

# CARTRIDGE AND BLOCK SPINDLES

A WIDE SELECTION FOR MILLING, DRILLING, BORING  
AND OTHER ROTATIONAL PROCESSES.



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Russell T.  
**Gilman**  
An SKF Company  
Precision Machine Tool Components



## Gilman & SKF Deliver New Quality Products and Services

### Take advantage of exclusive SKF technologies and precision Gilman craftsmanship.

- Whether your end application is a special machine or an OEM product line, Gilman's Grafton, WI plant -- along with three SKF spindle facilities worldwide -- assure you responsive engineering, precision manufacturing and prompt, efficient after-sale service.

- Emerging SKF bearing technology allows Gilman to "push the envelope" in high speed belt driven performance: up to 12,000 RPM in 50 Taper and 15,000 RPM in 40 Taper tooling/tool holders. Gilman also provides OEM spindles, special retrofits and cluster spindle modules.

### The "Engineering Handbook" for Gilman's belt driven spindle line.

- In addition to drilling, milling, grinding and turning, Gilman spindles have tackled many types of specialized machining operations, including computer hard disk finishing, silicon wafer cutting, glass finishing and servo memory to name just a few .... call us to discuss your specialized applications.

- Unlike some products machined for accuracy after assembly, Gilman components are precision manufactured with state-of-the-industry boring and grinding equipment to millionths-of-inch tolerances before being assembled in our Class 10,000 clean room.

- Gilman is ISO 9001 and 14001 certified for quality systems and environmentally friendly processes.

### Other precision Gilman and SKF spindles:

#### Gilman High Speed GHS Model integrally motorized spindles

"Dynamic Preload Control" -- a Gilman innovation -- allows our High Speed spindle bearing preload to be modified for optimum operational characteristics. SKF CE ceramic bearing technology makes high power, high stiffness and high RPM machining possible. 120 mm cartridge dia.; 7 kW; 36,000 RPM; to 230 mm cartridge dia.; 36 kW; 18,000 RPM

#### Gilman Low Speed GLS Model integrally motorized spindles

120 mm cartridge dia.; .56 kW; 9,000 RPM; to 230 mm cartridge dia.; 4 kW; 7,000 RPM

#### SKF Cartridge and Block belt driven spindles

MSUP, MSUC and MSUA Models are designed for transfer line use in milling and drilling operations.

#### SKF Cartridge integrally motorized spindles

MSUH Models are designed for fine boring or precision turning operations.

#### SKF Grinding spindles

100 mm cartridge dia.; 1.75 kW; 105,000 RPM; to 170 mm cartridge dia., 30 kW; 12,000 RPM

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## The Gilman Spindle Line

This catalog presents the current line of standard Gilman spindles, which are normally available for quick delivery from our extensive inventory stock. In these pages you'll find a wide variety of spindle sizes and speeds, in configurations to meet most machine applications.

Standard Gilman spindles can be motorized belt-driven; they range in size from 1/8 to 30 horsepower and are available at fixed speeds. We can also supply a full range of spindle accessories including draw bars, coolant unions, wrenches, bearing sensors, lubricators and others.

If none of these standard spindles meet your requirements, a custom-designed spindle may well be the answer. Please refer to pages 42 and 43 for a review of Gilman custom capabilities. Then dial 1-800-445-6267 (In WI 414-377-2434) to discuss your needs with one of our application engineers.

**Key features of Gilman spindles.** Every Gilman precision spindle is built from the highest quality materials and components, to deliver high performance and long life. Features include:

- **High-quality alloy steel shaft.** Case hardened and precision ground, the shaft combines a hard outer surface with a tough, resilient core. Shaft threads are also precision ground, resulting in excellent accuracy.
- Precision grade ABEC-7 angular contact **ball bearings** are provided as standard. (Model 1250 and 1875 spindles feature ABEC-7 shielded deep groove ball bearings.) Bearings are lubricated with high performance synthetic grease.
- Close-grain, stress-relieved **cast iron housings** provide excellent dampening and heat-transfer properties.
- **Precision runout tolerances** down to .0001 T.I.R. are standard, depending on the size of the spindle unit. (Please refer to the adjoining chart.) **Spindles with even higher precision (lower T.I.R. values) can be furnished on request.**

- Highly effective standard **sealing design** includes labyrinth seals with flinging grooves and a gravity drain. Lower speed models feature Nitrile rubber V-ring seals. Air purging can be specified if desired. Models 1250 and 1875 feature a sealing method described on pages 6 and 7.
- Special materials and sealing methods can be utilized with any Gilman spindle, as may be required by unusual **environmental situations.**
- **Motorized spindles** incorporate a 230/460 volt 3-phase 60-Hz totally-enclosed fan-cooled motor, with timing belt drives, as standard. (Model 1875 spindles are furnished with a totally-enclosed non-ventilated motor.) Poly-V, V-belt, and flat **belt drives** are available for applications where high speed and minimum vibration are required.
- **Vertical travel spindle units** combine a motorized spindle with a slide assembly. The precise and rigid Gilman slide unit is constructed with oil-grooved low-friction bearing material on the saddle wear surfaces, guided on two precision-ground and hardened rectangular steel ways. Saddle tracking accuracy is .0005 inch per 3 feet of travel. Three different slide drives are offered: manual lead screw right angle drive, powered ball lead screw, and hydraulic cylinder.

**Spindle selection and ordering.** Please refer to page 4 for information on selecting the proper size spindle to match your application. Detailed ordering information can be found on page 5.

Need assistance in selecting a spindle? Just call our application engineering department (1-800-445-6267; in Wisconsin call 414-377-2434; FAX 414-377-9438). Or, write us regarding your application, and we will recommend a standard design or modification, or a custom-engineered spindle to meet your needs. Please describe the application fully, including the type of machine in which the spindle will be used, speed, horsepower, configuration, and envelope or size requirements. Russell T. Gilman Inc. 1230 Cheyenne Avenue, P.O. Box 5, Grafton, WI 53024.

## Spindle Runout

Nose Style	Runout Location	MODEL							
		1250	1875	2750	3500	4000	5500	6500	8000
N.M.T.B.	Mounting Face			.0002	.0002	.0002	.0002	.0003	.0003
	Radial Diameter			.0002	.0002	.0002	.0002	.0003	.0003
	Internal Taper			.0001	.0001	.0001	.0001	.0002	.0002
Boring	Pilot Bore			.0001	.0001	.0001	.0001	.0002	.0002
	Mounting Face			.0001	.0001	.0001	.0001	.0002	.0002
Collet, Quickchange and Morse Taper	Internal Taper		.0003	.0001	.0001	.0001	.0001		
Straight Bore	Internal Bore		.0003	.0002					
Arbor	Radial Diameter	.0003	.0003						
Jacobs	External Taper	.0003	.0003						

Please note: It is the established policy of Russell T. Gilman Inc. to seek continuing improvement of our products. Accordingly, all dimensions, designs and specifications presented in this catalog are subject to change without notice.

# Gilman Sizing Instructions

**P**roper spindle sizing is important to ensure a long and dependable life. To help in selecting the correct spindle the following factors should be considered.

## General Rules For Sizing

- 1** Always select the largest spindle that will fit your particular space and comply with the speed requirements. This will give you the maximum spindle stiffness and longest life.
- 2** Keep tool overhang to a minimum, particularly when boring, end milling or nonsupported arbor milling. As you move further from the spindle bearings, bearing loads increase and spindle stiffness decreases. Use the specification charts to find the maximum overhang distance.
- 3** When boring, the spindle nose bearing bore should be approximately as large or larger than the hole being machined.
- 4** To minimize any shaft or bearing loading, keep within the maximum torque rating given on the specification charts.
- 5** Consider the environment in which the spindle is used. If the conditions are dusty, air purging is recommended. If there is heavy coolant or chips, it is advisable to supply a deflector cover to keep coolant or chips from directly attacking the spindle. Contact seals should be used unless speed requirements do not allow.
- 6** Specify the correct bearing arrangement. For mostly radial loaded applications, use a bearing pair at the nose end. For high axial loads, combination axial and radial loading or heavy or interrupted cuts, use a triplex bearing set at the nose end.
- 7** Gilman's engineering and sales staff is always available to help in selecting the correct spindles for your applications. When asking for assistance, please supply the following information:
  - a) Type of operation and stock removal amounts
  - b) Tooling description
  - c) Part material specification
  - d) Spindle orientation
  - e) Environmental conditions
  - f) Space limitations
  - g) Horsepower and RPM required

Whenever possible, supply a part print along with any other information that may be useful in spindle selection.

# Gilman Ordering Instructions

**E**ach spindle assembly is defined by the model number which consists of a maximum of seven code symbols.

**CARTRIDGE AND BLOCK SPINDLES** are identified by the first five code symbols. The first symbol determines the size of the spindle. The second symbol identifies the cartridge mounting or block configuration. The third symbol identifies the internal construction type and the fourth identifies the nose end bearing preload. The fifth symbol identifies the type of spindle nose.

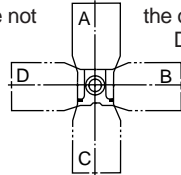
**SPECIFY SPEED WHEN ORDERING**

Brackets are available for all cartridge spindles, see dimension sheets for model numbers.

**MOTORIZED SPINDLES** use the first five code symbols of the cartridge assembly, and the sixth code symbol to describe the type of motor drive.

On most belt drive units, the motor can be positioned at four locations around the spindle (see drawing at right), but motor positions are not field changeable. Position "A" will be furnished unless otherwise specified. **Motor dimensions and frame size may vary. If exact dimensions are required, request certified print.**

Specify spindle speed when ordering. All motors will be supplied 230/460 volt, 3 phase 60 cycle. Consult factory for other motor specifications and spindle speeds not shown in charts.



Motor Positions

**MOTORIZED VERTICAL TRAVEL SPINDLES** use all

seven code symbols. The last symbol identifies the slide drive. All vertical travel belt drive units use the B1 belt drive in Position "A".

You can readily determine the spindle model number as you decide on size, cartridge mounting, internal construction, shaft type and if motorized or vertical travel drives are required.

Check to see that each code symbol in the model number is indicated under the size selected and to the left in the column under the assembly selected. These are the spindle assemblies that are available.

We can give prompt accurate service if complete information is provided with the order. If you have any questions, please phone our Sales Engineering Department at (414) 377-2434.

**SPECIFY AIR PURGE IF REQUIRED.** Fittings will be supplied upon request on nose end of cartridge spindles and each end of block spindles at additional charge.

**MODEL NUMBER CODE**

SIZE								DESCRIPTION	CODE
1250	1875	2750	3500	4000	5500	6500	8000		
<b>2750 C - X1 M - 30 - B1 - E1</b>									
<b>TYPE</b>									
		•	•	•				Plain Housing Cartridge	P
•	•	•	•	•				Positioning Nut Cartridge	N
•	•	•			•	•	•	Flange Housing Cartridge	C
•	•		•	•	•	•	•	Block Housing	B
<b>INTERNAL CONSTRUCTION</b>									
•	•	•	•	•	•	•	•	Duplex Ball Nose End, Contact Seal	X1
•	•	•		•	•	•	•	Duplex Ball Nose End, Labyrinth Seal	X2
•	•	•		•	•	•	•	Triplex Ball Nose End, Contact Seal	X3
•	•	•		•	•	•	•	Triplex Ball Nose End, Labyrinth Seal	X4
<b>NOSE END BEARING PRELOAD</b>									
•	•	•		•	•	•	•	Light Preload	L
•	•	•	•	•	•	•	•	Medium Preload	M‡
•	•	•		•	•	•	•	Heavy Preload	H
<b>SHAFT NOSE</b>									
		•	•					Jacobs Taper	JT
•	•	•	•	•				Arbor	AR°
•	•	•	•					Morse Taper	MT
•	•	•	•	•	•			Straight Bore	ST
•	•	•		•	•	•	•	Boring	BR
•	•	•		•	•			Collet	CT
•	•	•		•	•	•		Quick Change	QC
•	•	•		•	•			30 NMTB	30
•	•	•			•	•		40 NMTB	40
•	•	•				•	•	50 NMTB	50
<b>MOTOR DRIVE</b>									
•	•		•	•	•	•	•	Belt - Motor Drive End (High HP)	B1+
•	•		•	•	•	•	•	Belt - Motor Nose End (High HP)	B2
•	•		•	•	•	•	•	Belt - Motor Drive End (Low HP)	B3
•	•		•	•	•	•	•	Belt - Motor Nose End (Low HP)	B4
<b>SLIDE DRIVE</b>									
•			•	•	•			Ball Lead Screw Powered Drive	D1
•			•	•	•			Lead Screw Right Angle Manual Drive	E1
•			•	•	•			Hydraulic Cylinder Stop Rod	H2

° 1250 Arbor nose not available in motorized.  
 + B1 available in 6500 vertical travel motorized spindle.  
 ‡ Medium preload is offered as standard. Light & heavy preload are available at an additional cost. 1250 and 1875 only available with medium preload.

The Engineering Department of Russell T. Gilman, Inc., reserves the right to change specifications without notice. Do not base final decisions on catalog drawings — ask for a certified print when you order a spindle. If servicing should be required on any Gilman spindle, we suggest the unit be returned for factory service to assure optimum performance and life.

# Gilman 1250P, N Cartridge Spindles

1250 cartridge spindles are available in plain and positioning nut types. Positioning nut models feature two .001 inch graduated nuts at each end of the cartridge for axial adjustment of the spindle. Also available are two standard nose types and one standard internal construction.

Nose types:

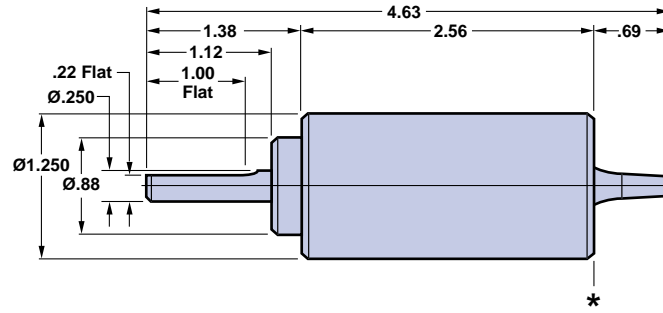
- #0 Jacobs taper
- .375 diameter arbor

Internal construction:

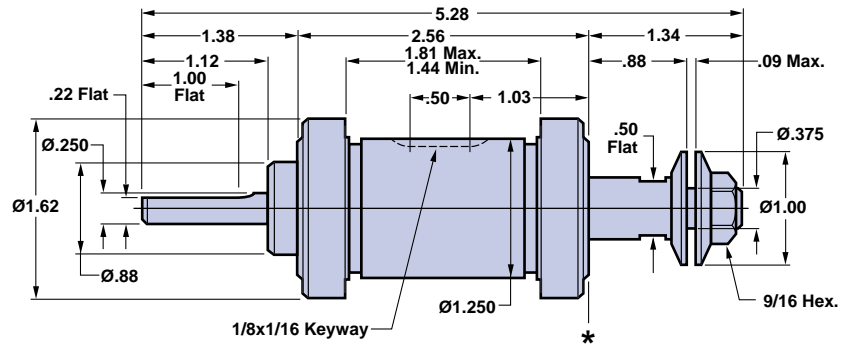
- XIM duplex shielded ball bearing at nose end

Two types of brackets are available, clamp type for plain cartridges and positioning type. Both are manufactured from close grain, stress relieved cast iron.

Refer to the 1250 specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



JT - #0 Jacobs Taper Shaft



AR - Ø.375 Arbor Shaft

## 1250 Specification Chart

Bearing And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1M	36	14,000	5,060	8 mm I.D. Duplex Ball	Shielded Bearing	8 mm I.D. Single Row Ball	Shielded Bearing

\* Maximum Tool Overhang (from \*) = 1 1/4 (IN.)

Maximum Torque = 5 (IN.- LBS.)

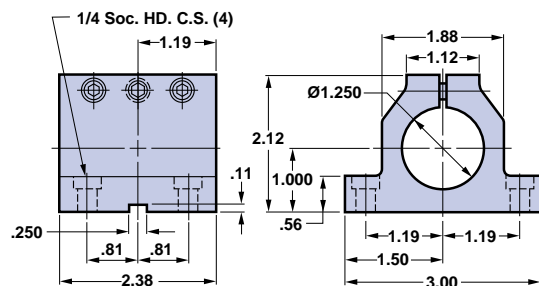
WK<sup>2</sup> = .023 (LB.- IN.<sup>2</sup>)

NOTE: Tool overhang pertains to boring, end milling and nonsupported arbor milling.

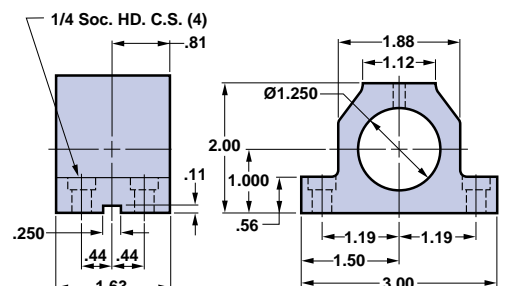
1250 APPROX. WT. 1 LB.



## 1250P & 1250N Brackets

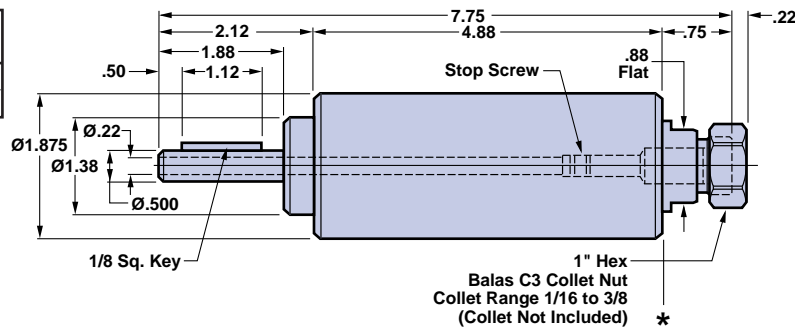


Clamp Type B1250P

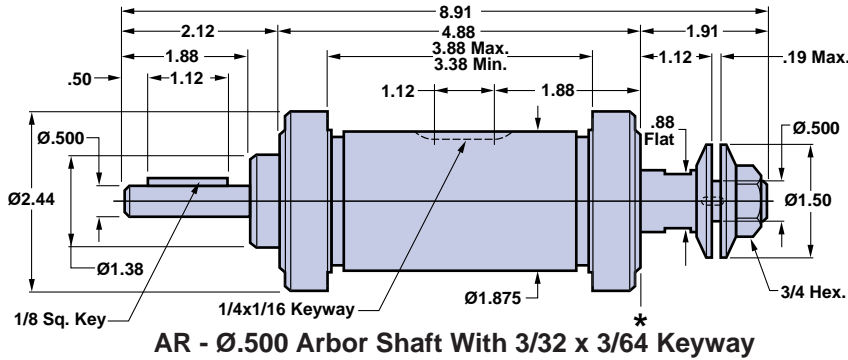


Positioning Nut Type B1250N

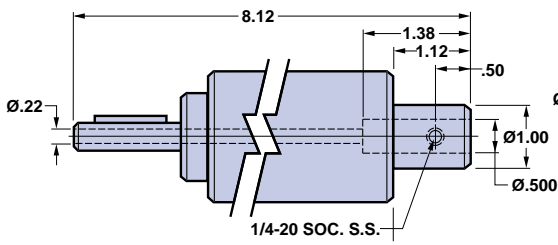
Tool Dia.	Max Tool Depth
1/16 to 1/4	2 In.
Over 1/4 to 3/8	1 3/16 In.



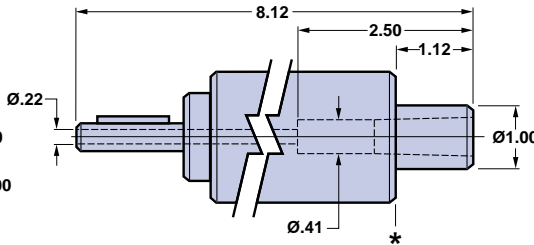
**CT - Balas C3 Collet Shaft**



**AR - Ø.500 Arbor Shaft With 3/32 x 3/64 Keyway**



**ST - Straight Bore Shaft**



**MT - #1 Morse Taper Shaft**

**1875 Specification Chart**

Bearing And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1M	45	15,800	33,444	17 mm I.D. Duplex Ball	Shielded Bearing	17 mm I.D. Single Row Ball	Shielded Bearing

\* Maximum Tool Overhang (from \*) = 2 1/2 (IN.)

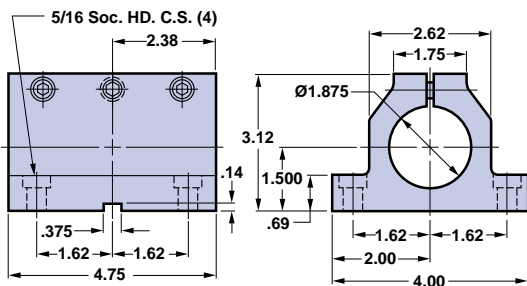
Maximum Torque = 35 (IN.- LBS.)

WK<sup>2</sup> = .205 (LB.- IN.<sup>2</sup>)

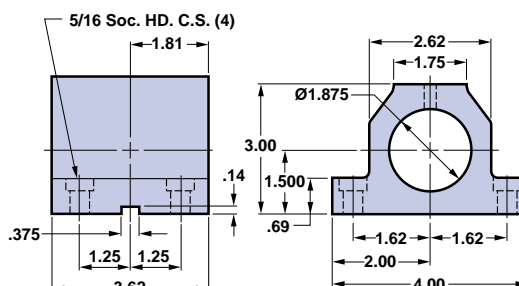
NOTE: Tool overhang pertains to boring, end milling and nonsupported arbor milling.

1875 APPROX. WT. 4 LBS.

**1875P & 1875N Brackets**



**Clamp Type B1875P**



**Positioning Nut Type B1875N**



**Gilman  
1875P, N  
Cartridge Spindles**

1875 cartridge spindles are available in plain and positioning nut types. Positioning nut models feature two .001 inch graduated nuts at each end of the cartridge for axial adjustment of the spindle. Also available are four standard nose types and one standard internal construction.

Nose types:

- 1/16 to 3/8 Balas collet
- .500 diameter arbor
- .500 diameter straight bore
- #1 Morse taper

Internal construction:

- X1M duplex shielded ball bearing at nose end

Two types of brackets are available, clamp type for plain cartridges and positioning type. Both are manufactured from close grain, stress relieved cast iron.

Refer to the 1875 specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

# Gilman 2750C Cartridge Spindles

2750C cartridge spindles and 2750B block spindles are available with five standard nose types and four standard internal construction types.

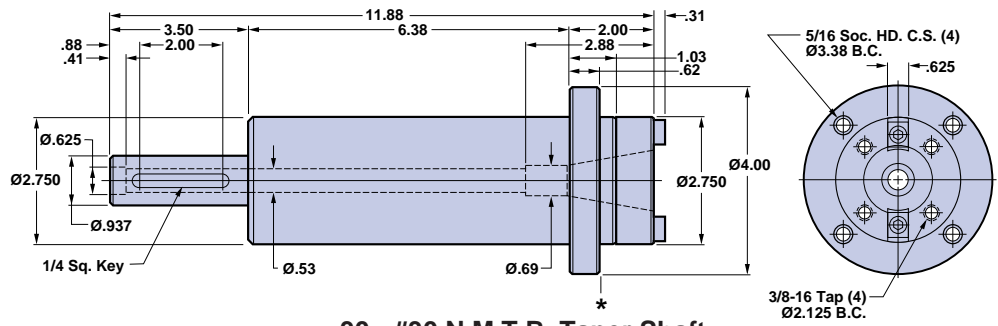
Nose types:

- #30 N.M.T.B. taper
- Boring
- #30 Erickson quick change
- 1/16 to 3/4 Erickson collet
- .750 diameter straight bore

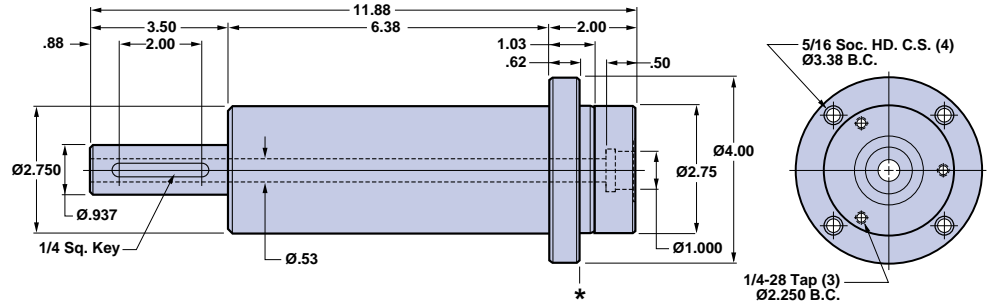
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

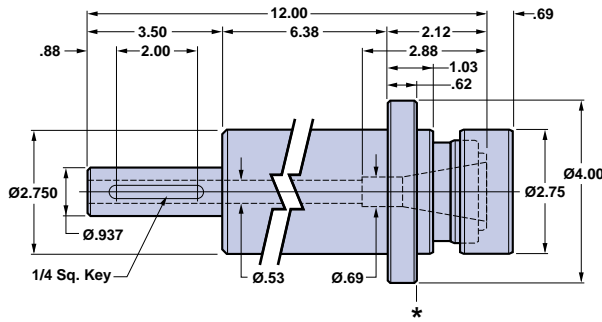
Refer to the 2750C/2750B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



**30 - #30 N.M.T.B. Taper Shaft**



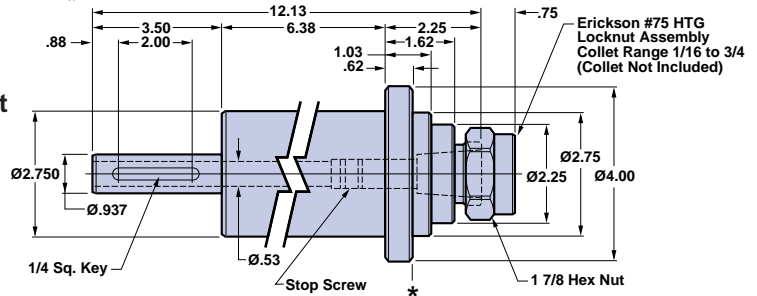
**BR - Boring Shaft**



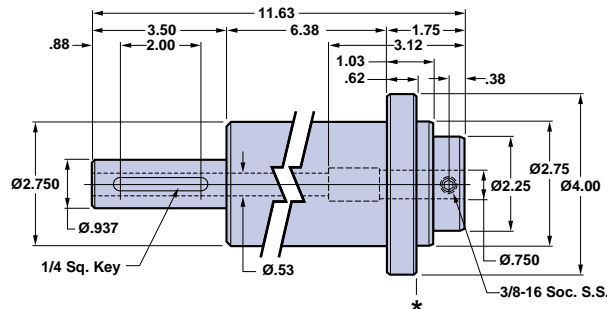
**QC - #30 N.M.T.B. Erickson Quick Change Shaft**

**CT - Erickson 075 Collet Shaft**

Tool Dia.	Max Tool Depth
1/16 to 9/16	4 In.
Over 9/16 to 3/4	2 In.



**ST - Straight Bore Shaft**



2750C APPROX. WT. 15 LBS.



For cartridge spindle brackets, see "Accessories Section", Page 44.

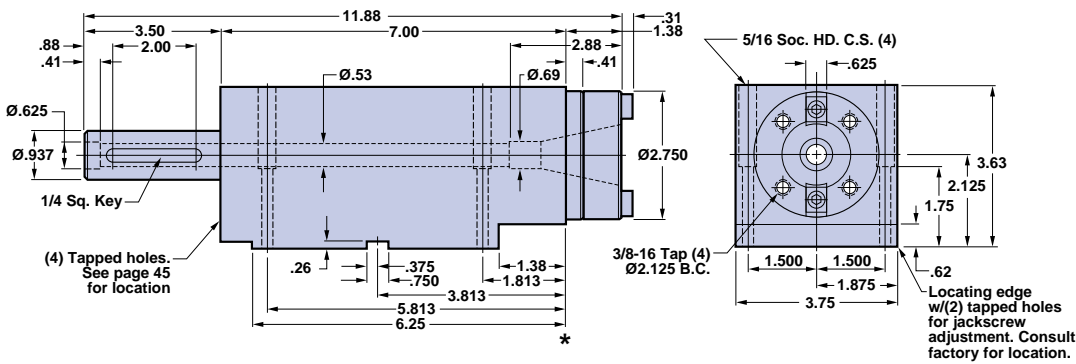
## 2750C & 2750B Specification Chart

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	46	5,300	180,000	30 mm I.D.		25 mm I.D.	
X1M	139	5,300	200,000	Duplex	Contact	Duplex	Labyrinth
X1H	289	5,300	210,000	Ball		Ball	
X2L	46	17,500†	180,000	30 mm I.D.		25 mm I.D.	
X2M	139	15,600†	200,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	289	10,400†	210,000	Ball		Ball	

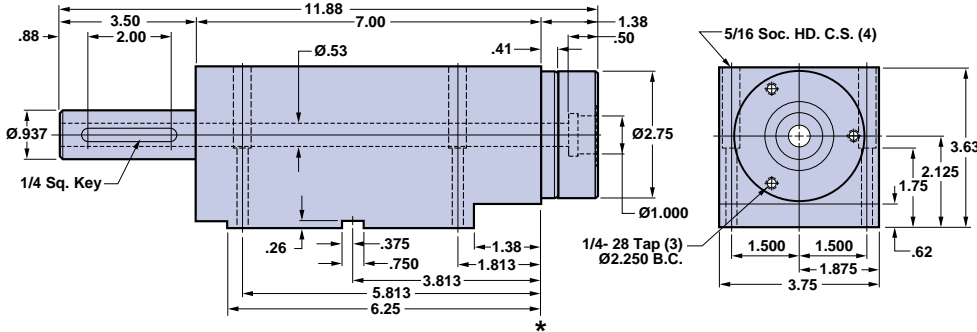
† QC Max. RPM = 4,200



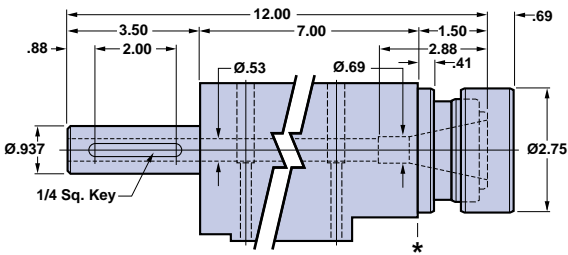
# Gilman 2750B Block Spindles



**30 - #30 N.M.T.B. Taper Shaft**



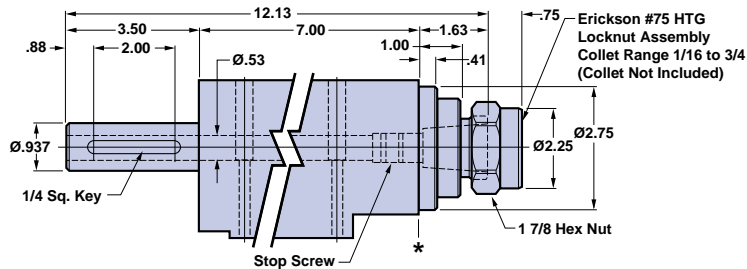
**BR - Boring Shaft**



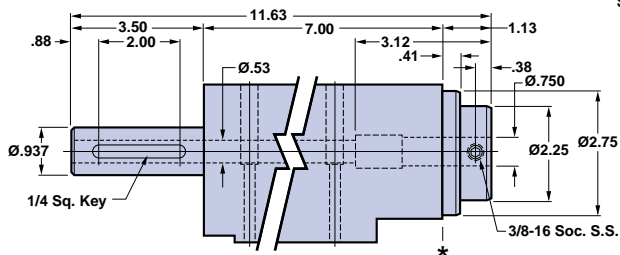
**QC - #30 N.M.T.B. Erickson Quick Change Shaft**

**CT - Erickson 075 Collet Shaft**

Tool Dia.	Max Tool Depth
1/16 to 9/16	4 In.
Over 9/16 to 3/4	2 In.



2750B APPROX. WT. 25 LBS.



**ST - Straight Bore Shaft**



## 2750C & 2750B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Thrust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	92	5,300	260,000	30 mm I.D.		25 mm I.D.	
X3M	290	5,300	290,000	Triplex	Contact	Duplex	Labyrinth
X3H	655	5,300	300,000	Ball		Ball	
X4L	92	15,600†	260,000	30 mm I.D.		25 mm I.D.	
X4M	290	10,400†	290,000	Triplex	Labyrinth	Duplex	Labyrinth
X4H	655	8,300†	300,000	Ball		Ball	

\* Maximum Tool Overhang (from \*) = 3 (IN.)

Maximum Torque = 133 (IN.- LBS.)  
 $WK^2 = 2.8$  (LB.- IN.<sup>2</sup>)

NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

† QC Max. RPM = 4,200

# Gilman 3500C Cartridge Spindles

3500C cartridge spindles and 3500B block spindles are available with four standard nose types and four standard internal construction types.

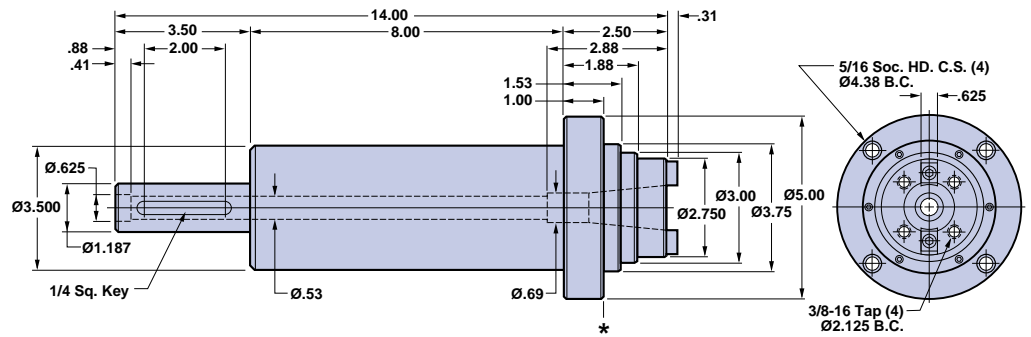
Nose types:

- #30 N.M.T.B. taper
- Boring
- #30 Erickson quick change
- 1/16 to 3/4 Erickson collet

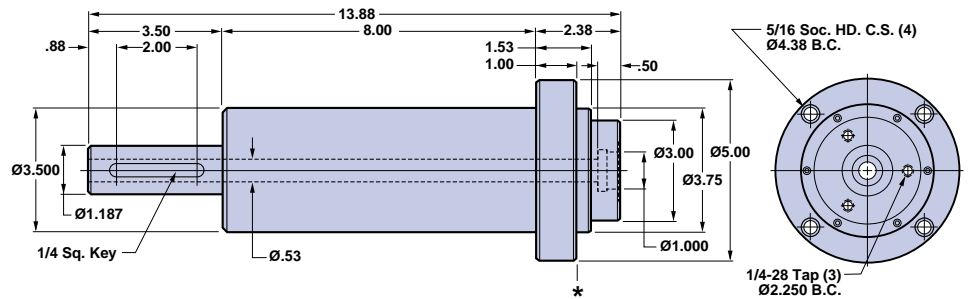
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

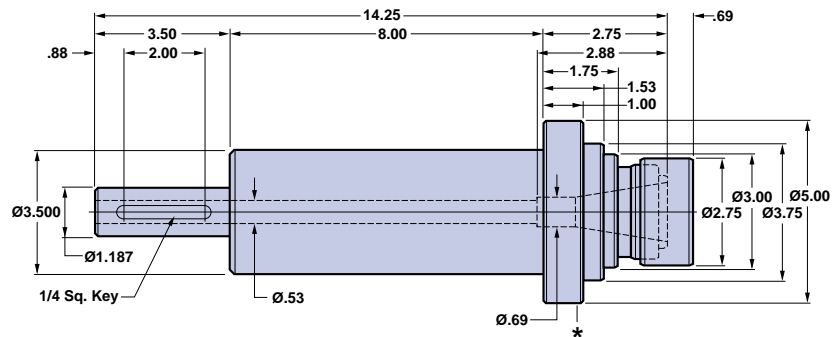
Refer to the 3500C/3500B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



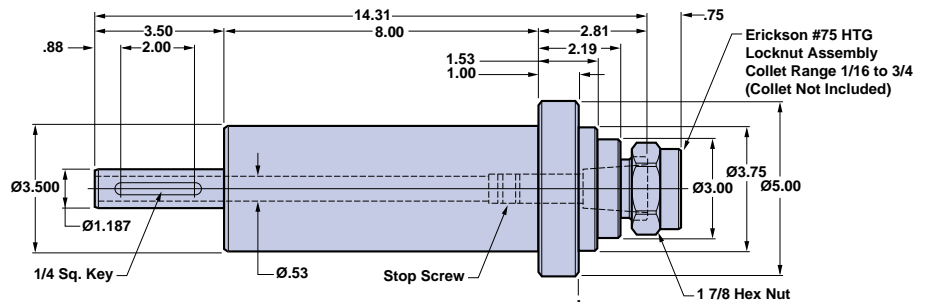
**30 - #30 N.M.T.B. Taper Shaft**



**BR - Boring Shaft**



**QC - #30 N.M.T.B. Erickson Quick Change Shaft**



**CT - Erickson 075 Collet Shaft**

Tool Dia.	Max Tool Depth
1/16 to 9/16	4 In.
Over 9/16 to 3/4	2 In.

3500C APPROX. WT. 30 LBS.



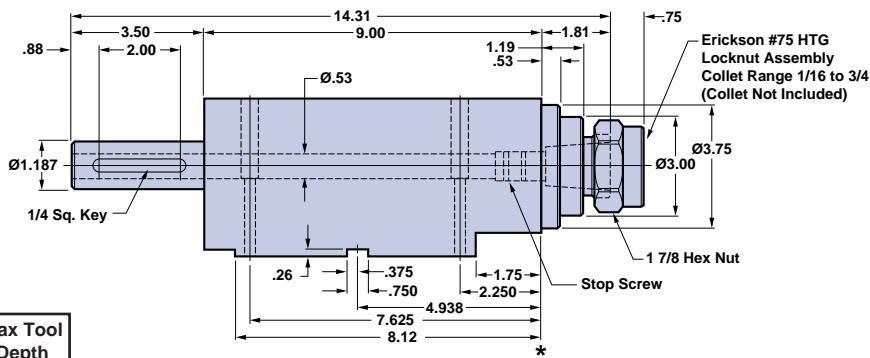
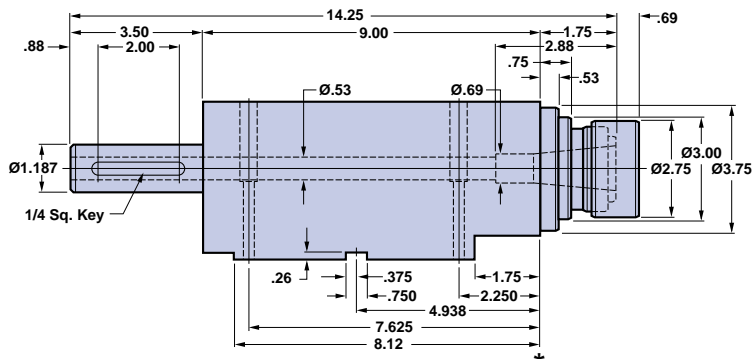
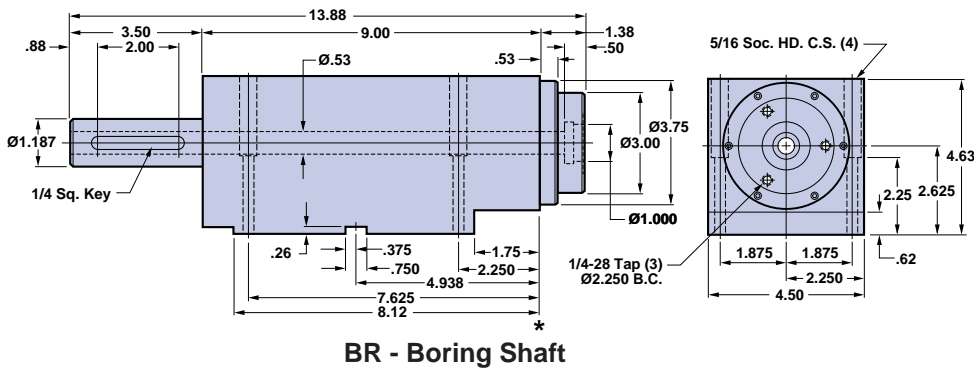
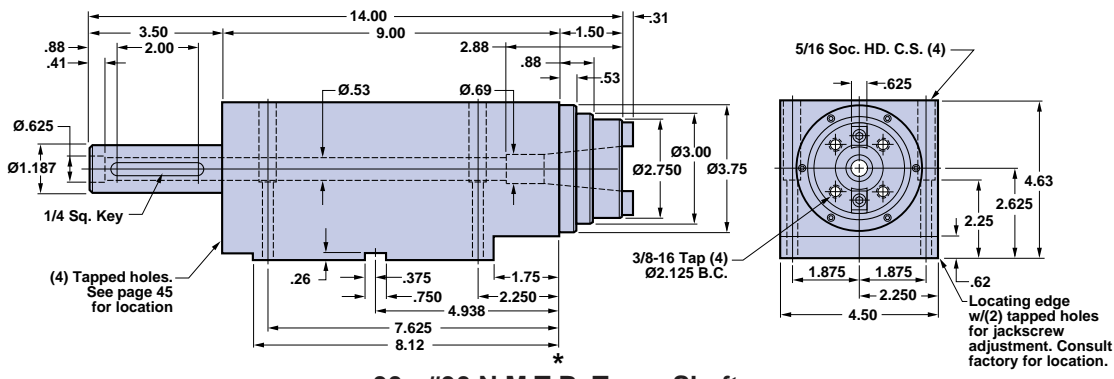
For cartridge spindle brackets, see "Accessories Section", Page 44.

## 3500C & 3500B Specification Chart

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	100	3,750	430,000	45 mm I.D.		35 mm I.D.	
X1M	265	3,750	490,000	Duplex	Contact	Duplex	Labyrinth
X1H	560	3,750	530,000	Ball		Ball	
X2L	100	13,900†	430,000	45 mm I.D.		35 mm I.D.	
X2M	265	10,800†	490,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	560	7,200†	530,000	Ball		Ball	

† QC Max. RPM = 4,200

# Gilman 3500B Block Spindles



Tool Dia.	Max Tool Depth
1/16 to 9/16	4 In.
Over 9/16 to 3/4	2 In.

3500B APPROX. WT. 45 LBS.



## 3500C & 3500B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	207	3,750	670,000	45 mm I.D.		35 mm I.D.	
X3M	527	3,750	750,000	Triplex	Contact	Duplex	Labyrinth
X3H	1,191	3,750	820,000	Ball		Ball	
X4L	207	10,800†	670,000	45 mm I.D.		35 mm I.D.	
X4M	527	7,200†	750,000	Triplex	Labyrinth	Duplex	Labyrinth
X4H	1,191	5,700†	820,000	Ball		Ball	

★ Maximum Tool Overhang (from ★) = 3 7/8 (IN.)

Maximum Torque = 527 (IN.- LBS.)

$WK^2 = 6.2$  (LB.- IN.<sup>2</sup>)

NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

† QC Max. RPM = 4,200

# Gilman 4000C Cartridge Spindles

4000C cartridge spindles and 4000B block spindles are available with three standard nose types and four standard internal construction types.

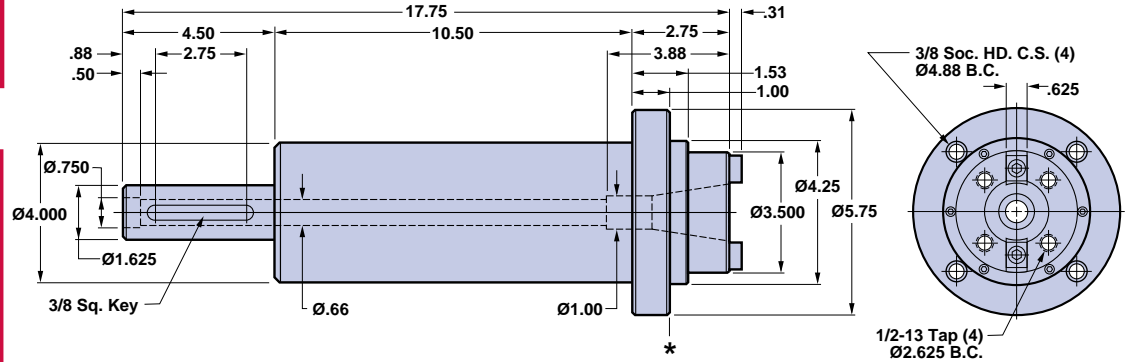
Nose types:

- #40 N.M.T.B. taper
- Boring
- #40 Erickson quick change

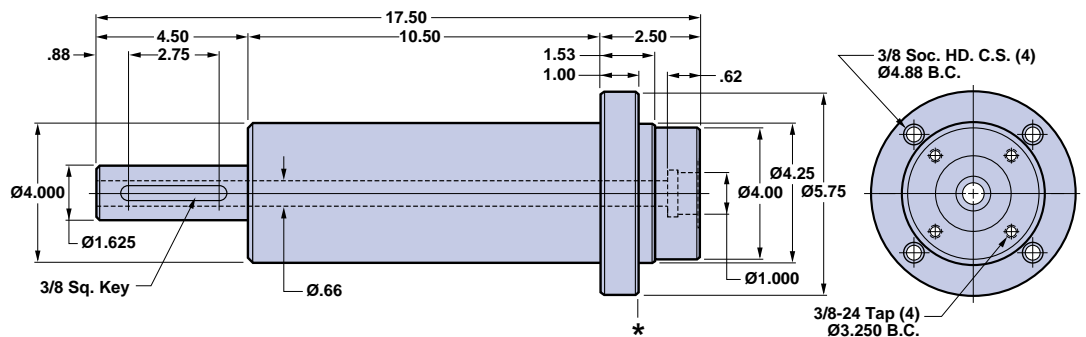
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

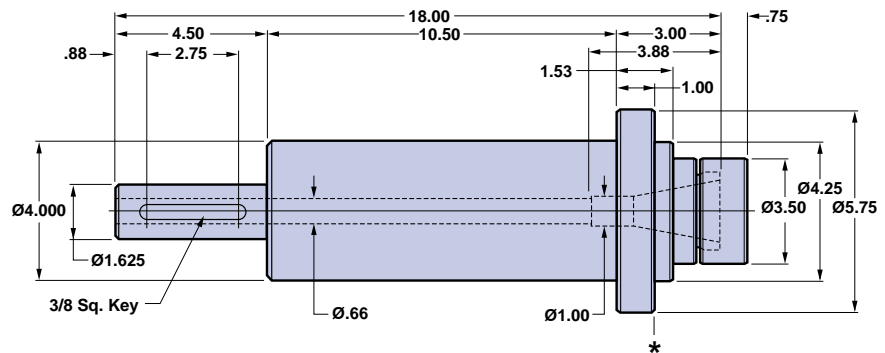
Refer to the 4000C/4000B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



40 - #40 N.M.T.B. Taper Shaft



BR - Boring Shaft



QC - #40 N.M.T.B. Erickson Quick Change Shaft

4000C APPROX. WT. 38 LBS.



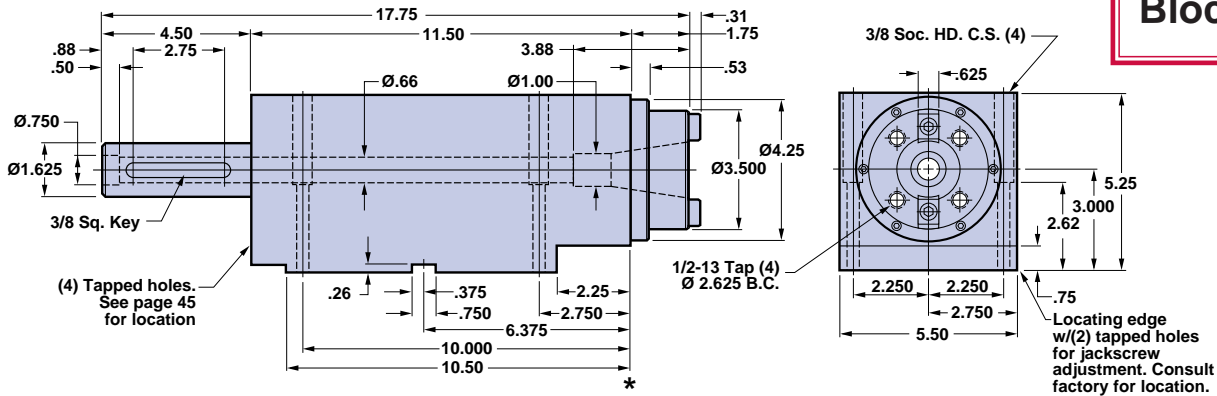
For cartridge spindle brackets, see "Accessories Section", Page 44.

## 4000C & 4000B Specification Chart

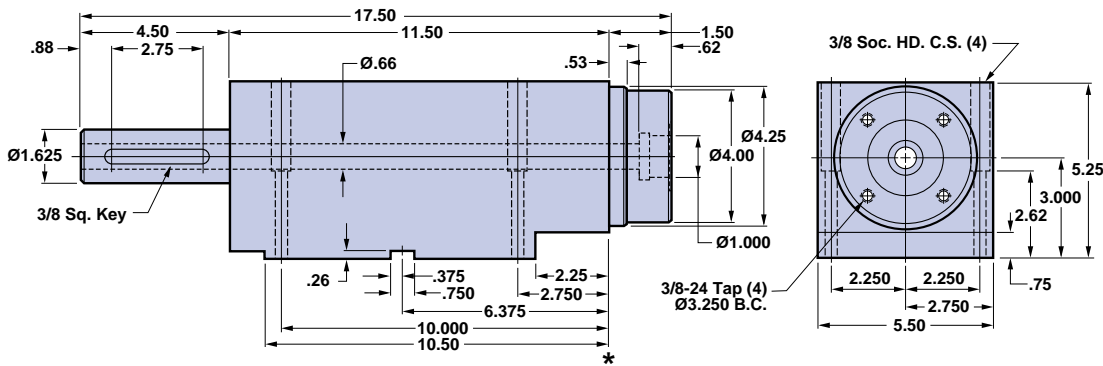
Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	161	3,150	460,000	55 mm I.D.		45 mm I.D.	
X1M	394	3,150	510,000	Duplex	Contact	Duplex	Labyrinth
X1H	855	3,150	540,000	Ball		Ball	
X2L	161	10,800†	460,000	55 mm I.D.		45 mm I.D.	
X2M	394	9,200†	510,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	855	6,100†	540,000	Ball		Ball	

† QC Max. RPM = 3,600

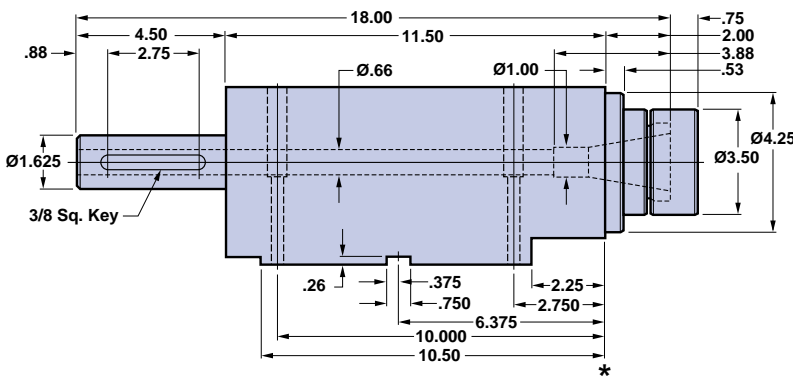
# Gilman 4000B Block Spindles



**40 - #40 N.M.T.B. Taper Shaft**

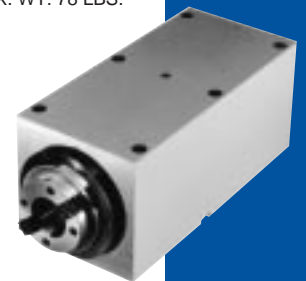


**BR - Boring Shaft**



**QC - #40 N.M.T.B. Erickson Quick Change Shaft**

4000B APPROX. WT. 78 LBS.



## 4000C & 4000B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	322	3,150	800,000	55 mm I.D.		45 mm I.D.	
X3M	847	3,150	890,000	Triplex	Contact	Duplex	Labyrinth
X3H	1693	3,150	950,000	Ball		Ball	
X4L	322	9,200†	800,000	55 mm I.D.		45 mm I.D.	
X4M	847	6,100†	890,000	Triplex	Labyrinth	Duplex	Labyrinth
X4H	1693	4,900†	950,000	Ball		Ball	

\* Maximum Tool Overhang (from \*) = 5 1/8 (IN.)

Maximum Torque = 1000 (IN.- LBS.)

WK<sup>2</sup> = 17.0 (LB.- IN.<sup>2</sup>)

NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

† QC Max. RPM = 3,600

# Gilman 5500C Cartridge Spindles

5500C cartridge spindles and 5500B block spindles are available with three standard nose types and four standard internal construction types.

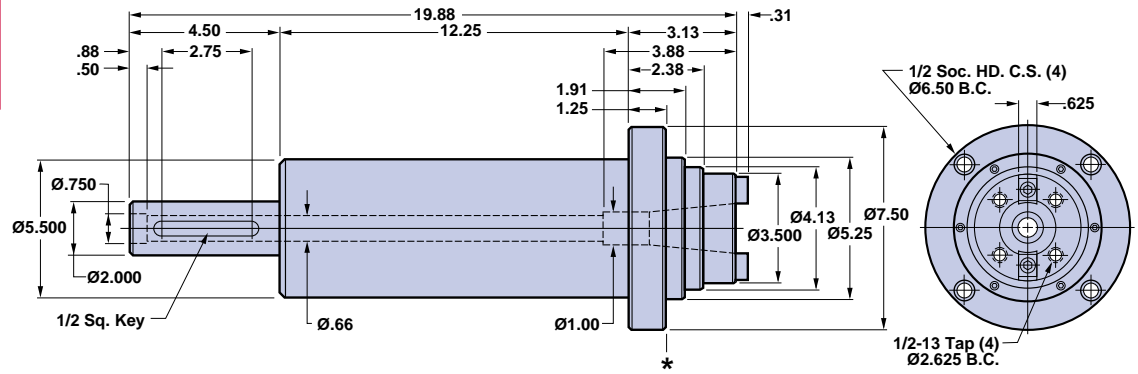
Nose types:

- #40 N.M.T.B. taper
- Boring
- #40 Erickson quick change

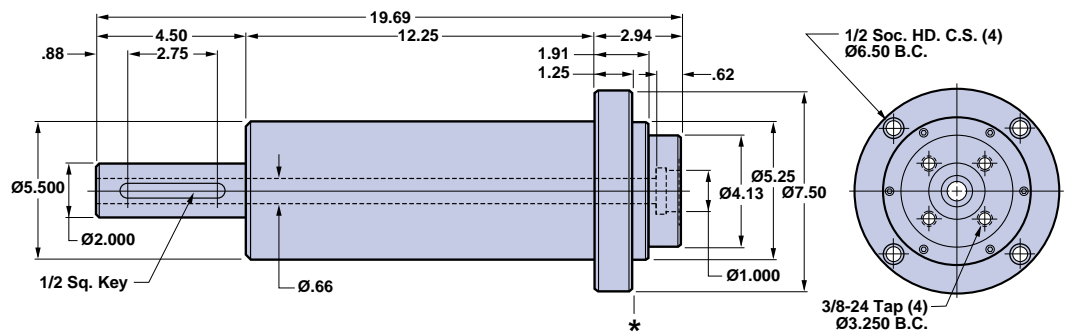
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

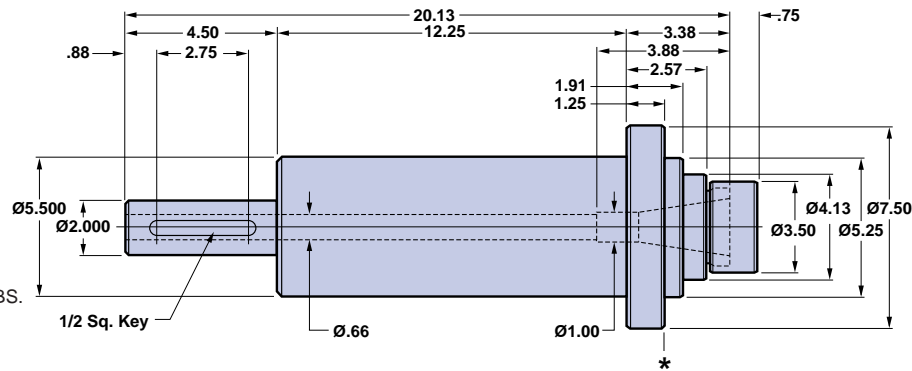
Refer to the 5500C/5500B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



40 - #40 N.M.T.B. Taper Shaft



BR - Boring Shaft



QC - #40 N.M.T.B. Erickson Quick Change Shaft

5500C APPROX. WT. 82 LBS.



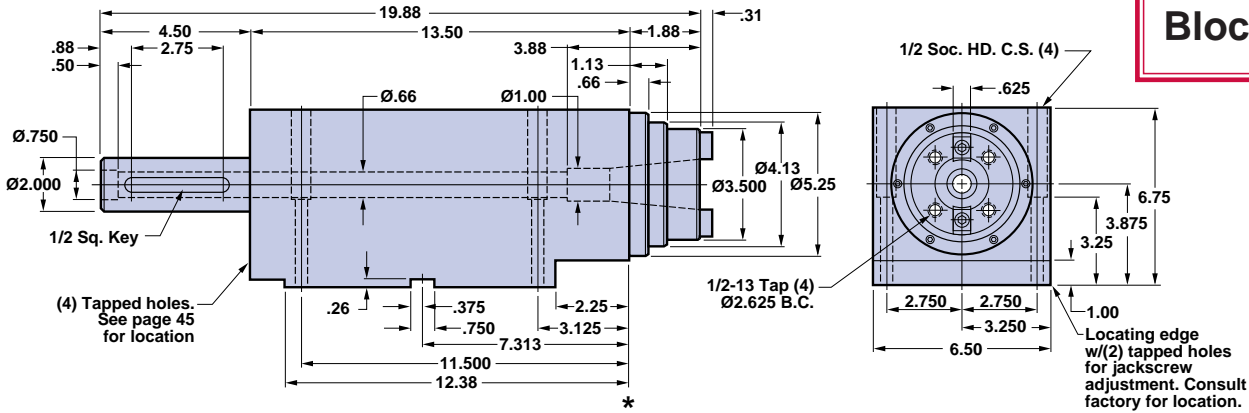
## 5500C & 5500B Specification Chart

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	200	2,500	750,000	70 mm I.D.		55 mm I.D.	
X1M	560	2,500	850,000	Duplex	Contact	Duplex	Labyrinth
X1H	1,160	2,500	930,000	Ball		Ball	
X2L	200	9,200†	750,000	70 mm I.D.		55 mm I.D.	
X2M	560	7,100†	850,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	1,160	4,750†	930,000	Ball		Ball	

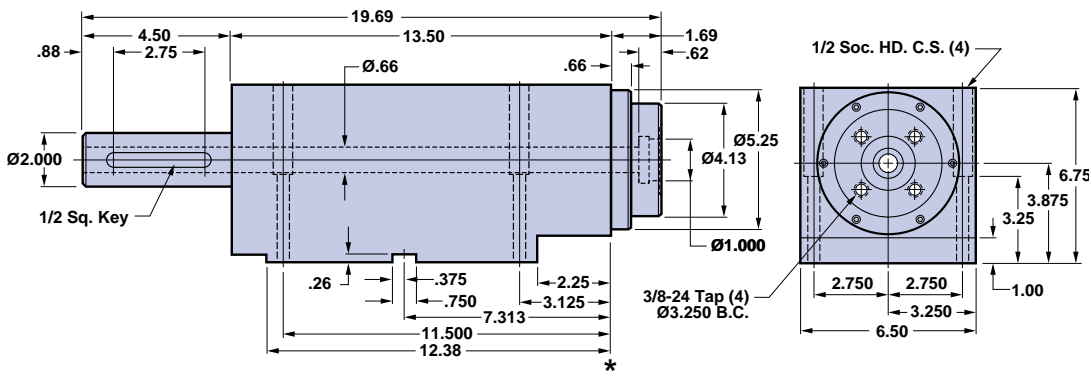
† QC Max. RPM = 3,600

For cartridge spindle brackets, see "Accessories Section", Page 44.

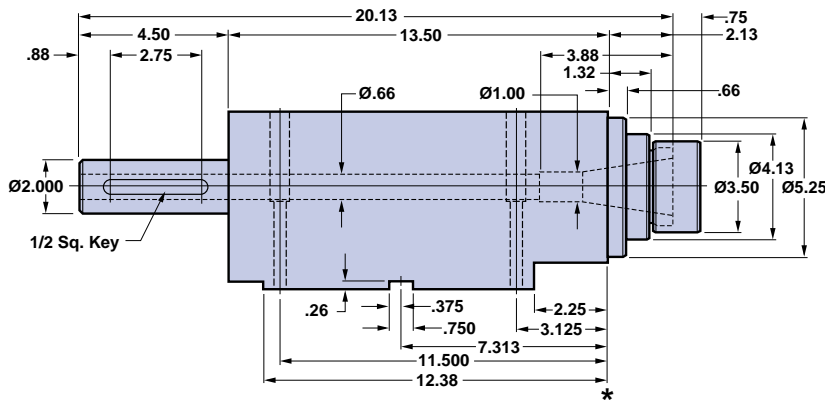
# Gilman 5500B Block Spindles



**40 - #40 N.M.T.B. Taper Shaft**



**BR - Boring Shaft**



**QC - #40 N.M.T.B. Erickson Quick Change Shaft**

5500B APPROX. WT. 138 LBS.



## 5500C & 5500B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	425	2,500	1,150,000	70 mm I.D.		55 mm I.D.	
X3M	1,175	2,500	1,290,000	Triplex Ball	Contact	Duplex Ball	Labyrinth
X3H	2,625	2,500	1,380,000				
X4L	425	7,100†	1,150,000	70 mm I.D.		55 mm I.D.	
X4M	1,175	4,750†	1,290,000	Triplex Ball	Labyrinth	Duplex Ball	Labyrinth
X4H	2,625	3,800†	1,380,000				

† QC Max. RPM = 3,600

\* Maximum Tool Overhang (from \*) = 6 1/8 (IN.)  
 Maximum Torque = 2164 (IN.- LBS.)  
 $WK^2 = 47.2 (LB.- IN.^2)$   
 NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.  
 Tool overhang pertains to boring, end milling and nonsupported arbor milling.

# Gilman 6500C Cartridge Spindles

6500C cartridge spindles and 6500B block spindles are available with two standard nose types and four standard internal construction types.

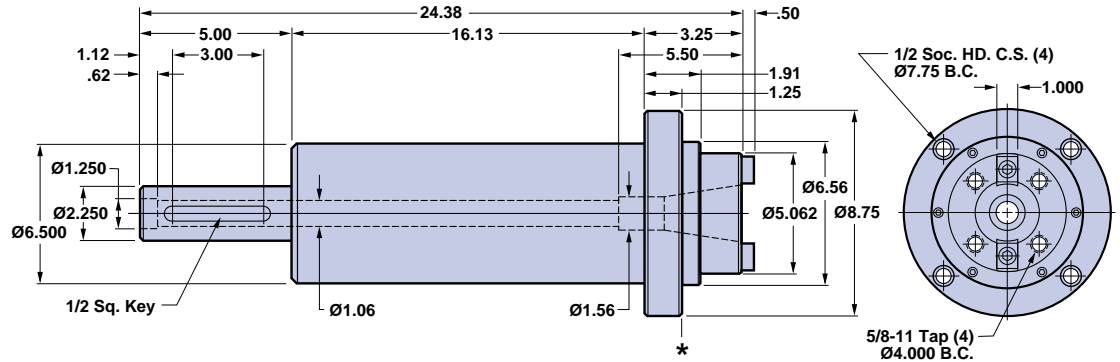
Nose types:

- #50 N.M.T.B. taper
- Boring

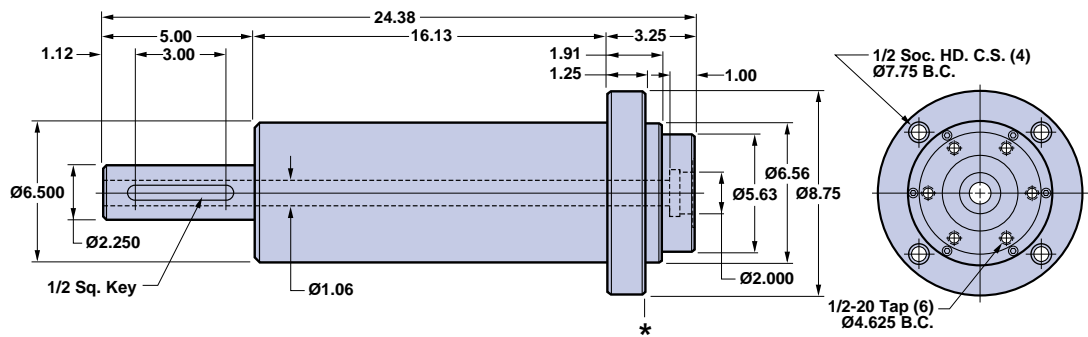
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

Refer to the 6500C/6500B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



50 - #50 N.M.T.B. Taper Shaft



BR - Boring Shaft

6500C APPROX. WT. 195 LBS.



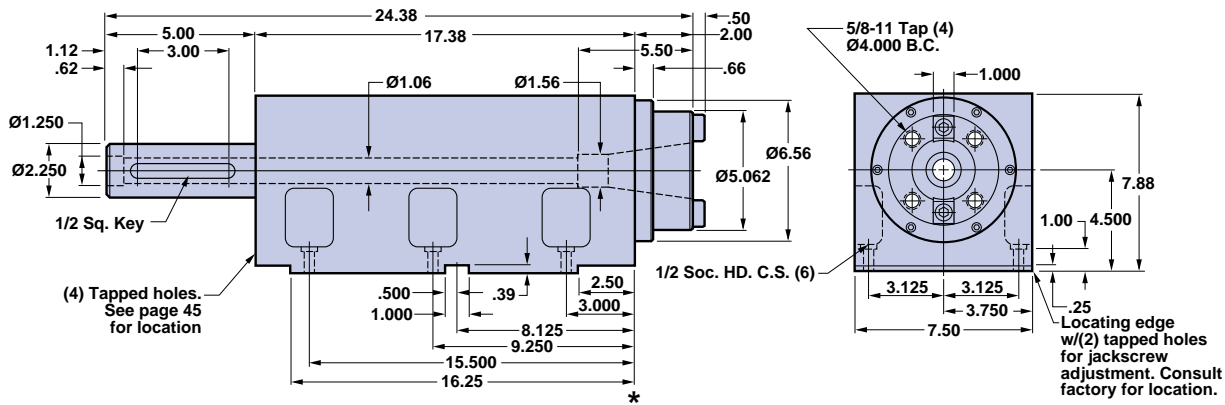
## 6500C & 6500B Specification Chart

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	280	2,125	960,000	85 mm I.D.		70mm I.D.	
X1M	765	2,125	1,080,000	Duplex	Contact	Duplex	Labyrinth
X1H	1380	2,125	1,160,000	Ball		Ball	
X2L	280	7,600	960,000	85mm I.D.		70 mm I.D.	
X2M	765	5,700	1,080,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	1380	3,800	1,160,000	Ball		Ball	

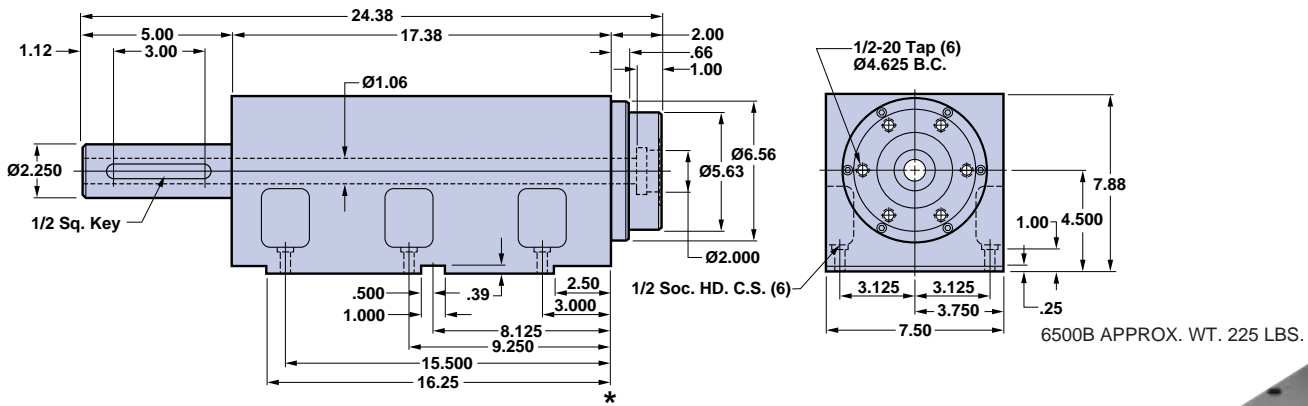
For cartridge spindle brackets, see "Accessories Section", Page 44.



# Gilman 6500B Block Spindles



**50 - #50 N.M.T.B. Taper Shaft**



**BR - Boring Shaft**

## 6500C & 6500B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	570	2,125	1,450,000	85 mm I.D.		70 mm I.D.	
X3M	1695	2,125	1,620,000	Triplex	Contact	Duplex	Labyrinth
X3H	3790	2,125	1,700,000	Ball		Ball	
X4L	570	5,700	1,450,000	85 mm I.D.		70 mm I.D.	
X4M	1695	3,800	1,620,000	Triplex	Labyrinth	Duplex	Labyrinth
X4H	3790	3,000	1,700,000	Ball		Ball	

★ Maximum Tool Overhang (from ★) = 8 (IN.)

Maximum Torque = 4100 (IN.- LBS.)

$WK^2 = 104.2 (LB.- IN.^2)$

NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.



# Gilman 8000C Cartridge Spindles

8000C cartridge spindles and 8000B block spindles are available with two standard nose types and four standard internal construction types.

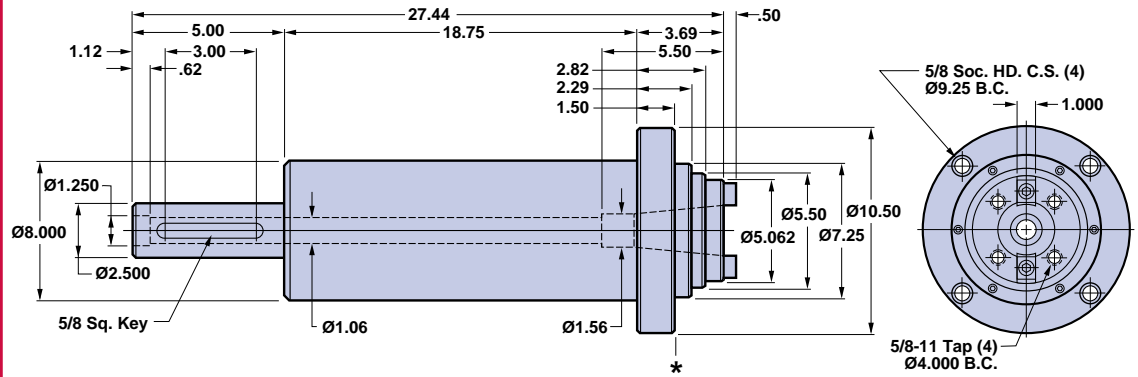
Nose types:

- #50 N.M.T.B. taper
- Boring

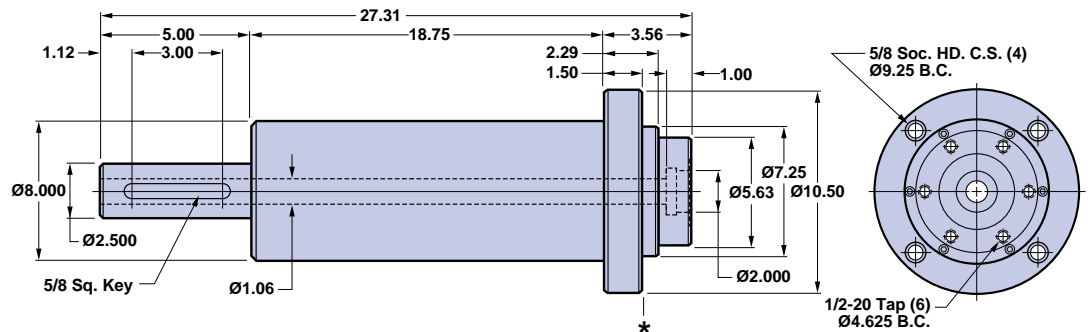
Internal constructions:

- X1M duplex ball bearing at nose end with contact seal
- X2M duplex ball bearing at nose end with labyrinth seal
- X3M triplex ball bearing at nose end with contact seal
- X4M triplex ball bearing at nose end with labyrinth seal

Refer to the 8000C/8000B specification chart as well as the sizing instructions on page 4 to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.



50 - #50 N.M.T.B. Taper Shaft



BR - Boring Shaft

8000C APPROX. WT. 260 LBS.

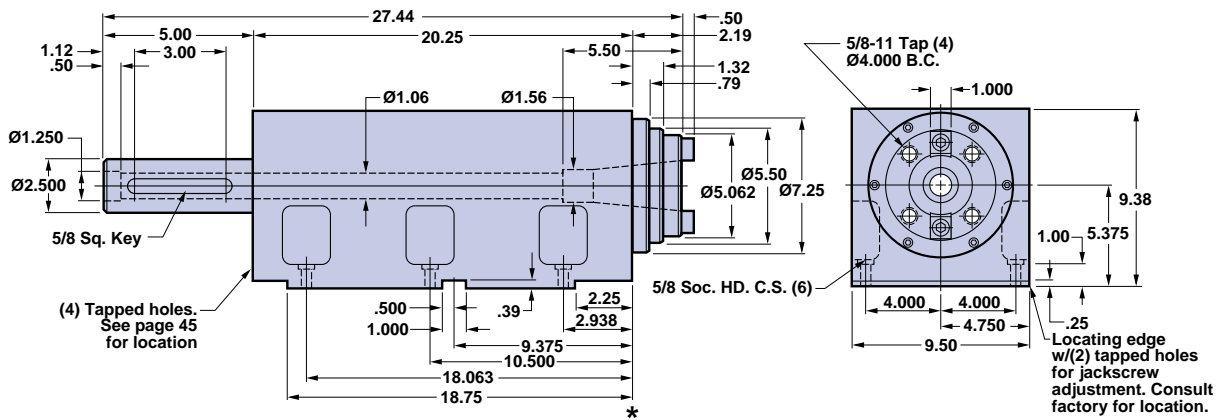


## 8000C & 8000B Specification Chart

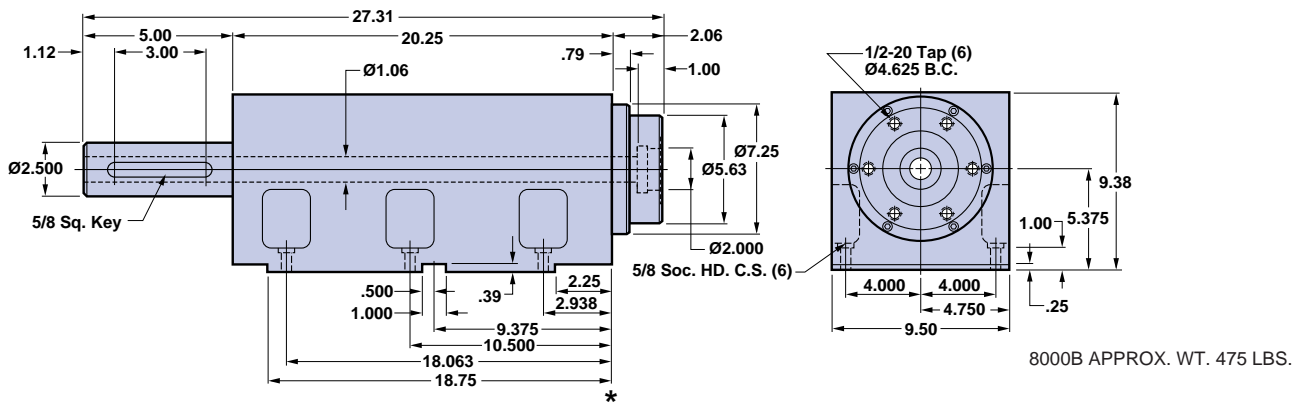
Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	370	1,800	1,430,000	100 mm I.D.		85 mm I.D.	
X1M	950	1,800	1,630,000	Duplex	Contact	Duplex	Labyrinth
X1H	2,045	1,800	1,780,000	Ball		Ball	
X2L	370	5,700	1,430,000	100 mm I.D.		85 mm I.D.	
X2M	950	4,600	1,630,000	Duplex	Labyrinth	Duplex	Labyrinth
X2H	2,045	3,100	1,780,000	Ball		Ball	

For cartridge spindle brackets, see "Accessories Section", Page 44.

# Gilman 8000B Block Spindles



**50 - #50 N.M.T.B. Taper Shaft**



**BR - Boring Shaft**



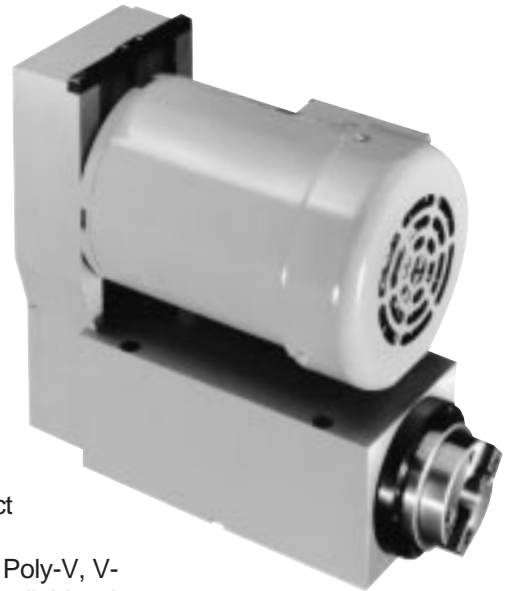
## 8000C & 8000B Specification Chart Continued

Bearings And Seal Construction Number	Maximum Trust (LBS.)	Maximum R.P.M.	Radial Stiffness At Nose (LBS./IN.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X3L	750	1,800	2,150,000	100 mm I.D.		85 mm I.D.	
X3M	2,100	1,800	2,450,000	Triplex	Contact	Duplex	Labyrinth
X3H	4,700	1,800	2,630,000	Ball		Ball	
X4L	750	4,600	2,150,000	100 mm I.D.		85 mm I.D.	
X4M	2,100	3,100	2,450,000	Triplex	Labyrinth	Duplex	Labyrinth
X4H	4,700	1,800	2,630,000	Ball		Ball	

\* Maximum Tool Overhang (from \*) = 9 3/8 (IN.)  
 Maximum Torque = 7460 (IN.- LBS.)  
 $WK^2 = 210.1 (LB.- IN.^2)$   
 NOTE: Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available at an additional cost.  
 Tool overhang pertains to boring, end milling and nonsupported arbor milling.

# Gilman Motorized Spindles

Gilman cartridge and block spindles are available as belt-driven motorized assemblies. Standard motors are 230/460 volt 3-phase 60-Hz totally enclosed fan-cooled NEMA frame. (Model 1875 spindles use totally enclosed non-ventilated motors.) A high tensile precision-machined aluminum belt and pulley housing is featured on all units except 6500C-B2, 6500B-B2, 8000C-B2 and 8000B-B2. This type of housing, along with a NEMA C-face motor mounting, allows the belt housing to be mounted at 12 o'clock (standard), 3 o'clock, 6 o'clock and 9 o'clock. The motor can also be mounted away from or over the spindle, but motor positions are not field changeable. Models 6500 B2 and 8000 B2 use a foot mounted NEMA motor mounted piggyback over the spindle unit with a sheet metal belt and pulley cover.



All Gilman motorized spindles operate at a fixed speed and incorporate a direct drive timing belt for positive power transmission. Poly-V, V-belt and flat belt drives are available where high speed and minimum vibration is required.



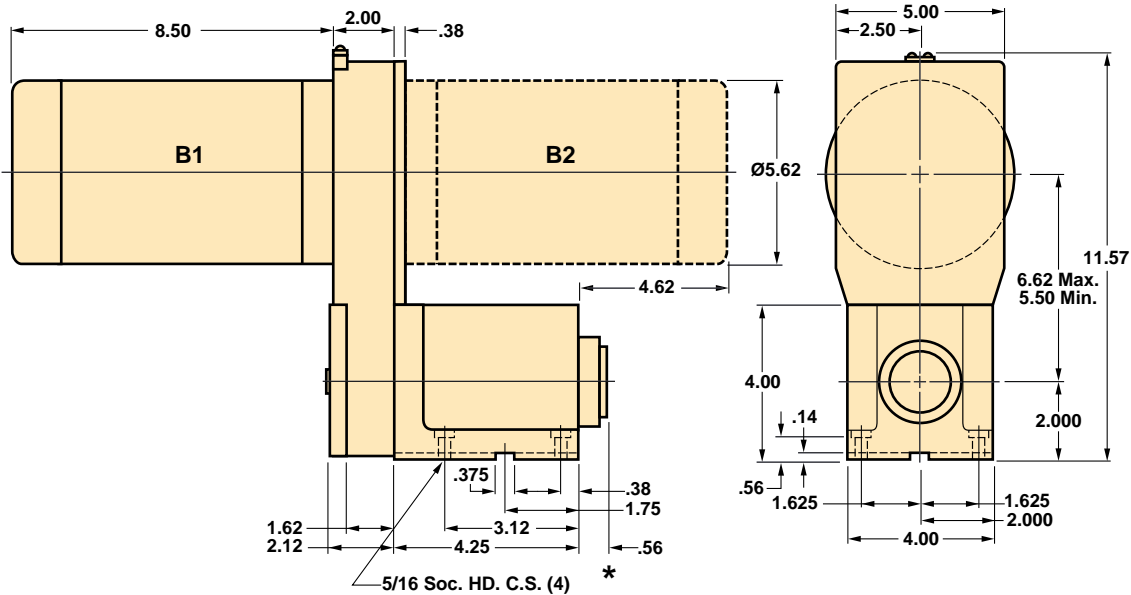
Vertical travel spindle units combine a belt-driven motorized spindle with a slide assembly. The precise and rigid Gilman slide unit is constructed with oil-grooved low-friction bearing material on the saddle wear surfaces, guided on two precision-ground and hardened rectangular steel ways. Saddle tracking accuracy is .0005 inch per 3 feet of travel. Three different slide drives are offered: manual lead screw right angle drive, powered ball lead screw, and hydraulic cylinder. Available in four sizes: 2750, 4000, 5500, & 6500. Consult factory for other available sizes: 3500 and 8000.

# Gilman 1875N Motorized Spindles

1875N motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. For 1875N spindle capabilities reference the 1875 specification chart. \*

## 1875N B1 & B2

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
635	2320	1160	1/3	48C
955	3500	1750	1/2	48C
1910	13,125	3500	1/2	48C



APPROX. WT. 35 LBS.

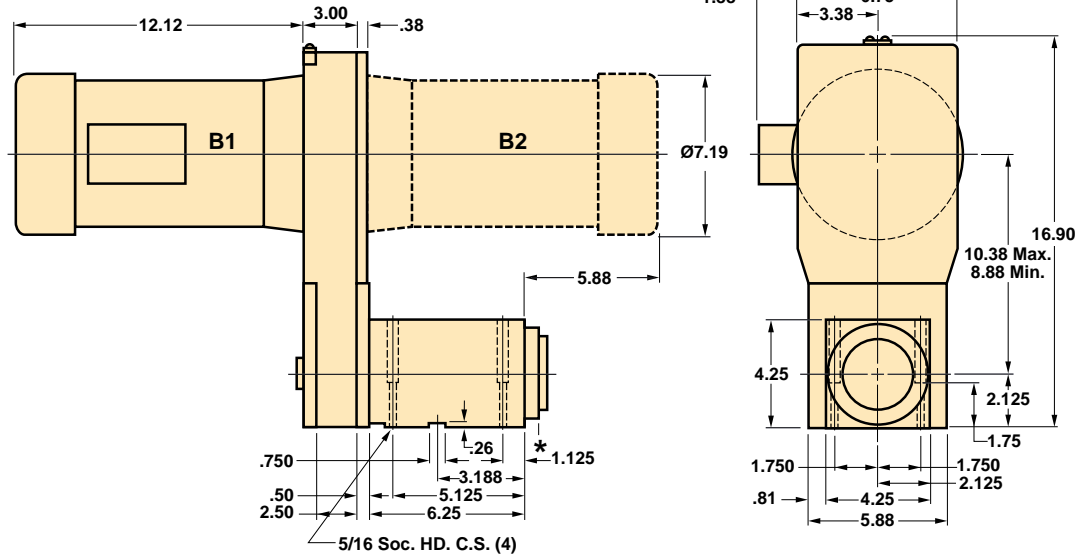
Note: \* See 1875N Spindles on Page 7.

# Gilman 2750C Motorized Spindles

2750C and 2750B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 2750C and 2750B are available in two sizes, the B1/B2 units (high horsepower) or B3/B4 units (low horsepower). For 2750 spindle capabilities reference the 2750 specification charts. \*

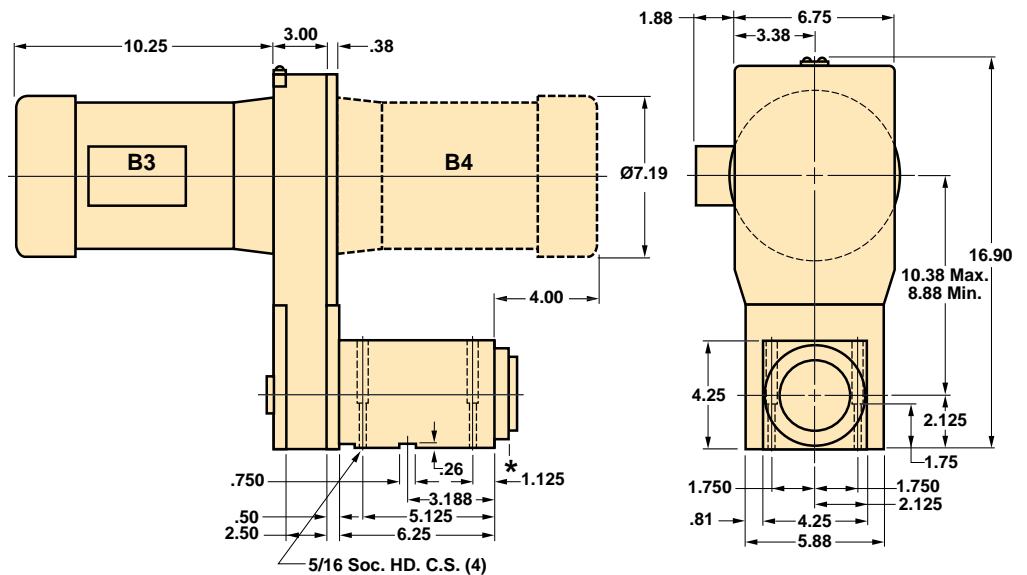
## 2750C B1 & B2

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
812	2836	1160	1 1/2	145TC
1225	4278	1750	2	145TC
2450	8556	3500	3	145TC



## 2750C B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
803	2836	1160	1/2	56C
1212	4278	1750	3/4	56C
2423	8556	3500	1	56C



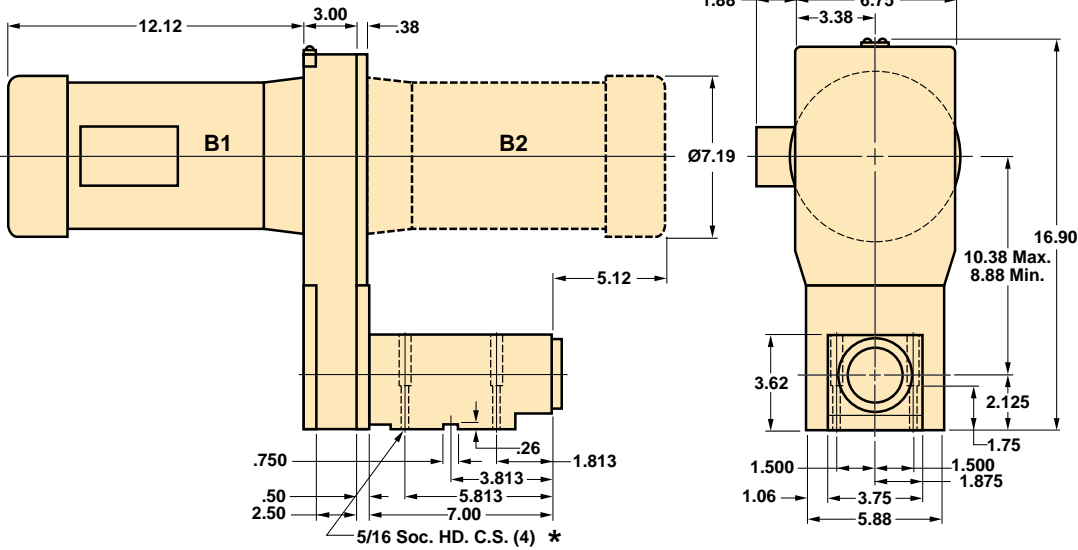
APPROX. WT. 95 LBS.

**Note:** \* See 2750C Cartridge Spindles on Page 8.

# Gilman 2750B Motorized Spindles

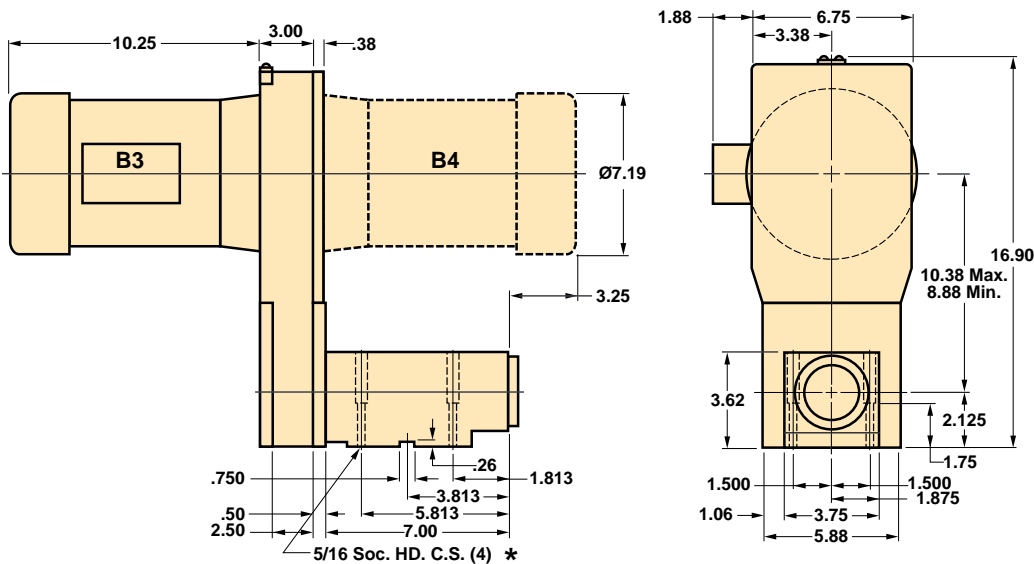
## 2750B B1 & B2

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
812	2836	1160	1 1/2	145TC
1225	4278	1750	2	145TC
2450	8556	3500	3	145TC



## 2750B B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
803	2836	1160	1/2	56C
1212	4278	1750	3/4	56C
2423	8556	3500	1	56C



APPROX. WT. 85 LBS.

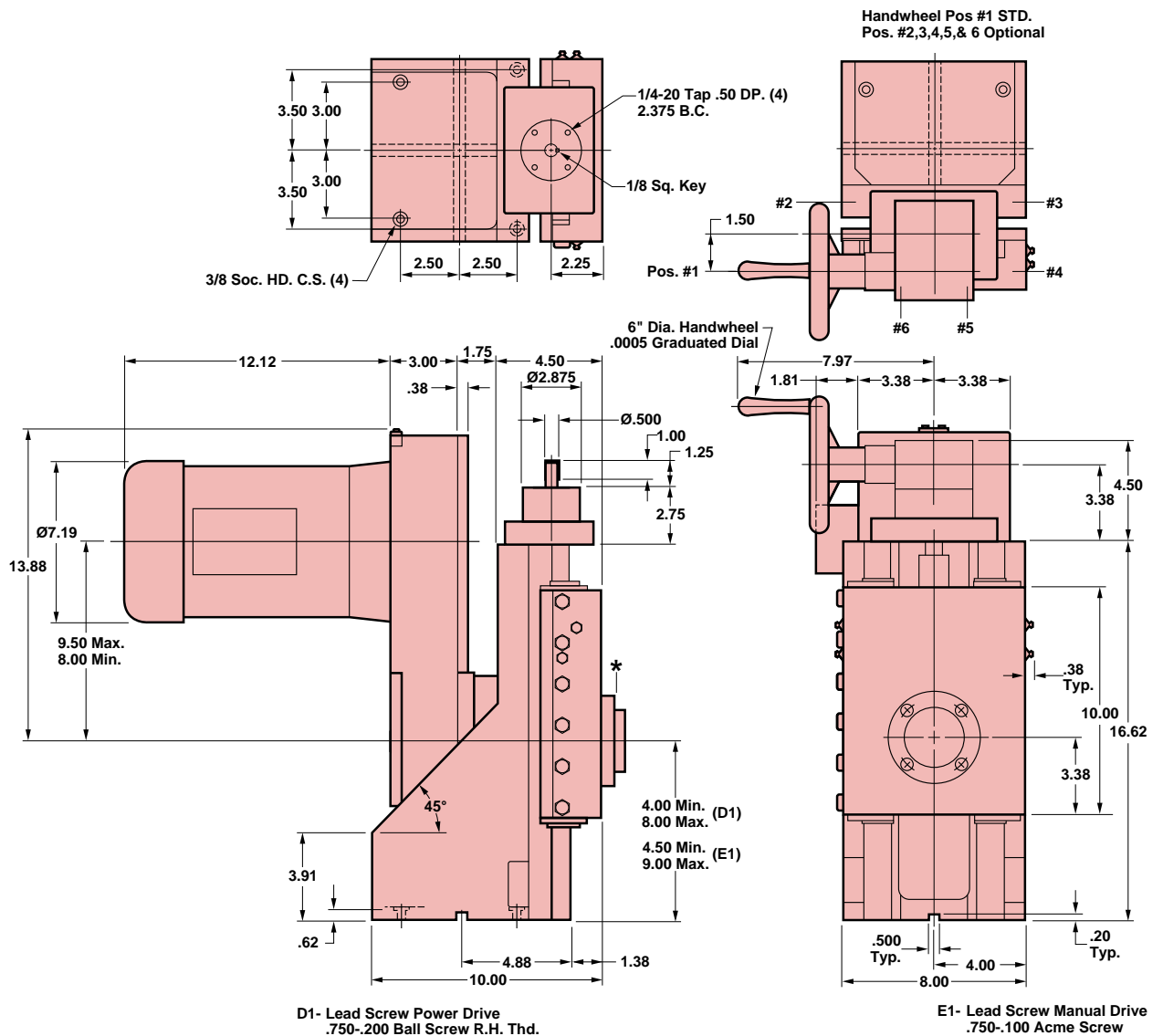
**Note:** \* See 2750B Block Spindles on Page 9.

# Gilman 2750C Motorized Vertical Travel Spindles

2750C motorized vertical travel spindle units are fixed speed units that combine a motorized timing belt drive spindle with a vertical hardened steel way slide assembly. Vertical positioning of the saddle and spindle can be accomplished with one of the three standard drive types.

- E1: .750-.100 Acme manual lead screw with a 2:1 reduction right angle drive.
- D1: .750-.200 Rolled ball lead screw powered drive with a nonpreloaded nut.
- H2: 2" Bore medium pressure hydraulic cylinder with a stop rod.

The lead screw manual drive can be positioned six ways with position #1 as standard (specify position number when ordering). The lead screw powered drive can be supplied with a ground ball lead screw and preloaded nut at additional cost. For 2750C spindle capabilities, reference the 2750 specification charts. \*



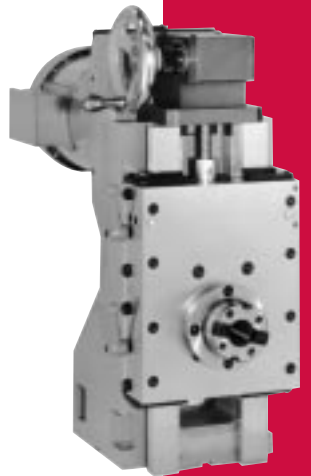
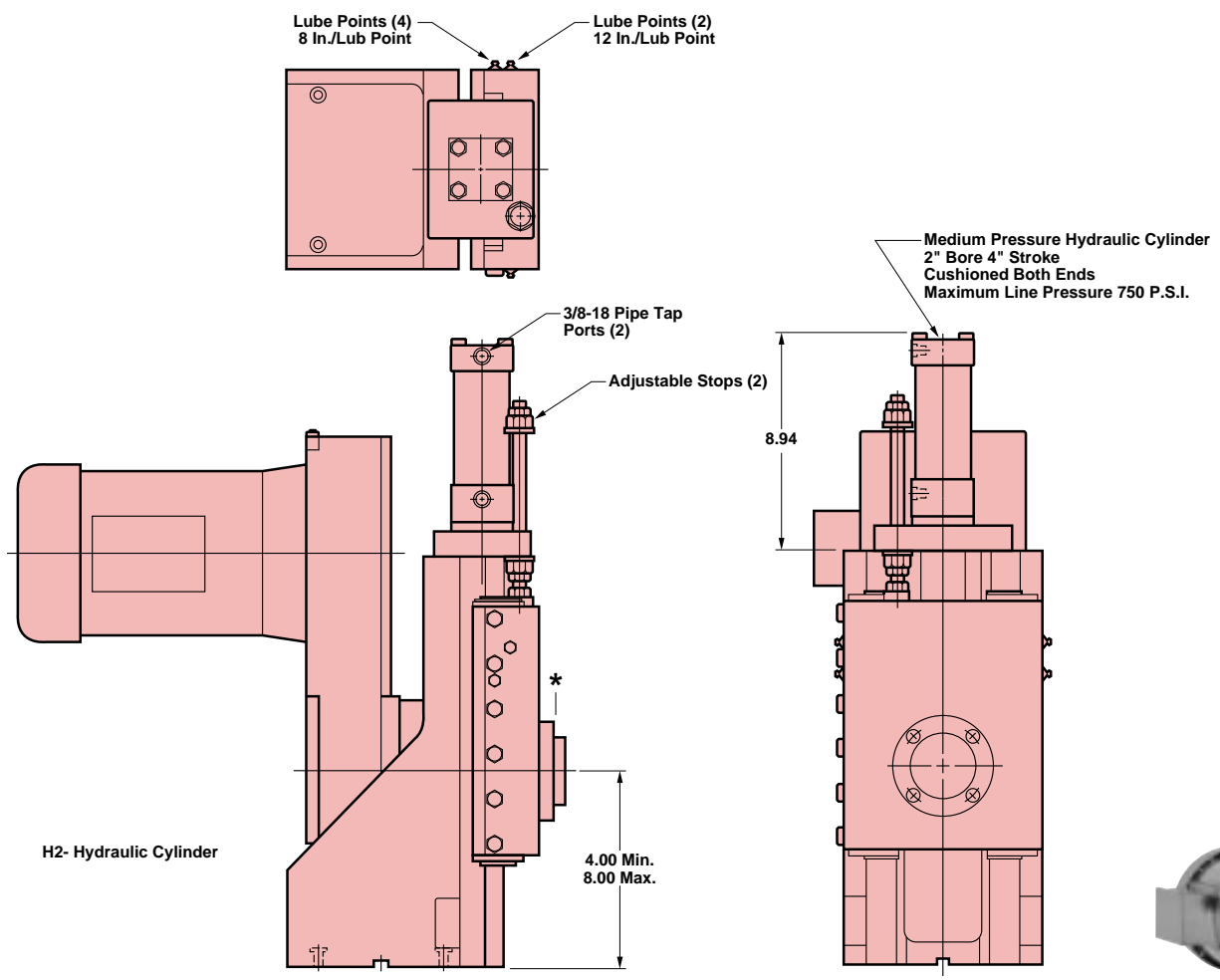
Note: \* See 2750C Cartridge Spindles on Page 8.



# Gilman 2750C Motorized Vertical Travel Spindles

## 2750C Vertical Travel

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
580	2836	1160	1 1/2	145TC
875	4278	1750	2	145TC
1750	8556	3500	3	145TC



APPROX. WT. 230 LBS.

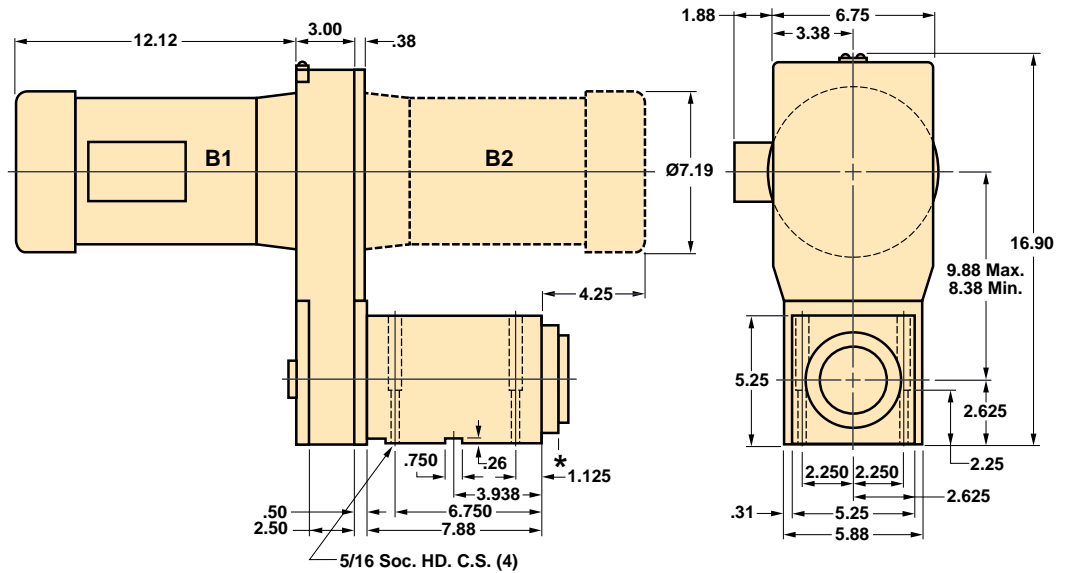
**Note:** \* See 2750C Cartridge Spindles on Page 8.

# Gilman 3500C Motorized Spindles

3500C and 3500B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 3500C and 3500B are available in two sizes, the B1/B2 units (high horsepower) or B3/B4 units (low horsepower). For 3500 spindle capabilities reference the 3500 specification charts. \*

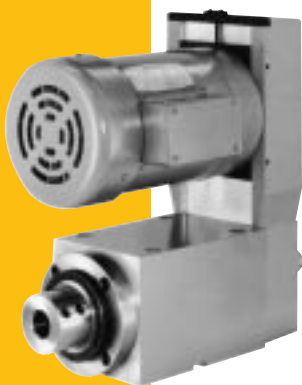
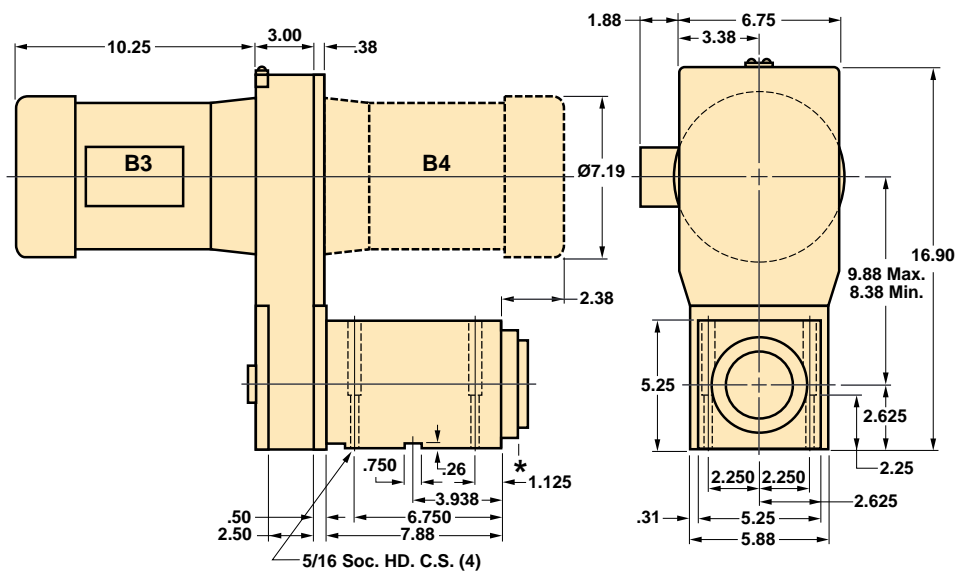
## 3500C B1 & B2

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
624	2127	1160	1 1/2	145TC
942	3208	1750	2	145TC
1885	6417	3500	3	145TC



## 3500C B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
653	2127	1160	1/2	56C
984	3208	1750	3/4	56C
1969	6417	3500	1	56C



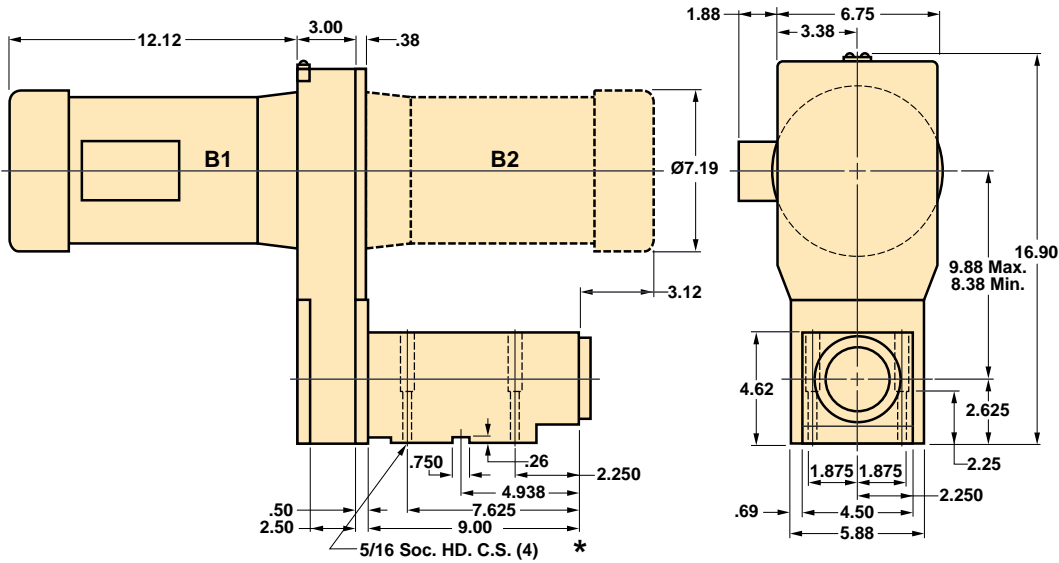
APPROX. WT. 125 LBS.

Note: \* See 3500C Cartridge Spindles on Page 10.

# Gilman 3500B Motorized Spindles

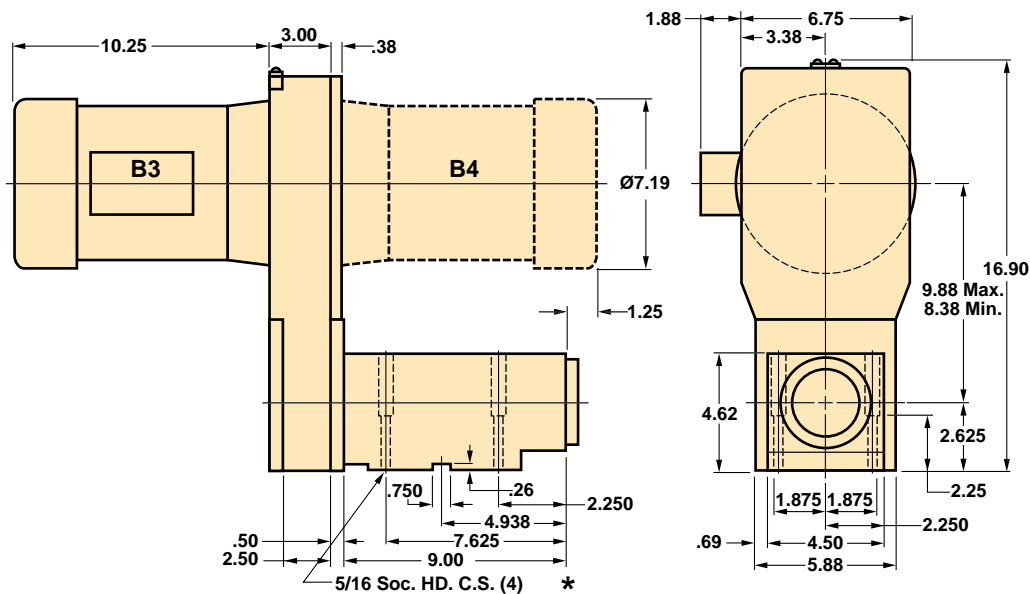
## 3500B B1 & B2

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
624	2127	1160	1 1/2	145TC
942	3208	1750	2	145TC
1885	6417	3500	3	145TC



## 3500B B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
653	2127	1160	1/2	56C
984	3208	1750	3/4	56C
1969	6417	3500	1	56C



APPROX. WT. 105 LBS.

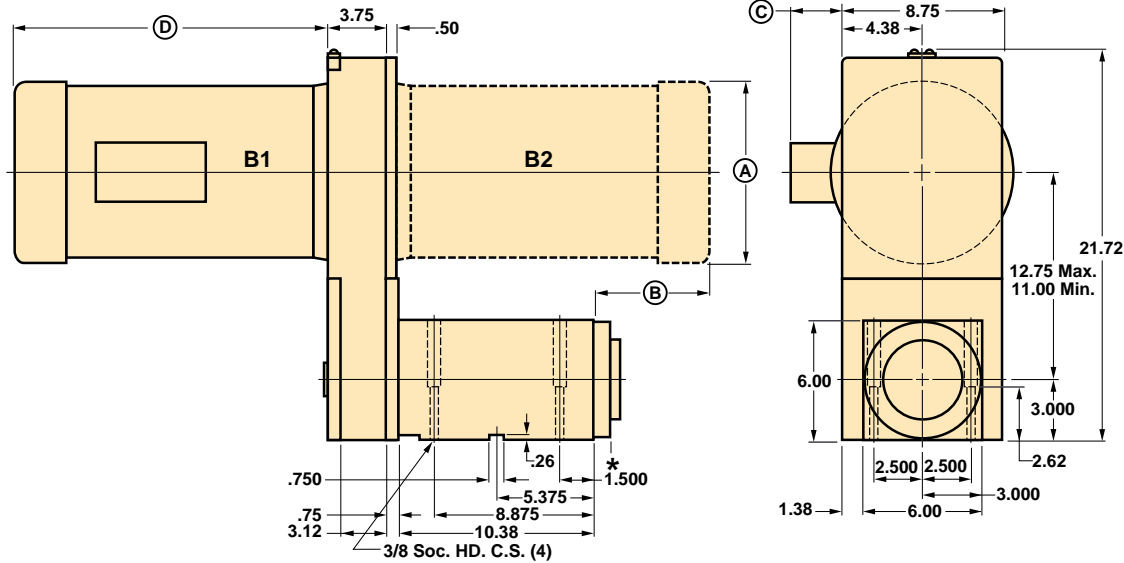
Note: \* See 3500B Block Spindles on Page 11.

# Gilman 4000C Motorized Spindles

4000C and 4000B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 4000C and 4000B are available in two sizes, the B1/B2 units (high horsepower) or B3/B4 units (low horsepower). For 4000 spindle capabilities reference the 4000 specification charts. \*

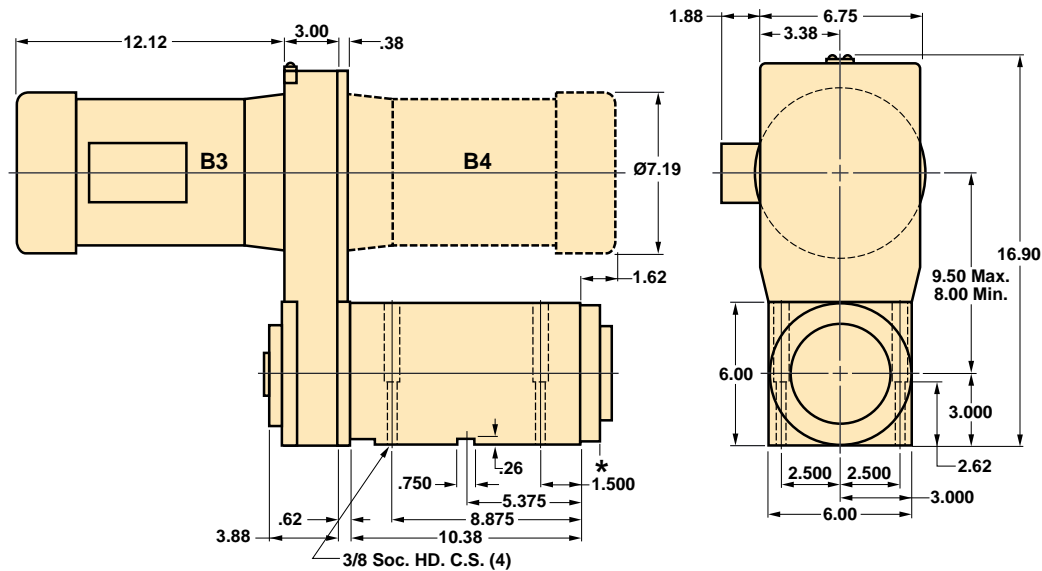
## 4000C B1 & B2

Spindle R.P.M.		Motor						
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	D
850	2320	1160	5	215TC	10.19	5.81	3.00	16.31
1283	3500	1750	7 1/2	213TC	10.19	5.81	3.00	16.31
2100	7000	3500	7 1/2	184TC	8.50	4.94	1.50	15.44



## 4000C B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
580	1823	1160	1 1/2	145TC
875	2750	1750	2	145TC
1750	5500	3500	3	145TC



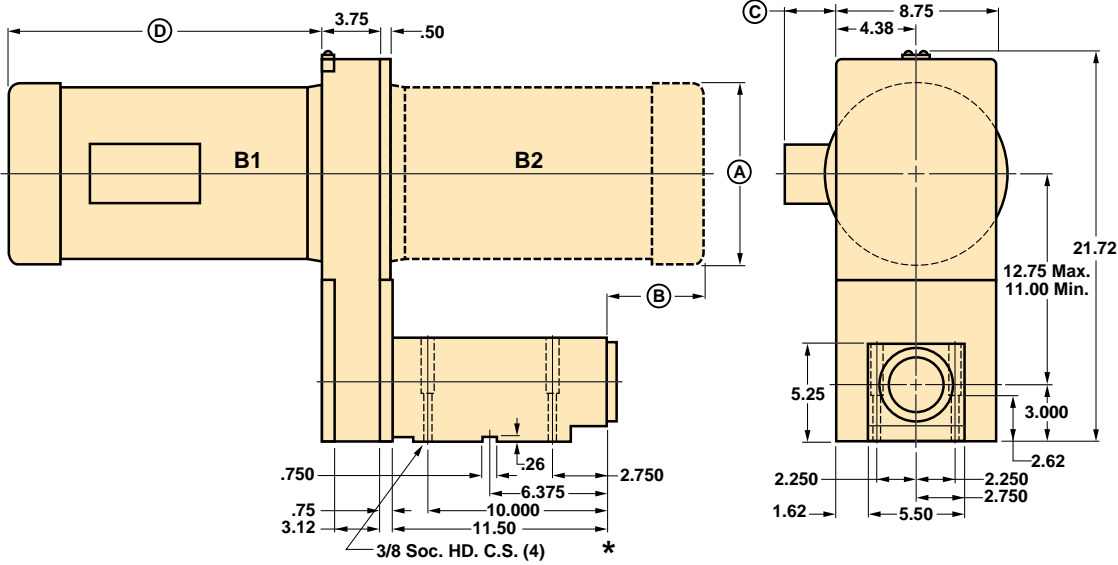
APPROX. WT. 300 LBS.

Note: \* See 4000C Cartridge Spindles on Page 12.

# Gilman 4000B Motorized Spindles

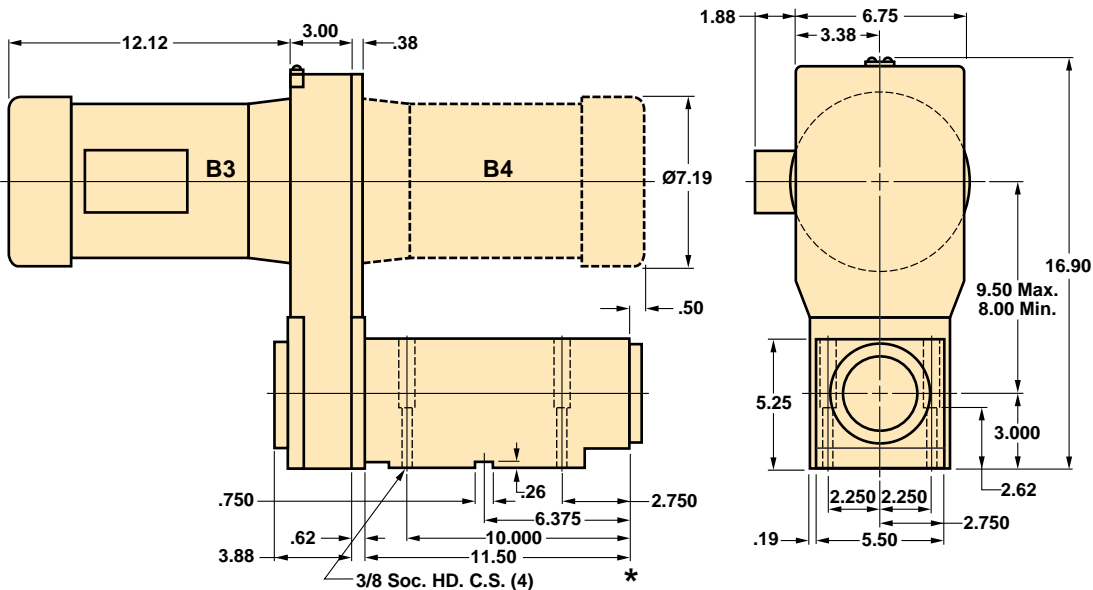
## 4000B B1 & B2

Spindle R.P.M.		Motor						
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	D
850	2320	1160	5	215TC	10.19	4.69	3.00	16.31
1283	3500	1750	7 1/2	213TC	10.19	4.69	3.00	16.31
2100	7000	3500	7 1/2	184TC	8.50	3.81	1.50	15.44



## 4000B B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
580	1823	1160	1 1/2	145TC
875	2750	1750	2	145TC
1750	5500	3500	3	145TC



**Note:** \* See 4000B Block Spindles on Page 13.

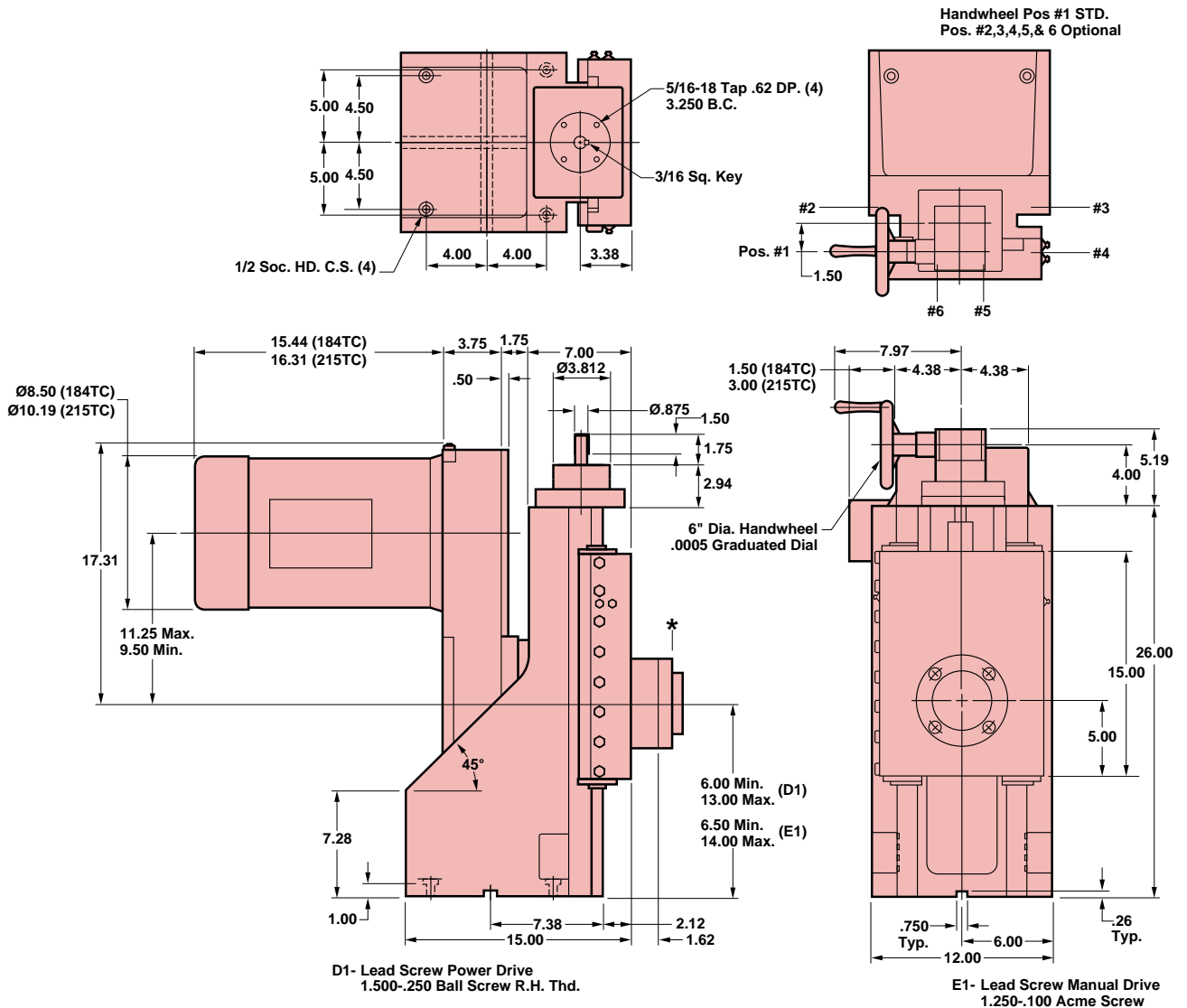
APPROX. WT. 290 LBS.

# Gilman 4000C Motorized Vertical Travel Spindles

4000C motorized vertical travel spindle units are fixed speed units that combine a motorized timing belt drive spindle with a vertical hardened steel way slide assembly. Vertical positioning of the saddle and spindle can be accomplished with one of the three standard drive types.

- E1: 1.250-.100 Acme manual lead screw with a 2:1 reduction right angle drive.
- D1: 1.500-.250 Rolled ball lead screw powered drive with a nonpreloaded nut.
- H2: 2 1/2" Bore medium pressure hydraulic cylinder with a stop rod.

The lead screw manual drive can be positioned six ways with position #1 as standard (specify position number when ordering). The lead screw powered drive can be supplied with a ground ball lead screw and preloaded nut at additional cost. For 4000C spindle capabilities, reference the 4000 specification charts. \*

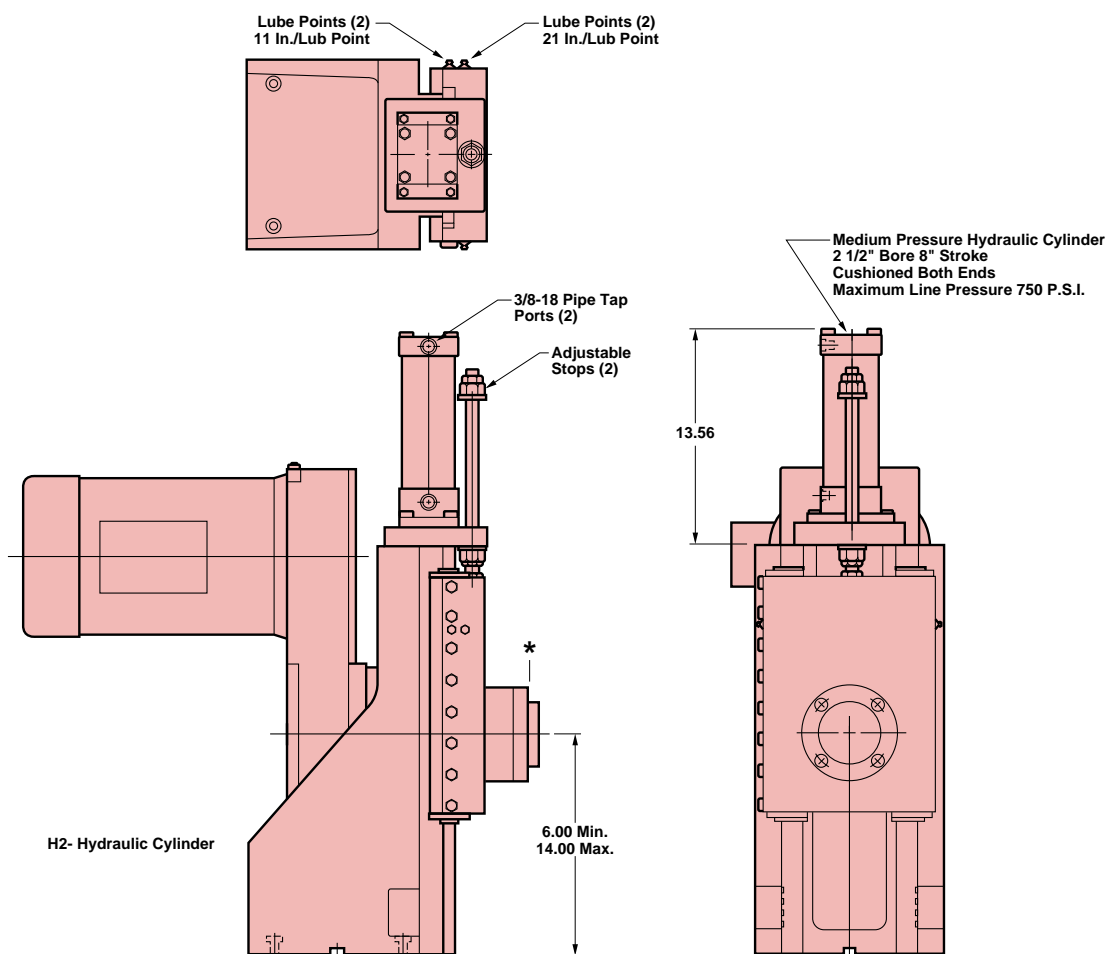


**Note:** \* See 4000C Cartridge Spindles on Page 12.

# Gilman 4000C Motorized Vertical Travel Spindles

## 4000C Vertical Travel

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
580	2320	1160	5	215TC
875	3500	1750	7 1/2	213TC
1432	7000	3500	7 1/2	184TC



**Note:** \* See 4000C Cartridge Spindles on Page 12.

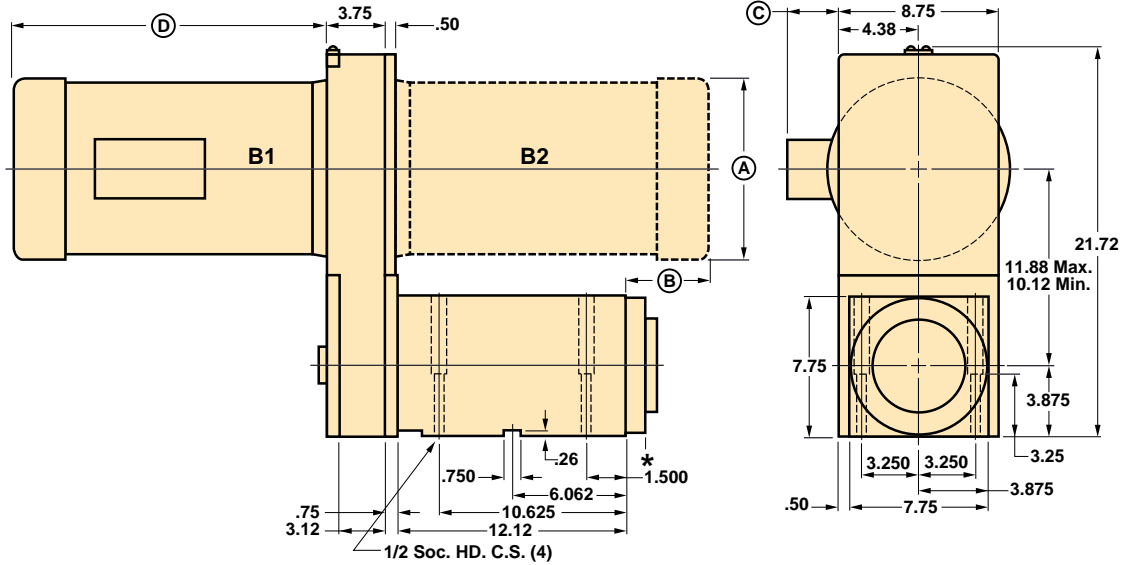
APPROX. WT. 640 LBS.

# Gilman 5500C Motorized Spindles

5500C and 5500B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 5500C and 5500B are available in two sizes, the B1/B2 units (high horsepower) or B3/B4 units (low horsepower). For 5500 spindle capabilities reference the 5500 specification charts. \*

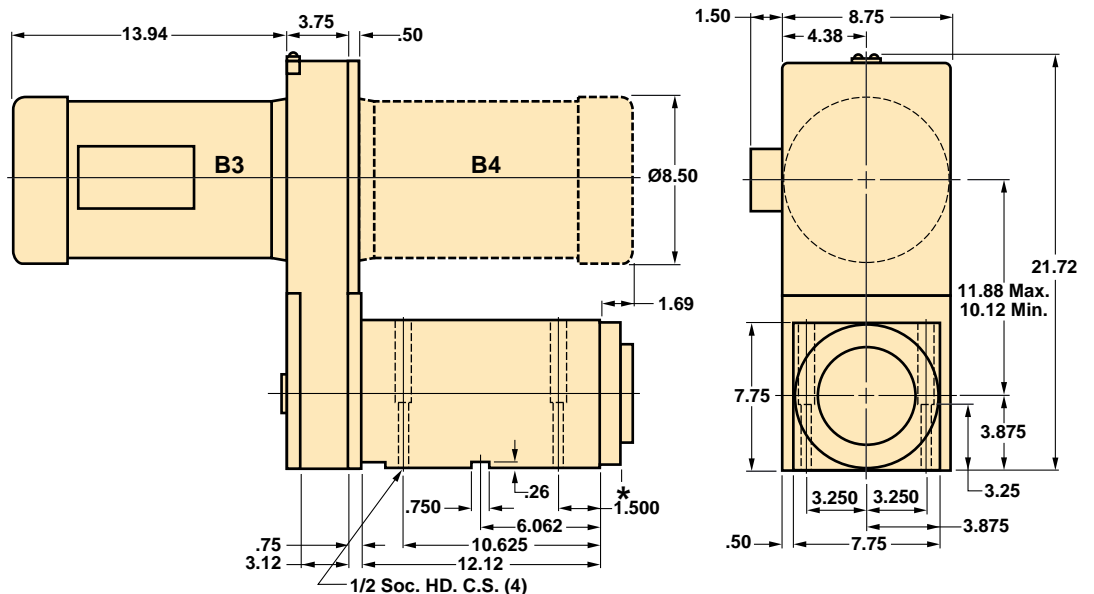
## 5500C B1 & B2

Spindle R.P.M.		Motor						
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	D
638	1963	1160	5	215TC	10.19	4.06	3.00	16.31
963	2962	1750	7 1/2	213TC	10.19	4.06	3.00	16.31
1575	5923	3500	7 1/2	184TC	8.50	3.19	1.50	15.44



## 5500C B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
522	1963	1160	2	184TC
788	2962	1750	3	182TC
1575	5923	3500	3	182TC



APPROX. WT. 395 LBS.

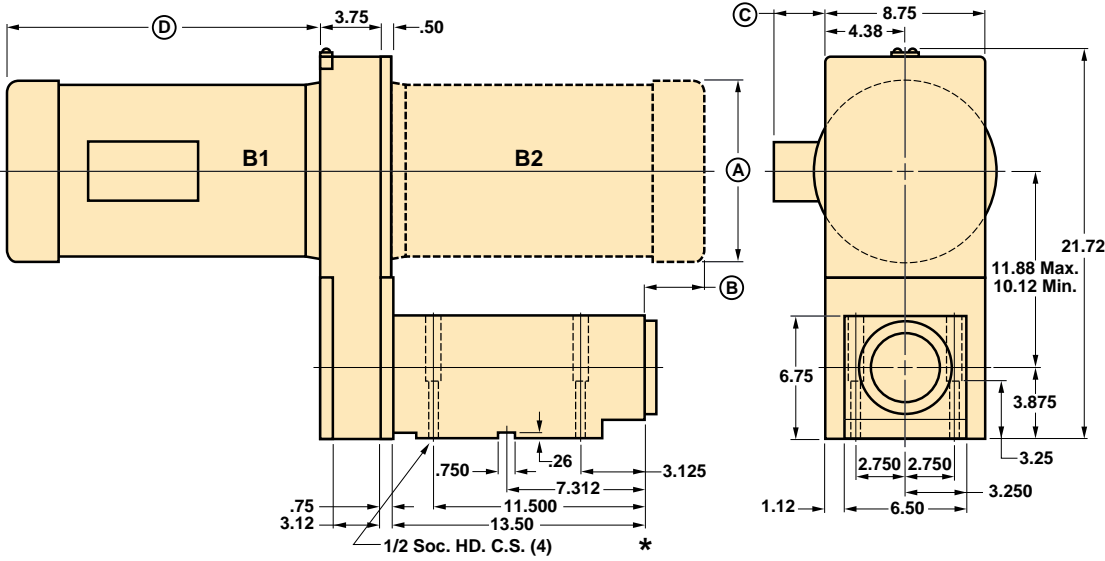
Note: \* See 5500C Cartridge Spindles on Page 14.



# Gilman 5500B Motorized Spindles

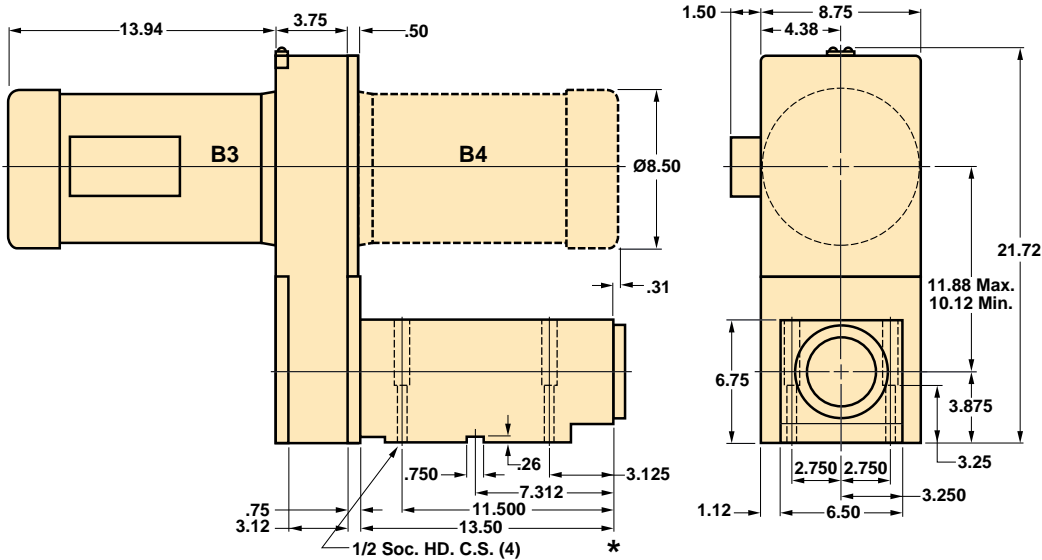
## 5500B B1 & B2

Spindle R.P.M.		Motor						
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	D
638	1963	1160	5	215TC	10.19	2.69	3.00	16.31
963	2962	1750	7 1/2	213TC	10.19	2.69	3.00	16.31
1575	5923	3500	7 1/2	184TC	8.50	1.81	1.50	15.44



## 5500B B3 & B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
522	1963	1160	2	184TC
788	2962	1750	3	182TC
1575	5923	3500	3	182TC



Note: \* See 5500B Block Spindles on Page 15.

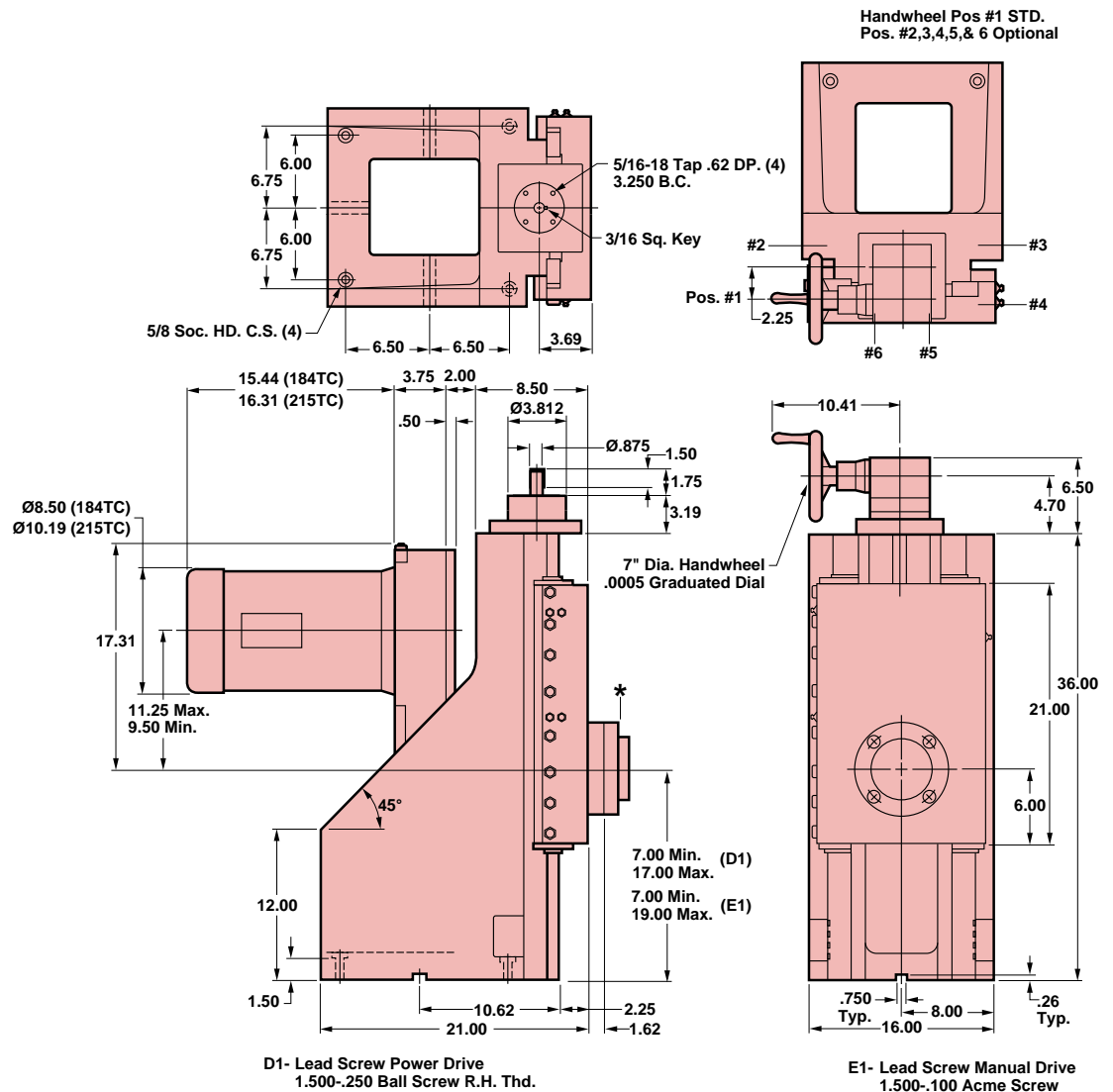
APPROX. WT. 310 LBS.

# Gilman 5500C Motorized Vertical Travel Spindles

5500C motorized vertical travel spindle units are fixed speed units that combine a motorized timing belt drive spindle with a vertical hardened steel way slide assembly. Vertical positioning of the saddle and spindle can be accomplished with one of the three standard drive types.

- E1: 1.500-.100 Acme manual lead screw with a 2:1 reduction right angle drive.
- D1: 1.500-.250 Rolled ball lead screw powered drive with a nonpreloaded nut.
- H2: 3 1/4" Bore medium pressure hydraulic cylinder with a stop rod.

The lead screw manual drive can be positioned six ways with position #1 as standard (specify position number when ordering). The lead screw powered drive can be supplied with a ground ball lead screw and preloaded nut at additional cost. For 5500C spindle capabilities, reference the 5500 specification charts. \*

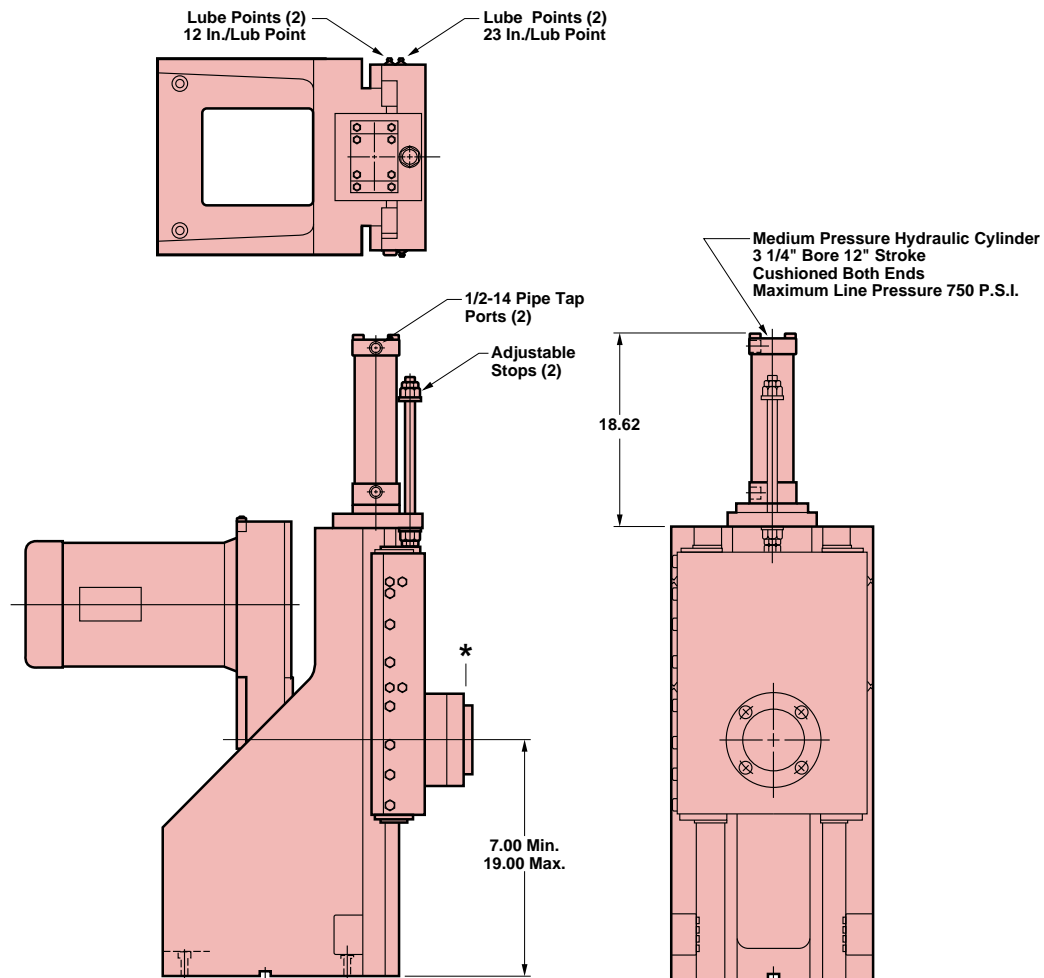


Note: \* See 5500C Cartridge Spindles on Page 14.

# Gilman 5500C Motorized Vertical Travel Spindles

## 5500C Vertical Travel

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
580	1963	1160	5	215TC
875	2962	1750	7 1/2	213TC
1432	5923	3500	7 1/2	184TC



H2- Hydraulic Cylinder

**Note:** \* See 5500C Cartridge Spindles on Page 14.

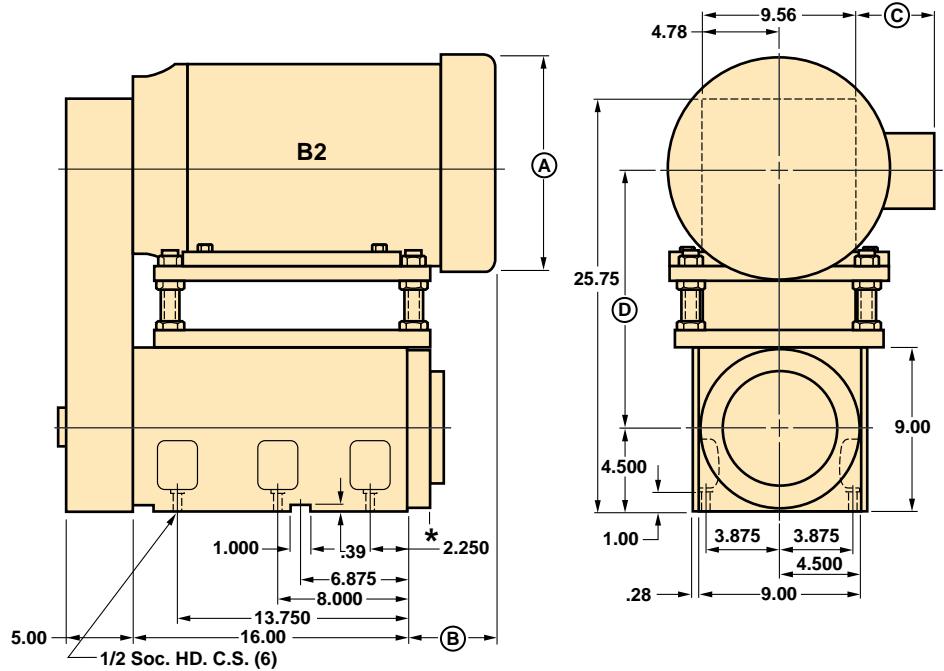
APPROX. WT. 1,520 LBS.

# Gilman 6500C Motorized Spindles

6500C and 6500B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 6500C and 6500B are available in two sizes, the B2 unit (high horsepower) or B3/B4 units (low horsepower). For 6500 spindle capabilities reference the 6500 specification charts. \*

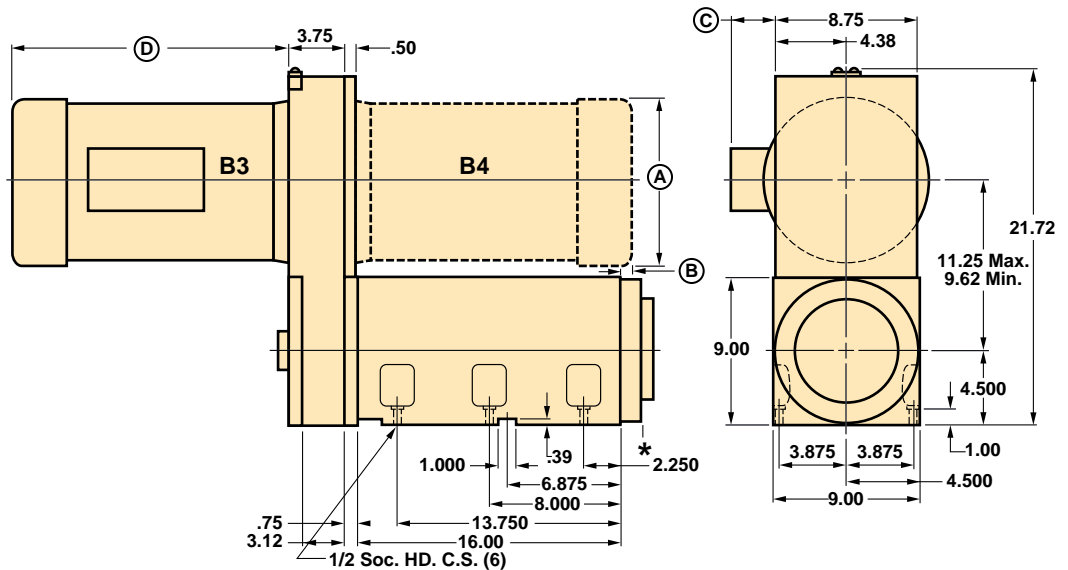
## 6500C B2

Spindle R.P.M.		Motor						D	
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	Min.	Max.
638	1864	1160	15	284T	14.50	6.09	6.94	14.75	16.75
963	2813	1750	20	256T	12.91	5.00	5.72	14.00	16.00
1488	4000	3500	20	256T	12.91	5.00	5.72	14.00	16.00



## 6500C B3 & B4

Spindle R.P.M.		Motor						D
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	
580	1595	1160	5	215TC	10.19	.19	3.00	16.31
875	2406	1750	7 1/2	213TC	10.19	.19	3.00	16.31
1432	4813	3500	7 1/2	184TC	8.50	-.69	1.50	15.44



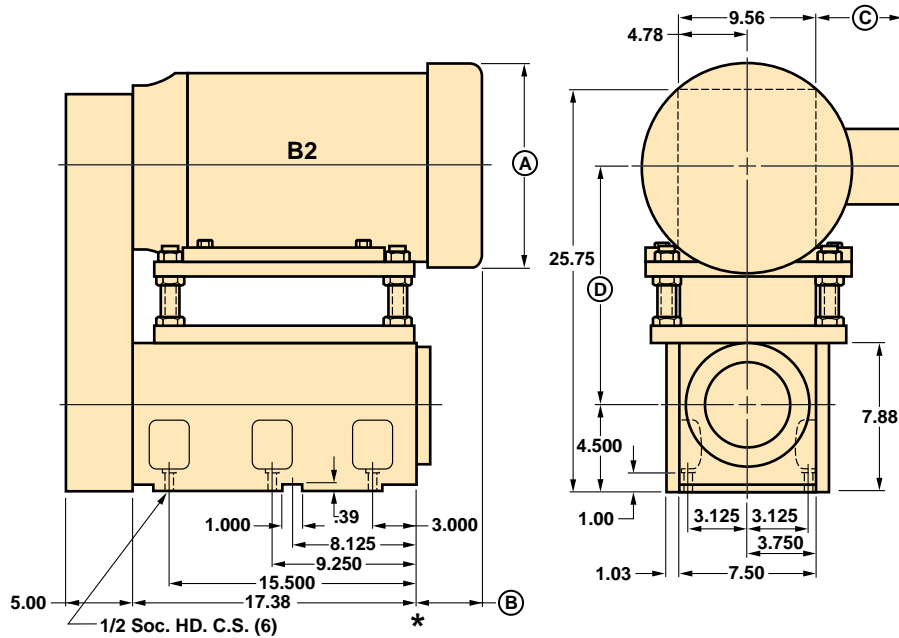
APPROX. WT. 930 LBS.

Note: \* See 6500C Cartridge Spindles on Page 16.

# Gilman 6500B Motorized Spindles

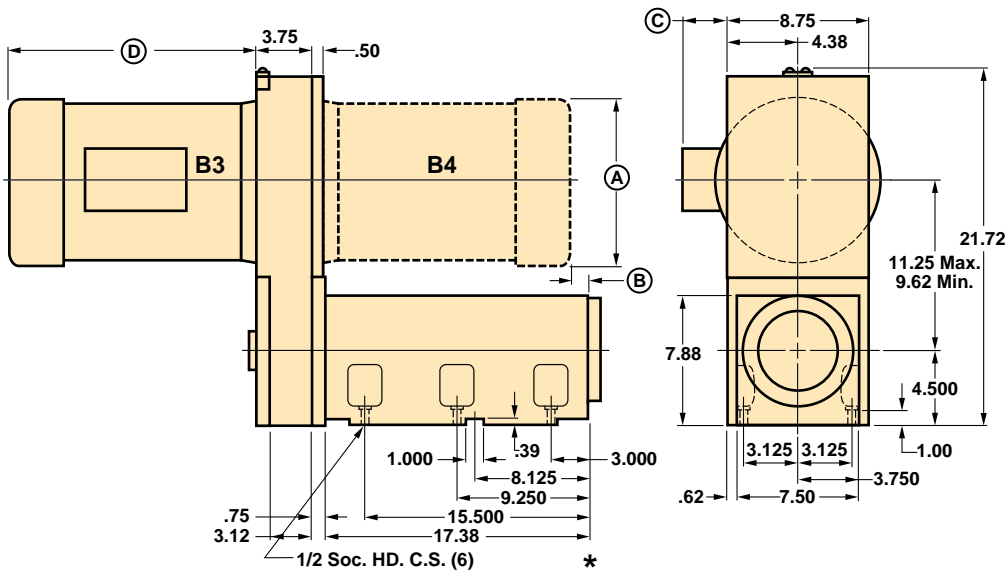
## 6500B B2

Spindle R.P.M.		Motor						D	
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	Min.	Max.
638	1864	1160	15	284T	14.50	4.70	6.94	13.62	15.62
963	2813	1750	20	256T	12.91	3.62	5.72	12.88	14.88
1488	4000	3500	20	256T	12.91	3.62	5.72	12.88	14.88



## 6500B B3 & B4

Spindle R.P.M.		Motor						D
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	
580	1595	1160	5	215TC	10.19	1.19	3.00	16.31
875	2406	1750	7 1/2	213TC	10.19	1.19	3.00	16.31
1432	4813	3500	7 1/2	184TC	8.50	2.06	1.50	15.44



Note: \* See 6500B Block Spindles on Page 17.

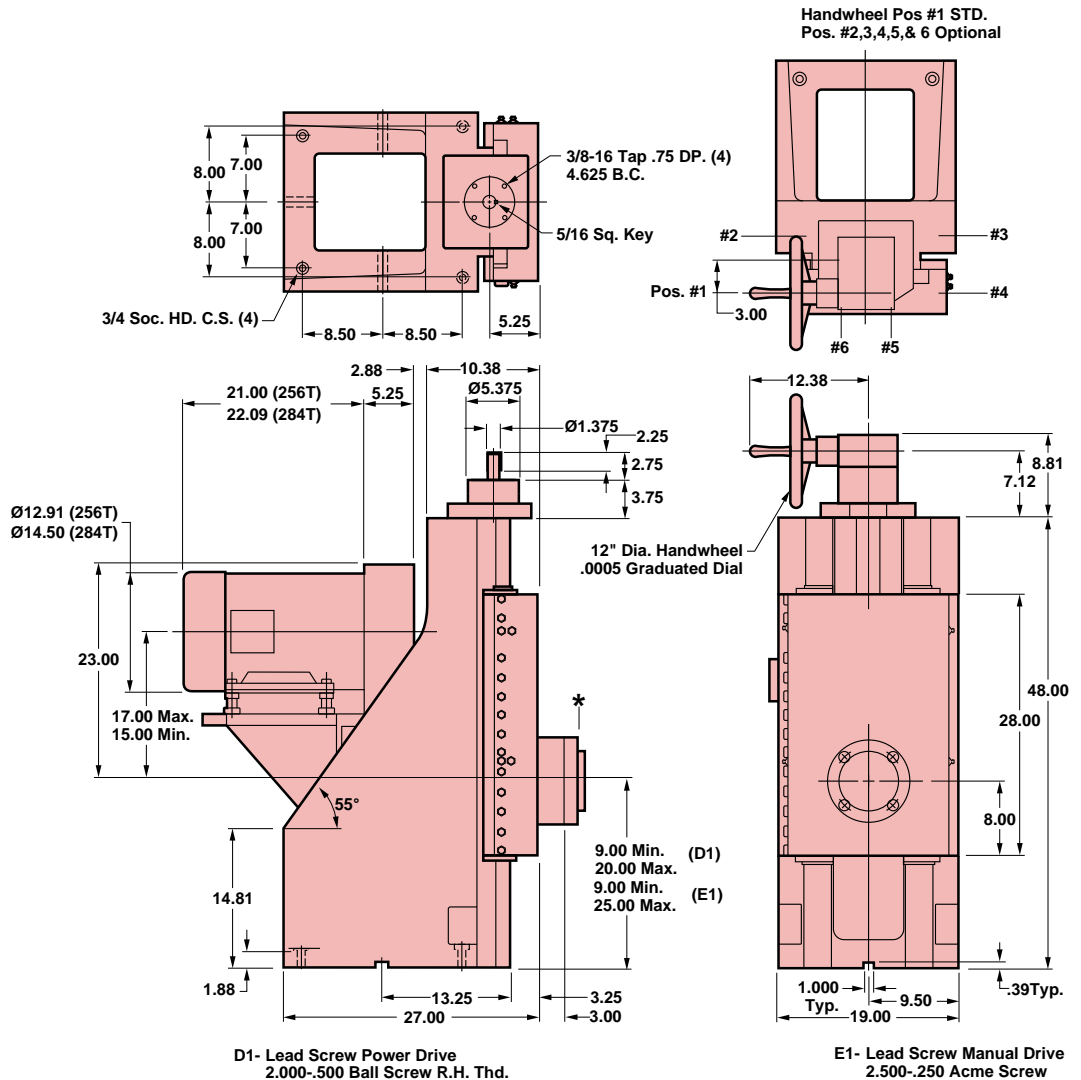
APPROX. WT. 755 LBS.

# Gilman 6500C Motorized Vertical Travel Spindles

6500C motorized vertical travel spindle units are fixed speed units that combine a motorized timing belt drive spindle with a vertical hardened steel way slide assembly. Vertical positioning of the saddle and spindle can be accomplished with one of the three standard drive types.

- E1: 2.500-.250 Acme manual lead screw with a 5:1 reduction right angle drive.
- D1: 2.000-.500 Rolled ball lead screw powered drive with a nonpreloaded nut.
- H2: 4" Bore medium pressure hydraulic cylinder with a stop rod.

The lead screw manual drive can be positioned six ways with position #1 as standard (specify position number when ordering). The lead screw powered drive can be supplied with a ground ball lead screw and preloaded nut at additional cost. For 6500C spindle capabilities, reference the 6500 specification charts. \*

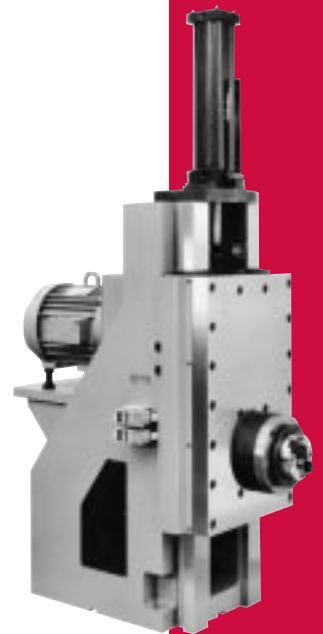
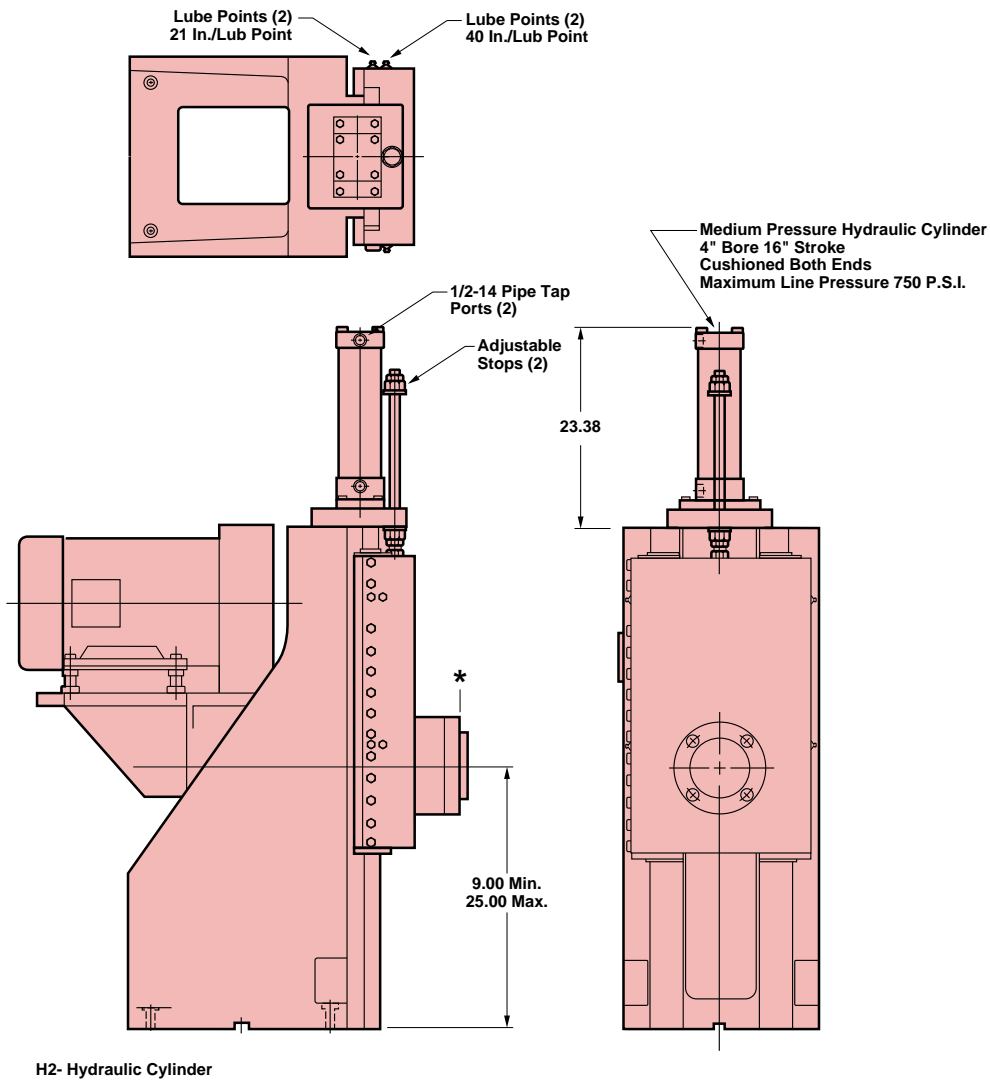


Note: \* See 6500C Cartridge Spindles on Page 16.

# Gilman 6500C Motorized Vertical Travel Spindles

## 6500C Vertical Travel

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
709	1864	1160	15	284T
1070	2813	1750	20	256T
1653	4000	3500	20	256T



**Note:** \* See 6500C Cartridge Spindles on Page 16.

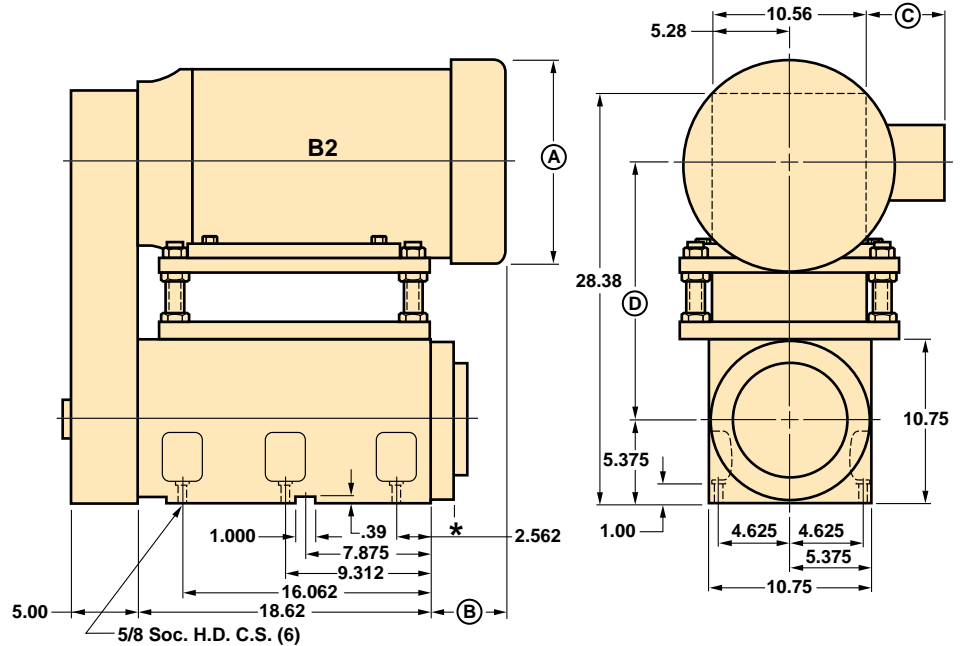
APPROX. WT. 2,600 LBS.

# Gilman 8000C Motorized Spindles

8000C and 8000B motorized spindles are fixed speed units incorporating a timing belt drive for positive power transmission. Poly-V, V-belt, and flat belt drives are available at additional cost where high speed and minimum vibration is required. The 8000C and 8000B are available in two sizes, the B2 unit (high horsepower) or B4 units (low horsepower). For 8000 spindle capabilities reference the 8000 specification charts.\*

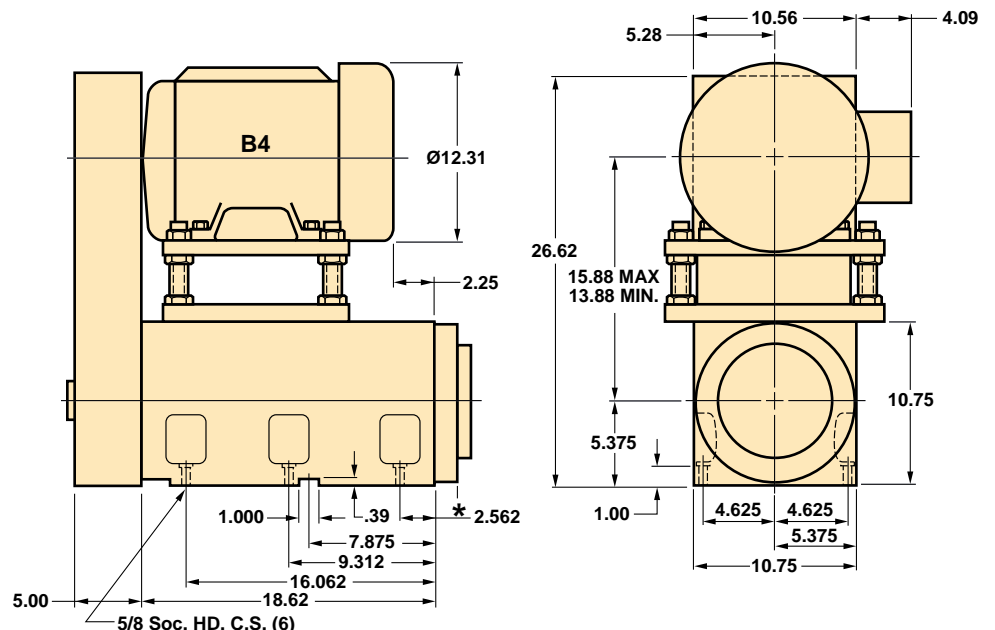
## 8000C B2

Spindle R.P.M.		Motor						D	
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	Min.	Max.
567	1864	1160	15	284T	14.50	3.46	5.92	15.62	17.62
856	2813	1750	20	256T	12.91	2.38	4.72	14.88	16.88
1478	4000	3500	30	286TS	14.50	5.12	5.92	15.62	17.62



## 8000C B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
438	2175	1160	5	215T
661	3281	1750	7 1/2	213T
1167	4813	3500	7 1/2	213T



APPROX. WT. 1210 LBS.

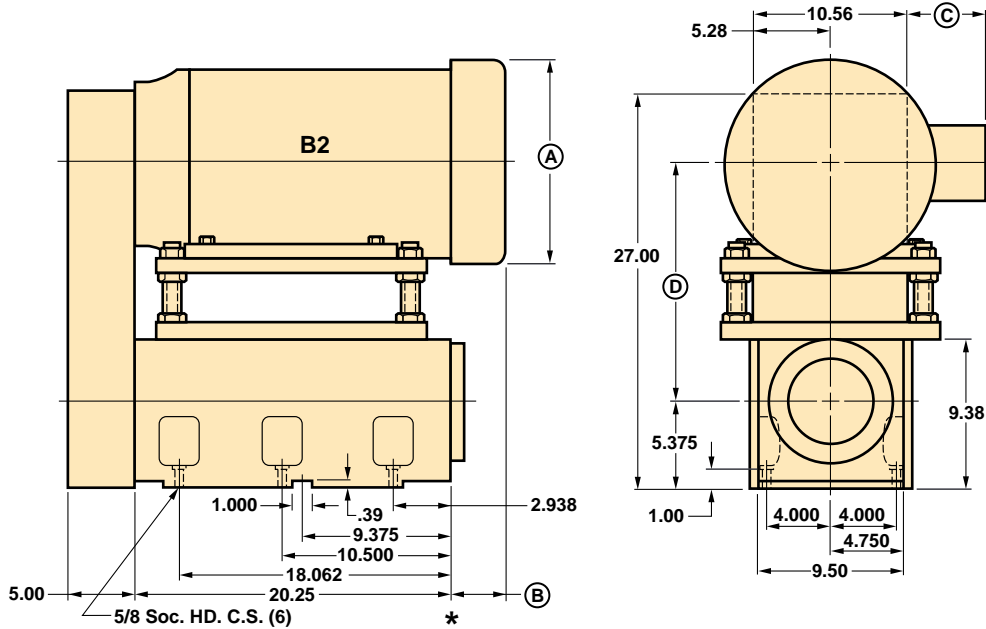
Note: \* See 8000C Cartridge Spindles on Page 18.



# Gilman 8000B Motorized Spindles

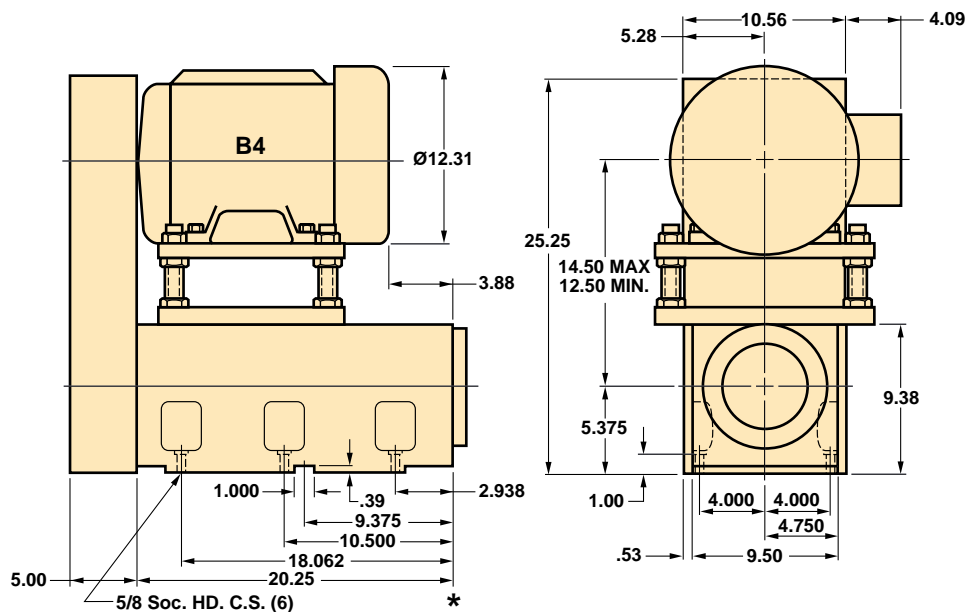
## 8000B B2

Spindle R.P.M.		Motor						D	
Minimum	Maximum	R.P.M.	H.P.	Frame	A	B	C	Min.	Max.
567	1864	1160	15	284T	14.50	1.83	5.92	14.25	16.25
856	2813	1750	20	256T	12.91	.75	4.72	13.50	15.50
1478	4000	3500	30	286TS	14.50	3.50	5.92	14.25	16.25



## 8000B B4

Spindle R.P.M.		Motor		
Minimum	Maximum	R.P.M.	H.P.	Frame
438	2175	1160	5	215T
661	3281	1750	7 1/2	213T
1167	4813	3500	7 1/2	213T



APPROX. WT. 1110 LBS.

**Note:** \* See 8000B Block Spindles on Page 19.

# Gilman Special Spindle Modules

Special applications may require a special spindle module. Engineers at Russell T. Gilman Inc. have years of experience fitting modules to the most challenging applications. Available as specials (except on 1250, 1875 and 2750 spindles) are various nose types such as Universal Kwik-Switch, Air Gage, HSK, Kennametal, Komet ABS, 3½"/ft. grinding taper, and a variety of collet types to meet your tooling requirements. Other special nose configurations are available.

Pictured below are just a few of the many special spindle modules assembled by Gilman for customers around the world. For information on these or other special spindle requirements, contact Gilman sales engineering for personalized assistance.



**1** 18083

Special vertical travel grinding spindle consisting of a special Model 2750C grinding spindle driven by an AC motor and poly-V belt with a ground ball screw driven HWL9 vertical slide.



**2** 17746

Two Model 3500 cluster spindles with provision for adding a third spindle at a later date. AC motor driven with poly-V belt drive.



**3** 17747

Special Model 5500B arbor spindle with piggy back mounted AC motor and V-belt drive.



**4** 17765

Dual Model 4000C #40 N.M.T.B. nose motorized vertical travel spindle assembly with AC motor, timing belt drive and hydraulic cylinder powered hardened steel way vertical slide.



**5** 17744

Three spindle cluster featuring (3) Model 5500 boring nose spindles. Two AC motors and poly-V belt drives power the spindles.

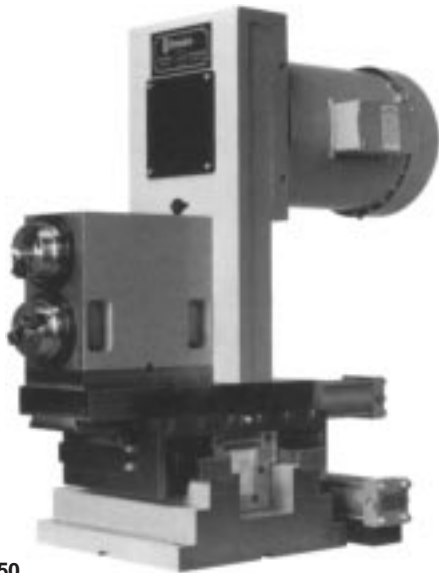
# Gilman Special Spindle Modules



**6 17749**  
 Four spindle cluster featuring (2) Model 3500 and (2) Model 5500 boring nose spindles. Two AC motors and timing belt drives power the spindles.



**7 17625**  
 Model 6500 #50 quick change nose "Quad-Quill" quill feed spindle allows for 6" of in and out feed.



**8 17750**  
 Dual Model 3500 timing belt driven motorized spindle assembly with two axis hardened steel way slide assembly.



**9 18084**  
 Three axis milling unit consisting of a hardened way slide, dovetail slide and a special vertical travel unit featuring a Model 3500 #30 N.M.T.B. nose spindle.



**10 17748**  
 Four spindle cluster mounted on a HWL12 slide. The cluster unit consists of (2) Model 3500 and (2) Model 2750 boring nose spindles with AC motors and poly-V belt drives. Designed to allow for variable spindle center-to-center distances.



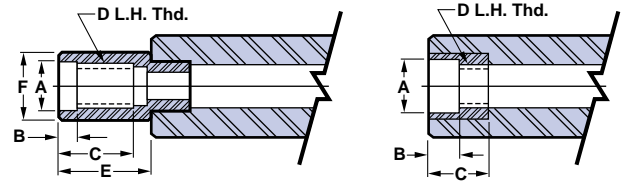
**11 17745**  
 Dual motorized spindle unit featuring (2) Model 4000 spindles with #40 N.M.T.B. nose, and powered by an AC gearmotor and timing belt mounted on a HWS12 slide.

# Gilman Spindle Accessories

## 1 Coolant Union Adapter

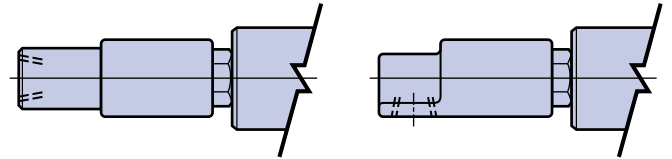
In cases where it is desirable to feed coolant through the spindle via a rotary union, a coolant union adapter may be fitted to all spindles with through-hole shafts.

Model	A	B	C	D	E	F
2750	.656	.28	.88	5/8-18	1.25	.91
3500	.656	.28	.88	5/8-18	1.25	.91
4000	.656	.28	.88	5/8-18	•	•
5500	.656	.28	.88	5/8-18	•	•
6500	1.250	.56	1.38	1-14	•	•
8000	1.250	.56	1.38	1-14	•	•



## 2 Rotating Coolant Unions

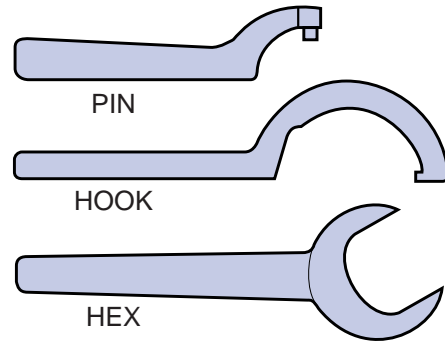
Rotary coolant unions are available in straight-through or 90° designs. They allow coolant to enter the drive end of the spindle and pass through the shaft to the tool. To install, a coolant union adapter must be utilized.



## 3 Wrenches

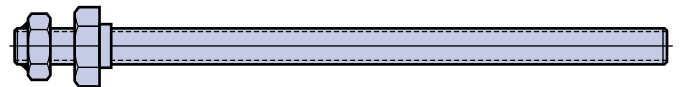
Wrenches for spindle collet locknuts and quickchange locknuts must be ordered separately from the spindle. Refer to chart for correct wrench number corresponding with spindle model.

Model	Quick Change		Collet	
	Pin	Hook	Pin	Hex
2750	A10294-2	A10048-2	A10016-2	A10081-2
3500	A10294-2	A10048-2	A10278-2	A10081-2
4000	A10272-2	A10048-2	•	•
5500	A10124-2	A10048-2	•	•



## 4 Manual Draw Bar

Precision Manual draw bars for spindles with #30, #40 and #50 N.M.T.B. tapers are made to operate at high speeds with minimal vibration.



## 5 Power Draw Bar Systems

Offering high speed operation and strong clamping power, these power draw bars provide short tool change cycles for automatic tool change applications. Available in #30, #40 and #50 milling tapers and with solid shaft or coolant-through design.

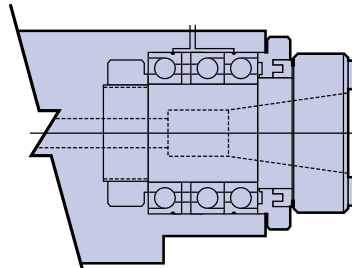


## 6 Air Purge Fittings

A #10-32 tapped hole is located on the nose end of the cartridge spindles (except 1250 and 1875 models) and on both the nose and drive ends of the block spindles for air purging. A push type fitting for 5/32" O.D. plastic tubing can be supplied for ease of connection.

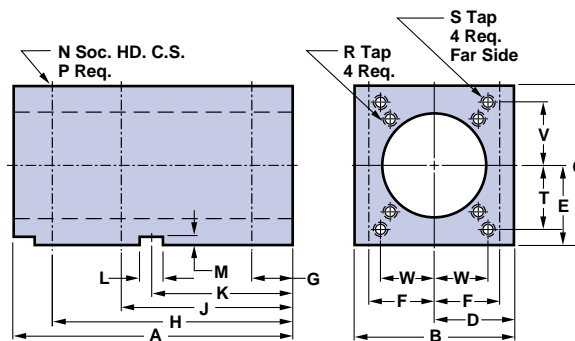
## 7 Bearing Force Monitoring System

Bearings force monitoring systems can detect tool wear, tool breakage and bearing temperatures during milling, boring, turning, drilling and tapping applications



## 8 Brackets

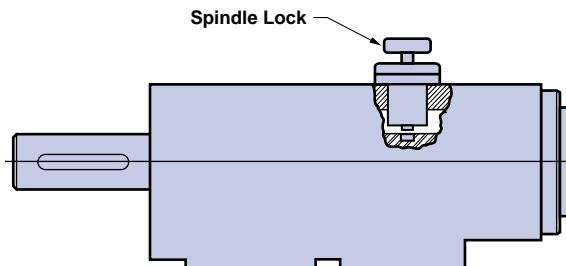
Gilman spindle brackets are manufactured from close grain, stress relieved cast iron. Models 1250 and 1875 have two types of brackets... positioning nut and clamp type. The 2750, 3500, 4000, 5500, 6500 and 8000 models have block type brackets for mounting flanged spindles.



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	WT.	Dwg. NO.
2750	6.25	4.25	4.25	2.125	2.125	1.75	1.12	5.12	•	3.188	.750	.26	5/16	4	5/16-18	5/16-18	1.50	1.12	1.50	20	D40364-2
3500	7.88	5.25	5.25	2.625	2.625	2.25	1.12	6.75	•	3.938	.750	.26	5/16	4	5/16-18	5/16-18	2.00	1.62	1.88	35	D40365-2
4000	10.38	6.00	6.00	3.000	3.000	2.50	1.50	8.88	•	5.375	.750	.26	3/8	4	3/8-16	3/8-16	2.00	1.75	2.25	60	D40366-2
5500	12.12	7.75	7.75	3.875	3.875	3.25	1.50	10.62	•	6.062	.750	.26	1/2	4	1/2-13	3/8-16	3.12	2.38	2.75	105	D40367-2
6500	16.00	9.00	9.00	4.500	4.500	3.88	2.25	13.75	8.00	6.875	1.000	.39	1/2	6	1/2-13	3/8-16	3.88	3.00	3.12	185	D40368-2
8000	18.62	10.75	10.75	5.375	5.375	4.62	2.56	16.06	9.31	7.875	1.000	.39	5/8	6	5/8-11	3/8-16	4.75	3.62	4.00	290	D40369-2

## 9 Manual Spindle Lock

A spindle lock is used to prevent the spindle shaft from rotating while tooling is being changed. Hold-to-lock or twist-lock styles are available. When using the twist-lock version, a motor interlocking switch is required to prevent spindle start-up while the lock is in position. Available on Block Spindles only.



## 10 Oil Lubricators

When very high speeds are required or high ambient temperatures and humidity are present an oil mist or oil + air lubricator may be utilized to keep the spindle running at peak performance.

## 11 Vertical Travel Accessories

Vertical travel spindle assemblies include many of the same accessories as Gilman's hardened steel way slides. Items such as limit switches, one-shot or automatic lubrication systems, and covers can all be used on vertical travel spindle assemblies. Refer to Gilman's Hardened Steel Way Catalog and consult factory for price and availability.

## 12 INPRO/SEAL™ Bearing Isolator.

Two-part dynamic seal consists of a stator press-fitted into the bearing housing, and a rotor attached to the shaft to form a non-contact, compound labyrinth. Bearing lubricant is captured in the inner portion of the labyrinth and flows back into the bearing housing. Outside contamination trying to enter the bearing housing is captured in the outer labyrinth paths and expelled through a port in the stator by centrifugal force and gravity.

# Gilman Application Engineering Data

The following data is a partial listing of information needed to assist in determining the approximate size of a spindle for a particular application.

For more complete information on speeds, feeds, materials, operations, power requirements, etc. consult Machinability Data Center (Metcut Research Associates, Inc.) handbook or similar publications.

- Use **lower speeds** for side and slot milling, heavy roughing cuts, hard, tough or abrasive materials, rigid parts and fixtures and maximum tool life.
- Use **higher speeds** for face milling, light finishing cuts, soft materials and less rigid parts and fixtures.
- Use **slower feeds** for side and slot milling, light finishing cuts, hard materials and less rigid parts and fixtures.
- Use **faster feeds** for face milling heavy roughing cuts, soft, or abrasive materials and rigid parts and fixtures.

The above information and data in tables at right is generally accepted as good practice, however variables such as part configuration, type of fixturing, dimensional tolerances, surface finish, tool geometry, tool overhang etc., all affect performance. Therefore the recommendations for speeds, feeds and horsepower are nominal and should be considered as good starting points. For final selection, consult a cutting tool specialist for the latest in cutting tool performance data.

Some helpful suggestions: keep cutter or tool extension to a minimum, use sufficient and the proper type of coolant, prevent chips from accumulating near cut, protect spindle from coolant and chips with adequate guarding.

Consult Gilman's Engineering and Sales Department for assistance in selecting a spindle suitable for a particular application providing the following information:

1. Material being machined and hardness.
2. Tool material, diameter, and number of teeth.
3. Type of operation face milling, slot milling, boring etc.
4. Maximum depth and width of cut or maximum area of material being machined in plane at right angles to the direction of feed.
5. HP and RPM required.

## Machining Formulas

FPM = Peripheral Speed of Tool in Feet per Minute

RPM = Speed of Tool in Revolutions per Minute

IPT = Feed Rate of Tool in Inches per Tooth

IPR = Feed Rate of Tool in Inches per Revolution

IPM = Feed Rate of Tool in Inches per Minute

D = Tool Diameter in Inches

N = Number of Teeth in Tool

d = Depth of Cut in Inches

w = Width of Cut in Inches

A = Area of Material Machined at Right Angles to Direction of Feed

P = Unit Power Factor in HP per Cu. In. per Min. (At Motor, Corrected For 80% Drive Eff.)

$$RPM = 3.82 \times \frac{FPM}{D} \quad FPM = RPM \times \frac{D}{3.82}$$

IPM = RPM x IPT x N = RPM x IPR

BORING HP = 12 x FPM x IPR x d x P

GUNDRILLING HP = .79 x D<sup>2</sup> x IPM x P

MILLING HP = d x w x IPM x P = A x IPM x P

TORQUE (in-lbs.) =  $\frac{HP \times 63025}{RPM}$

RPM

## BORING

Material		H.S.S. Tool		Carbide Tool		P
		Speed FPM	Feed IPR	Speed FPM	Feed IPR	
Steel	Soft 85-200 BHN	100-180	.005-.010	360-675	.006-.015	1.4
	Medium 200-325 BHN	55-145	.004-.010	240-570	.005-.015	1.7
	Hard 325-450 BHN	30-60	.003-.007	155-250	.004-.009	1.9
Stainless Steel†	Soft 135-275 BHN	80-150	.004-.008	315-500	.005-.010	1.6
	Hard 275-425 BHN	30-70	.003-.007	135-325	.004-.009	1.7
Cast Iron	Soft 120-220 BHN	60-140	.005-.010	250-460	.007-.015	1.0
	Hard 220-320 BHN	20-50	.003-.008	105-225	.004-.010	1.7
Ductile Iron	140-260 BHN	65-140	.006-.010	195-460	.008-.015	1.3
Malleable Iron	110-240-BHN	60-165	.005-.010	205-625	.007-.015	1.2
Aluminum	Except Die Castings	540-750	.008-.015	990-1600	.010-.020	.3
Aluminum	Die Castings	105-135	.008-.015	375-475	.010-.020	.3
Magnesium		700-800	.008-.015	1800-2000	.010-.020	.2
Brass & Bronze		250-480	.006-.015	500-950	.008-.020	1.2
Copper		90-115	.005-.008	180-225	.007-.010	1.2

## GUN DRILLING Carbide Tool

Material		Speed FPM	Hole Dia. and Feed IPR					P	
			$\frac{5}{64}$ -. $\frac{5}{32}$	$\frac{5}{32}$ -. $\frac{1}{4}$	$\frac{1}{4}$ -. $\frac{1}{2}$	$\frac{1}{2}$ -. $\frac{3}{4}$	$\frac{3}{4}$ -1		1-2
Steel	Soft 85-200 BHN	425-675			.0006	.0008	.001	.0015	1.1
	Medium 200-325 BHN	225-450	.00015	.0003	.0006	.0008	.001	.0015	1.4
	Hard 325-450 BHN	130-200	.00025	.0005	.0006	.0008	.001	.0015	1.7
Stainless Steel†	Soft 135-275 BHN	250-300	.00015	.0003	.0006	.0008	.001	.0015	1.1
	Hard 275-425 BHN	150-225	.00025	.0005	.0005	.0007	.0008	.001	1.2
Cast Iron	Soft 120-220 BHN	250-350	.00015	.0003	.0015	.003	.005	.007	1.1
	Hard 220-320 BHN	150-200	.00025	.0005	.001	.002	.0025	.003	1.6
Ductile Iron	140-260 BHN	200-300	.00015	.0003	.0006	.0008	.0015	.002	1.3
Malleable Iron	110-240-BHN	250-350	.00015	.0003	.0006	.0008	.0015	.002	1.2
Aluminum	Except Die Castings	650	.00015	.0003	.003	.005	.008	.010	.2
Aluminum	Die Castings	650	.00015	.0003	.003	.005	.008	.010	.2
Magnesium		650	.00015	.0003	.003	.005	.008	.010	.2
Brass & Bronze		500-600	.00015	.0003	.001	.003	.005	.008	.8
Copper		350	.00015	.0003	.001	.003	.005	.008	.9

## MILLING

Material		Face	Side & Slot w/Cutters	Slot w/End Mills		P
		H.S.S. Tool		Carbide Tool*		
		Speed FPM	Feed IPR	Speed FPM	Feed IPT	
Steel	Soft 85-200 BHN	65-325	.001-.012	290-840	.007-.014	1.4
	Medium 200-325 BHN	40-225	.0005-.012	200-650	.006-.014	1.8
	Hard 325-450 BHN	25-95	.0005-.008	150-375	.004-.010	2.2
Stainless Steel†	Soft 135-275 BHN	60-250	.0005-.010	205-625	.007-.014	1.7
	Hard 275-425 BHN	25-105	.0005-.007	165-400	.004-.009	1.9
Cast Iron	Soft 120-220 BHN	55-235	.0007-.016	300-630	.007-.020	.9
	Hard 220-320 BHN	25-85	.0005-.010	150-400	.005-.010	1.4
Ductile Iron	140-260 BHN	50-195	.0005-.016	250-665	.007-.020	1.1
Malleable Iron	110-240-BHN	55-330	.0007-.016	250-800	.007-.020	1.0
Aluminum	Except Die Castings	200-1500	.0005-.022	1200-Max.	.010-.020	.4
Aluminum	Die Castings	125-325	.0005-.020	800-2200	.010-.020	.4
Magnesium		450-1500	.001-.022	1200-Max.	.010-.020	.2
Brass & Bronze		155-600	.001-.020	400-1300	.007-.018	1.2
Copper		75-150	.001-.010	200-350	.005-.010	1.2

\*Not for Slot End Mills.

†Free Machining.

Data courtesy of Metcut Research Associates, Inc.

The following application examples will help familiarize you with the charts and formulas required to determine correct spindle selection.

## Application Example #1

- Boring 1 $\frac{7}{8}$ " diameter hole in die cast aluminum
- Rough size 1 $\frac{5}{8}$ "
- Carbide inserts, 5" tool overhang from front of housing

### Step 1 –

Determine the peripheral speed of tool (FPM), feed rate of tool (IPR), and Unit Power Factor (P) from the chart under Boring, Aluminum Die Casting, and Carbide Tooling.

Results: 475 FPM, .020 IPR and .3 HP/in<sup>3</sup>/min

### Step 2 –

Determine the depth of cut.

Results:  $\frac{1.88 - 1.62}{2} = .13$  in.

### Step 3 –

Calculate the required horsepower using the Boring HP formula.

Results: Boring HP = 12 x 475 FPM x .020 IPR x .13 in.  
x .3 HP/in<sup>3</sup>/min  
Boring HP = 4.45

### Step 4 –

Calculate the speed and torque required.

Results: RPM = 3.82 x  $\frac{475 \text{ FPM}}{1.88 \text{ in.}}$

RPM = 965

Torque =  $\frac{4.45 \text{ HP} \times 63025}{965 \text{ RPM}}$

Torque = 291 in–lbs.

### Step 5 –

Compare the tool overhang, hole diameter and torque to values on Spindle Specification Charts, and follow the sizing rules on page 4.

Results: 4000 Spindle

Front bearing bore 55mm > 1.88 in. (48mm)

Maximum tool overhang 5 $\frac{1}{8}$ " > 5 in.

Maximum torque 1000 in–lbs. > 291 in–lbs.

3500 Spindle

Front bearing bore 45mm < 1.88 in. (48mm)

Maximum tool overhang 3 $\frac{7}{8}$ " < 5 in.

Maximum torque 527 in–lbs. > 291 in–lbs.

By comparing the results, Model 4000C-X1M-BR would be the spindle of choice.

## Application Example #2

- Face mill a 2 $\frac{1}{2}$ " wide,  $\frac{1}{8}$ " deep pad in 225 BHN steel with a 4" diameter 6-tooth carbide insert cutter

### Step 1 –

Determine the peripheral speed of tool (FPM), feed rate of tool (IPT), and Unit Power Factor (P) from the chart under Milling, Steel Medium 200-325 BHN, and Carbide Tooling.

Results: 200 FPM, .006 IPT and 1.8 HP/in<sup>3</sup>/min

### Step 2 –

Calculate the speed of tool in RPM

Results: RPM = 3.82 x  $\frac{200 \text{ ft/min}}{4 \text{ in.}}$

RPM = 191

### Step 3 –

Calculate the feed rate of tool in in/min (IPM)

Results: IPM = 191 rev/min x 6 teeth x .006 in/tooth  
IPM = 6.88

### Step 4 –

Calculate the required horsepower using the Milling HP formula.

Results: Milling HP = .12 in. x 2.5 in. x 6.88 IPM x  
1.8 HP/in<sup>3</sup>/min

Milling HP = 3.72

### Step 5 –

Calculate the torque requirements.

Results: Torque =  $\frac{3.72 \text{ HP} \times 63025}{191 \text{ RPM}}$

Torque = 1228 in–lbs.

### Step 6 –

Compare the speed and torque to the values on the Spindle Specification Charts, and follow the sizing rules on page 4.

Results: 4000 Spindle

Maximum torque 1000 in–lbs.

5500 Spindle

Maximum torque 2164 in–lbs.

By comparing the results, Model 5500B-X3M-40 would be the spindle of choice.

## PARTNERSHIP IN PRECISION

Founded in 1952, Russell T. Gilman, Inc. serves a broad cross-section of the world's leading companies with a constantly evolving product line and engineering capabilities. You are invited to further explore the benefits of a partnership with Gilman as your preferred supplier of precision machine tool

components by touring our facilities. Gilman's Spindle Service Center provides complete remanufacturing services for conventional spindles and special applications.

Gilman, an SKF company, is part of the world's largest bearing and linear motion

component supplier. The U.S. based SKF Bearing Service Center provides unique bearing and preload configurations. In addition to Gilman's Spindle Service Center in Grafton, WI, SKF's Spindle Service Centers are also located in Gothenburg, Sweden; Schweinfurt, Germany; Steyr, Austria; and

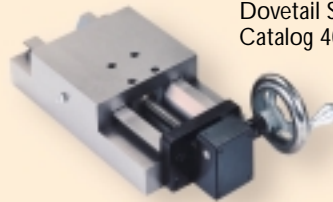
Chino, Japan. SKF also offers an international research and development center (NOVA) for studying bearing theory, lubrication technology and future applications.

For more information and the name of the Gilman representative in your area, please call, write, fax or visit our website.

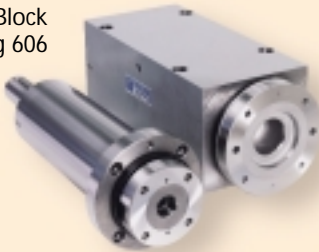
GHS/GLS  
Motorized Spindles  
Catalog 1199



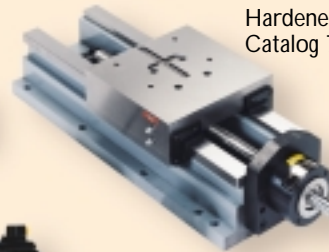
Dovetail Slides  
Catalog 400



Cartridge & Block  
Spindles Catalog 606



Hardened Steel Way Slides  
Catalog 707



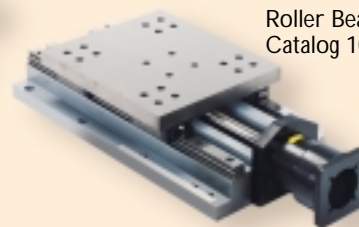
SKF Grinding  
Spindles  
Catalog 999  
SKF Routing  
Spindles  
Catalog 1299



Multi-Axis Modules  
Catalog 333



Roller Bearing Slides  
Catalog 101



## ENGINEERING HANDBOOK ON-LINE

Complete catalogs and engineering data. Downloadable DWG and DXF files to place in your CAD drawing. [www.rtgilman.com](http://www.rtgilman.com)



Spindle Service Center  
Catalog 599

**Russell T. Gilman**  
An SKF Company  
Precision Machine Tool Components



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