1000 hr L ₁₀	*	*	*	4.6	5.8	7.3	8.2	11	**	**
	5000 hr L ₁₀	*	0.9	1.9	2.7	3.4	4.3	4.8	6.2	**	**
Straight Cut 1:2 Speed up	Gear Strength	0.07	0.7	2.2	3.7	5.1	7.3	8.7	13	**	**
	1000 hr L ₁₀	*	*	*	*	*	*	*	11	**	**
	5000 hr L ₁₀	*	*	2.0	2.8	3.5	4.5	5.1	6.5	**	**
Spiral 1:1 Reduction	Gear Strength	0.11	1.1	3.3	5.9	7.7	10.9	13.1	19	27	32
	1000 hr L ₁₀	*	*	2.4	3.3	4.1	5.1	5.7	7	9	10
	5000 hr L ₁₀	*	0.6	1.3	1.8	2.2	2.8	3.1	3.9	4.8	5.4
Spiral 3:1 Reduction	Gear Strength	0.02	0.2	0.5	1.0	1.3	1.8	2.1	3	4	5
	1000 hr L ₁₀	*	*	*	*	1.2	1.5	1.7	2	3	3
	5000 hr L ₁₀	*	*	0.4	0.5	0.6	0.8	0.9	1.1	1.4	1.6

- * Use gear strength ratings only.
- ** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle. Intermitant operation may be allowed - call factory for evaluation and ratings. See rating explanation on Page 37. See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 33 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



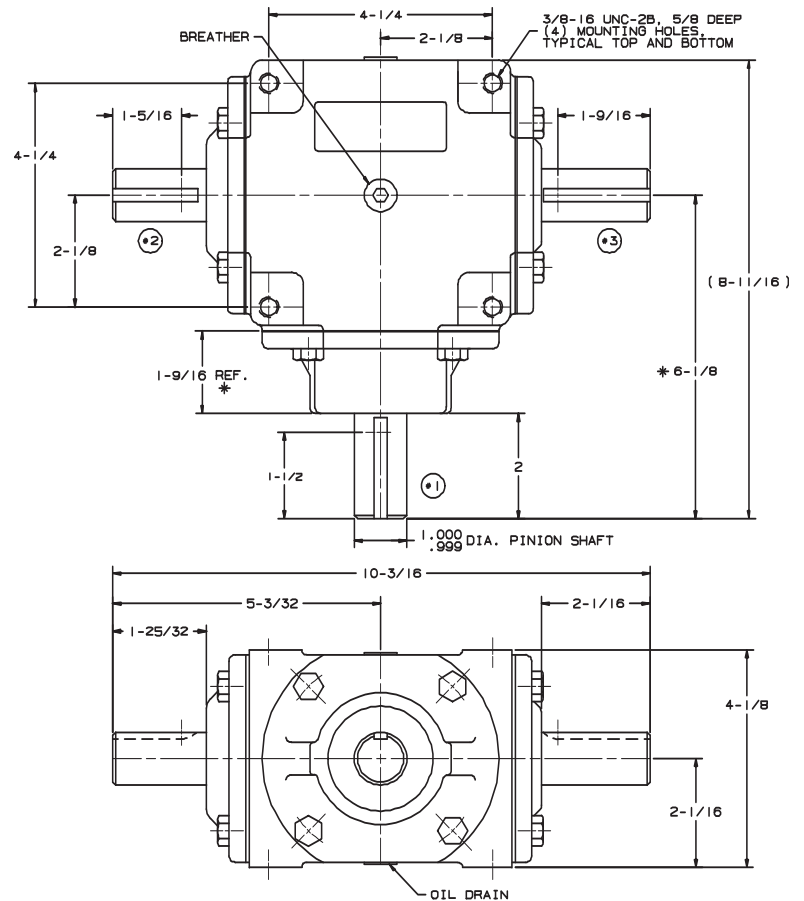
- Rugged Cast Iron housing.
- Weight = 16 lbs. (approx.)
- Oil Capacity = 16 oz. (approx.)

CROSS SHAFT

Type E 1:2 Ratio Only	Type G 1:2 Ratio Only
Shaft #2 .688/.666" Dia.	Shaft #2 1.000/.999" Dia.
Shaft #3 1.000/.999" Dia.	Shaft #3 .688/.688" Dia.
All Other Types & Ratios 1.000/.999" Dia.	

KEYWAYS

1.000" Dia. Shafts	.688" Dia. Shafts
1/4" x 1/8" Full Depth (see drawing)	3/16" x 3/32" 1-3/8" Full Depth



* DIFFERENCE BETWEEN MODELS 33 AND 40

Model 33-41 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio	1	1	1	1	1	1
Forged	1:1 Reduction	33-00	33-31	33-31	33-00	33-21	33-21
	1.35:1 Reduction	33-01	33-32	33-32	33-01	33-22	33-22
	1.5:1 Reduction	33-02	33-33	33-33	33-02	33-23	33-23
	1:1.5 Speed Up	33-05	33-34	33-34	33-05	33-35	33-35
Straight Cut	1:1 Reduction	33-66	33-67	33-67	33-66	33-68	33-68
	2:1 Reduction	33-03	33-36	33-36	33-03	33-37	33-37
	1:2 Speed Up	33-06	33-38	33-38	33-06	33-39	33-39
Spiral	1:1 Reduction	33-08	33-40	33-40	33-08	33-41	33-41
	1.5:1 Reduction	33-13	33-42	33-42	33-13	33-43	33-43
	2:1 Reduction	33-14	33-44	33-44	33-14	33-45	33-45

Bevel Gear Boxes – Sourcing Guide

Model 33 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Forged 1:1 Reduction	Gear Strength	.30	3.2	9.6	15.9	22.3	31.1	38.3	55.8	**	**
	1000 hr L10	*	*	*	*	*	*	*	*	**	**
	5000 hr L10	*	*	*	12.3	15.6	20.1	22.8	29.7	**	**
Forged 1.35:1 Reduction	Gear Strength	.20	1.5	4.4	7.4	10.4	14.8	17.8	25.9	37.0	**
	1000 hr L10	*	*	*	*	*	*	*	*	*	**
	5000 hr L10	*	*	*	*	*	*	*	*	*	**
Forged 1.5:1 Reduction	Gear Strength	.10	1.5	4.4	7.3	10.4	14.8	17.8	25.9	37.0	**
	1000 hr L10	*	*	*	*	*	*	*	*	*	**
	5000 hr L10	*	*	*	*	*	*	*	19.7	25.2	**
Forged 1:1.5 Speed Up	Gear Strength	.20	1.9	5.6	9.4	13.2	18.9	22.6	33.0	**	**
	1000 hr L10	*	*	*	*	*	*	*	*	**	**
	5000 hr L10	*	*	*	*	*	*	*	*	**	**
Straight Cut 1:1 Reduction	Gear Strength	.27	2.73	8.18	13.63	19.08	27.26	32.71	47.71	**	**
	1000 hr L10	*	*	*	*	*	*	*	*	**	*
	5000 hr L10	*	*	*	*	16.2	20.7	23.6	30.62	**	**
Straight Cut 2:1 Reduction	Gear Strength	.10	.80	2.4	4.1	5.7	8.2	9.8	14.3	20.4	24.4
	1000 hr L10	*	*	*	*	*	*	*	*	*	*
	5000 hr L10	*	*	*	*	*	*	*	*	*	*
Straight Cut 1:2 Speed Up	Gear Strength	.10	1.3	3.9	6.5	9.1	12.9	15.5	22.6	**	**
	1000 hr L10	*	*	*	*	*	*	*	*	**	**
	5000 hr L10	*	*	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	.20	2.3	6.9	11.6	16.2	23.1	27.7	40.5	57.8	69.3
	1000 hr L10	*	*	*	11.3	14.3	18.4	20.9	27.2	34.9	39.6
	5000 hr L10	*	*	*	7.0	8.8	11.3	12.9	16.8	21.5	24.5
Spiral 1.5:1 Reduction	Gear Strength	.10	1.0	3.1	5.1	7.2	10.3	12.3	18.0	25.7	30.8
	1000 hr L10	*	*	*	10.0	11.8	15.2	22.5	24.8	28.0	31.3
	5000 hr L10	*	*	*	*	5.0	6.4	7.2	9.4	12.1	13.7
Spiral 2:1 Reduction	Gear Strength	.10	.80	2.4	4.3	5.6	7.9	9.5	13.9	19.9	23.8
	1000 hr L10	*	*	*	*	*	*	*	*	*	*
	5000 hr L10	*	*	*	*	3.9	5.0	5.6	7.3	9.4	10.7

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 40 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



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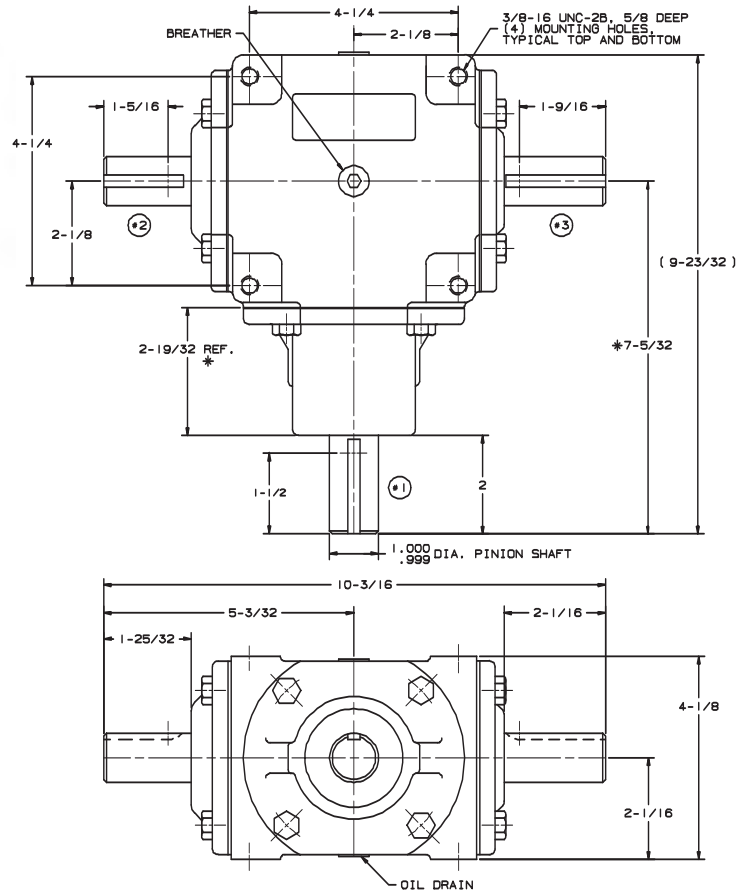
- Rugged Cast Iron housing.
- Weight = 17 lbs. (approx.)
- Oil Capacity = 16 oz. (approx.)

CROSS SHAFT

Type E 1:2 Ratio Only	Type G 1:2 Ratio Only
Shaft #2 .688/.686" Dia.	Shaft #2 1.000/.999" Dia.
Shaft #3 1.000/.999" Dia.	Shaft #3 .688/.686" Dia.
All Other Types and Shafts 1.000/.999" Dia.	

KEYWAYS

1.000 Dia. Shafts	.688 Dia. Shafts
1/4" x 1/8" Full Depth See Drawing	3/16" x 3/32" 1-3/8" Full Depth



* DIFFERENCE BETWEEN MODELS 33 AND 40

Model 40-17 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Forged	1:1 Reduction	40-00	40-01	40-01	40-00	40-02	40-02
	1.35:1 Reduction	40-125	40-126	40-126	40-125	40-127	40-127
	1.5:1 Reduction	40-117	40-128	40-128	40-117	40-129	40-129
	1:1.5 Speed Up	40-130	40-131	40-131	40-130	40-132	40-132
Straight Cut	1:1 Reduction	40-152	40-153	40-153	40-152	40-154	40-154
	2:1 Reduction	40-06	40-07	40-07	40-06	40-08	40-08
	1:2 Speed Up	40-12	40-13	40-13	40-12	40-14	40-14
Spiral	1:1 Reduction	40-15	40-16	40-16	40-15	40-17	40-17
	1.5:1 Reduction	40-18	40-19	40-19	40-18	40-20	40-20
	2:1 Reduction	40-21	40-22	40-22	40-21	40-23	40-23

Bevel Gear Boxes – Sourcing Guide

Model 40 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



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Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	500	700	1000	1200	1750	2500	3000
Forged 1:1 Reduction	Gear Strength	.30	3.2	9.6	15.9	22.3	31.1	38.3	55.8	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	12.3	15.6	20.1	22.8	29.7	**	**
Forged 1.35:1 Reduction	Gear Strength	.20	1.5	4.4	7.4	10.4	14.8	17.8	25.9	37.0	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
Forged 1.5:1 Reduction	Gear Strength	.10	1.50	4.4	7.3	10.4	14.8	17.8	25.9	37.0	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	19.7	25.2	**
Forged 1:1.5 Speed Up	Gear Strength	.20	1.9	5.6	9.4	13.2	18.9	22.6	33.0	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
Straight Cut 1:1 Reduction	Gear Strength	.27	2.73	8.18	13.63	19.08	27.26	32.71	47.71	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	*
	5000 hr. L ₁₀	*	*	*	*	16.12	20.7	23.6	30.62	**	**
Straight Cut 2:1 Reduction	Gear Strength	.10	.80	2.4	4.1	5.7	8.2	9.8	14.3	20.4	24.4
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
Straight Cut 1:2 Speed Up	Gear Strength	.10	1.3	3.9	6.5	9.1	12.9	15.5	22.6	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	.2	2.3	6.9	11.6	16.2	23.1	27.7	40.5	57.8	69.3
	1000 hr. L ₁₀	*	*	*	11.3	14.3	18.4	20.9	27.2	34.9	39.6
	5000 hr. L ₁₀	*	*	*	7.0	8.8	11.3	12.9	16.8	21.5	24.5
Spiral 1.5:1 Reduction	Gear Strength	.10	1.0	3.1	5.1	7.2	10.3	12.3	18.0	25.7	30.8
	1000 hr. L ₁₀	*	*	*	10.0	11.8	15.2	22.5	24.8	28.0	31.3
	5000 hr. L ₁₀	*	*	*	*	5.0	6.4	7.2	9.4	12.1	13.7
Spiral 2:1 Reduction	Gear Strength	.10	.80	2.4	4.3	5.6	7.9	9.5	13.9	19.9	23.8
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	3.9	5.0	5.6	7.3	9.4	10.7

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 90 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



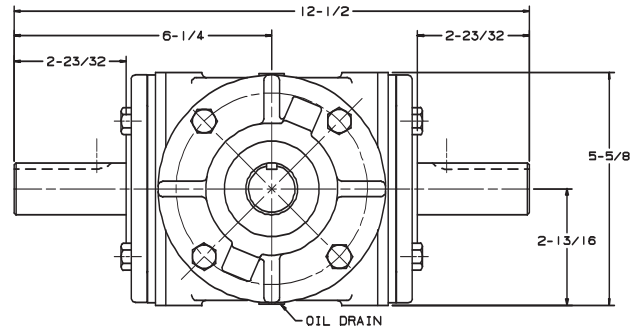
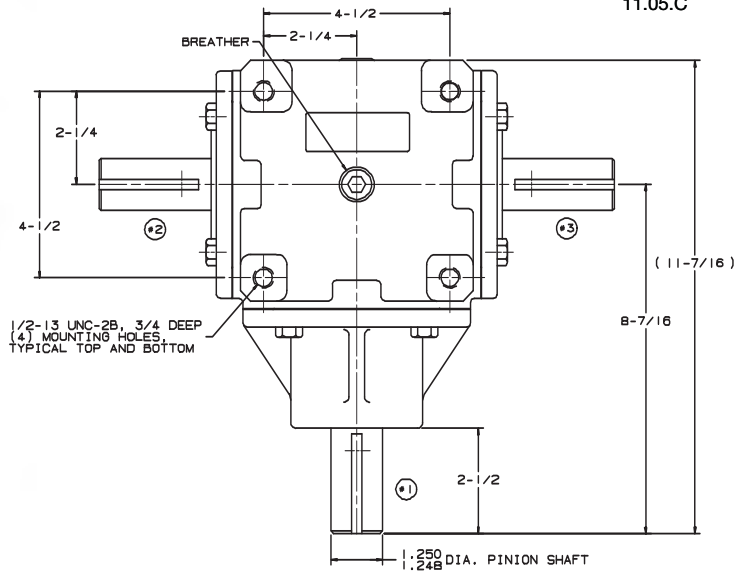
- Rugged Cast Iron Housing.
- Weight = 35 lbs. (approx.)
- Oil Capacity = 24 oz. (approx.)

CROSS SHAFT

Type E 1:2 Ratio Only	Type G 1:2 Ratio Only
Shaft #2 .857/.874" Dia.	Shaft #3 .875/.874" Dia.
All Other Types and Shafts 1.250/1.248" Dia.	

KEYWAYS

1/4" x 1/8" 2" Full Depth



Model 90-156 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Forged	1:1 Reduction	90-36	90-07	90-07	90-36	90-58	90-58
Straight Cut	1:1 Reduction	90-694	90-695	90-695	90-694	90-696	90-696
	1.5:1 Reduction	90-38	90-41	90-41	90-38	90-50	90-50
Straight Cut	2:1 Reduction	90-19	90-60	90-60	90-19	90-63	90-63
	1:1.5 Speed Up	90-37	90-40	90-40	90-37	90-51	90-51
Spiral	1:2 Speed Up	90-161	90-108	90-108	90-161	90-158	90-158
	1:1 Reduction	90-153	90-142	90-142	90-153	90-156	90-156
	1.5:1 Reduction	90-202	90-203	90-203	90-202	90-206	90-206

Bevel Gear Boxes – Sourcing Guide

Model 90 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		Input RPM									
		10	100	300	540	700	1000	1750	2000	2400	2800
Forged 1:1 Reduction	Gear Strength	.50	4.6	13.8	24.8	32.2	46.0	**	**	**	**
	1000 hr. L ₁₀	*	*	12.0	18.0	21.7	**	**	**	**	**
	5000 hr. L ₁₀	*	3.4	7.4	11.2	13.4	17.2	**	**	**	**
Straight Cut 1:1 Reduction	Gear Strength	.40	4.00	12.01	21.62	28.03	40.06	**	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	39.17	**	**	**	**
	5000 hr. L ₁₀	*	*	*	15.71	18.84	24.18	**	**	**	**
Straight cut 1.5:1 Reduction	Gear Strength	.20	2.1	6.3	11.4	14.8	21.1	**	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	**	**	**	**	**
	5000 hr. L ₁₀	*	*	*	6.3	7.5	9.6	**	**	**	**
Straight Cut 2:1 Reduction	Gear Strength	.10	1.4	4.2	7.6	9.8	14.0	24.5	28.1	33.7	39.3
	1000 hr. L ₁₀	*	*	*	*	*	*	*	27.0	31.0	34.6
	5000 hr. L ₁₀	*	*	*	6.8	8.1	11.2	15.4	16.9	19.2	21.4
Straight Cut 1:1.5 Speed Up	Gear Strength	.20	2.2	6.6	11.8	15.3	22.0	**	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	**	**	**	**	**
	5000 hr. L ₁₀	*	*	*	10.8	13.0	16.7	**	**	**	**
Straight Cut 1:2 Speed Up	Gear Strength	.20	.21	6.4	11.5	14.9	21.3	**	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	**	**	**	**	**
	5000 hr. L ₁₀	*	*	*	11.3	13.6	17.4	*	*	*	
Spiral 1:1 Reduction	Gear Strength	.20	.30	9.3	11.3	103.6	17.4	54.1	61.9	74.2	86.6
	1000 hr. L ₁₀	*	*	8.3	12.5	15.0	19.3	28.5	31.3	35.6	39.7
	5000 hr. L ₁₀	*	2.4	5.1	7.7	9.3	11.9	17.6	19.3	22.0	24.5
Spiral 1.5:1 Reduction	Gear Strength	.20	2.0	6.0	10.7	14.0	19.9	34.8	39.8	47.7	55.7
	1000 hr. L ₁₀	*	*	*	10.0	11.8	15.2	22.5	24.8	28.0	31.3
	5000 hr. L ₁₀	*	1.9	4.0	6.1	7.3	9.4	13.9	15.3	17.3	19.3

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 93 Standard – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



- Rugged Cast Iron housing.
- Weight = 41 lbs. (approx.)
- Oil Capacity = 32 oz. (approx.)

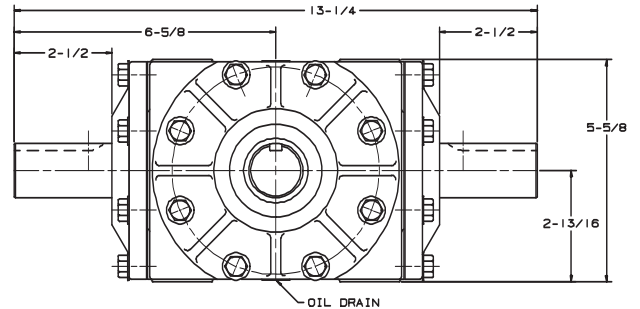
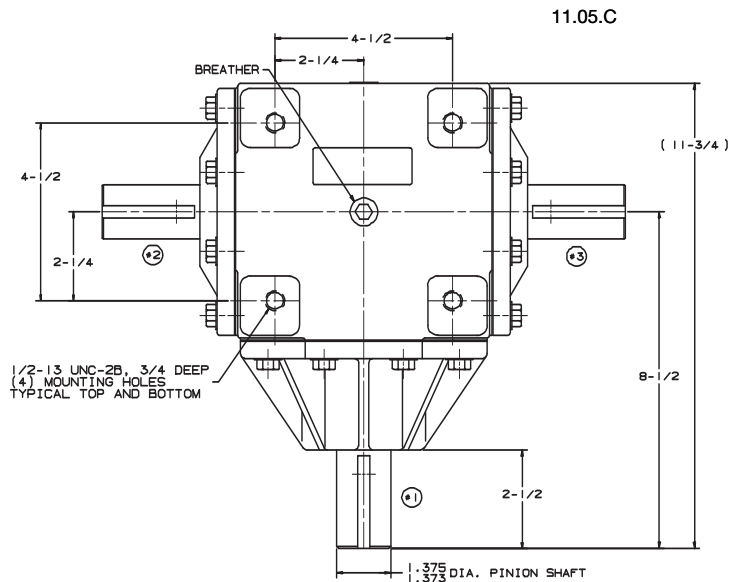
SHAFTS (3)

1.375/1.373" Dia.

For increased horsepower, 1.5" shafts and longer pinion cap are available on a special order basis

KEYWAYS

5/16" x 5/32"
1-7/8" Full Depth



Model 93-126 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio	[Diagrams of shaft arrangements 1, 2, 3]					
Forged	1:1 Reduction	93-100	93-101	93-101	93-100	93-102	93-102
Forged	1.35:1 Reduction	93-103	93-104	93-104	93-103	93-105	93-105
Straight Cut	1.5:1 Reduction	93-106	93-107	93-107	93-106	93-108	93-108
Straight Cut	2:1 Reduction	93-109	93-110	93-110	93-109	93-111	93-111
Straight Cut	3:1 Reduction	93-129	93-130	93-130	93-129	93-131	93-131
Forged	1:1.35 Speed Up	93-112	93-113	93-113	93-112	93-114	93-114
Straight Cut	1:1.5 Speed Up	93-115	93-116	93-116	93-115	93-117	93-117
Straight Cut	1:2 Speed Up*	93-109	93-110	93-110	93-109	93-111	93-111
Straight Cut	1:3 Speed Up*	93-129	93-130	93-130	93-129	93-131	93-131
Spiral	1:1 Reduction	93-124	93-125	93-125	93-124	93-126	93-126

Bevel Gear Boxes – Sourcing Guide

Model 93 Standard – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)								
		10	100	300	Input RPM		1000	1750	2000	2500
					540	700				
Forged 1:1 Reduction	Gear Strength	.80	8.2	24.6	44.3	57.5	82.2	**	**	**
	1000 hr. L ₁₀	*	*	23.0	35.8	41.6	53.4	**	**	**
	5000 hr. L ₁₀	*	6.5	14.2	22.1	25.7	32.9	**	**	**
Forged 1.35:1 Reduction	Gear Strength	.60	6.1	18.4	33.0	42.8	61.2	107.1	**	**
	1000 hr. L ₁₀	*	*	16.9	25.6	30.7	39.4	58.4	**	**
	5000 hr. L ₁₀	*	4.8	10.4	15.8	18.9	24.3	36.0	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	.40	4.2	12.6	22.8	29.5	42.2	73.8	**	**
	1000 hr. L ₁₀	*	*	*	22.0	24.0	30.9	45.7	**	**
	5000 hr. L ₁₀	*	3.8	8.2	12.3	14.8	19.0	28.2	**	**
Straight Cut 2:1 Reduction	Gear Strength	.20	2.1	6.4	11.6	15.0	21.4	37.6	42.9	53.7
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	52.0
	5000 hr. L ₁₀	*	*	*	10.9	13.2	17.0	25.0	27.0	32.1
Straight Cut 3:1 Reduction	Gear Strength	.17	1.7	5.1	9.1	11.8	16.8	29.5	33.7	42.1
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	38.7
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	29.3
Forged 1:1.35 Speed Up	Gear Strength	.60	6.7	20.3	36.5	47.4	67.7	**	**	**
	1000 hr. L ₁₀	*	*	20.3	30.7	36.9	47.3	**	**	**
	5000 hr. L ₁₀	*	5.8	12.5	18.9	22.7	29.2	**	**	**
Straight Cut 1:1.5 Speed Up	Gear Strength	.50	5.5	16.7	30.0	38.9	55.6	**	**	**
	1000 hr. L ₁₀	*	*	*	*	37.3	47.9	**	**	**
	5000 hr. L ₁₀	*	*	12.7	19.2	23.0	29.5	**	**	**
Straight Cut 1:2 Speed Up (cross shaft used as input)	Gear Strength	.40	4.0	11.8	21.2	27.5	39.3	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	**	**	**
	5000 hr. L ₁₀	*	*	11.9	18.0	21.6	27.5	**	**	**
Straight Cut 1:3 Speed Up (cross shaft used as input)	Gear Strength	.36	3.6	10.8	19.4	25.1	35.8	**	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	**	**	**
	5000 hr. L ₁₀	*	*	*	*	*	32.6	**	**	**
Spiral 1:1 Reduction	Gear Strength	.75	7.46	22.3	40.2	52.2	74.6	130.5	149	**
	1000 hr. L ₁₀	*	6.79	20.3	22.0	26.4	34.0	50.4	55.5	**
	5000 hr. L ₁₀	*	4.19	12.5	13.6	16.3	20.9	31.1	34.2	**

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 93 Hyd. Motor Driven – REFERENCE DATA



For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.

NOTE: Model 113 can also be provided with an SAE C flange.

11.05.C



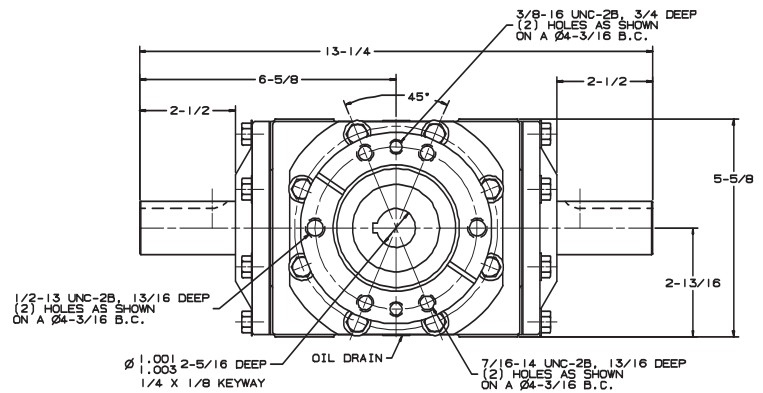
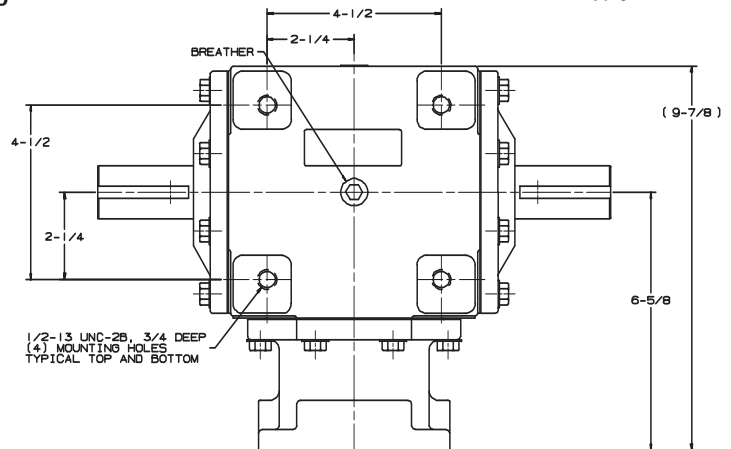
- Rugged Cast Iron housing.
- Weight = 43 lbs. (approx.)
- Oil Capacity = 40 oz. (approx.)

HYDRAULIC MOTOR MOUNTING FLANGE

Combined on one flange
 SAE A 2-Bolt (3/8" bolts)
 SAE A 2-Bolt (1/2" bolts)
 Special 4-Bolt (Ross MAB)

KEYWAYS

1.375 Dia. Cross Shafts	1.00/1.003 Dia Input Shaft (Female)
5/16" x 5/32"	1/4" x 1/8"
1-7/8" Full Depth	2-5/16" Deep



Model 93-2000 Shown Above

MODEL NUMBER	Gear Type & RATIO		TORQUE RATINGS (LB.-INCHES)							INTERMITTENT**
			CONTINUOUS*							
			10 RPM	100 RPM	300 RPM	540 RPM	700 RPM	1000 RPM	1750 RPM	
93-2000	Forged 1:1	Input	5181	5181	4003	3363	3110	2362	***	5181
		Output	5181	5181	4003	3363	3110	2362	***	5181
93-2001	Forged 1.35:1	Input	3856	3856	3059	2574	2372	2130	1804	3856
		Output	5206	5206	4130	3471	3202	2876	2435	5206
93-2002	Straight Cut 1.5:1	Input	2659	2659	2537	2127	2074	1768	1508	2659
		Output	3989	3989	3806	3191	3111	2652	2262	3989
93-2003	Straight Cut 2:1	Input	1353	1353	1353	1353	1353	1353	1241	1353
		Output	2700	2700	2700	2700	2700	2700	2482	2700
			INTERMITTENT HORSEPOWER RATINGS*							
			INPUT RPM							
93-2000	Forged 1:1		.82	8.2	24.6	44.4	57.5	82.2	***	
93-2001	Forged 1.35:1		.61	6.1	18.4	33.0	42.8	61.2	107.1	
93-2002	Straight Cut 1.5:1		.42	4.2	12.6	22.8	29.5	42.2	73.9	
93-2003	Straight Cut 2:1		.21	2.1	6.4	11.6	15.0	21.4	37.6	

* Use gear strength ratings only. See rating explanation on Page 37.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle. See important installation and lubrication information on Page 38

***Consult Factory

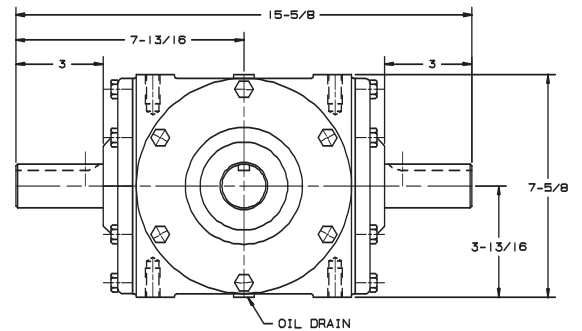
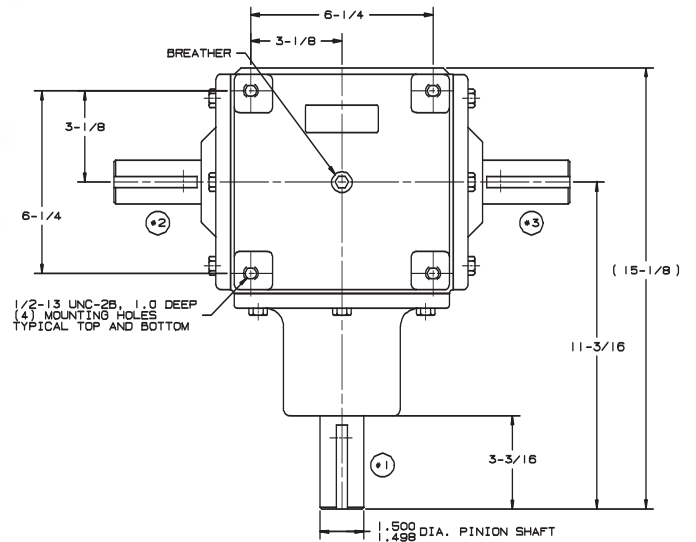
Bevel Gear Boxes – Sourcing Guide

Model 110 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



Model 110-144 Shown Above

- Rugged Cast Iron housing.
- Weight = 85 lbs. (approx.)
- Oil Capacity = 60 oz. (approx.)

SHAFTS (3)

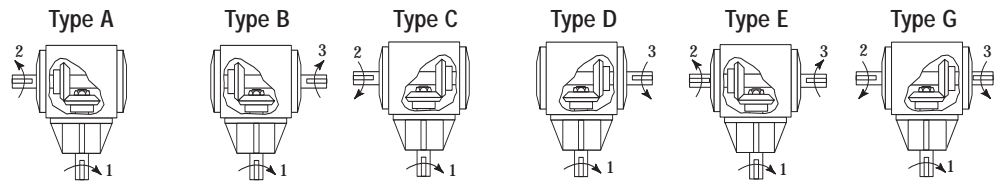
1.500/1.498" Dia.

KEYWAYS

3/8" x 3/16"
 2-1/2" Pinion Shaft (Effective Depth)
 2-3/8" Cross Shaft (Effective Depth)

SHAFT ARRANGEMENT AND ROTATION

MODEL NUMBERS



Gear Type	Gear Ratio	Type A	Type B	Type C	Type D	Type E	Type G
Forged	1:1 Reduction	110-05	110-09	110-09	110-05	110-03	110-03
Straight Cut	1.5:1 Reduction	110-06	110-10	110-10	110-06	110-04	110-04
	2:1 Reduction	110-85	110-86	110-86	110-85	110-89	110-89
Spiral	1:1 Reduction	110-133	110-136	110-136	110-133	110-144	110-144
	2:1 Reduction	110-458	110-459	110-459	110-458	110-162	110-162

Bevel Gear Boxes – Sourcing Guide

Model 110 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)									
		10	100	300	540	Input RPM 700	1000	1200	1400	1600	1750
Forged 1:1 Reduction	Gear Strength	1.38	13.75	41.26	74.26	96.26	137.52	165.02	**	**	**
	1000 hr. L ₁₀	*	*	*	65.5	78.53	103.08	114.48	**	**	**
	5000 hr. L ₁₀	*	*	26.79	40.43	48.48	63.63	70.67	**	**	**
Straight Cut 1.5:1 Reduction	Gear Strength	.66	6.62	19.87	35.77	46.37	66.24	79.49	92.74	105.98	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	*	*	44.16	56.68	64.4	71.74	78.77	**
Straight Cut 2:1 Reduction	Gear Strength	.36	3.58	10.73	19.32	25.05	35.78	42.94	50.09	57.25	52.62
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*	*	*
Spiral 1:1 Reduction	Gear Strength	1.31	13.13	39.4	70.92	91.94	131.34	157.61	183.88	210.15	229.85
	1000 hr. L ₁₀	*	*	33.4	50.41	60.49	77.55	88.09	98.27	107.73	114.79
	5000 hr. L ₁₀	*	9.55	20.62	31.12	37.34	47.87	54.38	60.66	66.5	70.86
Spiral 2:1 Reduction	Gear Strength	.49	4.88	14.63	26.33	34.13	48.76	58.51	68.26	78.02	85.33
	1000 hr. L ₁₀	*	*	*	*	33.58	42.75	49.0	54.56	59.90	63.83
	5000 hr. L ₁₀	*	*	11.46	17.29	20.73	26.39	30.25	33.68	36.98	39.40

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.
See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

Model 113 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



- Rugged Cast Iron Housing.
- Weight = 120 lbs. (approx.)
- Oil Capacity = 80 oz. (approx.)
- Optional SAE C Hydraulic motor input flange available.

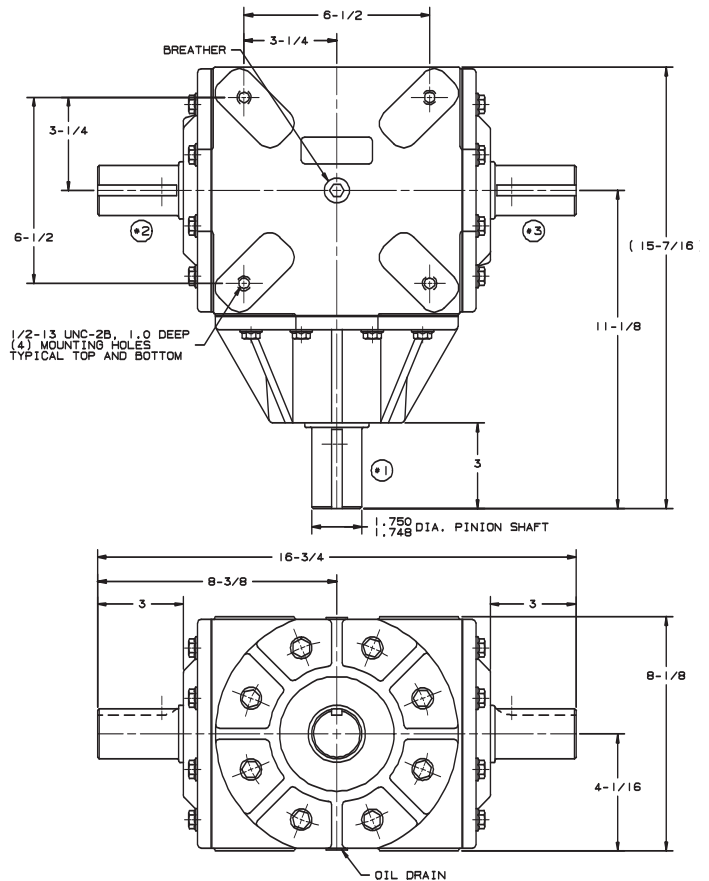
SHAFTS (3)

1.750/1.748" Dia.

The shafts are 2" in diameter internally – turned down to 1.75" externally. 2" diameter shafts can be provided on a special order basis.

KEYWAYS

3/8" x 3/16"
2-1/4" Full Depth



Model 113-24 Shown Above

MODEL NUMBERS		SHAFT ARRANGEMENT AND ROTATION					
		Type A	Type B	Type C	Type D	Type E	Type G
Gear Type	Gear Ratio						
Forged	1:1 Reduction	113-00	113-01	113-01	113-00	113-02	113-02
Straight Cut	1.35:1 Reduction	113-03	113-04	113-04	113-03	113-05	113-05
	1.5:1 Reduction	113-06	113-07	113-07	113-06	113-08	113-08
	2:1 Reduction	113-09	113-10	113-10	113-09	113-11	113-11
	3:1 Reduction	113-36	113-35	113-35	113-36	113-37	113-37
	1:1.35 Speed Up*	113-03	113-04	113-04	113-03	113-05	113-05
	1:1.5 Speed Up*	113-06	113-07	113-07	113-06	113-08	113-08
	1:2 Speed Up*	113-09	113-10	113-10	113-09	113-11	113-11
	1:3 Speed Up*	113-36	113-35	113-35	113-36	113-37	113-37
Spiral	1:1 Reduction	113-22	113-23	113-23	113-22	113-24	113-24

*Cross shaft used as input.

Bevel Gear Boxes – Sourcing Guide

Model 113 – REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Type & Ratio		MAXIMUM HORSEPOWER RATINGS (1.0 SERVICE FACTOR)							
		10	100	300	Input RPM 540	700	1000	1200	1750
Forged 1:1 Reduction	Gear Strength	2.5	24.9	74.6	134.2	174.0	**	**	**
	1000 hr. L ₁₀	*	*	*	126.8	152.1	**	**	**
	5000 hr. L ₁₀	*	24.1	51.9	78.3	93.9	**	**	**
Straight Cut 1.35:1 Reduction	Gear Strength	1.3	12.6	37.7	67.9	88.0	125.7	150.8	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	37.3	56.3	67.5	86.6	98.4	**
Straight Cut 1.5:1 Reduction	Gear Strength	1.0	10.0	30.1	54.2	70.3	100.4	120.5	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	**
	5000 hr. L ₁₀	*	*	*	51.3	61.5	79.0	89.7	**
Straight Cut 2:1 Reduction	Gear Strength	.70	7.0	21.0	37.7	48.9	69.9	83.9	122.3
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	34.9	41.8	53.7		79.4
Straight Cut 3:1 Reduction	Gear Strength	.40	3.8	11.4	20.5	26.5	37.9	45.5	66.3
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	*	*	*	*	*
Straight Cut 1:1.35 Speed Up (cross shaft used as input)	Gear Strength	1.5	14.9	44.6	80.3	104.1	148.7	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	69.3	83.1	106.7	**	**
Straight Cut 1:1.5 Speed Up (cross shaft used as input)	Gear Strength	1.43	14.3	42.9	77.2	100	143	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	68.1	81.7	105	**	**
Straight Cut 1:2 Speed Up (cross shaft used as input)	Gear Strength	1.16	11.6	34.8	62.6	81.1	116	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	*	*
	5000 hr. L ₁₀	*	*	*	56.7	68	87.2	*	*
Straight Cut 1:3 Speed Up (cross shaft used as input)	Gear Strength	.8	8.1	24.2	43.6	56.5	80.8	**	**
	1000 hr. L ₁₀	*	*	*	*	*	*	**	**
	5000 hr. L ₁₀	*	*	*	*	*	*	**	**
Spiral 1:1 Reduction	Gear Strength	1.69	16.8	50.6	91.1	118.2	168.8	202.6	*
	1000 hr. L ₁₀	*	*	48.5	73.2	87.8	112.6	128.0	*
	5000 hr. L ₁₀	*	13.8	29.9	45.2	54.2	69.5	79.0	*

* Use gear strength ratings only.

** Pitch line velocity is too fast for proper gear lubrication depending on duty cycle.

See rating explanation on Page 37.

See important installation and lubrication information on Page 38.

***For a detailed performance & cost comparison
of Forged, Straight Cut, and Spiral gears,
see page 36 of this document.***

Bevel Gear Boxes – Sourcing Guide

INDUSTRY CROSS REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



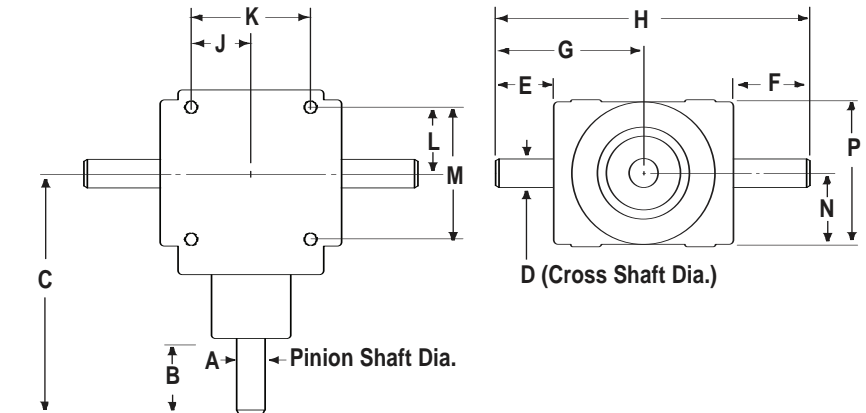
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Cross Reference Information:

Drawing dimensions shown on pages 34 & 35 should be used for initial comparison only. Use dimensions on a model-specific drawing once initial comparisons have been made. In addition to dimensions, other issues must be considered when comparing gear boxes.

These issues include:

- HP, torque and speed ratings
- Rotational direction of each shaft
- Lubrication fittings (if any)
- Drain port and breather locations
- Beveled gear type (forged, spiral, etc.)



Important: Bevel gear boxes are often made with “special” modifications. This is especially true with shaft lengths and diameters. Always measure the actual dimensions on the box you are replacing.

CROSS REFERENCE CHART (1:1 only)

(continues on page 35)

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E**	F**	G	H	J	K	L	M	N	P
Von Ruden	27	1.000	1.750	6.125	1.00	1.969	1.969	4.609	9.219	1.562	3.125	1.438	2.875	1.812	3.625
Von Ruden	2726	.750	2.125	5.625	.750	2.00	2.00	4.375	8.750	1.562	3.125	1.438	2.875	1.812	3.625
Hub City	M3	0.625	1.500	4.562	.0625	1.500	1.500	3.234	6.468	1.125	2.250	1.125	2.250	1.593	3.187
Curtis	200	0.750	1.062	4.687	0.750	1.000	1.000	3.375	6.750	1.562	3.125	1.438	2.875	1.812	3.625
Durst	A160	"	2.000	5.750	"	2.000	2.000	4.625	9.250	"	"	"	"	"	"
Von Ruden	33	1.000	2.000	6.125	1.000	1.781	2.062	5.093	10.18	2.125	4.250	2.125	4.250	2.062	4.125
Von Ruden	40	"	"	7.156	"	"	"	"	"	"	"	"	"	"	"
Hub City	150	"	"	5.179	"	#	#	5.093	10.18	"	"	"	"	"	"
Hub City	165	"	"	7.156	"	#	#	"	"	"	"	"	"	"	"
Browning	6H	"	1.750	6.125	"	1.625	1.625	4.546	9.218	#	4.375	#	2.750	2.125	4.250
Browning	9H	"	2.000	7.156	"	2.000	2.000	5.093	10.18	2.125	4.250	2.125	4.250	2.062	4.125
Boston Gear	R1211	"	"	5.500	"	"	-	5.500	-	"	"	"	"	"	"
(Made for Boston by Curtis)	R1214	"	"	7.375	"	"	2.000	"	11.00	"	"	"	"	"	"
	R1215/R1216	"	"	5.500	"	"	"	"	"	"	"	"	"	"	"
Curtis	211	"	"	"	"	"	-	"	-	"	"	"	"	"	"
Curtis	214	"	"	7.375	"	"	2.000	"	11.00	"	"	"	"	"	"
Curtis	215/216	"	"	5.500	"	"	"	"	"	"	"	"	"	"	"
Superior	200	"	"	6.875	"	"	"	5.590	11.18	"	"	"	"	"	"
Peerless	1100	"	#	#	"	#	#	#	#	"	"	"	"	"	"
Terrell	AB**	"	2.370	5.620	"	2.370	2.370	5.620	11.24	"	"	"	"	"	"
Prairie Gear	**	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Durst	A115	"	2.000	6.120	"	#	#	5.062	10.12	"	"	"	"	"	"
Durst	A18/A101	"	2.500	8.620	"	2.500	2.500	6.250	12.5	2.000	4.000	2.000	4.000	2.810	5.62

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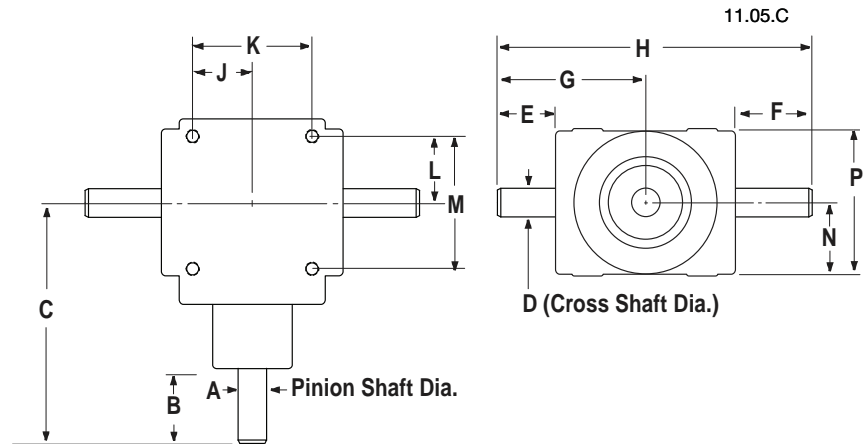
**Dimensions E and F are to end caps.

No dimension given in catalog.

Bevel Gear Boxes – Sourcing Guide

INDUSTRY CROSS REFERENCE DATA

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



CROSS REFERENCE CHART (1:1 only)
(continued from page 34)

Manufacturer	Model	SHAFT DIAMETERS AND LENGTHS								CASE DIMENSIONS					
		A	B	C	D	E**	F**	G	H	J	K	L	M	N	P
Von Ruden	90	1.250	2.500	8.437	1.250	2.718	2.178	6.250	12.5	2.250	4.500	2.250	4.500	2.812	5.625
Hub City	66	"	"	8.468	"	#	#	6.125	12.25	"	"	"	"	"	"
Browning	12H	"	2.375	"	"	2.375	2.375	"	"	"	"	"	"	"	"
Boston Gear	R1412/R1416	"	2.500	6.500	"	2.500	2.500	6.500	13.00	"	"	"	"	"	"
(Made for Boston	R1413	"	"	8.375	"	2.687	2.687	"	"	"	"	"	"	"	"
by Curtis)	R1414	"	"	"	"	2.500	2.500	8.375	16.75	"	"	"	"	"	"
Curtis	412/416	"	"	6.500	"	"	"	6.500	13.00	"	"	"	"	"	"
Curtis	413	"	"	8.375	"	2.687	2.687	"	"	"	"	"	"	"	"
Curtis	414	"	"	"	"	2.500	"	8.375	16.75	"	"	"	"	"	"
Superior	400	"	"	8.500	"	"	2.500	6.625	13.37	"	"	"	"	"	"
Terrell	AE	"	2.620	8.620	"	2.630	2.630	6.380	12.76	1.875	3.750	"	"	3.375	6.750
Von Ruden	93	1.375	2.500	8.500	1.375	2.500	2.500	6.625	13.25	2.250	4.500	2.250	4.500	2.812	5.625
Terrell	314	"	"	"	"	"	"	6.690	13.38	"	"	"	"	"	"
Superior	500	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Hub City	600	"	"	8.406	"	#	#	6.125	12.25	"	"	"	"	"	"
Hub City	88	"	3.000	10.87	"	#	#	7.906	15.81	3.250	6.500	3.250	6.500	4.093	8.187
Browning	15H	"	"	"	"	3.000	3.000	"	"	"	"	"	"	"	"
Boston Gear	R1511/R1515	"	2.937	8.250	"	2.937	2.937	8.250	16.00	3.000	6.000	3.000	6.000	3.750	7.500
(Made for Boston	R1514	"	"	11.68	"	"	"	"	"	"	"	"	"	"	"
by Curtis)		"	"	"	"	"	"	"	"	"	"	"	"	"	"
Curtis	511/515	"	"	8.250	"	"	"	"	"	"	"	"	"	"	"
Curtis	514	"	"	11.68	"	"	"	"	"	"	"	"	"	"	"
Durst	A-11	"	3.00	10.57	"	3.000	3.000	6.560	13.88	2.500	5.000	2.500	5.000	3.060	6.120
Durst	A-120	"	"	"	"	"	"	7.440	14.88"	"	"	"	"	3.500	7.000
Von Ruden	110	1.500	3.188	11.188	1.500	3.000	3.000	7.812	15.625	3.125	6.250	3.125	6.250	3.125	7.625
Von Ruden	113	1.750	3.000	11.125	1.750	3.000	3.000	8.375	16.75	3.250	6.500	3.250	6.500	4.062	8.125
Hub City	1000	"	"	13.00	"	#	#	9.140	18.28	4.000	8.000	4.000	8.000	4.750	9.500
Hub City	1010	2.000	4.000	15.00	2.000	#	#	10.75	21.50	"	"	"	"	"	"
Hub City	1200	2.500	5.000	16.87	2.500	#	#	12.81	25.62	4.500	9.000	4.500	9.000	6.187	12.37
Curtis	615	2.000	3.000	9.500	2.000	3.000	3.000	9.500	19.00	4.000	8.000	4.000	8.000	4.750	9.500
Durst	A-76	1.750	3.000	11.81	1.750	"	"	8.120	16.25	2.500	5.000	2.500	5.000	3.187	7.625
Terrell	176	1.375	3.375	11.68	"	"	"	7.688	15.37	2.375	4.375	3.000	6.000	4.500	9.000
Terrell	315	1.750	3.750	13.00	2.000	3.500	3.500	8.562	2.063	"	4.750	"	"	5.375	10.75

**Dimensions E and F are to end caps. # No dimension given in catalog.

Bevel Gear Boxes – Sourcing Guide

GEAR COMPARISONS AND SHIMMING

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C



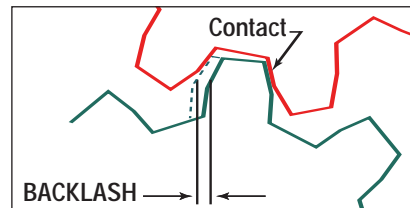
Gear Types

	Precision Forged	Straight Cut	Spiral
Horsepower	Highest. Forging process yields stronger metal grain structure. Also, forged gears can be designed with a web connecting the heel of teeth for increased strength.	Lower than forged.	Higher than straight cut. More teeth in continuous contact and increased tooth beam strength. But the thrust load imposed by spiral gears reduces bearing life.
Speed	Same as straight cut.	Same as forged.	Highest, due to better lubrication and contact.
Noise Level	Good	Improved over forged.	Best, more continuous tooth contact.
Cost/Gear (once tooled)	Relatively Low.	Moderate But set-up costs greatly influence price, especially in quantities less than 100.	Highest due to the extra machining required. Also, set-up costs influence cost significantly, especially in quantities less than 100.
Tooling Cost	Very high. Plus long lead time for tooling (months).	Low. Primarily a gear cutter.	Low. Primarily a gear cutter.
Economical Production Lot Size	High (1000s).	Low. But cost is influenced significantly by set-up, especially for less than 100.	Low. But cost is influenced significantly by set-up, especially for less than 100.

Backlash

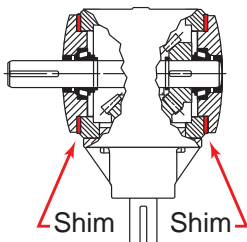
Our Standard backlash is 0.004" minimum and 0.012" to 0.015" maximum. Other backlash can be provided on a special order basis.

We shim our gear boxes for consistent backlash using the process described below.

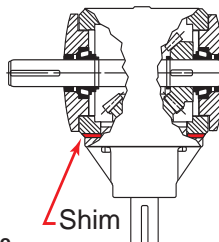


Backlash = The shortest distance between the non-contacting surfaces of adjacent gear teeth.

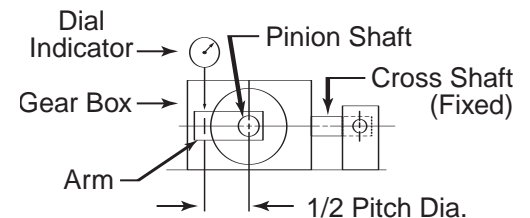
Shimming Procedure



STEP 1
Shim bearings on cross shaft to acceptable end play of .003" to .001"



STEP 2
Shim pinion housing to achieve proper backlash and gear tooth contact



STEP 3
Measure backlash

Bevel Gear Boxes – Sourcing Guide

SERVICE RATINGS

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Gear Box Ratings

Our strength and durability ratings are based on AGMA suggested guidelines, engineering calculations and our own actual experience. They should be used only as an initial selection guide.

We cannot guarantee that these ratings will prove satisfactory for all applications. Complete suitability can be determined only through prototyping and field testing.

AGMA Ratings

AGMA Ratings apply to gear material, heat treatment, design, tooth finish, tooth profile, and allowable tolerances.

Our straight cut and spiral gears are manufactured to AGMA Class 9 with forged gears manufactured to AGMA Class 7. Other AGMA classes can be provided.

Class of Service

Our ratings are based on AGMA Class 1 service conditions. A 1.00 service factor is used when the application is free from recurrent shock loading and is continuous but does not exceed 10 hours per day. For other operating conditions, the rated horsepower can be increased or decreased by dividing the rated horsepower by the proper service factor from this table.

Prime Mover	Duration of Service	DRIVEN MACHINE LOAD CLASSIFICATIONS		
		Uniform	Moderate Shock	Heavy Shock
Electric Motor	Occasional .5 hr/day	.0.50	.0.80	.1.25
	Intermittent 3 hrs/day	.0.80	.1.00	.1.50
	Up to 10 hrs/day	.1.00	.1.25	.1.75
	24 hrs per day	.1.25	.1.50	.2.00
Multi-Cylinder Internal Combustion Engine	Occasional .5 hr/day	.0.80	.1.00	.1.50
	Intermittent 3 hrs/day	.1.00	.1.25	.1.75
	Up to 10 hrs/day	.1.25	.1.50	.2.00
Single Cylinder Internal Combustion Engine	Occasional .5 hr/day	.1.00	.1.25	.1.75
	Intermittent 3 hrs/day	.1.25	.1.50	.2.00
	Up to 10 hrs/day	.1.50	.1.75	.2.25
	24 hrs/day	.1.75	.2.00	.2.50

Our Catalog Rating System

RPM	→	700
<hr/>		
HP based on gear strength	→	57.5
<hr/>		
HP based on 1000 hours L ₁₀ bearing life	→	41.6
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HP based on 5000 hours L ₁₀ bearing life	→	25.7
<hr/>		

Bearing Life Ratings

Our bearing life ratings are based on the L₁₀ life calculations which are an expression of reliability. There is a 90% reliability (100% less 10%) that the bearing life will equal or exceed the calculated hours listed.

We tabulate bearing ratings for both 1000 and 5000 hours of L₁₀ life.

Our calculations assume no externally applied thrust or radial loads. Bearing life can be calculated when external loads are applied, but our engineers need to know the location and direction of the external load as well as its magnitude. Use our application data sheet (DT176) when forwarding information.

Torque Ratings

Horsepower ratings are provided in these reference section. To determine torque, use this calculation.

$$T = 63.025 \frac{HP}{N}$$

T = Torque (Lb.-inches)
HP = Horsepower
N = RPM

Starting Torque

Momentary or starting torque should be limited to 200% of gear strength rated capacity.

Maximum Speeds

The maximum speeds listed in our catalog can be exceeded in some applications. Consult factory.

Bevel Gear Boxes – Sourcing Guide

THERMAL CAPACITIES AND LUBRICATION

For Complete Specifications & Comprehensive Performance Data See www.vonruden.com.



11.05.C

Thermal Capacity

The thermal capacity of a gear box (Its ability to dissipate heat) may be somewhat less than the mechanical horsepower ratings included in this documentation. The thermal capacity is dependent on load conditions (duty cycle) and cooling air circulation.

Additional cooling or a larger gear box may be required if the continuous operating temperature exceeds 200°F.

Prototype testing is recommended.

Lubrication Specifications

All Standard Bevel Boxes are splash lubricated and splash cooled. Shafts must be mounted horizontally (+/-15°). When shafts are mounted vertically, an external grease fitting may be required. Please specify when ordering.

The input speed rating must not exceed the gear box's specification. Maximum continuous operating temperature for standard units is 180° F (82° C). The maximum intermittent operating temperature should not exceed 225° F (107° C) with a rest period at least five times the running period. (Consult Factory on applications with operating parameters exceeding these requirements).

- All standard bevel boxes are **shipped without lubrication**. Box must be filled at least to the oil check plug before operating.
- The oil level should be established according to the gearbox's speed and mounting position.
- Boxes running below 500 RPM require a slightly higher oil level. In very low RPM applications the oil may be replaced with grease (Consult Factory).
- Overheating can be caused by too little or too much oil in the box.
- Use ISO VG150 EP antifoaming oil for normal operations. Use ISO VG100EP or ISO VG150EP antifoaming oil for high RPM applications.
- Fill, check and drain plugs are located for applications where all shafts are in a horizontal position, unless otherwise specified.
- Breather and drain plug positions meet most mounting requirements, however end users are responsible for relocating the breather and drain plugs to meet Von Ruden's specifications.
- Special units equipped with grease fittings should be serviced regularly with a multi-purpose NLGI Grade No. 2 grease.

Approximate Oil Capacities

Models	15	25	27	33	40	90	93	110	113
Ounces (oz.)	4	8	6	16	16	24	32	56	80
Liters (L)	.1	.2	.15	.5	.5	.7	.9	1.7	2.4

Recommended Lubricants

Ambient Temp.	Lubricant
-20° to 0° F	SAE 10W or 10W-40 Automotive Oil
0° to 40° F	SAE 80 Gear Oil with Anti-Foaming Agent
40° to 100° F	SAE 90 Gear Oil with Anti-Foaming Agent
100° to 150° F	SAE 140 Gear Oil with Anti-foaming Agent

Lubrication Change Intervals

The lubricant in a new gear box should be changed after 100 hours of operation or four (4) weeks by draining at operating temperature, thoroughly cleaning with a flushing oil to remove any particles, and refilling with clean oil. Thereafter, under normal operating conditions, the lubricant should be changed every 2500 hours of operation or every six (6) months.

Under severe operating conditions such as dust or rapid temperature changes, the lubricant should be changed more frequently.

Note

Von Ruden reminds users of these products that their safe operation depends on use in compliance with engineering information provided by Von Ruden Manufacturing. Users are also reminded that safe operation depends on proper installation, operation, and routine maintenance and inspection under prevailing conditions. It is the responsibility of users (and not Von Ruden) to provide and install guards or safety devices which may be required by recognized safety standards or by the Occupational Safety and health Act of 1970 and its subsequent provisions.