# STOCK GEARS

## OVER 9500 ITEMS HELP YOU GEAR UP FOR HIGHER PRODUCTIVITY

BROWNING is one of the most comprehensive lines of off-the-shelf gears in the industry, including spur, miter and bevel, and change gears. These are available in 20° pressure angle from 20 to 4 dp, and 14 1/2° pressure angle from 48 to 3 dp ... all designed to increase output, reduce costs and avoid specials.

- Thousands of shaft-ready finished bore and bushing types (a BROWNING exclusive) eliminate rework costs, assure true-running precision at all times.
- More stock sizes made of steel ... you get weldability plus greater strength, at cast iron prices.
- Extra tooth depth and larger radii provide stronger teeth, a deeper lubrication reservoir and more clearance.
- Many bevel gears are available hardened for longer life.
- Many odd-tooth sizes.
- Custom gear capabilities — up to 60" dia. and 17" face.

All BROWNING® gears meet AGMA quality standards and our own close manufacturing tolerances. Gear up with BROWNING to increase your productivity!


Spur gear and pinion, bushing type

Bevel gears

Bushing type Spur gear and rack

## STOCK GEARS

### SPUR GEARS

| Type | Material | Pressure Angle | Pitch Range | Tooth Range | Bore Range |
|---|---|---|---|---|---|
| Spur, Min. Bore (Fine Pitch) | Steel | 14 1/2° | 32, 24, 20 | 11-200 | 3/32-1 |
| Spur, Min. Bore | Steel & Cast Iron | 14 1/2 | 16,12,10,8,6,5,4,3 | 11-200 | 3/8 - 3 5/8 |
| Spur, Fin. Bore | | | 20,16,12,10,8,6 | 11-35 | 1/4 - 1 1/4 |
| Spur, Bushing Type | | | 16,12,10,8,6,5,4,3 | 15-200 | 3/8 - 4 1/4 |
| Spur, Min. Bore | Steel & Cast Iron | 20 | 20,16,12,10,8,6,5,4, | 12-240 | 5/16 - 3 5/8 |
| Spur, Fin. Bore | | | 20,16,12,10,8,6 | 12-40 | 1/4 - 1 1/4 |
| Spur, Bushing Type | | | 16,12,10,8,6,5,4 | 18-240 | 3/8 - 4 1/4 |
| Spur, Change Gear | Steel | 14 1/2 | 20,16,12,10,8 | 20-129 | 5/8 - 1 3/8** |
| Rack | Steel | 14 1/2 | 32,24,20,16,12,10,8,6,5,4,3 | - | - |
| | Steel | 20 | 20,16,12,10,8,6,5,4 | - | - |
| Spur, Min. Bore | Non-metallic | 14 1/2 | 16,12,10,8,6,5, | 12-96 | 3/8 - 2 1/4 |
| | | 20 | 16,12,8 | 15-24 | 3/8 - 1 3/4 |

### BEVEL AND MITER GEARS

| Type | Material | Pressure Angle | Pitch Range | Tooth Range | Bore Range |
|---|---|---|---|---|---|
| Bevel | Unhardened Steel | 20 | 20,16,12,10,8,6,5,4,3 | 10-96 | 3/16 - 3 |
| Miter | Hardened & Unhardened Steel | 20 | 32,24,20,16,12, 10,8,6,5,4 | 12-32 | 3/16 - 3 |
| Spiral Bevel | Hardened Steel | 20 | 14,10,8 | 16-34 | 1/2 - 1 1/2 |
| Spiral Miter | | | 12,10,8,7,6,5 | 15-28 | 1/2 - 1 3/8 |

** Bushing bore range is 7/16 - 1 1/16.

***NEW!* Expanded MTO Gear Rack Capability**

- From 1 DP to 64 DP
- Metric Module Pitch
- Face Widths to 18" (450 mm)
- Thickness to 18" (450 mm)
- Maximum width 23" (554 mm)
- 14 1/2, 20 25° P.A.
- Additional Steels
- Up to AGMA Call 11 Spacing Accuracy
- Up to any practical length
- Round and helical gear rack

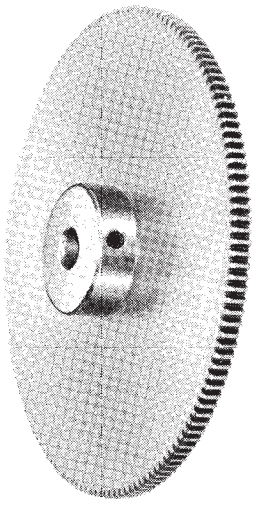
## 32 Pitch  3/16" Face  14 1/2° Pressure Angle

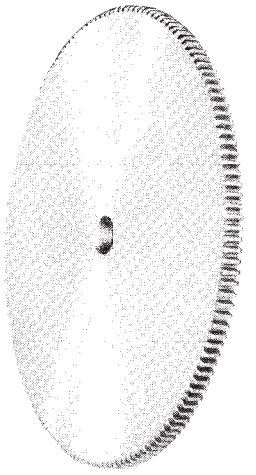
Table No. 2

### Stock Steel Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS3215 | .469" | .53" | 15 | 2 | 3/16" | 3/16" | 3/16" | 1/2" | 5/16" | 3/8" | .03 |
| NSS3216A | .500 | .56 | 16 | A2 | 3/16 | — | 3/16 | — | — | — | .03 |
| NSS3216 | .500 | .56 | 16 | 2 | 3/16 | 3/16 | 3/16 | 1/2 | 5/16 | 13/32 | .03 |
| NSS3218 | .562 | .62 | 18 | 2 | 3/16 | 3/16 | 3/16 | 1/2 | 5/16 | 15/32 | .03 |
| NSS3220A | .625 | .68 | 20 | A2 | 1/4 | — | 3/16 | — | — | — | .03 |
| NSS3220 | .625 | .68 | 20 | 2 | 1/4 | 1/4 | 3/16 | 1/2 | 5/16 | 17/32 | .03 |
| NSS3222A | .688 | .75 | 22 | A2 | 1/4 | — | 3/16 | — | — | — | .03 |
| NSS3222 | .688 | .75 | 22 | 2 | 1/4 | 1/4 | 3/16 | 1/2 | 5/16 | 19/32 | .03 |
| NSS3224A | .750 | .81 | 24 | A2 | 5/16 | — | 3/16 | — | — | — | .03 |
| NSS3224 | .750 | .81 | 24 | 2 | 5/16 | 5/16 | 3/16 | 1/2 | 5/16 | 21/32 | .06 |
| NSS3226 | .812 | .87 | 26 | 2 | 5/16 | 3/8 | 3/16 | 1/2 | 5/16 | 23/32 | .06 |
| NSS3228A | .875 | .93 | 28 | A2 | 3/8 | — | 3/16 | — | — | — | .06 |
| NSS3228 | .875 | .93 | 28 | 2 | 5/16 | 3/8 | 3/16 | 1/2 | 5/16 | 3/4 | .09 |
| NSS3230 | .938 | 1.00 | 30 | 2 | 5/16 | 3/8 | 3/16 | 1/2 | 5/16 | 3/4 | .09 |
| NSS3232A | 1.000 | 1.06 | 32 | A2 | 3/8 | — | 3/16 | — | — | — | .06 |
| NSS3232 | 1.000 | 1.06 | 32 | 2 | 5/16 | 3/8 | 3/16 | 9/16 | 3/8 | 3/4 | .13 |
| NSS3240A | 1.250 | 1.31 | 40 | A2 | 3/8 | — | 3/16 | — | — | — | .13 |
| NSS3240 | 1.250 | 1.31 | 40 | 2 | 3/8 | 7/16 | 3/16 | 9/16 | 3/8 | 7/8 | .19 |
| NSS3248A | 1.500 | 1.56 | 48 | A2 | 3/8 | — | 3/16 | — | — | — | .13 |
| NSS3248 | 1.500 | 1.56 | 48 | 2 | 3/8 | 7/16 | 3/16 | 9/16 | 3/8 | 7/8 | .19 |
| NSS3256A | 1.750 | 1.81 | 56 | A2 | 3/8 | — | 3/16 | — | — | — | .13 |
| NSS3256 | 1.750 | 1.81 | 56 | 2 | 3/8 | 1/2 | 3/16 | 9/16 | 3/8 | 1 | .25 |
| NSS3264A | 2.000 | 2.06 | 64 | A2 | 3/8 | — | 3/16 | — | — | — | .19 |
| NSS3264 | 2.000 | 2.06 | 64 | 2 | 3/8 | 1/2 | 3/16 | 9/16 | 3/8 | 1 | .31 |
| NSS3280A | 2.500 | 2.56 | 80 | A2 | 3/8 | — | 3/16 | — | — | — | .25 |
| NSS3280 | 2.500 | 2.56 | 80 | 2 | 3/8 | 9/16 | 3/16 | 9/16 | 3/8 | 1 1/8 | .38 |
| NSS3296A | 3.000 | 3.06 | 96 | A2 | 3/8 | — | 3/16 | — | — | — | .38 |
| NSS3296 | 3.000 | 3.06 | 96 | 2 | 3/8 | 9/16 | 3/16 | 11/16 | 1/2 | 1 1/4 | .56 |
| NSS32128 | 4.000 | 4.06 | 128 | 2 | 3/8 | 11/16 | 3/16 | 11/16 | 1/2 | 1 3/8 | .88 |
| NSS32160 | 5.000 | 5.06 | 160 | 2 | 3/8 | 11/16 | 3/16 | 11/16 | 1/2 | 1 3/8 | 1.3 |
| NSS32192 | 6.000 | 6.06 | 192 | 2 | 3/8 | 13/16 | 3/16 | 13/16 | 5/8 | 1 1/2 | 1.8 |
| NSS32200 | 6.250 | 6.31 | 200 | 2 | 3/8 | 13/16 | 3/16 | 13/16 | 5/8 | 1 1/2 | 1.9 |

**Note: All of above Gears have one Hollow Head Setscrew in Hub, except Type A2 which have no Setscrew.**





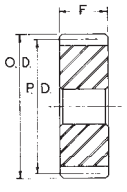
## 24 Pitch  1/4" Face  14 1/2° Pressure Angle

Table No. 1

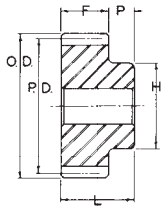
### Stock Steel Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS2412A | .500" | .58" | 12 | A2 | 1/4 | — | 1/4" | — | — | — | .03 |
| NSS2412 | .500 | .58 | 12 | 2 | 1/4 | 1/4" | 1/4 | 9/16 | 5/16 | 3/8" | .06 |
| NSS2414 | .583 | .66 | 14 | 2 | 1/4 | 1/4 | 1/4 | 9/16 | 5/16 | 15/32 | .06 |
| NSS2415A | .625 | .70 | 15 | A2 | 1/4 | — | 1/4 | — | — | — | .03 |
| NSS2415 | .625 | .70 | 15 | 2 | 1/4 | 1/4 | 1/4 | 9/16 | 5/16 | 1/2 | .06 |
| NSS2416A | .667 | .75 | 16 | A2 | 5/16 | — | 1/4 | — | — | — | .03 |
| NSS2416 | .667 | .75 | 16 | 2 | 5/16 | 5/16 | 1/4 | 9/16 | 5/16 | 35/64 | .06 |
| NSS2418A | .750 | .83 | 18 | A2 | 5/16 | — | 1/4 | — | — | — | .03 |
| NSS2418 | .750 | .83 | 18 | 2 | 5/16 | 3/8 | 1/4 | 9/16 | 5/16 | 5/8 | .06 |
| NSS2419 | .792 | .87 | 19 | 2 | 5/16 | 3/8 | 1/4 | 9/16 | 5/16 | 21/32 | .06 |
| NSS2420 | .833 | .91 | 20 | 2 | 5/16 | 3/8 | 1/4 | 9/16 | 5/16 | 23/32 | .06 |
| NSS2421A | .875 | .95 | 21 | A2 | 3/8 | — | 1/4 | — | — | — | .03 |
| NSS2421 | .875 | .95 | 21 | 2 | 3/8 | 1/2 | 1/4 | 9/16 | 5/16 | 3/4 | .06 |
| NSS2422 | .917 | 1.00 | 22 | 2 | 3/8 | 1/2 | 1/4 | 9/16 | 5/16 | 25/32 | .09 |
| NSS2423 | .958 | 1.04 | 23 | 2 | 3/8 | 1/2 | 1/4 | 5/8 | 3/8 | 13/16 | .09 |
| NSS2424A | 1.000 | 1.08 | 24 | A2 | 1/2 | — | 1/4 | — | — | — | .06 |
| NSS2424 | 1.000 | 1.08 | 24 | 2 | 3/8 | 1/2 | 1/4 | 5/8 | 3/8 | 7/8 | .13 |
| NSS2425 | 1.042 | 1.12 | 25 | 2 | 3/8 | 9/16 | 1/4 | 5/8 | 3/8 | 7/8 | .13 |
| NSS2426 | 1.083 | 1.16 | 26 | 2 | 3/8 | 9/16 | 1/4 | 5/8 | 3/8 | 7/8 | .13 |
| NSS2427 | 1.125 | 1.20 | 27 | 2 | 3/8 | 9/16 | 1/4 | 5/8 | 3/8 | 7/8 | .13 |
| NSS2428 | 1.167 | 1.25 | 28 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 | .13 |
| NSS2430A | 1.250 | 1.33 | 30 | A2 | 1/2 | — | 1/4 | — | — | — | .06 |
| NSS2430 | 1.250 | 1.33 | 30 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 | .13 |
| NSS2432 | 1.333 | 1.41 | 32 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .13 |
| NSS2433 | 1.375 | 1.45 | 33 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .13 |
| NSS2436A | 1.500 | 1.58 | 36 | A2 | 1/2 | — | 1/4 | — | — | — | .06 |
| NSS2436 | 1.500 | 1.58 | 36 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .19 |
| NSS2439 | 1.625 | 1.70 | 39 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .19 |
| NSS2440 | 1.667 | 1.75 | 40 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .19 |
| NSS2442A | 1.750 | 1.83 | 42 | A2 | 1/2 | — | 1/4 | — | — | — | .13 |
| NSS2442 | 1.750 | 1.83 | 42 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/8 | .19 |
| NSS2444 | 1.833 | 1.91 | 44 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .25 |
| NSS2445 | 1.875 | 1.95 | 45 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .25 |
| NSS2448A | 2.000 | 2.08 | 48 | A2 | 1/2 | — | 1/4 | — | — | — | .19 |
| NSS2448 | 2.000 | 2.08 | 48 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .25 |
| NSS2454 | 2.250 | 2.33 | 54 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .31 |
| NSS2456 | 2.333 | 2.41 | 56 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .38 |
| NSS2460A | 2.500 | 2.58 | 60 | A2 | 1/2 | — | 1/4 | — | — | — | .31 |
| NSS2460 | 2.500 | 2.58 | 60 | 2 | 3/8 | 5/8 | 1/4 | 5/8 | 3/8 | 1 1/4 | .38 |
| NSS2464 | 2.667 | 2.75 | 64 | 2 | 1/2 | 3/4 | 1/4 | 5/8 | 3/8 | 1 3/8 | .44 |
| NSS2466 | 2.750 | 2.83 | 66 | 2 | 1/2 | 3/4 | 1/4 | 5/8 | 3/8 | 1 3/8 | .5 |
| NSS2470 | 2.917 | 3.00 | 70 | 2 | 1/2 | 3/4 | 1/4 | 5/8 | 3/8 | 1 3/8 | .56 |
| NSS2472A | 3.000 | 3.08 | 72 | A2 | 1/2 | — | 1/4 | — | — | — | .5 |
| NSS2472 | 3.000 | 3.08 | 72 | 2 | 1/2 | 3/4 | 1/4 | 3/4 | 1/2 | 1 3/8 | .63 |
| NSS2484 | 3.500 | 3.58 | 84 | 2 | 1/2 | 3/4 | 1/4 | 3/4 | 1/2 | 1 1/2 | .81 |
| NSS2496 | 4.000 | 4.08 | 96 | 2 | 1/2 | 3/4 | 1/4 | 3/4 | 13/32 | 1 1/2 | 1.0 |
| NSS24120 | 5.000 | 5.08 | 120 | 2 | 1/2 | 3/4 | 1/4 | 3/4 | 13/32 | 1 1/2 | 1.5 |
| NSS24144 | 6.000 | 6.08 | 144 | 2 | 1/2 | 7/8 | 1/4 | 7/8 | 17/32 | 1 5/8 | 2.3 |

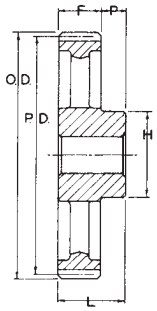
**Note: All of above Gears have One Hollow Head Setscrew in Hub, except type A2 gears which have no hubs and NSS2412 and NSS2414 which have One #35 (.110") Drilled Hole thru one wall of Hub.**



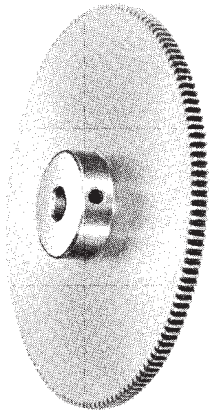
TYPE A2



TYPE 2



TYPE 4



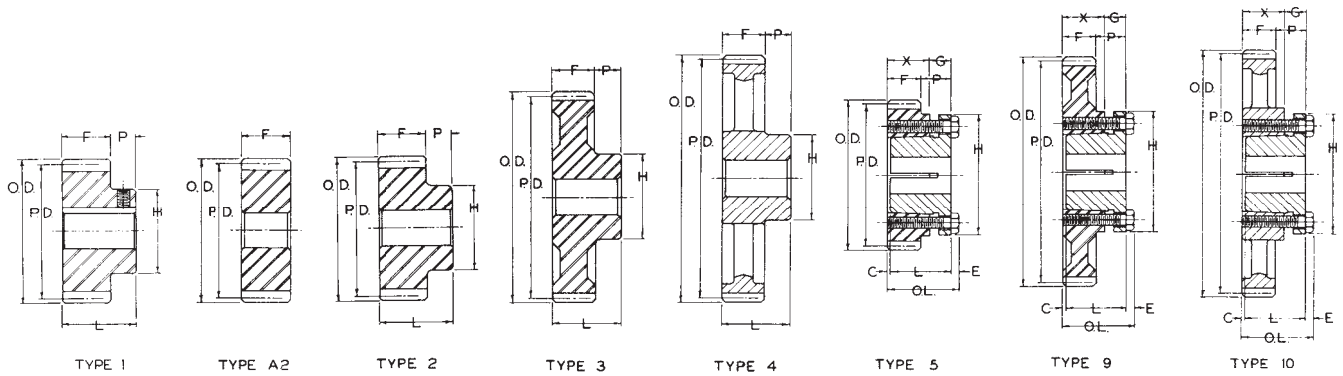
# 20 Pitch 3/8" Face 14 1/2° Pressure Angle

Table No. 1

## Stock Steel Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| **NSS2011*** | .600" | .70" | 11 | 2 | 5/16" | 5/16" | 3/8" | 3/4" | 3/8" | 29/64" | **.06** |
| **NSS2012** | .600 | .70 | 12 | 2 | 5/16 | 5/16 | 3/8 | 3/4 | 3/8 | 29/64 | **.06** |
| **NSS2013** | .650 | .75 | 13 | 2 | 5/16 | 3/8 | 3/8 | 3/4 | 3/8 | 1/2 | **.06** |
| **NSS2014** | .700 | .80 | 14 | 2 | 5/16 | 3/8 | 3/8 | 3/4 | 3/8 | 35/64 | **.06** |
| **NSS2015** | .750 | .85 | 15 | 2 | 3/8 | 3/8 | 3/8 | 3/4 | 3/8 | 19/32 | **.06** |
| **NSS2016** | .800 | .90 | 16 | 2 | 3/8 | 7/16 | 3/8 | 3/4 | 3/8 | 21/32 | **.12** |
| **NSS2017** | .850 | .95 | 17 | 2 | 3/8 | 7/16 | 3/8 | 3/4 | 3/8 | 45/64 | **.12** |
| **NSS2018** | .900 | 1.00 | 18 | 2 | 3/8 | 1/2 | 3/8 | 3/4 | 3/8 | 3/4 | **.12** |
| **NSS2019** | .950 | 1.05 | 19 | 2 | 3/8 | 1/2 | 3/8 | 3/4 | 3/8 | 51/64 | **.12** |
| **NSS2020** | 1.000 | 1.10 | 20 | 2 | 3/8 | 1/2 | 3/8 | 3/4 | 3/8 | 27/32 | **.12** |
| **NSS2021** | 1.050 | 1.15 | 21 | 2 | 3/8 | 1/2 | 3/8 | 3/4 | 3/8 | 7/8 | **.16** |
| **NSS2022** | 1.100 | 1.20 | 22 | 2 | 3/8 | 9/16 | 3/8 | 3/4 | 3/8 | 61/64 | **.19** |
| **NSS2023** | 1.150 | 1.25 | 23 | 2 | 3/8 | 9/16 | 3/8 | 3/4 | 3/8 | 61/64 | **.13** |
| **NSS2024** | 1.200 | 1.30 | 24 | 2 | 3/8 | 9/16 | 3/8 | 3/4 | 3/8 | **1 3/64** | **.13** |
| **NSS2025** | 1.250 | 1.35 | 25 | 2 | 3/8 | 5/8 | 3/8 | 3/4 | 3/8 | **1 3/32** | **.19** |
| **NSS2028** | 1.400 | 1.50 | 28 | 2 | 3/8 | 5/8 | 3/8 | 3/4 | 3/8 | **1 1/4** | **.25** |
| **NSS2030** | 1.500 | 1.60 | 30 | 2 | 3/8 | 3/4 | 3/8 | 3/4 | 3/8 | **1 11/32** | **.31** |
| **NSS2032** | 1.600 | 1.70 | 32 | 2 | 3/8 | 3/4 | 3/8 | 7/8 | 1/2 | **1 7/16** | **.38** |
| **NSS2035** | 1.750 | 1.85 | 35 | 2 | 3/8 | 7/8 | 3/8 | 7/8 | 1/2 | **1 9/16** | **.44** |
| **NSS2036** | 1.800 | 1.90 | 36 | 2 | 3/8 | 7/8 | 3/8 | 7/8 | 1/2 | **1 5/8** | **.5** |
| **NSS2040** | 2.000 | 2.10 | 40 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.56** |
| **NSS2045** | 2.250 | 2.35 | 45 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.63** |
| **NSS2048** | 2.400 | 2.50 | 48 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.81** |
| **NSS2050** | 2.500 | 2.60 | 50 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.88** |
| **NSS2055** | 2.750 | 2.85 | 55 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.94** |
| **NSS2060** | 3.000 | 3.10 | 60 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **.94** |
| **NSS2064** | 3.200 | 3.30 | 64 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.0** |
| **NSS2070** | 3.500 | 3.60 | 70 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.2** |
| **NSS2072** | 3.600 | 3.70 | 72 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.3** |
| **NSS2075** | 3.750 | 3.85 | 75 | 2 | 3/8 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.4** |
| **NSS2080** | 4.000 | 4.10 | 80 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.5** |
| **NSS2084** | 4.200 | 4.30 | 84 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **1.8** |
| **NSS2090** | 4.500 | 4.60 | 90 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **2.0** |
| **NSS2096** | 4.800 | 4.90 | 96 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **2.1** |
| **NSS20100** | 5.000 | 5.10 | 100 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **2.3** |
| **NSS20110** | 5.500 | 5.60 | 110 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **2.8** |
| **NSS20112** | 5.600 | 5.70 | 112 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **2.9** |
| **NSS20120** | 6.000 | 6.10 | 120 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **3.4** |
| **NSS20132** | 6.600 | 6.70 | 132 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **4.0** |
| **NSS20140** | 7.000 | 7.10 | 140 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **4.5** |
| **NSS20144** | 7.200 | 7.30 | 144 | 2 | 1/2 | **1** | 3/8 | 7/8 | 1/2 | **1 13/16** | **4.6** |
| **NSS20150** | 7.500 | 7.60 | 150 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **5.1** |
| **NSS20156** | 7.800 | 7.90 | 156 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **5.5** |
| **NSS20160** | 8.000 | 8.10 | 160 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **5.8** |
| **NSS20168** | 8.400 | 8.50 | 168 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **6.5** |
| **NSS20180** | 9.000 | 9.10 | 180 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **7.3** |
| **NSS20200** | 10.000 | 10.10 | 200 | 2 | 1/2 | **1** | 3/8 | 1 | 5/8 | **1 13/16** | **8.6** |

***Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.**



# 16 Pitch 1/2" Face 14 1/2° Pressure Angle

Table No. 1

## Stock Steel Finished Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Stock Bores marked "X" | | | | | | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | 5/16" | 3/8" | 1/2" | 5/8" | 3/4" | 7/8" | 1" | F | L | P | H | |
| NSS16F12 | .750" | .87" | 12 | 1 | X | — | — | — | — | — | — | 1/2" | 15/16" | 7/16" | 9/16" | .09 |
| NSS16F13 | .813 | .93 | 13 | 1 | — | X | — | — | — | — | — | 1/2 | 15/16 | 7/16 | 5/8 | .09 |
| NSS16F14 | .875 | 1.00 | 14 | 1 | — | X | — | — | — | — | — | 1/2 | 15/16 | 7/16 | 11/16 | .13 |
| NSS16F15 | .938 | 1.06 | 15 | 1 | — | X | X | — | — | — | — | 1/2 | 15/16 | 7/16 | 3/4 | .13 |
| NSS16F16 | 1.000 | 1.12 | 16 | 1 | — | X | X | — | — | — | — | 1/2 | 15/16 | 7/16 | 13/16 | .19 |
| NSS16F18 | 1.125 | 1.25 | 18 | 1 | — | — | X | — | — | — | — | 1/2 | 15/16 | 7/16 | 15/16 | .19 |
| NSS16F20 | 1.250 | 1.37 | 20 | 1 | — | — | X | X | — | — | — | 1/2 | 15/16 | 7/16 | 1 1/16 | .19 |
| NSS16F22 | 1.375 | 1.50 | 22 | 1 | — | — | X | X | — | — | — | 1/2 | 15/16 | 7/16 | 1 3/16 | .25 |
| NSS16F24 | 1.500 | 1.62 | 24 | 1 | — | — | X | X | X | — | — | 1/2 | 15/16 | 7/16 | 1 5/16 | .31 |
| NSS16F26 | 1.625 | 1.75 | 26 | 1 | — | — | X | X | X | — | — | 1/2 | 15/16 | 7/16 | 1 7/16 | .44 |
| NSS16F28 | 1.750 | 1.87 | 28 | 1 | — | — | X | X | X | — | — | 1/2 | 1 | 1/2 | 1 1/2 | .50 |
| NSS16F30 | 1.875 | 2.00 | 30 | 1 | — | — | X | X | X | — | X | 1/2 | 1 | 1/2 | 1 5/8 | .50 |
| NSS16F32 | 2.000 | 2.12 | 32 | 1 | — | — | X | X | X | — | X | 1/2 | 1 | 1/2 | 1 3/4 | .69 |

***Enlarged Pinion Tooth Form — Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.**

**All of above Gears are Steel. Furnished with one Hollow Head Setscrew and Standard Keyseat, except 1/2" bore and smaller which have Setscrew only. For standard Keyseats see Page F-8.**

Table No. 2

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS1611* | .750" | .87" | 11 | 2 | 3/8" | 3/8" | 1/2" | 15/16" | 7/16" | 9/16" | .06 |
| NSS1612 | .750 | .87 | 12 | 2 | 3/8 | 3/8 | 1/2 | 15/16 | 7/16 | 9/16 | .06 |
| NSS1613 | .813 | .93 | 13 | 2 | 3/8 | 3/8 | 1/2 | 15/16 | 7/16 | 5/8 | .06 |
| NSS1614 | .875 | 1.00 | 14 | 2 | 3/8 | 7/16 | 1/2 | 15/16 | 7/16 | 11/16 | .06 |
| NSS1615 | .938 | 1.06 | 15 | 2 | 1/2 | 1/2 | 1/2 | 15/16 | 7/16 | 3/4 | .09 |
| NSS1616 | 1.000 | 1.12 | 16 | 2 | 1/2 | 1/2 | 1/2 | 15/16 | 7/16 | 13/16 | .09 |
| NSS1617 | 1.063 | 1.18 | 17 | 2 | 1/2 | 1/2 | 1/2 | 15/16 | 7/16 | 7/8 | .09 |
| NSS1618 | 1.125 | 1.25 | 18 | 2 | 1/2 | 9/16 | 1/2 | 15/16 | 7/16 | 15/16 | .13 |
| NSS1619 | 1.188 | 1.31 | 19 | 2 | 1/2 | 9/16 | 1/2 | 15/16 | 7/16 | 1 | .13 |
| NSS1620 | 1.250 | 1.37 | 20 | 2 | 1/2 | 5/8 | 1/2 | 15/16 | 7/16 | 1 1/16 | .13 |
| NSS1621 | 1.313 | 1.43 | 21 | 2 | 1/2 | 5/8 | 1/2 | 15/16 | 7/16 | 1 1/8 | .19 |
| NSS1622 | 1.375 | 1.50 | 22 | 2 | 1/2 | 5/8 | 1/2 | 15/16 | 7/16 | 1 3/16 | .19 |
| NSS1623 | 1.438 | 1.56 | 23 | 2 | 1/2 | 11/16 | 1/2 | 15/16 | 7/16 | 1 1/4 | .25 |
| NSS1624 | 1.500 | 1.62 | 24 | 2 | 1/2 | 3/4 | 1/2 | 15/16 | 7/16 | 1 5/16 | .31 |
| NSS1626 | 1.625 | 1.75 | 26 | 2 | 1/2 | 3/4 | 1/2 | 15/16 | 7/16 | 1 7/16 | .31 |
| NSS1628 | 1.750 | 1.87 | 28 | 2 | 1/2 | 7/8 | 1/2 | 1 | 1/2 | 1 1/2 | .50 |
| NSS1630 | 1.875 | 2.00 | 30 | 2 | 1/2 | 1 | 1/2 | 1 | 1/2 | 1 5/8 | .56 |
| NSS1632 | 2.000 | 2.12 | 32 | 2 | 1/2 | 1 | 1/2 | 1 | 1/2 | 1 3/4 | .63 |
| NSS1634 | 2.125 | 2.25 | 34 | 2 | 1/2 | 1 1/8 | 1/2 | 1 | 1/2 | 1 7/8 | .75 |
| NSS1636 | 2.250 | 2.37 | 36 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | .81 |
| NSS1638 | 2.375 | 2.50 | 38 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | .94 |
| NSS1640 | 2.500 | 2.62 | 40 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.0 |
| NSS1644 | 2.750 | 2.87 | 44 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.1 |
| NSS1648 | 3.000 | 3.12 | 48 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.3 |
| NSS1652 | 3.250 | 3.37 | 52 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.5 |
| NSS1654 | 3.375 | 3.50 | 54 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.6 |
| NSS1656 | 3.500 | 3.62 | 56 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 | 1.7 |
| NSS1660 | 3.750 | 3.87 | 60 | 2 | 1/2 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 1.8 |
| NSS1664 | 4.000 | 4.12 | 64 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 1.8 |
| NSS1668 | 4.250 | 4.37 | 68 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.2 |
| NSS1672 | 4.500 | 4.62 | 72 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.3 |
| NSS1680 | 5.000 | 5.12 | 80 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.6 |
| NSS1684 | 5.250 | 5.37 | 84 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 3.1 |
| NSS1688 | 5.500 | 5.62 | 88 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.3 |
| NCS1696 | 6.000 | 6.12 | 96 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.3 |
| NCS16104 | 6.500 | 6.62 | 104 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.9 |
| NCS16112 | 7.000 | 7.12 | 112 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.8 |
| NCS16120 | 7.500 | 7.62 | 120 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 3.0 |
| NCS16128 | 8.000 | 8.12 | 128 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 3.4 |
| NCS16136 | 8.500 | 8.62 | 136 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 4.1 |
| NCS16144 | 9.000 | 9.12 | 144 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/4 | 3/4 | 2 | 8.5 |
| NCS16160 | 10.000 | 10.12 | 160 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/4 | 3/4 | 2 | 4.5 |
| NCS16192 | 12.000 | 12.12 | 192 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/4 | 3/4 | 2 | 5.4 |

***Enlarged Pinion Tooth Form — Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.**

**All 88 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F

# 12 Pitch 3/4" Face 14 1/2° Pressure Angle

Table No. 1

## Stock Steel Finished Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Stock Bores Marked "X" | | | | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | 1/2" | 5/8" | 3/4" | 7/8" | 1" | F | L | P | H | |
| NSS12F11* | 1.000" | 1.16" | 11 | 1 | X | — | — | — | — | 3/4" | 1 1/4" | 1/2" | 3/4" | .1 |
| NSS12F12 | 1.000 | 1.16 | 12 | 1 | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 3/4 | .1 |
| NSS12F13 | 1.083 | 1.25 | 13 | 1 | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 13/16 | .2 |
| NSS12F14 | 1.167 | 1.33 | 14 | 1 | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 29/32 | .2 |
| NSS12F15 | 1.250 | 1.41 | 15 | 1 | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 1 | .3 |
| NSS12F16 | 1.333 | 1.50 | 16 | 1 | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 1 1/16 | .3 |
| NSS12F18 | 1.500 | 1.66 | 18 | 1 | — | X | — | — | — | 3/4 | 1 1/4 | 1/2 | 1 1/4 | .4 |
| NSS12F20 | 1.667 | 1.83 | 20 | 1 | — | X | X | — | — | 3/4 | 1 1/4 | 1/2 | 1 13/32 | .5 |
| NSS12F21 | 1.750 | 1.91 | 21 | 1 | — | X | X | X | — | 3/4 | 1 1/4 | 1/2 | 1 1/2 | .6 |
| NSS12F22 | 1.833 | 2.00 | 22 | 1 | — | X | X | X | X | 3/4 | 1 1/4 | 1/2 | 1 9/16 | .6 |
| NSS12F24 | 2.000 | 2.16 | 24 | 1 | — | X | X | X | X | 3/4 | 1 1/4 | 1/2 | 1 3/4 | .8 |

***Enlarged Pinion Tooth Form — Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.**
**All of above Gears are Steel. Furnished with one Hollow Head Setscrew and Standard Keyseat, except 1/2" bore and smaller which have Setscrew only.**
**For standard Keyseats see Page F-8.**

Table No. 2

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS1211* | 1.000" | 1.16" | 11 | 2 | 1/2" | 1/2" | 3/4" | 1 1/4" | 1/2" | 3/4" | .1 |
| NSS1212 | 1.000 | 1.16 | 12 | 2 | 1/2 | 1/2 | 3/4 | 1 1/4 | 1/2 | 3/4 | .1 |
| NSS1213 | 1.083 | 1.25 | 13 | 2 | 1/2 | 1/2 | 3/4 | 1 1/4 | 1/2 | 13/16 | .1 |
| NSS1214 | 1.167 | 1.33 | 14 | 2 | 1/2 | 1/2 | 3/4 | 1 1/4 | 1/2 | 29/32 | .1 |
| NSS1215 | 1.250 | 1.41 | 15 | 2 | 5/8 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 | .2 |
| NSS1216 | 1.333 | 1.50 | 16 | 2 | 5/8 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 1/16 | .3 |
| NSS1217 | 1.417 | 1.58 | 17 | 2 | 5/8 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 1/8 | .3 |
| NSS1218 | 1.500 | 1.66 | 18 | 2 | 5/8 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 1/4 | .4 |
| NSS1219 | 1.583 | 1.75 | 19 | 2 | 5/8 | 11/16 | 3/4 | 1 1/4 | 1/2 | 1 5/16 | .4 |
| NSS1220 | 1.667 | 1.83 | 20 | 2 | 5/8 | 3/4 | 3/4 | 1 1/4 | 1/2 | 1 13/32 | .5 |
| NSS1221 | 1.750 | 1.91 | 21 | 2 | 5/8 | 7/8 | 3/4 | 1 1/4 | 1/2 | 1 1/2 | .5 |
| NSS1222 | 1.833 | 2.00 | 22 | 2 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 9/16 | .6 |
| NSS1223 | 1.917 | 2.08 | 23 | 2 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 5/8 | .8 |
| NSS1224 | 2.000 | 2.16 | 24 | 2 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 3/4 | .8 |
| NSS1225 | 2.083 | 2.25 | 25 | 2 | 5/8 | 1 1/16 | 3/4 | 1 1/4 | 1/2 | 1 27/32 | .9 |
| NSS1226 | 2.167 | 2.33 | 26 | 2 | 5/8 | 1 1/8 | 3/4 | 1 3/8 | 5/8 | 1 15/16 | 1.0 |
| NSS1228 | 2.333 | 2.50 | 28 | 2 | 5/8 | 1 3/16 | 3/4 | 1 3/8 | 5/8 | 2 1/16 | 1.4 |
| NSS1230 | 2.500 | 2.66 | 30 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 1.5 |
| NSS1232 | 2.667 | 2.83 | 32 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 1.9 |
| NSS1234 | 2.833 | 3.00 | 34 | 2 | 5/8 | 1 1/2 | 3/4 | 1 3/8 | 5/8 | 2 3/8 | 2.1 |
| NSS1236 | 3.000 | 3.16 | 36 | 2 | 5/8 | 1 5/8 | 3/4 | 1 3/8 | 5/8 | 2 1/2 | 2.4 |
| NSS1238 | 3.167 | 3.33 | 38 | 2 | 5/8 | 1 5/8 | 3/4 | 1 3/8 | 5/8 | 2 1/2 | 2.4 |
| NSS1240 | 3.333 | 3.50 | 40 | 2 | 5/8 | 1 5/8 | 3/4 | 1 3/8 | 5/8 | 2 1/2 | 2.6 |
| NSS1242 | 3.500 | 3.66 | 42 | 2 | 5/8 | 1 5/8 | 3/4 | 1 3/8 | 5/8 | 2 1/2 | 2.6 |
| NSS1244 | 3.667 | 3.83 | 44 | 2 | 5/8 | 1 5/8 | 3/4 | 1 3/8 | 5/8 | 2 1/2 | 2.8 |
| NSS1248 | 4.000 | 4.16 | 48 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.4 |
| NSS1254 | 4.500 | 4.66 | 54 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.1 |
| NSS1256 | 4.667 | 4.83 | 56 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.4 |
| NSS1260 | 5.000 | 5.16 | 60 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.1 |
| NCS1264 | 5.333 | 5.50 | 64 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.8 |
| NCS1266 | 5.500 | 5.66 | 66 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.8 |
| NCS1272 | 6.000 | 6.16 | 72 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.8 |
| NCS1278 | 6.500 | 6.66 | 78 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.6 |
| NCS1284 | 7.000 | 7.16 | 84 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.2 |
| NCS1290 | 7.500 | 7.66 | 90 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.1 |
| NCS1296 | 8.000 | 8.16 | 96 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.8 |
| NCS12102 | 8.500 | 8.66 | 102 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.9 |
| NCS12108 | 9.000 | 9.16 | 108 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.4 |
| NCS12112 | 9.333 | 9.50 | 112 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.8 |
| NCS12120 | 10.000 | 10.16 | 120 | 4 | 7/8 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.8 |
| NCS12132 | 11.000 | 11.16 | 132 | 4 | 7/8 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 8.9 |
| NCS12144 | 12.000 | 12.16 | 144 | 4 | 7/8 | 1 1/2 | 3/4 | 1 3/4 | 1 | 2 1/2 | 8.4 |
| NCS12156 | 13.000 | 13.16 | 156 | 4 | 7/8 | 1 1/2 | 3/4 | 1 3/4 | 1 | 2 1/2 | 10.5 |
| NCS12168 | 14.000 | 14.16 | 168 | 4 | 7/8 | 1 1/2 | 3/4 | 1 3/4 | 1 | 2 1/2 | 10.3 |
| NCS12180 | 15.000 | 15.16 | 180 | 4 | 7/8 | 1 1/2 | 3/4 | 1 3/4 | 1 | 2 1/2 | 13.8 |

***Enlarged Pinion Tooth Form — Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.**
**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F

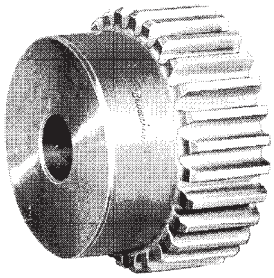
# 12 Pitch — 3/4" Face — 14 1/2° Pressure Angle

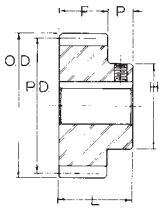
Table No. 1

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

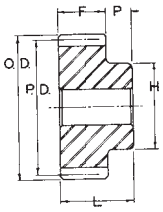
| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS12G30 | G | 2.500" | 2.66" | 30 | 6 | 3/4" | 1 3/8" | 1" | 7/16" | 3/16" | 2" | — | — | 3/16" | .8 |
| NSS12H36 | H | 3.000 | 3.16 | 36 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16" | 7/8" | 3/16 | 1.1 |
| NSS12H42 | H | 3.500 | 3.66 | 42 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 1.5 |
| NSS12H48 | H | 4.000 | 4.16 | 48 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 2.3 |
| NSS12H54 | H | 4.500 | 4.66 | 54 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.0 |
| NSS12H60 | H | 5.000 | 5.16 | 60 | 9 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 2.9 |
| NCS12H72 | H | 6.000 | 6.16 | 72 | 10 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 2.9 |
| NCS12H84 | H | 7.000 | 7.16 | 84 | 10 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.5 |
| NCS12H120 | H | 10.000 | 10.16 | 120 | 10 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 5.2 |
| NCS12P144 | P1 | 12.000 | 12.16 | 144 | 16 | 3/4 | 2 3/16 | 1 15/16 | 1 3/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 8.3 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

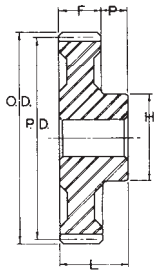




TYPE 1



TYPE 2



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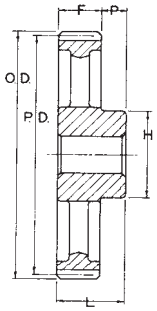

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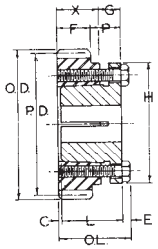

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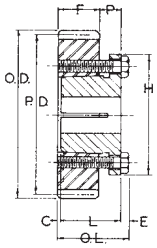

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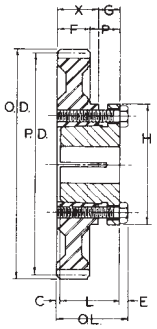

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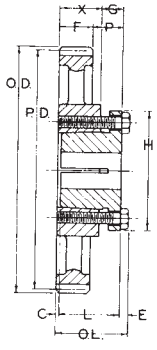
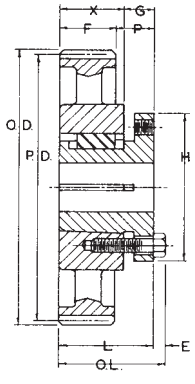


TYPE 10



TYPE 16

## Bore Range

Table No. 2

| Bushing | Bore Range |
|---|---|
| G | 3/8" — 1" |
| H | 3/8 — 1 1/2 |
| P1 | 1/2 — 1 3/4 |

## Standard Keyseats

Table No. 3

| Bore Range | Keyseat |
|---|---|
| 3/8" — 7/16" | None |
| 1/2 — 9/16 | 1/8" x 1/16" |
| 5/8 — 7/8 | 3/16 x 3/32 |
| 15/16 — 1 1/4 | 1/4 x 1/8 |
| 1 15/16 — 1 3/8 | 5/16 x 5/32 |
| 1 7/16 — 1 3/4 | 3/8 x 3/16 |
| 1 13/16 — 2 1/4 | 1/2 x 1/4 |
| 2 5/16 — 2 11/16 | 5/8 x 5/16 |

**1 3/8 Bore Bushings also available with "3/8" x 3/16" Keyseat.**

F

## 10 Pitch  1" Face  14 1/2° Pressure Angle

Table No. 1

### Stock Steel Finished Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Stock Bores Marked "X" | | | | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | 1/2" | 5/8" | 3/4" | 7/8" | 1" | F | L | P | H | |
| NSS10F12 | 1.200" | 1.40" | 12 | 1 | X | — | — | — | — | 1" | 1 5/8" | 5/8" | 29/32" | .3 |
| NSS10F14 | 1.400 | 1.60 | 14 | 1 | — | X | — | — | — | 1 | 1 5/8 | 5/8 | 1 7/64 | .4 |
| NSS10F15 | 1.500 | 1.70 | 15 | 1 | — | X | — | — | — | 1 | 1 5/8 | 5/8 | 1 7/32 | .4 |
| NSS10F16 | 1.600 | 1.80 | 16 | 1 | — | X | X | — | — | 1 | 1 5/8 | 5/8 | 1 5/16 | .6 |
| NSS10F18 | 1.800 | 2.00 | 18 | 1 | — | — | X | X | — | 1 | 1 5/8 | 5/8 | 1 33/64 | .7 |
| NSS10F20 | 2.000 | 2.20 | 20 | 1 | — | — | X | X | X | 1 | 1 5/8 | 5/8 | 1 23/32 | .9 |
| NSS10F24 | 2.400 | 2.60 | 24 | 1 | — | — | X | X | X | 1 | 1 5/8 | 5/8 | 2 7/64 | 1.6 |

**All of above Gears are Steel. Furnished with one Hollow Head Setscrew and Standard Keyseat, except 1/2" bore which has Setscrew only.**

Table No. 2

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS1011* | 1.200" | 1.40" | 11 | 2 | 5/8" | 5/8" | 1" | 1 5/8" | 5/8" | 29/32" | .3 |
| NSS1012 | 1.200 | 1.40 | 12 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 29/32 | .3 |
| NSS1013 | 1.300 | 1.50 | 13 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 1 | .3 |
| NSS1014 | 1.400 | 1.60 | 14 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 1 7/64 | .4 |
| NSS1015 | 1.500 | 1.70 | 15 | 2 | 3/4 | 3/4 | 1 | 1 5/8 | 5/8 | 1 13/64 | .4 |
| NSS1016 | 1.600 | 1.80 | 16 | 2 | 3/4 | 3/4 | 1 | 1 5/8 | 5/8 | 1 5/16 | .4 |
| NSS1017 | 1.700 | 1.90 | 17 | 2 | 3/4 | 3/4 | 1 | 1 5/8 | 5/8 | 1 3/8 | .6 |
| NSS1018 | 1.800 | 2.00 | 18 | 2 | 3/4 | 7/8 | 1 | 1 5/8 | 5/8 | 1 33/64 | .7 |
| NSS1019 | 1.900 | 2.10 | 19 | 2 | 3/4 | 7/8 | 1 | 1 5/8 | 5/8 | 1 9/16 | .9 |
| NSS1020 | 2.000 | 2.20 | 20 | 2 | 3/4 | 1 | 1 | 1 5/8 | 5/8 | 1 45/64 | 1.0 |
| NSS1021 | 2.100 | 2.30 | 21 | 2 | 3/4 | 1 | 1 | 1 5/8 | 5/8 | 1 3/4 | 1.1 |
| NSS1022 | 2.200 | 2.40 | 22 | 2 | 3/4 | 1 1/8 | 1 | 1 5/8 | 5/8 | 1 7/8 | 1.3 |
| NSS1024 | 2.400 | 2.60 | 24 | 2 | 3/4 | 1 1/4 | 1 | 1 5/8 | 5/8 | 2 7/64 | 1.5 |
| NSS1025 | 2.500 | 2.70 | 25 | 2 | 3/4 | 1 3/8 | 1 | 1 5/8 | 5/8 | 2 13/64 | 1.8 |
| NSS1026 | 2.600 | 2.80 | 26 | 2 | 3/4 | 1 7/16 | 1 | 1 5/8 | 5/8 | 2 5/16 | 1.9 |
| NSS1028 | 2.800 | 3.00 | 28 | 2 | 3/4 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 2.6 |
| NSS1030 | 3.000 | 3.20 | 30 | 2 | 3/4 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 3.0 |
| NSS1032 | 3.200 | 3.40 | 32 | 2 | 3/4 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 3.3 |
| NSS1035 | 3.500 | 3.70 | 35 | 2 | 3/4 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 3.8 |
| NSS1036 | 3.600 | 3.80 | 36 | 2 | 3/4 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 3.8 |
| NSS1038 | 3.800 | 4.00 | 38 | 2 | 3/4 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 4.3 |
| NSS1040 | 4.000 | 4.20 | 40 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 4.5 |
| NSS1042 | 4.200 | 4.40 | 42 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 4.9 |
| NSS1045 | 4.500 | 4.70 | 45 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.6 |
| NSS1048 | 4.800 | 5.00 | 48 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.7 |
| NSS1050 | 5.000 | 5.20 | 50 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.3 |
| NSS1054 | 5.400 | 5.60 | 54 | 2 | 7/8 | 1 3/4 | 1 | 1 7/8 | 7/8 | 2 5/8 | 8.0 |
| NCS1055 | 5.500 | 5.70 | 55 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 4.7 |
| NCS1060 | 6.000 | 6.20 | 60 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.0 |
| NCS1064 | 6.400 | 6.60 | 64 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.4 |
| NCS1065 | 6.500 | 6.70 | 65 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.5 |
| NCS1070 | 7.000 | 7.20 | 70 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.9 |
| NCS1072 | 7.200 | 7.40 | 72 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.5 |
| NCS1075 | 7.500 | 7.70 | 75 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.3 |
| NCS1080 | 8.000 | 8.20 | 80 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.6 |
| NCS1084 | 8.400 | 8.60 | 84 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.8 |
| NCS1090 | 9.000 | 9.20 | 90 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 7.3 |
| NCS1096 | 9.600 | 9.80 | 96 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 8.4 |
| NCS10100 | 10.000 | 10.20 | 100 | 4 | 1 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 8.0 |
| NCS10110 | 11.000 | 11.20 | 110 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 10.8 |
| NCS10112 | 11.200 | 11.40 | 112 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 10.8 |
| NCS10120 | 12.000 | 12.20 | 120 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 11.8 |
| NCS10140 | 14.000 | 14.20 | 140 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 15.4 |
| NCS10144 | 14.400 | 14.60 | 144 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 15.1 |
| NCS10160 | 16.000 | 16.20 | 160 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 17.7 |
| NCS10180 | 18.000 | 18.20 | 180 | 4 | 1 | 1 5/8 | 1 | 2 | 1 | 2 3/4 | 19.6 |

*** Enlarged Pinion Tooth Form — Pitch Diameter is Special. Use for calculating Center Distance but not for Ratio.**
**All 54 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F

# 10 Pitch — 1" Face — 14 1/2° Pressure Angle

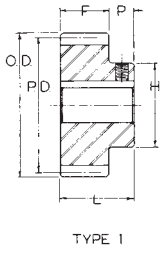
Table No. 1

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

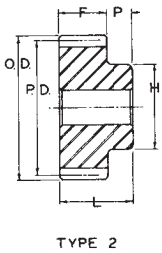
| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS10G25 | G | 2.500" | 2.70" | 25 | 6 | 1" | 1 5/8" | 1" | 7/16" | 7/16" | 2" | — | — | 3/16" | .9 |
| NSS10H30 | H | 3.000 | 3.20 | 30 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 1.3 |
| NSS10H32 | H | 3.200 | 3.40 | 32 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 1.6 |
| NSS10H35 | H | 3.500 | 3.70 | 35 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 2.0 |
| NSS10H36 | H | 3.600 | 3.80 | 36 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 2.3 |
| NSS10H40 | H | 4.000 | 4.20 | 40 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 2.9 |
| NSS10H45 | H | 4.500 | 4.70 | 45 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 3.8 |
| NSS10H48 | H | 4.800 | 5.00 | 48 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | 7/16" | 1" | 3/16 | 4.8 |
| NSS10H50 | H | 5.000 | 5.20 | 50 | 7 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | 7/16 | 1 | 3/16 | 3.4 |
| NSS10H54 | H | 5.400 | 5.60 | 54 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | 7/16 | 1 | 3/16 | 6.3 |
| NCS10H55 | H | 5.500 | 5.70 | 55 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.0 |
| NCS10H60 | H | 6.000 | 6.20 | 60 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.8 |
| NCS10H64 | H | 6.400 | 6.60 | 64 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.4 |
| NCS10H70 | H | 7.000 | 7.20 | 70 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 4.3 |
| NCS10H72 | H | 7.200 | 7.40 | 72 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 4.8 |
| NCS10H80 | H | 8.000 | 8.20 | 80 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 5.0 |
| NCS10H90 | H | 9.000 | 9.20 | 90 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 5.8 |
| NCS10H96 | H | 9.600 | 9.80 | 96 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 6.4 |
| NCS10H100 | H | 10.000 | 10.20 | 100 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 6.4 |
| NCS10P120 | P1 | 12.000 | 12.20 | 120 | 16 | 1 | 2 3/16 | 1 15/16 | 15/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.2 |
| NCS10P140 | P1 | 14.000 | 14.20 | 140 | 16 | 1 | 2 3/16 | 1 15/16 | 15/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 13.0 |
| NCS10P180 | P1 | 18.000 | 18.20 | 180 | 16 | 1 | 2 3/16 | 1 15/16 | 15/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 19.9 |
| NCS10P200 | P1 | 20.000 | 20.20 | 200 | 16 | 1 | 2 3/16 | 1 15/16 | 15/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 22.3 |

**All 54 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F



TYPE 1



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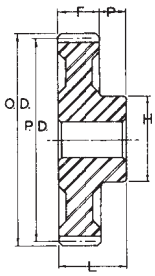
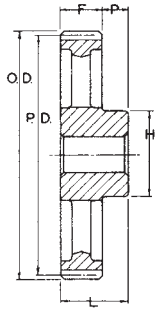
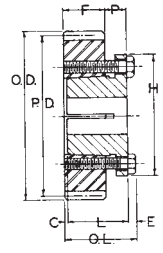


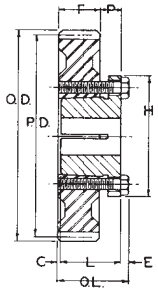
TYPE 3



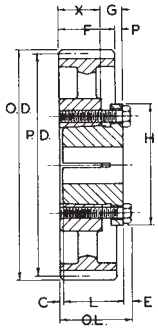
TYPE 4



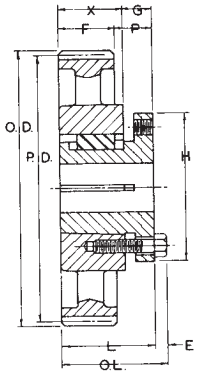
TYPE 6



TYPE 7



TYPE 8



TYPE 16

**Browning® Gears with a greater depth of cut and larger radius at bottom of tooth have stronger teeth — a deeper lubrication reservoir and more clearance for dirt removal**

### Bore Range

Table No. 2

| Bushing | Bore Range |
|---|---|
| G | 3/8" — 1" |
| H | 3/8 — 1 1/2 |
| P1 | 1/2 — 1 3/4 |

### Standard Keyseats

Table No. 3

| Bore Range | Keyseat |
|---|---|
| 3/8" — 7/16" | None |
| 1/2 — 9/16 | 1/8" X 1/16" |
| 5/8 — 7/8 | 3/16 X 3/32 |
| 15/16 — 1 1/4 | 1/4 X 1/8 |
| 1 5/16 — 1 3/8 | 5/16 X 5/32 |
| 1 7/16 — 1 3/4 | 3/8 X 3/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Keyseat.**

## 8 Pitch — 1 1/4" Face — 14 1/2° Pressure Angle

Table No. 1

### Stock Steel Finished Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Stock Bores Marked "X" | | | | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | 5/8" | 3/4" | 7/8" | 1" | 1 1/8" | F | L | P | H | |
| NSS8F12 | 1.500" | 1.75" | 12 | 1 | x | — | — | — | — | 1 1/4" | 2" | 3/4" | 1 1/8" | .5 |
| NSS8F14 | 1.750 | 2.00 | 14 | 1 | — | x | — | — | — | 1 1/4 | 2 | 3/4 | 1 3/8 | .8 |
| NSS8F15 | 1.875 | 2.12 | 15 | 1 | — | x | — | — | — | 1 1/4 | 2 | 3/4 | 1 1/2 | 1.0 |
| NSS8F16 | 2.000 | 2.25 | 16 | 1 | — | x | x | x | — | 1 1/4 | 2 | 3/4 | 1 5/8 | 1.2 |
| NSS8F18 | 2.250 | 2.50 | 18 | 1 | — | x | x | x | x | 1 1/4 | 2 | 3/4 | 1 7/8 | 1.6 |
| NSS8F20 | 2.500 | 2.75 | 20 | 1 | — | x | x | x | x | 1 1/4 | 2 | 3/4 | 2 1/8 | 2.2 |
| NSS8F22 | 2.750 | 3.00 | 22 | 1 | — | x | x | x | x | 1 1/4 | 2 | 3/4 | 2 3/8 | 2.6 |

**All Above Gears are Steel. Furnished with one Hollow Head Setscrew and Standard Keyseat.**

Table No. 2

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. of Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS811* | 1.500" | 1.75" | 11 | 2 | 3/4" | 3/4" | 1 1/4 " | 2" | 3/4" | 1 1/8" | .5 |
| NSS812 | 1.500 | 1.75 | 12 | 2 | 3/4 | 3/4 | 1 1/4 | 2 | 3/4 | 1 1/8 | .5 |
| NSS813 | 1.625 | 1.87 | 13 | 2 | 3/4 | 3/4 | 1 1/4 | 2 | 3/4 | 1 1/4 | .8 |
| NSS814 | 1.750 | 2.00 | 14 | 2 | 3/4 | 3/4 | 1 1/4 | 2 | 3/4 | 1 3/8 | 1.0 |
| NSS815 | 1.875 | 2.12 | 15 | 2 | 7/8 | 1 | 1 1/4 | 2 | 3/4 | 1 1/2 | .8 |
| NSS816 | 2.000 | 2.25 | 16 | 2 | 7/8 | 1 | 1 1/4 | 2 | 3/4 | 1 5/8 | 1.0 |
| NSS817 | 2.125 | 2.37 | 17 | 2 | 7/8 | 1 | 1 1/4 | 2 | 3/4 | 1 3/4 | 1.2 |
| NSS818 | 2.250 | 2.50 | 18 | 2 | 7/8 | 1 1/8 | 1 1/4 | 2 | 3/4 | 1 7/8 | 1.4 |
| NSS819 | 2.375 | 2.62 | 19 | 2 | 7/8 | 1 1/4 | 1 1/4 | 2 | 3/4 | 2 | 1.8 |
| NSS820 | 2.500 | 2.75 | 20 | 2 | 7/8 | 1 1/4 | 1 1/4 | 2 | 3/4 | 2 1/8 | 1.9 |
| NSS821 | 2.625 | 2.87 | 21 | 2 | 7/8 | 1 3/8 | 1 1/4 | 2 | 3/4 | 2 1/4 | 2.4 |
| NSS822 | 2.750 | 3.00 | 22 | 2 | 7/8 | 1 1/2 | 1 1/4 | 2 | 3/4 | 2 3/8 | 2.6 |
| NSS824 | 3.000 | 3.25 | 24 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 3.5 |
| NSS826 | 3.250 | 3.50 | 26 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 4.0 |
| NSS828 | 3.500 | 3.75 | 28 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 4.4 |
| NSS830 | 3.750 | 4.00 | 30 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 3/4 | 5.1 |
| NSS832 | 4.000 | 4.25 | 32 | 2 | 1 | 1 7/8 | 1 1/4 | 2 1/4 | 1 | 2 7/8 | 5.7 |
| NSS836 | 4.500 | 4.75 | 36 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 7.0 |
| NSS840 | 5.000 | 5.25 | 40 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 8.7 |
| NSS842 | 5.250 | 5.50 | 42 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 9.8 |
| NSS844 | 5.500 | 5.75 | 44 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 10.3 |
| NSS848 | 6.000 | 6.25 | 48 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 11.9 |
| NSS852 | 6.500 | 6.75 | 52 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 13.9 |
| NSS854 | 6.750 | 7.00 | 54 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 15.1 |
| NCS856 | 7.000 | 7.25 | 56 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 8.5 |
| NCS860 | 7.500 | 7.75 | 60 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 9.3 |
| NCS864 | 8.000 | 8.25 | 64 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 9.7 |
| NCS872 | 9.000 | 9.25 | 72 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 11.1 |
| NCS876 | 9.500 | 9.75 | 76 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 11.5 |
| NCS880 | 10.000 | 10.25 | 80 | 4 | 1 1/8 | 1 13/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 | 12.6 |
| NCS884 | 10.500 | 10.75 | 84 | 4 | 1 1/8 | 1 13/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 | 13.3 |
| NCS888 | 11.000 | 11.25 | 88 | 4 | 1 1/8 | 1 13/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 | 14.2 |
| NCS896 | 12.000 | 12.25 | 96 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 16.1 |
| NCS8100 | 12.500 | 12.75 | 100 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 16.9 |
| NCS8112 | 14.000 | 14.25 | 112 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 19.4 |
| NCS8120 | 15.000 | 15.25 | 120 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 21.5 |
| NCS8128 | 16.000 | 16.25 | 128 | 4 | 1 1/8 | 2 3/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/2 | 26.6 |
| NCS8144 | 18.000 | 18.25 | 144 | 4 | 1 1/8 | 2 3/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/2 | 28.6 |
| NCS8160 | 20.000 | 20.25 | 160 | 4 | 1 1/8 | 2 1/4 | 1 1/4 | 2 1/2 | 1 1/4 | 3 3/4 | 36.6 |

***Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use for calculating Center Distance but not for Ratio.**
**All 54 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

**BROWNING® Stock Gears**

**BROWNING Split Taper® Bushings**

# 8 Pitch — 1 1/4" Face — 14 1/2° Pressure Angle

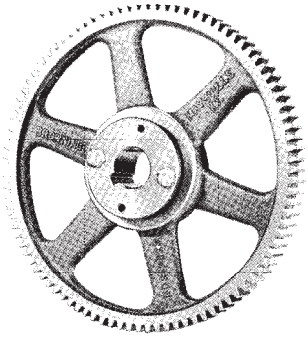
Table No. 1

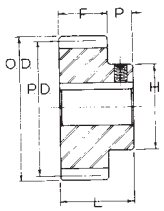
## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS8H24 | H | 3.000" | 3.25" | 24 | 6 | 1 1/4" | 1 7/8" | 1 1/4" | 7/16" | 7/16" | 2 1/2" | — | — | 3/16" | 1.1 |
| NSS8H28 | H | 3.500 | 3.75 | 28 | 6 | 1 1/4 | 1 7/8 | 1 1/4 | 7/16 | 7/16 | 2 1/2 | — | — | 3/16 | 2.6 |
| NSS8H30 | H | 3.750 | 4.00 | 30 | 6 | 1 1/4 | 1 7/8 | 1 1/4 | 7/16 | 7/16 | 2 1/2 | — | — | 3/16 | 3.0 |
| NSS8H32 | H | 4.000 | 4.25 | 32 | 6 | 1 1/4 | 1 7/8 | 1 1/4 | 7/16 | 7/16 | 2 1/2 | — | — | 3/16 | 3.6 |
| NSS8P36 | P1 | 4.500 | 4.75 | 36 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8" | 1 5/16" | 1/4 | 4.5 |
| NSS8P40 | P1 | 5.000 | 5.25 | 40 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 5.8 |
| NSS8P42 | P1 | 5.250 | 5.50 | 42 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.9 |
| NSS8P44 | P1 | 5.500 | 5.75 | 44 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 7.7 |
| NSS8P48 | P1 | 6.000 | 6.25 | 48 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.2 |
| NSS8P54 | P1 | 6.750 | 7.00 | 54 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 12.1 |
| NSS8P56 | P1 | 7.000 | 7.25 | 56 | 15 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.6 |
| NSS8P60 | P1 | 7.500 | 7.75 | 60 | 15 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 7.4 |
| NCS8P64 | P1 | 8.000 | 8.25 | 64 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 7.7 |
| NCS8P72 | P1 | 9.000 | 9.25 | 72 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.1 |
| NCS8P80 | P1 | 10.000 | 10.25 | 80 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.6 |
| NCS8P84 | P1 | 10.500 | 10.75 | 84 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.9 |
| NCS8P88 | P1 | 11.000 | 11.25 | 88 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 11.9 |
| NCS8P96 | P1 | 12.000 | 12.25 | 96 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 13.4 |
| NCS8P112 | P1 | 14.000 | 14.25 | 112 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 16.9 |
| NCS8P120 | P1 | 15.000 | 15.25 | 120 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 18.5 |
| NCS8P128 | P1 | 16.000 | 16.25 | 128 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 21.8 |
| NCS8P144 | P1 | 18.000 | 18.25 | 144 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 26.3 |
| NCS8Q160 | Q1 | 20.000 | 20.25 | 160 | 16 | 1 1/4 | 2 25/32 | 2 1/2 | 1 1/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 32.2 |

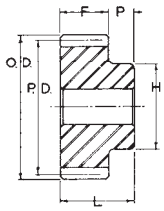
**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**







TYPE 1



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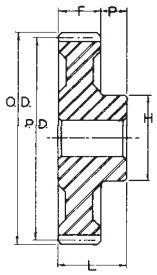
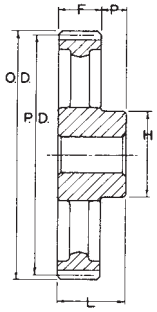
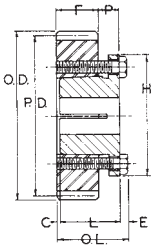


TYPE 3

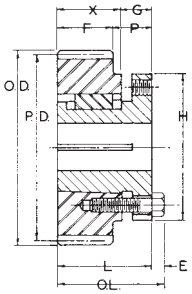


TYPE 4

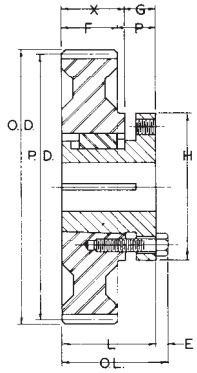
**Browning has All Three**
**Minimum Bore Gears — Large Hubs for Reboring**
**Finished Bore Gears — All Steel** } **Off the Shelf**
**Bushing type — Split Taper Bushings** } **Ready to use**



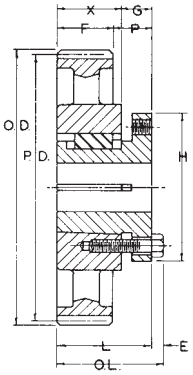
TYPE 6



TYPE 14



TYPE 15



TYPE 16

## Bore Range

Table No .2

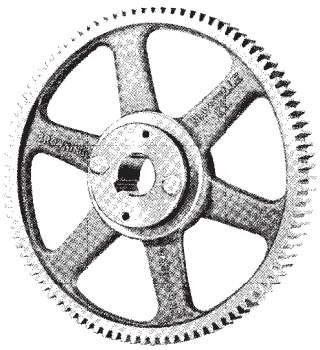
| Bushing | Bore Range |
|---|---|
| H | 3/8" to 1 1/2" |
| P1 | 1/2 to 1 3/4 |
| Q1 | 3/4 to 2 11/16 |

## Standard Keyseats

Table No. 3

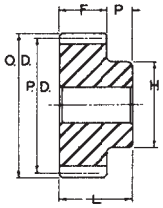
| Bore Range | Keyseat |
|---|---|
| 3/8" — 7/16" | None |
| 1/2 — 9/16 | 1/8" x 1/16" |
| 5/8 — 7/8 | 3/16 x 3/32 |
| 15/16 — 1 1/4 | 1/4 x 1/8 |
| 1 5/16 — 1 3/8 | 5/16 x 5/32 |
| 1 7/16 — 1 3/4 | 3/8 x 3/16 |
| 1 13/16 — 2 1/4 | 1/2 x 1/4 |
| 2 5/16 — 2 11/16 | 5/8 x 5/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Keyseat.**

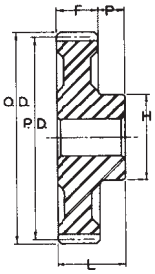


## BROWNING® Stock Gears

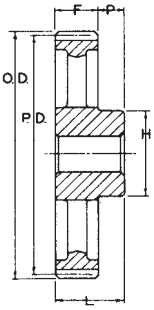
## BROWNING Split Taper® Bushings




TYPE 2




TYPE 3




TYPE 4

**Browning Gears are all**
**Individually Packaged**
**Easy to Stock**
**Easy to Identify**

### Bore Range

Table No. 1

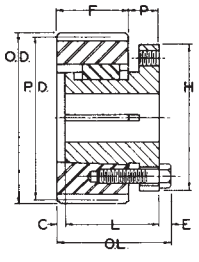
| Bushing | Bore Range |
|---|---|
| P1 | 1/2" — 1 3/4" |
| Q1 | 3/4 — 2 11/16 |

### Standard Keyseats

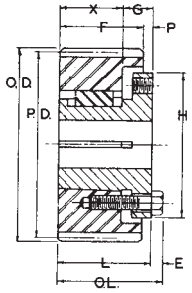
Table No. 2

| Bore Range | Keyseat |
|---|---|
| 3/8" — 7/16" | None |
| 1/2 — 9/16 | 1/8" x 1/16" |
| 5/8 — 7/8 | 3/16 x 3/32 |
| 15/16 — 1 1/4 | 1/4 x 1/8 |
| 1 5/16 — 1 3/8 | 5/16 x 5/32 |
| 1 7/16 — 1 3/4 | 3/8 x 3/16 |
| 1 13/16 — 2 1/4 | 1/2 x 1/4 |
| 2 5/16 — 2 3/4 | 5/8 x 5/16 |

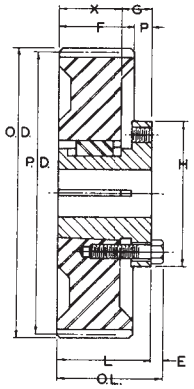
**1 3/8" Bore Bushings also available with 3/8" x 3/16" Keyseat.**




TYPE 11




TYPE 12

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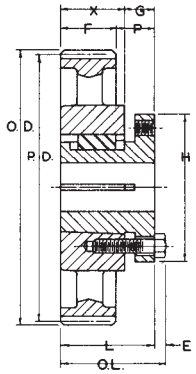
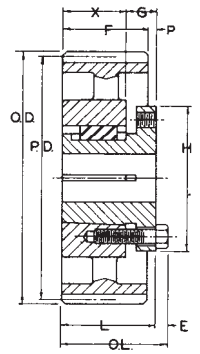



TYPE 16




TYPE 17

# 6 Pitch — 1 1/2" Face — 14 1/2° Pressure Angle

Table No. 1

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. of Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS611* | 2.000" | 2.33" | 11 | 2 | 1" | 1" | 1 1/2" | 2 3/8" | 7/8" | 1 1/2" | .9 |
| NSS612 | 2.000 | 2.33 | 12 | 2 | 1 | 1 | 1 1/2 | 2 3/8 | 7/8 | 1 1/2 | 1.0 |
| NSS614 | 2.333 | 2.66 | 14 | 2 | 1 | 1 1/8 | 1 1/2 | 2 3/8 | 7/8 | 1 13/16 | 1.5 |
| NSS615 | 2.500 | 2.83 | 15 | 2 | 1 | 1 1/4 | 1 1/2 | 2 3/8 | 7/8 | 2 | 2.2 |
| NSS616 | 2.667 | 3.00 | 16 | 2 | 1 | 1 3/8 | 1 1/2 | 2 3/8 | 7/8 | 2 5/32 | 2.6 |
| NSS618 | 3.000 | 3.33 | 18 | 2 | 1 | 1 5/8 | 1 1/2 | 2 3/8 | 7/8 | 2 1/2 | 3.7 |
| NSS620 | 3.333 | 3.66 | 20 | 2 | 1 | 1 3/4 | 1 1/2 | 2 3/8 | 7/8 | 2 27/32 | 4.7 |
| NSS621 | 3.500 | 3.83 | 21 | 2 | 1 | 1 | 1 1/2 | 2 3/8 | 7/8 | 3 | 5.2 |
| NSS624 | 4.000 | 4.33 | 24 | 2 | 1 1/8 | 2 | 1 1/2 | 2 1/2 | 1 | 3 | 6.6 |
| NSS627 | 4.500 | 4.83 | 27 | 2 | 1 1/8 | 2 | 1 1/2 | 2 1/2 | 1 | 3 | 8.0 |
| NSS630 | 5.000 | 5.33 | 30 | 2 | 1 1/8 | 2 1/8 | 1 1/2 | 2 1/2 | 1 | 3 1/8 | 9.8 |
| NSS632 | 5.333 | 5.66 | 32 | 2 | 1 1/8 | 2 1/8 | 1 1/2 | 2 1/2 | 1 | 3 1/8 | 11.0 |
| NSS633 | 5.500 | 5.83 | 33 | 2 | 1 1/8 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 11.6 |
| NSS636 | 6.000 | 6.33 | 36 | 2 | 1 1/8 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 14.2 |
| NSS640 | 6.667 | 7.00 | 40 | 2 | 1 1/8 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 17.0 |
| NSS642 | 7.000 | 7.33 | 42 | 2 | 1 1/8 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 17.8 |
| NCS648 | 8.000 | 8.33 | 48 | 4 | 1 1/8 | 2 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 12.6 |
| NCS654 | 9.000 | 9.33 | 54 | 4 | 1 1/8 | 2 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 13.9 |
| NCS660 | 10.000 | 10.33 | 60 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 16.0 |
| NCS664 | 10.667 | 11.00 | 64 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 17.4 |
| NCS666 | 11.000 | 11.33 | 66 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 17.9 |
| NCS672 | 12.000 | 12.33 | 72 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 20.3 |
| NCS684 | 14.000 | 14.33 | 84 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 22.0 |
| NCS696 | 16.000 | 16.33 | 96 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 27.9 |
| NCS6108 | 18.000 | 18.33 | 108 | 4 | 1 1/4 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 34.3 |
| NCS6120 | 20.000 | 20.33 | 120 | 4 | 1 1/4 | 2 1/4 | 1 1/2 | 3 | 1 1/2 | 3 1/2 | 42.5 |
| NCS6144 | 24.000 | 24.33 | 144 | 4 | 1 1/4 | 2 1/4 | 1 1/2 | 3 | 1 1/2 | 3 3/4 | 50.0 |

*Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use For Calculating Center Distance but not for Ratio.

All 42 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.

Table No. 2

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS6P21 | P1 | 3.500" | 3.83" | 21 | 11 | 1 1/2" | 2 3/8" | 1 15/16" | 5/8" | 3/16" | 3" | — | — | 1/4" | 2.7 |
| NSS6P24 | P1 | 4.000 | 4.33 | 24 | 11 | 1 1/2 | 2 3/8 | 1 15/16 | 5/8 | 3/16 | 3 | — | — | 1/4 | 3.9 |
| NSS6P30 | P1 | 5.000 | 5.33 | 30 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.5 |
| NSS6P32 | P1 | 5.333 | 5.66 | 32 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 7.7 |
| NSS6P33 | P1 | 5.500 | 5.83 | 33 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 8.1 |
| NSS6P36 | P1 | 6.000 | 6.33 | 36 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.1 |
| NSS6P40 | P1 | 6.667 | 7.00 | 40 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 12.6 |
| NSS6P42 | P1 | 7.000 | 7.33 | 42 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 14.2 |
| NCS6P48 | P1 | 8.000 | 8.33 | 48 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.2 |
| NCS6P60 | P1 | 10.000 | 10.33 | 60 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 12.1 |
| NCS6P64 | P1 | 10.667 | 11.00 | 64 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 14.5 |
| NCS6P72 | P1 | 12.000 | 12.33 | 72 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 16.6 |
| NCS6Q84 | Q1 | 14.000 | 14.33 | 84 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 22.8 |
| NCS6Q96 | Q1 | 16.000 | 16.33 | 96 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 26.8 |
| NCS6Q108 | Q1 | 18.000 | 18.33 | 108 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 31.4 |
| NCS6Q120 | Q1 | 20.000 | 20.33 | 120 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 44.2 |
| NCS6Q132 | Q1 | 22.000 | 22.33 | 132 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 39.1 |
| NCS6Q144 | Q1 | 24.000 | 24.33 | 144 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 44.8 |

All 42 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.

**All Browning® Gears are made to AGMA Standards**
**Each gear is individually marked and packaged**
**Gear charting equipment is used to check and help provide high quality stock gears at low cost**

## 5 Pitch — 1 3/4" Face — 14 1/2° Pressure Angle

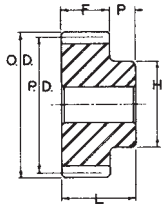
Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

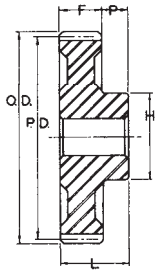
| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS511* | 2.400" | 2.80" | 11 | 2 | 1 1/16" | 1 1/16" | 1 3/4" | 2 5/8" | 7/8" | 1 13/16" | 2.0 |
| NSS512 | 2.400 | 2.80 | 12 | 2 | 1 1/16 | 1 1/16 | 1 3/4 | 2 5/8 | 7/8 | 1 13/16 | 2.9 |
| NSS514 | 2.800 | 3.20 | 14 | 2 | 1 1/16 | 1 3/8 | 1 3/4 | 2 5/8 | 7/8 | 2 3/16 | 3.1 |
| NSS515 | 3.000 | 3.40 | 15 | 2 | 1 1/16 | 1 1/2 | 1 3/4 | 2 5/8 | 7/8 | 2 3/8 | 3.6 |
| NSS516 | 3.200 | 3.60 | 16 | 2 | 1 1/16 | 1 3/4 | 1 3/4 | 2 5/8 | 7/8 | 2 5/8 | 4.4 |
| NSS518 | 3.600 | 4.00 | 18 | 2 | 1 1/16 | 2 | 1 3/4 | 2 5/8 | 7/8 | 3 | 5.9 |
| NSS520 | 4.000 | 4.40 | 20 | 2 | 1 1/16 | 2 3/8 | 1 3/4 | 2 5/8 | 7/8 | 3 3/8 | 7.6 |
| NSS524 | 4.800 | 5.20 | 24 | 2 | 1 1/16 | 2 3/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 11.1 |
| NSS525 | 5.000 | 5.40 | 25 | 2 | 1 1/16 | 2 3/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 12.1 |
| NSS530 | 6.000 | 6.40 | 30 | 2 | 1 1/16 | 2 3/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 16.3 |
| NSS535 | 7.000 | 7.40 | 35 | 2 | 1 3/16 | 2 3/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 22.0 |
| NCS540 | 8.000 | 8.40 | 40 | 4 | 1 3/16 | 2 1/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 15.6 |
| NCS545 | 9.000 | 9.40 | 45 | 4 | 1 3/16 | 2 1/8 | 1 3/4 | 3 | 1 1/4 | 3 3/8 | 17.9 |
| NCS550 | 10.000 | 10.40 | 50 | 4 | 1 3/16 | 2 1/4 | 1 3/4 | 3 | 1 1/4 | 3 3/4 | 21.3 |
| NCS555 | 11.000 | 11.40 | 55 | 4 | 1 3/16 | 2 1/4 | 1 3/4 | 3 | 1 1/4 | 3 3/4 | 24.5 |
| NCS560 | 12.000 | 12.40 | 60 | 4 | 1 3/16 | 2 1/4 | 1 3/4 | 3 | 1 1/4 | 3 3/4 | 26.8 |
| NCS570 | 14.000 | 14.40 | 70 | 4 | 1 3/16 | 2 1/4 | 1 3/4 | 3 | 1 1/4 | 3 3/4 | 31.5 |
| NCS580 | 16.000 | 16.40 | 80 | 4 | 1 3/16 | 2 1/4 | 1 3/4 | 3 | 1 1/4 | 3 3/4 | 36.1 |
| NCS5100 | 20.000 | 20.40 | 100 | 4 | 1 5/16 | 2 3/4 | 1 3/4 | 3 1/4 | 1 1/2 | 4 1/2 | 52.0 |
| NCS5120 | 24.000 | 24.40 | 120 | 4 | 1 5/16 | 2 3/4 | 1 3/4 | 3 1/4 | 1 1/2 | 4 1/2 | 59.5 |

***Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use for calculating Center Distance but not for Ratio.**
**All 35 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

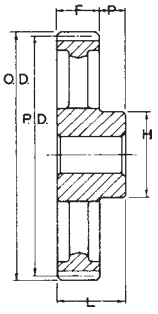




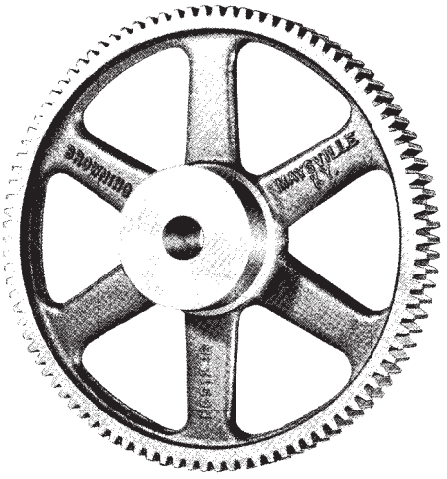

TYPE 2

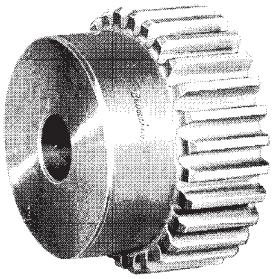



TYPE 3




TYPE 4





## Steel and Cast Iron Gears

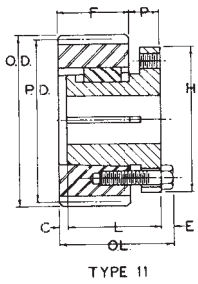
# 5 Pitch — 1 3/4" Face — 14 1/2° Pressure Angle

Table No. 1

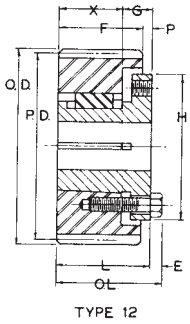
## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth. | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS5P18 | P1 | 3.600" | 4.00" | 18 | 11 | 1 3/4" | 2 5/8" | 1 15/16" | 5/8" | 7/16" | 3" | — | — | 1/4" | 3.4 |
| NSS5P20 | P1 | 4.000 | 4.40 | 20 | 11 | 1 3/4 | 2 5/8 | 1 15/16 | 5/8 | 7/16 | 3 | — | — | 1/4 | 4.5 |
| NSS5P24 | P1 | 4.800 | 5.20 | 24 | 12 | 1 3/4 | 2 3/16 | 1 15/16 | 3/16 | — | 3 | 5/8" | 1 5/16" | 1/4 | 6.4 |
| NSS5P30 | P1 | 6.000 | 6.40 | 30 | 12 | 1 3/4 | 2 3/16 | 1 15/16 | 3/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.6 |
| NSS5P35 | P1 | 7.000 | 7.40 | 35 | 12 | 1 3/4 | 2 3/16 | 1 15/16 | 3/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 14.9 |
| NCS5Q40 | Q1 | 8.000 | 8.40 | 40 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 14.7 |
| NCS5Q45 | Q1 | 9.000 | 9.40 | 45 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 17.4 |
| NCS5Q50 | Q1 | 10.000 | 10.40 | 50 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 17.4 |
| NCS5Q60 | Q1 | 12.000 | 12.40 | 60 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 21.6 |
| NCS5Q70 | Q1 | 14.000 | 14.40 | 70 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 28.0 |
| NCS5Q80 | Q1 | 16.000 | 16.40 | 80 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 33.5 |
| NCS5Q90 | Q1 | 18.000 | 18.40 | 90 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 36.5 |
| NCS5Q120 | Q1 | 24.000 | 24.40 | 120 | 16 | 1 3/4 | 2 25/32 | 2 1/2 | 3/4 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 52.0 |

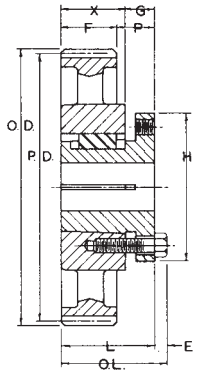
**All 35 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron**



TYPE 11



TYPE 12



TYPE 16

### Bore Range

Table No .2

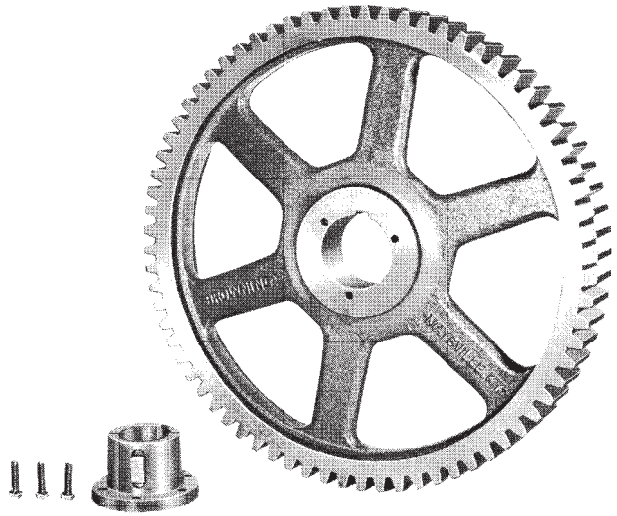
| Bushing | Bore Range |
|---|---|
| P1 | 1/2" — 1 3/4" |
| Q1 | 3/4 — 2 11/16 |

### Standard Keyseats

Table No .3

| Bore Range | Keyseat |
|---|---|
| 1/2" — 9/16" | 1/8" x 1/16" |
| 5/8 — 7/8 | 3/16 x 3/32 |
| 15/16 — 1 1/4 | 1/4 x 1/8 |
| 1 15/16 — 1 3/8 | 5/16 x 5/32 |
| 1 7/16 — 1 3/4 | 3/8 x 3/16 |
| 1 13/16 — 2 1/4 | 1/2 x 1/4 |
| 2 5/16 — 2 11/16 | 5/8 x 5/16 |
| 2 13/16 — 3 1/4 | 3/4 x 3/8 |

**1 3/8" Bore Bushing also available with 3/8" x 3/16" Keyseat.**



**Browning® Bushed Gears hold the shaft with Clamp Fit and eliminate costly reworking on replacement gears.**

F

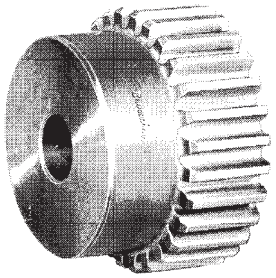
## 4 Pitch  2" Face  14 1/2° Pressure Angle

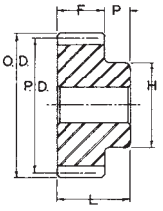
Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

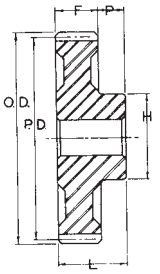
| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS411* | 3.000" | 3.50" | 11 | 2 | 1 1/8" | 1 3/8" | 2" | 2 7/8" | 7/8" | 2 1/4" | 3.8 |
| NSS412 | 3.000 | 3.50 | 12 | 2 | 1 1/8 | 1 3/8 | 2 | 2 7/8 | 7/8 | 2 1/4 | 4.1 |
| NSS414 | 3.500 | 4.00 | 14 | 2 | 1 1/8 | 1 7/8 | 2 | 2 7/8 | 7/8 | 2 3/4 | 5.8 |
| NSS415 | 3.750 | 4.25 | 15 | 2 | 1 1/8 | 2 | 2 | 2 7/8 | 7/8 | 3 | 6.8 |
| NSS416 | 4.000 | 4.50 | 16 | 2 | 1 1/8 | 2 1/4 | 2 | 2 7/8 | 7/8 | 3 1/4 | 8.3 |
| NSS418 | 4.500 | 5.00 | 18 | 2 | 1 1/8 | 2 5/8 | 2 | 2 7/8 | 7/8 | 3 3/4 | 10.7 |
| NSS420 | 5.000 | 5.50 | 20 | 2 | 1 1/8 | 3 | 2 | 2 7/8 | 7/8 | 4 1/4 | 13.6 |
| NSS422 | 5.500 | 6.00 | 22 | 2 | 1 1/8 | 3 3/8 | 2 | 2 7/8 | 7/8 | 4 3/4 | 16.8 |
| NSS424 | 6.000 | 6.50 | 24 | 2 | 1 1/8 | 3 3/8 | 2 | 3 1/2 | 1 1/2 | 4 3/4 | 22.4 |
| NSS428 | 7.000 | 7.50 | 28 | 2 | 1 1/4 | 3 3/8 | 2 | 3 1/2 | 1 1/2 | 4 3/4 | 28.1 |
| NCS430 | 7.500 | 8.00 | 30 | 3 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 24.6 |
| NCS432 | 8.000 | 8.50 | 32 | 3 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 25.6 |
| NCS436 | 9.000 | 9.50 | 36 | 3 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 30.9 |
| NCS440 | 10.000 | 10.50 | 40 | 4 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 29.0 |
| NCS442 | 10.500 | 11.00 | 42 | 4 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 30.2 |
| NCS444 | 11.000 | 11.50 | 44 | 4 | 1 1/4 | 2 5/8 | 2 | 3 1/2 | 1 1/2 | 4 1/4 | 32.5 |
| NCS448 | 12.000 | 12.50 | 48 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 37.5 |
| NCS454 | 13.500 | 14.00 | 54 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 41.8 |
| NCS456 | 14.000 | 14.50 | 56 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 40.6 |
| NCS460 | 15.000 | 15.50 | 60 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 45.9 |
| NCS464 | 16.000 | 16.50 | 64 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 48.3 |
| NCS472 | 18.000 | 18.50 | 72 | 4 | 1 1/4 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 3/4 | 59.5 |
| NCS480 | 20.000 | 20.50 | 80 | 4 | 1 3/8 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 3/4 | 63.0 |
| NCS488 | 22.000 | 22.50 | 88 | 4 | 1 3/8 | 2 3/4 | 2 | 3 3/4 | 1 3/4 | 4 3/4 | 70.5 |
| NCS496 | 24.000 | 24.50 | 96 | 4 | 1 3/8 | 3 | 2 | 3 3/4 | 1 3/4 | 5 | 78.0 |
| NCS4120 | 30.000 | 30.50 | 120 | 4 | 1 3/8 | 3 | 2 | 3 3/4 | 1 3/4 | 5 | 112.0 |
| NCS4144 | 36.000 | 36.50 | 144 | 4 | 1 3/8 | 3 | 2 | 3 3/4 | 1 3/4 | 5 | 161.0 |

***Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use for calculating Center Distance but not for Ratio.**
**All 28 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

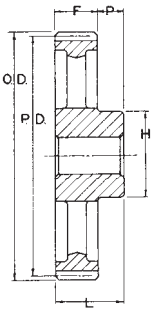




TYPE 2



TYPE 3



TYPE 4

## For High Torque, Shock Applications Use Browning® Bushed Gears

## In Stock Ready to Ship

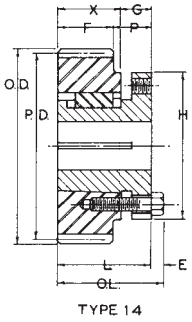
# 4Pitch 2"Face 14 1/2° Pressure Angle

Table No. 1

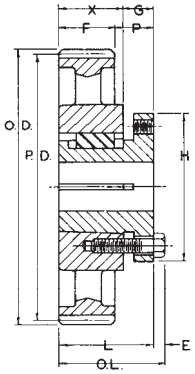
## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | H | G | X | E | |
| NSS4P15 | P2 | 3.750" | 4.25" | 15 | 14 | 2" | 3 3/16" | 2 15/16" | 15/16" | 3" | 5/8" | 2 5/16" | 1/4" | 4.7 |
| NSS4P16 | P2 | 4.000 | 4.50 | 16 | 14 | 2 | 3 3/16 | 2 15/16 | 15/16 | 3 | 5/8 | 2 5/16 | 1/4 | 5.6 |
| NSS4P20 | P2 | 5.000 | 5.50 | 20 | 14 | 2 | 3 3/16 | 2 15/16 | 15/16 | 3 | 5/8 | 2 5/16 | 1/4 | 9.6 |
| NSS4P24 | P2 | 6.000 | 6.50 | 24 | 14 | 2 | 3 3/16 | 2 15/16 | 15/16 | 3 | 5/8 | 2 5/16 | 1/4 | 14.4 |
| NSS4P28 | P2 | 7.000 | 7.50 | 28 | 14 | 2 | 3 3/16 | 2 15/16 | 15/16 | 3 | 5/8 | 2 5/16 | 1/4 | 20.4 |
| NCS4Q30 | Q1 | 7.500 | 8.00 | 30 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 18.1 |
| NCS4Q32 | Q1 | 8.000 | 8.50 | 32 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 16.2 |
| NCS4Q36 | Q1 | 9.000 | 9.50 | 36 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 19.5 |
| NCS4Q40 | Q1 | 10.000 | 10.50 | 40 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 25.6 |
| NCS4Q44 | Q1 | 11.000 | 11.50 | 44 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 24.9 |
| NCS4Q48 | Q1 | 12.000 | 12.50 | 48 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 27.8 |
| NCS4Q54 | Q1 | 13.500 | 14.00 | 54 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 31.1 |
| NCS4Q56 | Q1 | 14.000 | 14.50 | 56 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 32.3 |
| NCS4Q60 | Q1 | 15.000 | 15.50 | 60 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 35.9 |
| NCS4Q64 | Q1 | 16.000 | 16.50 | 64 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 39.9 |
| NCS4Q72 | Q1 | 18.000 | 18.50 | 72 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 43.3 |
| NCS4R80 | R1 | 20.000 | 20.50 | 80 | 16 | 2 | 3 5/32 | 2 7/8 | 7/8 | 5 3/8 | 7/8 | 2 | 9/32 | 52.5 |
| NCS4R88 | R1 | 22.000 | 22.50 | 88 | 16 | 2 | 3 5/32 | 2 7/8 | 7/8 | 5 3/8 | 7/8 | 2 | 9/32 | 60.3 |
| NCS4R96 | R1 | 24.000 | 24.50 | 96 | 16 | 2 | 3 5/32 | 2 7/8 | 7/8 | 5 3/8 | 7/8 | 2 | 9/32 | 65.5 |
| NCS4R120 | R1 | 30.000 | 30.50 | 120 | 16 | 2 | 3 5/32 | 2 7/8 | 7/8 | 5 3/8 | 7/8 | 2 | 9/32 | 96.5 |
| NCS4R144 | R1 | 36.000 | 36.50 | 144 | 16 | 2 | 3 5/32 | 2 7/8 | 7/8 | 5 3/8 | 7/8 | 2 | 9/32 | 127 |

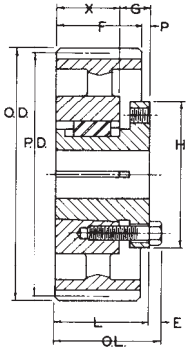
**All 28 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**



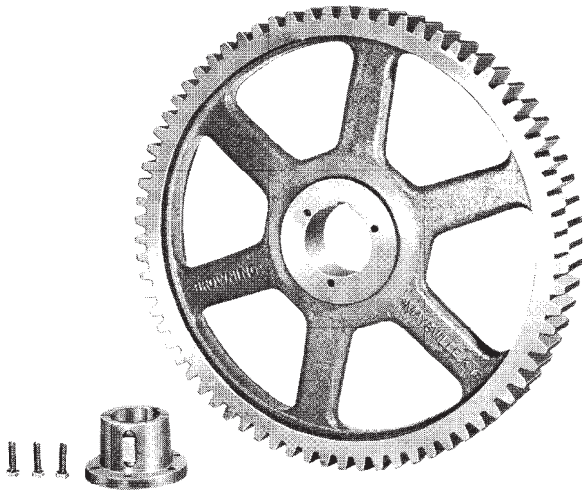
TYPE 14



TYPE 16



TYPE 17



## Bore Range

Table No. 2

| Bushing | Bore Range |
|---|---|
| P2 | 3/4" to 1 3/4" |
| Q1 | 3/4 to 2 11/16 |
| R1 | 1 1/8 to 3 3/4 |

## Standard Keyseats

Table No. 3

| Bore Range | Keyseat |
|---|---|
| 3/4" to 7/8" | 3/16" x 3/32" |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 3/4 | 5/8 x 5/16 |
| 2 13/16 to 3 1/4 | 3/4 x 3/8 |
| 3 3/8 to 3 3/4 | 7/8 x 7/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

**Precision Inspected**

## 3 Pitch  3" Face  14 1/2° Pressure Angle

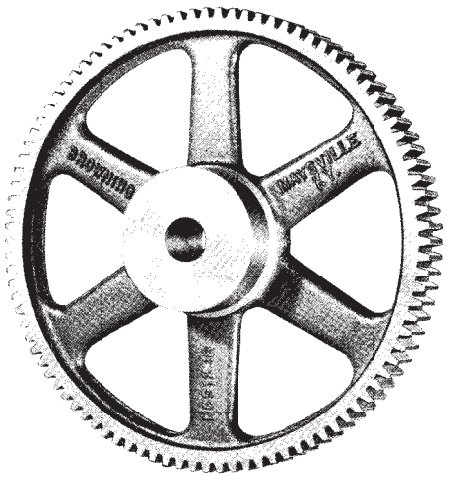
Table No. 1

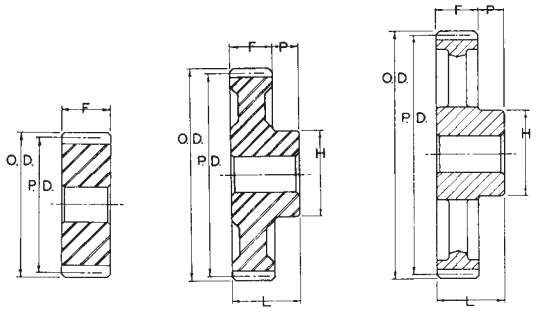
### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NSS311A* | 4.000" | 4.66" | 11 | A2 | 1 5/16" | 1 7/16" | 4" | 4" | — | — | 11.7 |
| NSS312A | 4.000 | 4.66 | 12 | A2 | 1 5/16 | 1 7/16 | 4 | 4 | — | — | 11.8 |
| NSS314A | 4.667 | 5.33 | 14 | A2 | 1 5/16 | 2 | 3 | 3 | — | — | 12.6 |
| NSS315A | 5.000 | 5.66 | 15 | A2 | 1 5/16 | 2 1/4 | 3 | 3 | — | — | 14.8 |
| NSS316A | 5.333 | 6.00 | 16 | A2 | 1 5/16 | 2 3/8 | 3 | 3 | — | — | 17.0 |
| NSS318A | 6.000 | 6.66 | 18 | A2 | 1 5/16 | 3 | 3 | 3 | — | — | 22.0 |
| NSS320A | 6.667 | 7.33 | 20 | A2 | 1 5/16 | 3 5/8 | 3 | 3 | — | — | 27.8 |
| NSS321A | 7.000 | 7.66 | 21 | A2 | 1 5/16 | 3 15/16 | 3 | 3 | — | — | 30.6 |
| NSS324 | 8.000 | 8.66 | 24 | 3 | 1 7/16 | 3 1/4 | 3 | 4 1/4 | 1 1/4" | 4 1/2" | 41.0 |
| NCS330 | 10.000 | 10.66 | 30 | 3 | 1 7/16 | 3 1/4 | 3 | 4 1/4 | 1 1/4" | 5 1/4 | 53.5 |
| NCS336 | 12.000 | 12.66 | 36 | 3 | 1 7/16 | 3 1/4 | 3 | 4 3/4 | 1 3/4 | 5 1/4 | 69.0 |
| NCS342 | 14.000 | 14.66 | 42 | 4 | 1 7/16 | 3 1/4 | 3 | 4 3/4 | 1 3/4 | 5 1/4 | 73.5 |
| NCS348 | 16.000 | 16.66 | 48 | 4 | 1 9/16 | 3 1/4 | 3 | 4 3/4 | 1 3/4 | 5 1/4 | 84.0 |
| NCS354 | 18.000 | 18.66 | 54 | 4 | 1 9/16 | 3 1/4 | 3 | 4 3/4 | 1 3/4 | 5 1/4 | 95.0 |
| NCS360 | 20.000 | 20.66 | 60 | 4 | 1 9/16 | 3 1/4 | 3 | 4 3/4 | 1 3/4 | 5 1/4 | 104 |
| NCS372 | 24.000 | 24.66 | 72 | 4 | 1 11/16 | 3 3/8 | 3 | 4 3/4 | 1 3/4 | 5 3/4 | 142 |
| NCS384 | 28.000 | 28.66 | 84 | 4 | 1 11/16 | 3 3/8 | 3 | 4 3/4 | 1 3/4 | 5 3/4 | 169 |
| NCS396 | 32.000 | 32.66 | 96 | 4 | 1 15/16 | 3 3/8 | 3 | 4 3/4 | 1 3/4 | 5 3/4 | 183 |
| NCS3108 | 36.000 | 36.66 | 108 | 4 | 1 15/16 | 3 3/8 | 3 | 4 3/4 | 1 3/4 | 5 3/4 | 219 |
| NCS3120 | 40.000 | 40.66 | 120 | 4 | 1 15/16 | 3 5/8 | 3 | 4 3/4 | 1 3/4 | 6 | 240 |

*Enlarged Pinion Tooth Form – Pitch Diameter is Special. Use for calculating Center Distance but not for Ratio.
All 24 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.

F




**Distribution Nation - Wide and in Canada**

All Browning® Gears are made to AGMA Standards
Each gear is individually marked and packaged
Gear charting equipment is used to check and help provide high quality stock gears at low cost

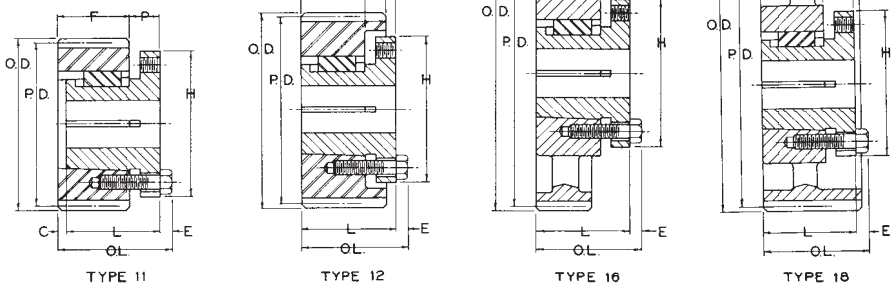
# 3 Pitch  3" Face  14 1/2° Pressure Angle

Table No. 1

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| NSS3Q15 | Q2 | 5.000" | 5.66" | 15 | 11 | 3" | 4 1/32" | 3 1/2" | 3/4" | 1/4" | 4 1/8" | — | — | 9/32" | 10.5 |
| NSS3Q18 | Q2 | 6.000 | 6.66 | 18 | 11 | 3 | 4 1/32" | 3 1/2 | 3/4 | 1/4 | 4 1/8 | — | — | 9/32 | 17.8 |
| NSS3Q20 | Q2 | 6.667 | 7.33 | 20 | 12 | 3 | 3 25/32 | 3 1/2 | 1/2 | — | 4 1/8 | 3/4" | 2 3/4" | 9/32 | 22.6 |
| NSS3Q21 | Q2 | 7.000 | 7.66 | 21 | 12 | 3 | 3 25/32 | 3 1/2 | 1/2 | — | 4 1/8 | 3/4 | 2 3/4 | 9/32 | 25.9 |
| NSS3R24 | R1 | 8.000 | 8.66 | 24 | 12 | 3 | 3 5/32 | 2 7/8 | 1/8* | — | 5 3/8 | 7/8 | 2 | 9/32 | 25.4 |
| NCS3R30 | R1 | 10.000 | 10.66 | 30 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 40.0 |
| NCS3R36 | R1 | 12.000 | 12.66 | 36 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 50.5 |
| NCS3R42 | R1 | 14.000 | 14.66 | 42 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 56.0 |
| NCS3R48 | R1 | 16.000 | 16.66 | 48 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 65.5 |
| NCS3R54 | R1 | 18.000 | 18.66 | 54 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 77.0 |
| NCS3R60 | R1 | 20.000 | 20.66 | 60 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 87.0 |
| NCS3R72 | R1 | 24.000 | 24.66 | 72 | 18 | 3 | 3 5/32 | 2 7/8 | 1/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 114 |
| NCS3S84 | S1 | 28.000 | 28.66 | 84 | 16 | 3 | 4 3/4 | 4 3/8 | 1 3/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 151 |
| NCS3S96 | S1 | 32.000 | 32.66 | 96 | 16 | 3 | 4 3/4 | 4 3/8 | 1 3/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 180 |
| NCS3S108 | S1 | 36.000 | 36.66 | 108 | 16 | 3 | 4 3/4 | 4 3/8 | 1 3/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 198 |
| NCS3S120 | S1 | 40.000 | 40.66 | 120 | 16 | 3 | 4 3/4 | 4 3/8 | 1 3/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 244 |

**All 24 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron. *Face of bushing flange is under rim by amount shown.**




## Bore Range

Table No. 2

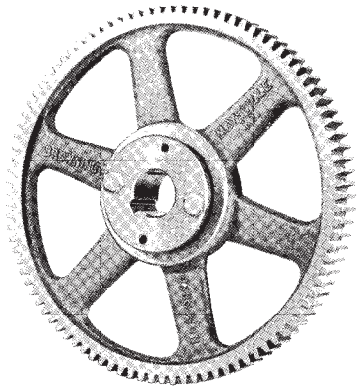
| Bushing | Bore Range |
|---|---|
| Q2 | 1" — 2 5/8" |
| R1 | 1 1/8 — 3 3/4 |
| S1 | 1 11/16 — 4 1/4 |

## Standard Keyseats

Table No. 3

| Bore Range | Keyseat |
|---|---|
| 1" — 1 1/4" | 1/4" X 1/8" |
| 1 5/16 — 1 3/8 | 5/16 X 5/32 |
| 1 7/16 — 1 3/4 | 3/8 X 3/16 |
| 1 13/16 — 2 1/4 | 1/2 X 1/4 |
| 2 5/16 — 2 3/4 | 5/8 X 5/16 |
| 2 13/16 — 3 1/4 | 3/4 X 3/8 |
| 3 5/16 — 3 3/4 | 7/8 X 7/16 |
| 3 13/16 — 4 3/8 | 1 X 1/2 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**



**Browning® Bushed Gears hold the shaft with Clamp Fit and eliminate costly reworking on replacement gears.**

# 20 Pitch  1/2" Face  20° Pressure Angle

Table No. 1

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS2012 | .600" | .70" | 12 | 2 | 5/16" | 5/16" | 1/2" | 15/16" | 7/16" | 29/64" | .1 |
| YSS2014 | .700 | .80 | 14 | 2 | 5/16 | 3/8 | 1/2 | 15/16 | 7/16 | 9/16 | .1 |
| YSS2015 | .750 | .85 | 15 | 2 | 3/8 | 3/8 | 1/2 | 15/16 | 7/16 | 39/64 | .1 |
| YSS2016 | .800 | .90 | 16 | 2 | 3/8 | 7/16 | 1/2 | 15/16 | 7/16 | 21/32 | .1 |
| YSS2018 | .900 | 1.00 | 18 | 2 | 3/8 | 1/2 | 1/2 | 15/16 | 7/16 | 3/4 | .1 |
| YSS2020 | 1.000 | 1.10 | 20 | 2 | 1/2 | 1/2 | 1/2 | 15/16 | 7/16 | 55/64 | .1 |
| YSS2024 | 1.200 | 1.30 | 24 | 2 | 1/2 | 9/16 | 1/2 | 15/16 | 7/16 | 1 1/16 | .2 |
| YSS2025 | 1.250 | 1.35 | 25 | 2 | 1/2 | 5/8 | 1/2 | 15/16 | 7/16 | 1 7/64 | .3 |
| YSS2030 | 1.500 | 1.60 | 30 | 2 | 1/2 | 3/4 | 1/2 | 15/16 | 7/16 | 1 23/64 | .4 |
| YSS2035 | 1.750 | 1.85 | 35 | 2 | 1/2 | 7/8 | 1/2 | 1 | 1/2 | 1 9/16 | .6 |
| YSS2040 | 2.000 | 2.10 | 40 | 2 | 1/2 | 1 | 1/2 | 1 | 1/2 | 1 13/16 | .8 |
| YSS2045 | 2.250 | 2.35 | 45 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 1/16 | 1.0 |
| YSS2050 | 2.500 | 2.60 | 50 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 1/16 | 1.1 |
| YSS2060 | 3.000 | 3.10 | 60 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 1/16 | 1.4 |
| YSS2070 | 3.500 | 3.60 | 70 | 2 | 1/2 | 1 1/4 | 1/2 | 1 | 1/2 | 2 1/16 | 1.8 |
| YSS2080 | 4.000 | 4.10 | 80 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 1/16 | 1.9 |
| YSS2084 | 4.200 | 4.30 | 84 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 1/16 | 2.6 |
| YSS2090 | 4.500 | 4.60 | 90 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 1/16 | 2.1 |
| YSS20100 | 5.000 | 5.10 | 100 | 2 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 1/16 | 2.5 |
| YCS20120 | 6.000 | 6.10 | 120 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.5 |
| YCS20140 | 7.000 | 7.10 | 140 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 2.9 |
| YCS20160 | 8.000 | 8.10 | 160 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/8 | 5/8 | 2 | 3.3 |
| YCS20180 | 9.000 | 9.10 | 180 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/4 | 3/4 | 2 | 3.9 |
| YCS20200 | 10.000 | 10.10 | 200 | 4 | 5/8 | 1 1/4 | 1/2 | 1 1/4 | 3/4 | 2 | 4.3 |

**All 100 Tooth Gears and smaller are Steel. All larger gears are Cast Iron.**

F

**20° P.A. Gears will not Mesh with 14 1/2° P.A. Gears**

## Bore Range

Table No. 2

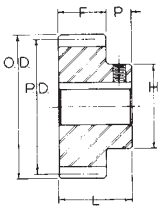
| Bushing | Bore Range |
|---|---|
| G | 3/8" to 1" |
| H | 3/8 to 1 1/2 |
| P1 | 1/2 to 1 3/4 |

## Standard Keyseats

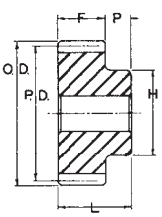
Table No. 3

| Bore Range | Keyseat |
|---|---|
| 3/8" & 7/16" | None |
| 1/2 & 9/16 | 1/8" x 1/16" |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |

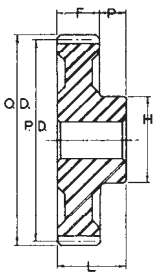
**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**



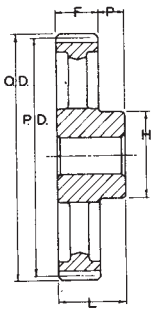
TYPE 1



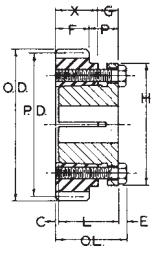
TYPE 2



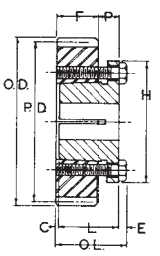
TYPE 3



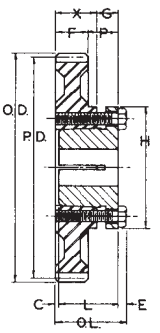
TYPE 4



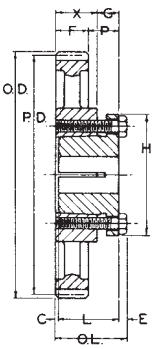
TYPE 5



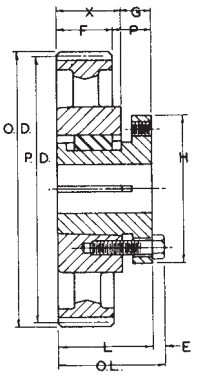
TYPE 6



TYPE 9



TYPE 10



TYPE 16

# 16 Pitch 3/4" Face 20° Pressure Angle

Table No. 1

## Stock Steel Finished Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Stock bores Marked "X" | | | | | | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | 5/16" | 3/8" | 1/2" | 5/8" | 3/4" | 7/8" | 1" | F | L | P | H | |
| YSS16F12 | .750" | .87" | 12 | 1 | X | — | — | — | — | — | — | 3/4" | 1 1/4" | 1/2" | 9/16" | .1 |
| YSS16F14 | .875 | 1.00 | 14 | 1 | — | X | — | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 11/16 | .1 |
| YSS16F15 | .938 | 1.06 | 15 | 1 | — | X | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 3/4 | .2 |
| YSS16F16 | 1.000 | 1.12 | 16 | 1 | — | X | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 13/16 | .2 |
| YSS16F18 | 1.125 | 1.25 | 18 | 1 | — | — | X | — | — | — | — | 3/4 | 1 1/4 | 1/2 | 15/16 | .2 |
| YSS16F20 | 1.250 | 1.37 | 20 | 1 | — | — | X | X | — | — | — | 3/4 | 1 1/4 | 1/2 | 1 1/16 | .3 |
| YSS16F24 | 1.500 | 1.62 | 24 | 1 | — | — | X | X | X | — | — | 3/4 | 1 1/4 | 1/2 | 1 5/16 | .4 |
| YSS16F28 | 1.750 | 1.87 | 28 | 1 | — | — | — | X | X | — | — | 3/4 | 1 1/4 | 1/2 | 1 1/2 | .6 |
| YSS16F30 | 1.875 | 2.00 | 30 | 1 | — | — | — | X | X | X | — | 3/4 | 1 1/4 | 1/2 | 1 5/8 | .8 |
| YSS16F32 | 2.000 | 2.12 | 32 | 1 | — | — | — | X | X | X | X | 3/4 | 1 1/4 | 1/2 | 1 3/4 | .8 |

**All of above Gears are Steel. Furnished with one Hollow Head Setscrew and Standard Keyseat except 1/2" bore and smaller which have Setscrew only.**

Table No. 2

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS1612 | .750" | .87" | 12 | 2 | 3/8" | 3/8" | 3/4" | 1 1/4" | 1/2" | 9/16" | .1 |
| YSS1614 | .875 | 1.00 | 14 | 2 | 3/8 | 7/16 | 3/4 | 1 1/4 | 1/2 | 11/16 | .1 |
| YSS1615 | .938 | 1.06 | 15 | 2 | 3/8 | 1/2 | 3/4 | 1 1/4 | 1/2 | 3/4 | .1 |
| YSS1616 | 1.000 | 1.12 | 16 | 2 | 1/2 | 1/2 | 3/4 | 1 1/4 | 1/2 | 13/16 | .1 |
| YSS1618 | 1.125 | 1.25 | 18 | 2 | 1/2 | 9/16 | 3/4 | 1 1/4 | 1/2 | 15/16 | .2 |
| YSS1620 | 1.250 | 1.37 | 20 | 2 | 5/8 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 1/16 | .3 |
| YSS1624 | 1.500 | 1.62 | 24 | 2 | 5/8 | 3/4 | 3/4 | 1 1/4 | 1/2 | 1 5/16 | .4 |
| YSS1628 | 1.750 | 1.87 | 28 | 2 | 5/8 | 7/8 | 3/4 | 1 1/4 | 1/2 | 1 1/2 | .6 |
| YSS1630 | 1.875 | 2.00 | 30 | 2 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 5/8 | .7 |
| YSS1632 | 2.000 | 2.12 | 32 | 2 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 3/4 | .8 |
| YSS1636 | 2.250 | 2.37 | 36 | 2 | 5/8 | 1 1/4 | 3/4 | 1 1/4 | 1/2 | 2 | 1.1 |
| YSS1640 | 2.500 | 2.62 | 40 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 1.5 |
| YSS1648 | 3.000 | 3.12 | 48 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 2.2 |
| YSS1656 | 3.500 | 3.62 | 56 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 2.6 |
| YSS1660 | 3.750 | 3.87 | 60 | 2 | 5/8 | 1 3/8 | 3/4 | 1 3/8 | 5/8 | 2 1/4 | 2.9 |
| YSS1664 | 4.000 | 4.12 | 64 | 2 | 3/4 | 1 3/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.3 |
| YSS1672 | 4.500 | 4.62 | 72 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.7 |
| YSS1680 | 5.000 | 5.12 | 80 | 2 | 3/4 | 1 5/8 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.2 |
| YCS1696 | 6.000 | 6.12 | 96 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 3.7 |
| YCS16112 | 7.000 | 7.12 | 112 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 4.3 |
| YCS16128 | 8.000 | 8.12 | 128 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.0 |
| YCS16144 | 9.000 | 9.12 | 144 | 4 | 3/4 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 5.4 |
| YCS16160 | 10.000 | 10.12 | 160 | 4 | 7/8 | 1 1/2 | 3/4 | 1 1/2 | 3/4 | 2 1/2 | 6.0 |
| YCS16192 | 12.000 | 12.12 | 192 | 4 | 7/8 | 1 1/2 | 3/4 | 1 3/4 | 1 | 2 1/2 | 7.9 |

**All 80 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

Table No. 3

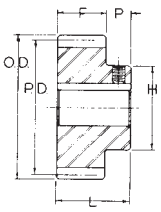
## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS16G36 | G | 2.250" | 2.37" | 36 | 6 | 3/4" | 1 3/8" | 1" | 7/16" | 3/16" | 2" | — | — | 3/16" | .6 |
| YSS16G40 | G | 2.500 | 2.62 | 40 | 6 | 3/4 | 1 3/8 | 1 | 7/16 | 3/16 | 2 | — | — | 3/16 | .8 |
| YSS16H48 | H | 3.000 | 3.12 | 48 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16" | 7/8" | 3/16 | 1.0 |
| YSS16H56 | H | 3.500 | 3.62 | 56 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 1.7 |
| YSS16H64 | H | 4.000 | 4.12 | 64 | 5 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 2.3 |
| YSS16H80 | H | 5.000 | 5.12 | 80 | 9 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.0 |
| YCS16H96 | H | 6.000 | 6.12 | 96 | 10 | 3/4 | 1 1/2 | 1 1/4 | 9/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 3.0 |

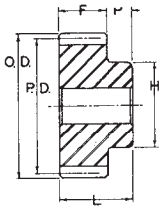
**All 80 Tooth Gears and smaller are Steel. All larger, Cast Iron.**

**12 Pitch** **1" Face** **20° Pressure Angle**

## Note: 20° Pressure Angle Gears will not Mesh with 14 1/2° Pressure Angle Gears



TYPE 1



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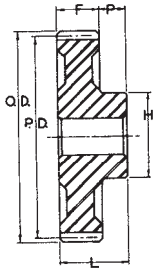
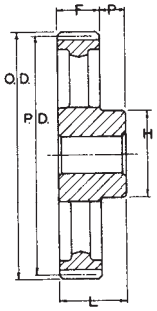
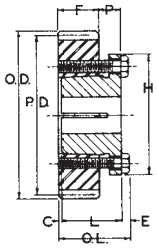


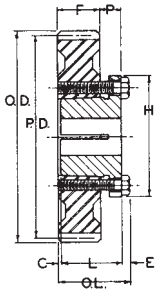
TYPE 3



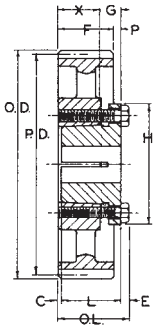
TYPE 4



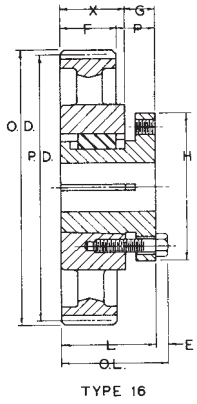
TYPE 6



TYPE 7



TYPE 8



TYPE 16

### Bore Range

Table No. 1

| Bushing | Bore Range |
|---|---|
| G | 3/8" to 1" |
| H | 3/8 to 1 1/2 |
| P1 | 1/2 to 1 3/4 |

### Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 3/8" & 7/16" | None |
| 1/2 & 9/16 | 1/8" x 1/16" |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/6 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

**For Engineering See Pages F-48 to F-71**

# 12 Pitch  1" Face  20° Pressure Angle

Table No. 1

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS1212 | 1.000" | 1.16" | 12 | 2 | 1/2" | 1/2" | 1" | 1 5/8" | 5/8" | 3/4" | .2 |
| YSS1213 | 1.083 | 1.25 | 13 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 13/16 | .2 |
| YSS1214 | 1.167 | 1.33 | 14 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 29/32 | .2 |
| YSS1215 | 1.250 | 1.41 | 15 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 1 | .3 |
| YSS1216 | 1.333 | 1.50 | 16 | 2 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 1 1/16 | .4 |
| YSS1218 | 1.500 | 1.66 | 18 | 2 | 3/4 | 3/4 | 1 | 1 5/8 | 5/8 | 1 1/4 | .4 |
| YSS1220 | 1.667 | 1.83 | 20 | 2 | 3/4 | 3/4 | 1 | 1 5/8 | 5/8 | 1 13/32 | .6 |
| YSS1221 | 1.750 | 1.91 | 21 | 2 | 3/4 | 7/8 | 1 | 1 5/8 | 5/8 | 1 1/2 | .7 |
| YSS1224 | 2.000 | 2.16 | 24 | 2 | 3/4 | 1 | 1 | 1 5/8 | 5/8 | 1 3/4 | 1.0 |
| YSS1228 | 2.333 | 2.50 | 28 | 2 | 3/4 | 1 1/4 | 1 | 1 5/8 | 5/8 | 2 1/16 | 1.3 |
| YSS1230 | 2.500 | 2.66 | 30 | 2 | 3/4 | 1 3/8 | 1 | 1 5/8 | 5/8 | 2 1/4 | 1.8 |
| YSS1236 | 3.000 | 3.16 | 36 | 2 | 3/4 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 3.0 |
| YSS1242 | 3.500 | 3.66 | 42 | 2 | 3/4 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 3.6 |
| YSS1248 | 4.000 | 4.16 | 48 | 2 | 7/8 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 4.5 |
| YSS1254 | 4.500 | 4.66 | 54 | 2 | 7/8 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 5.4 |
| YSS1260 | 5.000 | 5.16 | 60 | 2 | 7/8 | 1 5/8 | 1 | 1 7/8 | 7/8 | 2 1/2 | 5.2 |
| YCS1266 | 5.500 | 5.66 | 66 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 4.6 |
| YCS1272 | 6.000 | 6.16 | 72 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.0 |
| YCS1284 | 7.000 | 7.16 | 84 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 5.8 |
| YCS1296 | 8.000 | 8.16 | 96 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 6.6 |
| YCS12108 | 9.000 | 9.16 | 108 | 4 | 7/8 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 7.1 |
| YCS12120 | 10.000 | 10.16 | 120 | 4 | 1 | 1 9/16 | 1 | 1 7/8 | 7/8 | 2 5/8 | 7.8 |
| YCS12132 | 11.000 | 11.16 | 132 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 10.9 |
| YCS12144 | 12.000 | 12.16 | 144 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 11.8 |
| YCS12168 | 14.000 | 14.16 | 168 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 13.7 |
| YCS12192 | 16.000 | 16.16 | 192 | 4 | 1 | 1 9/16 | 1 | 2 | 1 | 2 5/8 | 17.3 |
| YCS12216 | 18.000 | 18.16 | 216 | 4 | 1 | 1 5/8 | 1 | 2 | 1 | 2 3/4 | 21.0 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

Table No. 2

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

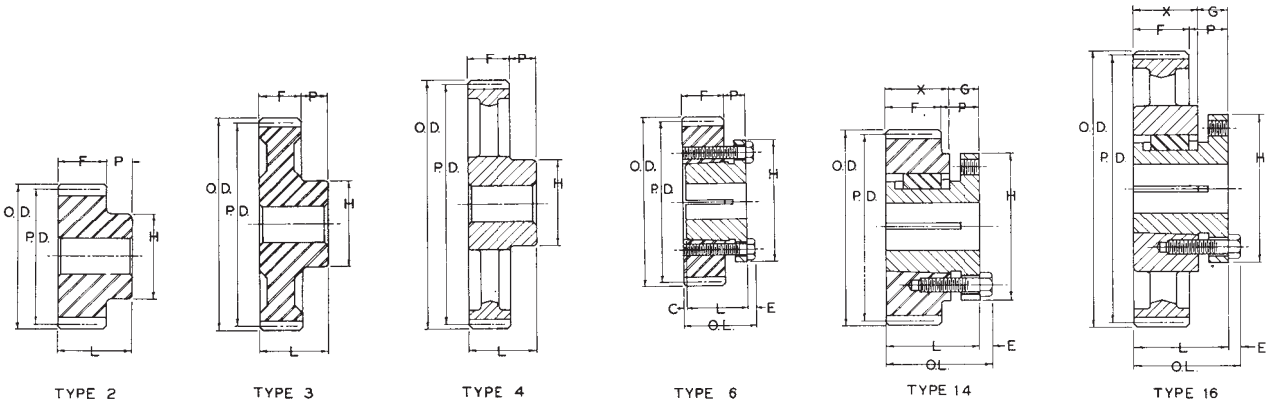
| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS12H36 | H | 3.000" | 3.16" | 36 | 6 | 1" | 1 5/8" | 1 1/4" | 7/16" | 3/16" | 2 1/2" | — | — | 3/16" | 1.4 |
| YSS12H42 | H | 3.500 | 3.66 | 42 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 2.0 |
| YSS12H48 | H | 4.000 | 4.16 | 48 | 6 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 3.0 |
| YSS12H60 | H | 5.000 | 5.16 | 60 | 7 | 1 | 1 5/8 | 1 1/4 | 7/16 | 3/16 | 2 1/2 | — | — | 3/16 | 3.5 |
| YCS12H72 | H | 6.000 | 6.16 | 72 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16" | 7/8" | 3/16 | 3.4 |
| YCS12H84 | H | 7.000 | 7.16 | 84 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 4.5 |
| YCS12H96 | H | 8.000 | 8.16 | 96 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 5.2 |
| YCS12H108 | H | 9.000 | 9.16 | 108 | 8 | 1 | 1 1/2 | 1 1/4 | 5/16 | 1/16 | 2 1/2 | 7/16 | 7/8 | 3/16 | 5.8 |
| YCS12P144 | P1 | 12.000 | 12.16 | 144 | 16 | 1 | 2 3/16 | 1 15/16 | 15/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.5 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F

**10 Pitch** **1 1/4" Face** **20° Pressure Angle**

## BROWNING® Gears — The most complete line of Stock Gears in Finished Bore, Minimum Bore and Bushing Types.




F

**Steel and Cast Iron Gears of best quality accurately machined and inspected.**

### Bore Range

Table No. 1

| Bushing | Bore Range |
|---|---|
| H | 3/8" to 1 1/2" |
| P1 | 1/2 to 1 3/4 |
| Q1 | 3/4 to 2 11/16 |

### Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 3/8" & 7/16" | None |
| 1/2 & 9/16 | 1/8" x 1/16" |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 11/16 | 5/8 x 5/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

# 10 Pitch — 1 1/4" Face — 20° Pressure Angle

Table No. 1

## Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS1012 | 1.200" | 1.40" | 12 | 2 | 5/8" | 5/8" | 1 1/4" | 1 7/8" | 5/8" | 29/32" | .4 |
| YSS1014 | 1.400 | 1.60 | 14 | 2 | 5/8 | 5/8 | 1 1/4 | 1 7/8 | 5/8 | 1 7/64 | .6 |
| YSS1015 | 1.500 | 1.70 | 15 | 2 | 3/4 | 3/4 | 1 1/4 | 1 7/8 | 5/8 | 1 7/32 | .6 |
| YSS1016 | 1.600 | 1.80 | 16 | 2 | 3/4 | 3/4 | 1 1/4 | 1 7/8 | 5/8 | 1 5/16 | .7 |
| YSS1018 | 1.800 | 2.00 | 18 | 2 | 3/4 | 7/8 | 1 1/4 | 1 7/8 | 5/8 | 1 33/64 | .9 |
| YSS1020 | 2.000 | 2.20 | 20 | 2 | 7/8 | 1 | 1 1/4 | 1 7/8 | 5/8 | 1 23/32 | 1.0 |
| YSS1024 | 2.400 | 2.60 | 24 | 2 | 7/8 | 1 1/4 | 1 1/4 | 1 7/8 | 5/8 | 2 7/64 | 1.8 |
| YSS1025 | 2.500 | 2.70 | 25 | 2 | 7/8 | 1 3/8 | 1 1/4 | 1 7/8 | 5/8 | 2 7/32 | 2.0 |
| YSS1028 | 2.800 | 3.00 | 28 | 2 | 7/8 | 1 5/8 | 1 1/4 | 1 7/8 | 5/8 | 2 1/2 | 2.8 |
| YSS1030 | 3.000 | 3.20 | 30 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 3.7 |
| YSS1035 | 3.500 | 3.70 | 35 | 2 | 7/8 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 4.5 |
| YSS1040 | 4.000 | 4.20 | 40 | 2 | 1 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 5.4 |
| YSS1045 | 4.500 | 4.70 | 45 | 2 | 1 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 6.7 |
| YSS1048 | 4.800 | 5.00 | 48 | 2 | 1 | 1 3/4 | 1 1/4 | 2 1/4 | 1 | 2 5/8 | 7.4 |
| YSS1050 | 5.000 | 5.20 | 50 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 8.5 |
| YSS1055 | 5.500 | 5.70 | 55 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 10.4 |
| YSS1060 | 6.000 | 6.20 | 60 | 2 | 1 | 2 | 1 1/4 | 2 1/4 | 1 | 3 | 12.0 |
| YCS1070 | 7.000 | 7.20 | 70 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 8.7 |
| YCS1080 | 8.000 | 8.20 | 80 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 9.8 |
| YCS1090 | 9.000 | 9.20 | 90 | 4 | 1 | 1 13/16 | 1 1/4 | 2 1/4 | 1 | 3 | 10.9 |
| YCS10100 | 10.000 | 10.20 | 100 | 4 | 1 1/8 | 1 13/16 | 1 1/4 | 2 3/8 | 1 1/8 | 3 | 13.1 |
| YCS10120 | 12.000 | 12.20 | 120 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 15.7 |
| YCS10140 | 14.000 | 14.20 | 140 | 4 | 1 1/8 | 2 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/4 | 19.5 |
| YCS10160 | 16.000 | 16.20 | 160 | 4 | 1 1/8 | 2 1/4 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/2 | 25.1 |
| YCS10180 | 18.000 | 18.20 | 180 | 4 | 1 1/8 | 2 1/4 | 1 1/4 | 2 3/8 | 1 1/8 | 3 1/2 | 29.6 |
| YCS10200 | 20.000 | 20.20 | 200 | 4 | 1 1/8 | 2 1/4 | 1 1/4 | 2 1/2 | 1 1/4 | 3 3/4 | 34.8 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

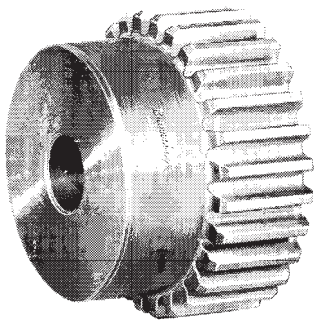
F

Table No. 2

## Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS10H30 | H | 3.000" | 3.20" | 30 | 6 | 1 1/4" | 1 7/8" | 1 1/4" | 7/16" | 7/16" | 2 1/2" | — | — | 3/16" | 2.8 |
| YSS10H35 | H | 3.500 | 3.70 | 35 | 6 | 1 1/4 | 1 7/8 | 1 1/4 | 7/16 | 7/16 | 2 1/2 | — | — | 3/16 | 2.6 |
| YSS10H40 | H | 4.000 | 4.20 | 40 | 6 | 1 1/4 | 1 7/8 | 1 1/4 | 7/16 | 7/16 | 2 1/2 | — | — | 3/16 | 3.6 |
| YSS10P45 | P1 | 4.500 | 4.70 | 45 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8" | 1 5/16" | 1/4 | 4.5 |
| YSS10P55 | P1 | 5.500 | 5.70 | 55 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.8 |
| YSS10P60 | P1 | 6.000 | 6.20 | 60 | 14 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.5 |
| YCS10P70 | P1 | 7.000 | 7.20 | 70 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.8 |
| YCS10P80 | P1 | 8.000 | 8.20 | 80 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 7.9 |
| YCS10P100 | P1 | 10.000 | 10.20 | 100 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.6 |
| YCS10P110 | P1 | 11.000 | 11.20 | 110 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 12.4 |
| YCS10P140 | P1 | 14.000 | 14.20 | 140 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 15.6 |
| YCS10P180 | P1 | 18.000 | 18.20 | 180 | 16 | 1 1/4 | 2 3/16 | 1 15/16 | 11/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 25.6 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

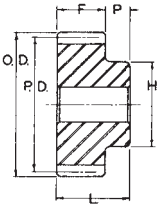


**For Bushing Details see Page A-1.**

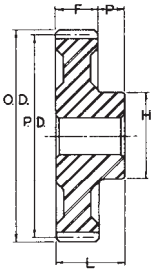
# 8 Pitch — 1 1/2" Face — 20° Pressure Angle

**Browning has All Three**

**Finished Bore Gears — All Steel** } **Off the Shelf**
**Bushing Type — Browning Split Taper® Bushings** } **Ready to Use**
**Minimum Bore Gears — Large Hubs for Reboring**



TYPE 2



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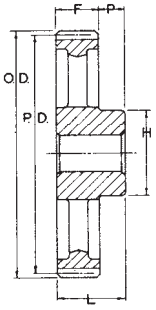

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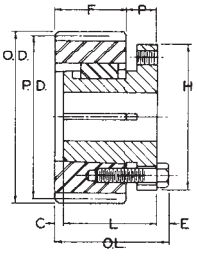

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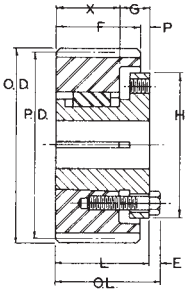
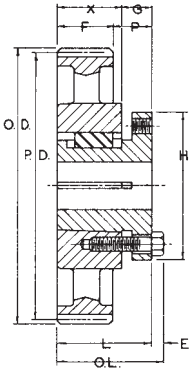
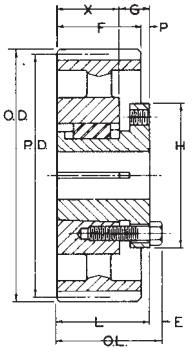


TYPE 12



TYPE 16



TYPE 17

**All Gears Individually Packaged and Clearly Labeled for Easy Identification**

## Bore Range

Table No. 1

| Bushing | Bore Range |
|---|---|
| P1 | 1/2" to 1 3/4" |
| Q1 | 3/4 to 2 11/16 |

## Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 1/2" & 9/16" | 1/8" x 1/16" |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 11/16 | 5/8 x 5/16 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

## 8 Pitch — 1 1/2" Face — 20° Pressure Angle

Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS812 | 1.500" | 1.75" | 12 | 2 | 3/4" | 3/4" | 1 1/2" | 2 1/4" | 3/4" | 1 1/8" | .6 |
| YSS814 | 1.750 | 2.00 | 14 | 2 | 3/4 | 3/4 | 1 1/2 | 2 1/4 | 3/4 | 1 3/8 | 1.0 |
| YSS815 | 1.875 | 2.12 | 15 | 2 | 3/4 | 7/8 | 1 1/2 | 2 1/4 | 3/4 | 1 1/2 | 1.2 |
| YSS816 | 2.000 | 2.25 | 16 | 2 | 7/8 | 1 | 1 1/2 | 2 3/8 | 7/8 | 1 5/8 | 1.4 |
| YSS818 | 2.250 | 2.50 | 18 | 2 | 7/8 | 1 1/8 | 1 1/2 | 2 3/8 | 7/8 | 1 7/8 | 1.9 |
| YSS820 | 2.500 | 2.75 | 20 | 2 | 7/8 | 1 1/4 | 1 1/2 | 2 3/8 | 7/8 | 2 1/8 | 2.5 |
| YSS822 | 2.750 | 3.00 | 22 | 2 | 7/8 | 1 1/2 | 1 1/2 | 2 3/8 | 7/8 | 2 3/8 | 3.0 |
| YSS824 | 3.000 | 3.25 | 24 | 2 | 7/8 | 1 3/4 | 1 1/2 | 2 3/8 | 7/8 | 2 5/8 | 3.9 |
| YSS828 | 3.500 | 3.75 | 28 | 2 | 7/8 | 2 1/8 | 1 1/2 | 2 3/8 | 7/8 | 3 1/8 | 5.4 |
| YSS832 | 4.000 | 4.25 | 32 | 2 | 1 | 2 1/8 | 1 1/2 | 2 1/2 | 1 | 3 1/8 | 6.9 |
| YSS836 | 4.500 | 4.75 | 36 | 2 | 1 | 2 1/8 | 1 1/2 | 2 1/2 | 1 | 3 1/8 | 8.3 |
| YSS840 | 5.000 | 5.25 | 40 | 2 | 1 | 2 1/8 | 1 1/2 | 2 1/2 | 1 | 3 1/8 | 9.9 |
| YSS844 | 5.500 | 5.75 | 44 | 2 | 1 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 12.5 |
| YSS848 | 6.000 | 6.25 | 48 | 2 | 1 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 14.5 |
| YSS856 | 7.000 | 7.25 | 56 | 2 | 1 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 19.0 |
| YSS860 | 7.500 | 7.75 | 60 | 2 | 1 | 2 1/4 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 21.1 |
| YCS864 | 8.000 | 8.25 | 64 | 4 | 1 | 2 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 12.9 |
| YCS872 | 9.000 | 9.25 | 72 | 4 | 1 | 2 | 1 1/2 | 2 1/2 | 1 | 3 1/4 | 14.3 |
| YCS880 | 10.000 | 10.25 | 80 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 16.6 |
| YCS888 | 11.000 | 11.25 | 88 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 17.8 |
| YCS896 | 12.000 | 12.25 | 96 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 20.1 |
| YCS8112 | 14.000 | 14.25 | 112 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 25.1 |
| YCS8120 | 15.000 | 15.25 | 120 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 26.7 |
| YCS8128 | 16.000 | 16.25 | 128 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 28.6 |
| YCS8144 | 18.000 | 18.25 | 144 | 4 | 1 1/8 | 2 | 1 1/2 | 2 3/4 | 1 1/4 | 3 1/4 | 34.9 |
| YCS8160 | 20.000 | 20.25 | 160 | 4 | 1 1/4 | 2 1/4 | 1 1/2 | 3 | 1 1/2 | 3 1/2 | 42.1 |

**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

Table No. 2

### Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS8P28 | P1 | 3.500" | 3.75" | 28 | 11 | 1 1/2" | 2 3/8" | 1 15/16" | 5/8" | 3/16" | 3" | — | — | 1/4" | 2.8 |
| YSS8P32 | P1 | 4.000 | 4.25 | 32 | 11 | 1 1/2 | 2 3/8 | 1 15/16 | 5/8 | 3/16 | 3 | — | — | 1/4 | 3.9 |
| YSS8P36 | P1 | 4.500 | 4.75 | 36 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8" | 1 5/16" | 1/4 | 5.1 |
| YSS8P40 | P1 | 5.000 | 5.25 | 40 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 6.4 |
| YSS8P44 | P1 | 5.500 | 5.75 | 44 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 8.0 |
| YSS8P48 | P1 | 6.000 | 6.25 | 48 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.1 |
| YSS8P56 | P1 | 7.000 | 7.25 | 56 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 14.0 |
| YSS8P60 | P1 | 7.500 | 7.75 | 60 | 12 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 15.8 |
| YCS8P64 | P1 | 8.000 | 8.25 | 64 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.8 |
| YCS8P72 | P1 | 9.000 | 9.25 | 72 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 10.9 |
| YCS8P80 | P1 | 10.000 | 10.25 | 80 | 17 | 1 1/2 | 2 3/16 | 1 15/16 | 7/16 | — | 3 | 5/8 | 1 5/16 | 1/4 | 12.3 |
| YCS8Q112 | Q1 | 14.000 | 14.25 | 112 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 21.9 |
| YCS8Q120 | Q1 | 15.000 | 15.25 | 120 | 16 | 1 1/2 | 2 25/32 | 2 1/2 | 1 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 24.8 |

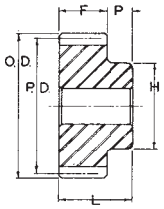
**All 60 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

**Note: 20° Pressure Angle Gears will not Mesh with 14 1/2° Pressure Angle Gears**

F

**6 Pitch** **2" Face** **20° Pressure Angle**

**For Engineering Data See Pages F-48 to F-71.**



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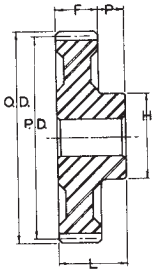

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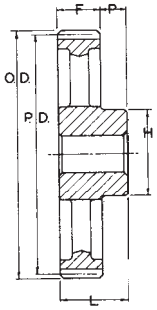

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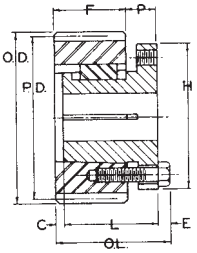

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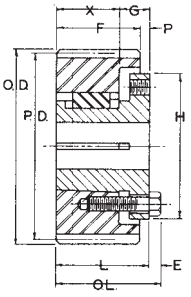

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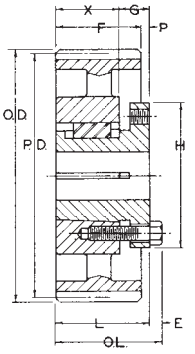
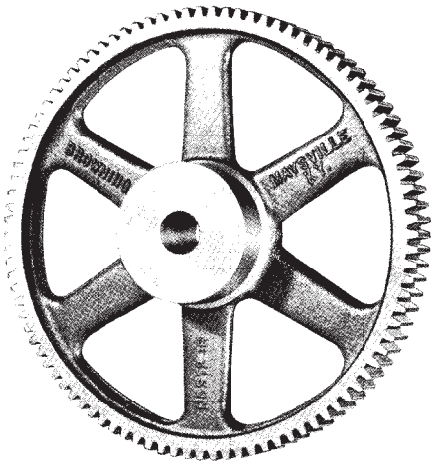


TYPE 17



## Bore Range

Table No. 1

| Bushing | Bore Range |
|---|---|
| P1 | 1/2" to 1 3/4" |
| Q1 | 3/4 to 2 11/16 |

**For Bushing Details see Page A-1.**

## Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 1/2" & 9/16" | 1/8" x 1/16" |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 & 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 3/4 | 5/8 x 5/16 |
| 2 13/16 to 3 3/16 | 3/4 x 3/8 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

## 6 Pitch  2" Face  20° Pressure Angle

Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS612 | 2.000" | 2.33" | 12 | 2 | 1" | 1" | 2" | 2 7/8" | 7/8" | 1 1/2" | 1.5 |
| YSS614 | 2.333 | 2.66 | 14 | 2 | 1 | 1 1/8 | 2 | 2 7/8 | 7/8 | 1 13/16 | 2.4 |
| YSS615 | 2.500 | 2.83 | 15 | 2 | 1 | 1 1/4 | 2 | 2 7/8 | 7/8 | 2 | 2.8 |
| YSS616 | 2.667 | 3.00 | 16 | 2 | 1 | 1 3/8 | 2 | 2 7/8 | 7/8 | 2 5/32 | 3.2 |
| YSS618 | 3.000 | 3.33 | 18 | 2 | 1 | 1 5/8 | 2 | 2 7/8 | 7/8 | 2 1/2 | 4.4 |
| YSS621 | 3.500 | 3.83 | 21 | 2 | 1 | 2 | 2 | 2 7/8 | 7/8 | 3 | 6.5 |
| YSS624 | 4.000 | 4.33 | 24 | 2 | 1 1/8 | 2 | 2 | 3 1/2 | 1 1/2 | 3 | 9.1 |
| YSS627 | 4.500 | 4.83 | 27 | 2 | 1 1/8 | 2 | 2 | 3 1/2 | 1 1/2 | 3 | 10.8 |
| YSS630 | 5.000 | 5.33 | 30 | 2 | 1 1/8 | 2 1/8 | 2 | 3 1/2 | 1 1/2 | 3 1/8 | 13.3 |
| YSS633 | 5.500 | 5.83 | 33 | 2 | 1 1/8 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 1/4 | 15.8 |
| YSS636 | 6.000 | 6.33 | 36 | 2 | 1 1/8 | 2 5/16 | 2 | 3 1/2 | 1 1/2 | 3 3/8 | 19.4 |
| YSS642 | 7.000 | 7.33 | 42 | 2 | 1 1/4 | 2 5/16 | 2 | 3 1/2 | 1 1/2 | 3 3/8 | 25.2 |
| YCS648 | 8.000 | 8.33 | 48 | 4 | 1 1/4 | 2 1/8 | 2 | 3 1/2 | 1 1/2 | 3 3/8 | 18.1 |
| YCS654 | 9.000 | 9.33 | 54 | 4 | 1 1/4 | 2 1/8 | 2 | 3 1/2 | 1 1/2 | 3 3/8 | 19.8 |
| YCS660 | 10.000 | 10.33 | 60 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 24.0 |
| YCS666 | 11.000 | 11.33 | 66 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 26.1 |
| YCS672 | 12.000 | 12.33 | 72 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 29.3 |
| YCS684 | 14.000 | 14.33 | 84 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 35.9 |
| YCS696 | 16.000 | 16.33 | 96 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 40.0 |
| YCS6108 | 18.000 | 18.33 | 108 | 4 | 1 1/4 | 2 1/4 | 2 | 3 1/2 | 1 1/2 | 3 3/4 | 45.9 |
| YCS6120 | 20.000 | 20.33 | 120 | 4 | 1 3/8 | 2 3/4 | 2 | 3 1/2 | 1 1/2 | 4 1/2 | 56.0 |

**All 42 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

Table No. 2

### Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS6P24 | P1 | 4.000" | 4.33" | 24 | 11 | 2" | 2 7/8" | 1 15/16" | 5/8" | 11/16" | 3" | — | — | 1/4" | 5.2 |
| YSS6P30 | P1 | 5.000 | 5.33 | 30 | 12 | 2 | 2 3/16 | 1 15/16 | 1/16U | — | 3 | 5/8" | 1 5/16" | 1/4 | 7.7 |
| YSS6P33 | P1 | 5.500 | 5.83 | 33 | 12 | 2 | 2 3/16 | 1 15/16 | 1/16U | — | 3 | 5/8 | 1 5/16 | 1/4 | 9.3 |
| YSS6P36 | P1 | 6.000 | 6.33 | 36 | 12 | 2 | 2 3/16 | 1 15/16 | 1/16U | — | 3 | 5/8 | 1 5/16 | 1/4 | 11.2 |
| YSS6P42 | P1 | 7.000 | 7.33 | 42 | 12 | 2 | 2 3/16 | 1 15/16 | 1/16U | — | 3 | 5/8 | 1 5/16 | 1/4 | 15.5 |
| YCS6Q48 | Q1 | 8.000 | 8.33 | 48 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 15.9 |
| YCS6Q54 | Q1 | 9.000 | 9.33 | 54 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 18.7 |
| YCS6Q60 | Q1 | 10.000 | 10.33 | 60 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 18.8 |
| YCS6Q66 | Q1 | 11.000 | 11.33 | 66 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 22.9 |
| YCS6Q72 | Q1 | 12.000 | 12.33 | 72 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 23.8 |
| YCS6Q96 | Q1 | 16.000 | 16.33 | 96 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 35.0 |
| YCS6Q108 | Q1 | 18.000 | 18.33 | 108 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 40.0 |
| YCS6Q120 | Q1 | 20.000 | 20.33 | 120 | 17 | 2 | 2 25/32 | 2 1/2 | 1/2 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 52.5 |

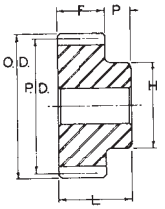
**All 42 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**
**NOTE - "U" after "P" dimension indicates bushing flange under rim by amount shown.**

## BROWNING® Gears— The most complete line of Stock Gears in Finished Bore, Minimum Bore and Bushing Types.

**5 Pitch** **2 1/2" Face** **20° Pressure Angle**

## Precision Inspected

## Distribution Nation - Wide and in Canada



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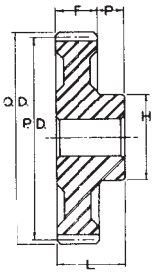

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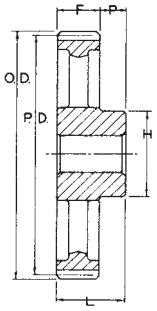

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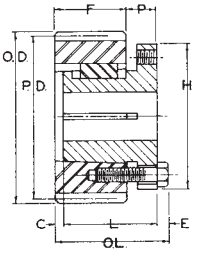

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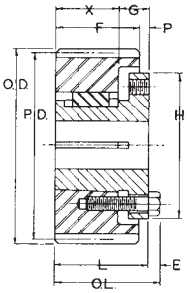

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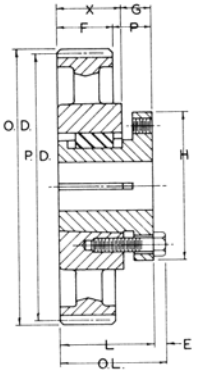

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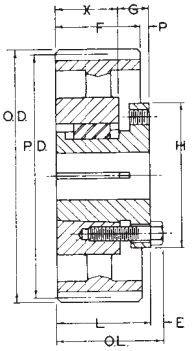


TYPE 17

F

### Bore Range

Table No. 1

| Bushing | Bore Range |
|---|---|
| P2 | 3/4" to 1 3/4" |
| Q1 | 3/4 to 2 11/16 |
| R1 | 1 1/8 to 3 3/4 |
| S1 | 1 11/16 to 4 1/4 |

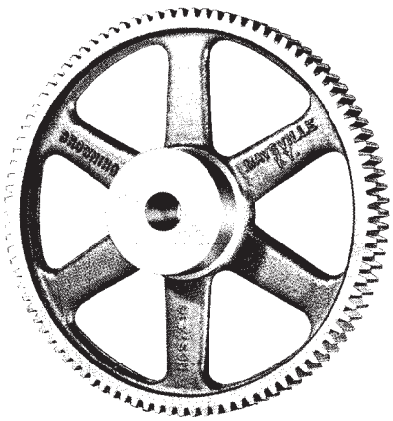
### Standard Keyseats

Table No. 2

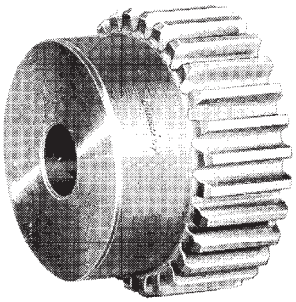
| Bore Range | Keyseat |
|---|---|
| 3/4" to 7/8" | 3/16" x 3/32" |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 5/16 to 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 3/4 | 5/8 x 5/16 |
| 2 13/16 to 3 1/4 | 3/4 x 3/8 |
| 3 5/16 to 3 3/4 | 7/8 x 7/16 |
| 3 3/16 to 4 1/4 | 1 x 1/2 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**

## All Items Individually Packaged



## For Bushing Details See Page A-1



## 5 Pitch — 2 1/2" Face — 20° Pressure Angle

Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| YSS512 | 2.400" | 2.80" | 12 | 2 | 1 1/8" | 1 1/8" | 2 1/2" | 3 3/8" | 7/8" | 1 13/16" | 2.8 |
| YSS514 | 2.800 | 3.20 | 14 | 2 | 1 1/8 | 1 3/8 | 2 1/2 | 3 3/8 | 7/8 | 2 3/16 | 4.2 |
| YSS515 | 3.000 | 3.40 | 15 | 2 | 1 1/8 | 1 1/2 | 2 1/2 | 3 3/8 | 7/8 | 2 3/8 | 5.0 |
| YSS516 | 3.200 | 3.60 | 16 | 2 | 1 1/8 | 1 3/4 | 2 1/2 | 3 3/8 | 7/8 | 2 5/8 | 5.9 |
| YSS518 | 3.600 | 4.00 | 18 | 2 | 1 1/8 | 2 | 2 1/2 | 3 3/8 | 7/8 | 3 | 7.8 |
| YSS520 | 4.000 | 4.40 | 20 | 2 | 1 1/8 | 2 3/8 | 2 1/2 | 3 3/8 | 7/8 | 3 3/8 | 10.0 |
| YSS524 | 4.800 | 5.20 | 24 | 2 | 1 1/8 | 2 3/8 | 2 1/2 | 3 3/4 | 1 1/4 | 3 3/4 | 15.5 |
| YSS525 | 5.000 | 5.40 | 25 | 2 | 1 1/8 | 3 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 17.8 |
| YSS528 | 5.600 | 6.00 | 28 | 2 | 1 1/8 | 3 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 21.4 |
| YSS530 | 6.000 | 6.40 | 30 | 2 | 1 1/8 | 3 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 24.0 |
| YSS535 | 7.000 | 7.40 | 35 | 2 | 1 1/4 | 3 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 31.9 |
| YCS540 | 8.000 | 8.40 | 40 | 3 | 1 1/4 | 2 5/8 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 30.0 |
| YCS545 | 9.000 | 9.40 | 45 | 3 | 1 1/4 | 2 5/8 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 30.3 |
| YCS550 | 10.000 | 10.40 | 50 | 4 | 1 1/4 | 2 5/8 | 2 1/2 | 3 3/4 | 1 1/4 | 4 1/4 | 33.3 |
| YCS560 | 12.000 | 12.40 | 60 | 4 | 1 3/8 | 2 3/4 | 2 1/2 | 4 | 1 1/2 | 4 1/2 | 45.7 |
| YCS570 | 14.000 | 14.40 | 70 | 4 | 1 3/8 | 2 3/4 | 2 1/2 | 4 | 1 1/2 | 4 1/2 | 49.0 |
| YCS580 | 16.000 | 16.40 | 80 | 4 | 1 3/8 | 2 3/4 | 2 1/2 | 4 | 1 1/2 | 4 1/2 | 56.5 |
| YCS590 | 18.000 | 18.40 | 90 | 4 | 1 3/8 | 2 3/4 | 2 1/2 | 4 | 1 1/2 | 4 3/4 | 65.5 |

**All 35 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

F

Table No. 2

### Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

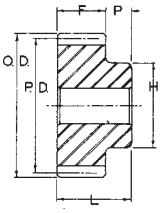
| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS5P18 | P2 | 3.600" | 4.00" | 18 | 11 | 2 1/2" | 3 3/8" | 2 15/16" | 5/8" | 3/16" | 3" | — | — | 1/4" | 4.9 |
| YSS5P20 | P2 | 4.000 | 4.40 | 20 | 11 | 2 1/2 | 3 3/8 | 2 15/16 | 5/8 | 3/16 | 3 | — | — | 1/4 | 6.7 |
| YSS5P35 | P2 | 7.000 | 7.40 | 35 | 12 | 2 1/2 | 3 3/16 | 2 15/16 | 7/16 | — | 3 | 5/8" | 2 5/16" | 1/4 | 24.0 |
| YCS5Q40 | Q1 | 8.000 | 8.40 | 40 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 18.6 |
| YCS5Q45 | Q1 | 9.000 | 9.40 | 45 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 22.2 |
| YCS5Q60 | Q1 | 12.000 | 12.40 | 60 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 32.9 |
| YCS5Q70 | Q1 | 14.000 | 14.40 | 70 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 35.9 |
| YCS5Q80 | Q1 | 16.000 | 16.40 | 80 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 47.1 |
| YCS5Q90 | Q1 | 18.000 | 18.40 | 90 | 17 | 2 1/2 | 2 25/32 | 2 1/2 | 0 | — | 4 1/8 | 3/4 | 1 3/4 | 9/32 | 52.0 |
| YCS5R100 | R1 | 20.000 | 20.40 | 100 | 17 | 2 1/2 | 3 5/32 | 2 7/8 | 3/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 60.0 |
| YCS5R120 | R1 | 24.000 | 24.40 | 120 | 17 | 2 1/2 | 3 5/32 | 2 7/8 | 3/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 77.0 |
| YCS5S140 | S1 | 28.000 | 28.40 | 140 | 16 | 2 1/2 | 4 3/4 | 4 3/8 | 1 7/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 141 |

**All 35 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

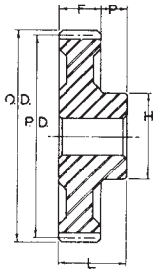
**Steel and Cast Iron High Quality Gears, with Split Taper Bushings — For Combined Strength and Economy.**

**4 Pitch** **3 1/2" Face** **20° Pressure Angle**

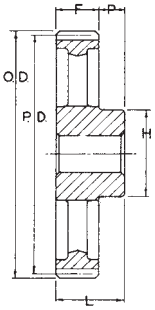
# BROWNING® Gears — The most complete line of Stock Gears in Finished Bore, Minimum Bore and Bushing Types.



TYPE 2



TYPE 3



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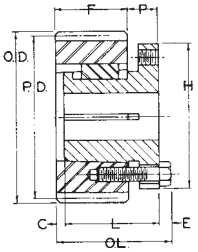
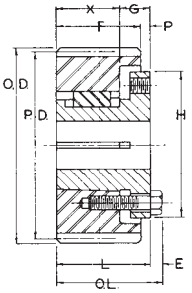


TYPE 11



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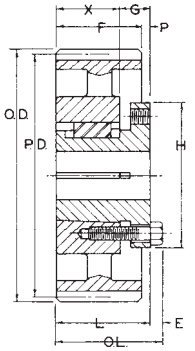
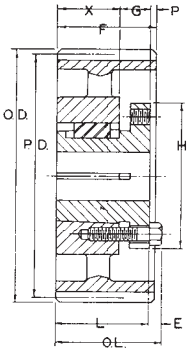


TYPE 17



TYPE 18

**For Engineering Data See Pages F-48 to F-71**

## Bore Range

Table No. 1

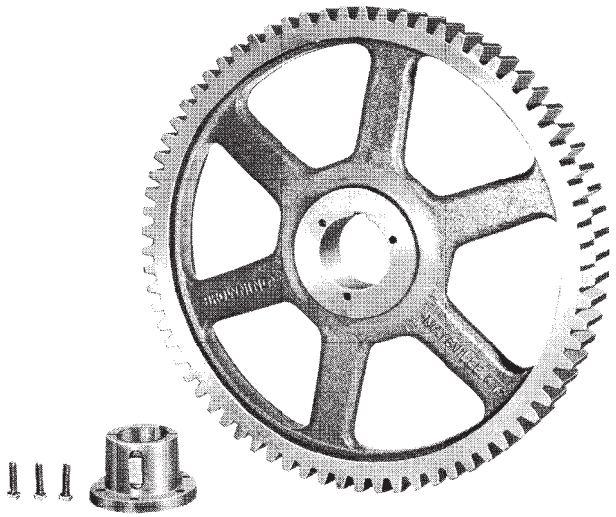
| Bushing | Bore Range |
|---|---|
| Q2 | 1" to 2 5/8" |
| R1 | 1 1/8 to 3 3/4 |
| S1 | 1 11/16 to 4 1/4 |

## Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 1" to 1 1/4" | 1/4" x 1/8" |
| 1 5/16 to 1 3/8 | 5/16 x 5/32 |
| 1 7/16 to 1 3/4 | 3/8 x 3/16 |
| 1 13/16 to 2 1/4 | 1/2 x 1/4 |
| 2 5/16 to 2 3/4 | 5/8 x 5/16 |
| 2 13/16 to 3 1/4 | 3/4 x 3/8 |
| 3 5/16 to 3 3/4 | 7/8 x 7/16 |
| 3 13/16 to 4 1/4 | 1 x 1/2 |

**1 3/8" Bore Bushings also available with 3/8" x 3/16" Ks.**



**For Bushing Details See Page A-1.**

## 4 Pitch — 3 1/2" Face — 20° Pressure Angle

Table No. 1

### Stock Steel and Cast Iron Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max | F | L | P | H | |
| YSS412 | 3.000" | 3.50" | 12 | 2 | 1 1/16" | 1 3/8" | 3 1/2" | 4 1/2" | 1" | 2 1/4" | 6.6 |
| YSS414 | 3.500 | 4.00 | 14 | 2 | 1 1/16 | 1 7/8 | 3 1/2 | 4 1/2 | 1 | 2 3/4 | 9.8 |
| YSS415 | 3.750 | 4.25 | 15 | 2 | 1 1/16 | 2 | 3 1/2 | 4 1/2 | 1 | 3 | 11.5 |
| YSS416 | 4.000 | 4.50 | 16 | 2 | 1 5/16 | 2 1/4 | 3 1/2 | 4 1/2 | 1 | 3 1/4 | 12.7 |
| YSS418 | 4.500 | 5.00 | 18 | 2 | 1 5/16 | 2 3/8 | 3 1/2 | 4 1/2 | 1 | 3 3/4 | 16.8 |
| YSS420 | 5.000 | 5.50 | 20 | 2 | 1 5/16 | 3 | 3 1/2 | 4 1/2 | 1 | 4 1/4 | 21.4 |
| YSS424 | 6.000 | 6.50 | 24 | 2 | 1 5/16 | 3 1/2 | 3 1/2 | 4 1/2 | 1 | 5 1/4 | 32.2 |
| YSS428 | 7.000 | 7.50 | 28 | 2 | 1 5/16 | 4 1/2 | 3 1/2 | 4 1/2 | 1 | 6 1/4 | 45.3 |
| YSS432 | 8.000 | 8.50 | 32 | 2 | 1 7/16 | 2 3/4 | 3 1/2 | 4 3/4 | 1 1/4 | 4 1/2 | 47.3 |
| YCS436 | 9.000 | 9.50 | 36 | 3 | 1 7/16 | 2 3/4 | 3 1/2 | 4 3/4 | 1 1/4 | 4 1/2 | 52.5 |
| YCS440 | 10.000 | 10.50 | 40 | 3 | 1 7/16 | 3 1/4 | 3 1/2 | 4 3/4 | 1 1/4 | 5 1/4 | 59.9 |
| YCS444 | 11.000 | 11.50 | 44 | 3 | 1 7/16 | 3 1/4 | 3 1/2 | 4 3/4 | 1 1/4 | 5 1/4 | 69.8 |
| YCS448 | 12.000 | 12.50 | 48 | 3 | 1 7/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 78.5 |
| YCS456 | 14.000 | 14.50 | 56 | 4 | 1 7/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 84.8 |
| YCS460 | 15.000 | 15.50 | 60 | 4 | 1 9/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 91.0 |
| YCS464 | 16.000 | 16.50 | 64 | 4 | 1 9/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 93.8 |
| YCS472 | 18.000 | 18.50 | 72 | 4 | 1 9/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 107.0 |
| YCS480 | 20.000 | 20.50 | 80 | 4 | 1 9/16 | 3 1/4 | 3 1/2 | 5 1/4 | 1 3/4 | 5 1/4 | 114.0 |

**All 32 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron.**

Table No. 2

### Stock Steel and Cast Iron Spur Gears with Browning Split Taper® Bushings

| Part No. | | Diameter | | No. Teeth | Type | Dimensions | | | | | | | | | Wt. Lbs. Less Bush. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Bush. | Pitch | Nominal O.D. | | | F | O.L. | L | P | C | H | G | X | E | |
| YSS4Q20 | Q2 | 5.000" | 5.50" | 20 | 11 | 3 1/2" | 4 17/32" | 3 1/2" | 3/4" | 3/4" | 4 1/8" | — | — | 9/32" | 12.9 |
| YSS4Q24 | Q2 | 6.000 | 6.50 | 24 | 11 | 3 1/2 | 4 17/32 | 3 1/2 | 3/4 | 3/4 | 4 1/8 | — | — | 9/32 | 21.5 |
| YSS4Q28 | Q2 | 7.000 | 7.50 | 28 | 12 | 3 1/2 | 3 25/32 | 3 1/2 | 0 | — | 4 1/8 | 3/4" | 2 3/4" | 9/32 | 29.4 |
| YSS4R32 | R1 | 8.000 | 8.50 | 32 | 12 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8* | — | 5 3/8 | 7/8 | 2 | 9/32 | 28.5 |
| YCS4R40 | R1 | 10.000 | 10.50 | 40 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 42.7 |
| YCS4R44 | R1 | 11.000 | 11.50 | 44 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 47.8 |
| YCS4R60 | R1 | 15.000 | 15.50 | 60 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 67.5 |
| YCS4R64 | R1 | 16.000 | 16.50 | 64 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 73.8 |
| YCS4R72 | R1 | 18.000 | 18.50 | 72 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 84.0 |
| YCS4R80 | R1 | 20.000 | 20.50 | 80 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 96.5 |
| YCS4R96 | R1 | 24.000 | 24.50 | 96 | 18 | 3 1/2 | 3 1/2 | 2 7/8 | 5/8 | — | 5 3/8 | 7/8 | 2 | 9/32 | 124 |
| YCS4S112 | S1 | 28.000 | 28.50 | 112 | 17 | 3 1/2 | 4 3/4 | 4 3/8 | 7/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 166 |
| YCS4S128 | S1 | 32.000 | 32.50 | 128 | 17 | 3 1/2 | 4 3/4 | 4 3/8 | 7/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 199 |
| YCS4S160 | S1 | 40.000 | 40.50 | 160 | 17 | 3 1/2 | 4 3/4 | 4 3/8 | 7/8 | — | 6 3/8 | 1 1/16 | 3 5/16 | 3/8 | 250 |

**All 32 Tooth Gears and smaller are Steel. All larger sizes, Cast Iron. *Face of bushing flange is under rim by amount shown.**

**Minimum Bore Gears are furnished without Keyseats or Setscrews. They can be re-bored to suit, Keyseated and Setscrewed. They have large machined hubs for easy reboring and wide bore range. For Shaft Ready Gears at lower Cost use Browning® Bushed Gears.**

# 20 Pitch — 3/8" Face — 14 1/2° Pressure Angle

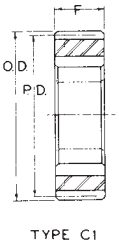
Table No. 1

## Specifications — Stock Steel Change Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs | Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Gear | Bush | | | | Pitch | Nominal O.D. | | | Gear | Bush. | | |
| NCG2020 | 1.000" | 1.10" | 20 | C1 | 5/8" | 7/16" | 3/8" | .06 | NCG2070 | 3.500" | 3.60" | 70 | C1 | 5/8" | 7/16" | 3/8" | 1.0 |
| NCG2021 | 1.050 | 1.15 | 21 | C1 | 5/8 | 7/16 | 3/8 | .06 | NCG2071 | 3.550 | 3.65 | 71 | C1 | 5/8 | 7/16 | 3/8 | 1.0 |
| NCG2022 | 1.100 | 1.20 | 22 | C1 | 5/8 | 7/16 | 3/8 | .06 | NCG2072 | 3.600 | 3.70 | 72 | C1 | 5/8 | 7/16 | 3/8 | 1.0 |
| NCG2023 | 1.150 | 1.25 | 23 | C1 | 5/8 | 7/16 | 3/8 | .06 | NCG2073 | 3.650 | 3.75 | 73 | C1 | 5/8 | 7/16 | 3/8 | 1.1 |
| NCG2024 | 1.200 | 1.30 | 24 | C1 | 5/8 | 7/16 | 3/8 | .09 | NCG2074 | 3.700 | 3.80 | 74 | C1 | 5/8 | 7/16 | 3/8 | 1.1 |
| NCG2025 | 1.250 | 1.35 | 25 | C1 | 5/8 | 7/16 | 3/8 | .09 | NCG2075 | 3.750 | 3.85 | 75 | C1 | 5/8 | 7/16 | 3/8 | 1.1 |
| NCG2026 | 1.300 | 1.40 | 26 | C1 | 5/8 | 7/16 | 3/8 | .09 | NCG2076 | 3.800 | 3.90 | 76 | C1 | 5/8 | 7/16 | 3/8 | 1.2 |
| NCG2027 | 1.350 | 1.45 | 27 | C1 | 5/8 | 7/16 | 3/8 | .09 | NCG2077 | 3.850 | 3.95 | 77 | C1 | 5/8 | 7/16 | 3/8 | 1.2 |
| NCG2028 | 1.400 | 1.50 | 28 | C1 | 5/8 | 7/16 | 3/8 | .13 | NCG2078 | 3.900 | 4.00 | 78 | C1 | 5/8 | 7/16 | 3/8 | 1.3 |
| NCG2029 | 1.450 | 1.55 | 29 | C1 | 5/8 | 7/16 | 3/8 | .13 | NCG2079 | 3.950 | 4.05 | 79 | C1 | 5/8 | 7/16 | 3/8 | 1.3 |
| NCG2030 | 1.500 | 1.60 | 30 | C1 | 5/8 | 7/16 | 3/8 | .13 | NCG2080 | 4.000 | 4.10 | 80 | C1 | 5/8 | 7/16 | 3/8 | 1.3 |
| NCG2031 | 1.550 | 1.65 | 31 | C1 | 5/8 | 7/16 | 3/8 | .13 | NCG2081 | 4.050 | 4.15 | 81 | C1 | 5/8 | 7/16 | 3/8 | 1.3 |
| NCG2032 | 1.600 | 1.70 | 32 | C1 | 5/8 | 7/16 | 3/8 | .13 | NCG2082 | 4.100 | 4.20 | 82 | C1 | 5/8 | 7/16 | 3/8 | 1.4 |
| NCG2033 | 1.650 | 1.75 | 33 | C1 | 5/8 | 7/16 | 3/8 | .19 | NCG2083 | 4.150 | 4.25 | 83 | C1 | 5/8 | 7/16 | 3/8 | 1.4 |
| NCG2034 | 1.700 | 1.80 | 34 | C1 | 5/8 | 7/16 | 3/8 | .19 | NCG2084 | 4.200 | 4.30 | 84 | C1 | 5/8 | 7/16 | 3/8 | 1.4 |
| NCG2035 | 1.750 | 1.85 | 35 | C1 | 5/8 | 7/16 | 3/8 | .19 | NCG2085 | 4.250 | 4.35 | 85 | C1 | 5/8 | 7/16 | 3/8 | 1.4 |
| NCG2036 | 1.800 | 1.90 | 36 | C1 | 5/8 | 7/16 | 3/8 | .19 | NCG2086 | 4.300 | 4.40 | 86 | C1 | 5/8 | 7/16 | 3/8 | 1.5 |
| NCG2037 | 1.850 | 1.95 | 37 | C1 | 5/8 | 7/16 | 3/8 | .19 | NCG2087 | 4.350 | 4.45 | 87 | C1 | 5/8 | 7/16 | 3/8 | 1.5 |
| NCG2038 | 1.900 | 2.00 | 38 | C1 | 5/8 | 7/16 | 3/8 | .25 | NCG2088 | 4.400 | 4.50 | 88 | C1 | 5/8 | 7/16 | 3/8 | 1.6 |
| NCG2039 | 1.950 | 2.05 | 39 | C1 | 5/8 | 7/16 | 3/8 | .25 | NCG2089 | 4.450 | 4.55 | 89 | C1 | 5/8 | 7/16 | 3/8 | 1.6 |
| NCG2040 | 2.000 | 2.10 | 40 | C1 | 5/8 | 7/16 | 3/8 | .25 | NCG2090 | 4.500 | 4.60 | 90 | C1 | 5/8 | 7/16 | 3/8 | 1.6 |
| NCG2041 | 2.050 | 2.15 | 41 | C1 | 5/8 | 7/16 | 3/8 | .25 | NCG2091 | 4.550 | 4.65 | 91 | C1 | 5/8 | 7/16 | 3/8 | 1.7 |
| NCG2042 | 2.100 | 2.20 | 42 | C1 | 5/8 | 7/16 | 3/8 | .31 | NCG2092 | 4.600 | 4.70 | 92 | C1 | 5/8 | 7/16 | 3/8 | 1.8 |
| NCG2043 | 2.150 | 2.25 | 43 | C1 | 5/8 | 7/16 | 3/8 | .31 | NCG2093 | 4.650 | 4.75 | 93 | C1 | 5/8 | 7/16 | 3/8 | 1.8 |
| NCG2044 | 2.200 | 2.30 | 44 | C1 | 5/8 | 7/16 | 3/8 | .31 | NCG2094 | 4.700 | 4.80 | 94 | C1 | 5/8 | 7/16 | 3/8 | 1.8 |
| NCG2045 | 2.250 | 2.35 | 45 | C1 | 5/8 | 7/16 | 3/8 | .31 | NCG2095 | 4.750 | 4.85 | 95 | C1 | 5/8 | 7/16 | 3/8 | 1.8 |
| NCG2046 | 2.300 | 2.40 | 46 | C1 | 5/8 | 7/16 | 3/8 | .31 | NCG2096 | 4.800 | 4.90 | 96 | C1 | 5/8 | 7/16 | 3/8 | 1.9 |
| NCG2047 | 2.350 | 2.45 | 47 | C1 | 5/8 | 7/16 | 3/8 | .38 | NCG2097 | 4.850 | 4.95 | 97 | C1 | 5/8 | 7/16 | 3/8 | 2.0 |
| NCG2048 | 2.400 | 2.50 | 48 | C1 | 5/8 | 7/16 | 3/8 | .38 | NCG2098 | 4.900 | 5.00 | 98 | C1 | 5/8 | 7/16 | 3/8 | 2.0 |
| NCG2049 | 2.450 | 2.55 | 49 | C1 | 5/8 | 7/16 | 3/8 | .38 | NCG2099 | 4.950 | 5.05 | 99 | C1 | 5/8 | 7/16 | 3/8 | 2.0 |
| NCG2050 | 2.500 | 2.60 | 50 | C1 | 5/8 | 7/16 | 3/8 | .44 | NCG20100 | 5.000 | 5.10 | 100 | C1 | 5/8 | 7/16 | 3/8 | 2.0 |
| NCG2051 | 2.550 | 2.65 | 51 | C1 | 5/8 | 7/16 | 3/8 | .44 | NCG20101 | 5.050 | 5.15 | 101 | C1 | 5/8 | 7/16 | 3/8 | 2.0 |
| NCG2052 | 2.600 | 2.70 | 52 | C1 | 5/8 | 7/16 | 3/8 | .50 | NCG20102 | 5.100 | 5.20 | 102 | C1 | 5/8 | 7/16 | 3/8 | 2.1 |
| NCG2053 | 2.650 | 2.75 | 53 | C1 | 5/8 | 7/16 | 3/8 | .50 | NCG20103 | 5.150 | 5.25 | 103 | C1 | 5/8 | 7/16 | 3/8 | 2.2 |
| NCG2054 | 2.700 | 2.80 | 54 | C1 | 5/8 | 7/16 | 3/8 | .50 | NCG20104 | 5.200 | 5.30 | 104 | C1 | 5/8 | 7/16 | 3/8 | 2.2 |
| NCG2055 | 2.750 | 2.85 | 55 | C1 | 5/8 | 7/16 | 3/8 | .56 | NCG20105 | 5.250 | 5.35 | 105 | C1 | 5/8 | 7/16 | 3/8 | 2.3 |
| NCG2056 | 2.800 | 2.90 | 56 | C1 | 5/8 | 7/16 | 3/8 | .56 | NCG20106 | 5.300 | 5.40 | 106 | C1 | 5/8 | 7/16 | 3/8 | 2.3 |
| NCG2057 | 2.850 | 2.95 | 57 | C1 | 5/8 | 7/16 | 3/8 | .56 | NCG20107 | 5.350 | 5.45 | 107 | C1 | 5/8 | 7/16 | 3/8 | 2.3 |
| NCG2058 | 2.900 | 3.00 | 58 | C1 | 5/8 | 7/16 | 3/8 | .63 | NCG20108 | 5.400 | 5.50 | 108 | C1 | 5/8 | 7/16 | 3/8 | 2.4 |
| NCG2059 | 2.950 | 3.05 | 59 | C1 | 5/8 | 7/16 | 3/8 | .63 | NCG20109 | 5.450 | 5.55 | 109 | C1 | 5/8 | 7/16 | 3/8 | 2.5 |
| NCG2060 | 3.000 | 3.10 | 60 | C1 | 5/8 | 7/16 | 3/8 | .69 | NCG20110 | 5.500 | 5.60 | 110 | C1 | 5/8 | 7/16 | 3/8 | 2.5 |
| NCG2061 | 3.050 | 3.15 | 61 | C1 | 5/8 | 7/16 | 3/8 | .69 | NCG20111 | 5.550 | 5.65 | 111 | C1 | 5/8 | 7/16 | 3/8 | 2.5 |
| NCG2062 | 3.100 | 3.20 | 62 | C1 | 5/8 | 7/16 | 3/8 | .69 | NCG20112 | 5.600 | 5.70 | 112 | C1 | 5/8 | 7/16 | 3/8 | 2.5 |
| NCG2063 | 3.150 | 3.25 | 63 | C1 | 5/8 | 7/16 | 3/8 | .69 | NCG20113 | 5.650 | 5.75 | 113 | C1 | 5/8 | 7/16 | 3/8 | 2.6 |
| NCG2064 | 3.200 | 3.30 | 64 | C1 | 5/8 | 7/16 | 3/8 | .75 | NCG20114 | 5.700 | 5.80 | 114 | C1 | 5/8 | 7/16 | 3/8 | 2.8 |
| NCG2065 | 3.250 | 3.35 | 65 | C1 | 5/8 | 7/16 | 3/8 | .75 | NCG20115 | 5.750 | 5.85 | 115 | C1 | 5/8 | 7/16 | 3/8 | 2.8 |
| NCG2066 | 3.300 | 3.40 | 66 | C1 | 5/8 | 7/16 | 3/8 | .81 | NCG20116 | 5.800 | 5.90 | 116 | C1 | 5/8 | 7/16 | 3/8 | 2.8 |
| NCG2067 | 3.350 | 3.45 | 67 | C1 | 5/8 | 7/16 | 3/8 | .81 | NCG20117 | 5.850 | 5.95 | 117 | C1 | 5/8 | 7/16 | 3/8 | 2.8 |
| NCG2068 | 3.400 | 3.50 | 68 | C1 | 5/8 | 7/16 | 3/8 | .88 | NCG20118 | 5.900 | 6.00 | 118 | C1 | 5/8 | 7/16 | 3/8 | 2.9 |
| NCG2069 | 3.450 | 3.55 | 69 | C1 | 5/8 | 7/16 | 3/8 | .94 | NCG20119 | 5.950 | 6.05 | 119 | C1 | 5/8 | 7/16 | 3/8 | 2.9 |
| | | | | | | | | | NCG20120 | 6.000 | 6.10 | 120 | C1 | 5/8 | 7/16 | 3/8 | 3.0 |

**These Change Gears can be used interchangeably with Spur Gears shown on Page F-5 for intermediate ratios.**

**See page A-7 for Steel Hubs for reworking these gears.**

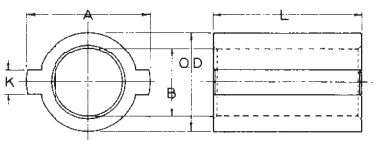


TYPE C1

Table No. 2

## Change Gear Bushing

| Part No. | Dimensions | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | O.D. | A | B | L | K | |
| CGB20 | 5/8" | 47/64" | 7/16" | 3/4" | 1/8" | .1 |




## All Browning® Change Gears Are Steel

# 16 Pitch — 1/2" Face — 14 1/2° Pressure Angle

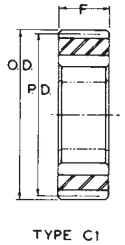
Table No. 1

## Specifications — Stock Steel Change Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs | Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Gear | Bush. | | | | Pitch | Nominal O.D. | | | Gear | Bush. | | |
| NCG1620 | 1.250" | 1.37" | 20 | C1 | 3/4" | 1/2" | 1/2" | .09 | NCG1675 | 4.688" | 4.81" | 75 | C1 | 3/4" | 1/2" | 1/2" | 2.5 |
| NCG1621 | 1.313 | 1.43 | 21 | C1 | 3/4 | 1/2 | 1/2 | .09 | NCG1676 | 4.750 | 4.87 | 76 | C1 | 3/4 | 1/2 | 1/2 | 2.7 |
| NCG1622 | 1.375 | 1.50 | 22 | C1 | 3/4 | 1/2 | 1/2 | .09 | NCG1677 | 4.813 | 4.93 | 77 | C1 | 3/4 | 1/2 | 1/2 | 2.8 |
| NCG1623 | 1.438 | 1.56 | 23 | C1 | 3/4 | 1/2 | 1/2 | .13 | NCG1678 | 4.875 | 5.00 | 78 | C1 | 3/4 | 1/2 | 1/2 | 2.8 |
| NCG1624 | 1.500 | 1.62 | 24 | C1 | 3/4 | 1/2 | 1/2 | .13 | NCG1679 | 4.938 | 5.06 | 79 | C1 | 3/4 | 1/2 | 1/2 | 2.8 |
| NCG1625 | 1.563 | 1.68 | 25 | C1 | 3/4 | 1/2 | 1/2 | .19 | NCG1680 | 5.000 | 5.12 | 80 | C1 | 3/4 | 1/2 | 1/2 | 3.0 |
| NCG1626 | 1.625 | 1.75 | 26 | C1 | 3/4 | 1/2 | 1/2 | .19 | NCG1681 | 5.063 | 5.18 | 81 | C1 | 3/4 | 1/2 | 1/2 | 3.0 |
| NCG1627 | 1.688 | 1.81 | 27 | C1 | 3/4 | 1/2 | 1/2 | .25 | NCG1682 | 5.125 | 5.25 | 82 | C1 | 3/4 | 1/2 | 1/2 | 3.0 |
| NCG1628 | 1.750 | 1.87 | 28 | C1 | 3/4 | 1/2 | 1/2 | .25 | NCG1683 | 5.188 | 5.31 | 83 | C1 | 3/4 | 1/2 | 1/2 | 3.2 |
| NCG1629 | 1.813 | 1.93 | 29 | C1 | 3/4 | 1/2 | 1/2 | .25 | NCG1684 | 5.250 | 5.37 | 84 | C1 | 3/4 | 1/2 | 1/2 | 3.3 |
| NCG1630 | 1.875 | 2.00 | 30 | C1 | 3/4 | 1/2 | 1/2 | .31 | NCG1685 | 5.313 | 5.43 | 85 | C1 | 3/4 | 1/2 | 1/2 | 3.3 |
| NCG1631 | 1.938 | 2.06 | 31 | C1 | 3/4 | 1/2 | 1/2 | .31 | NCG1686 | 5.375 | 5.50 | 86 | C1 | 3/4 | 1/2 | 1/2 | 3.3 |
| NCG1632 | 2.000 | 2.12 | 32 | C1 | 3/4 | 1/2 | 1/2 | .38 | NCG1687 | 5.438 | 5.56 | 87 | C1 | 3/4 | 1/2 | 1/2 | 3.5 |
| NCG1633 | 2.063 | 2.18 | 33 | C1 | 3/4 | 1/2 | 1/2 | .38 | NCG1688 | 5.500 | 5.62 | 88 | C1 | 3/4 | 1/2 | 1/2 | 3.5 |
| NCG1634 | 2.125 | 2.25 | 34 | C1 | 3/4 | 1/2 | 1/2 | .38 | NCG1689 | 5.563 | 5.68 | 89 | C1 | 3/4 | 1/2 | 1/2 | 3.6 |
| NCG1635 | 2.188 | 2.31 | 35 | C1 | 3/4 | 1/2 | 1/2 | .44 | NCG1690 | 5.625 | 5.75 | 90 | C1 | 3/4 | 1/2 | 1/2 | 3.8 |
| NCG1636 | 2.250 | 2.37 | 36 | C1 | 3/4 | 1/2 | 1/2 | .44 | NCG1691 | 5.688 | 5.81 | 91 | C1 | 3/4 | 1/2 | 1/2 | 3.8 |
| NCG1637 | 2.313 | 2.43 | 37 | C1 | 3/4 | 1/2 | 1/2 | .50 | NCG1692 | 5.750 | 5.87 | 92 | C1 | 3/4 | 1/2 | 1/2 | 3.8 |
| NCG1638 | 2.375 | 2.50 | 38 | C1 | 3/4 | 1/2 | 1/2 | .50 | NCG1693 | 5.813 | 5.93 | 93 | C1 | 3/4 | 1/2 | 1/2 | 3.9 |
| NCG1639 | 2.438 | 2.56 | 39 | C1 | 3/4 | 1/2 | 1/2 | .56 | NCG1694 | 5.875 | 6.00 | 94 | C1 | 3/4 | 1/2 | 1/2 | 4.1 |
| NCG1640 | 2.500 | 2.62 | 40 | C1 | 3/4 | 1/2 | 1/2 | .56 | NCG1695 | 5.938 | 6.06 | 95 | C1 | 3/4 | 1/2 | 1/2 | 4.1 |
| NCG1641 | 2.563 | 2.68 | 41 | C1 | 3/4 | 1/2 | 1/2 | .63 | NCG1696 | 6.000 | 6.12 | 96 | C1 | 3/4 | 1/2 | 1/2 | 4.3 |
| NCG1642 | 2.625 | 2.75 | 42 | C1 | 3/4 | 1/2 | 1/2 | .68 | NCG1697 | 6.063 | 6.18 | 97 | C1 | 3/4 | 1/2 | 1/2 | 4.3 |
| NCG1643 | 2.688 | 2.81 | 43 | C1 | 3/4 | 1/2 | 1/2 | .75 | NCG1698 | 6.125 | 6.25 | 98 | C1 | 3/4 | 1/2 | 1/2 | 4.3 |
| NCG1644 | 2.750 | 2.87 | 44 | C1 | 3/4 | 1/2 | 1/2 | .75 | NCG1699 | 6.188 | 6.31 | 99 | C1 | 3/4 | 1/2 | 1/2 | 4.4 |
| NCG1645 | 2.813 | 2.93 | 45 | C1 | 3/4 | 1/2 | 1/2 | .75 | NCG16100 | 6.250 | 6.37 | 100 | C1 | 3/4 | 1/2 | 1/2 | 4.6 |
| NCG1646 | 2.875 | 3.00 | 46 | C1 | 3/4 | 1/2 | 1/2 | .81 | NCG16101 | 6.313 | 6.43 | 101 | C1 | 3/4 | 1/2 | 1/2 | 4.8 |
| NCG1647 | 2.938 | 3.06 | 47 | C1 | 3/4 | 1/2 | 1/2 | .81 | NCG16102 | 6.375 | 6.50 | 102 | C1 | 3/4 | 1/2 | 1/2 | 4.8 |
| NCG1648 | 3.000 | 3.12 | 48 | C1 | 3/4 | 1/2 | 1/2 | .94 | NCG16103 | 6.438 | 6.56 | 103 | C1 | 3/4 | 1/2 | 1/2 | 4.9 |
| NCG1649 | 3.063 | 3.18 | 49 | C1 | 3/4 | 1/2 | 1/2 | .94 | NCG16104 | 6.500 | 6.62 | 104 | C1 | 3/4 | 1/2 | 1/2 | 5.1 |
| NCG1650 | 3.125 | 3.25 | 50 | C1 | 3/4 | 1/2 | 1/2 | 1.00 | NCG16105 | 6.563 | 6.68 | 105 | C1 | 3/4 | 1/2 | 1/2 | 5.1 |
| NCG1651 | 3.188 | 3.31 | 51 | C1 | 3/4 | 1/2 | 1/2 | 1.00 | NCG16106 | 6.625 | 6.75 | 106 | C1 | 3/4 | 1/2 | 1/2 | 5.2 |
| NCG1652 | 3.250 | 3.37 | 52 | C1 | 3/4 | 1/2 | 1/2 | 1.00 | NCG16107 | 6.688 | 6.81 | 107 | C1 | 3/4 | 1/2 | 1/2 | 5.2 |
| NCG1653 | 3.313 | 3.43 | 53 | C1 | 3/4 | 1/2 | 1/2 | 1.10 | NCG16108 | 6.750 | 6.87 | 108 | C1 | 3/4 | 1/2 | 1/2 | 5.3 |
| NCG1654 | 3.375 | 3.50 | 54 | C1 | 3/4 | 1/2 | 1/2 | 1.10 | NCG16109 | 6.813 | 6.93 | 109 | C1 | 3/4 | 1/2 | 1/2 | 5.4 |
| NCG1655 | 3.438 | 3.56 | 55 | C1 | 3/4 | 1/2 | 1/2 | 1.30 | NCG16110 | 6.875 | 7.00 | 110 | C1 | 3/4 | 1/2 | 1/2 | 5.5 |
| NCG1656 | 3.500 | 3.62 | 56 | C1 | 3/4 | 1/2 | 1/2 | 1.30 | NCG16111 | 6.938 | 7.06 | 111 | C1 | 3/4 | 1/2 | 1/2 | 5.5 |
| NCG1657 | 3.563 | 3.68 | 57 | C1 | 3/4 | 1/2 | 1/2 | 1.40 | NCG16112 | 7.000 | 7.12 | 112 | C1 | 3/4 | 1/2 | 1/2 | 5.8 |
| NCG1658 | 3.625 | 3.75 | 58 | C1 | 3/4 | 1/2 | 1/2 | 1.50 | NCG16113 | 7.063 | 7.18 | 113 | C1 | 3/4 | 1/2 | 1/2 | 5.8 |
| NCG1659 | 3.688 | 3.81 | 59 | C1 | 3/4 | 1/2 | 1/2 | 1.50 | NCG16114 | 7.125 | 7.25 | 114 | C1 | 3/4 | 1/2 | 1/2 | 6.0 |
| NCG1660 | 3.750 | 3.87 | 60 | C1 | 3/4 | 1/2 | 1/2 | 1.60 | NCG16115 | 7.188 | 7.31 | 115 | C1 | 3/4 | 1/2 | 1/2 | 6.3 |
| NCG1661 | 3.813 | 3.93 | 61 | C1 | 3/4 | 1/2 | 1/2 | 1.60 | NCG16116 | 7.250 | 7.37 | 116 | C1 | 3/4 | 1/2 | 1/2 | 6.3 |
| NCG1662 | 3.875 | 4.00 | 62 | C1 | 3/4 | 1/2 | 1/2 | 1.80 | NCG16117 | 7.313 | 7.43 | 117 | C1 | 3/4 | 1/2 | 1/2 | 6.3 |
| NCG1663 | 3.938 | 4.06 | 63 | C1 | 3/4 | 1/2 | 1/2 | 1.80 | NCG16118 | 7.375 | 7.50 | 118 | C1 | 3/4 | 1/2 | 1/2 | 6.4 |
| NCG1664 | 4.000 | 4.12 | 64 | C1 | 3/4 | 1/2 | 1/2 | 1.80 | NCG16119 | 7.438 | 7.56 | 119 | C1 | 3/4 | 1/2 | 1/2 | 6.4 |
| NCG1665 | 4.063 | 4.18 | 65 | C1 | 3/4 | 1/2 | 1/2 | 2.00 | NCG16120 | 7.500 | 7.62 | 120 | C1 | 3/4 | 1/2 | 1/2 | 6.5 |
| NCG1666 | 4.125 | 4.25 | 66 | C1 | 3/4 | 1/2 | 1/2 | 2.00 | NCG16121 | 7.563 | 7.68 | 121 | C1 | 3/4 | 1/2 | 1/2 | 6.8 |
| NCG1667 | 4.188 | 4.31 | 67 | C1 | 3/4 | 1/2 | 1/2 | 2.00 | NCG16122 | 7.625 | 7.75 | 122 | C1 | 3/4 | 1/2 | 1/2 | 6.8 |
| NCG1668 | 4.250 | 4.37 | 68 | C1 | 3/4 | 1/2 | 1/2 | 2.10 | NCG16123 | 7.688 | 7.81 | 123 | C1 | 3/4 | 1/2 | 1/2 | 7.0 |
| NCG1669 | 4.313 | 4.43 | 69 | C1 | 3/4 | 1/2 | 1/2 | 2.10 | NCG16124 | 7.750 | 7.87 | 124 | C1 | 3/4 | 1/2 | 1/2 | 7.0 |
| NCG1670 | 4.375 | 4.50 | 70 | C1 | 3/4 | 1/2 | 1/2 | 2.30 | NCG16125 | 7.813 | 7.93 | 125 | C1 | 3/4 | 1/2 | 1/2 | 7.2 |
| NCG1671 | 4.438 | 4.56 | 71 | C1 | 3/4 | 1/2 | 1/2 | 2.30 | NCG16126 | 7.875 | 8.00 | 126 | C1 | 3/4 | 1/2 | 1/2 | 7.2 |
| NCG1672 | 4.500 | 4.62 | 72 | C1 | 3/4 | 1/2 | 1/2 | 2.50 | NCG16127 | 7.938 | 8.06 | 127 | C1 | 3/4 | 1/2 | 1/2 | 7.4 |
| NCG1673 | 4.563 | 4.68 | 73 | C1 | 3/4 | 1/2 | 1/2 | 2.50 | NCG16128 | 8.000 | 8.12 | 128 | C1 | 3/4 | 1/2 | 1/2 | 7.4 |
| NCG1674 | 4.625 | 4.75 | 74 | C1 | 3/4 | 1/2 | 1/2 | 2.50 | NCG16129 | 8.063 | 8.18 | 129 | C1 | 3/4 | 1/2 | 1/2 | 7.5 |

**These Change Gears can be used interchangeably with Spur Gears shown on Page F-6 for intermediate ratios.**

**See page A-7 for Steel Hubs for reworking these gears.**

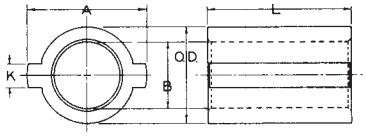


TYPE C1

Table No. 2

## Change Gear Bushing

| Part No. | Dimensions | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | O.D. | A | B | L | K | |
| CGB16 | 3/4" | 29/32" | 1/2" | 1" | 3/16" | .1 |

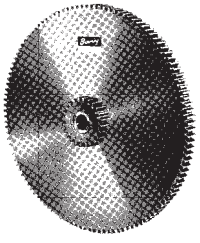


# 12 Pitch — 3/4" Face — 14 1/2° Pressure Angle

Table No. 1

## Specifications — Stock Steel Change Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. | Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Gear | Bush. | | | | Pitch | Nominal O.D. | | | Gear | Bush. | | |
| NCG1220 | 1.667" | 1.83" | 20 | C1 | 1" | 3/4" | 3/4" | .2 | NCG1270 | 5.833" | 6.00" | 70 | C1 | 1" | 3/4" | 3/4" | 6.8 |
| NCG1221 | 1.750 | 1.91 | 21 | C1 | 1 | 3/4 | 3/4 | .2 | NCG1271 | 5.917 | 6.08 | 71 | C1 | 1 | 3/4 | 3/4 | 7.0 |
| NCG1222 | 1.833 | 2.00 | 22 | C1 | 1 | 3/4 | 3/4 | .3 | NCG1272 | 6.000 | 6.16 | 72 | C1 | 1 | 3/4 | 3/4 | 7.3 |
| NCG1223 | 1.917 | 2.08 | 23 | C1 | 1 | 3/4 | 3/4 | .3 | NCG1273 | 6.083 | 6.25 | 73 | C1 | 1 | 3/4 | 3/4 | 7.4 |
| NCG1224 | 2.000 | 2.16 | 24 | C1 | 1 | 3/4 | 3/4 | .4 | NCG1274 | 6.167 | 6.33 | 74 | C1 | 1 1/4 | 3/4 | 3/4 | 7.6 |
| NCG1225 | 2.083 | 2.25 | 25 | C1 | 1 | 3/4 | 3/4 | .4 | NCG1275 | 6.250 | 6.41 | 75 | C1 | 1 | 3/4 | 3/4 | 7.6 |
| NCG1226 | 2.167 | 2.33 | 26 | C1 | 1 | 3/4 | 3/4 | .5 | NCG1276 | 6.333 | 6.50 | 76 | C1 | 1 | 3/4 | 3/4 | 8.0 |
| NCG1227 | 2.250 | 2.41 | 27 | C1 | 1 | 3/4 | 3/4 | .5 | NCG1277 | 6.417 | 6.58 | 77 | C1 | 1 | 3/4 | 3/4 | 8.1 |
| NCG1228 | 2.333 | 2.50 | 28 | C1 | 1 | 3/4 | 3/4 | .6 | NCG1278 | 6.500 | 6.66 | 78 | C1 | 1 | 3/4 | 3/4 | 8.4 |
| NCG1229 | 2.417 | 2.58 | 29 | C1 | 1 | 3/4 | 3/4 | .8 | NCG1279 | 6.583 | 6.75 | 79 | C1 | 1 | 3/4 | 3/4 | 8.7 |
| NCG1230 | 2.500 | 2.66 | 30 | C1 | 1 | 3/4 | 3/4 | .8 | NCG1280 | 6.667 | 6.83 | 80 | C1 | 1 | 3/4 | 3/4 | 8.7 |
| NCG1231 | 2.583 | 2.75 | 31 | C1 | 1 | 3/4 | 3/4 | .8 | NCG1281 | 6.750 | 6.91 | 81 | C1 | 1 | 3/4 | 3/4 | 8.8 |
| NCG1232 | 2.667 | 2.83 | 32 | C1 | 1 | 3/4 | 3/4 | 1.0 | NCG1282 | 6.833 | 7.00 | 82 | C1 | 1 | 3/4 | 3/4 | 8.9 |
| NCG1233 | 2.750 | 2.91 | 33 | C1 | 1 | 3/4 | 3/4 | 1.1 | NCG1283 | 6.917 | 7.08 | 83 | C1 | 1 | 3/4 | 3/4 | 9.2 |
| NCG1234 | 2.833 | 3.00 | 34 | C1 | 1 | 3/4 | 3/4 | 1.1 | NCG1284 | 7.000 | 7.16 | 84 | C1 | 1 | 3/4 | 3/4 | 9.4 |
| NCG1235 | 2.917 | 3.08 | 35 | C1 | 1 | 3/4 | 3/4 | 1.3 | NCG1285 | 7.083 | 7.25 | 85 | C1 | 1 | 3/4 | 3/4 | 9.5 |
| NCG1236 | 3.000 | 3.16 | 36 | C1 | 1 | 3/4 | 3/4 | 1.3 | NCG1286 | 7.167 | 7.33 | 86 | C1 | 1 | 3/4 | 3/4 | 9.8 |
| NCG1237 | 3.083 | 3.25 | 37 | C1 | 1 | 3/4 | 3/4 | 1.4 | NCG1287 | 7.250 | 7.41 | 87 | C1 | 1 | 3/4 | 3/4 | 10.0 |
| NCG1238 | 3.167 | 3.33 | 38 | C1 | 1 | 3/4 | 3/4 | 1.5 | NCG1288 | 7.333 | 7.50 | 88 | C1 | 1 | 3/4 | 3/4 | 10.2 |
| NCG1239 | 3.250 | 3.41 | 39 | C1 | 1 | 3/4 | 3/4 | 1.6 | NCG1289 | 7.417 | 7.58 | 89 | C1 | 1 | 3/4 | 3/4 | 10.5 |
| NCG1240 | 3.333 | 3.50 | 40 | C1 | 1 | 3/4 | 3/4 | 1.6 | NCG1290 | 7.500 | 7.66 | 90 | C1 | 1 | 3/4 | 3/4 | 10.5 |
| NCG1241 | 3.417 | 3.58 | 41 | C1 | 1 | 3/4 | 3/4 | 1.8 | NCG1291 | 7.583 | 7.75 | 91 | C1 | 1 | 3/4 | 3/4 | 11.2 |
| NCG1242 | 3.500 | 3.66 | 42 | C1 | 1 | 3/4 | 3/4 | 1.8 | NCG1292 | 7.667 | 7.83 | 92 | C1 | 1 | 3/4 | 3/4 | 11.2 |
| NCG1243 | 3.583 | 3.75 | 43 | C1 | 1 | 3/4 | 3/4 | 2.0 | NCG1293 | 7.750 | 7.91 | 93 | C1 | 1 | 3/4 | 3/4 | 11.6 |
| NCG1244 | 3.667 | 3.83 | 44 | C1 | 1 | 3/4 | 3/4 | 2.1 | NCG1294 | 7.833 | 8.00 | 94 | C1 | 1 | 3/4 | 3/4 | 11.8 |
| NCG1245 | 3.750 | 3.91 | 45 | C1 | 1 | 3/4 | 3/4 | 2.1 | NCG1295 | 7.917 | 8.08 | 95 | C1 | 1 | 3/4 | 3/4 | 12.0 |
| NCG1246 | 3.833 | 4.00 | 46 | C1 | 1 | 3/4 | 3/4 | 2.3 | NCG1296 | 8.000 | 8.16 | 96 | C1 | 1 | 3/4 | 3/4 | 12.1 |
| NCG1247 | 3.917 | 4.08 | 47 | C1 | 1 | 3/4 | 3/4 | 2.4 | NCG1297 | 8.083 | 8.25 | 97 | C1 | 1 | 3/4 | 3/4 | 12.5 |
| NCG1248 | 4.000 | 4.16 | 48 | C1 | 1 | 3/4 | 3/4 | 2.6 | NCG1298 | 8.167 | 8.33 | 98 | C1 | 1 | 3/4 | 3/4 | 12.6 |
| NCG1249 | 4.083 | 4.25 | 49 | C1 | 1 | 3/4 | 3/4 | 2.8 | NCG1299 | 8.250 | 8.41 | 99 | C1 | 1 | 3/4 | 3/4 | 12.9 |
| NCG1250 | 4.167 | 4.33 | 50 | C1 | 1 | 3/4 | 3/4 | 2.8 | NCG12100 | 8.333 | 8.50 | 100 | C1 | 1 | 3/4 | 3/4 | 13.1 |
| NCG1251 | 4.250 | 4.41 | 51 | C1 | 1 | 3/4 | 3/4 | 2.8 | NCG12101 | 8.417 | 8.58 | 101 | C1 | 1 | 3/4 | 3/4 | 13.1 |
| NCG1252 | 4.333 | 4.50 | 52 | C1 | 1 | 3/4 | 3/4 | 3.0 | NCG12102 | 8.500 | 8.66 | 102 | C1 | 1 | 3/4 | 3/4 | 13.4 |
| NCG1253 | 4.417 | 4.58 | 53 | C1 | 1 | 3/4 | 3/4 | 3.2 | NCG12103 | 8.583 | 8.75 | 103 | C1 | 1 | 3/4 | 3/4 | 13.7 |
| NCG1254 | 4.500 | 4.66 | 54 | C1 | 1 | 3/4 | 3/4 | 3.3 | NCG12104 | 8.667 | 8.83 | 104 | C1 | 1 | 3/4 | 3/4 | 13.9 |
| NCG1255 | 4.583 | 4.75 | 55 | C1 | 1 | 3/4 | 3/4 | 3.4 | NCG12105 | 8.750 | 8.91 | 105 | C1 | 1 | 3/4 | 3/4 | 14.3 |
| NCG1256 | 4.667 | 4.83 | 56 | C1 | 1 | 3/4 | 3/4 | 3.5 | NCG12106 | 8.833 | 9.00 | 106 | C1 | 1 | 3/4 | 3/4 | 14.5 |
| NCG1257 | 4.750 | 4.91 | 57 | C1 | 1 | 3/4 | 3/4 | 3.7 | NCG12107 | 8.917 | 9.08 | 107 | C1 | 1 | 3/4 | 3/4 | 14.7 |
| NCG1258 | 4.833 | 5.00 | 58 | C1 | 1 | 3/4 | 3/4 | 3.8 | NCG12108 | 9.000 | 9.16 | 108 | C1 | 1 | 3/4 | 3/4 | 14.7 |
| NCG1259 | 4.917 | 5.08 | 59 | C1 | 1 | 3/4 | 3/4 | 3.8 | NCG12109 | 9.083 | 9.25 | 109 | C1 | 1 | 3/4 | 3/4 | 15.2 |
| NCG1260 | 5.000 | 5.16 | 60 | C1 | 1 | 3/4 | 3/4 | 4.0 | NCG12110 | 9.167 | 9.33 | 110 | C1 | 1 | 3/4 | 3/4 | 15.5 |
| NCG1261 | 5.083 | 5.25 | 61 | C1 | 1 | 3/4 | 3/4 | 4.2 | NCG12111 | 9.250 | 9.41 | 111 | C1 | 1 | 3/4 | 3/4 | 15.6 |
| NCG1262 | 5.167 | 5.33 | 62 | C1 | 1 | 3/4 | 3/4 | 4.3 | NCG12112 | 9.333 | 9.50 | 112 | C1 | 1 | 3/4 | 3/4 | 16.1 |
| NCG1263 | 5.250 | 5.41 | 63 | C1 | 1 | 3/4 | 3/4 | 4.5 | NCG12113 | 9.417 | 9.58 | 113 | C1 | 1 | 3/4 | 3/4 | 16.2 |
| NCG1264 | 5.333 | 5.50 | 64 | C1 | 1 | 3/4 | 3/4 | 4.5 | NCG12114 | 9.500 | 9.66 | 114 | C1 | 1 | 3/4 | 3/4 | 16.5 |
| NCG1265 | 5.417 | 5.58 | 65 | C1 | 1 | 3/4 | 3/4 | 4.9 | NCG12115 | 9.583 | 9.75 | 115 | C1 | 1 | 3/4 | 3/4 | 17.2 |
| NCG1266 | 5.500 | 5.66 | 66 | C1 | 1 | 3/4 | 3/4 | 5.0 | NCG12116 | 9.667 | 9.83 | 116 | C1 | 1 | 3/4 | 3/4 | 17.6 |
| NCG1267 | 5.583 | 5.75 | 67 | C1 | 1 | 3/4 | 3/4 | 5.3 | NCG12117 | 9.750 | 9.91 | 117 | C1 | 1 | 3/4 | 3/4 | 17.7 |
| NCG1268 | 5.667 | 5.83 | 68 | C1 | 1 | 3/4 | 3/4 | 5.3 | NCG12118 | 9.833 | 10.00 | 118 | C1 | 1 | 3/4 | 3/4 | 18.0 |
| NCG1269 | 5.750 | 5.91 | 69 | C1 | 1 | 3/4 | 3/4 | 5.5 | NCG12119 | 9.917 | 10.08 | 119 | C1 | 1 | 3/4 | 3/4 | 18.2 |
| | | | | | | | | | NCG12120 | 10.000 | 10.16 | 120 | C1 | 1 | 3/4 | 3/4 | 18.3 |



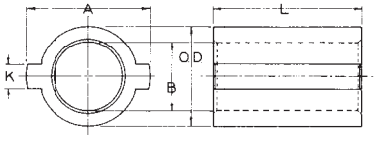
**These Change Gears can be used interchangeably with Spur Gears shown on Page F-7 and F-8 for intermediate ratios.**

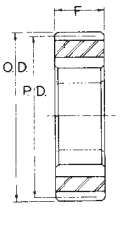
**See page A-7 for Steel Hubs for reworking these gears.**

Table No. 2

## Change Gear Bushing

| Part No. | Dimensions | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | O.D. | A | B | L | K | |
| CGB12 | 1" | 1 7/32" | 3/4" | 1 1/2" | 1/4" | .2 |




TYPE C1

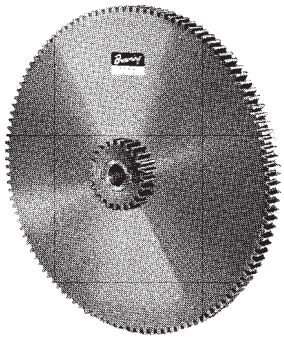
## All Browning® Change Gears Are Steel

# 10 Pitch — 1" Face — 14 1/2° Pressure Angle

Table No. 1

## Specifications — Stock Steel Change Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. | Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Gear | Bush. | | | | Pitch | Nominal O.D. | | | Gear | Bush. | | |
| NCG1020 | 2.000" | 2.20" | 20 | C1 | 1 1/4" | 1" | 1" | .4 | NCG1060 | 6.000" | 6.20" | 60 | C1 | 1 1/4" | 1" | 1" | 8.0 |
| NCG1021 | 2.100 | 2.30 | 21 | C1 | 1 1/4 | 1 | 1 | .5 | NCG1061 | 6.100 | 6.30 | 61 | C1 | 1 1/4 | 1 | 1 | 8.3 |
| NCG1022 | 2.200 | 2.40 | 22 | C1 | 1 1/4 | 1 | 1 | .7 | NCG1062 | 6.200 | 6.40 | 62 | C1 | 1 1/4 | 1 | 1 | 8.6 |
| NCG1023 | 2.300 | 2.50 | 23 | C1 | 1 1/4 | 1 | 1 | .8 | NCG1063 | 6.300 | 6.50 | 63 | C1 | 1 1/4 | 1 | 1 | 8.8 |
| NCG1024 | 2.400 | 2.60 | 24 | C1 | 1 1/4 | 1 | 1 | .9 | NCG1064 | 6.400 | 6.60 | 64 | C1 | 1 1/4 | 1 | 1 | 9.0 |
| NCG1025 | 2.500 | 2.70 | 25 | C1 | 1 1/4 | 1 | 1 | .9 | NCG1065 | 6.500 | 6.70 | 65 | C1 | 1 1/4 | 1 | 1 | 9.4 |
| NCG1026 | 2.600 | 2.80 | 26 | C1 | 1 1/4 | 1 | 1 | 1.0 | NCG1066 | 6.600 | 6.80 | 66 | C1 | 1 1/4 | 1 | 1 | 9.7 |
| NCG1027 | 2.700 | 2.90 | 27 | C1 | 1 1/4 | 1 | 1 | 1.2 | NCG1067 | 6.700 | 6.90 | 67 | C1 | 1 1/4 | 1 | 1 | 10.2 |
| NCG1028 | 2.800 | 3.00 | 28 | C1 | 1 1/4 | 1 | 1 | 1.4 | NCG1068 | 6.800 | 7.00 | 68 | C1 | 1 1/4 | 1 | 1 | 10.3 |
| NCG1029 | 2.900 | 3.10 | 29 | C1 | 1 1/4 | 1 | 1 | 1.5 | NCG1069 | 6.900 | 7.10 | 69 | C1 | 1 1/4 | 1 | 1 | 10.6 |
| NCG1030 | 3.000 | 3.20 | 30 | C1 | 1 1/4 | 1 | 1 | 1.6 | NCG1070 | 7.000 | 7.20 | 70 | C1 | 1 1/4 | 1 | 1 | 11.0 |
| NCG1031 | 3.100 | 3.30 | 31 | C1 | 1 1/4 | 1 | 1 | 1.8 | NCG1071 | 7.100 | 7.30 | 71 | C1 | 1 1/4 | 1 | 1 | 11.2 |
| NCG1032 | 3.200 | 3.40 | 32 | C1 | 1 1/4 | 1 | 1 | 1.8 | NCG1072 | 7.200 | 7.40 | 72 | C1 | 1 1/4 | 1 | 1 | 11.9 |
| NCG1033 | 3.300 | 3.50 | 33 | C1 | 1 1/4 | 1 | 1 | 1.9 | NCG1073 | 7.300 | 7.50 | 73 | C1 | 1 1/4 | 1 | 1 | 12.1 |
| NCG1034 | 3.400 | 3.60 | 34 | C1 | 1 1/4 | 1 | 1 | 2.1 | NCG1074 | 7.400 | 7.60 | 74 | C1 | 1 1/4 | 1 | 1 | 12.4 |
| NCG1035 | 3.500 | 3.70 | 35 | C1 | 1 1/4 | 1 | 1 | 2.3 | NCG1075 | 7.500 | 7.70 | 75 | C1 | 1 1/4 | 1 | 1 | 12.5 |
| NCG1036 | 3.600 | 3.80 | 36 | C1 | 1 1/4 | 1 | 1 | 2.4 | NCG1076 | 7.600 | 7.80 | 76 | C1 | 1 1/4 | 1 | 1 | 12.9 |
| NCG1037 | 3.700 | 3.90 | 37 | C1 | 1 1/4 | 1 | 1 | 2.6 | NCG1077 | 7.700 | 7.90 | 77 | C1 | 1 1/4 | 1 | 1 | 13.7 |
| NCG1038 | 3.800 | 4.00 | 38 | C1 | 1 1/4 | 1 | 1 | 2.7 | NCG1078 | 7.800 | 8.00 | 78 | C1 | 1 1/4 | 1 | 1 | 13.9 |
| NCG1039 | 3.900 | 4.10 | 39 | C1 | 1 1/4 | 1 | 1 | 2.9 | NCG1079 | 7.900 | 8.10 | 79 | C1 | 1 1/4 | 1 | 1 | 14.2 |
| NCG1040 | 4.000 | 4.20 | 40 | C1 | 1 1/4 | 1 | 1 | 3.0 | NCG1080 | 8.000 | 8.20 | 80 | C1 | 1 1/4 | 1 | 1 | 14.5 |
| NCG1041 | 4.100 | 4.30 | 41 | C1 | 1 1/4 | 1 | 1 | 3.4 | NCG1081 | 8.100 | 8.30 | 81 | C1 | 1 1/4 | 1 | 1 | 14.7 |
| NCG1042 | 4.200 | 4.40 | 42 | C1 | 1 1/4 | 1 | 1 | 3.5 | NCG1082 | 8.200 | 8.40 | 82 | C1 | 1 1/4 | 1 | 1 | 15.1 |
| NCG1043 | 4.300 | 4.50 | 43 | C1 | 1 1/4 | 1 | 1 | 3.6 | NCG1083 | 8.300 | 8.50 | 83 | C1 | 1 1/4 | 1 | 1 | 15.7 |
| NCG1044 | 4.400 | 4.60 | 44 | C1 | 1 1/4 | 1 | 1 | 3.8 | NCG1084 | 8.400 | 8.60 | 84 | C1 | 1 1/4 | 1 | 1 | 16.1 |
| NCG1045 | 4.500 | 4.70 | 45 | C1 | 1 1/4 | 1 | 1 | 4.1 | NCG1085 | 8.500 | 8.70 | 85 | C1 | 1 1/4 | 1 | 1 | 16.4 |
| NCG1046 | 4.600 | 4.80 | 46 | C1 | 1 1/4 | 1 | 1 | 4.1 | NCG1086 | 8.600 | 8.80 | 86 | C1 | 1 1/4 | 1 | 1 | 16.7 |
| NCG1047 | 4.700 | 4.90 | 47 | C1 | 1 1/4 | 1 | 1 | 4.5 | NCG1087 | 8.700 | 8.90 | 87 | C1 | 1 1/4 | 1 | 1 | 17.1 |
| NCG1048 | 4.800 | 5.00 | 48 | C1 | 1 1/4 | 1 | 1 | 4.7 | NCG1088 | 8.800 | 9.00 | 88 | C1 | 1 1/4 | 1 | 1 | 17.3 |
| NCG1049 | 4.900 | 5.10 | 49 | C1 | 1 1/4 | 1 | 1 | 4.9 | NCG1089 | 8.900 | 9.10 | 89 | C1 | 1 1/4 | 1 | 1 | 18.2 |
| NCG1050 | 5.000 | 5.20 | 50 | C1 | 1 1/4 | 1 | 1 | 5.6 | NCG1090 | 9.000 | 9.20 | 90 | C1 | 1 1/4 | 1 | 1 | 18.3 |
| NCG1051 | 5.100 | 5.30 | 51 | C1 | 1 1/4 | 1 | 1 | 5.7 | NCG1091 | 9.100 | 9.30 | 91 | C1 | 1 1/4 | 1 | 1 | 19.1 |
| NCG1052 | 5.200 | 5.40 | 52 | C1 | 1 1/4 | 1 | 1 | 6.0 | NCG1092 | 9.200 | 9.40 | 92 | C1 | 1 1/4 | 1 | 1 | 19.6 |
| NCG1053 | 5.300 | 5.50 | 53 | C1 | 1 1/4 | 1 | 1 | 6.1 | NCG1093 | 9.300 | 9.50 | 93 | C1 | 1 1/4 | 1 | 1 | 20.1 |
| NCG1054 | 5.400 | 5.60 | 54 | C1 | 1 1/4 | 1 | 1 | 6.6 | NCG1094 | 9.400 | 9.60 | 94 | C1 | 1 1/4 | 1 | 1 | 20.6 |
| NCG1055 | 5.500 | 5.70 | 55 | C1 | 1 1/4 | 1 | 1 | 6.6 | NCG1095 | 9.500 | 9.70 | 95 | C1 | 1 1/4 | 1 | 1 | 20.9 |
| NCG1056 | 5.600 | 5.80 | 56 | C1 | 1 1/4 | 1 | 1 | 7.1 | NCG1096 | 9.600 | 9.80 | 96 | C1 | 1 1/4 | 1 | 1 | 21.6 |
| NCG1057 | 5.700 | 5.90 | 57 | C1 | 1 1/4 | 1 | 1 | 7.2 | NCG1097 | 9.700 | 9.90 | 97 | C1 | 1 1/4 | 1 | 1 | 22.0 |
| NCG1058 | 5.800 | 6.00 | 58 | C1 | 1 1/4 | 1 | 1 | 7.5 | NCG1098 | 9.800 | 10.00 | 98 | C1 | 1 1/4 | 1 | 1 | 22.2 |
| NCG1059 | 5.900 | 6.10 | 59 | C1 | 1 1/4 | 1 | 1 | 7.7 | NCG1099 | 9.900 | 10.10 | 99 | C1 | 1 1/4 | 1 | 1 | 22.4 |
| | | | | | | | | | NCG10100 | 10.000 | 10.20 | 100 | C1 | 1 1/4 | 1 | 1 | 22.5 |



These Change Gears can be used interchangeably with Spur Gears shown on Page F-9 and F-10 for intermediate ratios.

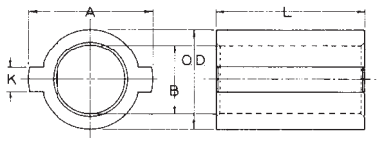
See page A-7 for Steel Hubs for reworking these gears.

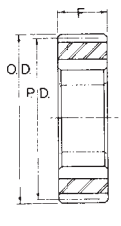
**All Browning® Change Gears Are Steel.**

Table No. 2

## Change Gear Bushing

| Part No. | Dimensions | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | O.D. | A | B | L | K | |
| CGB10 | 1 1/4" | 1 33/64" | 1" | 2" | 5/16" | .3 |



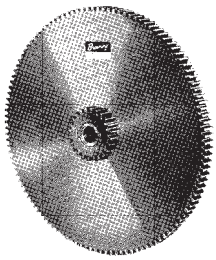
TYPE C1

# 8 Pitch — 1 1/4" Face — 14 1/2° Pressure Angle

Table No. 1

## Specifications - Stock Steel Change Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. | Part No. | Diameter | | No. Teeth | Type | Bore | | F | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Gear | Bush. | | | | Pitch | Nominal O.D. | | | Gear | Bush. | | |
| NCG820 | 2.500" | 2.75" | 20 | C1 | 1 3/8" | 1 1/8" | 1 1/4" | 1.1 | NCG860 | 7.500" | 7.75" | 60 | C1 | 1 3/8" | 1 1/8" | 1 1/4" | 15.4 |
| NCG821 | 2.625 | 2.87 | 21 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 1.3 | NCG861 | 7.625 | 7.87 | 61 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 15.8 |
| NCG822 | 2.750 | 3.00 | 22 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 1.4 | NCG862 | 7.750 | 8.00 | 62 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 16.5 |
| NCG823 | 2.875 | 3.12 | 23 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 1.6 | NCG863 | 7.875 | 8.12 | 63 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 16.9 |
| NCG824 | 3.000 | 3.25 | 24 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 1.8 | NCG864 | 8.000 | 8.25 | 64 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 17.7 |
| NCG825 | 3.125 | 3.37 | 25 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 2.0 | NCG865 | 8.125 | 8.37 | 65 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 18.1 |
| NCG826 | 3.250 | 3.50 | 26 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 2.3 | NCG866 | 8.250 | 8.50 | 66 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 18.6 |
| NCG827 | 3.375 | 3.62 | 27 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 2.5 | NCG867 | 8.375 | 8.62 | 67 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 19.3 |
| NCG828 | 3.500 | 3.75 | 28 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 2.7 | NCG868 | 8.500 | 8.75 | 68 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 19.7 |
| NCG829 | 3.625 | 3.87 | 29 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 2.8 | NCG869 | 8.625 | 8.87 | 69 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 20.8 |
| NCG830 | 3.750 | 4.00 | 30 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 3.3 | NCG870 | 8.750 | 9.00 | 70 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 21.5 |
| NCG831 | 3.875 | 4.12 | 31 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 3.6 | NCG871 | 8.875 | 9.12 | 71 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 22.2 |
| NCG832 | 4.000 | 4.25 | 32 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 3.8 | NCG872 | 9.000 | 9.25 | 72 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 22.6 |
| NCG833 | 4.125 | 4.37 | 33 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 4.0 | NCG873 | 9.125 | 9.37 | 73 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 23.3 |
| NCG834 | 4.250 | 4.50 | 34 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 4.3 | NCG874 | 9.250 | 9.50 | 74 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 24.0 |
| NCG835 | 4.375 | 4.62 | 35 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 4.6 | NCG875 | 9.375 | 9.62 | 75 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 25.4 |
| NCG836 | 4.500 | 4.75 | 36 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 4.9 | NCG876 | 9.500 | 9.75 | 76 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 25.6 |
| NCG837 | 4.625 | 4.87 | 37 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 5.3 | NCG877 | 9.625 | 9.87 | 77 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 26.5 |
| NCG838 | 4.750 | 5.00 | 38 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 5.6 | NCG878 | 9.750 | 10.00 | 78 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 26.8 |
| NCG839 | 4.875 | 5.12 | 39 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 5.9 | NCG879 | 9.875 | 10.12 | 79 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 27.5 |
| NCG840 | 5.000 | 5.25 | 40 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 6.3 | NCG880 | 10.000 | 10.25 | 80 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 28.1 |
| NCG841 | 5.125 | 5.37 | 41 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 7.3 | NCG881 | 10.125 | 10.37 | 81 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 29.3 |
| NCG842 | 5.250 | 5.50 | 42 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 7.3 | NCG882 | 10.250 | 10.50 | 82 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 30.1 |
| NCG843 | 5.375 | 5.62 | 43 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 7.8 | NCG883 | 10.375 | 10.62 | 83 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 30.9 |
| NCG844 | 5.500 | 5.75 | 44 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 8.1 | NCG884 | 10.500 | 10.75 | 84 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 31.2 |
| NCG845 | 5.625 | 5.87 | 45 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 8.6 | NCG885 | 10.625 | 10.87 | 85 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 32.5 |
| NCG846 | 5.750 | 6.00 | 46 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 9.0 | NCG886 | 10.750 | 11.00 | 86 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 32.9 |
| NCG847 | 5.875 | 6.12 | 47 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 9.4 | NCG887 | 10.875 | 11.12 | 87 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 33.5 |
| NCG848 | 6.000 | 6.25 | 48 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 9.7 | NCG888 | 11.000 | 11.25 | 88 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 33.8 |
| NCG849 | 6.125 | 6.37 | 49 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 10.0 | NCG889 | 11.125 | 11.37 | 89 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 34.8 |
| NCG850 | 6.250 | 6.50 | 50 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 10.7 | NCG890 | 11.250 | 11.50 | 90 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 36.6 |
| NCG851 | 6.375 | 6.62 | 51 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 11.0 | NCG891 | 11.375 | 11.62 | 91 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 36.9 |
| NCG852 | 6.500 | 6.75 | 52 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 11.7 | NCG892 | 11.500 | 11.75 | 92 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 37.8 |
| NCG853 | 6.625 | 6.87 | 53 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 11.9 | NCG893 | 11.625 | 11.87 | 93 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 38.6 |
| NCG854 | 6.750 | 7.00 | 54 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 12.3 | NCG894 | 11.750 | 12.00 | 94 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 40.2 |
| NCG855 | 6.875 | 7.12 | 55 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 13.1 | NCG895 | 11.875 | 12.12 | 95 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 40.5 |
| NCG856 | 7.000 | 7.25 | 56 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 13.3 | NCG896 | 12.000 | 12.25 | 96 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 41.0 |
| NCG857 | 7.125 | 7.37 | 57 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 13.9 | NCG897 | 12.125 | 12.37 | 97 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 41.6 |
| NCG858 | 7.250 | 7.50 | 58 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 14.6 | NCG898 | 12.250 | 12.50 | 98 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 43.9 |
| NCG859 | 7.375 | 7.62 | 59 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 15.2 | NCG899 | 12.375 | 12.62 | 99 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 44.2 |
| | | | | | | | | | NCG8100 | 12.500 | 12.75 | 100 | C1 | 1 3/8 | 1 1/8 | 1 1/4 | 45.5 |



**These Change Gears can be used interchangeably with Spur Gears shown on Page F-11 and F-12 for intermediate ratios.**

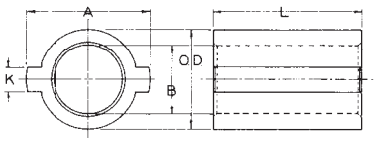
**See page A-7 for Steel Hubs for reworking these gears.**

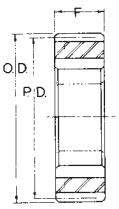
**All Browning® Change Gears Are Steel.**

Table No. 2

## Change Gear Bushing

| Part No. | Dimensions | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | O.D. | A | B | L | K | |
| CGB8 | 1 3/8" | 1 45/64" | 1 1/8" | 2 1/2" | 3/8" | .4 |




TYPE C1

## 14 1/2° Pressure Angle

**Will not operate with 20° Gears**

Table No. 1

### Stock Steel Rack

| Part No. | Stock Lengths | Pitch | Dimensions | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | | | W | T | B | |
| 4NSR32x3/16 | 4 Ft. | 32 | 3/16" | 3/16" | .156" | .5 |
| 6NSR32x3/16 | 6 Ft. | 32 | 3/16 | 3/16 | .156 | 1.2 |
| 2NSR24x1/4 | 2 Ft. | 24 | 1/4 | 1/4 | .208 | .5 |
| 4NSR24x1/4 | 4 Ft. | 24 | 1/4 | 1/4 | .208 | 1.1 |
| 6NSR24x1/4 | 6 Ft. | 24 | 1/4 | 1/4 | .208 | 1.5 |
| 2NSR20x3/8 | 2 Ft. | 20 | 3/8 | 3/8 | .325 | .9 |
| 4NSR20x3/8 | 4 Ft. | 20 | 3/8 | 3/8 | .325 | 1.8 |
| 6NSR20x3/8 | 6 Ft. | 20 | 3/8 | 3/8 | .325 | 3.0 |
| 4NSR16x5/16 | 4 Ft. | 16 | 5/16 | 5/16 | .250 | 1.4 |
| 6NSR16x5/16 | 6 Ft. | 16 | 5/16 | 5/16 | .250 | 2.0 |
| 4NSR16x1/2 | 4 Ft. | 16 | 1/2 | 1/2 | .438 | 3.3 |
| 6NSR16x1/2 | 6 Ft. | 16 | 1/2 | 1/2 | .438 | 4.8 |
| 12NSR16x1/2 | 12 Ft. | 16 | 1/2 | 1/2 | .438 | 10.0 |
| 4NSR12x1/2 | 4 Ft. | 12 | 3/4 | 1/2 | .417 | 4.5 |
| 6NSR12x1/2 | 6 Ft. | 12 | 3/4 | 1/2 | .417 | 6.8 |
| 4NSR12x3/4 | 4 Ft. | 12 | 3/4 | 3/4 | .667 | 7.1 |
| 6NSR12x3/4 | 6 Ft. | 12 | 3/4 | 3/4 | .667 | 10.6 |
| 12NSR12x3/4 | 12 Ft. | 12 | 3/4 | 3/4 | .667 | 22.0 |
| 4NSR10x5/8 | 4 Ft. | 10 | 1 | 5/8 | .525 | 7.6 |
| 6NSR10x5/8 | 6 Ft. | 10 | 1 | 5/8 | .525 | 11.4 |
| 12NSR10x5/8 | 12 Ft. | 10 | 1 | 5/8 | .525 | 22.0 |
| 4NSR10x1 | 4 Ft. | 10 | 1 | 1 | .900 | 12.8 |
| 6NSR10x1 | 6 Ft. | 10 | 1 | 1 | .900 | 19.1 |
| 12NSR10x1 | 12 Ft. | 10 | 1 | 1 | .900 | 40.0 |
| 4NSR8x3/4 | 4 Ft. | 8 | 1 1/4 | 3/4 | .625 | 11.0 |
| 6NSR8x3/4 | 6 Ft. | 8 | 1 1/4 | 3/4 | .625 | 16.5 |
| 12NSR8x3/4 | 12 Ft. | 8 | 1 1/4 | 3/4 | .625 | 33.0 |
| 4NSR8x1 1/4 | 4 Ft. | 8 | 1 1/4 | 1 1/4 | 1.125 | 19.3 |
| 6NSR8x1 1/4 | 6 Ft. | 8 | 1 1/4 | 1 1/4 | 1.125 | 29.3 |
| 12NSR8x1 1/4 | 12 Ft. | 8 | 1 1/4 | 1 1/4 | 1.125 | 60.0 |
| 4NSR6x1 | 4 Ft. | 6 | 1 1/2 | 1 | .833 | 16.9 |
| 6NSR6x1 | 6 Ft. | 6 | 1 1/2 | 1 | .833 | 25.7 |
| 4NSR6x1 1/2 | 4 Ft. | 6 | 1 1/2 | 1 1/2 | 1.333 | 27.5 |
| 6NSR6x1 1/2 | 6 Ft. | 6 | 1 1/2 | 1 1/2 | 1.333 | 41.3 |
| 4NSR5x1 1/4 | 4 Ft. | 5 | 1 3/4 | 1 1/4 | 1.050 | 31.3 |
| 6NSR5x1 1/4 | 6 Ft. | 5 | 1 3/4 | 1 1/4 | 1.050 | 47.8 |
| 4NSR5x1 1/2 | 4 Ft. | 5 | 1 3/4 | 1 1/2 | 1.300 | 25.0 |
| 6NSR5x1 1/2 | 6 Ft. | 5 | 1 3/4 | 1 1/2 | 1.300 | 37.9 |
| 4NSR4x1 1/2 | 4 Ft. | 4 | 2 | 1 1/2 | 1.250 | 34.1 |
| 6NSR4x1 1/2 | 6 Ft. | 4 | 2 | 1 1/2 | 1.250 | 50.8 |
| 4NSR4x2 | 4 Ft. | 4 | 2 | 2 | 1.750 | 48.0 |
| 6NSR4x2 | 6 Ft. | 4 | 2 | 2 | 1.750 | 71.5 |
| 4NSR3x1 1/2 | 4 Ft. | 3 | 3 | 1 1/2 | 1.167 | 47.3 |
| 6NSR3x1 1/2 | 6 Ft. | 3 | 3 | 1 1/2 | 1.167 | 70.5 |

**Furnished only in stock lengths shown. Other lengths available on special order. Price on application.**

## 20° Pressure Angle

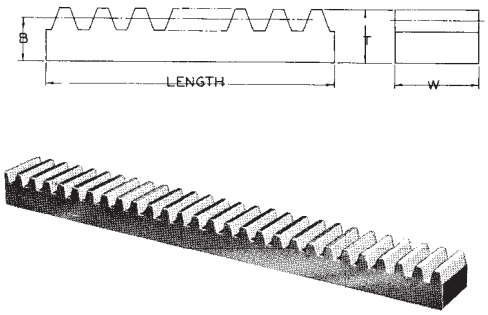
**Will not operate with 14 1/2° Gears**

Table No. 2

### Stock Steel Rack

| Part No. | Stock Lengths | Pitch | Dimensions | | | Wt. Lbs. |
|---|---|---|---|---|---|---|
| | | | W | T | B | |
| 4YSR20x1/2 | 4 Ft. | 20 | 1/2" | 1/2" | .450" | 3.4 |
| 6YSR20x1/2 | 6 Ft. | 20 | 1/2 | 1/2 | .450 | 5.0 |
| 4YSR16x3/4 | 4 Ft. | 16 | 3/4 | 3/4 | .688 | 7.3 |
| 6YSR16x3/4 | 6 Ft. | 16 | 3/4 | 3/4 | .688 | 11.1 |
| 4YSR12x1 | 4 Ft. | 12 | 1 | 1 | .917 | 13.0 |
| 6YSR12x1 | 6 Ft. | 12 | 1 | 1 | .917 | 19.6 |
| 4YSR10x1 1/4 | 4 Ft. | 10 | 1 1/4 | 1 1/4 | 1.150 | 20.0 |
| 6YSR10x1 1/4 | 6 Ft. | 10 | 1 1/4 | 1 1/4 | 1.150 | 30.0 |
| 4YSR8x1 1/2 | 4 Ft. | 8 | 1 1/2 | 1 1/2 | 1.375 | 28.0 |
| 6YSR8x1 1/2 | 6 Ft. | 8 | 1 1/2 | 1 1/2 | 1.375 | 42.0 |
| 4YSR6x1 1/2 | 4 Ft. | 6 | 2 | 1 1/2 | 1.333 | 36.9 |
| 6YSR6x1 1/2 | 6 Ft. | 6 | 2 | 1 1/2 | 1.333 | 55.0 |
| 4YSR5x1 1/2 | 4 Ft. | 5 | 2 1/2 | 1 1/2 | 1.300 | 44.9 |
| 6YSR5x1 1/2 | 6 Ft. | 5 | 2 1/2 | 1 1/2 | 1.300 | 66.8 |
| 4YSR4x2 | 4 Ft. | 4 | 3 1/2 | 2 | 1.750 | 83.0 |
| 6YSR4x2 | 6 Ft. | 4 | 3 1/2 | 2 | 1.750 | 125 |

**Furnished only in stock lengths shown. Other lengths available on special order. Price on application.**





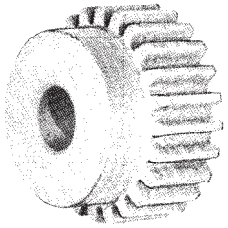

**STOCK LENGTHS ARE EXTRA LONG TO ALLOW FOR CUTTING AND MATCHING.**

F

BROWNING® Non-Metallic Spur Gears are made of laminated Phenolic material having high impact strength. This material has excellent qualities of resistance to moisture and wear

Non-metallic Gears are usually employed as driving pinions with steel or cast iron mating gears, where the reduction of noise is of primary importance and where pitch line velocities exceed 1000 FPM. These Gears prove more effective at high speeds but are not recommended for continual low speed high torque applications.

These Gears should be well lubricated, same as metallic Gears, for increased life, and they should not be used where temperatures exceed 350° F.



## 16Pitch 1/2"Face 14 1/2° Pressure Angle

Table No. 1

### Stock Non-Metallic Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS1616 | 1.000" | 1.12" | 16 | N1 | 3/8" | 3/8" | 1/2" | 1" | 1/2" | 13/16" | .06 |
| NFS1620 | 1.250 | 1.37 | 20 | N1 | 3/8 | 9/16 | 1/2 | 1 | 1/2 | 1 1/16 | .09 |
| NFS1624 | 1.500 | 1.62 | 24 | N1 | 1/2 | 3/4 | 1/2 | 1 | 1/2 | 1 5/16 | .13 |
| NFS1632 | 2.000 | 2.12 | 32 | N1 | 1/2 | 1 | 1/2 | 1 | 1/2 | 1 13/16 | .13 |
| NFS1640A | 2.500 | 2.62 | 40 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .13 |
| NFS1648A | 3.000 | 3.12 | 48 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .19 |
| NFS1656A | 3.500 | 3.62 | 56 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .25 |
| NFS1664A | 4.000 | 4.12 | 64 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .31 |
| NFS1680A | 5.000 | 5.12 | 80 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .44 |
| NFS1696A | 6.000 | 6.12 | 96 | N2 | 1/2 | — | 1/2 | 1/2 | — | — | .69 |

## 12Pitch 3/4"Face 14 1/2° Pressure Angle

Table No. 2

### Stock Non-Metallic Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS1215 | 1.250" | 1.41" | 15 | N1 | 1/2" | 1/2" | 3/4" | 1 1/4" | 1/2" | 1" | .06 |
| NFS1218 | 1.500 | 1.66 | 18 | N1 | 1/2 | 5/8 | 3/4 | 1 1/4 | 1/2 | 1 1/4 | .09 |
| NFS1221 | 1.750 | 1.91 | 21 | N1 | 1/2 | 3/4 | 3/4 | 1 1/4 | 1/2 | 1 1/2 | .13 |
| NFS1224 | 2.000 | 2.16 | 24 | N1 | 5/8 | 1 | 3/4 | 1 1/4 | 1/2 | 1 3/4 | .19 |
| NFS1230 | 2.500 | 2.66 | 30 | N1 | 5/8 | 1 1/2 | 3/4 | 1 1/4 | 1/2 | 2 1/4 | .25 |
| NFS1236A | 3.000 | 3.16 | 36 | N2 | 5/8 | — | 3/4 | 3/4 | — | — | .25 |
| NFS1242A | 3.500 | 3.66 | 42 | N2 | 5/8 | — | 3/4 | 3/4 | — | — | .38 |
| NFS1248A | 4.000 | 4.16 | 48 | N2 | 5/8 | — | 3/4 | 3/4 | — | — | .44 |
| NFS1254A | 4.500 | 4.66 | 54 | N2 | 3/4 | — | 3/4 | 3/4 | — | — | .56 |
| NFS1260A | 5.000 | 5.16 | 60 | N2 | 3/4 | — | 3/4 | 3/4 | — | — | .69 |
| NFS1272A | 6.000 | 6.16 | 72 | N2 | 3/4 | — | 3/4 | 3/4 | — | — | 1.0 |

## 10Pitch 1"Face 14 1/2° Pressure Angle

Table No. 3

### Stock Non-Metallic Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS1015 | 1.500" | 1.70" | 15 | N1 | 5/8" | 5/8" | 1" | 1 5/8" | 5/8" | 1 3/16" | .13 |
| NFS1016 | 1.600 | 1.80 | 16 | N1 | 5/8 | 5/8 | 1 | 1 5/8 | 5/8 | 1 19/64 | .19 |
| NFS1018 | 1.800 | 2.00 | 18 | N1 | 5/8 | 3/4 | 1 | 1 5/8 | 5/8 | 1 1/2 | .19 |
| NFS1020 | 2.000 | 2.20 | 20 | N1 | 3/4 | 7/8 | 1 | 1 5/8 | 5/8 | 1 11/16 | .25 |
| NFS1025 | 2.500 | 2.70 | 25 | N1 | 3/4 | 1 3/8 | 1 | 1 5/8 | 5/8 | 2 3/16 | .38 |
| NFS1030 | 3.000 | 3.20 | 30 | N1 | 3/4 | 1 3/4 | 1 | 1 5/8 | 5/8 | 2 11/16 | .50 |
| NFS1035A | 3.500 | 3.70 | 35 | N2 | 3/4 | — | 1 | 1 | — | — | .56 |
| NFS1040A | 4.000 | 4.20 | 40 | N2 | 3/4 | — | 1 | 1 | — | — | .69 |
| NFS1045A | 4.500 | 4.70 | 45 | N2 | 3/4 | — | 1 | 1 | — | — | .75 |
| NFS1050A | 5.000 | 5.20 | 50 | N2 | 3/4 | — | 1 | 1 | — | — | 1.1 |
| NFS1060A | 6.000 | 6.20 | 60 | N2 | 3/4 | — | 1 | 1 | — | — | 1.5 |

## 8 Pitch — 1 1/4" Face — 14 1/2° Pressure Angle

Table No. 1

### Stock Non-Metallic Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS816 | 2.000" | 2.25" | 16 | N1 | 3/4" | 7/8" | 1 1/4" | 2" | 3/4" | 1 5/8" | .25 |
| NFS818 | 2.250 | 2.50 | 18 | N1 | 3/4 | 1 1/8 | 1 1/4 | 2 | 3/4 | 1 7/8 | .38 |
| NFS820 | 2.500 | 2.75 | 20 | N1 | 7/8 | 1 3/8 | 1 1/4 | 2 | 3/4 | 2 1/8 | .38 |
| NFS824 | 3.000 | 3.25 | 24 | N1 | 7/8 | 1 3/4 | 1 1/4 | 2 | 3/4 | 2 5/8 | .63 |
| NFS828 | 3.500 | 3.75 | 28 | N1 | 7/8 | 2 1/4 | 1 1/4 | 2 | 3/4 | 3 1/8 | .81 |
| NFS832A | 4.000 | 4.25 | 32 | N2 | 1 | — | 1 1/4 | 1 1/4 | — | — | .81 |
| NFS836A | 4.500 | 4.75 | 36 | N2 | 1 | — | 1 1/4 | 1 1/4 | — | — | 1.0 |
| NFS840A | 5.000 | 5.25 | 40 | N2 | 1 | — | 1 1/4 | 1 1/4 | — | — | 1.2 |
| NFS848A | 6.000 | 6.25 | 48 | N2 | 1 | — | 1 1/4 | 1 1/4 | — | — | 1.6 |

## 6 Pitch — 1 3/4" Face — 14 1/2° Pressure Angle

Table No. 2

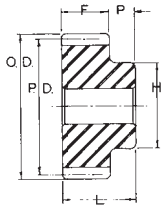
### Stock Non-Metallic Minimum Bore Spur Gears

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS612A | 2.000" | 2.33" | 12 | N2 | 1" | — | 1 3/4" | 1 3/4" | — | — | .25 |
| NFS614A | 2.333 | 2.66 | 14 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .38 |
| NFS615A | 2.500 | 2.83 | 15 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .44 |
| NFS616A | 2.667 | 3.00 | 16 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .50 |
| NFS617A | 2.833 | 3.16 | 17 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .50 |
| NFS618A | 3.000 | 3.33 | 18 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .50 |
| NFS620A | 3.333 | 3.66 | 20 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | .69 |
| NFS624A | 4.000 | 4.33 | 24 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | 1.0 |
| NFS630A | 5.000 | 5.33 | 30 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | 1.8 |
| NFS636A | 6.000 | 6.33 | 36 | N2 | 1 | — | 1 3/4 | 1 3/4 | — | — | 2.5 |

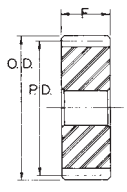
## 5 Pitch — 2" Face — 14 1/2° Pressure Angle

Table No. 3

| Part No. | Diameter | | No. Teeth | Type | Bore | | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pitch | Nominal O.D. | | | Stock | Max. | F | L | P | H | |
| NFS515A | 3.000 | 3.40 | 15 | N2 | 1 1/8 | — | 2 | 2 | — | — | .63 |
| NFS516A | 3.200 | 3.60 | 16 | N2 | 1 1/8 | — | 2 | 2 | — | — | .75 |
| NFS517A | 3.400 | 3.80 | 17 | N2 | 1 1/8 | — | 2 | 2 | — | — | .81 |
| NFS520A | 4.000 | 4.40 | 20 | N2 | 1 1/8 | — | 2 | 2 | — | — | 1.3 |
| NFS521A | 4.200 | 4.60 | 21 | N2 | 1 1/8 | — | 2 | 2 | — | — | 1.3 |
| NFS525A | 5.000 | 5.40 | 25 | N2 | 1 1/8 | — | 2 | 2 | — | — | 1.8 |

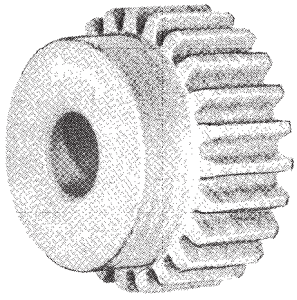



TYPE N1

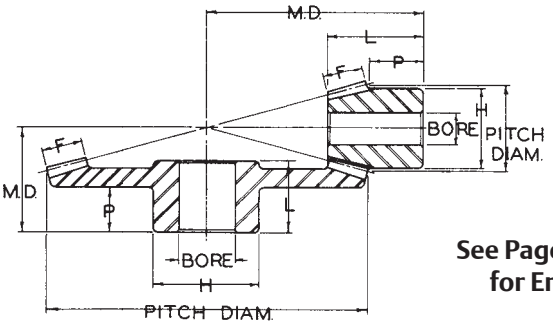



TYPE N2

**Individually Packaged and Clearly Labelled.**



F




See Page F-72 to F-74 for Engineering

# Steel Bevel Gears

## 20° Pressure Angle

Table No. 1

### Specifications — Unhardened Steel Bevel Gears

| Part No. | Pitch | Pitch Diam. | No. Teeth | Bore | | MD Dim. | Mat'l. | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Stock | Max. | | | F | L | P | H | |
| YSB20B20-20 | 20 | 1.000" | 20 | 3/8" | 3/8" | .688" | Stl. | .170" | 29/64" | 5/16" | 3/4" | .1 |
| YSB20B10-20 | 20 | .500 | 10 | 3/16 | 3/16 | .750 | Stl. | .170 | 27/64 | 1/4 | 13/32 | .1 |
| YSB16B24-15 | 16 | 1.500 | 24 | 1/2 | 9/16 | 1.188 | Stl. | .250 | 3/4 | 9/16 | 1 1/8 | .2 |
| YSB16B16-15 | 16 | 1.000 | 16 | 3/8 | 7/16† | 1.250 | Stl. | .250 | 47/64 | 7/16 | 13/16 | .1 |
| YSB16B24-20 | 16 | 1.500 | 24 | 1/2 | 1/2 | 1.000 | Stl. | .190 | 5/8 | 7/16 | 1 | .2 |
| YSB16B12-20 | 16 | .750 | 12 | 3/8 | 3/8 | 1.125 | Stl. | .190 | 37/64 | 11/32 | 21/32 | .1 |
| YSB16B32-20 | 16 | 2.000 | 32 | 1/2 | 9/16 | 1.188 | Stl. | .350 | 49/64 | 1/2 | 1 1/8 | .2 |
| YSB16B16-20 | 16 | 1.000 | 16 | 3/8 | 7/16† | 1.500 | Stl. | .350 | 27/32 | 7/16 | 13/16 | .1 |
| YSB16B48-30 | 16 | 3.000 | 48 | 5/8 | 13/16 | 1.313 | Stl. | .420 | 7/8 | 9/16 | 1 1/2 | .8 |
| YSB16B16-30 | 16 | 1.000 | 16 | 7/16† | 7/16† | 2.000 | Stl. | .420 | 59/64 | 15/32 | 7/8 | .1 |
| YSB16B64-40 | 16 | 4.000 | 64 | 5/8 | 1 3/8 | 1.375 | Stl. | .480 | 57/64 | 9/16 | 2 1/4 | 1.6 |
| YSB16B16-40 | 16 | 1.000 | 16 | 1/2 | 1/2 | 2.500 | Stl. | .480 | 63/64 | 15/32 | 13/16 | .1 |
| YSB16B96-60 | 16 | 6.000 | 96 | 5/8 | 1 | 1.688 | Stl. | .610 | 1 1/4 | 7/8 | 1 3/4 | 3.0 |
| YSB16B16-60 | 16 | 1.000 | 16 | 1/2 | 1/2 | 3.750 | Stl. | .610 | 1 3/8 | 23/32 | 15/16 | .1 |
| YSB14B28-20 | 14 | 2.000 | 28 | 1/2 | 7/8 | 1.375 | Stl. | .350 | 15/16 | 21/32 | 1 5/8 | .5 |
| YSB14B14-20 | 14 | 1.000 | 14 | 1/2 | 1/2 | 1.625 | Stl. | .350 | 31/32 | 9/16 | 13/16 | .1 |
| YSB12B27-15 | 12 | 2.250 | 27 | 1/2 | 13/16 | 1.750 | Stl. | .410 | 1 1/8 | 25/32 | 1 1/2 | .6 |
| YSB12B18-15 | 12 | 1.500 | 18 | 1/2 | 9/16 | 1.875 | Stl. | .410 | 1 1/8 | 21/32 | 1 1/4 | .2 |
| YSB12B36-20 ▲ | 12 | 3.000 | 36 | 5/8 | 1 5/16 | 1.875 | Stl. | .530 | 1 17/64 | 7/8 | 2 1/8 | 1.4 |
| YSB12B18-20 ▲ | 12 | 1.500 | 18 | 1/2 | 5/8 | 2.375 | Stl. | .530 | 1 3/8 | 13/16 | 1 5/16 | .4 |
| YSB12F36-20x1 ▲ | 12 | 3.000 | 36 | 1* | — | 1.875 | Stl. | .530 | 1 17/64 | 7/8 | 2 1/8 | 1.2 |
| YSB12F18-20x3/4 ▲ | 12 | 1.500 | 18 | 3/4 ● | — | 2.375 | Stl. | .530 | 1 3/8 | 13/16 | 1 5/16 | .3 |
| YSBF12B36-20 | 12 | 3.000 | 36 | 5/8 | 3/4 | 1.500 | Stl. | .460 | 7/8 | 1/2 | 1 7/16 | .7 |
| YSBF12B18-20 | 12 | 1.500 | 18 | 1/2 | 9/16 | 2.250 | Stl. | .460 | 1 13/64 | 11/16 | 1 1/4 | .3 |
| YSB12B48-20 | 12 | 4.000 | 48 | 5/8 | 7/8 | 2.000 | Stl. | .590 | 1 11/64 | 3/4 | 1 5/8 | 1.5 |
| YSB12B24-20 | 12 | 2.000 | 24 | 1/2 | 13/16 | 2.875 | Stl. | .590 | 1 7/16 | 3/4 | 1 1/2 | .8 |
| YSB12B54-30 | 12 | 4.500 | 54 | 5/8 | 1 | 1.750 | Stl. | .600 | 1 1/16 | 3/4 | 1 3/4 | 1.7 |
| YSB12B18-30 | 12 | 1.500 | 18 | 1/2 | 9/16 | 3.000 | Stl. | .600 | 1 11/32 | 11/16 | 1 1/4 | .4 |
| YSB12B72-40 | 12 | 6.000 | 72 | 3/4 | 1 1/4 | 2.000 | Stl. | .600 | 1 5/16 | 61/64 | 2 | 3.1 |
| YSB12B18-40 | 12 | 1.500 | 18 | 1/2 | 9/16 | 3.750 | Stl. | .600 | 1 23/64 | 23/32 | 1 1/4 | .4 |
| YSB12B72-60 | 12 | 6.000 | 72 | 3/4 | 1 1/4 | 1.750 | Stl. | .740 | 1 5/16 | 61/64 | 2 | 3.1 |
| YSB12B12-60 | 12 | 1.000 | 12 | 1/2 | 1/2 | 3.750 | Stl. | .740 | 1 31/64 | 23/32 | 15/16 | .2 |
| YSB10B30-15 | 10 | 3.000 | 30 | 3/4 | 1 1/2 | 2.250 | Stl. | .570 | 1 7/16 | 1 | 2 1/2 | 1.7 |
| YSB10B20-15 | 10 | 2.000 | 20 | 3/4 | 15/16 | 2.500 | Stl. | .570 | 1 33/64 | 29/32 | 1 3/4 | .8 |
| YSB10B40-20 | 10 | 4.000 | 40 | 7/8 | 2 | 2.500 | Stl. | .710 | 1 11/16 | 1 3/16 | 3 | 3.7 |
| YSB10B20-20 | 10 | 2.000 | 20 | 3/4 | 15/16 | 3.125 | Stl. | .710 | 1 51/64 | 1 1/16 | 1 3/4 | .9 |
| YSB10B50-20 | 10 | 5.000 | 50 | 3/4 | 1 1/4 | 2.625 | Stl. | .700 | 1 19/32 | 1 | 2 | 3.6 |
| YSB10B25-20 | 10 | 2.500 | 25 | 3/4 | 1 1/4 | 3.375 | Stl. | .700 | 1 35/64 | 3/4 | 2 | 1.2 |
| YSB10B60-30 ▲ | 10 | 6.000 | 60 | 7/8 | 2 | 2.750 | Stl. | .780 | 1 55/64 | 1 3/8 | 3 | 6.3 |
| YSB10B20-30 ▲ | 10 | 2.000 | 20 | 3/4 | 1 | 4.375 | Stl. | .780 | 2 5/32 | 1 5/16 | 1 3/4 | 1.2 |
| YSB10F60-30x1 ▲ | 10 | 6.000 | 60 | 1* | — | 2.750 | Stl. | .780 | 1 55/64 | 1 3/8 | 3 | 5.9 |
| YSB10F20-30x7/8 ▲ | 10 | 2.000 | 20 | 7/8* | — | 4.375 | Stl. | .780 | 2 5/32 | 1 5/16 | 1 3/4 | 1.2 |

* With Standard Keyway and Setscrew. ● With Setscrew only.
▲ Bracketed groups—Any pinion may be used with any gear.
† No Keyway or Setscrew.

## Installation Data

**Browning® Bevel and Miter Gears will give smooth quiet operation if properly mounted and lubricated. The following requirements must be considered:**

1. All Stock Bevel and Miter Gears must be accurately mounted at 90° angle for proper tooth bearing.
2. Mounting Distance (MD) is the distance from the end of the hub of one gear to the center line of the mating gear. It is very important that this dimension be correct to provide proper backlash and tooth contact.
3. Since all Bevel and Miter Gears develop axial as well as radial thrust, adequate bearing support must be provided.
4. Lubrication with mineral oil is generally recommended for straight Bevel and Miter Gears. Heavily loaded gears and those subjected to shock will require Extreme Pressure lubricants. Oil temperature should not exceed 150° F. for continuous normal duty, although temperature up to 200° F. may be satisfactory for short periods of operation.

# Steel Bevel Gears

**20° Pressure Angle**

Table No. 1

### Specifications — Unhardened Steel Bevel Gears

| Part No. | Pitch | Pitch Diam. | No. Teeth | Bore | | MD Dim. | Mat'l. | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Stock | Max. | | | F | L | P | H | |
| YSB10B60-40 | 10 | 6.000" | 60 | 7/8" | 1 5/8" | 2.250" | Stl. | .720" | 1 5/8" | 1 1/8" | 2 1/2" | 4.6 |
| YSB10B15-40 | 10 | 1.500 | 15 | 5/8 | 3/4 | 3.875 | Stl. | .720 | 1 39/64 | 27/32 | 1 7/16 | .6 |
| YSB10B90-60 | 10 | 9.000 | 90 | 1 | 1 13/16 | 2.500 | Stl. | .860 | 1 13/16 | 1 5/16 | 2 3/4 | 9.8 |
| YSB10B15-60 | 10 | 1.500 | 15 | 5/8 | 3/4 | 5.500 | Stl. | .860 | 1 55/64 | 31/32 | 1 7/16 | .6 |
| YSB8B40-20 ▲ | 8 | 5.000 | 40 | 1 | 2 | 2.875 | Stl. | .820 | 1 27/32 | 1 1/4 | 3 | 5.0 |
| YSB8B20-20 ▲ | 8 | 2.500 | 20 | 7/8 | 1 1/4 | 4.000 | Stl. | .820 | 2 9/32 | 1 13/32 | 2 1/8 | 2.0 |
| YSB8F40-20x1 ▲ | 8 | 5.000 | 40 | 1* | - | 2.875 | Stl. | .820 | 1 27/32 | 1 1/4 | 3 | 5.0 |
| YSB8F20-20x1 ▲ | 8 | 2.500 | 20 | 1* | - | 4.000 | Stl. | .820 | 2 9/32 | 1 13/32 | 2 1/8 | 1.8 |
| YSB8B48-30 | 8 | 6.000 | 48 | 7/8 | 1 13/16 | 2.375 | Stl. | .840 | 1 5/8 | 1 | 2 3/4 | 5.3 |
| YSB8B16-30 | 8 | 2.000 | 16 | 3/4 | 1 | 4.250 | Stl. | .840 | 2 5/64 | 1 3/16 | 1 3/4 | 1.2 |
| YSB8B64-40 | 8 | 8.000 | 64 | 1 | 1 13/16 | 2.750 | Stl. | .840 | 1 7/8 | 1 1/4 | 2 3/4 | 9.7 |
| YSB8B16-40 | 8 | 2.000 | 16 | 7/8 | 1 1/8 | 5.250 | Stl. | .840 | 2 3/32 | 1 7/32 | 1 7/8 | 1.3 |
| YSB8B72-40 | 8 | 9.000 | 72 | 1 1/8 | 2 | 3.250 | Stl. | 1.220 | 2 5/16 | 1 11/16 | 3 | 12.3 |
| YSB8B18-40 | 8 | 2.250 | 18 | 7/8 | 1 1/4 | 5.750 | Stl. | 1.220 | 2 15/32 | 1 7/32 | 2 1/8 | 1.9 |
| YSB6B36-20 ▲ | 6 | 6.000 | 36 | 1 1/8 | 2 1/4 | 3.500 | Stl. | 1.060 | 2 1/4 | 1 1/2 | 3 1/4 | 8.4 |
| YSB6B18-20 ▲ | 6 | 3.000 | 18 | 1 | 1 7/16 | 4.750 | Stl. | 1.060 | 2 49/64 | 1 19/32 | 2 1/2 | 3.4 |
| YSB6F36-20x1 1/8 ▲ | 6 | 6.000 | 36 | 1 1/8* | - | 3.500 | Stl. | 1.060 | 2 1/4 | 1 1/2 | 3 1/4 | 8.6 |
| YSB6F18-20x1 1/8 ▲ | 6 | 3.000 | 18 | 1 1/8* | - | 4.750 | Stl. | 1.060 | 2 49/64 | 1 19/32 | 2 1/2 | 3.1 |
| YSB6B42-20 | 6 | 7.000 | 42 | 1 1/8 | 2 1/4 | 3.750 | Stl. | 1.050 | 2 19/64 | 1 1/2 | 3 1/2 | 11.4 |
| YSB6B21-20 | 6 | 3.500 | 21 | 1 | 1 5/8 | 5.000 | Stl. | 1.050 | 2 33/64 | 1 1/4 | 2 1/2 | 3.8 |
| YSB6B48-20 | 6 | 8.000 | 48 | 1 1/8 | 2 1/4 | 3.438 | Stl. | 1.170 | 1 57/64 | 1 | 3 1/4 | 11.8 |
| YSB6B24-20 | 6 | 4.000 | 24 | 1 | 1 3/4 | 5.438 | Stl. | 1.170 | 2 35/64 | 1 1/4 | 2 5/8 | 4.9 |
| YSB6B45-30 | 6 | 7.500 | 45 | 1 1/8 | 2 1/4 | 3.000 | Stl. | 1.070 | 2 1/8 | 1 1/4 | 3 1/4 | 10.6 |
| YSB6B15-30 | 6 | 2.500 | 15 | 7/8 | 1 1/4 | 5.250 | Stl. | 1.070 | 2 9/16 | 1 7/16 | 2 1/8 | 2.3 |
| YSB6B60-40 | 6 | 10.000 | 60 | 1 1/8 | 2 1/4 | 3.250 | Stl. | 1.210 | 2 1/4 | 1 3/8 | 3 1/4 | 17.6 |
| YSB6B15-40 | 6 | 2.500 | 15 | 1 | 1 3/8 | 6.750 | Stl. | 1.210 | 2 31/32 | 1 3/4 | 2 1/2 | 3.3 |
| YSB5B30-20 | 5 | 6.000 | 30 | 1 1/8 | 2 1/4 | 3.500 | Stl. | 1.040 | 2 1/4 | 1 3/8 | 3 1/4 | 8.9 |
| YSB5B15-20 | 5 | 3.000 | 15 | 1 | 1 3/8 | 4.375 | Stl. | 1.040 | 2 25/64 | 1 9/32 | 2 5/8 | 3.1 |
| YSB5B45-30 | 5 | 9.000 | 45 | 1 1/4 | 2 1/4 | 3.750 | Stl. | 1.310 | 2 1/2 | 1 11/16 | 3 3/4 | 17.1 |
| YSB5B15-30 | 5 | 3.000 | 15 | 1 | 1 1/2 | 5.875 | Stl. | 1.310 | 2 11/16 | 1 5/16 | 2 5/8 | 3.6 |
| YSB5B60-40 | 5 | 12.000 | 60 | 1 1/4 | 2 3/8 | 3.750 | Stl. | 1.700 | 2 5/8 | 1 9/16 | 4 | 31.2 |
| YSB5B15-40 | 5 | 3.000 | 15 | 1 | 1 9/16 | 7.500 | Stl. | 1.700 | 3 13/64 | 1 7/16 | 3 | 5.0 |
| YSB4B32-20 | 4 | 8.000 | 32 | 1 1/8 | 2 1/4 | 4.250 | Stl. | 1.400 | 2 11/16 | 1 9/16 | 3 3/4 | 17.6 |
| YSB4B16-20 | 4 | 4.000 | 16 | 1 1/8 | 1 7/8 | 6.000 | Stl. | 1.400 | 3 11/32 | 1 13/16 | 3 1/4 | 7.5 |
| YSB4B42-30 | 4 | 10.500 | 42 | 1 1/8 | 2 1/4 | 4.000 | Stl. | 1.420 | 2 11/16 | 1 1/2 | 3 3/4 | 26.4 |
| YSB4B14-30 | 4 | 3.500 | 14 | 1 1/8 | 1 13/16 | 7.250 | Stl. | 1.420 | 3 27/64 | 1 15/16 | 3 1/4 | 7.0 |
| YSB4B56-40 | 4 | 14.000 | 56 | 1 1/4 | 2 5/8 | 4.250 | Stl. | 1.690 | 2 7/8 | 1 5/8 | 4 1/4 | 48.7 |
| YSB4B14-40 | 4 | 3.500 | 14 | 1 1/8 | 1 7/8 | 9.000 | Stl. | 1.690 | 3 45/64 | 1 15/16 | 3 1/4 | 7.6 |
| YSB3B30-20 | 3 | 10.000 | 30 | 1 1/4 | 3 | 5.500 | Stl. | 1.870 | 3 19/32 | 2 | 5 | 39.9 |
| YSB3B15-20 | 3 | 5.000 | 15 | 1 1/8 | 2 | 7.250 | Stl. | 1.870 | 4 1/32 | 1 15/16 | 3 3/4 | 13.7 |

* With Standard Keyway and Setscrew.

▲ Bracketed groups—Any pinion may be used with any gear

F

## Straight Tooth

## 20° Pressure Angle

Table No. 1

### Specifications — Unhardened Steel Miter Gears

| Part No. | Pitch | Pitch Diam. | No. Teeth | Bore | | MD Dim. | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Stock | Max. | | F | L | P | H | |
| YSM32B16 | 32 | .500" | 16 | 3/16" | 3/16" | .500" | .120" | 11/32" | 13/64" | 13/32" | .1 |
| YSM32B24 | 32 | .750 | 24 | 3/16 | 3/16 | .688 | .140 | 27/64 | 1/4 | 1/2 | .1 |
| YSM24B18 | 24 | .750 | 18 | 1/4 | 1/4 | .813 | .156 | 9/16 | 3/8 | 5/8 | .1 |
| YSM24B24 | 24 | 1.000 | 24 | 1/4 | 1/4 | .906 | .200 | 9/16 | 9/32 | 5/8 | .1 |
| YSM20B12 | 20 | .600 | 12 | 1/4 | 1/4 | .671 | .120 | 31/64 | 5/16 | 1/2 | .1 |
| YSM20B18 | 20 | .900 | 18 | 5/16 | 5/16 | .953 | .140 | 5/8 | 13/32 | 5/8 | .1 |
| YSM20B20 | 20 | 1.000 | 20 | 3/8 | 3/8 | 1.125 | .234 | 13/16 | 1/2 | 3/4 | .1 |
| YSM20B25 | 20 | 1.250 | 25 | 3/8 | 1/2 | 1.188 | .250 | 3/4 | 7/16 | 1 | .1 |
| YSM16B12 | 16 | .750 | 12 | 5/16 | 5/16 | .813 | .160 | 37/64 | 3/8 | 5/8 | .1 |
| YSM16B16 | 16 | 1.000 | 16 | 3/8 | 3/8 | 1.063 | .220 | 3/4 | 7/16 | 3/4 | .1 |
| YSM16B20 | 16 | 1.250 | 20 | 7/16 | 1/2 | 1.250 | .270 | 27/32 | 1/2 | 1 | .2 |
| YSM16B24 | 16 | 1.500 | 24 | 1/2 | 1/2 | 1.375 | .310 | 7/8 | 1/2 | 1 | .2 |
| YSM14B14 | 14 | 1.000 | 14 | 3/8 | 7/16 | 1.063 | .190 | 47/64 | 1/2 | 7/8 | .1 |
| x YSM14F14x7/16 | 14 | 1.000 | 14 | 7/16 | 7/16 | 1.063 | .190 | 47/64 | 1/2 | 7/8 | .1 |
| YSM12B15 | 12 | 1.250 | 15 | 3/8 | 1/2 | 1.250 | .270 | 55/64 | 1/2 | 1 | .1 |
| YSM12B15x7/16 | 12 | 1.250 | 15 | 7/16 | 1/2 | 1.250 | .270 | 55/64 | 1/2 | 1 | .1 |
| YSM12B15x1/2 | 12 | 1.250 | 15 | 1/2 | 1/2 | 1.250 | .270 | 55/64 | 1/2 | 1 | .1 |
| x YSM12F15x1/2 | 12 | 1.250 | 15 | 1/2 | 1/2 | 1.250 | .270 | 55/64 | 1/2 | 1 | .1 |
| YSM12B18 | 12 | 1.500 | 18 | 1/2 | 5/8 | 1.500 | .320 | 1 1/64 | 5/8 | 1 1/4 | .3 |
| YSM12B18x5/8 | 12 | 1.500 | 18 | 5/8 | 5/8 | 1.500 | .320 | 1 1/64 | 5/8 | 1 1/4 | .2 |
| ° YSM12F18x5/8 | 12 | 1.500 | 18 | 5/8 | 5/8 | 1.500 | .320 | 1 1/64 | 5/8 | 1 1/4 | .2 |
| YSM12B21 | 12 | 1.750 | 21 | 1/2 | 3/4 | 1.750 | .390 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| YSM12B21x5/8 | 12 | 1.750 | 21 | 5/8 | 3/4 | 1.750 | .390 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| ° YSM12F21x5/8 | 12 | 1.750 | 21 | 5/8 | 3/4 | 1.750 | .390 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| YSM12B21x3/4 | 12 | 1.750 | 21 | 3/4 | 3/4 | 1.750 | .390 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| ° YSM12F21x3/4 | 12 | 1.750 | 21 | 3/4 | 3/4 | 1.750 | .390 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| YSM12B24 | 12 | 2.000 | 24 | 1/2 | 5/8 | 1.875 | .430 | 1 7/32 | 11/16 | 1 5/16 | .5 |
| YSM12B30 | 12 | 2.500 | 30 | 5/8 | 7/8 | 2.313 | .540 | 1 31/64 | 27/32 | 1 5/8 | .9 |
| YSM10B20 | 10 | 2.000 | 20 | 1/2 | 7/8 | 2.000 | .440 | 1 23/64 | 13/16 | 1 5/8 | .7 |
| YSM10B20x5/8 | 10 | 2.000 | 20 | 5/8 | 7/8 | 2.000 | .440 | 1 23/64 | 13/16 | 1 5/8 | .7 |
| ° YSM10F20x5/8 | 10 | 2.000 | 20 | 5/8 | 7/8 | 2.000 | .440 | 1 23/64 | 13/16 | 1 5/8 | .7 |
| YSM10B20x3/4 | 10 | 2.000 | 20 | 3/4 | 7/8 | 2.000 | .440 | 1 23/64 | 13/16 | 1 5/8 | .6 |
| ° YSM10F20x3/4 | 10 | 2.000 | 20 | 3/4 | 7/8 | 2.000 | .440 | 1 23/64 | 13/16 | 1 5/8 | .6 |
| YSM10B25 | 10 | 2.500 | 25 | 3/4 | 1 1/4 | 2.438 | .550 | 1 5/8 | 15/16 | 2 | 1.3 |
| YSM10B25x7/8 | 10 | 2.500 | 25 | 7/8 | 1 1/4 | 2.438 | .550 | 1 5/8 | 15/16 | 2 | 1.2 |
| ° YSM10F25x7/8 | 10 | 2.500 | 25 | 7/8 | 1 1/4 | 2.438 | .550 | 1 5/8 | 15/16 | 2 | 1.2 |
| YSM10B25x1 | 10 | 2.500 | 25 | 1 | 1 1/4 | 2.438 | .550 | 1 5/8 | 15/16 | 2 | 1.1 |
| ° YSM10F25x1 | 10 | 2.500 | 25 | 1 | 1 1/4 | 2.438 | .550 | 1 5/8 | 15/16 | 2 | 1.1 |
| YSM8B24 | 8 | 3.000 | 24 | 3/4 | 1 | 2.563 | .640 | 1 37/64 | 13/16 | 1 3/4 | 1.4 |
| YSM8B24x1 | 8 | 3.000 | 24 | 1 | 1 3/8 | 2.750 | .640 | 1 49/64 | 1 1/16 | 2 1/4 | 1.8 |
| ° YSM8F24x1 | 8 | 3.000 | 24 | 1 | 1 3/8 | 2.750 | .640 | 1 49/64 | 1 1/16 | 2 1/4 | 1.8 |
| YSM8B24x1 1/4 | 8 | 3.000 | 24 | 1 1/4 | 1 5/8 | 2.750 | .640 | 1 49/64 | 1 | 2 1/2 | 1.8 |
| ° YSM8F24x1 1/4 | 8 | 3.000 | 24 | 1 1/4 | 1 5/8 | 2.750 | .640 | 1 49/64 | 1 | 2 1/2 | 1.8 |
| ° YSM8F28x1 3/16 | 8 | 3.500 | 28 | 1 3/16 | 1 5/8 | 3.250 | .750 | 2 3/32 | 1 1/4 | 2 1/2 | 2.7 |
| ° YSM8F28x1 1/4 | 8 | 3.500 | 28 | 1 1/4 | 1 5/8 | 3.250 | .750 | 2 3/32 | 1 1/4 | 2 1/2 | 2.7 |
| YSM8B32x7/8 | 8 | 4.000 | 32 | 7/8 | 1 1/2 | 3.438 | .840 | 2 3/32 | 15/16 | 2 3/8 | 3.8 |
| YSM8B32 | 8 | 4.000 | 32 | 1 | 2 | 3.625 | .840 | 2 9/32 | 1 1/8 | 3 | 4.7 |
| YSM6B24x1 | 6 | 4.000 | 24 | 1 | 2 | 3.625 | .860 | 2 5/16 | 1 5/16 | 3 | 4.6 |
| YSM6B24 | 6 | 4.000 | 24 | 1 1/4 | 2 | 3.625 | .860 | 2 5/16 | 1 5/16 | 3 | 4.4 |
| YSM6B24x1 1/2 | 6 | 4.000 | 24 | 1 1/2 | 2 | 3.625 | .860 | 2 5/16 | 1 5/16 | 3 | 4.1 |
| ° YSM6F24x1 1/2 | 6 | 4.000 | 24 | 1 1/2 | 2 | 3.625 | .860 | 2 5/16 | 1 5/16 | 3 | 4.1 |
| YSM6B27 | 6 | 4.500 | 27 | 1 1/4 | 2 3/16 | 4.125 | .960 | 2 5/8 | 1 1/2 | 3 1/4 | 6.3 |
| YSM5B25 | 5 | 5.000 | 25 | 1 3/8 | 2 1/4 | 4.625 | 1.100 | 3 | 1 3/4 | 3 1/2 | 8.8 |
| ° YSM5F25x1 1/2 | 5 | 5.000 | 25 | 1 1/2 | 2 1/4 | 4.625 | 1.100 | 3 | 1 3/4 | 3 1/2 | 8.4 |
| ° YSM5F25x1 3/4 | 5 | 5.000 | 25 | 1 3/4 | 2 1/4 | 4.625 | 1.100 | 3 | 1 3/4 | 3 1/2 | 7.8 |
| YSM4B24 | 4 | 6.000 | 24 | 1 1/2 | 2 3/8 | 5.500 | 1.330 | 3 9/16 | 1 15/16 | 4 | 14.5 |
| ° YSM4F24x1 3/4 | 4 | 6.000 | 24 | 1 3/4 | 2 3/8 | 5.500 | 1.330 | 3 9/16 | 1 15/16 | 4 | 14.0 |
| YSM4B28 | 4 | 7.000 | 28 | 2 | 3 | 6.000 | 1.430 | 3 5/8 | 1 15/16 | 5 | 21.5 |

x - With Setscrews only.
o - With Standard Keyway and Setscrew

**Browning® Miter Gears are available in both Hardened and Unhardened types. For Engineering see Pages F-72 to F-74.**

F

## Straight Tooth

## 20° Pressure Angle

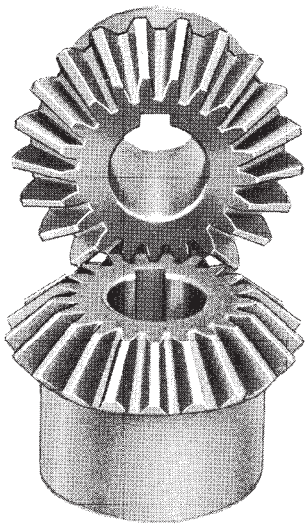
Table No. 1

### Specifications — Hardened Steel Miter Gears

| Part No. | Pitch | Pitch Diam. | No. Teeth | Bore | MD Dim. | Dimensions | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | F | L | P | H | |
| YSM16F16Hx3/8 | 16 | 1.000" | 16 | 3/8" | 1 1/16" | .22" | 3/4" | 7/16" | 3/4" | .1 |
| YSM12F15Hx1/2 | 12 | 1.250 | 15 | 1/2 | 1 1/4 | .27 | 55/64 | 1/2 | 1 | .1 |
| YSM12F18Hx5/8 | 12 | 1.500 | 18 | 5/8 | 1 1/2 | .32 | 1 1/64 | 5/8 | 1 1/4 | .2 |
| YSM12F21Hx5/8 | 12 | 1.750 | 21 | 5/8 | 1 3/4 | .39 | 1 3/16 | 11/16 | 1 3/8 | .4 |
| YSM12F30Hx5/8 | 12 | 2.500 | 30 | 5/8 | 2 5/16 | .54 | 1 31/64 | 27/32 | 1 5/8 | .8 |
| YSM10F20Hx5/8 | 10 | 2.000 | 20 | 5/8 | 2 | .44 | 1 23/64 | 13/16 | 1 5/8 | .6 |
| YSM10F20Hx3/4 | 10 | 2.000 | 20 | 3/4 | 2 | .44 | 1 23/64 | 13/16 | 1 5/8 | .6 |
| YSM10F25Hx3/4 | 10 | 2.500 | 25 | 3/4 | 2 7/16 | .55 | 1 5/8 | 15/16 | 2 | 1.3 |
| YSM10F25Hx7/8 | 10 | 2.500 | 25 | 7/8 | 2 7/16 | .55 | 1 5/8 | 15/16 | 2 | 1.2 |
| YSM10F25Hx1 | 10 | 2.500 | 25 | 1 | 2 7/16 | .55 | 1 5/8 | 15/16 | 2 | 1.2 |
| YSM8F24Hx3/4 | 8 | 3.000 | 24 | 3/4 | 2 9/16 | .64 | 1 37/64 | 13/16 | 1 3/4 | 1.4 |
| YSM8F24Hx1 | 8 | 3.000 | 24 | 1 | 2 3/4 | .64 | 1 49/64 | 1 1/16 | 2 1/4 | 1.8 |
| YSM8F24Hx1 1/4 | 8 | 3.000 | 24 | 1 1/4 | 2 3/4 | .64 | 1 49/64 | 1 | 2 1/2 | 1.8 |
| YSM8F28Hx1 | 8 | 3.500 | 28 | 1 | 3 1/4 | .75 | 2 3/32 | 1 1/4 | 2 1/2 | 2.9 |
| YSM8F28Hx1 3/16 | 8 | 3.500 | 28 | 1 3/16 | 3 1/4 | .75 | 2 3/32 | 1 1/4 | 2 1/2 | 2.8 |
| YSM8F28Hx1 1/4 | 8 | 3.500 | 28 | 1 1/4 | 3 1/4 | .75 | 2 3/32 | 1 1/4 | 2 1/2 | 2.7 |
| YSM8F32Hx1 | 8 | 4.000 | 32 | 1 | 3 5/8 | .84 | 2 9/32 | 1 1/8 | 3 | 4.8 |
| YSM6F24Hx1 1/4 | 6 | 4.000 | 24 | 1 1/4 | 3 5/8 | .86 | 2 5/16 | 1 5/16 | 3 | 4.5 |
| YSM6F24Hx1 1/2 | 6 | 4.000 | 24 | 1 1/2 | 3 5/8 | .86 | 2 5/16 | 1 5/16 | 3 | 4.0 |
| YSM5F25Hx1 3/8 | 5 | 5.000 | 25 | 1 3/8 | 4 5/8 | 1.10 | 3 | 1 3/4 | 3 1/2 | 8.6 |
| YSM5F25Hx1 3/4 | 5 | 5.000 | 25 | 1 3/4 | 4 5/8 | 1.10 | 3 | 1 3/4 | 3 1/2 | 7.9 |
| YSM4F24Hx1 3/4 | 4 | 6.000 | 24 | 1 3/4 | 5 1/2 | 1.33 | 3 9/16 | 1 15/16 | 4 | 13.8 |

**All of above have Standard Keyway and Setscrew.**

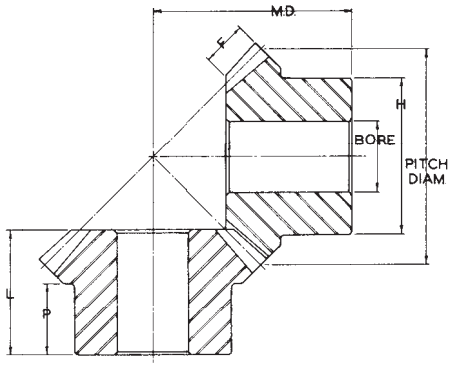
F



### Standard Keyseats

Table No. 2

| Bore Range | Keyseat |
|---|---|
| 3/8" | 3/32" x 3/64" |
| 1/2 | 1/8 x 1/16 |
| 5/8 to 7/8 | 3/16 x 3/32 |
| 15/16 to 1 1/4 | 1/4 x 1/8 |
| 1 3/8 to 1 3/4 | 3/8 x 3/16 |




**Miter Gears must be run in sets of two or more Gears with the same Pitch, Pressure Angle and number of Teeth.**

Spiral Bevel and Miter Gears have continuous pitch line contact and therefore run more smoothly and quietly than straight tooth gears. They must be run in sets of mating gears with opposite hand spiral. In Browning® stock spiral bevel gear sets the pinion has left hand spiral and the gear has right hand spiral.

Table No. 1

## Specifications — Hardened Steel Spiral Bevel Gears

| Part No. | Pitch | Pitch Dia. | No. Teeth | Bore | Keyseat | MD Dim. | DIMENSIONS | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | F | L | P | H | |
| YSBS14F16LH-20x1/2 | 14 | 1.143 | 16 | 1/2 | 1/8 x 1/16 | 1.625 | .380 | 27/32 | 29/64 | 1 | .2 |
| YSBS14F32RH-20x7/8 | 14 | 2.285 | 32 | 7/8 | 3/16 x 3/32 | 1.375 | .380 | 27/32 | 9/16 | 1 5/8 | .6 |
| YSBS10F17LH-20x5/8 | 10 | 1.700 | 17 | 5/8 | 3/16 x 3/32 | 2.375 | .570 | 1 7/32 | 5/8 | 1 1/2 | .6 |
| YSBS10F34RH-20x1 3/16 | 10 | 3.400 | 34 | 1 3/16 | 1/4 x 1/8 | 1.875 | .570 | 1 1/8 | 3/4 | 2 | 1.5 |
| YSBS8F17LH-20x3/4 | 8 | 2.125 | 17 | 3/4 | 3/16 x 3/32 | 3.125 | .710 | 1 11/16 | 15/16 | 1 7/8 | 1.5 |
| YSBS8F34RH-20x1 1/2 | 8 | 4.250 | 34 | 1 1/2 | 3/8 x 3/16 | 2.500 | .710 | 1 9/16 | 1 1/16 | 2 7/8 | 3.2 |

**All sizes are furnished with Keyseat and Setscrew.**

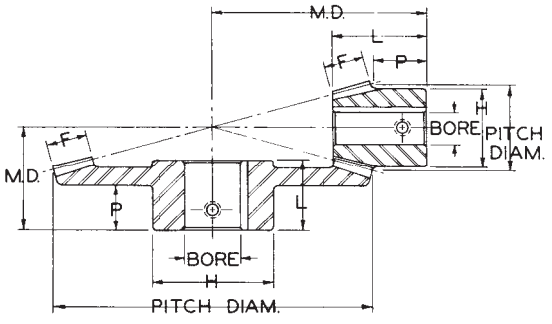
Table No. 2

## Specifications — Hardened Steel Spiral Miter Gears

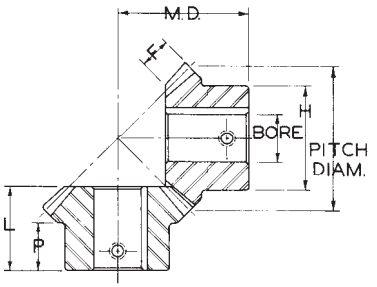
| Part No. | Pitch | Pitch Dia. | No. Teeth | Bore | Keyseat | MD Dim. | DIMENSIONS | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | F | L | P | H | |
| YSMS12F15RHx1/2 | 12 | 1.250 | 15 | 1/2 | 1/8 x 1/16 | 1.250 | .270 | 27/32 | 1/2 | 1 | .2 |
| YSMS12F15LHx1/2 | 12 | 1.250 | 15 | 1/2 | 1/8 x 1/16 | 1.250 | .270 | 27/32 | 1/2 | 1 | .2 |
| YSMS12F18RHx5/8 | 12 | 1.500 | 18 | 5/8 | 3/16 x 3/32 | 1.500 | .320 | 1 | 5/8 | 1 1/4 | .3 |
| YSMS12F18LHx5/8 | 12 | 1.500 | 18 | 5/8 | 3/16 x 3/32 | 1.500 | .320 | 1 | 5/8 | 1 1/4 | .3 |
| YSMS10F20RHx3/4 | 10 | 2.000 | 20 | 3/4 | 3/16 x 3/32 | 2.000 | .440 | 1 11/32 | 13/16 | 1 5/8 | .7 |
| YSMS10F20LHx3/4 | 10 | 2.000 | 20 | 3/4 | 3/16 x 3/32 | 2.000 | .440 | 1 11/32 | 13/16 | 1 5/8 | .7 |
| YSMS10F25RHx7/8 | 10 | 2.500 | 25 | 7/8 | 3/16 x 3/32 | 2.437 | .570 | 1 5/8 | 15/16 | 2 | 1.4 |
| YSMS10F25LHx7/8 | 10 | 2.500 | 25 | 7/8 | 3/16 x 3/32 | 2.437 | .570 | 1 5/8 | 15/16 | 2 | 1.4 |
| YSMS8F28RHx1 3/16 | 8 | 3.500 | 28 | 1 3/16 | 1/4 x 1/8 | 3.250 | .780 | 2 3/32 | 1 1/4 | 2 1/2 | 2.8 |
| YSMS8F28LHx1 3/16 | 8 | 3.500 | 28 | 1 3/16 | 1/4 x 1/8 | 3.250 | .780 | 2 3/32 | 1 1/4 | 2 1/2 | 2.8 |
| YSMS7F21RHx1 | 7 | 3.000 | 21 | 1 | 1/4 x 1/8 | 2.750 | .680 | 1 25/32 | 7/8 | 2 1/4 | 2.1 |
| YSMS7F21LHx1 | 7 | 3.000 | 21 | 1 | 1/4 x 1/8 | 2.750 | .680 | 1 25/32 | 7/8 | 2 1/4 | 2.1 |
| YSMS6F24RHx1 1/4 ▲ | 6 | 4.000 | 24 | 1 1/4 | 1/4 x 1/8 | 3.625 | .890 | 2 5/16 | 1 5/16 | 3 | 4.3 |
| YSMS6F24LHx1 1/4 ▲ | 6 | 4.000 | 24 | 1 1/4 | 1/4 x 1/8 | 3.625 | .890 | 2 5/16 | 1 5/16 | 3 | 4.3 |
| YSMS6F24RHx1 1/2 ▲ | 6 | 4.000 | 24 | 1 1/2 | 3/8 x 3/16 | 3.625 | .890 | 2 5/16 | 1 5/16 | 3 | 4.0 |
| YSMS6F24LHx1 1/2 ▲ | 6 | 4.000 | 24 | 1 1/2 | 3/8 x 3/16 | 3.625 | .890 | 2 5/16 | 1 5/16 | 3 | 4.0 |
| YSMS5F25RHx1 3/8 | 5 | 5.000 | 25 | 1 3/8 | 5/16 x 5/32 | 4.625 | 1.140 | 3 | 1 3/4 | 3 1/2 | 8.7 |
| YSMS5F25LHx1 3/8 | 5 | 5.000 | 25 | 1 3/8 | 5/16 x 5/32 | 4.625 | 1.140 | 3 | 1 3/4 | 3 1/2 | 8.7 |

▲ **These gears will run together to give selection of bore combinations.**
**All sizes are furnished with Keyseat and Setscrew.**

For Engineering Data, See Page F-75




Spiral Bevel Gears




Spiral Miter Gears

## GENERAL

Spur gearing is the most widely used type for power transmission, offering uniform ratio and positive shaft locations. Two or more spur gears may be used in a gear train for positively connecting shafts rotating at a constant speed ratio. The relative speed of rotation is governed by the gear ratio, or number of teeth in the driven gear divided by the number of teeth in the driver. Additional gears in a train may offer other shaft speeds as well as opposite shaft rotation.

Spur gears are strong and efficient, and when properly used, will give long and satisfactory service. For higher speed applications, where noise is a factor, a non-metallic gear of laminated phenolic may be used in the gear train. While 14 1/2° Pressure Angle involute tooth form is most widely used, 20° Pressure Angle is also a standard type. Gears using 14 1/2° and 20° pressure angles will not operate together. The 20° type is desired for heavy shock loads.

For many high speed applications, Helical Gears have superseded spur gears due to quieter operation. Helical Gears give maximum smoothness and quietness when used on parallel shafts. Since these gears develop end thrust, it is necessary to provide suitable counteracting thrust washers or bearings.

Helical Gears are also known as Spiral Gears when used on right angle shaft applications. They are used for low ratios and where little horsepower is required, but smoothness of operation is desired.

Bevel and Miter Gears are used for right angle drives where shafts intersect. Miter Gear sets give 1:1 ratio. Bevel Gear set stock ratios range from 1 1/2:1 to 6:1. Bevel and Miter Gears are subject to the same limitations of speed and operating conditions as are Spur Gears. They develop end thrust which must be counteracted by suitable washers or bearings.

Bushed Miter Gears using stock Browning Split Taper® Bushings are also available. Use of the Tapered Bushing eliminates the requirement for thrust washers or bearings.

Worm Gearing is used for higher speed ratios and is the smoothest and quietest form of gearing when correctly designed and properly lubricated. They develop end thrust which must be counteracted by suitable washers or bearings.

Horsepower ratings govern gear selection for safe operation based on beam strength alone. This does not take wear into account. Hardened teeth will improve life as will the correct type of lubrication.

## LUBRICATION

Since all types of gears operate more smoothly, quietly and with longer life expectancy if properly lubricated, it is an important consideration in the design of gear drives. Lubrication may be by drip, splash, immersion or pressure, depending on the type of gear, speed in terms of pitch-line velocity, hardness of material and combination of materials.

The most common types of gear lubricants used to hold gear tooth wear to a minimum and to minimize rubbing and sliding friction between metallic teeth are generally of mineral origin. Vegetable and animal as well as some synthetic lubricants are also occasionally used. Mineral oils, paraffin or asphaltic base are recommended for most gear applications. These oils are suitable for gears of all materials, including non-metallic materials.

Worm gearing is subjected entirely to sliding friction rather than combined sliding and rolling friction encountered with involute spur gears. The best result in worm gear lubrication is obtained with a steam cylinder oil or an oil containing a small percentage of acid-free tallow.

The pour point of any lubricant should be below the lowest expected operating temperature. Where heavy loads are expected, mild extreme-pressure lubricant should be used, with viscosity the same as for mineral oil. The extreme-pressure lubricants should not be used for bronze gears

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## RATINGS

BROWNING® Gears are rated in accordance with AGMA and Industrial Standards, and are based on 8-10 hours operation per day, no shock load and oil bath lubrication. The ratings, except worms and worm gears, are based primarily on the Lewis Formula, Barth Revision, which takes into consideration beam strength, but not wear. Worm and worm gear ratings are according to AGMA Standards including strength and wear considerations. Material stress values are shown in Table No. 1. Gear life is largely dependent on the type of service, care in installation and method of lubrication. **BROWNING** suggests using Service Factors shown in Tables No. 2 and 3 for better design of all gear drives.

### Material Stress Values

Table No. 1

| Type Gear | Material | Stress PSI |
|---|---|---|
| Spur | Hardened Steel | 30000 |
| Spur | Unhardened Steel | 20000 |
| Spur | Cast Iron | 12000 |
| Spur | Non-Metallic | 6000 |
| Bevel | Unhardened Steel | 16000 |
| Miter | Hardened Steel | 25000 |
| Miter | Unhardened Steel | 16000 |

### SERVICE FACTORS

#### Type Load

Table No. 2

| Hours Operation per Day | Service Factors | | |
|---|---|---|---|
| | No Shock | Light Shock | Heavy Shock |
| 8-10 | 1.0 | 1.2 | 1.4 |
| 11-16 | 1.1 | 1.3 | 1.5 |
| 17-24 | 1.2 | 1.4 | 1.6 |

#### Type Lubrication

Table No. 3

| Type Lubrication | Service Factor |
|---|---|
| Intermittent | .7 |
| Grease | .4 |
| Oil, Drip | .2 |
| Oil, Bath | .0 |

## Spur Gears

BROWNING® Spur Gears are made to Standard Diametral Pitch and are available in 14 1/2° and 20° pressure angles. The Diametral Pitch of a gear refers to the number of teeth per inch of Pitch Diameter.

The Center Distance between two spur gears is one-half the sum of their Pitch Diameters. BROWNING Spur Gears are cut to run at standard center distance with proper backlash to provide for lubrication and misalignment.

Tables of gear specifications and of Horsepower Ratings at a variety of speeds are given for currently available sizes. Fine pitch gears, primarily used to transmit motion rather than power, are not shown in Horsepower Tables. Horsepower Ratings are based on tooth strength, for normal 8 hour operation, with proper lubrication, and at a pitch line velocity not over 1000 feet per minute for 14 1/2° P.A. gears and 1200 feet per minute for 20° P.A. gears. For more severe service additional horsepower capacity must be provided.

The following Diametral Pitch Formulae are used in the design of BROWNING Spur Gears:

### DIAMETRAL PITCH IS THE NUMBER OF TEETH PER EACH INCH OF PITCH DIAMETER

Table No. 1

| To Obtain | Having | Formulae |
|---|---|---|
| Diametral Pitch | Circular Pitch | Divide 3.1416 by the Circular Pitch. |
| | Number of Teeth and Pitch Dia. | Divide the Number of Teeth by the Pitch Diameter. |
| | Number of Teeth and Outside Dia. | Divide No. of Teeth plus 2 by the Outside Diameter. |
| Pitch Diameter | Number of Teeth and Diametral Pitch | Divide the Number of Teeth by the Diametral Pitch. |
| | Number of Teeth and Outside Dia. | Divide the product of the number of Teeth and the Outside Diameter by the Number of Teeth plus 2. |
| | Outside Diameter and Diametral Pitch | From the Outside Diameter subtract the quotient of 2 divided by the Diametral Pitch. |
| Number of Teeth | Pitch Diameter and Diametral Pitch | Multiply the Pitch Diameter by the Diametral Pitch. |
| Tooth Thickness on the Pitch Line | Diametral Pitch | Divide 1.5708 by the Diametral Pitch. |
| Addendum | Diametral Pitch | Divide 1 by the Diametral Pitch. |
| Outside Diameter | Pitch Diameter and Addendum | Add 2 Addendums to the Pitch Diameter. |
| Minimum Whole Depth (Hobbed) | Diametral Pitch | Coarser than 24 D.P. = $\frac{2.35}{D.P.}$ |
| Clearance | Whole Depth and Addendum | From the Whole Depth subtract 2 Addendums |
| Center Distance | Driver P.D. Driven P.D. | $\frac{\text{Driver P.D.} + \text{Driven P.D.}}{2}$ |

**BROWNING** Spur Gear of 14 1/2° and 20° Pressure Angle are available in several types as indicated on pages F-3 to F-34. The 14 1/2° Change Gear offer many additional ratios since they can be modified with Stock Steel Hubs for use as Spur Gears, and are available with any number of teeth between the smallest and largest stock sizes.

Spur Gear Drives, for acceptable operation, should have a basic minimum number of teeth as shown in Table No. 2 below. For smooth operation and an economical drive select the finest pitch gears of suitable capacity. Because 20° P.A. Spur Gears have a greater horsepower capacity than comparable 14 1/2° P. A. gears, using 20° P. A. gears will normally give a finer pitch, smoother running, and less expensive gear drive.

The rating of both the driving pinion and the driven gear must be equal to or greater than the required design horsepower of the drive, including all Service Factors.

Table No. 2

| Pressure Angle | Min. No. of Teeth in Pinion | Preferred Min. No. of Teeth in Pinion | Min. Total No. of Teeth in Mating Pair |
|---|---|---|---|
| 14 1/2° | 16 | 20 | 40 |
| 20° | 14 | 18 | 28 |

**WARNING — Less than optimum performance, i.e., high noise, less life, etc. may be expected if gears below minimums indicated are used.**

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes**

# 14 1/2° SPUR GEAR
# PITCH SELECTION CHARTS

**Table No. 1**

| Design H.P. | 16 Teeth | | | | | | | 18 Teeth | | | | | | | 20 Teeth | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | |
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| .05 | 16 | 20 | 24 | 32 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 |
| .10 | 12 | 16 | 20 | 24 | 24 | 32 | 32 | 12 | 16 | 20 | 24 | 32 | 32 | 32 | 12 | 16 | 24 | 24 | 32 | 32 | 32 |
| 1/4 | 10 | 12 | 16 | 20 | 20 | 24 | 24 | 10 | 12 | 16 | 20 | 20 | 24 | 24 | 10 | 12 | 16 | 20 | 24 | 24 | 24 |
| 1/3 | 8 | 10 | 16 | 16 | 20 | 20 | 24 | 10 | 12 | 16 | 20 | 20 | 20 | 24 | 10 | 12 | 16 | 20 | 20 | 24 | 24 |
| 1/2 | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 20 | 20 | 20 |
| 3/4 | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 10 | 12 | 12 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 16 | 20 |
| 1 | 6 | 8 | 10 | 12 | 12 | 16 | 16 | 6 | 8 | 12 | 12 | 12 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 |
| 1 1/2 | 5 | 6 | 10 | 12 | 12 | 12 | 12 | 5 | 6 | 10 | 12 | 12 | 12 | 12 | 6 | 8 | 10 | 12 | 12 | 12 | 16 |
| 2 | 4 | 6 | 8 | 10 | 12 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | 12 | 5 | 6 | 10 | 10 | 12 | 12 | 12 |
| 3 | 4 | 5 | 8 | 8 | 10 | 10 | 10 | 4 | 5 | 8 | 10 | 10 | 10 | 12 | 4 | 6 | 8 | 10 | 10 | 10 | 12 |
| 5 | 3 | 4 | 6 | 8 | 8 | 8 | 10 | 3 | 4 | 6 | 8 | 8 | 8 | 10 | 4 | 5 | 6 | 8 | 8 | 10 | 10 |
| 7 1/2 | 3 | 3 | 5 | 6 | 6 | 6 | 8 | 3 | 4 | 5 | 6 | 6 | 8 | 8 | 3 | 4 | 6 | 6 | 8 | 8 | — |
| 10 | 3 | 3 | 4 | 5 | 6 | 6 | — | 3 | 3 | 5 | 6 | 6 | 6 | 6 | 3 | 3 | 5 | 6 | 6 | — | — |
| 15 | — | 3 | 4 | 4 | 5 | — | — | — | — | 4 | 5 | 5 | 5 | 6 | — | 3 | 4 | 5 | 5 | — | — |
| 20 | — | — | 3 | 4 | 4 | — | — | — | — | 3 | 4 | 5 | — | — | — | 3 | 4 | 4 | 5 | — | — |
| 25 | — | — | 3 | 3 | 4 | — | — | — | — | 3 | 4 | — | — | — | — | — | 3 | 4 | — | — | — |
| 30 | — | — | 3 | 3 | — | — | — | — | — | 3 | 3 | — | — | — | — | — | 3 | — | — | — | — |
| 40 | — | — | — | 3 | — | — | — | — | — | 3 | 3 | — | — | — | — | — | 3 | — | — | — | — |
| 50 | — | — | — | 3 | — | — | — | — | — | — | 3 | — | — | — | — | — | — | — | — | — | — |

**Table No. 2**

| Design H.P. | 22 Teeth | | | | | | | 24 Teeth | | | | | | | 26 Teeth | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | |
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| .05 | 20 | 20 | 32 | 32 | 32 | 32 | 32 | 20 | 24 | 32 | 32 | 32 | 32 | 32 | 20 | 24 | 32 | 32 | 32 | 32 | 32 |
| .10 | 12 | 16 | 24 | 24 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 |
| 1/4 | 10 | 12 | 20 | 20 | 24 | 24 | 24 | 12 | 12 | 20 | 20 | 24 | 24 | 24 | 12 | 12 | 20 | 24 | 24 | 24 | 32 |
| 1/3 | 10 | 12 | 16 | 20 | 20 | 24 | 24 | 10 | 12 | 16 | 20 | 20 | 24 | 24 | 10 | 12 | 16 | 20 | 24 | 24 | 24 |
| 1/2 | 10 | 10 | 16 | 16 | 20 | 20 | 20 | 10 | 12 | 16 | 16 | 20 | 20 | 24 | 10 | 12 | 16 | 20 | 20 | 20 | 24 |
| 3/4 | 8 | 10 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 |
| 1 | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 8 | 10 | 12 | 12 | 16 | 16 | 16 | 8 | 10 | 12 | 16 | 16 | 16 | 20 |
| 1 1/2 | 6 | 8 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 12 | 12 | 12 | 16 | 16 |
| 2 | 5 | 6 | 10 | 12 | 12 | 12 | 12 | 6 | 6 | 10 | 12 | 12 | 12 | 12 | 6 | 8 | 10 | 12 | 12 | 12 | — |
| 3 | 4 | 6 | 8 | 10 | 10 | 12 | 12 | 5 | 6 | 8 | 10 | 10 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | — |
| 5 | 4 | 5 | 6 | 8 | 8 | 10 | — | 4 | 5 | 6 | 8 | 10 | 10 | — | 4 | 5 | 8 | 8 | 10 | 10 | — |
| 7 1/2 | 3 | 4 | 6 | 6 | 8 | 8 | — | 3 | 4 | 6 | 6 | 8 | 8 | — | 4 | 5 | 6 | 8 | 8 | — | — |
| 10 | 3 | 4 | 5 | 6 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | 8 | — | 3 | 4 | 6 | 6 | 6 | — | — |
| 15 | — | 3 | 4 | 5 | 6 | — | — | — | 3 | 4 | 5 | 6 | — | — | — | 3 | 5 | 6 | — | — | — |
| 20 | — | 3 | 4 | 4 | — | — | — | — | — | 4 | 5 | — | — | — | — | — | 4 | 5 | — | — | — |
| 25 | — | — | 3 | 4 | — | — | — | — | — | 3 | 4 | — | — | — | — | — | 4 | — | — | — | — |
| 30 | — | — | 3 | 4 | — | — | — | — | — | 3 | 4 | — | — | — | — | —. | 3 | — | — | — | — |

**Table No. 3**

| Design H.P. | 28 Teeth | | | | | | | 30 Teeth | | | | | | | 32 Teeth | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | | R.P.M. Small Gear | | | | | | |
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| .05 | 20 | 24 | 32 | 32 | 32 | 32 | 32 | 20 | 24 | 32 | 32 | 32 | 32 | 32 | 20 | 24 | 32 | 32 | 32 | 32 | 32 |
| .10 | 16 | 20 | 24 | 32 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 | 16 | 20 | 24 | 32 | 32 | 32 | 32 |
| 1/4 | 12 | 16 | 20 | 24 | 24 | 24 | 32 | 12 | 16 | 20 | 24 | 24 | 24 | 32 | 12 | 16 | 20 | 24 | 24 | 24 | 32 |
| 1/3 | 12 | 12 | 20 | 20 | 24 | 24 | 24 | 12 | 12 | 20 | 20 | 24 | 24 | 24 | 12 | 12 | 20 | 20 | 24 | 24 | 24 |
| 1/2 | 10 | 12 | 16 | 20 | 20 | 20 | 24 | 10 | 12 | 16 | 20 | 20 | 20 | 24 | 10 | 12 | 16 | 20 | 20 | 24 | 24 |
| 3/4 | 8 | 10 | 12 | 16 | 20 | 20 | 20 | 8 | 10 | 12 | 16 | 20 | 20 | 20 | 8 | 12 | 16 | 16 | 20 | 20 | 20 |
| 1 | 8 | 10 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 |
| 1 1/2 | 6 | 8 | 12 | 12 | 12 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 |
| 2 | 6 | 8 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 12 | 16 |
| 3 | 5 | 6 | 10 | 10 | 12 | 12 | — | 5 | 6 | 10 | 10 | 12 | 12 | — | 5 | 6 | 10 | 12 | 12 | 12 | — |
| 5 | 4 | 5 | 8 | 8 | 10 | — | — | 3 | 6 | 8 | 10 | 10 | — | — | 4 | 6 | 8 | 10 | 10 | — | — |
| 7 1/2 | 4 | 5 | 6 | 8 | 8 | — | — | 3 | 5 | 6 | 8 | 8 | — | — | 3 | 5 | 6 | 8 | 8 | — | — |
| 10 | 3 | 4 | 6 | 6 | 8 | — | — | 3 | 3 | 6 | 6 | 8 | — | — | 3 | 3 | 6 | 6 | 8 | — | — |
| 15 | — | 3 | 5 | 6 | — | — | — | — | 3 | 5 | 6 | — | — | — | — | 3 | 5 | 6 | — | — | — |
| 20 | — | — | 4 | 5 | — | — | — | — | 3 | 3 | 5 | — | — | — | — | 3 | 3 | — | — | — | — |
| 25 | — | — | 4 | — | — | — | — | — | — | 3 | — | — | — | — | — | — | 3 | — | — | — | — |
| 30 | — | — | 3 | — | — | — | — | — | — | 3 | — | — | — | — | — | — | 3 | — | — | — | — |

F

## Spur Gears

BROWNING® Spur Gear Horsepower Tables when used in conjunction with "Pitch Selection Charts," Pages F-50 and F-55 and "Ratio and Center Distance Charts," Pages F-59 to F-71, greatly simplify the selection of a Spur Gear Drive, including those using change gears and non-metallic spur gears.

All BROWNING spur Gears, steel, cast iron and non-metallic have the proper amount of backlash incorporated in them so that mounting on centers of one-half the sum of the pitch diameters is the correct setting. Closer mounting removes the backlash, causing crowding and rapid destruction of the involute profiles generated in the gear teeth. Bearings of ample size should be mounted adjacent to each gear to prevent shaft deflection.

Table No. 1

### Ratings for 14 1/2° Steel Spur and Change Gears

| Number of Teeth | HORSEPOWER AT VARIOUS R.P.M. | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32 D.P. | | | | | | | 24 D.P. | | | | | | | 20 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 11 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .04 | .07 | .10 | .19 | .27 | .34 | .46 | | |
| 12 | — | — | — | — | — | — | — | .02 | .03 | .05 | .09 | .13 | .17 | .22 | .04 | .07 | .10 | .19 | .27 | .34 | .46 | | |
| 13 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .04 | .08 | .12 | .22 | .30 | .38 | .50 | | |
| 14 | — | — | — | — | — | — | — | .02 | .04 | .06 | .12 | .17 | .21 | .28 | .05 | .09 | .13 | .24 | .33 | .41 | .55 | | |
| 15 | .011 | .021 | .030 | .057 | .081 | .103 | .141 | .03 | .05 | .07 | .13 | .18 | .23 | .31 | .06 | .10 | .15 | .27 | .38 | .47 | .61 | | |
| 16 | .012 | .023 | .033 | .063 | .089 | .112 | .153 | .03 | .05 | .08 | .14 | .20 | .25 | .33 | .06 | .11 | .16 | .30 | .41 | .51 | .66 | | |
| 17 | — | — | — | — | — | — | — | .03 | .06 | .09 | .16 | .22 | .27 | .36 | .07 | .12 | .18 | .32 | .45 | .55 | .71 | | |
| 18 | .014 | .027 | .040 | .074 | .104 | .131 | .176 | .03 | .06 | .09 | .17 | .23 | .29 | .38 | .07 | .14 | .19 | .35 | .47 | .59 | .75 | | |
| 19 | — | — | — | — | — | — | — | .04 | .07 | .10 | .18 | .25 | .31 | .40 | .07 | .14 | .21 | .37 | .50 | .62 | .79 | | |
| 20 | .016 | .031 | .046 | .084 | .119 | .148 | .198 | .04 | .07 | .11 | .19 | .26 | .33 | .42 | .08 | .16 | .22 | .40 | .55 | .67 | .85 | | |
| 21 | — | — | — | — | — | — | — | .04 | .08 | .11 | .20 | .28 | .34 | .45 | .09 | .16 | .24 | .42 | .57 | .70 | .89 | | |
| 22 | .018 | .034 | .051 | .094 | .132 | .164 | .218 | .04 | .08 | .12 | .21 | .29 | .36 | .46 | .09 | .18 | .25 | .45 | .60 | .73 | .93 | | |
| 23 | — | — | — | — | — | — | — | .05 | .09 | .13 | .22 | .30 | .37 | .48 | .10 | .19 | .27 | .47 | .63 | .77 | .97 | | |
| 24 | .019 | .039 | .056 | .104 | .144 | .178 | .235 | .05 | .09 | .13 | .23 | .32 | .39 | .50 | .10 | .19 | .28 | .49 | .65 | .78 | .94 | | |
| 25 | — | — | — | — | — | — | — | .05 | .10 | .14 | .25 | .33 | .40 | .52 | .11 | .20 | .29 | .51 | .68 | .82 | 1.02 | | |
| 26 | .022 | .043 | .063 | .114 | .158 | .195 | .254 | .05 | .10 | .14 | .26 | .35 | .42 | .53 | — | — | — | — | — | — | — | | |
| 27 | — | — | — | — | — | — | — | .06 | .11 | .15 | .27 | .36 | .44 | .55 | — | — | — | — | — | — | — | | |
| 28 | .024 | .047 | .068 | .124 | .171 | .210 | .272 | .06 | .11 | .16 | .28 | .37 | .45 | .57 | .12 | .23 | .33 | .58 | .76 | .90 | 1.13 | | |
| 30 | .027 | .051 | .074 | .134 | .184 | .224 | .289 | .06 | .12 | .17 | .30 | .40 | .48 | .60 | .13 | .25 | .36 | .62 | .81 | .96 | 1.18 | | |
| 32 | .029 | .055 | .079 | .142 | .194 | .236 | .303 | .07 | .13 | .18 | .32 | .42 | .50 | .63 | .14 | .27 | .38 | .65 | .85 | 1.00 | 1.23 | | |
| 33 | — | — | — | — | — | — | — | .07 | .13 | .19 | .33 | .43 | .52 | .64 | — | — | — | — | — | — | — | | |
| 35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .16 | .30 | .42 | .70 | .91 | 1.07 | 1.30 | | |
| 36 | — | — | — | — | — | — | — | .08 | .15 | .21 | .36 | .47 | .55 | .68 | .16 | .31 | .43 | .73 | .94 | 1.10 | 1.33 | | |
| 39 | — | — | — | — | — | — | — | .09 | .16 | .22 | .38 | .50 | .59 | .72 | — | — | — | — | — | — | — | | |
| 40 | .037 | .071 | .101 | .178 | .238 | .286 | .358 | .09 | .16 | .23 | .39 | .51 | .60 | .73 | .19 | .35 | .48 | .80 | 1.03 | 1.19 | 1.43 | | |
| 42 | — | — | — | — | — | — | — | .09 | .17 | .24 | .41 | .53 | .62 | .75 | — | — | — | — | — | — | — | | |
| 44 | — | — | — | — | — | — | — | .10 | .18 | .25 | .43 | .55 | .64 | .77 | — | — | — | — | — | — | — | | |
| 45 | — | — | — | — | — | — | — | .10 | .19 | .26 | .43 | .56 | .65 | .78 | .21 | .39 | .54 | .88 | 1.11 | 1.28 | 1.51 | | |
| 48 | .045 | .086 | .122 | .210 | .276 | .328 | .403 | .11 | .20 | .28 | .46 | .59 | .68 | .81 | .23 | .41 | .57 | .92 | 1.16 | 1.33 | 1.56 | | |
| 50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .24 | .43 | .59 | .95 | 1.19 | 1.36 | 1.59 | | |
| 54 | — | — | — | — | — | — | — | .12 | .22 | .30 | .50 | .63 | .72 | .85 | — | — | — | — | — | — | — | | |
| 55 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .26 | .47 | .64 | 1.01 | 1.26 | 1.43 | 1.65 | | |
| 56 | .054 | .100 | .141 | .238 | .308 | .362 | .438 | .13 | .23 | .32 | .52 | .65 | .75 | .87 | — | — | — | — | — | — | — | | |
| 60 | — | — | — | — | — | — | — | .13 | .24 | .33 | .54 | .67 | .77 | .90 | .28 | .50 | .68 | 1.07 | 1.31 | 1.48 | 1.70 | | |
| 64 | .062 | .113 | .159 | .263 | .337 | .392 | .469 | .14 | .26 | .36 | .56 | .70 | .80 | .93 | .30 | .53 | .72 | 1.11 | 1.35 | 1.52 | — | | |
| 66 | — | — | — | — | — | — | — | .15 | .26 | .36 | .57 | .71 | .80 | .93 | — | — | — | — | — | — | — | | |
| 70 | — | — | — | — | — | — | — | .16 | .28 | .38 | .60 | .73 | .83 | .96 | .33 | .58 | .78 | 1.19 | 1.44 | 1.61 | — | | |
| 72 | — | — | — | — | — | — | — | .16 | .29 | .39 | .61 | .74 | .84 | — | .34 | .59 | .80 | 1.21 | 1.46 | 1.62 | — | | |
| 75 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .35 | .61 | .82 | 1.23 | 1.48 | 1.65 | — | | |
| 80 | .076 | .139 | .205 | .307 | .385 | .441 | .515 | — | — | — | — | — | — | — | .37 | .64 | .85 | 1.27 | 1.52 | 1.68 | — | | |
| 84 | — | — | — | — | — | — | — | .18 | .32 | .43 | .66 | .80 | .89 | — | .39 | .67 | .88 | 1.30 | 1.55 | — | — | | |
| 90 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .41 | .71 | .93 | 1.36 | 1.61 | — | — | | |
| 96 | .091 | .163 | .222 | .346 | .425 | .481 | .552 | .21 | .36 | .48 | .72 | .86 | .95 | — | .44 | .74 | .97 | 1.40 | 1.64 | — | — | | |
| 100 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .46 | .77 | 1.01 | 1.44 | 1.69 | — | — | | |
| 110 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .49 | .83 | 1.07 | 1.50 | 1.74 | — | — | | |
| 112 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .50 | .84 | 1.08 | 1.51 | 1.75 | — | — | | |
| 120 | — | — | — | — | — | — | — | .25 | .43 | .56 | .80 | .94 | — | — | .53 | .88 | 1.12 | 1.56 | 1.79 | — | — | | |
| 128 | .118 | .206 | .274 | .408 | .487 | .539 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 132 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .57 | .93 | 1.18 | 1.61 | — | — | — | | |
| 140 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .60 | .97 | 1.22 | 1.65 | — | — | — | | |
| 144 | — | — | — | — | — | — | — | .30 | .49 | .63 | .87 | 1.00 | — | — | .61 | .98 | 1.24 | 1.66 | — | — | — | | |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .64 | 1.02 | 1.28 | 1.71 | — | — | — | | |
| 156 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .66 | 1.05 | 1.30 | 1.73 | — | — | — | | |
| 160 | .143 | .244 | .318 | .456 | .532 | — | — | — | — | — | — | — | — | — | .67 | 1.06 | 1.32 | 1.74 | — | — | — | | |
| 168 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .69 | 1.09 | 1.35 | 1.78 | — | — | — | | |
| 180 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .73 | 1.13 | 1.39 | 1.81 | — | — | — | | |
| 192 | .167 | .277 | .354 | .492 | .566 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 200 | .173 | .285 | .364 | .501 | — | — | — | — | — | — | — | — | — | — | .78 | 1.20 | 1.46 | 1.88 | — | — | — | | |

**Ratings below Heavy Line are not recommended as Pitch Line Velocity exceeds 1000 feet per minute; they are published for interpolation purposes only. Interpolate for intermediate sizes and speeds.**

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes**

Table No. 1

## Ratings for 14 1/2° Steel and Cast Iron Spur Gears and Steel Change Gears

| Number of Teeth | HORSEPOWER AT VARIOUS R.P.M. | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 D.P. | | | | | | | 12 D.P. | | | | | | | 10 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 11 | .08 | .15 | .21 | .39 | .55 | .68 | .89 | .20 | .38 | .55 | .99 | 1.34 | 1.64 | 2.09 | .38 | .72 | 1.04 | 1.83 | 2.45 | 2.95 | 3.71 | | |
| 12 | .08 | .15 | .21 | .39 | .55 | .68 | .89 | .20 | .38 | .55 | .99 | 1.34 | 1.64 | 2.09 | .38 | .72 | 1.04 | 1.83 | 2.45 | 2.95 | 3.71 | | |
| 13 | .09 | .17 | .24 | .44 | .61 | .75 | .98 | .21 | .43 | .62 | 1.11 | 1.49 | 1.81 | 2.30 | .43 | .81 | 1.16 | 2.03 | 2.70 | 3.24 | 4.04 | | |
| 14 | .10 | .18 | .26 | .48 | .66 | .81 | 1.05 | .25 | .47 | .68 | 1.20 | 1.61 | 1.94 | 2.45 | .48 | .90 | 1.28 | 2.21 | 2.92 | 3.49 | 4.16 | | |
| 15 | .11 | .22 | .31 | .55 | .75 | .94 | 1.18 | .28 | .55 | .80 | 1.38 | 1.84 | 2.21 | 2.76 | .54 | 1.03 | 1.47 | 2.50 | 3.29 | 3.92 | 4.87 | | |
| 16 | .13 | .24 | .33 | .60 | .81 | 1.00 | 1.27 | .32 | .60 | .86 | 1.50 | 2.01 | 2.39 | 2.96 | .61 | 1.12 | 1.63 | 2.69 | 3.56 | 4.22 | 5.13 | | |
| 17 | .13 | .25 | .36 | .64 | .87 | 1.06 | 1.35 | .34 | .66 | .93 | 1.61 | 2.13 | 2.54 | 3.14 | .65 | 1.23 | 1.73 | 2.93 | 3.81 | 4.48 | 5.43 | | |
| 18 | .15 | .29 | .39 | .69 | .93 | 1.13 | 1.43 | .37 | .71 | 1.02 | 1.73 | 2.27 | 2.71 | 3.31 | .76 | 1.40 | 1.94 | 3.24 | 4.16 | 4.86 | 5.83 | | |
| 19 | .15 | .29 | .42 | .73 | .98 | 1.19 | 1.49 | .40 | .75 | 1.07 | 1.82 | 2.38 | 2.82 | 3.45 | .76 | 1.41 | 1.97 | 3.29 | 4.24 | 4.94 | 5.93 | | |
| 20 | .17 | .32 | .45 | .79 | 1.06 | 1.27 | 1.59 | .44 | .82 | 1.15 | 1.95 | 2.54 | 2.99 | 3.64 | .83 | 1.53 | 2.13 | 3.53 | 4.52 | 5.25 | 6.28 | | |
| 21 | .18 | .34 | .48 | .85 | 1.13 | 1.35 | 1.68 | .47 | .87 | 1.23 | 2.07 | 2.68 | 3.14 | 3.81 | .88 | 1.62 | 2.26 | 3.72 | 4.73 | 5.48 | 6.52 | | |
| 22 | .19 | .36 | .51 | .88 | 1.17 | 1.40 | 1.73 | .49 | .92 | 1.28 | 2.15 | 2.78 | 3.25 | 3.92 | .93 | 1.71 | 2.38 | 3.88 | 4.93 | 5.69 | 6.73 | | |
| 23 | .20 | .37 | .53 | .92 | 1.21 | 1.45 | 1.78 | .52 | .96 | 1.34 | 2.23 | 2.87 | 3.35 | 4.02 | — | — | — | — | — | — | — | | |
| 24 | .21 | .39 | .56 | .96 | 1.26 | 1.49 | 1.84 | .55 | 1.01 | 1.41 | 2.33 | 2.99 | 3.47 | 4.15 | 1.03 | 1.87 | 2.59 | 4.17 | 5.25 | 6.02 | 7.07 | | |
| 25 | — | — | — | — | — | — | — | .57 | 1.05 | 1.47 | 2.42 | 3.08 | 3.58 | 4.25 | 1.08 | 1.97 | 2.71 | 4.35 | 5.45 | 6.24 | 7.29 | | |
| 26 | .23 | .43 | .61 | 1.04 | 1.36 | 1.60 | 1.95 | .60 | 1.11 | 1.54 | 2.52 | 3.20 | 3.70 | 4.38 | 1.13 | 2.06 | 2.83 | 4.51 | 5.63 | 6.42 | 7.49 | | |
| 28 | .25 | .47 | .66 | 1.11 | 1.44 | 1.70 | 2.05 | .66 | 1.20 | 1.66 | 2.69 | 3.39 | 3.90 | 4.59 | 1.24 | 2.24 | 3.06 | 4.82 | 5.97 | 6.77 | — | | |
| 30 | .28 | .51 | .72 | 1.20 | 1.54 | 1.80 | 2.17 | .72 | 1.30 | 1.79 | 2.88 | 3.60 | 4.12 | 4.82 | 1.35 | 2.42 | 3.28 | 5.12 | 6.29 | 7.11 | — | | |
| 32 | .30 | .55 | .77 | 1.27 | 1.63 | 1.89 | 2.26 | .77 | 1.39 | 1.91 | 3.03 | 3.77 | 4.29 | 4.98 | 1.44 | 2.57 | 3.47 | 5.36 | 6.55 | 7.36 | — | | |
| 34 | .32 | .58 | .81 | 1.33 | 1.70 | 1.96 | 2.33 | .82 | 1.47 | 2.01 | 3.16 | 3.90 | 4.43 | 5.12 | — | — | — | — | — | — | — | | |
| 35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.59 | 2.81 | 3.77 | 5.74 | 6.95 | 7.76 | — | | |
| 36 | .34 | .62 | .86 | 1.40 | 1.78 | 2.05 | 2.42 | .87 | 1.57 | 2.13 | 3.32 | 4.08 | 4.61 | 5.27 | 1.64 | 2.89 | 3.87 | 5.87 | 7.08 | — | — | | |
| 38 | .36 | .66 | .91 | 1.46 | 1.84 | 2.12 | 2.48 | .92 | 1.65 | 2.23 | 3.44 | 4.20 | 4.74 | — | 1.74 | 3.05 | 4.06 | 6.10 | 7.33 | — | — | | |
| 40 | .38 | .69 | .96 | 1.53 | 1.92 | 2.20 | 2.57 | .98 | 1.74 | 2.35 | 3.60 | 4.38 | 4.91 | — | 1.84 | 3.20 | 4.25 | 6.32 | 7.55 | — | — | | |
| 42 | — | — | — | — | — | — | — | 1.04 | 1.83 | 2.46 | 3.74 | 4.52 | 5.06 | — | 1.93 | 3.35 | 4.43 | 6.54 | 7.77 | — | — | | |
| 44 | .42 | .76 | 1.04 | 1.65 | 2.05 | 2.33 | 2.70 | 1.09 | 1.91 | 2.56 | 3.86 | 4.65 | 5.17 | — | — | — | — | — | — | — | — | | |
| 45 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.08 | 3.57 | 4.70 | 6.85 | 8.09 | — | — | | |
| 48 | .46 | .82 | 1.12 | 1.75 | 2.15 | 2.43 | 2.79 | 1.18 | 2.06 | 2.73 | 4.06 | 4.85 | 5.37 | — | 2.24 | 3.76 | 4.91 | 7.09 | 8.31 | — | — | | |
| 50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.30 | 3.89 | 5.07 | 7.27 | 8.49 | — | — | | |
| 52 | .50 | .88 | 1.19 | 1.84 | 2.24 | 2.52 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 54 | .52 | .92 | 1.24 | 1.89 | 2.30 | 2.57 | — | 1.32 | 2.27 | 2.99 | 4.36 | 5.15 | — | — | 2.46 | 4.13 | 5.33 | 7.54 | — | — | — | | |
| 55 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.50 | 2.51 | 3.24 | 4.57 | — | — | — | | |
| 56 | .53 | .94 | 1.27 | 1.93 | 2.33 | 2.61 | — | 1.37 | 2.34 | 3.07 | 4.45 | 5.23 | — | — | — | — | — | — | — | — | — | | |
| 60 | .57 | 1.00 | 1.34 | 2.01 | 2.42 | 2.69 | — | 1.46 | 2.47 | 3.21 | 4.60 | 5.38 | — | — | 1.62 | 2.68 | 3.43 | 4.77 | — | — | — | | |
| 64 | .61 | 1.06 | 1.41 | 2.09 | 2.50 | 2.77 | — | .93 | 1.56 | 2.02 | 2.86 | 3.32 | — | — | 1.71 | 2.81 | 3.57 | 4.90 | | | | | |
| 65 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 2.84 | 3.61 | 4.95 | — | — | — | | |
| 66 | — | — | — | — | — | — | — | .96 | 1.60 | 2.07 | 2.92 | 3.38 | — | — | — | — | — | — | — | — | — | | |
| 68 | .64 | 1.12 | 1.48 | 2.17 | 2.58 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.85 | 3.00 | 3.78 | 5.12 | — | — | — | | |
| 72 | .68 | 1.16 | 1.53 | 2.23 | 2.63 | — | — | 1.03 | 1.71 | 2.18 | 3.03 | 3.48 | — | — | 1.90 | 3.06 | 3.85 | 5.19 | — | — | — | | |
| 75 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.96 | 3.14 | 3.94 | 5.26 | — | — | — | | |
| 78 | — | — | — | — | — | — | — | 1.10 | 1.81 | 2.30 | 3.15 | — | — | — | — | — | — | — | — | — | — | | |
| 80 | .74 | 1.26 | 1.64 | 2.35 | 2.75 | — | — | — | — | — | — | — | — | — | 2.06 | 3.27 | 4.07 | 5.39 | — | — | — | | |
| 84 | .77 | 1.30 | 1.69 | 2.40 | 2.80 | — | — | 1.17 | 1.89 | 2.39 | 3.23 | — | — | — | 2.14 | 3.38 | 4.19 | 5.49 | — | — | — | | |
| 85 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.17 | 3.41 | 4.21 | 5.52 | — | — | — | | |
| 88 | .48 | .81 | 1.05 | 1.48 | 1.72 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 90 | — | — | — | — | — | — | — | 1.24 | 1.98 | 2.49 | 3.32 | — | — | — | 2.27 | 3.54 | 4.35 | 5.65 | — | — | — | | |
| 95 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.37 | 3.66 | 4.48 | 5.76 | — | — | — | | |
| 96 | .53 | .87 | 1.12 | 1.55 | 1.78 | — | — | 1.31 | 2.08 | 2.58 | 3.41 | — | — | — | 2.38 | 3.68 | 4.50 | 5.77 | — | — | — | | |
| 100 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.46 | 3.78 | 4.59 | 5.85 | — | — | — | | |
| 102 | — | — | — | — | — | — | — | 1.37 | 2.16 | 2.67 | 3.50 | — | — | — | — | — | — | — | — | — | — | | |
| 104 | .56 | .92 | 1.17 | 1.60 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 105 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.55 | 3.88 | 4.69 | 5.93 | — | — | — | | |
| 108 | — | — | — | — | — | — | — | 1.43 | 2.23 | 2.75 | 3.56 | — | — | — | — | — | — | — | — | — | — | | |
| 110 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.64 | 3.98 | 4.80 | 6.02 | — | — | — | | |
| 112 | .59 | .96 | 1.21 | 1.64 | — | — | — | 1.47 | 2.28 | 2.79 | 3.60 | — | — | — | 2.67 | 4.02 | 4.83 | — | — | — | — | | |
| 114 | — | — | — | — | — | — | — | 1.49 | 2.30 | 2.81 | 3.62 | — | — | — | — | — | — | — | — | — | — | | |
| 120 | .63 | 1.00 | 1.26 | 1.68 | — | — | — | 1.54 | 2.37 | 2.88 | 3.67 | — | — | — | 2.80 | 4.17 | 4.98 | — | — | — | — | | |
| 126 | — | — | — | — | — | — | — | 1.61 | 2.44 | 2.96 | 3.74 | — | — | — | — | — | — | — | — | — | — | | |
| 128 | .66 | 1.05 | 1.31 | 1.74 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 130 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.96 | 4.35 | 5.15 | — | — | — | — | | |
| 132 | — | — | — | — | — | — | — | 1.66 | 2.50 | 3.02 | 3.79 | — | — | — | — | — | — | — | — | — | — | | |
| 136 | .69 | 1.09 | 1.35 | 1.77 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 140 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.11 | 4.52 | 5.31 | — | — | — | — | | |
| 144 | .72 | 1.13 | 1.39 | 1.80 | — | — | — | 1.76 | 2.62 | 3.13 | 3.89 | — | — | — | 3.17 | 4.57 | 5.36 | — | — | — | — | | |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.26 | 4.67 | 5.45 | — | — | — | — | | |
| 152 | .75 | 1.16 | 1.42 | 1.83 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 156 | — | — | — | — | — | — | — | 1.87 | 2.74 | 3.25 | — | — | — | — | — | — | — | — | — | — | — | | |
| 160 | .78 | 1.20 | 1.45 | 1.86 | — | — | — | — | — | — | — | — | — | — | 3.41 | 4.80 | — | — | — | — | — | | |
| 168 | .81 | 1.23 | 1.48 | 1.88 | — | — | — | 1.96 | 2.84 | 3.33 | — | — | — | — | — | — | — | — | — | — | — | | |
| 170 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.51 | 4.92 | — | — | — | — | — | | |
| 176 | .84 | 1.27 | 1.53 | 1.93 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 180 | — | — | — | — | — | — | — | 2.04 | 2.93 | 3.42 | — | — | — | — | 3.64 | 5.05 | — | — | — | — | — | | |
| 192 | .89 | 1.35 | 1.60 | 1.97 | — | — | — | 2.12 | 3.00 | 3.48 | — | — | — | — | — | — | — | — | — | — | — | | |
| 198 | — | — | — | — | — | — | — | 2.17 | 3.06 | 3.54 | — | — | — | — | — | — | — | — | — | — | — | | |
| 200 | .92 | 1.36 | 1.61 | — | — | — | — | — | — | — | — | — | — | — | 3.87 | 5.27 | — | — | — | — | — | | |

Ratings above Heavy Dash Line are for Steel Spur Gears and Change Gears. Ratings below this line are for Cast Iron Spur Gears. For Change Gears multiply ratings below this line by 1.66. Interpolate sizes and speeds.
Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1000 feet per minute. they are published for interpolation purposes only.

**⚠WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes

Table No. 1 **Ratings for 14 1/2° Steel and Cast Iron Spur Gears and Steel Change Gears**

| Number of Teeth | HORSEPOWER AT VARIOUS R.P.M. | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 D.P. | | | | | | | 6 D.P. | | | | | | | 5 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 11 | .73 | 1.38 | 1.95 | 3.35 | 4.40 | 5.23 | 6.43 | 1.53 | 2.83 | 3.96 | 6.55 | 8.39 | 9.75 | 11.65 | 2.53 | 4.63 | 6.39 | 10.31 | 12.97 | 14.88 | 17.46 | | |
| 12 | .73 | 1.38 | 1.95 | 3.35 | 4.40 | 5.23 | 6.43 | 1.53 | 2.83 | 3.96 | 6.55 | 8.39 | 9.75 | 11.65 | 2.53 | 4.63 | 6.39 | 10.31 | 12.97 | 14.88 | 17.46 | | |
| 13 | .82 | 1.54 | 2.19 | 3.71 | 4.85 | 5.73 | 6.98 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 14 | .88 | 1.84 | 2.32 | 3.91 | 5.08 | 5.95 | 7.21 | 1.97 | 3.47 | 4.80 | 7.77 | 9.80 | 11.27 | 13.27 | 3.13 | 5.65 | 7.71 | 12.16 | 15.06 | 17.09 | 19.76 | | |
| 15 | 1.07 | 1.91 | 2.75 | 4.67 | 5.89 | 6.88 | 8.34 | 2.20 | 4.04 | 5.35 | 8.82 | 11.02 | 12.74 | 14.69 | 3.60 | 6.51 | 8.74 | 13.72 | 16.80 | 19.03 | 21.94 | | |
| 16 | 1.19 | 2.14 | 3.00 | 5.00 | 6.06 | 7.38 | 8.80 | 2.41 | 4.44 | 5.97 | 9.52 | 11.81 | 13.58 | 15.62 | 3.91 | 7.10 | 9.41 | 14.74 | 17.94 | 20.25 | — | | |
| 17 | 1.26 | 2.32 | 3.23 | 5.32 | 6.77 | 7.83 | 9.30 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 18 | 1.43 | 2.53 | 3.54 | 5.73 | 7.17 | 8.35 | 9.78 | 2.83 | 5.13 | 6.88 | 10.80 | 13.39 | 14.98 | 17.27 | 4.54 | 8.31 | 11.31 | 16.82 | 20.22 | 22.48 | — | | |
| 19 | 1.45 | 2.66 | 3.67 | 5.93 | 7.46 | 8.58 | 10.07 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 20 | 1.58 | 2.88 | 3.96 | 6.35 | 7.96 | 9.11 | 10.64 | 3.27 | 5.79 | 7.81 | 11.98 | 14.58 | 16.35 | — | 5.36 | 9.33 | 12.38 | 18.43 | 22.01 | 24.38 | — | | |
| 21 | 1.68 | 3.05 | 4.19 | 6.67 | 8.32 | 9.48 | 11.03 | 3.48 | 6.14 | 8.25 | 12.55 | 15.19 | 16.97 | — | — | — | — | — | — | — | — | | |
| 22 | 1.77 | 3.20 | 4.38 | 6.93 | 8.59 | 9.76 | 11.31 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 24 | 1.96 | 3.52 | 4.79 | 7.47 | 9.18 | 10.37 | — | 4.03 | 7.02 | 9.32 | 13.88 | 16.54 | 18.35 | — | 6.55 | 11.18 | 14.62 | 21.09 | 24.74 | — | — | | |
| 25 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.89 | 11.69 | 15.22 | 21.82 | 25.50 | — | — | | |
| 26 | 2.16 | 3.85 | 5.19 | 8.01 | 9.76 | 10.97 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 27 | — | — | — | — | — | — | — | 4.65 | 7.98 | 10.49 | 15.31 | 18.07 | — | — | — | — | — | — | — | — | — | | |
| 28 | 2.37 | 4.18 | 5.62 | 8.55 | 10.35 | 11.56 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 30 | 2.56 | 4.48 | 5.99 | 9.01 | 10.83 | 12.05 | — | 5.14 | 8.84 | 11.51 | 16.49 | 19.27 | — | — | 8.45 | 14.00 | 17.92 | 24.88 | 28.58 | — | — | | |
| 32 | 2.73 | 4.76 | 6.32 | 9.41 | 11.24 | 12.45 | — | 5.57 | 9.37 | 12.13 | 17.19 | 19.97 | — | — | — | — | — | — | — | — | — | | |
| 33 | — | — | — | — | — | — | — | 5.70 | 9.60 | 12.37 | 17.42 | 20.18 | — | — | — | — | — | — | — | — | — | | |
| 35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.82 | 15.92 | 20.07 | 27.14 | — | — | — | | |
| 36 | 3.09 | 5.32 | 6.99 | 10.19 | 12.03 | — | — | 6.26 | 10.37 | 13.28 | 18.44 | 21.18 | — | — | — | — | — | — | — | — | — | | |
| 40 | 3.46 | 5.86 | 7.64 | 10.94 | 12.79 | — | — | 6.97 | 11.37 | 14.41 | 19.66 | — | — | — | 6.72 | 10.68 | 13.29 | 17.58 | — | — | — | | |
| 42 | 3.64 | 6.14 | 7.96 | 11.31 | 13.16 | — | — | 7.32 | 11.86 | 14.95 | 29.23 | — | — | — | — | — | — | — | — | — | — | | |
| 44 | 3.81 | 6.39 | 8.24 | 11.62 | 13.47 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 45 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.49 | 11.69 | 14.37 | 18.65 | — | — | — | | |
| 48 | 4.13 | 6.84 | 8.76 | 12.16 | 13.97 | — | — | 4.94 | 7.85 | 9.77 | 12.92 | — | — | — | — | — | — | — | — | — | — | | |
| 50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.17 | 12.54 | 15.25 | 19.44 | — | — | — | | |
| 52 | 4.42 | 7.23 | 9.19 | 12.60 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 54 | 4.58 | 7.46 | 9.44 | 12.85 | — | — | — | 5.45 | 8.50 | 10.45 | 13.56 | — | — | — | — | — | — | — | — | — | — | | |
| 55 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.80 | 13.28 | 16.00 | 20.11 | — | — | — | | |
| 56 | 2.84 | 4.61 | 5.81 | 7.86 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 60 | 3.01 | 4.84 | 6.06 | 8.10 | — | — | — | 5.93 | 9.10 | 11.08 | 14.12 | — | — | — | 9.40 | 13.99 | 16.70 | 20.72 | — | — | — | | |
| 64 | 3.17 | 5.04 | 6.27 | 8.29 | — | — | — | 6.22 | 9.44 | 11.29 | 14.44 | — | — | — | — | — | — | — | — | — | — | | |
| 66 | — | — | — | — | — | — | — | 6.39 | 9.65 | 11.62 | 14.57 | — | — | — | — | — | — | — | — | — | — | | |
| 68 | 3.35 | 5.26 | 6.51 | 8.53 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 70 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.51 | 15.24 | 17.89 | — | — | — | — | | |
| 72 | 3.49 | 5.45 | 6.70 | 8.69 | — | — | — | 6.82 | 10.15 | 12.12 | 15.03 | — | — | — | — | — | — | — | — | — | — | | |
| 76 | 3.64 | 5.63 | 6.89 | 8.86 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 80 | 3.79 | 5.81 | 7.07 | 9.00 | — | — | — | — | — | — | — | — | — | — | 11.47 | 16.26 | 18.88 | — | — | — | — | | |
| 84 | 3.93 | 5.98 | 7.23 | 9.16 | — | — | — | 7.58 | 11.00 | 12.93 | — | — | — | — | — | — | — | — | — | — | — | | |
| 88 | 4.06 | 6.13 | 7.39 | 9.31 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 90 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 12.36 | 17.17 | 19.72 | — | — | — | — | | |
| 92 | 4.19 | 6.30 | 7.55 | 9.44 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 96 | 4.33 | 6.45 | 7.70 | — | — | — | — | 8.30 | 11.76 | 13.66 | — | — | — | — | — | — | — | — | — | — | — | | |
| 100 | 4.45 | 6.59 | 7.84 | — | — | — | — | — | — | — | — | — | — | — | 13.21 | 18.01 | — | — | — | — | — | | |
| 108 | — | — | — | — | — | — | — | 8.93 | 12.40 | 14.24 | — | — | — | — | — | — | — | — | — | — | — | | |
| 110 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 13.92 | 18.69 | — | — | — | — | — | | |
| 112 | 4.82 | 6.99 | 8.22 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 120 | 5.04 | 7.22 | 8.44 | — | — | — | — | 9.50 | 12.96 | — | — | — | — | — | 14.60 | 19.31 | — | — | — | — | — | | |
| 128 | 5.25 | 7.44 | 8.64 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 132 | — | — | — | — | — | — | — | 10.02 | 13.51 | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 144 | 5.64 | 7.84 | 9.00 | — | — | — | — | 10.51 | 13.90 | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 160 | 6.00 | 8.18 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 168 | 6.15 | 8.33 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |

Ratings above Heavy Dash Line are for Steel Spur Gears and Change Gears (8 pitch). Ratings below this line are for Cast Iron Spur Gears. For 8 Pitch Change Gears multiply ratings below this line by 1.66. Interpolate for intermediate sizes and speeds. Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1000 feet per minute.

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes**

Table No.1

## Ratings for 14 1/2° Steel and Cast Iron Spur Gears

| Number of teeth | HORSEPOWER AT VARIOUS R.P.M. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 D.P. | | | | | | | 3 D.P. | | | | | | |
| | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 25 | 50 | 100 | 200 | 300 | 600 | 900 |
| 11 | 2.35 | 4.42 | 7.92 | 10.77 | 16.80 | 20.65 | 23.33 | 3.19 | 6.13 | 11.35 | 19.75 | 26.25 | 39.04 | 46.52 |
| 12 | 2.35 | 4.42 | 7.92 | 10.77 | 16.80 | 20.65 | 23.33 | 3.19 | 6.13 | 11.35 | 19.75 | 26.25 | 39.04 | 46.52 |
| 14 | 2.91 | 5.44 | 9.48 | 12.89 | 19.62 | 23.75 | 26.54 | 3.97 | 7.60 | 13.92 | 23.81 | 31.21 | 45.26 | 50.25 |
| 15 | 3.60 | 6.37 | 11.27 | 14.69 | 22.04 | 26.45 | 29.63 | 4.90 | 8.82 | 16.16 | 26.94 | 34.10 | 51.11 | 58.78 |
| 16 | 3.81 | 6.86 | 11.93 | 15.83 | 23.61 | 28.18 | 31.23 | 5.08 | 10.31 | 17.33 | 28.95 | 39.24 | 53.83 | 62.46 |
| 18 | 4.32 | 8.10 | 13.76 | 18.08 | 26.45 | 31.31 | — | 5.94 | 11.34 | 20.51 | 34.01 | 43.18 | 59.92 | 69.09 |
| 20 | 5.07 | 9.23 | 15.65 | 20.38 | 29.20 | 34.12 | — | 6.96 | 13.03 | 23.13 | 37.75 | 47.83 | 65.22 | — |
| 21 | — | — | — | — | — | — | — | 7.46 | 13.93 | 24.61 | 39.86 | 50.27 | 67.99 | — |
| 22 | 5.68 | 10.26 | 17.20 | 22.20 | 31.28 | 36.24 | — | — | — | — | — | — | — | — |
| 24 | 6.28 | 11.25 | 18.64 | 23.86 | 33.14 | 38.17 | — | 5.22 | 9.71 | 16.86 | 28.02 | 33.48 | 44.38 | — |
| 28 | 7.57 | 13.37 | 21.66 | 27.31 | 36.94 | — | — | — | — | — | — | — | — | — |
| 30 | 4.91 | 8.61 | 13.81 | 17.30 | 23.13 | — | — | 6.87 | 12.51 | 21.22 | 32.53 | 39.58 | 50.50 | — |
| 32 | 5.26 | 9.15 | 14.53 | 18.08 | 23.92 | — | — | — | — | — | — | — | — | — |
| 36 | 5.95 | 10.22 | 15.94 | 19.59 | 25.42 | — | — | 8.39 | 15.04 | 24.90 | 37.06 | 44.27 | — | — |
| 40 | 6.65 | 11.27 | 17.29 | 21.03 | — | — | — | — | — | — | — | — | — | — |
| 42 | 7.00 | 11.80 | 17.95 | 21.73 | — | — | — | 9.95 | 17.57 | 28.48 | 41.28 | 48.56 | — | — |
| 44 | 7.33 | 12.28 | 18.55 | 22.34 | — | — | — | — | — | — | — | — | — | — |
| 48 | 7.87 | 12.81 | 19.29 | 23.38 | — | — | — | 11.32 | 19.77 | 31.59 | 44.65 | 51.81 | — | — |
| 54 | 8.79 | 14.32 | 20.89 | 24.67 | — | — | — | 12.68 | 21.79 | 33.97 | 47.20 | — | — | — |
| 56 | 9.09 | 14.73 | 21.36 | 25.13 | — | — | — | — | — | — | — | — | — | — |
| 60 | 9.63 | 15.46 | 22.15 | 25.88 | — | — | — | 14.00 | 23.73 | 36.41 | 49.68 | — | — | — |
| 64 | 10.14 | 16.10 | 22.82 | 26.50 | — | — | — | — | — | — | — | — | — | — |
| 72 | 11.19 | 17.45 | 24.23 | 27.83 | — | — | — | 16.46 | 27.26 | 40.58 | 53.62 | — | —. | — |
| 80 | 12.12 | 18.59 | 25.35 | — | — | — | — | — | — | — | — | — | — | — |
| 84 | 12.57 | 19.13 | 25.87 | — | — | — | — | 18.72 | 32.47 | 43.98 | 56.70 | — | — | — |
| 88 | 13.01 | 19.64 | 26.36 | — | — | — | — | — | — | — | — | — | — | — |
| 96 | 13.87 | 20.64 | 27.30 | — | — | — | — | 20.88 | 33.17 | 47.02 | 59.36 | — | — | — |
| 108 | — | — | — | — | — | — | — | 22.89 | 35.70 | 49.59 | — | — | — | — |
| 120 | 16.12 | 23.11 | 29.43 | — | — | — | — | 24.74 | 37.96 | 51.78 | — | — | — | — |
| 144 | 18.06 | 25.09 | — | — | — | — | — | — | — | — | — | — | — | — |

Ratings above Heavy Dash Line are for Steel Spur Gears; those below are for Cast Iron Spur Gears. Interpolate for intermediate sizes and speeds.
Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1000 feet per minute; they are published for interpolation purposes only.

F

## EXAMPLES

A drive is desired for 2 H.P., 300 R.P.M. drive shaft to 100 R.P.M. driven shaft to operate on approximately 4 inch centers, 11-16 hours per day, with light shock load and with drip lubrication. Driving shaft is 7/8" diameter with 3/16" x 3/32" keyseat. Driven shaft is 1 7/16" diameter with 3/8" x 3/16" keyseat.

### EXAMPLE 1, using 14 1/2° P.A. Gears

**A.** Overload Service Factor, Tables 2 and 3 Page F-48.
11-1 6 hours operation—light shock = 1.3
Drip lubrication = .2
Service Factor = 1 .5

**B.** Required horsepower: 1 .5 x 2 = 3.0

**C.** Ratio is $\frac{300}{100} = 3.00$

**D.** Refer to Table No. 1, Page F-69 under 3.000 ratio and gear combination having suitable minimum number of teeth in pinion and giving 4.000" centers. This table indicates 8 pitch, 16 teeth or 10 pitch, 20 teeth to be within required limits.

**E.** Refer to Pitch Selection Chart, Table No. 1, Page F-50 for 3 H.P. at 300 R.P.M. This shows the 8 pitch, 16 tooth gear to be suitable.

**F.** Check H.P. capacity in Rating Table No. 1, Page F-53 which shows 3.00 H.P. for driver at 300 R.P.M., and 4.13 H.P. for driven at 100 R.P.M.

**G.** Select gears from Table No. 1 and Table No. 2 Page F-11 and Table No. 1,Page F-12.

### EXAMPLE 2, using 20° P.A. Gears

**A.** Overload Service Factor, Tables 2 and 3 Page F-48.
11-1 6 hours operation—light shock = 1 .3
Drip lubrication = .2
Service Factor = 1.5

**B.** Required horsepower: 1 .5 x 2 = 3.0

**C.** Ratio is $\frac{300}{100} = 3.00$

**D.** Refer to Table No. 1, Page F-69 under 3.000 ratio and gear combination having suitable minimum number of teeth in pinion and giving 4.000" centers. This table indicates 8 pitch, 16 teeth or 10 pitch, 20 teeth to be within required limits.

**E.** Refer fo Pitch Selection Chart, Tables No. 1 and 2, Page F-55 for 3 H.P. at 300 R.P.M. These show the 10 pitch, 20 tooth gear to be desirable as the finer pitch.

**F.** Check H.P. capacity in Rating Table No. 2, Page F-56 which shows 3.02 H.P. for driver at 300 R.P.M., and 3.97 H.P. for driven at 100 R.P.M.

**G.** Select gears from Table No. 1, and Table No. 2, Page F-26.

# 20° SPUR GEAR
# PITCH SELECTION CHARTS

**Table No. 1**

| Design H.P. | 14 Teeth R.P.M. Small Gear | | | | | | | 16 Teeth R.P.M. Small Gear | | | | | | | 18 Teeth R.P.M. Small Gear | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| **.05** | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| **.10** | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 |
| **1/4** | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 |
| **1/3** | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 |
| **1/2** | 8 | 10 | 12 | 16 | 20 | 20 | 20 | 8 | 10 | 16 | 16 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 |
| **3/4** | 6 | 8 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 |
| **1** | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 16 | 16 | 16 | 20 | 6 | 10 | 12 | 16 | 16 | 16 | 20 |
| **1 1/2** | 6 | 6 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 |
| **2** | 5 | 6 | 8 | 10 | 12 | 12 | 12 | 5 | 6 | 10 | 12 | 12 | 12 | 16 | 6 | 6 | 10 | 12 | 12 | 12 | 16 |
| **3** | 4 | 6 | 8 | 10 | 10 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | 12 |
| **5** | 4 | 5 | 6 | 8 | 8 | 10 | 10 | 4 | 5 | 6 | 8 | 10 | 10 | 10 | 4 | 5 | 6 | 8 | 10 | 10 | 12 |
| **7 1/2** | — | 4 | 6 | 6 | 8 | 8 | 8 | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 4 | 5 | 6 | 8 | 8 | 8 | 10 |
| **10** | — | 4 | 5 | 6 | 6 | 6 | 8 | — | 4 | 5 | 6 | 6 | 8 | 8 | — | 4 | 6 | 6 | 6 | 8 | 8 |
| **15** | — | — | 4 | 5 | 6 | 6 | 6 | — | — | 5 | 5 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | 6 | — |
| **20** | — | — | 4 | 5 | 5 | 5 | 6 | — | — | 4 | 5 | 5 | 6 | — | — | — | 4 | 5 | 6 | 6 | — |
| **25** | — | — | 4 | 4 | 5 | 5 | — | — | — | 4 | 4 | 5 | 5 | — | — | — | 4 | 5 | 5 | 5 | — |
| **30** | — | — | — | 4 | 4 | 4 | — | — | — | 4 | 4 | 4 | 5 | — | — | — | 4 | 4 | 5 | 5 | — |
| **40** | — | — | — | 4 | 4 | 4 | — | — | — | — | 4 | 4 | — | — | — | — | — | 4 | 4 | — | — |
| **50** | — | — | — | — | 4 | 4 | — | — | — | — | — | 4 | — | — | — | — | — | 4 | 4 | — | — |

**Table No. 2**

| Design H.P. | 20 Teeth R.P.M. Small Gear | | | | | | | 22 Teeth R.P.M. Small Gear | | | | | | | 24 Teeth R.P.M. Small Gear | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| **.05** | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| **.10** | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 |
| **1/4** | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 |
| **1/3** | 12 | 12 | 20 | 20 | 20 | 20 | 20 | 12 | 12 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 |
| **1/2** | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 |
| **3/4** | 8 | 10 | 16 | 16 | 20 | 20 | 20 | 8 | 10 | 16 | 16 | 20 | 20 | 20 | 8 | 12 | 16 | 16 | 20 | 20 | 20 |
| **1** | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 | 8 | 10 | 12 | 16 | 16 | 20 | 20 |
| **1 1/2** | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 16 | 16 | 16 | 16 | 6 | 8 | 12 | 16 | 16 | 16 | 16 |
| **2** | 6 | 8 | 10 | 12 | 12 | 16 | 16 | 6 | 8 | 10 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 |
| **3** | 5 | 6 | 10 | 10 | 12 | 12 | 12 | 5 | 6 | 10 | 12 | 12 | 12 | 16 | 6 | 6 | 10 | 12 | 12 | 12 | 16 |
| **5** | 4 | 5 | 8 | 10 | 10 | 10 | 12 | 4 | 6 | 8 | 10 | 10 | 10 | 12 | 5 | 6 | 8 | 10 | 10 | 12 | 12 |
| **7 1/2** | 4 | 5 | 6 | 8 | 8 | 8 | 10 | 4 | 5 | 6 | 8 | 8 | 10 | 10 | 4 | 5 | 6 | 8 | 8 | 10 | 10 |
| **10** | 4 | 4 | 6 | 6 | 8 | 8 | 8 | 4 | 4 | 6 | 6 | 8 | 8 | — | 4 | 5 | 6 | 8 | 8 | 8 | — |
| **15** | — | 4 | 5 | 6 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | 6 | — |
| **20** | — | — | 5 | 5 | 6 | 6 | — | — | 4 | 5 | 5 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | — | — |
| **25** | — | — | 4 | 5 | 5 | 6 | — | — | — | 4 | 5 | 5 | 6 | — | — | — | 4 | 5 | 6 | — | — |
| **30** | — | — | 4 | 4 | 5 | — | — | — | — | 4 | 5 | 5 | — | — | — | — | 4 | 5 | 5 | — | — |
| **40** | — | — | 4 | 4 | 4 | — | — | — | — | 4 | 4 | — | — | — | — | — | 4 | 4 | 5 | — | — |
| **50** | — | — | — | 4 | — | — | — | — | — | — | 4 | — | — | — | — | — | — | 4 | — | — | — |

**Table No. 3**

| Design H.P. | 26 Teeth R.P.M. Small Gear | | | | | | | 28 Teeth R.P.M. Small Gear | | | | | | | 30 Teeth R.P.M. Small Gear | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 300 | 600 | 900 | 1200 | 1800 |
| **.05** | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| **.10** | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 |
| **1/4** | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 |
| **1/3** | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 | 12 | 16 | 20 | 20 | 20 | 20 | 20 |
| **1/2** | 10 | 12 | 20 | 20 | 20 | 20 | 20 | 12 | 12 | 16 | 20 | 20 | 20 | 20 | 12 | 12 | 20 | 20 | 20 | 20 | 20 |
| **3/4** | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 | 10 | 12 | 16 | 20 | 20 | 20 | 20 |
| **1** | 8 | 10 | 16 | 16 | 20 | 20 | 20 | 8 | 12 | 16 | 16 | 20 | 20 | 20 | 8 | 12 | 16 | 16 | 20 | 20 | 20 |
| **1 1/2** | 6 | 10 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 16 | 20 | 8 | 10 | 12 | 16 | 16 | 16 | 20 |
| **2** | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 12 | 16 | 16 | 16 | 6 | 8 | 12 | 16 | 16 | 16 | 16 |
| **3** | 6 | 6 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 12 | 16 | 6 | 8 | 10 | 12 | 12 | 16 | 16 |
| **5** | 5 | 6 | 8 | 10 | 10 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | 12 | 5 | 6 | 8 | 10 | 12 | 12 | 12 |
| **7 1/2** | 4 | 5 | 6 | 8 | 10 | 10 | 10 | 4 | 5 | 8 | 8 | 10 | 10 | — | 4 | 6 | 8 | 8 | 10 | 10 | — |
| **10** | 4 | 5 | 6 | 8 | 8 | 8 | 10 | 4 | 5 | 6 | 8 | 8 | 8 | — | 4 | 5 | 6 | 8 | 8 | 10 | — |
| **15** | — | 4 | 5 | 6 | 6 | 6 | — | — | 4 | 6 | 6 | 6 | 8 | — | — | 4 | 6 | 6 | 6 | 8 | — |
| **20** | — | 4 | 5 | 6 | 6 | 6 | — | — | 4 | 5 | 6 | 6 | — | — | — | 4 | 5 | 6 | 6 | — | — |
| **25** | — | — | 5 | 5 | 6 | — | — | — | 4 | 5 | 5 | 6 | — | — | — | 4 | 5 | 5 | 6 | — | — |
| **30** | — | — | 4 | 5 | 5 | — | — | — | — | 4 | 5 | — | — | — | — | — | 4 | 5 | — | — | — |
| **40** | — | — | 4 | 4 | 5 | — | — | — | — | 4 | 4 | — | — | — | — | — | 4 | 4 | — | — | — |
| **50** | — | — | — | 4 | — | — | — | — | — | 4 | 4 | — | — | — | — | — | 4 | 4 | — | — | — |

F

**Table No. 1**

## Ratings for 20º Steel and Cast Iron Spur Gears

| Number of Teeth | HORSEPOWER AT VARIOUS R.P.M | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 D.P. | | | | | | | 16 D.P. | | | | | | | 12 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 12 | .06 | .11 | .16 | .30 | .43 | .53 | .71 | .13 | .26 | .37 | .69 | .96 | 1.18 | 1.55 | .31 | .60 | .86 | 1.54 | 2.09 | 2.55 | 3.27 | | |
| 13 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .36 | .68 | .98 | 1.75 | 2.36 | 2.86 | 3.64 | | |
| 14 | .07 | .14 | .21 | .39 | .54 | .67 | .89 | .17 | .32 | .48 | .87 | 1.19 | 1.46 | 1.83 | .41 | .77 | 1.11 | 1.96 | 2.63 | 3.17 | 4.00 | | |
| 15 | .09 | .15 | .23 | .44 | .60 | .74 | .97 | .20 | .37 | .53 | .98 | 1.33 | 1.61 | 2.08 | .45 | .86 | 1.23 | 2.16 | 2.88 | 3.46 | 4.34 | | |
| 16 | .09 | .18 | .25 | .46 | .64 | .79 | 1.04 | .21 | .40 | .58 | 1.04 | 1.42 | 1.73 | 2.21 | .49 | .93 | 1.33 | 2.31 | 3.07 | 3.68 | 4.57 | | |
| 18 | .11 | .20 | .30 | .53 | .73 | .90 | 1.16 | .25 | .47 | .67 | 1.19 | 1.61 | 1.95 | 2.46 | .57 | 1.08 | 1.53 | 2.63 | 3.46 | 4.11 | 5.05 | | |
| 20 | .12 | .23 | .34 | .60 | .82 | 1.00 | 1.28 | .28 | .54 | .77 | 1.34 | 1.80 | 2.16 | 2.70 | .66 | 1.23 | 1.74 | 2.95 | 3.84 | 4.52 | 5.50 | | |
| 21 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .70 | 1.31 | 1.85 | 3.11 | 4.04 | 4.74 | 5.73 | | |
| 24 | .15 | .29 | .41 | .73 | .98 | 1.18 | 1.48 | .35 | .66 | .94 | 1.61 | 2.12 | 2.52 | 3.10 | .82 | 1.51 | 2.11 | 3.50 | 4.48 | 5.21 | 6.22 | | |
| 25 | .16 | .31 | .44 | .77 | 1.02 | 1.23 | 1.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 28 | — | — | — | — | — | — | — | .43 | .80 | 1.12 | 1.89 | 2.44 | 2.87 | 3.47 | .99 | 1.80 | 2.50 | 4.05 | 5.10 | 5.86 | 6.90 | | |
| 30 | .20 | .38 | .53 | .92 | 1.21 | 1.43 | 1.76 | .46 | .86 | 1.20 | 2.01 | 2.59 | 3.02 | 3.63 | 1.07 | 1.94 | 2.67 | 4.29 | 5.37 | 6.15 | 7.18 | | |
| 32 | — | — | — | — | — | — | — | .50 | .93 | 1.29 | 2.14 | 2.74 | 3.19 | 3.81 | — | — | — | — | — | — | — | | |
| 35 | .24 | .45 | .63 | 1.07 | 1.38 | 1.63 | 1.97 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 36 | — | — | — | — | — | — | — | .58 | 1.06 | 1.46 | 2.38 | 3.01 | 3.47 | 4.10 | 1.32 | 2.37 | 3.22 | 5.03 | 6.18 | 6.98 | 8.02 | | |
| 40 | .28 | .52 | .73 | 1.21 | 1.55 | 1.80 | 2.16 | .65 | 1.18 | 1.63 | 2.62 | 3.28 | 3.75 | 4.38 | — | — | — | — | — | — | — | | |
| 42 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.58 | 2.79 | 3.74 | 5.69 | 6.89 | 7.70 | 8.73 | | |
| 45 | .33 | .60 | .83 | 1.35 | 1.71 | 1.97 | 2.32 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 48 | — | — | — | — | — | — | — | .80 | 1.43 | 1.95 | 3.04 | 3.73 | 4.22 | 4.84 | 1.82 | 3.18 | 4.22 | 6.28 | 7.50 | 8.30 | — | | |
| 50 | .36 | .66 | .91 | 1.46 | 1.83 | 2.10 | 2.45 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.05 | 3.53 | 4.64 | 6.77 | 7.99 | 8.78 | — | | |
| 56 | — | — | — | — | — | — | — | .94 | 1.66 | 2.23 | 3.39 | 4.10 | 4.59 | 5.21 | — | — | — | — | — | — | — | | |
| 60 | .44 | .79 | 1.08 | 1.68 | 2.07 | 2.34 | 2.69 | 1.01 | 1.77 | 2.36 | 3.55 | 4.27 | 4.75 | — | 2.28 | 3.88 | 5.05 | 7.23 | 8.45 | — | — | | |
| 64 | — | — | — | — | — | — | — | 1.08 | 1.88 | 2.50 | 3.72 | 4.45 | 4.92 | — | — | — | — | — | — | — | — | | |
| 66 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.51 | 2.53 | 3.27 | 4.60 | 5.33 | — | — | | |
| 70 | .52 | .92 | 1.23 | 1.87 | 2.27 | 2.53 | 2.86 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 72 | — | — | — | — | — | — | — | 1.21 | 2.08 | 2.73 | 3.98 | 4.70 | 5.17 | — | 1.63 | 2.70 | 3.46 | 4.8 | 5.51 | — | — | | |
| 80 | .59 | 1.03 | 1.37 | 2.03 | 2.43 | 2.69 | — | 1.34 | 2.27 | 2.95 | 4.23 | 4.95 | — | — | — | — | — | — | — | — | — | | |
| 84 | .62 | 1.07 | 1.41 | 2.08 | 2.47 | 2.73 | — | — | — | — | — | — | — | — | 1.87 | 3.02 | 3.81 | 5.15 | 5.81 | — | — | | |
| 90 | .66 | 1.13 | 1.48 | 2.16 | 2.55 | 2.81 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 96 | — | — | — | — | — | — | — | .94 | 1.56 | 1.99 | 2.77 | 3.18 | — | — | 2.08 | 3.31 | 4.12 | 5.45 | — | — | — | | |
| 100 | .73 | 1.23 | 1.60 | 2.30 | 2.68 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 108 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.30 | 3.59 | 4.41 | 5.72 | — | — | — | | |
| 112 | — | — | — | — | — | — | — | 1.07 | 1.74 | 2.19 | 2.96 | 3.37 | — | — | — | — | — | — | — | — | — | | |
| 120 | .51 | .85 | 1.09 | 1.50 | 1.73 | — | — | — | — | — | — | — | — | — | 2.50 | 3.83 | 4.66 | 5.97 | — | — | — | | |
| 128 | — | — | — | — | — | — | — | 1.20 | 1.91 | 2.37 | 3.14 | — | — | — | — | — | — | — | — | — | — | | |
| 132 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.68 | 4.05 | 4.88 | 6.12 | — | — | — | | |
| 140 | .58 | .94 | 1.19 | 1.61 | 1.83 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 144 | — | — | — | — | — | — | — | 1.32 | 2.06 | 2.54 | 3.29 | — | — | — | 2.86 | 4.26 | 5.09 | 6.33 | — | — | — | | |
| 160 | .65 | 1.03 | 1.28 | 1.70 | — | — | — | 1.43 | 2.19 | 2.67 | 3.40 | — | — | — | — | — | — | — | — | — | — | | |
| 168 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.18 | 4.61 | 5.42 | 6.57 | — | — | — | | |
| 180 | .71 | 1.11 | 1.37 | 1.77 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 192 | — | — | — | — | — | — | — | 1.64 | 2.44 | 2.92 | 3.58 | — | — | — | 3.49 | 4.95 | 5.75 | — | — | — | — | | |
| 200 | .78 | 1.19 | 1.45 | 1.85 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 216 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.76 | 5.22 | 5.99 | — | — | — | — | | |
| 240 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.97 | 5.42 | 6.13 | — | — | — | — | | |

Ratings above Heavy Dash Line are for Steel Spur Gears; those below are for Cast Iron Spur Gears.
Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1200 feet per minute.

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

**Table No. 2**

## Ratings for 20º Steel Spur Gears

| Number of Teeth | HORSEPOWER AT VARIOUS R.P.M | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 D.P. | | | | | | | 8 D.P. | | | | | | | 6 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 12 | .56 | 1.06 | 1.51 | 2.66 | 3.57 | 4.30 | 5.40 | 1.03 | 1.93 | 2.74 | 4.71 | 6.19 | 7.35 | 9.04 | 2.38 | 4.41 | 6.16 | 10.20 | 13.06 | 15.19 | 18.14 | | |
| 14 | .72 | 1.37 | 1.94 | 3.37 | 4.45 | 5.31 | 6.57 | 1.34 | 2.49 | 3.51 | 5.91 | 7.66 | 9.00 | 10.89 | 3.09 | 5.65 | 7.82 | 12.68 | 15.98 | 18.38 | 21.63 | | |
| 15 | .81 | 1.52 | 2.16 | 3.70 | 4.87 | 5.78 | 7.10 | 1.49 | 2.77 | 3.88 | 6.49 | 8.36 | 9.76 | 11.73 | 3.45 | 6.29 | 8.64 | 13.86 | 17.35 | 19.86 | 23.20 | | |
| 16 | .88 | 1.64 | 2.32 | 3.96 | 5.17 | 6.11 | 7.47 | 1.61 | 2.99 | 4.17 | 6.91 | 8.85 | 10.29 | 12.29 | 3.73 | 6.77 | 9.26 | 14.71 | 18.30 | 20.84 | 24.20 | | |
| 18 | 1.02 | 1.90 | 2.67 | 4.49 | 5.80 | 6.79 | 8.20 | 1.88 | 3.45 | 4.78 | 7.78 | 9.85 | 11.36 | 13.41 | 4.32 | 7.75 | 10.53 | 16.42 | 20.19 | 22.81 | 26.20 | | |
| 20 | 1.17 | 2.16 | 3.02 | 5.00 | 6.40 | 7.44 | 8.89 | 2.15 | 3.91 | 5.38 | 8.63 | 10.81 | 12.37 | 14.45 | — | — | — | — | — | — | — | | |
| 21 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.25 | 9.27 | 12.45 | 18.95 | 22.94 | 25.63 | 29.06 | | |
| 22 | — | — | — | — | — | — | — | 2.41 | 4.36 | 5.96 | 9.42 | 11.68 | 13.27 | 15.38 | — | — | — | — | — | — | — | | |
| 24 | 1.45 | 2.65 | 3.65 | 5.89 | 7.41 | 8.50 | 9.97 | 2.65 | 4.75 | 6.46 | 10.08 | 12.39 | 13.99 | 16.07 | 6.05 | 10.54 | 13.99 | 20.83 | 24.88 | 27.55 | — | | |
| 25 | 1.53 | 2.78 | 3.83 | 6.15 | 7.70 | 8.81 | 10.30 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 27 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.94 | 11.93 | 15.68 | 22.88 | 27.01 | 29.69 | — | | |
| 28 | 1.74 | 3.14 | 4.29 | 6.77 | 8.38 | 9.51 | 11.00 | 3.18 | 5.61 | 7.54 | 11.47 | 13.89 | 15.52 | 17.60 | — | — | — | — | — | — | — | | |
| 30 | 1.88 | 3.38 | 4.59 | 7.16 | 8.80 | 9.94 | 11.42 | — | — | — | — | — | — | — | 7.77 | 13.18 | 17.17 | 24.60 | 28.74 | — | — | | |
| 32 | — | — | — | — | — | — | — | 3.71 | 6.46 | 8.58 | 12.76 | 15.24 | 16.88 | — | — | — | — | — | — | — | — | | |
| 33 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.62 | 14.45 | 18.64 | 26.28 | 30.44 | — | — | | |

Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1200 feet per minute.

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

F

Table No. 1

## Ratings for 20° Steel and Cast Iron Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 D.P. | | | | | | | 8 D.P. | | | | | | | 6 D.P. | | | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | | |
| 35 | 2.25 | 3.98 | 5.34 | 8.13 | 9.84 | 10.99 | 12.46 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 36 | — | — | — | — | — | — | — | 4.22 | 7.25 | 9.53 | 13.89 | 15.41 | 18.03 | — | 9.48 | 15.70 | 20.10 | 27.92 | 32.06 | — | — | | |
| 40 | 2.62 | 4.56 | 6.06 | 9.02 | 10.77 | 11.93 | — | 4.74 | 8.04 | 10.46 | 15.00 | 17.52 | — | — | — | — | — | — | — | — | — | | |
| 42 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.15 | 18.06 | 22.77 | 30.81 | 34.40 | — | — | | |
| 44 | — | — | — | — | — | — | — | 5.25 | 8.80 | 11.35 | 16.00 | 18.53 | — | — | — | — | — | — | — | — | — | | |
| 45 | 2.98 | 5.12 | 6.73 | 9.82 | 11.59 | 12.74 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 48 | 3.19 | 5.43 | 7.10 | 10.25 | 12.02 | — | — | 5.73 | 9.49 | 12.15 | 16.87 | 19.33 | — | — | 7.63 | 12.11 | 15.07 | 19.93 | — | — | — | | |
| 50 | 3.32 | 5.63 | 7.34 | 10.51 | 12.28 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.48 | 13.23 | 16.26 | 21.10 | — | — | — | | |
| 55 | 3.65 | 6.11 | 7.89 | 11.12 | 12.88 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 56 | — | — | — | — | — | — | — | 6.64 | 10.76 | 13.56 | 18.34 | 20.74 | — | — | — | — | — | — | — | — | — | | |
| 60 | 3.97 | 6.58 | 8.42 | 11.69 | 13.43 | — | — | 7.08 | 11.36 | 14.22 | 19.01 | — | — | — | 9.31 | 14.27 | 17.36 | 22.14 | — | — | — | | |
| 64 | — | — | — | — | — | — | — | 4.48 | 7.16 | 8.87 | 11.74 | — | — | — | — | — | — | — | — | — | — | | |
| 66 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.12 | 15.28 | 18.41 | 23.09 | — | — | — | | |
| 70 | 2.75 | 4.46 | 5.62 | 7.61 | 8.60 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 72 | — | — | — | — | — | — | — | 4.95 | 7.76 | 9.50 | 12.41 | — | — | — | 10.78 | 16.05 | 19.17 | 23.77 | — | — | — | | |
| 80 | 3.09 | 4.91 | 6.11 | 8.08 | — | — | — | 5.45 | 8.35 | 10.16 | 12.90 | — | — | — | — | — | — | — | — | — | — | | |
| 84 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 12.10 | 17.53 | 20.78 | 24.96 | — | — | — | | |
| 88 | — | — | — | — | — | — | — | 5.84 | 8.82 | 10.62 | 13.36 | — | — | — | — | — | — | — | — | — | — | | |
| 90 | 3.39 | 5.29 | 6.51 | 8.44 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 96 | — | — | — | — | — | — | — | 6.23 | 9.27 | 11.08 | 13.77 | — | — | — | 13.24 | 18.77 | 21.80 | — | — | — | — | | |
| 100 | 3.70 | 5.67 | 6.90 | 8.80 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 108 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.33 | 19.90 | 22.86 | — | — | — | — | | |
| 110 | 3.97 | 6.00 | 7.23 | 9.09 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 112 | — | — | — | — | — | — | — | 6.97 | 10.11 | 11.89 | — | — | — | — | — | — | — | — | — | — | — | | |
| 120 | 4.24 | 6.31 | 7.53 | 9.37 | — | — | — | 7.32 | 10.49 | 12.25 | — | — | — | — | 15.32 | 20.89 | 23.72 | — | — | — | — | | |
| 128 | — | — | — | — | — | — | — | 7.63 | 10.81 | 12.55 | — | — | — | — | — | — | — | — | — | — | — | | |
| 132 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 16.19 | 21.74 | — | — | — | — | — | | |
| 140 | 4.72 | 6.84 | 8.05 | 9.75 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 144 | — | — | — | — | — | — | — | 8.24 | 11.45 | 13.15 | — | — | — | — | 17.04 | 22.54 | — | — | — | — | — | | |
| 160 | 5.16 | 7.31 | 8.49 | — | — | — | — | 8.77 | 11.96 | 13.61 | — | — | — | — | — | — | — | — | — | — | — | | |
| 176 | — | — | — | — | — | — | — | 9.29 | 12.47 | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 180 | 5.57 | 7.73 | 8.88 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 192 | — | — | — | — | — | — | — | 9.77 | 12.93 | — | — | — | — | — | — | — | — | — | — | — | — | | |
| 200 | 5.95 | 8.11 | 9.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |

Table No. 2

## Ratings for 20° Steel and Cast Iron Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 D.P. | | | | | | | 4 D.P. | | | | | | |
| | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 | 50 | 100 | 200 | 300 | 600 | 900 | 1200 |
| 12 | 4.22 | 7.72 | 10.65 | 17.19 | 21.61 | 24.80 | 29.09 | 4.79 | 9.03 | 16.17 | 21.98 | 34.29 | 42.16 | 47.62 |
| 14 | 5.46 | 9.85 | 13.46 | 21.22 | 26.27 | 29.83 | 34.49 | 6.23 | 11.64 | 20.55 | 27.59 | 41.98 | 50.82 | 56.79 |
| 15 | 6.08 | 10.90 | 14.82 | 23.11 | 28.42 | 32.10 | 36.87 | 6.96 | 12.93 | 22.67 | 30.27 | 45.55 | 54.75 | 60.90 |
| 16 | 6.57 | 11.71 | 15.84 | 24.45 | 29.86 | 33.37 | 38.35 | 7.54 | 13.95 | 24.29 | 32.25 | 48.00 | 57.34 | 63.50 |
| 18 | 7.60 | 13.39 | 17.94 | 27.17 | 32.79 | 36.58 | — | 8.76 | 16.09 | 27.63 | 36.33 | 53.00 | 62.57 | 68.76 |
| 20 | 8.65 | 15.06 | 19.99 | 29.75 | 35.54 | 39.36 | — | 10.02 | 18.24 | 30.93 | 40.27 | 57.71 | 67.43 | — |
| 24 | 10.58 | 18.04 | 23.57 | 34.01 | 39.90 | 43.68 | — | 12.38 | 22.18 | 36.74 | 47.03 | 65.31 | 75.01 | — |
| 25 | 11.14 | 18.89 | 24.60 | 35.25 | 41.18 | — | — | — | — | — | — | — | — | — |
| 28 | 12.57 | 21.01 | 27.07 | 38.04 | 43.98 | — | — | 14.84 | 26.21 | 42.47 | 53.54 | 72.43 | 82.11 | — |
| 30 | 13.51 | 22.37 | 28.63 | 39.76 | 45.67 | — | — | — | — | — | — | — | — | — |
| 32 | — | — | — | — | — | — | — | 17.23 | 30.01 | 47.68 | 59.32 | 78.50 | — | — |
| 35 | 15.91 | 25.79 | 32.51 | 43.98 | 49.98 | — | — | — | — | — | — | — | — | — |
| 36 | — | — | — | — | — | — | — | 11.82 | 20.30 | 31.67 | 38.94 | 50.52 | — | — |
| 40 | 10.96 | 17.41 | 21.65 | 28.64 | — | — | — | 13.27 | 22.51 | 34.53 | 42.00 | 53.57 | — | — |
| 44 | — | — | — | — | — | — | — | 14.70 | 24.63 | 37.20 | 44.81 | 56.37 | — | — |
| 45 | 12.29 | 19.18 | 23.58 | 30.59 | — | — | — | — | — | — | — | — | — | — |
| 48 | — | — | — | — | — | — | — | 16.05 | 26.58 | 39.55 | 47.25 | 58.50 | — | — |
| 50 | 13.53 | 20.75 | 25.24 | 32.19 | — | — | — | — | — | — | — | — | — | — |
| 56 | — | — | — | — | — | — | — | 18.51 | 30.12 | 43.67 | 51.36 | 62.24 | — | — |
| 60 | 15.79 | 23.50 | 28.07 | 34.83 | — | — | — | 19.46 | 31.81 | 45.57 | 53.25 | — | — | — |
| 64 | — | — | — | — | — | — | — | 21.10 | 33.52 | 47.51 | 55.10 | — | — | — |
| 70 | 17.84 | 25.86 | 30.42 | 36.76 | — | — | — | — | — | — | — | — | — | — |
| 72 | — | — | — | — | — | — | — | 23.23 | 36.23 | 50.32 | 57.79 | — | — | — |
| 80 | 19.65 | 27.85 | 32.34 | — | — | — | — | 25.41 | 38.98 | 53.16 | 60.20 | — | — | — |
| 90 | 21.18 | 29.42 | 33.79 | — | — | — | — | — | — | — | — | — | — | — |
| 96 | — | — | — | — | — | — | — | 29.07 | 43.27 | 57.23 | — | — | — | — |
| 100 | 22.68 | 30.93 | 35.19 | — | — | — | — | — | — | — | — | — | — | — |
| 110 | 23.97 | 32.17 | — | — | — | — | — | — | — | — | — | — | — | — |
| 112 | — | — | — | — | — | — | — | 32.53 | 47.16 | 60.84 | — | — | — | — |
| 120 | 25.23 | 33.37 | — | — | — | — | — | — | — | — | — | — | — | — |
| 128 | — | — | — | — | — | — | — | 35.58 | 50.43 | 63.68 | — | — | — | — |
| 140 | 27.39 | 35.34 | — | — | — | — | — | — | — | — | — | — | — | — |
| 160 | 29.24 | 36.96 | — | — | — | — | — | 40.93 | 55.83 | 68.25 | — | — | — | — |
| 180 | 30.94 | 38.14 | — | — | — | — | — | — | — | — | — | — | — | — |

Ratings above Heavy Dash Line are for Steel Spur Gears; those below are for Cast Iron Spur Gears.
Ratings below Heavy Solid Line are not recommended as Pitch Line Velocity exceeds 1200 feet per minute.

**⚠WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

Table No. 1

## Ratings for 14 1/2° Non-Metallic Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M. | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 D.P. | | | | | | | 12 D.P. | | | | | | | 10 D.P. | | | | | | |
| | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 |
| 15 | — | — | — | — | — | — | — | .13 | .20 | .34 | .45 | .56 | .72 | 1.15 | .27 | .38 | .63 | .83 | 1.00 | 1.31 | 2.08 |
| 16 | .06 | .09 | .15 | .20 | .25 | .32 | .52 | .16 | .22 | .37 | .49 | .60 | .78 | 1.28 | .30 | .41 | .68 | .89 | 1.08 | 1.42 | 2.35 |
| 18 | .07 | .10 | .17 | .23 | .28 | .37 | .59 | .19 | .26 | .43 | .56 | .68 | .90 | 1.44 | .33 | .47 | .78 | 1.02 | 1.24 | 1.63 | 2.60 |
| 20 | .09 | .12 | .20 | .26 | .32 | .42 | .69 | .22 | .30 | .48 | .63 | .77 | 1.01 | 1.69 | .40 | .54 | .88 | 1.15 | 1.39 | 1.85 | 3.12 |
| 21 | — | — | — | — | — | — | — | .23 | .31 | .50 | .66 | .81 | 1.06 | 1.80 | — | — | — | — | — | — | — |
| 22 | .10 | .13 | .22 | .28 | .35 | .46 | .76 | .24 | .33 | .53 | .70 | .89 | 1.12 | 1.90 | — | — | — | — | — | — | — |
| 24 | .11 | .15 | .24 | .31 | .38 | .50 | .82 | .27 | .36 | .58 | .76 | .92 | 1.22 | 2.07 | — | — | — | — | — | — | — |
| 25 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .51 | .67 | 1.09 | 1.42 | 1.73 | 2.32 | 4.00 |
| 30 | — | — | — | — | — | — | — | .34 | .44 | .73 | .95 | 1.14 | 1.56 | 2.64 | .62 | .81 | 1.29 | 1.69 | 2.07 | 2.80 | 4.89 |
| 32 | .14 | .19 | .31 | .40 | .49 | .65 | 1.12 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 35 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .71 | .95 | 1.49 | 1.98 | 2.42 | 3.30 | — |
| 36 | — | — | — | — | — | — | — | .40 | .52 | .82 | 1.13 | 1.36 | 1.83 | 3.18 | — | — | — | — | — | — | — |
| 40 | .18 | .24 | .38 | .49 | .62 | .82 | 1.41 | — | — | — | — | — | — | — | .80 | 1.02 | 1.63 | 2.16 | 2.65 | 3.65 | — |
| 42 | — | — | — | — | — | — | — | .47 | .62 | .97 | 1.29 | 1.57 | 2.16 | — | — | — | — | — | — | — | — |
| 44 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 45 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .88 | 1.19 | 1.90 | 2.46 | 3.07 | 4.14 | — |
| 48 | .21 | .28 | .44 | .60 | .72 | .96 | 1.65 | .51 | .66 | 1.05 | 1.39 | 1.7 | 2.33 | — | — | — | — | — | — | — | — |
| 50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | .95 | 1.27 | 2.03 | 2.70 | 3.36 | 4.65 | — |
| 54 | — | — | — | — | — | — | — | .56 | .76 | 1.21 | 1.57 | 1.95 | 2.65 | — | — | — | — | — | — | — | — |
| 56 | .24 | .32 | .50 | .67 | .81 | 1.11 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 60 | — | — | — | — | — | — | — | .60 | .80 | 1.29 | 1.72 | 2.13 | 2.95 | — | 1.11 | 1.44 | 2.34 | 3.15 | 3.94 | 5.47 | — |
| 64 | .26 | .34 | .54 | .72 | .88 | 1.20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 72 | .29 | .39 | .62 | .80 | 1.00 | 1.37 | — | .71 | .92 | 1.49 | 2.00 | 2.51 | 3.48 | — | — | — | — | — | — | — | — |
| 80 | .31 | .41 | .66 | .88 | 1.09 | 1.51 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 96 | .36 | .47 | .76 | 1.03 | 1.28 | 1.77 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

Table No. 2

## Ratings for 14 1/2° Non-Metallic Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M. | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 D.P. | | | | | | | 6 D.P. | | | | | | | 5 D.P. | | | | | | |
| | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 |
| 12 | — | — | — | — | — | — | — | .84 | 1.17 | 1.91 | 2.43 | 3.12 | 4.00 | 6.75 | 1.46 | 1.91 | 3.12 | 4.09 | 5.05 | 6.62 | 11.43 |
| 13 | — | — | — | — | — | — | — | .94 | 1.31 | 2.00 | 2.61 | 3.38 | 4.37 | 7.30 | 1.56 | 2.00 | 3.21 | 4.27 | 5.20 | 6.85 | 12.25 |
| 14 | — | — | — | — | — | — | — | 1.02 | 1.41 | 2.27 | 2.88 | 3.68 | 4.86 | 7.75 | 1.65 | 2.14 | 3.45 | 4.65 | 5.63 | 7.34 | 12.58 |
| 15 | — | — | — | — | — | — | — | 1.20 | 1.59 | 2.57 | 3.30 | 4.12 | 5.49 | 9.43 | 1.88 | 2.47 | 3.88 | 5.35 | 6.41 | 8.54 | 14.70 |
| 16 | .56 | .76 | 1.23 | 1.61 | 1.96 | 2.60 | 4.39 | 1.29 | 1.69 | 2.67 | 3.65 | 4.50 | 5.87 | 10.10 | 2.07 | 2.68 | 4.26 | 5.78 | 6.87 | 9.44 | — |
| 17 | — | — | — | — | — | — | — | 1.41 | 1.84 | 2.94 | 4.00 | 4.82 | 6.34 | 10.90 | 2.22 | 2.98 | 4.52 | 6.20 | 7.46 | 10.45 | — |
| 18 | .61 | .88 | 1.41 | 1.84 | 2.25 | 3.00 | 4.71 | 1.51 | 1.98 | 3.12 | 4.30 | 5.15 | 6.95 | 11.80 | 2.40 | 3.11 | 4.93 | 6.55 | 8.04 | 10.92 | — |
| 19 | — | — | — | — | — | — | — | 1.61 | 2.16 | 3.34 | 4.52 | 5.48 | 7.23 | — | 2.48 | 3.23 | 5.20 | 6.86 | 8.35 | 11.32 | — |
| 20 | .74 | .99 | 1.59 | 2.08 | 2.54 | 3.40 | 5.84 | 1.84 | 2.42 | 3.80 | 5.07 | 6.24 | 8.52 | — | 2.65 | 3.40 | 5.43 | 7.20 | 8.80 | 12.12 | — |
| 21 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.76 | 3.66 | 5.88 | 7.74 | 9.55 | 12.80 | — |
| 24 | .90 | 1.19 | 1.90 | 2.50 | 3.06 | 4.13 | 7.22 | 2.03 | 2.61 | 4.17 | 5.53 | 6.76 | 9.26 | — | — | — | — | — | — | — | — |
| 25 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.27 | 4.35 | 6.96 | 9.28 | 11.55 | 16.00 | — |
| 28 | 1.06 | 1.38 | 2.20 | 2.91 | 3.57 | 4.86 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | — | — | — | — | — | — | — | 2.52 | 3.36 | 5.37 | 7.17 | 8.90 | 12.40 | — | — | — | — | — | — | — | — |
| 32 | 1.18 | 1.52 | 2.43 | 3.22 | 3.94 | 5.40 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 36 | 1.30 | 1.77 | 2.83 | 3.66 | 4.56 | 6.00 | — | 3.02 | 3.84 | 6.34 | 8.52 | 10.68 | 14.60 | — | — | — | — | — | — | — | — |
| 40 | 1.43 | 1.91 | 3.06 | 4.07 | 5.06 | 7.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 48 | 1.71 | 2.17 | 3.58 | 4.83 | 6.04 | 8.20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

Table No. 3

## Ratings for 20° Non-Metallic Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 D.P. | | | | | | | 12 D.P. | | | | | | |
| | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 |
| **15** | **.10** | **.15** | **.24** | **.33** | **.40** | **.51** | **.83** | **.22** | **.32** | **.55** | **.72** | **.87** | **1.11** | **1.88** |
| **16** | **.11** | **.16** | **.27** | **.36** | **.43** | **.55** | **.91** | **.25** | **.35** | **.61** | **.78** | **.93** | **1.24** | **2.05** |
| **18** | **.12** | **.18** | **.30** | **.40** | **.48** | **.62** | **1.04** | **.29** | **.40** | **.66** | **.86** | **1.02** | **1.40** | **2.26** |
| **20** | **.14** | **.20** | **.34** | **.45** | **.54** | **.69** | **1.17** | **.32** | **.45** | **.74** | **.94** | **1.15** | **1.52** | **2.51** |
| **24** | **.18** | **.25** | **.41** | **.53** | **.62** | **.86** | **1.39** | **.39** | **.54** | **.87** | **1.11** | **1.43** | **1.83** | **3.09** |

Table No. 4

## Ratings for 20° Non-Metallic Spur Gears

| Number of Teeth | HORSE POWER AT VARIOUS R.P.M. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 D.P. | | | | | | | 8 D.P. | | | | | | |
| | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 | 200 | 300 | 600 | 900 | 1200 | 1800 | 3600 |
| **15** | **.41** | **.56** | **.93** | **1.22** | **1.43** | **1.97** | **3.19** | **.72** | **1.01** | **1.63** | **2.11** | **2.70** | **3.48** | **5.85** |
| **16** | **.44** | **.60** | **1.04** | **1.29** | **1.57** | **2.08** | **3.41** | **.76** | **1.06** | **1.73** | **2.19** | **2.82** | **3.62** | **6.11** |
| **18** | **.51** | **.69** | **1.13** | **1.48** | **1.85** | **2.40** | **4.00** | **.87** | **1.21** | **1.94** | **2.42** | **3.15** | **4.09** | **6.69** |
| **20** | **.55** | **.77** | **1.23** | **1.58** | **2.04** | **2.62** | **4.42** | **1.01** | **1.33** | **2.16** | **2.77** | **3.46** | **4.61** | **7.92** |
| **24** | **.68** | **.91** | **1.49** | **1.89** | **2.39** | **3.05** | **5.42** | **1.21** | **1.59** | **2.50** | **3.44** | **4.12** | **5.56** | **9.45** |

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

**1.000-1.063 RATIO**

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 11 | 11 | 1.000 | .229† | .344† | .458† | .600† | .750† | 1.000† | 1.200† | 1.500† | 2.000† | 2.400† | 3.000† | 4.000† |
| 12 | 12 | 1.000 | .250† | .375† | .500† | .600 | .750 | 1.000 | 1.200 | 1.500 | 2.000 | 2.400 | 3.000 | 4.000† |
| 13 | 13 | 1.000 | — | .406† | .542† | .650† | .813† | 1.083 | 1.300† | 1.625† | — | — | — | — |
| 14 | 14 | 1.000 | .292† | .438† | .583† | .700 | .875 | 1.167 | 1.400 | 1.750 | 2.333 | 2.800 | 3.500 | 4.667† |
| 15 | 15 | 1.000 | .313† | .469† | .625† | .750 | .938 | 1.250 | 1.500 | 1.875 | 2.500 | 3.000 | 3.750 | 5.000† |
| 16 | 16 | 1.000 | .333† | .500† | .667† | .800 | 1.000 | 1.333 | 1.600 | 2.000 | 2.667 | 3.200 | 4.000 | 5.333† |
| 17 | 17 | 1.000 | — | — | .708† | .850† | 1.063† | 1.417† | 1.700† | 2.125† | — | — | — | — |
| 18 | 18 | 1.000 | .375† | .563† | .750† | .900 | 1.125 | 1.500 | 1.800 | 2.250 | 3.000 | 3.600 | 4.500 | 6.000† |
| 19 | 19 | 1.000 | — | — | .792† | .950† | 1.188† | 1.583† | 1.900† | 2.375† | — | — | — | — |
| 20 | 20 | 1.000 | .417† | .625† | .833† | 1.000 | 1.250 | 1.667 | 2.000 | 2.500 | 3.333† | 4.000 | 5.000 | 6.667† |
| 21 | 21 | 1.000 | — | — | .875† | 1.050† | 1.313† | 1.750 | 2.100† | 2.625† | 3.500 | — | — | 7.000† |
| 22 | 22 | 1.000 | .458† | .688† | .917† | 1.100† | 1.375† | 1.833† | 2.200† | 2.750 | — | — | 5.500† | — |
| 23 | 23 | 1.000 | — | — | .958† | 1.150† | 1.438† | 1.917† | — | — | — | — | — | — |
| 24 | 24 | 1.000 | .500† | .750† | 1.000† | 1.200 | 1.500 | 2.000 | 2.400 | 3.000 | 4.000 | 4.800 | 6.000 | 8.000† |
| 25 | 25 | 1.000 | — | .781† | 1.042† | 1.250 | — | 2.083† | 2.500 | — | — | 5.000 | — | — |
| 26 | 26 | 1.000 | .542† | .813† | 1.083† | — | 1.625† | 2.167† | 2.600† | 3.250† | — | — | — | — |
| 27 | 27 | 1.000 | — | — | 1.125† | — | — | — | — | — | 4.500 | — | — | — |
| 28 | 28 | 1.000 | .583† | .875† | 1.167† | 1.400† | 1.750 | 2.333 | 2.800 | 3.500 | — | 5.600* | 7.000 | — |
| 30 | 30 | 1.000 | — | .938† | 1.250† | 1.500 | 1.875 | 2.500 | 3.000 | 3.750† | 5.000 | 6.000 | 7.500† | 10.000† |
| 32 | 32 | 1.000 | .667† | 1.000† | 1.333† | 1.600† | 2.000 | 2.667† | 3.200† | 4.000 | 5.333† | — | 8.000 | — |
| 33 | 33 | 1.000 | — | — | 1.375† | — | — | — | — | — | 5.500 | — | — | — |
| 34 | 34 | 1.000 | — | — | — | — | 2.125† | 2.833† | — | — | — | — | — | — |
| 35 | 35 | 1.000 | — | — | — | 1.750 | — | — | 3.500 | — | — | 7.000 | — | — |
| 36 | 36 | 1.000 | .750† | 1.125† | 1.500† | 1.800† | 2.250 | 3.000 | 3.600† | 4.500 | 6.000 | — | 9.000 | 12.000† |
| 38 | 38 | 1.000 | — | — | — | — | 2.375† | 3.167† | 3.800† | — | — | — | — | — |
| 39 | 39 | 1.000 | — | — | 1.625† | — | — | — | — | — | — | — | — | — |
| 40 | 40 | 1.000 | .833† | 1.250† | 1.667† | 2.000 | 2.500 | 3.333† | 4.000 | 5.000 | 6.667† | 8.000 | 10.000 | — |
| 42 | 42 | 1.000 | — | — | 1.750† | — | — | 3.500 | 4.200† | 5.250† | 7.000 | — | 10.500† | 14.000† |
| 44 | 44 | 1.000 | .917† | 1.375† | 1.833† | — | 2.750† | 3.667† | — | 5.500 | — | — | 11.000 | — |
| 45 | 45 | 1.000 | — | — | 1.875† | 2.250 | — | — | 4.500 | — | — | 9.000 | — | — |
| 48 | 48 | 1.000 | 1.000† | 1.500† | 2.000† | 2.400† | 3.000 | 4.000 | 4.800 | 6.000 | 8.000 | — | 12.000 | 16.000† |
| 50 | 50 | 1.000 | — | 1.563† | — | 2.500 | — | — | 5.000 | — | — | 10.000 | — | — |
| 52 | 52 | 1.000 | 1.083† | 1.625† | — | — | 3.250† | — | — | 6.500† | — | — | — | — |
| 54 | 54 | 1.000 | 1.125† | — | 2.250† | — | 3.375† | 4.500 | 5.400† | 6.750† | 9.000 | — | 13.500† | 18.000† |
| 55 | 55 | 1.000 | — | — | — | 2.750† | — | — | 5.500 | — | — | 11.000† | — | — |
| 56 | 56 | 1.000 | 1.167† | 1.750† | 2.333† | — | 3.500 | 4.667† | — | 7.000 | — | — | 14.000 | — |
| 60 | 60 | 1.000 | 1.250† | 1.875† | 2.500† | 3.000 | 3.750 | 5.000 | 6.000 | 7.500 | 10.000 | 12.000 | 15.000 | 20.000† |
| 64 | 64 | 1.000 | — | 2.000† | 2.667† | 3.200† | 4.000 | 5.333† | 6.400† | 8.000 | 10.667† | — | 16.000 | — |
| 65 | 65 | 1.000 | — | — | — | — | — | — | 6.500† | — | — | — | — | — |
| 66 | 66 | 1.000 | 1.375† | — | 2.750† | — | — | 5.500 | — | — | 11.000 | — | — | — |
| 68 | 68 | 1.000 | — | — | — | — | 4.250† | — | — | 8.500† | — | — | — | — |
| 70 | 70 | 1.000 | — | 2.188† | 2.917† | 3.500 | — | — | 7.000 | — | — | 14.000 | — | — |
| 72 | 72 | 1.000 | 1.500† | 2.250† | 3.000† | 3.600† | 4.500 | 6.000 | 7.200† | 9.000 | 12.000 | — | 18.000 | 24.000† |
| 75 | 75 | 1.000 | — | 2.344† | — | 3.750† | — | — | 7.500† | — | — | — | — | — |
| 76 | 76 | 1.000 | — | — | — | — | — | — | — | 9.500† | — | — | — | — |
| 78 | 78 | 1.000 | — | — | — | — | — | 6.500† | — | — | — | — | — | — |
| 80 | 80 | 1.000 | 1.667† | 2.500† | — | 4.000 | 5.000 | — | 8.000 | 10.000 | — | 16.000 | 20.000 | — |
| 84 | 84 | 1.000 | 1.750† | — | 3.500† | 4.200 | 5.250† | 7.000 | 8.400† | 10.500† | 14.000 | — | 21.000† | 28.000† |
| 64 | 65 | 1.016 | — | — | — | — | — | — | 6.450† | — | — | — | — | — |
| 54 | 55 | 1.019 | — | — | — | — | — | — | 5.450† | — | — | — | — | — |
| 44 | 45 | 1.023 | — | — | 1.854† | — | — | — | — | — | — | — | — | — |
| 39 | 40 | 1.026 | — | — | 1.646† | — | — | — | — | — | — | — | — | — |
| 35 | 36 | 1.029 | — | — | — | 1.775† | — | — | 3.550† | — | — | — | — | — |
| 70 | 72 | 1.029 | — | 2.219† | 2.958† | 3.550† | — | — | 7.100† | — | — | — | — | — |
| 32 | 33 | 1.031 | — | — | 1.354† | — | — | — | — | — | 5.417† | — | — | — |
| 64 | 66 | 1.031 | — | — | 2.708† | — | — | 5.417† | — | — | 10.833† | — | — | — |
| 27 | 28 | 1.037 | — | — | 1.146† | — | — | — | — | — | — | — | — | — |
| 54 | 56 | 1.037 | 1.146† | — | 2.292† | — | 3.438† | 4.583† | — | 6.875† | — | — | 13.750† | — |
| 26 | 27 | 1.038 | — | — | 1.104† | — | — | — | — | — | — | — | — | — |
| 52 | 54 | 1.038 | 1.104† | — | — | — | 3.313† | — | — | 6.625† | — | — | — | — |
| 25 | 26 | 1.040 | — | .797† | 1.063† | — | — | 2.125† | 2.550† | — | — | — | — | — |
| 50 | 52 | 1.040 | — | 1.594† | — | — | — | — | — | — | — | — | — | — |
| 24 | 25 | 1.042 | — | .766† | 1.021† | 1.225 | — | 2.042† | 2.450 | — | — | 4.900 | — | — |
| 48 | 50 | 1.042 | — | 1.531† | — | 2.450† | — | — | 4.900 | — | — | — | — | — |
| 72 | 75 | 1.042 | — | 2.297† | — | 3.675† | — | — | 7.350† | — | — | — | — | — |
| 23 | 24 | 1.043 | — | — | .979† | 1.175† | 1.469† | 1.958† | — | — | — | — | — | — |
| 22 | 23 | 1.045 | — | — | .938† | 1.125† | 1.406† | 1.875† | — | — | — | — | — | — |
| 21 | 22 | 1.048 | — | — | .896† | 1.075† | 1.344† | 1.792† | 2.150† | 2.688† | — | — | — | — |
| 42 | 44 | 1.048 | — | — | 1.792† | — | — | 3.583† | — | 5.375† | — | — | 10.750† | — |
| 20 | 21 | 1.050 | — | — | .854† | 1.025† | 1.281† | 1.708 | 2.050† | 2.563† | 3.417† | — | — | 6.833† |
| 40 | 42 | 1.050 | — | — | 1.708† | — | — | 3.417† | 4.100† | 5.125† | 6.833† | — | 10.250† | — |
| 80 | 84 | 1.050 | 1.708† | — | — | 4.100 | 5.125† | — | 8.200† | 10.250† | — | — | 20.500† | — |
| 19 | 20 | 1.053 | — | — | .813† | .975† | 1.219† | 1.625† | 1.950† | 2.438† | — | — | — | — |
| 38 | 40 | 1.053 | — | — | — | — | 2.438† | 3.250† | 3.900† | — | — | — | — | — |
| 76 | 80 | 1.053 | — | — | — | — | — | — | — | 9.750† | — | — | — | — |
| 18 | 19 | 1.056 | — | — | .771† | .925† | 1.156† | 1.542† | 1.850† | 2.313† | — | — | — | — |
| 36 | 38 | 1.056 | — | — | — | — | 2.313† | 3.083† | 3.700† | — | — | — | — | — |
| 72 | 76 | 1.056 | — | — | — | — | — | — | — | 9.250† | — | — | — | — |
| 17 | 18 | 1.059 | — | — | .729† | .875† | 1.094† | 1.458† | 1.750† | 2.188† | — | — | — | — |
| 34 | 36 | 1.059 | — | — | — | — | 2.188† | 2.917† | — | — | — | — | — | — |
| 68 | 72 | 1.059 | — | — | — | — | 4.375† | — | — | 8.750† | — | — | — | — |
| 66 | 70 | 1.061 | — | — | 2.833† | — | — | — | — | — | — | — | — | — |
| 16 | 17 | 1.063 | — | — | .688† | .825† | 1.031† | 1.375† | 1.650† | 2.063† | — | — | — | — |
| 32 | 34 | 1.063 | — | — | — | — | 2.063† | 2.750† | — | — | — | — | — | — |
| 64 | 68 | 1.063 | — | — | — | — | 4.125† | — | — | 8.250† | — | — | — | — |

† = 14 1/2°  * = 20° only.

**WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

1.067-1.158 RATIO

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 15 | 16 | 1.067 | .323† | .484† | .646† | .775 | .969 | 1.292 | 1.550 | 1.938 | 2.583 | 3.100 | 3.875 | 5.167† |
| 30 | 32 | 1.067 | — | .969† | 1.292† | 1.550† | 1.938 | 2.583† | 3.100† | 3.875† | 5.167† | — | 7.750† | — |
| 45 | 48 | 1.067 | — | — | 1.938† | 2.325† | — | — | 4.650 | — | — | — | — | — |
| 60 | 64 | 1.067 | — | 1.938† | 2.583† | 3.100† | 3.875 | 5.167† | 6·200† | 7.750 | 10.333† | — | 15.500 | — |
| 75 | 80 | 1.067 | — | 2.422† | — | 3.875† | — | — | 7.750† | — | — | — | — | — |
| 14 | 15 | 1.071 | .302† | .453† | .604† | .725 | .906 | 1.208 | 1.450 | 1.813 | 2.417 | 2.900 | 3.625 | 4.833† |
| 28 | 30 | 1.071 | — | .906† | 1.208† | 1.450† | 1.813 | 2.417 | 2.900 | 3.625† | — | 5.800* | 7.250† | — |
| 42 | 45 | 1.071 | — | — | 1.813† | — | — | — | 4.350† | — | — | — | — | — |
| 56 | 60 | 1.071 | 1.208† | 1.813† | 2.417† | — | 3.625 | 4.833† | — | 7.250 | — | — | 14.500 | — |
| 70 | 75 | 1.071 | — | 2.266† | — | 3.625† | — | — | 7.250† | — | — | — | — | — |
| 13 | 14 | 1.077 | — | .422† | .563† | .675† | .844† | 1.125 | 1.350† | 1.688† | — | — | — | — |
| 26 | 28 | 1.077 | .563† | .844† | 1.125† | — | 1.688† | 2.250† | 2.700† | 3.375† | — | — | — | — |
| 39 | 42 | 1.077 | — | — | 1.688† | — | — | — | — | — | — | — | — | — |
| 52 | 56 | 1.077 | 1.125† | 1.688† | — | — | 3.375† | — | — | 6.750† | — | — | — | — |
| 65 | 70 | 1.077 | — | — | — | — | — | — | 6.750† | — | — | — | — | — |
| 78 | 84 | 1.077 | — | — | — | — | — | 6.750† | — | — | — | — | — | — |
| 25 | 27 | 1.080 | — | — | 1.083† | — | — | — | — | — | — | — | — | — |
| 50 | 54 | 1.080 | — | — | — | — | — | — | 5.200† | — | — | — | — | — |
| 12 | 13 | 1.083 | — | .391† | .521† | .625† | .781† | 1.042 | 1.250† | 1.563† | — | — | — | — |
| 24 | 26 | 1.083 | .521† | .781† | 1.042† | — | 1.563† | 2.083† | 2.500† | 3.125† | — | — | — | — |
| 36 | 39 | 1.083 | — | — | 1.563† | — | — | — | — | — | — | — | — | — |
| 48 | 52 | 1.083 | 1.042† | 1.563† | — | — | 3.125† | — | — | 6.250† | — | — | — | — |
| 60 | 65 | 1.083 | — | — | — | — | — | — | 6.250† | — | — | — | — | — |
| 72 | 78 | 1.083 | — | — | — | — | — | 6.250† | — | — | — | — | — | — |
| 35 | 38 | 1.086 | — | — | — | — | — | — | 3.650† | — | — | — | — | — |
| 23 | 25 | 1.087 | — | — | 1.000† | 1.200† | — | 2.000† | — | — | — | — | — | — |
| 11 | 12 | 1.091 | .204† | .359† | .479† | .600† | .750† | 1.000† | 1.200† | 1.500† | 2.000† | 2.400† | 3.000† | 4.000† |
| 22 | 24 | 1.091 | .479† | .719† | .958† | 1.150† | 1.438† | 1.917† | 2.300† | 2.875 | — | — | 5.750† | — |
| 33 | 36 | 1.091 | — | — | 1.438† | — | — | — | — | — | 5.750 | — | — | — |
| 44 | 48 | 1.091 | .958† | 1.438† | 1.917† | — | 2.875† | 3.833† | — | 5.750 | — | — | 11.500 | — |
| 55 | 60 | 1.091 | — | — | — | 2.875† | — | — | 5.750 | — | — | 11.500† | — | — |
| 66 | 72 | 1.091 | 1.438† | — | 2.875† | — | — | 5.750 | — | — | 11.500 | — | — | — |
| 32 | 35 | 1.094 | — | — | — | 1.675† | — | — | 3.350† | — | — | — | — | — |
| 64 | 70 | 1.094 | — | 2.094† | 2.792† | 3.350† | — | — | 6.700† | — | — | — | — | — |
| 21 | 23 | 1.095 | — | — | .917† | 1.100† | 1.375† | 1.833† | — | — | — | — | — | — |
| 20 | 22 | 1.100 | .438† | .656† | .875† | 1.050† | 1.313† | 1.750† | 2.100† | 2.625 | — | — | 5.250† | — |
| 30 | 33 | 1.100 | — | — | 1.313† | — | — | — | — | — | 5.250 | — | — | — |
| 40 | 44 | 1.100 | .875† | 1.313† | 1.750† | — | 2.625† | 3.500† | — | 5.250 | — | — | 10.500 | — |
| 50 | 55 | 1.100 | — | — | — | 2.625† | — | — | 5.250 | — | — | 10.500† | — | — |
| 60 | 66 | 1.100 | 1.313† | — | 2.625† | — | — | 5.250 | — | — | 10.500 | — | — | — |
| 19 | 21 | 1.105 | — | — | .833† | 1.000† | 1.250† | 1.667† | 2.000† | 2.500† | — | — | — | — |
| 38 | 42 | 1.105 | — | — | — | — | — | 3.333† | 4.000† | — | — | — | — | — |
| 76 | 84 | 1.105 | — | — | — | — | — | — | — | 10.000† | — | — | — | — |
| 65 | 72 | 1.108 | — | — | — | — | — | — | 6.850† | — | — | — | — | — |
| 18 | 20 | 1.111 | .396† | .594† | .792† | .950 | 1.188 | 1.583 | 1.900 | 2.375 | 3.167† | 3.800 | 4.750 | 6.333† |
| 27 | 30 | 1.111 | — | — | 1.188† | — | — | — | — | — | 4.750 | — | — | — |
| 36 | 40 | 1.111 | .792† | 1.188† | 1.583† | 1.900† | 2.375 | 3.167† | 3.800† | 4.750 | 6.333† | — | 9.500 | — |
| 45 | 50 | 1.111 | — | — | — | 2.375 | — | — | 4.750 | — | — | 9.500 | — | — |
| 54 | 60 | 1.111 | 1.188† | — | 2.375† | — | 3.563† | 4.750 | 5.700† | 7.125† | 9.500 | — | 14.250† | 19.000† |
| 72 | 80 | 1.111 | 1.583† | 2.375† | — | 3.800† | 4.750 | — | 7.600† | 9.500 | — | — | 19.000 | — |
| 17 | 19 | 1.118 | — | — | .750† | .900† | 1.125† | 1.500† | 1.800† | 2.250† | — | — | — | — |
| 34 | 38 | 1.118 | — | — | — | — | 2.250† | 3.000† | — | — | — | — | — | — |
| 68 | 76 | 1.118 | — | — | — | — | — | — | — | 9.000† | — | — | — | — |
| 25 | 28 | 1.120 | — | .828† | 1.104† | 1.325† | — | 2.208† | 2.650 | — | — | 5.300* | — | — |
| 50 | 56 | 1.120 | — | 1.656† | — | — | — | — | — | — | — | — | — | — |
| 75 | 84 | 1.120 | — | — | — | 3.975† | — | — | 7.950† | — | — | — | — | — |
| 16 | 18 | 1.125 | .354† | .531† | .708† | .850 | 1.063 | 1.417 | 1.700 | 2.125 | 2.833 | 3.400 | 4.250 | 5.667† |
| 24 | 27 | 1.125 | — | — | 1.063† | — | — | — | — | — | 4.250 | — | — | — |
| 32 | 36 | 1.125 | .708† | 1.063† | 1.417† | 1.700† | 2.125 | 2.833† | 3.400† | 4.250 | 5.667† | — | 8.500 | — |
| 40 | 45 | 1.125 | — | — | 1.771† | 2.125 | — | — | 4.250 | — | — | 8.500 | — | — |
| 48 | 54 | 1.125 | 1.063† | — | 2.125† | — | 3.188† | 4.250 | 5.100† | 6.375† | 8.500 | — | 12.750† | 17.000† |
| 64 | 72 | 1.125 | — | 2.125† | 2.833† | 3.400† | 4.250 | 5.667† | 6.800† | 8.500 | 11.333† | — | 17.000 | — |
| 39 | 44 | 1.128 | — | — | 1.729† | — | — | — | — | — | — | — | — | — |
| 23 | 26 | 1.130 | — | — | 1.021† | — | 1.531† | 2.042† | — | — | — | — | — | — |
| 15 | 17 | 1.133 | — | — | .667† | .800† | 1.000† | 1.333† | 1.600† | 2.000† | — | — | — | — |
| 30 | 34 | 1.133 | — | — | — | — | 2.000† | 2.667† | — | — | — | — | — | — |
| 60 | 68 | 1.133 | — | — | — | — | 4.000† | — | — | 8.000† | — | — | — | — |
| 22 | 25 | 1.136 | — | .734† | .979† | 1.175† | — | 1.958† | 2.350† | — | — | — | — | — |
| 44 | 50 | 1.136 | — | 1.469† | — | — | — | — | — | — | — | — | — | — |
| 14 | 16 | 1.143 | .313† | .469† | .625† | .750 | .938 | 1.250 | 1.500 | 1.875 | 2.500 | 3.000 | 3.750 | 5.000† |
| 21 | 24 | 1.143 | — | — | .938† | 1.125† | 1.406† | 1.875 | 2.250† | 2.813† | 3.750 | — | — | 7.500† |
| 28 | 32 | 1.143 | .625† | .938† | 1.250† | 1.500† | 1.875 | 2.500† | 3.000† | 3.750 | — | — | 7.500 | — |
| 35 | 40 | 1.143 | — | — | — | 1.875 | — | — | 3.750 | — | — | 7.500 | — | — |
| 42 | 48 | 1.143 | — | — | 1.875† | — | — | 3.750 | 4.500† | 5.625† | 7.500 | — | 11.250† | 15.000† |
| 56 | 64 | 1.143 | — | — | 2.500† | — | 3.750 | 5.000† | — | 7.500 | — | — | 15.000 | — |
| 70 | 80 | 1.143 | — | 2.344† | — | 3.750 | — | — | 7.500 | — | — | 15.000 | — | — |
| 48 | 55 | 1.146 | — | — | — | 2.575† | — | — | 5.150 | — | — | — | — | — |
| 20 | 23 | 1.150 | — | — | .896† | 1.075† | 1.344† | 1.792† | — | — | — | — | — | — |
| 13 | 15 | 1.154 | — | .438† | .583† | .700† | .875† | 1.167 | 1.400† | 1.750† | — | — | — | — |
| 26 | 30 | 1.154 | — | .875† | 1.167† | — | 1.750† | 2.333† | 2.800† | 3.500† | — | — | — | — |
| 39 | 45 | 1.154 | — | — | 1.750† | — | — | — | — | — | — | — | — | — |
| 52 | 60 | 1.154 | 1.167† | 1.750† | — | — | 3.500* | — | — | 7.000† | — | — | — | — |
| 65 | 75 | 1.154 | — | — | — | — | — | — | 7.000† | — | — | — | — | — |
| 19 | 22 | 1.158 | — | — | .854† | 1.025† | 1.281† | 1.708† | 2.050† | 2.563† | — | — | — | — |
| 38 | 44 | 1.158 | — | — | — | — | 2.563† | 3.417† | — | — | — | — | — | — |

† = 14 1/2° only  * = 20° only.

**WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

F

**1.164-1.267 RATIO** Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 55 | 64 | 1.164 | — | — | — | 2.975† | — | — | 5.950† | — | — | — | — | — |
| 12 | 14 | 1.167 | .271† | .406† | .542† | .650 | .813 | 1.083 | 1.300 | 1.625 | 2.167 | 2.600 | 3.250 | 4.333† |
| 18 | 21 | 1.167 | — | — | .813† | .975† | 1.219† | 1.625 | 1.950† | 2.438† | 3.250 | — | — | 6.500† |
| 24 | 28 | 1.167 | .542† | .813† | 1.083† | 1.300† | 1.625 | 2.167 | 2.600 | 3.250 | — | 5.200* | 6.500 | — |
| 30 | 35 | 1.167 | — | — | — | 1.625 | — | — | 3.250 | — | — | 6.500 | — | — |
| 36 | 42 | 1.167 | — | — | 1.625† | — | — | 3.250 | 3.900† | 4.875† | 6.500 | — | 9.750† | 13.000† |
| 48 | 56 | 1.167 | 1.083† | 1.625† | 2.166† | — | 3.250 | 4.333† | — | 6.500 | — | — | 13.000 | — |
| 60 | 70 | 1.167 | — | 2.031† | 2.708† | 3.250 | — | — | 6.500 | — | — | 13.000 | — | — |
| 72 | 84 | 1.167 | 1.625† | — | 3.250† | 3.900† | 4.875† | 6.500 | 7.800† | 9.750† | 13.000 | — | 19.500† | 26.000† |
| 64 | 75 | 1.172 | — | 2.172† | — | 3.475† | — | — | 6.950† | — | — | — | — | — |
| 23 | 27 | 1.174 | — | — | 1.042† | — | — | — | — | — | — | — | — | — |
| 17 | 20 | 1.176 | — | — | .771† | .925† | 1.156† | 1.542† | 1.850† | 2.313† | — | — | — | — |
| 34 | 40 | 1.176 | — | — | — | — | 2.313† | 3.083† | — | — | — | — | — | — |
| 68 | 80 | 1.176 | — | — | — | — | 4.625† | — | — | 9.250† | — | — | — | — |
| 28 | 33 | 1.179 | — | — | 1.271† | — | — | — | — | — | — | — | — | — |
| 56 | 66 | 1.179 | 1.271† | — | 2.542† | — | — | 5.083† | — | — | — | — | — | — |
| 11 | 13 | 1.182 | — | .375† | .500† | .625† | .781† | 1.042† | 1.250† | 1.563† | — | — | — | — |
| 22 | 26 | 1.182 | .500† | .750† | 1.000† | — | 1.500† | 2.000† | 2.400† | 3.00† | — | — | — | — |
| 33 | 39 | 1.182 | — | — | 1.500† | — | — | — | — | — | — | — | — | — |
| 44 | 52 | 1.182 | 1.000† | 1.500† | — | — | 3.000† | — | — | 6.000† | — | — | — | — |
| 55 | 65 | 1.182 | — | — | — | — | — | — | 6.000† | — | — | — | — | — |
| 66 | 78 | 1.182 | — | — | — | — | — | 6.000† | — | — | — | — | — | — |
| 38 | 45 | 1.184 | — | — | — | — | — | — | 4.150† | — | — | — | — | — |
| 27 | 32 | 1.185 | — | — | 1.229† | — | — | — | — | — | 4.917† | — | — | — |
| 54 | 64 | 1.185 | — | — | 2.458† | — | 3.688† | 4.917† | 5.900† | 7.375† | 9.833† | — | 14.750† | — |
| 16 | 19 | 1.188 | — | — | .729† | .875† | 1.094† | 1.458† | 1.750† | 2.188† | — | — | — | — |
| 32 | 38 | 1.188 | — | — | — | — | 2.188† | 2.917† | 3.500† | — | — | — | — | — |
| 64 | 76 | 1.188 | — | — | — | — | — | — | — | 8.750† | — | — | — | — |
| 21 | 25 | 1.190 | — | — | .958† | 1.150† | — | 1.917† | 2.300† | — | — | — | — | — |
| 42 | 50 | 1.190 | — | — | — | — | — | — | 4.600† | — | — | — | — | — |
| 15 | 18 | 1.200 | .344† | .516† | .688† | .825 | 1.031 | 1.375 | 1.650 | 2.063 | 2.750 | 3.300 | 4.125 | 5.500† |
| 20 | 24 | 1.200 | .458† | .688† | .917† | 1.100 | 1.375 | 1.833 | 2.200 | 2.750 | 3.667† | 4.400 | 5.500 | 7.333† |
| 25 | 30 | 1.200 | — | .859† | 1.146† | 1.375 | — | 2.292† | 2.750 | — | — | 5.500 | — | — |
| 30 | 36 | 1.200 | — | 1.031† | 1.375† | 1.650† | 2.063 | 2.750 | 3.300† | 4.125† | 5.500 | — | 8.250† | 11.000† |
| 35 | 42 | 1.200 | — | — | — | — | — | — | 3.850† | — | — | — | — | — |
| 40 | 48 | 1.200 | .917† | 1.375† | 1.833† | 2.200† | 2.750 | 3.667† | 4.400 | 5.500 | 7.333† | — | 11.000 | — |
| 45 | 54 | 1.200 | — | — | 2.063† | — | — | — | 4.950† | — | — | — | — | — |
| 50 | 60 | 1.200 | — | 1.719† | — | 2.750 | — | — | 5.500 | — | — | 11.000 | — | — |
| 60 | 72 | 1.200 | 1.375† | 2.063† | 2.750† | 3.300† | 4.125 | 5.500 | 6.600† | 8.250 | 11.000 | — | 16.500 | 22.000† |
| 70 | 84 | 1.200 | — | — | 3.208† | 3.850 | — | — | 7.700† | — | — | — | — | — |
| 54 | 65 | 1.204 | — | — | — | — | — | — | 5.950† | — | — | — | — | — |
| 19 | 23 | 1.211 | — | — | .875† | 1.050† | 1.313† | 1.750† | — | — | — | — | — | — |
| 33 | 40 | 1.212 | — | — | 1.521† | — | — | — | — | — | 6.083† | — | — | — |
| 66 | 80 | 1.212 | 1.521† | — | — | — | — | — | — | — | — | — | — | — |
| 14 | 17 | 1.214 | — | — | .646† | .775† | .969† | 1.292† | 1.550† | 1.938† | — | — | — | — |
| 28 | 34 | 1.214 | — | — | — | — | 1.938† | 2.583† | — | — | — | — | — | — |
| 56 | 68 | 1.214 | — | — | — | — | 3.875† | — | — | 7.750† | — | — | — | — |
| 23 | 28 | 1.217 | — | — | 1.063† | 1.275† | 1.594† | 2.125† | — | — | — | — | — | — |
| 32 | 39 | 1.219 | — | — | 1.479† | — | — | — | — | — | — | — | — | — |
| 64 | 78 | 1.219 | — | — | — | — | — | 5.917† | — | — | — | — | — | — |
| 18 | 22 | 1.222 | .417† | .625† | .833† | 1.000† | 1.250† | 1.667† | 2.000† | 2.500 | — | — | 5.000† | — |
| 27 | 33 | 1.222 | — | — | 1.250† | — | — | — | — | — | 5.000 | — | — | — |
| 36 | 44 | 1.222 | .833† | 1.250† | 1.667† | — | 2.500† | 3.333† | — | 5.000 | — | — | 10.000 | — |
| 45 | 55 | 1.222 | — | — | — | 2.500† | — | — | 5.000 | — | — | 10.000† | — | — |
| 54 | 66 | 1.222 | 1.250† | — | 2.500† | — | — | 5.000 | — | — | 10.000 | — | — | — |
| 22 | 27 | 1.227 | — | — | 1.021† | — | — | — | — | — | — | — | — | — |
| 44 | 54 | 1.227 | 1.021† | — | 2.042† | — | 3.063† | 4.083† | — | 6.125† | — | — | 12.250† | — |
| 13 | 16 | 1.231 | — | .453† | .604† | .725† | .906† | 1.208 | 1.450† | 1.813† | — | — | — | — |
| 26 | 32 | 1.231 | .604† | .906† | 1.208† | — | 1.813† | 2.417† | 2.900† | 3.625† | — | — | — | — |
| 39 | 48 | 1.231 | — | — | 1.813† | — | — | — | — | — | — | — | — | — |
| 52 | 64 | 1.231 | — | 1.813† | — | — | 3.625† | — | — | 7.250† | — | — | — | — |
| 65 | 80 | 1.231 | — | — | — | — | — | — | 7.250† | — | — | — | — | — |
| 17 | 21 | 1.235 | — | — | .792† | .950† | 1.188† | 1.583† | 1.900† | 2.375† | — | — | — | — |
| 34 | 42 | 1.235 | — | — | — | — | — | 3.167† | — | — | — | — | — | — |
| 68 | 84 | 1.235 | — | — | — | — | 4.750† | — | — | 9.500† | — | — | — | — |
| 21 | 26 | 1.238 | — | — | .979† | — | 1.469† | 1.958† | 2.350† | 2.938† | — | — | — | — |
| 42 | 52 | 1.238 | — | — | — | — | — | — | — | 5.875† | — | — | — | — |
| 45 | 56 | 1.244 | — | — | 2.104† | — | — | — | — | — | — | — | — | — |
| 12 | 15 | 1.250 | .281† | .422† | .563† | .675 | .844 | 1.125 | 1.350 | 1.688 | 2.2500 | 2.700 | 3.376 | 4.500† |
| 16 | 20 | 1.250 | .375† | .563† | .750† | .900 | 1.125 | 1.500 | 1.800 | 2.250 | 3.000† | 3.600 | 4.500 | 6.000† |
| 20 | 25 | 1.250 | — | .703† | .938† | 1.125 | — | 1.875† | 2.250 | — | — | 4.500 | — | — |
| 24 | 30 | 1.250 | — | .844† | 1.125† | 1.350 | 1.688 | 2.250 | 2.700 | 3.375† | 4.500 | 5.400 | 6.750† | 9.000† |
| 28 | 35 | 1.250 | — | — | — | 1.575† | — | — | 3.150 | — | — | 6.300* | — | — |
| 32 | 40 | 1.250 | .750† | 1.125† | 1.500† | 1.8001 | 2.250 | 3.000† | 3.600† | 4.500 | 6.000† | — | 9.000 | — |
| 36 | 45 | 1.250 | — | — | 1.688† | 2.025† | — | — | 4.050† | — | — | — | — | — |
| 40 | 50 | 1.250 | — | 1.406† | — | 2.250 | — | — | 4.500 | — | — | 9.000 | — | — |
| 48 | 60 | 1.250 | 1.125 | 1.688† | 2.250† | 2.700† | 3.375 | 4.500 | 5.400 | 6.750 | 9.000 | — | 13.500 | 18.000† |
| 56 | 70 | 1.250 | — | 1.969† | 2.625† | — | — | — | — | — | — | — | — | — |
| 60 | 75 | 1.250 | — | 2.109† | — | 3.375† | — | — | 6.750† | — | — | — | — | — |
| 64 | 80 | 1.250 | — | 2.250† | — | 3.600† | 4.500 | — | 7.200† | 9.000 | — | — | 18.000 | — |
| 54 | 68 | 1.259 | — | — | — | — | 3.813† | — | — | 7.625† | — | — | — | — |
| 19 | 24 | 1.263 | — | — | .896† | 1.075† | 1.344† | 1.792† | 2.150† | 2.688† | — | — | — | — |
| 38 | 48 | 1.263 | — | — | — | — | 2.688† | 3.583† | 4.300† | — | — | — | — | — |
| 15 | 19 | 1.267 | — | — | .708† | .850† | 1.063† | 1.417† | 1.700† | 2.125† | — | — | — | — |
| 30 | 38 | 1.267 | — | — | — | — | 2.125† | 2.833† | 3.400† | — | — | — | — | — |

† = 14 1/2° only * = 20° only.

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

1.267-1.391 RATIO

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 60 | 76 | 1.267 | — | — | — | — | — | — | — | 8.500† | — | — | — | — |
| 26 | 33 | 1.269 | — | — | 1.229† | — | — | — | — | — | — | — | — | — |
| 52 | 66 | 1.269 | 1.229† | — | — | — | — | — | — | — | — | — | — | — |
| 11 | 14 | 1.273 | .260† | .391† | .521† | .650† | .813† | 1.083† | 1.300† | 1.625† | 2.167† | 2.600† | 3.250† | 4.333† |
| 22 | 28 | 1.273 | .521† | .781† | 1.042† | 1.250† | 1.563† | 2.083† | 2.500† | 3.125 | — | — | 6.250† | — |
| 33 | 42 | 1.273 | — | — | 1.563† | — | — | — | — | — | 6.250 | — | — | — |
| 44 | 56 | 1.273 | 1.042† | 1.563† | 2.083† | — | 3.125† | 4.167† | — | 6.250 | — | — | 12.500† | — |
| 55 | 70 | 1.273 | — | — | — | 3.125† | — | — | 6.250 | — | — | 12.500† | — | — |
| 66 | 84 | 1.273 | 1.563† | — | 3.125† | — | — | 6.250 | — | — | 12.500 | — | — | — |
| 18 | 23 | 1.278 | — | — | .854† | 1.025† | 1.281† | 1.708† | — | — | — | — | — | — |
| 25 | 32 | 1.280 | — | .891† | 1.188† | 1.425† | — | 2.375† | 2.850† | — | — | — | — | — |
| 50 | 64 | 1.280 | — | 1.781† | — | 2.850† | — | — | 5.700† | — | — | — | — | — |
| 14 | 18 | 1.286 | .333† | .500† | .667† | .800 | 1.000 | 1.333 | 1.600 | 2.000 | 2.667 | 3.200 | 4.000 | 5.333† |
| 21 | 27 | 1.286 | — | — | 1.000† | — | — | — | — | — | 4.000 | — | — | — |
| 28 | 36 | 1.286 | .667† | 1.000† | 1.333† | 1.600† | 2.000 | 2.667 | 3.200† | 4.000 | — | — | 8.000 | — |
| 35 | 45 | 1.286 | — | — | — | 2.000 | — | — | 4.000 | — | — | 8.000 | — | — |
| 42 | 54 | 1.286 | — | — | 2.000† | — | — | 4.000 | 4.800† | 6.000† | 8.000 | — | 12.000† | 16.000† |
| 56 | 72 | 1.286 | 1.333† | 2.000† | 2.667† | — | 4.000 | 5.333† | — | 8.000 | — | — | 16.000 | — |
| 65 | 84 | 1.292 | — | — | — | — | — | — | 7.450† | — | — | — | — | — |
| 17 | 22 | 1,294 | — | — | .813† | .975† | 1.219† | 1.625† | 1.950† | 2.438† | — | — | — | — |
| 34 | 44 | 1.294 | — | — | — | — | 2.438† | 3.250† | — | — | — | — | — | — |
| 54 | 70 | 1.296 | — | — | 2.583† | — | — | — | 6.200† | — | — | — | — | — |
| 20 | 26 | 1.300 | .479† | .719† | .958† | — | 1.438† | 1.917† | 2.300† | 2.875† | — | — | — | — |
| 30 | 39 | 1.300 | — | — | 1.438† | — | — | — | — | — | — | — | — | — |
| 40 | 52 | 1.300 | .958† | 1.438† | — | — | 2.875† | — | — | 5.750† | — | — | — | — |
| 50 | 65 | 1,300 | — | — | — | — | — | — | 5.750† | — | — | — | — | — |
| 60 | 78 | 1.300 | — | — | — | — | — | 5.750† | — | — | — | — | — | — |
| 23 | 30 | 1.304 | — | — | 1.104† | 1.325† | 1.656† | 2.208† | — | — | — | — | — | — |
| 13 | 17 | 1.308 | — | — | .625† | .750† | .938† | 1.250† | 1.500† | 1.875† | — | — | — | — |
| 26 | 34 | 1.308 | — | — | — | — | 1.875† | 2.500† | — | — | — | — | — | — |
| 52 | 68 | 1,308 | — | — | — | — | 3.750† | — | — | 7.500† | — | — | — | — |
| 55 | 72 | 1.309 | — | — | — | 3.175† | — | — | 6.350† | — | — | — | — | — |
| 42 | 55 | 1.310 | — | — | — | — | — | — | 4.850† | — | — | — | — | — |
| 16 | 21 | 1.313 | — | — | .771† | .925† | 1.156† | 1.542 | 1.850† | 2.313† | 3.083 | — | — | 6.167† |
| 32 | 42 | 1.313 | — | — | 1.542† | — | — | 3.083† | 3.700† | 4.625† | 6.167† | — | 9.250† | — |
| 64 | 84 | 1.313 | — | — | 3,083† | 3.700† | 4.625† | 6.167† | 7.400† | 9.250† | 12.333† | — | 18.500† | — |
| 19 | 25 | 1.316 | — | — | .917† | 1.100† | — | 1.833† | 2.200† | — | — | — | — | — |
| 38 | 50 | 1.316 | — | — | — | — | — | — | 4.400† | — | — | — | — | — |
| 25 | 33 | 1.320 | — | — | 1.208† | — | — | — | — | — | — | — | — | — |
| 12 | 16 | 1.333 | .292† | .438† | .583† | .700 | .875 | 1.167 | 1.400 | 1.750 | 2.333 | 2.800 | 3.500 | 4.667† |
| 15 | 20 | 1,333 | .365† | .547† | .729† | .875 | 1.094 | 1.458 | 1.750 | 2.188 | 2.917† | 3.500 | 4.375 | 5.833† |
| 18 | 24 | 1.333 | .438† | .656† | .875† | 1.050 | 1.313 | 1.750 | 2.100 | 2.625 | 3.500 | 4.200 | 5.250 | 7.000† |
| 21 | 28 | 1.333 | — | — | 1.021† | 1.225† | 1.531† | 2.042 | 2.450† | 3.063† | — | — | — | — |
| 24 | 32 | 1.333 | .583† | .875† | 1.167† | 1.400† | 1.750 | 2.333† | 2.800† | 3.500 | 4.667† | — | 7.000 | — |
| 27 | 36 | 1.333 | — | — | 1.313† | — | — | — | — | — | 5.250 | — | — | — |
| 30 | 40 | 1.333 | — | 1.094† | 1.458† | 1.750 | 2.188 | 2.197† | 3.500 | 4.375† | 5.833† | 7.000 | 8.750† | — |
| 33 | 44 | 1.333 | — | — | 1.604† | — | — | — | — | — | — | — | — | — |
| 36 | 48 | 1.333 | .875† | 1.313† | 1.750† | 2.100† | 2.625 | 3.500 | 4.200† | 5.250 | 7.000 | — | 10.500 | 14.000† |
| 42 | 56 | 1.333 | — | — | 2.042† | — | — | 4.083† | — | 6.125† | — | — | 12.250† | — |
| 45 | 60 | 1.333 | — | — | 2.188† | 2.625 | — | — | 5.250 | — | — | 10.500 | — | — |
| 48 | 64 | 1.333 | — | 1.750† | 2.333† | 2.800† | 3.500 | 4.667† | 5.600† | 7.000 | 9.333† | — | 14.000 | — |
| 54 | 72 | 1,333 | 1.313† | — | 2.625† | — | 3.938† | 5.250 | 6.300† | 7.875† | 10.500 | — | 15.750† | 21.000† |
| 60 | 80 | 1,333 | 1.458† | 2.188† | — | 3.500 | 4.375 | — | 7.000 | 8.750 | — | 14.000 | 17.500 | — |
| 56 | 75 | 1.339 | — | 2.047† | — | — | — | — | — | — | — | — | — | — |
| 26 | 35 | 1.346 | — | — | — | — | — | — | 3.050† | — | — | — | — | — |
| 52 | 70 | 1.346 | — | 1.906† | — | — | — | — | — | — | — | — | — | — |
| 20 | 27 | 1.350 | — | — | .979† | — | — | — | — | — | 3.917† | — | — | — |
| 40 | 54 | 1.350 | .979† | — | 1.958† | — | 2.938† | 3.917† | 4.700† | 5.875† | 7.833† | — | 11.750† | — |
| 17 | 23 | 1.353 | — | — | .833† | 1.000† | 1.250† | 1.667† | — | — | — | — | — | — |
| 48 | 65 | 1.354 | — | — | — | — | — | — | 5.650† | — | — | — | — | — |
| 14 | 19 | 1.357 | — | — | .688† | .825† | 1.031† | 1.375† | 1.650† | 2.063† | — | — | — | — |
| 28 | 38 | 1.357 | — | — | — | — | 2.063† | 2.750† | 3.300† | — | — | — | — | — |
| 56 | 76 | 1.357 | — | — | — | — | — | — | — | 8.250† | — | — | — | — |
| 25 | 34 | 1.360 | — | — | — | — | — | 2.458† | — | — | — | — | — | — |
| 11 | 15 | 1.364 | .271† | .406† | .542† | .675† | .844† | 1.125† | 1.350† | 1.688† | 2.250† | 2.700† | 3.375† | 4.500† |
| 22 | 30 | 1.364 | — | .813† | 1.083† | 1.300† | 1.625† | 2.167† | 2.600† | 3.250† | — | — | 6.500† | — |
| 33 | 45 | 1.364 | — | — | 1.625† | — | — | — | — | — | — | — | — | — |
| 44 | 60 | 1.364 | 1.083† | 1.625† | 2.167† | — | 3.250† | 4.333† | — | 6.500 | — | — | 13.000 | — |
| 55 | 75 | 1.364 | — | — | — | 3.250† | — | — | 6.500† | — | — | — | — | — |
| 19 | 26 | 1.368 | — | — | .938† | — | 1.406† | 1.875† | 2.250† | 2.813† | — | — | — | — |
| 38 | 52 | 1.368 | — | — | — | — | 2.813† | — | — | — | — | — | — | — |
| 35 | 48 | 1,371 | — | — | — | 2.075† | — | — | 4.150 | — | — | — | — | — |
| 16 | 22 | 1,375 | .396† | .594† | .792† | .950† | 1.188† | 1.583† | 1.900† | 2.375 | — | — | 4.750† | — |
| 24 | 33 | 1.375 | — | — | 1.188† | — | — | — | — | — | 4.750 | — | — | — |
| 32 | 44 | 1.375 | .792† | 1.188† | 1.583† | — | 2.375† | 3.167† | — | 4.750 | — | — | 9.500 | — |
| 40 | 55 | 1.375 | — | — | — | 2.375† | — | — | 4.750 | — | — | 9.500† | — | — |
| 48 | 66 | 1.375 | 1.188† | — | 2.375† | — | — | 4.750 | — | — | 9.500 | — | — | — |
| 13 | 18 | 1.385 | — | .484† | .646† | .775† | .969† | 1.292 | 1.550† | 1.938† | — | — | — | — |
| 26 | 36 | 1.385 | .646† | .969† | 1.292† | — | 1.938† | 2.583† | 3.100† | 3.875† | — | — | — | — |
| 39 | 54 | 1,385 | — | — | 1.938† | — | — | — | — | — | — | — | — | — |
| 52 | 72 | 1.385 | 1.292† | 1.938† | — | — | 3.875† | — | — | 7.750† | — | — | — | — |
| 18 | 25 | 1.389 | — | .672† | .896† | 1.075 | — | 1.792† | 2.150 | — | — | 4.300 | — | — |
| 36 | 50 | 1.389 | — | 1.344† | — | 2.150† | — | — | 4.300† | — | — | — | — | — |
| 54 | 75 | 1.389 | — | — | — | — | — | — | 6.450† | — | — | — | — | — |
| 23 | 32 | 1.391 | — | — | 1.146† | 1.375† | 1.719† | 2.292† | — | — | — | — | — | — |

† = 14 1/2° only  * = 20° only.

WARNING See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

**1.393-1.538 RATIO**

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 28 | 39 | 1.393 | — | — | 1.396† | — | — | — | — | — | — | — | — | — |
| 56 | 78 | 1.393 | — | — | — | — | — | 5.583† | — | — | — | — | — | — |
| 15 | 21 | 1.400 | — | — | .750† | .900† | 1.125† | 1.500 | 1.800† | 2.250† | 3.000 | — | — | 6.000† |
| 20 | 28 | 1.400 | .500† | .750† | 1.000† | 1.200† | 1.500 | 2.000 | 2.400 | 3.000 | — | 4.800* | 6.000 | — |
| 25 | 35 | 1.400 | — | — | — | 1.500 | — | — | 3.000 | — | — | 6.000 | — | — |
| 30 | 42 | 1.400 | — | — | 1.500† | — | — | 3.000 | 3.600† | 4.500† | 6.000 | — | 9.000† | 12.000† |
| 40 | 56 | 1.400 | 1.000† | 1.500† | 2.000† | — | 3.000 | 4.000† | — | 6.000 | — | — | 12.000 | — |
| 50 | 70 | 1.400 | — | 1.875† | — | 3.000 | — | — | 6.000 | — | — | 12.000 | — | — |
| 60 | 84 | 1.400 | 1.500† | — | 3.000† | 3.600 | 4.500† | 6.000 | 7.200† | 9.000† | 12.000 | — | 18.000† | 24.000† |
| 32 | 45 | 1.406 | — | — | 1.604† | 1.925† | — | — | 3.850† | — | — | — | — | — |
| 54 | 76 | 1.407 | — | — | — | — | — | — | — | 8.125† | — | — | — | — |
| 17 | 24 | 1.412 | — | — | .854† | 1.025† | 1.281† | 1.708† | 2.050† | 2.563† | — | — | — | — |
| 34 | 48 | 1.412 | — | — | — | — | 2.563† | 3.417† | — | — | — | — | — | — |
| 12 | 17 | 1.417 | — | — | .604† | .725† | .906† | 1.208† | 1.450† | 1.813† | — | — | — | — |
| 24 | 34 | 1.417 | — | — | — | — | 1.813† | 2.417† | — | — | — | — | — | — |
| 48 | 68 | 1.417 | — | — | — | — | 3.625† | — | — | 7.250† | — | — | — | — |
| 19 | 27 | 1.421 | — | — | .958† | — | — | — | — | — | — | — | — | — |
| 38 | 54 | 1.421 | — | — | — | — | 2.875† | 3.833† | 4.600† | — | — | — | — | — |
| 45 | 64 | 1.422 | — | — | 2.271† | 2.725† | — | — | 5.450† | — | — | — | — | — |
| 14 | 20 | 1.429 | .354† | .531† | .708† | .850 | 1.063 | 1.417 | 1.700 | 2.125 | 2.833† | 3.400 | 4.250 | 5.667† |
| 21 | 30 | 1.429 | — | — | 1.063† | 1.275† | 1.594† | 2.125 | 2.550† | 3.188† | 4.250 | — | — | 8.500† |
| 28 | 40 | 1.429 | .708† | 1.063† | 1.417† | 1.700† | 2.125 | 2.833† | 3.400 | 4.250 | — | 6.800* | 8.500 | — |
| 35 | 50 | 1.429 | — | — | — | 2.125 | — | — | 4.250 | — | — | 8.500 | — | — |
| 42 | 60 | 1.429 | — | — | 2.125† | — | — | 4.250 | 5.100† | 6.375† | 8.500 | — | 12.750† | 17.000† |
| 56 | 80 | 1.429 | 1.417† | 2.125† | — | — | 4.250 | — | — | 8.500 | — | — | 17.000 | — |
| 23 | 33 | 1.435 | — | — | 1.167† | — | — | — | — | — | — | — | — | — |
| 39 | 56 | 1.436 | — | — | 1.979† | — | — | — | — | — | — | — | — | — |
| 16 | 23 | 1.438 | — | — | .813† | .975† | 1.219† | 1.625† | — | — | — | — | — | — |
| 25 | 36 | 1.440 | — | .953† | 1.271† | 1.525† | — | 2.542† | 3.050† | — | — | — | — | — |
| 50 | 72 | 1.440 | — | 1.906† | — | 3.050† | — | — | 6.100† | — | — | — | — | — |
| 52 | 75 | 1.442 | — | 1.984† | — | — | — | — | — | — | — | — | — | — |
| 18 | 26 | 1.444 | .458† | .688† | .917† | — | 1.375† | 1.833† | 2.200† | 2.750† | — | — | — | — |
| 27 | 39 | 1.444 | — | — | 1.375† | — | — | — | — | — | — | — | — | — |
| 36 | 52 | 1.444 | .917† | 1.375† | — | — | 2.750† | — | — | 5.500† | — | — | — | — |
| 45 | 65 | 1.444 | — | — | — | — | — | — | 5.500† | — | — | — | — | — |
| 54 | 78 | 1.444 | — | — | — | — | — | 5.500† | — | — | — | — | — | — |
| 38 | 55 | 1.447 | — | — | — | — | — | — | 4.650† | — | — | — | — | — |
| 11 | 16 | 1.455 | .281† | .422† | .563† | .700† | .875† | 1.167† | 1.400† | 1.750† | 2.333† | 2.800† | 3.500† | 4.667† |
| 22 | 32 | 1.455 | .563† | .844† | 1.125† | 1.350† | 1.688† | 2.250† | 2.700† | 3.375 | — | — | 6.750† | — |
| 33 | 48 | 1.455 | — | — | 1.688† | — | — | — | — | — | 6.750 | — | — | — |
| 44 | 64 | 1.455 | — | 1.688† | 2.250† | — | 3.375† | 4.500† | — | 6.750 | — | — | 13.500 | — |
| 55 | 80 | 1.455 | — | — | — | 3.375† | — | — | 6.750 | — | — | 13.500† | — | — |
| 24 | 35 | 1.458 | — | — | — | 1.475 | — | — | 2.950 | — | — | 5.900 | — | — |
| 48 | 70 | 1.458 | — | 1.844† | 2.458† | 2.950† | — | — | 5.900 | — | — | — | — | — |
| 13 | 19 | 1.462 | — | — | .667† | .800† | 1.000† | 1.333† | 1.600† | 2.000† | — | — | — | — |
| 26 | 38 | 1.462 | — | — | — | — | 2.000† | 2.667† | 3.200† | — | — | — | — | — |
| 52 | 76 | 1.462 | — | — | — | — | — | — | — | 8.000† | — | — | — | — |
| 15 | 22 | 1.467 | .385† | .578† | .771† | .925† | 1.156† | 1.542† | 1.850† | 2.313 | — | — | 4.625† | — |
| 30 | 44 | 1.467 | — | 1.156† | 1.542† | — | 2.313† | 3.083† | — | 4.625† | — | — | 9.250† | — |
| 45 | 66 | 1.467 | — | — | 2.313† | — | — | — | — | — | — | — | — | — |
| 17 | 25 | 1.471 | — | — | .875† | 1.050† | — | 1.750† | 2.100† | — | — | — | — | — |
| 19 | 28 | 1.474 | — | — | .979† | 1.175† | 1.469† | 1.958† | 2.350† | 2.938† | — | — | — | — |
| 38 | 56 | 1.474 | — | — | — | — | 2.938† | 3.917† | — | — | — | — | — | — |
| 23 | 34 | 1.478 | — | — | — | — | 1.781† | 2.375† | — | — | — | — | — | — |
| 27 | 40 | 1.481 | — | — | 1.396† | — | — | — | — | — | 5.583† | — | — | — |
| 54 | 80 | 1.481 | 1.396† | — | — | — | 4.188† | — | 6.700† | 8.375† | — | — | 16.750† | — |
| 12 | 18 | 1.500 | .313† | .469† | .625† | .750 | .938 | 1.250 | 1.500 | 1.875 | 2.500 | 3.000 | 3.750 | 5.000† |
| 14 | 21 | 1.500 | — | — | .729† | .875† | 1.094† | 1.458 | 1.750† | 2.188† | 2.917 | — | — | 5.833† |
| 16 | 24 | 1.500 | .417† | .625† | .833† | 1.000 | 1.250 | 1.667 | 2.000 | 2.500 | 3.333 | 4.000 | 5.000 | 6.667† |
| 18 | 27 | 1.500 | — | — | .938† | — | — | — | — | — | 3.750 | — | — | — |
| 20 | 30 | 1.500 | — | .781† | 1.042† | 1.250 | 1.563 | 2.083 | 2.500 | 3.125† | 4.167† | 5.000 | 6.250† | 8.333† |
| 22 | 33 | 1.500 | — | — | 1.146† | — | — | — | — | — | — | — | — | — |
| 24 | 36 | 1.500 | .625† | .938† | 1.250† | 1.500† | 1.875 | 2.500 | 3.000† | 3.750 | 5.000 | — | 7.500 | 10.000† |
| 26 | 39 | 1.500 | — | — | 1.354† | — | — | — | — | — | — | — | — | — |
| 28 | 42 | 1.500 | — | — | 1.458† | — | — | 2.917 | 3.500† | 4.375† | — | — | 8.750† | — |
| 30 | 45 | 1.500 | — | — | 1.563† | 1.875 | — | — | 3.750 | — | — | 7.500 | — | — |
| 32 | 48 | 1.500 | .833† | 1.250† | 1.667† | 2.000† | 2.500 | 3.333† | 4.000† | 5.000 | 6.667† | — | 10.000 | — |
| 36 | 54 | 1.500 | .938† | — | 1.875† | — | 2.813† | 3.750 | 4.500† | 5.625† | 7.500 | — | 11.250† | 15.000† |
| 40 | 60 | 1.500 | 1.042† | 1.563† | 2.083† | 2.500 | 3.125 | 4.167† | 5.000 | 6.250 | 8.333† | 10.000 | 12.500 | — |
| 44 | 66 | 1.500 | 1.146† | — | 2.292† | — | — | 4.583† | — | — | — | — | — | — |
| 48 | 72 | 1.500 | 1.250† | 1.875† | 2.500† | 3.000† | 3.750 | 5.000 | 6.000† | 7.500 | 10.000 | — | 15.000 | 20.000† |
| 50 | 75 | 1.500 | — | 1.953† | — | 3.125† | — | — | 6.250† | — | — | — | — | — |
| 56 | 84 | 1.500 | 1.458† | — | 2.917† | — | 4.375† | 5.833† | — | 8.750† | — | — | 17.500† | — |
| 25 | 38 | 1.520 | — | — | — | — | — | 2.625† | 3.150† | — | — | — | — | — |
| 23 | 35 | 1.522 | — | — | — | 1.450† | — | — | — | — | — | — | — | — |
| 21 | 32 | 1.524 | — | — | 1.104† | 1.325† | 1.656† | 2.208† | 2.650† | 3.313† | 4.417† | — | — | — |
| 42 | 64 | 1.524 | — | — | 2.208† | — | — | 4.417† | 5.300† | 6.625† | 8.833† | — | 13.250† | — |
| 55 | 84 | 1.527 | — | — | — | 3.475† | — | — | 6.950† | — | — | — | — | — |
| 36 | 55 | 1.528 | — | — | — | 2.275† | — | — | 4.550† | — | — | — | — | — |
| 17 | 26 | 1.529 | — | — | .896† | — | 1.344† | 1.792† | 2.150† | 2.688† | — | — | — | — |
| 34 | 52 | 1.529 | — | — | — | — | 2.688† | — | — | — | — | — | — | — |
| 15 | 23 | 1.533 | — | — | .792† | .950† | 1.188† | 1.583† | — | — | — | — | — | — |
| 13 | 20 | 1.538 | — | .516† | .688† | .825† | 1.031† | 1.375 | 1.650† | 2.063† | — | — | — | — |
| 26 | 40 | 1.538 | .688† | 1.031† | 1.375† | — | 2.063† | 2.750† | 3.300† | 4.125† | — | — | — | — |
| 39 | 60 | 1.538 | — | — | 2.063† | — | — | — | — | — | — | — | — | — |

† = 14 1/2º only * = 20º only.

**⚠WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

1.538-1.704 RATIO

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 52 | 80 | 1.538 | 1.375† | 2.063† | — | — | 4.125† | — | — | 8.250† | — | — | — | — |
| 35 | 54 | 1.543 | — | — | — | — | — | — | 4.450† | — | — | — | — | — |
| 11 | 17 | 1.545 | — | — | .583† | .725† | .906† | 1.208† | 1.450† | 1.813† | — | — | — | — |
| 22 | 34 | 1.545 | — | — | — | — | 1.750† | 2.333† | — | — | — | — | — | — |
| 44 | 68 | 1.545 | — | — | — | — | 3.500† | — | — | 7.000† | — | — | — | — |
| 42 | 65 | 1.548 | — | — | — | — | — | — | 5.350† | — | — | — | — | — |
| 18 | 28 | 1.556 | .479† | .719† | .958† | 1.150† | 1.438 | 1.917 | 2.300 | 2.875 | — | 4.600* | 5.750 | — |
| 27 | 42 | 1.556 | — | — | 1.438† | — | — | — | — | — | 5.750 | — | — | — |
| 36 | 56 | 1.556 | .958† | 1.438† | 1.917† | — | 2.875 | 3.833† | — | 5.750 | — | — | 11.500 | — |
| 45 | 70 | 1.556 | — | — | 2.396† | 2.875 | — | — | 5.750 | — | — | 11.500 | — | — |
| 54 | 84 | 1.556 | 1.438† | — | 2.875† | — | 4.313† | 5.750 | 6.900† | 8.625† | 11.500 | — | 17.250† | 23.000† |
| 25 | 39 | 1.560 | — | — | 1.333† | — | — | — | — | — | — | — | — | — |
| 16 | 25 | 1.563 | — | .641† | .854† | 1.025 | — | 1.708† | 2.050 | — | — | 4.100 | — | — |
| 32 | 50 | 1.563 | — | 1.281† | — | 2.050† | — | — | 4.100† | — | — | — | — | — |
| 48 | 75 | 1.563 | — | 1.922† | — | 3.075† | — | — | 6.150† | — | — | — | — | — |
| 23 | 36 | 1.565 | — | — | 1.229† | 1.475† | 1.844† | 2.458† | — | — | — | — | — | — |
| 14 | 22 | 1.571 | .375† | .563† | .750† | .900† | 1.125† | 1.500† | 1.800† | 2.250 | — | — | 4.500† | — |
| 21 | 33 | 1.571 | — | — | 1.125† | — | — | — | — | — | 4.500 | — | — | — |
| 28 | 44 | 1.571 | .750† | 1.125† | 1.500† | — | 2.250† | 3.000† | — | 4.500 | — | — | 9.000 | — |
| 35 | 55 | 1.571 | — | — | — | 2.250† | — | — | 4.500 | — | — | 9.000† | — | — |
| 42 | 66 | 1.571 | — | — | 2.250† | — | — | 4.500 | — | — | 9.000 | — | — | — |
| 19 | 30 | 1.579 | — | — | 1.021† | 1.225† | 1.531† | 2.042† | 2.450† | 3.063† | — | — | — | — |
| 38 | 60 | 1.579 | — | — | — | — | 3.063† | 4.083† | 4.900† | — | — | — | — | — |
| 12 | 19 | 1.583 | — | — | .646† | .775† | .969† | 1.292† | 1.550† | 1.938† | — | — | — | — |
| 24 | 38 | 1.583 | — | — | — | — | 1.938† | 2.583† | 3.100† | — | — | — | — | — |
| 48 | 76 | 1.583 | — | — | — | — | — | — | — | 7.750† | — | — | — | — |
| 17 | 27 | 1.588 | — | — | .917† | — | — | — | — | — | — | — | — | — |
| 34 | 54 | 1.588 | — | — | — | — | 2.750† | 3.667† | — | — | — | — | — | — |
| 22 | 35 | 1.591 | — | — | — | 1.425† | — | — | 2.850† | — | — | — | — | — |
| 44 | 70 | 1.591 | — | 1.781† | 2.375† | — | — | — | — | — | — | — | — | — |
| 15 | 24 | 1.600 | .406† | .609† | .813† | .975 | 1.219 | 1.625 | 1.950 | 2.438 | 3.250 | 3.900 | 4.875 | 6.500† |
| 20 | 32 | 1.600 | .542† | .813† | 1.083† | 1.300† | 1.625 | 2.167† | 2.600† | 3.250 | 4.333† | — | 6.500 | — |
| 25 | 40 | 1.600 | — | 1.016† | 1.354† | 1.625 | — | 2.708† | 3.250 | — | — | 6.500 | — | — |
| 30 | 48 | 1.600 | — | 1.219† | 1.625† | 1.950† | 2.438 | 3.250 | 3.900 | 4.875† | 6.500 | — | 9.750† | 13.000† |
| 40 | 64 | 1.600 | — | 1.625† | 2.167† | 2.600† | 3.250 | 4.333† | 5.200† | 6.500 | 8.667† | — | 13.000 | — |
| 45 | 72 | 1.600 | — | — | 2.438† | 2.925† | — | — | 5.850† | — | — | — | — | — |
| 50 | 80 | 1.600 | — | 2.031† | — | 3.250 | — | — | 6.500 | — | — | 13.000 | — | — |
| 28 | 45 | 1.607 | — | — | 1.521† | 1.825† | — | — | 3.650 | — | — | 7.300* | — | — |
| 13 | 21 | 1.615 | — | — | .708† | .850† | 1.063† | 1.417 | 1.700† | 2.125† | — | — | — | — |
| 26 | 42 | 1.615 | — | — | 1.417† | — | — | 2.833† | 3.400† | 4.250† | — | — | — | — |
| 52 | 84 | 1.615 | 1.417† | — | — | — | 4.250† | — | — | 8.500† | — | — | — | — |
| 21 | 34 | 1.619 | — | — | — | — | 1.719† | 2.292† | — | — | — | — | — | — |
| 42 | 68 | 1.619 | — | — | — | — | — | — | — | 6.875† | — | — | — | — |
| 16 | 26 | 1.625 | .438† | .656† | .875† | — | 1.313† | 1.750† | 2.100† | 2.625† | — | — | — | — |
| 24 | 39 | 1.625 | — | — | 1.313† | — | — | — | — | — | — | — | — | — |
| 32 | 52 | 1.625 | .875† | 1.313† | — | — | 2.625† | — | — | 5.250† | — | — | — | — |
| 40 | 65 | 1.625 | — | — | — | — | — | — | 5.250† | — | — | — | — | — |
| 48 | 78 | 1.625 | — | — | — | — | — | 5.250† | — | — | — | — | — | — |
| 27 | 44 | 1.630 | — | — | 1.479† | — | — | — | — | — | — | — | — | — |
| 11 | 18 | 1.636 | .302† | .453† | .604† | .750† | .938† | 1.250† | 1.500† | 1.875† | 2.500† | 3.000† | 3.750† | 5.000† |
| 22 | 36 | 1.636 | .604† | .906† | 1.208† | 1.450† | 1.813† | 2.417† | 2.900† | 3.625 | — | — | 7.250† | — |
| 33 | 54 | 1.636 | — | — | 1.813† | — | — | — | — | — | 7.250 | — | — | — |
| 44 | 72 | 1.636 | 1.208† | 1.813† | 2.417† | — | 3.625† | 4.833† | — | 7.250 | — | — | 14.500 | — |
| 39 | 64 | 1.641 | — | — | 2.146† | — | — | — | — | — | — | — | — | — |
| 14 | 23 | 1.643 | — | — | .771† | .925† | 1.156† | 1.542† | — | — | — | — | — | — |
| 17 | 28 | 1.647 | — | — | .938† | 1.125† | 1.406† | 1.875† | 2.250† | 2.813† | — | — | — | — |
| 34 | 56 | 1.647 | — | — | — | — | 2.813† | 3.750† | — | — | — | — | — | — |
| 20 | 33 | 1.650 | — | — | 1.104† | — | — | — | — | — | 4.417† | — | — | — |
| 40 | 66 | 1.650 | 1.104† | — | 2.208† | — | — | 4.417† | — | — | 8.833† | — | — | — |
| 23 | 38 | 1.652 | — | — | — | — | 1.906† | 2.542† | — | — | — | — | — | — |
| 12 | 20 | 1.667 | .333† | .500† | .667† | .800 | 1.000 | 1.333 | 1.600 | 2.000 | 2.667† | 3.200 | 4.000 | 5.333† |
| 15 | 25 | 1.667 | — | .625† | .833† | 1.000 | — | 1.667† | 2.000 | — | — | 4.000 | — | — |
| 18 | 30 | 1.667 | — | .750† | 1.000† | 1.200 | 1.500 | 2.000 | 2.400 | 3.000† | 4.000 | 4.800 | 6.000† | 8.000† |
| 21 | 35 | 1.667 | — | — | — | 1.400† | — | — | 2.800† | — | — | — | — | — |
| 24 | 40 | 1.667 | .667† | 1.000† | 1.333† | 1.600 | 2.000 | 2.667† | 3.200 | 4.000 | 5.333† | 6.400 | 8.000 | — |
| 27 | 45 | 1.667 | — | — | 1.500† | — | — | — | — | — | — | — | — | — |
| 30 | 50 | 1.667 | — | 1.250† | — | 2.000 | — | — | 4.000 | — | — | 8.000 | — | — |
| 36 | 60 | 1.667 | 1.000† | 1.500† | 2.000† | 2.400† | 3.000 | 4.000 | 4.800† | 6.000 | 8.000 | — | 12.000 | 16.000† |
| 42 | 70 | 1.667 | — | — | 2.333† | — | — | — | 5.600† | — | — | — | — | — |
| 45 | 75 | 1.667 | — | — | — | 3.000† | — | — | 6.000† | — | — | — | — | — |
| 48 | 80 | 1.667 | 1.333† | 2.000† | — | 3.200† | 4.000 | — | 6.400 | 8.000 | — | — | 16.000 | — |
| 25 | 42 | 1.680 | — | — | 1.396† | — | — | 2.792† | 3.350† | — | — | — | — | — |
| 50 | 84 | 1.680 | — | — | — | 3.350 | — | — | 6.700† | — | — | — | — | — |
| 19 | 32 | 1.684 | — | — | 1.063† | 1.275† | 1.594† | 2.125† | 2.550† | 3.188† | — | — | — | — |
| 38 | 64 | 1.684 | — | — | — | — | 3.188† | 4.250† | 5.100† | — | — | — | — | — |
| 16 | 27 | 1.688 | — | — | .896† | — | — | — | — | — | 3.583 | — | — | — |
| 32 | 54 | 1.688 | .896† | — | 1.792† | — | 2.688† | 3.583† | 4.300† | 5.375† | 7.167† | — | 10.750† | — |
| 13 | 22 | 1.692 | — | .547† | .729† | .875† | 1.094† | 1.458† | 1.750† | 2.188† | — | — | — | — |
| 26 | 44 | 1.692 | .729† | 1.094† | 1.458† | — | 2.188† | 2.917† | — | 4.375† | — | — | — | — |
| 39 | 66 | 1.692 | — | — | 2.188† | — | — | — | — | — | — | — | — | — |
| 23 | 39 | 1.696 | — | — | 1.292† | — | — | — | — | — | — | — | — | — |
| 33 | 56 | 1.697 | — | — | 1.854† | — | — | — | — | — | — | — | — | — |
| 20 | 34 | 1.700 | — | — | — | — | 1.688† | 2.250† | — | — | — | — | — | — |
| 40 | 68 | 1.700 | — | — | — | — | 3.375† | — | — | 6.750† | — | — | — | — |
| 44 | 75 | 1.704 | — | 1.859† | — | — | — | — | — | — | — | — | — | — |

†= 14 1/2° only * = 20° only.

**⚠WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

**1.711-1.905 RATIO**

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 38 | 65 | 1.711 | — | — | — | — | — | — | 5.150† | — | — | — | — | — |
| 14 | 24 | 1.714 | .396† | .594† | .792† | .950 | 1.188 | 1.583 | 1.900 | 2.375 | 3.167 | 3.800 | 4.750† | 6.333† |
| 21 | 36 | 1.714 | — | — | 1.188† | 1.425† | 1.781† | 2.375 | 2.850† | 3.563† | 4.750 | — | — | 9.500† |
| 28 | 48 | 1.714 | .792† | 1.188† | 1.583† | 1.900† | 2.375 | 3.167 | 3.800 | 4.750 | — | — | 9.500 | — |
| 35 | 60 | 1.714 | — | — | — | 2.375 | — | — | 4.750 | — | — | 9.500 | — | — |
| 42 | 72 | 1.714 | — | — | 2.375† | — | — | 4.750 | 5.700† | 7.125† | 9.500 | — | 14.250† | 19.000† |
| 32 | 55 | 1.719 | — | — | — | 2.175† | — | — | 4.350† | — | — | — | — | — |
| 11 | 19 | 1.727 | — | — | .625† | .775† | .969† | 1.292† | 1.550† | 1.938† | — | — | — | — |
| 22 | 38 | 1.727 | — | — | — | — | 1.875† | 2.500† | 3.000† | — | — | — | — | — |
| 44 | 76 | 1.727 | — | — | — | — | — | — | — | 7.500† | — | — | — | — |
| 26 | 45 | 1.731 | — | — | 1.479† | — | — | — | 3.550† | — | — | — | — | — |
| 15 | 26 | 1.733 | .427† | .641† | .854† | — | 1.281† | 1.708† | 2.050† | 2.563† | — | — | — | — |
| 30 | 52 | 1.733 | — | 1.281† | — | — | 2.563† | — | — | 5.125† | — | — | — | — |
| 19 | 33 | 1.737 | — | — | 1.0833† | — | — | — | — | — | — | — | — | — |
| 38 | 66 | 1.737 | — | — | — | — | — | 4.333† | — | — | — | — | — | — |
| 23 | 40 | 1.739 | — | — | 1.313† | 1.575† | 1.969† | 2.625† | — | — | — | — | — | — |
| 12 | 21 | 1.750 | — | — | .688† | .825† | 1.031† | 1.375 | 1.650† | 2.063† | 2.750 | — | — | 5.500† |
| 16 | 28 | 1.750 | .458† | .688† | .917† | 1.100† | 1.375 | 1.833 | 2.200 | 2.750 | — | 4.400* | 5.500 | — |
| 20 | 35 | 1.750 | — | — | — | 1.375 | — | — | 2.750 | — | — | 5.500 | — | — |
| 24 | 42 | 1.750 | — | — | 1.375† | — | — | 2.750 | 3.300† | 4.125† | 5.500 | — | 8.250† | 11.000† |
| 32 | 56 | 1.750 | .917† | 1.375† | 1.833† | — | 2.750 | 3.667† | — | 5.500 | — | — | 11.000 | — |
| 40 | 70 | 1.750 | — | 1.719† | 2.292† | 2.750 | — | — | 5.500 | — | — | 11.000 | — | — |
| 48 | 84 | 1.750 | 1.375† | — | 2.750† | 3.300† | 4.125† | 5.500 | 6.600† | 8.250† | 11.000 | — | 16.500† | 22.000† |
| 25 | 44 | 1.760 | — | 1.078† | 1.438† | — | — | 2.875† | — | — | — | — | — | — |
| 17 | 30 | 1.765 | — | — | .979† | 1.175† | 1.469† | 1.958† | 2.350† | 2.938† | — | — | — | — |
| 34 | 60 | 1.765 | — | — | — | — | 2.938† | 3.917† | — | — | — | — | — | — |
| 13 | 23 | 1.769 | — | — | .750† | .900† | 1.125† | 1.500† | — | — | — | — | — | — |
| 22 | 39 | 1.773 | — | — | 1.271† | — | — | — | — | — | — | — | — | — |
| 44 | 78 | 1.773 | — | — | — | — | — | 5.083† | — | — | — | — | — | — |
| 18 | 32 | 1.778 | .521† | .781† | 1.042† | 1.250† | 1.563 | 2.083† | 2.500† | 3.125 | 4.167† | — | 6.250 | — |
| 27 | 48 | 1.778 | — | — | 1.563† | — | — | — | — | — | 6.250 | — | — | — |
| 36 | 64 | 1.778 | — | 1.563† | 2.083† | 2.500† | 3.125 | 4.167† | 5.000† | 6.250 | 8.333† | — | 12.500 | — |
| 45 | 80 | 1.778 | — | — | — | 3.125 | — | — | 6.250 | — | — | 12.500 | — | — |
| 14 | 25 | 1.786 | — | .609† | .813† | .975 | — | 1.625† | 1.950 | — | — | 3.900 | — | — |
| 28 | 50 | 1.786 | — | 1.219† | — | 1.950† | — | — | 3.900 | — | — | 7.800† | — | — |
| 42 | 75 | 1.786 | — | — | — | — | — | — | 5.850† | — | — | — | — | — |
| 19 | 34 | 1.789 | — | — | — | — | 1.656† | 2.208† | — | — | — | — | — | — |
| 38 | 68 | 1.789 | — | — | — | — | 3.313† | — | — | — | — | — | — | — |
| 39 | 70 | 1.795 | — | — | 2.271† | — | — | — | — | — | — | — | — | — |
| 15 | 27 | 1.800 | — | — | .875† | — | — | — | — | — | 3.500 | — | — | — |
| 20 | 36 | 1.800 | .583† | .875† | 1.167† | 1.400† | 1.750 | 2.333 | 2.800† | 3.500 | 4.667† | — | 7.000 | 9.333† |
| 25 | 45 | 1.800 | — | — | 1.458† | 1.750 | — | — | 3.500 | — | — | 7.000 | — | — |
| 30 | 54 | 1.800 | — | — | 1.750† | — | 2.625† | 3.500 | 4.200† | 5.250† | 7.000 | — | 10.500† | 14.000† |
| 40 | 72 | 1.800 | 1.167† | 1.750† | 2.333† | 2.800† | 3.500 | 4.667† | 5.600† | 7.000 | 9.333† | — | 14.000 | — |
| 36 | 65 | 1.806 | — | — | — | — | — | — | 5.050† | — | — | — | — | — |
| 21 | 38 | 1.810 | — | — | — | — | 1.844† | 2.458† | 2.950† | — | — | — | — | — |
| 42 | 76 | 1.810 | — | — | — | — | — | — | — | 7.375† | — | — | — | — |
| 11 | 20 | 1.818 | .323† | .484† | .646† | .800† | 1.000† | 1.333† | 1.600† | 2.000† | 2.667† | 3.200† | 4.000† | 5.333† |
| 22 | 40 | 1.818 | .646† | .969† | 1.292† | 1.550† | 1.938† | 2.583† | 3.100† | 3.875 | — | — | 7.750† | — |
| 33 | 60 | 1.818 | — | — | 1.938† | — | — | — | — | — | 7.750 | — | — | — |
| 44 | 80 | 1.818 | 1.292† | 1.938† | — | — | 3.875† | — | — | 7.750 | — | — | 15.500 | — |
| 23 | 42 | 1.826 | — | — | 1.354† | — | — | 2.708† | — | — | — | — | — | — |
| 35 | 64 | 1.829 | — | — | — | 2.475† | — | — | 4.950† | — | — | — | — | — |
| 12 | 22 | 1.833 | .354† | .531† | .708† | .850† | 1.063† | 1.417† | 1.700† | 2.125 | — | — | 4.250† | — |
| 18 | 33 | 1.833 | — | — | 1.063† | — | — | — | — | — | 4.250 | — | — | — |
| 24 | 44 | 1.833 | .708† | 1.063† | 1.417† | — | 2.125† | 2.833† | — | 4.250 | — | — | 8.500 | — |
| 30 | 55 | 1.833 | — | — | — | 2.125† | — | — | 4.2500 | — | — | 8.500† | — | — |
| 36 | 66 | 1.833 | 1.063† | — | 2.125† | — | — | 4.250 | — | — | 8.500 | — | — | — |
| 19 | 35 | 1.842 | — | — | — | 1.350† | — | — | 2.700† | — | — | — | — | — |
| 38 | 70 | 1.842 | — | — | — | — | — | — | 5.400† | — | — | — | — | — |
| 13 | 24 | 1.846 | — | .578† | .771† | .925† | 1.156† | 1.542 | 1.850† | 2.313† | — | — | — | — |
| 26 | 48 | 1.846 | .771† | 1.156† | 1.542† | — | 2.313† | 3.083† | 3.700† | 4.625† | — | — | — | — |
| 39 | 72 | 1.846 | — | — | 2.313† | — | — | — | — | — | — | — | — | — |
| 14 | 26 | 1.857 | .417† | .625† | .833† | — | 1.250† | 1.667† | 2.000† | 2.500† | — | — | — | — |
| 21 | 39 | 1.857 | — | — | 1.250† | — | — | — | — | — | — | — | — | — |
| 28 | 52 | 1.857 | .833† | 1.250† | — | — | 2.500† | — | — | 5.000† | — | — | — | — |
| 35 | 65 | 1.857 | — | — | — | — | — | — | 5.000† | — | — | — | — | — |
| 42 | 78 | 1.857 | — | — | — | — | — | 5.000† | — | — | — | — | — | — |
| 15 | 28 | 1.867 | .448† | .672† | .896† | 1.075† | 1.344 | 1.792 | 2.150 | 2.688 | — | 4.300* | 5.375 | — |
| 30 | 56 | 1.867 | — | 1.344† | 1.792† | — | 2.688 | 3.583† | — | 5.375† | — | — | 10.750† | — |
| 45 | 84 | 1.867 | — | — | 2.688† | 3.225 | — | — | 6.450† | — | — | — | — | — |
| 16 | 30 | 1.875 | — | .719† | .958† | 1.150 | 1.438 | 1.917 | 2.300 | 2.875† | 3.833† | 4.600 | 5.750† | 7.667† |
| 24 | 45 | 1.875 | — | — | 1.438† | 1.725 | — | — | 3.450 | — | — | 6.900 | — | — |
| 32 | 60 | 1.875 | .958† | 1.438† | 1.917† | 2.300† | 2.875 | 3.833† | 4.600† | 5.750 | 7.667† | — | 11.500 | — |
| 40 | 75 | 1.875 | — | 1.797† | — | 2.875† | — | — | 5.750† | — | — | — | — | — |
| 17 | 32 | 1.882 | — | — | 1.021† | 1.225† | 1.531† | 2.042† | 2.450† | 3.063† | — | — | — | — |
| 34 | 64 | 1.882 | — | — | — | — | 3.063† | 4.083† | — | — | — | — | — | — |
| 18 | 34 | 1.889 | — | — | — | — | 1.625† | 2.167† | — | — | — | — | — | — |
| 36 | 68 | 1.889 | — | — | — | — | 3.250† | — | — | 6.500† | — | — | — | — |
| 19 | 36 | 1.895 | — | — | 1.146† | 1.375† | 1.719† | 2.292† | 2.750† | 3.438† | — | — | — | — |
| 38 | 72 | 1.895 | — | — | — | — | 3.438† | 4.583† | 5.500† | — | — | — | — | — |
| 20 | 38 | 1.900 | — | — | — | — | 1.813† | 2.417† | 2.900† | — | — | — | — | — |
| 40 | 76 | 1.900 | — | — | — | — | — | — | — | 7.250† | — | — | — | — |
| 21 | 40 | 1.905 | — | — | 1.271† | 1.525† | 1.906† | 2.542† | 3.050† | 3.813† | 5.083† | — | — | — |
| 42 | 80 | 1.905 | — | — | — | — | — | — | 6.100† | 7.625† | — | — | 15.250† | — |

† = 14 1/2° only  * = 20° only.

**⚠WARNING** **See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.**

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

1.909-2.160 RATIO

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 11 | 21 | 1.909 | — | — | .667† | .825† | 1.031† | 1.375† | 1.650† | 2.063† | 2.750† | — | — | 5.500† |
| 22 | 42 | 1.909 | — | — | 1.333† | — | — | 2.667† | 3.200† | 4.000† | — | — | 8.000† | — |
| 44 | 84 | 1.909 | 1.333† | — | 2.667† | — | 4.000† | 5.333† | — | 8.000† | — | — | 16.000† | — |
| 23 | 44 | 1.913 | — | — | 1.396† | — | 2.094† | 2.792† | — | — | — | — | — | — |
| 12 | 23 | 1.917 | — | — | .729† | .875† | 1.094† | 1.458† | — | — | — | — | — | — |
| 25 | 48 | 1.920 | — | 1.141† | 1.521† | 1.825† | — | 3.042† | 3.650 | — | — | — | — | — |
| 13 | 25 | 1.923 | — | .594† | .792† | .950† | — | 1.583† | 1.900† | — | — | — | — | — |
| 26 | 50 | 1.923 | — | 1.188† | — | — | — | — | 3.800† | — | — | — | — | — |
| 14 | 27 | 1.929 | — | — | .854† | — | — | — | — | — | 3.417 | — | — | — |
| 28 | 54 | 1.929 | .854† | — | 1.708† | — | 2.563† | 3.417 | 4.100† | 5.125† | — | — | 10.250† | — |
| 33 | 64 | 1.939 | — | — | 2.021† | — | — | — | — | — | 8.083† | — | — | — |
| 17 | 33 | 1.941 | — | — | 1.042† | — | — | — | — | — | — | — | — | — |
| 34 | 66 | 1.941 | — | — | — | — | — | 4.167† | — | — | — | — | — | — |
| 18 | 35 | 1.944 | — | — | — | 1.325 | — | — | 2.650 | — | — | 5.300 | — | — |
| 36 | 70 | 1.944 | — | 1.656† | 2.208† | 2.650† | — | — | 5.300† | — | — | — | — | — |
| 20 | 39 | 1.950 | — | — | 1.229† | — | — | — | — | — | — | — | — | — |
| 40 | 78 | 1.950 | — | — | — | — | — | 4.917† | — | — | — | — | — | — |
| 23 | 45 | 1.957 | — | — | 1.417† | 1.700† | — | — | — | — | — | — | — | — |
| 28 | 55 | 1.964 | — | — | — | 2.075† | — | — | 4.150 | — | — | — | — | — |
| 38 | 75 | 1.974 | — | — | — | — | — | — | 5.650† | — | — | — | — | — |
| 11 | 22 | 2.000 | .344† | .516† | .688† | .850† | 1.063† | 1.417† | 1.700† | 2.125† | — | — | 4.250† | — |
| 12 | 24 | 2.000 | .375† | .563† | .750† | .900 | 1.125 | 1.500 | 1.800 | 2.250 | 3.000 | 3.600 | 4.500 | 6.000† |
| 13 | 26 | 2.000 | — | .609† | .813† | — | 1.219† | 1.625† | 1.950† | 2.438† | — | — | — | — |
| 14 | 28 | 2.000 | .438† | .656† | .875† | 1.050† | 1.313 | 1.750 | 2.100 | 2.625 | — | 4.200* | 5.250 | — |
| 15 | 30 | 2.000 | — | .703† | .938† | 1.125 | 1.406 | 1.875 | 2.250 | 2.813† | 3.750 | 4.500 | 5.625† | 7.500† |
| 16 | 32 | 2.000 | .500† | .750† | 1.000† | 1.200† | 1.500 | 2.000† | 2.400† | 3.000 | 4.000† | — | 6.000 | — |
| 17 | 34 | 2.000 | — | — | — | — | 1.594† | 2.125† | — | — | — | — | — | — |
| 18 | 36 | 2.000 | .563† | .844† | 1.125† | 1.350† | 1.688 | 2.250 | 2.700† | 3.375 | 4.500 | — | 6.750 | 9.000† |
| 19 | 38 | 2.000 | — | — | — | — | 1.781† | 2.375† | 2.850† | — | — | — | — | — |
| 20 | 40 | 2.000 | .625† | .938† | 1.250† | 1.500 | 1.875 | 2.500† | 3.000 | 3.750 | 5.000† | 6.000 | 7.500 | — |
| 21 | 42 | 2.000 | — | — | 1.313† | — | — | 2.625 | 3.150† | 3.938† | 5.250 | — | — | 10.500† |
| 22 | 44 | 2.000 | .688† | 1.031† | 1.375† | — | 2.063† | 2.750† | — | 4.125 | — | — | 8.250† | |
| 24 | 48 | 2.000 | .750† | 1.125† | 1.500† | 1.800† | 2.250 | 3.000 | 3.600 | 4.500 | 6.000 | — | 9.000 | 12.000† |
| 25 | 50 | 2.000 | — | 1.172† | — | 1.875 | — | — | 3.750 | — | — | 7.500 | — | — |
| 26 | 52 | 2.000 | .813† | 1.219† | — | — | 2.438† | — | — | 4.875† | — | — | — | — |
| 27 | 54 | 2.000 | — | — | 1.688† | — | — | — | — | — | 6.750 | — | — | — |
| 28 | 56 | 2.000 | .875† | 1.313† | 1.750† | — | 2.625 | 3.500† | — | 5.250 | — | — | 10.500 | — |
| 30 | 60 | 2.000 | — | 1.406† | 1.875† | 2.250 | 2.813 | 3.750 | 4.500 | 5.625† | 7.500 | 9.000 | 11.250† | 15.000† |
| 32 | 64 | 2.000 | — | 1.500† | 2.000† | 2.400† | 3.000 | 4.000† | 4.800† | 6.000 | 8.000† | — | 12.000 | — |
| 33 | 66 | 2.000 | — | — | 2.063† | — | — | — | — | — | 8.250 | — | — | — |
| 34 | 68 | 2.000 | — | — | — | — | 3.188† | — | — | — | — | — | — | — |
| 35 | 70 | 2.000 | — | — | — | 2.625 | — | — | 5.250 | — | — | 10.500 | — | — |
| 36 | 72 | 2.000 | 1.125† | 1.688† | 2.250† | 2.700† | 3.375 | 4.500 | 5.400† | 6.750 | 9.000 | — | 13.500 | 18.000† |
| 40 | 80 | 2.000 | 1.250† | 1.875† | — | 3.000 | 3.750 | — | 6.000 | 7.500 | — | 12.000 | 15.000 | — |
| 42 | 84 | 2.000 | — | — | 2.625† | — | — | 5.250 | 6.300† | 7.875† | 10.500 | — | 15.750† | 21.000 |
| 32 | 65 | 2.031 | — | — | — | — | — | — | 4.850† | — | — | — | — | — |
| 22 | 45 | 2.045 | — | — | 1.396† | 1.675† | — | — | 3.350† | — | — | — | — | — |
| 19 | 39 | 2.053 | — | — | 1.208† | — | — | — | — | — | — | — | — | — |
| 38 | 78 | 2.053 | — | — | — | — | — | 4.833† | — | — | — | — | — | — |
| 35 | 72 | 2.057 | — | — | — | 2.675† | — | — | 5.350† | — | — | — | — | — |
| 17 | 35 | 2.059 | — | — | — | 1.300† | — | — | 2.600† | — | — | — | — | — |
| 16 | 33 | 2.063 | — | — | 1.021† | — | — | — | — | — | 4.083 | — | — | — |
| 32 | 66 | 2.063 | 1.021† | — | 2.042† | — | — | 4.083† | — | — | 8.167† | — | — | — |
| 27 | 56 | 2.074 | — | — | 1.729† | — | — | — | — | — | — | — | — | — |
| 13 | 27 | 2.077 | — | — | .833† | — | — | — | — | — | — | — | — | — |
| 26 | 54 | 2.077 | .833† | — | 1.667† | — | 2.500† | 3.333† | 4.000† | 5.000† | — | — | — | — |
| 25 | 52 | 2.080 | — | 1.203† | — | — | — | — | — | — | — | — | — | — |
| 12 | 25 | 2.083 | — | .578† | .771† | .925 | — | 1.542† | 1.850 | — | — | 3.700 | — | — |
| 24 | 50 | 2.083 | — | 1.156† | — | 1.850 | — | — | 3.700 | — | — | 7.400 | — | — |
| 36 | 75 | 2.083 | — | 1.734† | — | 2.775† | — | — | 5.500† | — | — | — | — | — |
| 23 | 48 | 2.087 | — | — | 1.479† | 1.775† | 2.219† | 2.958† | — | — | — | — | — | — |
| 11 | 23 | 2.091 | — | — | .708† | .850† | 1.063† | 1.417† | — | — | — | — | — | — |
| 21 | 44 | 2.095 | — | — | 1.354† | — | 2.031† | 2.708† | — | 4.063† | — | — | — | — |
| 20 | 42 | 2.100 | — | — | 1.292† | — | — | 2.583 | 3.100† | 3.875† | 5.167† | — | 7.750† | 10.333† |
| 40 | 84 | 2.100 | 1.292† | — | 2.583† | 3.100 | 3.875† | 5.167† | 6.200† | 7.750† | 10.333† | — | 15.500† | — |
| 19 | 40 | 2.105 | — | — | 1.229† | 1.475† | 1.844† | 2.458† | 2.950† | 3.688† | — | — | — | — |
| 38 | 80 | 2.105 | — | — | — | — | 3.688† | — | 5.900† | — | — | — | — | — |
| 18 | 38 | 2.111 | — | — | — | — | 1.750† | 2.333† | 2.800† | | — | — | — | — |
| 36 | 76 | 2.111 | — | — | — | — | — | — | — | 7.000† | — | — | — | — |
| 26 | 55 | 2.115 | — | — | — | — | — | — | 4.050† | — | — | — | — | — |
| 17 | 36 | 2.118 | — | — | 1.104† | 1.325† | 1.656† | 2.208† | 2.650† | 3.313† | — | — | — | — |
| 34 | 72 | 2.118 | — | — | — | — | 3.313† | 4.417† | — | — | — | — | — | — |
| 33 | 70 | 2.121 | — | — | 2.146† | — | — | — | — | — | — | — | — | — |
| 16 | 34 | 2.125 | — | — | — | — | 1.563† | 2.083† | — | — | — | — | — | — |
| 32 | 68 | 2.125 | — | — | — | — | 3.125† | — | — | 6.250† | — | — | — | — |
| 15 | 32 | 2.133 | .490† | .734† | .979† | 1.175† | 1.469 | 1.958† | 2.350† | 2.938 | 3.917† | — | 5.875 | — |
| 30 | 64 | 2.133 | — | 1.469† | 1.958† | 2.350† | 2.938 | 3.917† | 4.700† | 5.875† | 7.833† | — | 11.750† | — |
| 14 | 30 | 2.143 | — | .688† | .917† | 1.100 | 1.375 | 1.833 | 2.200 | 2.750† | 3.667 | 4.400 | 5.500† | 7.333† |
| 21 | 45 | 2.143 | — | — | 1.375† | 1.650† | — | — | 3.300† | — | — | — | — | — |
| 28 | 60 | 2.143 | .917† | 1.375† | 1.833† | 2.200† | 2.750 | 3.667 | 4.400 | 5.500 | — | 8.800* | 11.000 | — |
| 35 | 75 | 2.143 | — | — | — | 2.750† | — | — | 5.500† | — | — | — | — | — |
| 13 | 28 | 2.154 | — | .641† | .854† | 1.025† | 1.281† | 1.708 | 2.050† | 2.563† | — | — | — | — |
| 26 | 56 | 2.154 | .854† | 1.281† | 1.708† | — | 2.563† | 3.417† | — | 5.125† | — | — | — | — |
| 39 | 84 | 2.154 | — | — | 2.563† | — | — | — | — | — | — | — | — | — |
| 25 | 54 | 2.160 | — | — | 1.646† | — | — | 3.292† | 3.950† | — | — | — | — | — |

† = 14 1/2° only  * = 20° only.

F

**2.167-2.500 RATIO**

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 12 | 26 | 2.167 | .396† | .594† | .792† | — | 1.188† | 1.583† | 1.900† | 2.375† | — | — | — | — |
| 18 | 39 | 2.167 | — | — | 1.188† | — | — | — | — | — | — | — | — | — |
| 24 | 52 | 2.167 | .792† | 1.188† | — | — | 2.375† | — | — | 4.750† | — | — | — | — |
| 30 | 65 | 2.167 | — | — | — | — | — | — | 4.750† | — | — | — | — | — |
| 36 | 78 | 2.167 | — | — | — | — | — | 4.750† | — | — | — | — | — | — |
| 23 | 50 | 2.174 | — | — | — | 1.825† | — | — | — | — | — | — | — | — |
| 11 | 24 | 2.182 | .365† | .547† | .729† | .900† | 1.125† | 1.500† | 1.800† | 2.250† | 3.000† | 3.600† | 4.500† | 6.000† |
| 22 | 48 | 2.182 | .729† | 1.094† | 1.458† | 1.750† | 2.188† | 2.917† | 3.500† | 4.375 | — | — | 8.750† | — |
| 33 | 72 | 2.182 | — | — | 2.188† | — | — | — | — | — | 8.750 | — | — | — |
| 16 | 35 | 2.188 | — | — | — | 1.275 | — | — | 2.550 | — | — | 5.100 | — | — |
| 32 | 70 | 2.188 | — | 1.594† | 2.125† | 2.550† | — | — | 5.100† | — | — | — | — | — |
| 15 | 33 | 2.200 | — | — | 1.000† | — | — | — | — | — | 4.000 | — | — | — |
| 20 | 44 | 2.200 | .667† | 1.000† | 1.333† | — | 2.000† | 2.667† | — | 4.000 | — | — | 8.000 | — |
| 25 | 55 | 2.200 | — | — | — | 2.000† | — | — | 4.000 | — | — | 8.000† | — | — |
| 30 | 66 | 2.200 | — | — | 2.000† | — | — | 4.000 | — | — | 8.000 | — | — | — |
| 19 | 42 | 2.211 | — | — | 1.271† | — | — | 2.542† | 3.050† | 3.813† | — | — | — | — |
| 38 | 84 | 2.211 | — | — | — | — | 3.813† | 5.083† | 6.100† | — | — | — | — | — |
| 18 | 40 | 2.222 | .604† | .906† | 1.208† | 1.450 | 1.813 | 2.417† | 2.900 | 3.625 | 4.833† | 5.800 | 7.250 | — |
| 27 | 60 | 2.222 | — | — | 1.813† | — | — | — | — | — | 7.250 | — | — | — |
| 36 | 80 | 2.222 | 1.208† | 1.813† | — | 2.900† | 3.625 | — | 5.800† | 7.250 | — | — | 14.500 | — |
| 17 | 38 | 2.235 | — | — | — | — | 1.719† | 2.292† | 2.750† | — | — | — | — | — |
| 25 | 56 | 2.240 | — | 1.266† | 1.688† | — | — | 3.375† | — | — | — | — | — | — |
| 12 | 27 | 2.250 | — | — | .813† | — | — | — | — | — | 3.250 | — | — | — |
| 16 | 36 | 2.250 | .542† | .813† | 1.083† | 1.300† | 1.625 | 2.167 | 2.600† | 3.250 | 4.333 | — | 6.500 | 8.667† |
| 20 | 45 | 2.250 | — | — | 1.354† | 1.625 | — | — | 3.250 | — | — | 6.500 | — | — |
| 24 | 54 | 2.250 | .813† | — | 1.625† | — | 2.438† | 3.250 | 3.900† | 4.875† | 6.500 | — | 9.750† | 13.000† |
| 32 | 72 | 2.250 | 1.083† | 1.625† | 2.167† | 2.600† | 3.250 | 4.333† | 5.200† | 6.500 | 8.667† | — | 13.000 | — |
| 23 | 52 | 2.261 | — | — | — | — | 2.344† | — | — | — | — | — | — | — |
| 15 | 34 | 2.267 | — | — | — | — | 1.531† | 2.042† | — | — | — | — | — | — |
| 30 | 68 | 2.267 | — | — | — | — | 3.063† | — | — | 6.125† | — | — | — | — |
| 11 | 25 | 2.273 | — | .563† | .750† | .925† | — | 1.542† | 1.850† | — | — | 3.700† | — | — |
| 22 | 50 | 2.273 | — | 1.125† | — | 1.800† | — | — | 3.600† | — | — | — | — | — |
| 14 | 32 | 2.286 | .479† | .719† | .958† | 1.150† | 1.438 | 1.917† | 2.300† | 2.875 | 3.833† | — | 5.750 | — |
| 21 | 48 | 2.286 | — | — | 1.438† | 1.725† | 2.156 | 2.875 | 3.450† | 4.313† | 5.750 | — | — | 11.500† |
| 28 | 64 | 2.286 | — | 1.438† | 1.917† | 2.300† | 2.875 | 3.833† | 4.600† | 5.750 | — | — | 11.500 | — |
| 35 | 80 | 2.286 | — | — | — | 2.875 | — | — | 5.750 | — | — | 11.500 | — | — |
| 24 | 55 | 2.292 | — | — | — | 1.975† | — | — | 3.950 | — | — | 7.900† | — | — |
| 17 | 39 | 2.294 | — | — | 1.167† | — | — | — | — | — | — | — | — | — |
| 34 | 78 | 2.294 | — | — | — | — | — | 4.667† | — | — | — | — | — | — |
| 13 | 30 | 2.308 | — | .672† | .896† | 1.075† | 1.344† | 1.792 | 2.150† | 2.688† | — | — | — | — |
| 26 | 60 | 2.308 | .896† | 1.344† | 1.792† | — | 2.688† | 3.583† | 4.300† | 5.375† | — | — | — | — |
| 19 | 44 | 2.316 | — | — | 1.313† | — | 1.969† | 2.625† | — | 3.938† | — | — | — | — |
| 28 | 65 | 2.321 | — | — | — | — | — | — | 4.650† | — | — | — | — | — |
| 12 | 28 | 2.333 | .417† | .625† | .833† | 1.000† | 1.250 | 1.667 | 2.000 | 2.500 | — | 4.000* | 5.000 | — |
| 15 | 35 | 2.333 | — | — | — | 1.250 | — | — | 2.500 | — | — | 5.000 | — | — |
| 18 | 42 | 2.333 | — | — | 1.250† | — | — | 2.500 | 3.000† | 3.750† | 5.000 | — | 7.500† | 10.000† |
| 24 | 56 | 2.333 | .833† | 1.250† | 1.667† | — | 2.500 | 3.333† | — | 5.000 | — | — | 10.000 | — |
| 30 | 70 | 2.333 | — | 1.563† | 2.083† | 2.500 | — | — | 5.000 | — | — | 10.000 | — | — |
| 36 | 84 | 2.333 | 1.250† | — | 2.500† | 3.000† | 3.750† | 5.000 | 6.000† | 7.500† | 10.000 | — | 15.000† | 20.000† |
| 32 | 75 | 2.344 | — | 1.672† | — | 2.675† | — | — | 5.350* | — | — | — | — | — |
| 23 | 54 | 2.348 | — | — | 1.604† | — | 2.406† | 3.208† | — | — | — | — | — | — |
| 17 | 40 | 2.353 | — | — | 1.888† | 1.425† | 1.781† | 2.375† | 2.850† | 3.563† | — | — | — | — |
| 34 | 80 | 2.358 | — | — | — | — | 3.563† | — | — | — | — | — | — | — |
| 14 | 33 | 2.357 | — | — | .979† | — | — | — | — | — | 3.917 | — | — | — |
| 28 | 66 | 2.357 | .979† | — | 1.958† | — | — | 3.917 | — | — | — | — | — | — |
| 11 | 26 | 2.364 | .385† | .578† | .771† | — | 1.188† | 1.583† | 1.900† | 2.375† | — | — | — | — |
| 22 | 52 | 2.364 | .771† | 1.156† | — | — | 2.313† | — | — | 4.625† | — | — | — | — |
| 19 | 45 | 2.368 | — | — | 1.333† | 1.600† | — | — | 3.200† | — | — | — | — | — |
| 27 | 64 | 2.370 | — | — | 1.896† | — | — | — | — | — | 7.583† | — | — | — |
| 16 | 38 | 2.375 | — | — | — | — | 1.688† | 2.250† | 2.700† | — | — | — | — | — |
| 32 | 76 | 2.375 | — | — | — | — | — | — | — | 6.750† | — | — | — | — |
| 21 | 50 | 2.381 | — | — | — | 1.775† | — | — | 3.550† | — | — | — | — | — |
| 23 | 55 | 2.391 | — | — | — | 1.950† | — | — | — | — | — | — | — | — |
| 15 | 36 | 2.400 | .531† | .797† | 1.063† | 1.275† | 1.594 | 2.125 | 2.550† | 3.188 | 4.250 | — | 6.375 | 8.500† |
| 20 | 48 | 2.400 | .708† | 1.063† | 1.417† | 1.700† | 2.125 | 2.833 | 3.400 | 4.250 | 5.667† | — | 8.500 | 11.333† |
| 25 | 60 | 2.400 | — | 1.328† | 1.771† | 2.125 | — | 3.542† | 4.250 | — | — | 8.500 | — | — |
| 30 | 72 | 2.400 | — | 1.594† | 2.125† | 2.550† | 3.188 | 4.250 | 5.100† | 6.375† | 8.500 | — | 12.750† | 17.000† |
| 35 | 84 | 2.400 | — | — | — | 2.975 | — | — | 5.950† | — | — | — | — | — |
| 14 | 34 | 2.429 | — | — | — | — | 1.500† | 2.000† | — | — | — | — | — | — |
| 28 | 68 | 2.429 | — | — | — | — | 3.000† | — | — | 6.000† | — | — | — | — |
| 23 | 56 | 2.435 | — | — | 1.646† | — | 2.469 | 3.292† | — | — | — | — | — | — |
| 16 | 39 | 2.438 | — | — | 1.146† | — | — | — | — | — | — | — | — | — |
| 32 | 78 | 2.438 | — | — | — | — | — | 4.583† | — | — | — | — | — | — |
| 18 | 44 | 2.444 | .646† | .969† | 1.292† | — | 1.938† | 2.583† | — | 3.875 | — | — | 7.750 | — |
| 27 | 66 | 2.444 | — | — | 1.938† | — | — | — | — | — | 7.750 | — | — | — |
| 11 | 27 | 2.455 | — | — | .792† | — | — | — | — | — | 3.250† | — | — | — |
| 22 | 54 | 2.455 | .792† | — | 1.583† | — | 2.375† | 3.167† | 3.800† | 4.750† | — | — | 9.500† | — |
| 13 | 32 | 2.462 | — | .703† | .938† | 1.125† | 1.406† | 1.875† | 2.250† | 2.813† | — | — | — | — |
| 26 | 64 | 2.462 | — | 1.406† | 1.875† | — | 2.813† | 3.750† | 4.500† | 5.625† | — | — | — | — |
| 17 | 42 | 2.471 | — | — | 1.229† | — | — | 2.458† | 2.950† | 3.688† | — | — | — | — |
| 34 | 84 | 2.471 | — | — | — | — | 3.688† | 4.917† | — | — | — | — | — | — |
| 21 | 52 | 2.476 | — | — | — | — | 2.281† | — | — | 4.563† | — | — | — | — |
| 12 | 30 | 2.500 | — | .656† | .875† | 1.050 | 1.313 | 1.750 | 2.100 | 2.625† | 3.500 | 4.200 | 5.250† | 7.000† |
| 14 | 35 | 2.500 | — | — | — | 1.225 | — | — | 2.450 | — | — | 4.900 | — | — |
| 16 | 40 | 2.500 | .583† | .875† | 1.167† | 1.400 | 1.750 | 2.333† | 2.800 | 3.500 | 4.667† | 5.600 | 7.000 | — |

† = 14 1/2° only  * = 20° only.

**WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

2.500-2.923 RATIO

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 18 | 45 | 2.500 | — | — | 1.313† | 1.575 | — | — | 3.150 | — | — | 6.300 | — | — |
| 20 | 50 | 2.500 | — | 1.094† | — | 1.750 | — | — | 3.500 | — | — | 7.000 | — | — |
| 22 | 55 | 2.500 | — | — | — | 1.925† | — | — | 3.850† | — | — | — | — | — |
| 24 | 60 | 2.500 | .875† | 1.313† | 1.750† | 2.100 | 2.625 | 3.500 | 4.200 | 5.250 | 7.000 | 8.400 | 10.500 | 14.000† |
| 26 | 65 | 2.500 | — | — | — | — | — | — | 4.550† | — | — | — | — | — |
| 28 | 70 | 2.500 | — | 1.531† | 2.042† | 2.450† | — | — | 4.900 | — | — | 9.800* | — | — |
| 30 | 75 | 2.500 | — | 1.641† | — | 2.625† | — | — | 5.250† | — | — | — | — | — |
| 32 | 80 | 2.500 | 1.167† | 1.750† | — | 2.800† | 3.500 | — | 5.600† | 7.000 | — | — | 14.000 | — |
| 19 | 48 | 2.526 | — | — | 1.396† | 1.675† | 2.094† | 2.792† | 3.350† | 4.188† | — | — | — | — |
| 15 | 38 | 2.533 | — | — | — | — | 1.636† | 2.208† | 2.650† | — | — | — | — | — |
| 30 | 76 | 2.533 | — | — | — | — | — | — | — | 6.625† | — | — | — | — |
| 13 | 33 | 2.538 | — | — | .958† | — | — | — | — | — | — | — | — | — |
| 26 | 66 | 2.538 | .958† | — | 1.917† | — | — | 3.833† | — | — | — | — | — | — |
| 11 | 28 | 2.545 | .406† | .609† | .813† | 1.000† | 1.250† | 1.667† | 2.000† | 2.500† | — | — | 5.000† | — |
| 22 | 56 | 2.545 | .813† | 1.219† | 1.625† | — | 2.438† | 3.250† | — | 4.875 | — | — | 9.750† | — |
| 33 | 84 | 2.545 | — | — | 2.438† | — | — | — | — | — | 9.750 | — | — | — |
| 25 | 64 | 2.560 | — | 1.391† | 1.854† | 2.225† | — | 3.708† | 4.500† | — | — | — | — | — |
| 14 | 36 | 2.571 | .521† | .781† | 1.042† | 1.250† | 1.563 | 2.083 | 2.500† | 3.125 | 4.167 | — | 6.250 | 8.333† |
| 21 | 54 | 2.571 | — | — | 1.563† | — | 2.344† | 3.125 | 3.750† | 4.688† | 6.250 | — | — | 12.500† |
| 28 | 72 | 2.571 | 1.042† | 1.563† | 2.083† | 2.500† | 3.125 | 4.167 | 5.000† | 6.250 | — | — | 12.500 | — |
| 17 | 44 | 2.588 | — | — | 1.271† | — | 1.906† | 2.542† | — | 3.813† | — | — | — | — |
| 27 | 70 | 2.593 | — | — | 2.021† | — | — | — | — | — | — | — | — | — |
| 15 | 39 | 2.600 | — | — | 1.125† | — | — | — | — | — | — | — | — | — |
| 20 | 52 | 2.600 | .750† | 1.125† | — | — | 2.250† | — | — | 4.500† | — | — | — | — |
| 25 | 65 | 2.600 | — | — | — | — | — | — | 4.500† | — | — | — | — | — |
| 30 | 78 | 2.600 | — | — | — | — | — | 4.500† | — | — | — | — | — | — |
| 23 | 60 | 2.609 | — | — | 1.729† | 2.075† | 2.594† | 3.458† | — | — | — | — | — | — |
| 13 | 34 | 2.615 | — | — | — | — | 1.469† | 1.958† | — | — | — | — | — | — |
| 26 | 68 | 2.615 | — | — | — | — | 2.938† | — | — | 5.875† | — | — | — | — |
| 21 | 55 | 2.619 | — | — | — | 1.900† | — | — | 3.800† | — | — | — | — | — |
| 16 | 42 | 2.625 | — | — | 1.208† | — | — | 2.417 | 2.900† | 3.625† | 4.833 | — | 7.250† | 9.667† |
| 32 | 84 | 2.625 | 1.208† | — | 2.417† | 2.900† | 3.625† | 4.833† | 5.800† | 7.250† | 9.667† | — | 14.500† | — |
| 19 | 50 | 2.632 | — | — | — | 1.725† | — | — | 3.450† | — | — | — | — | — |
| 25 | 66 | 2.640 | — | — | 1.896† | — | — | 3.792† | — | — | — | — | — | — |
| 17 | 45 | 2.647 | — | — | 1.292† | 1.550† | — | — | 3.100† | — | — | — | — | — |
| 12 | 32 | 2.667 | .458† | .688† | .917† | 1.100† | 1.375 | 1.833† | 2.200† | 2.750 | 3.667† | — | 5.500 | — |
| 15 | 40 | 2.667 | .573† | .859† | 1.146† | 1.375 | 1.719 | 2.292† | 2.750 | 3.438 | 4.583† | 5.500 | 6.875 | — |
| 18 | 48 | 2.667 | .688† | 1.031† | 1.375† | 1.650† | 2.063 | 2.750 | 3.300 | 4.125 | 5.500 | — | 8.250 | 11.000† |
| 21 | 56 | 2.667 | — | — | 1.604† | — | 2.406† | 3.208† | — | 4.813† | — | — | — | — |
| 24 | 64 | 2.667 | — | 1.375† | 1.833† | 2.200† | 2.750 | 3.667† | 4.400† | 5.500 | 7.333† | — | 11.000 | — |
| 27 | 72 | 2.667 | — | — | 2.063† | — | — | — | — | — | 8.250 | — | — | — |
| 30 | 80 | 2.667 | — | 1.719† | — | 2.750 | 3.438 | — | 5.500 | 6.875† | — | 11.000 | 13.750† | — |
| 28 | 75 | 2.679 | — | 1.609† | — | 2.575† | — | — | 5.150† | — | — | — | — | — |
| 13 | 35 | 2.692 | — | — | — | 1.200† | — | — | 2.400† | — | — | — | — | — |
| 26 | 70 | 2.692 | — | 1.500† | 2.000† | — | — | — | 4.800† | — | — | — | — | — |
| 20 | 54 | 2.700 | .771† | — | 1.542† | — | 2.313† | 3.083 | 3.700† | 4.625† | 6.167† | — | 9.250† | 12.333† |
| 24 | 65 | 2.708 | — | — | — | — | — | — | 4.450† | — | — | — | — | — |
| 14 | 38 | 2.714 | — | — | — | — | 1.625† | 2.167† | 2.600† | — | — | — | — | — |
| 28 | 76 | 2.714 | — | — | — | — | — | — | — | 6.500† | — | — | — | — |
| 11 | 30 | 2.727 | — | .641† | .854† | 1.050† | 1.313† | 1.750† | 2.100† | 2.625† | 3.500† | 4.200† | 5.250† | 7.000† |
| 22 | 60 | 2.727 | .854† | 1.281† | 1.708† | 2.050† | 2.563† | 3.417† | 4.100† | 5.125 | — | — | 10.250† | — |
| 19 | 52 | 2.737 | — | — | — | — | 2.219† | — | — | 4.438† | — | — | — | — |
| 12 | 33 | 2.750 | — | — | .938† | — | — | — | — | — | 3.750 | — | — | — |
| 16 | 44 | 2.750 | .625† | .938† | 1.250† | — | 1.875† | 2.500† | — | 3.750 | — | — | 7.500 | — |
| 20 | 55 | 2.750 | — | — | — | 1.875† | — | — | 3.750 | — | — | 7.500† | — | — |
| 24 | 66 | 2.750 | .938† | — | 1.875† | — | — | 3.750 | — | — | 7.500 | — | — | — |
| 13 | 36 | 2.769 | — | .766† | 1.021† | 1.225† | 1.531† | 2.042 | 2.450† | 3.063† | — | — | — | — |
| 26 | 72 | 2.769 | 1.021† | 1.531† | 2.042† | — | 3.063† | 4.083† | 4.900† | 6.125† | — | — | — | — |
| 18 | 50 | 2.778 | — | 1.063† | — | 1.700 | — | — | 3.400 | — | — | 6.800 | — | — |
| 23 | 64 | 2.783 | — | — | 1.183† | 2.175† | 2.719† | 3.625† | — | — | — | — | — | — |
| 14 | 39 | 2.786 | — | — | 1.104† | — | — | — | — | — | — | — | — | — |
| 28 | 78 | 2.786 | — | — | — | — | — | 4.417† | — | — | — | — | — | — |
| 15 | 42 | 2.800 | — | — | 1.188† | — | — | 2.375 | 2.850† | 3.563† | 4.750 | — | 7.125† | 9.500† |
| 20 | 56 | 2.800 | .792† | 1.188† | 1.583† | — | 2.375 | 3.167† | — | 4.75 | — | — | 9.500 | — |
| 25 | 70 | 2.800 | — | 1.484† | 1.979† | 2.375 | — | — | 4.750 | — | — | 9.500 | — | — |
| 30 | 84 | 2.800 | — | — | 2.375† | 2.850 | 3.563† | 4.750 | 5.700† | 7.125† | 9.500 | — | 14.250† | 19.000† |
| 16 | 45 | 2.813 | — | — | 1.271† | 1.525 | — | — | 3.050 | — | — | 6.100 | — | — |
| 17 | 48 | 2.824 | — | — | 1.354† | 1.625† | 2.031† | 2.708† | 3.250† | 4.063† | — | — | — | — |
| 12 | 34 | 2.833 | — | — | — | — | 1.438† | 1.917† | — | — | — | — | — | — |
| 24 | 68 | 2.833 | — | — | — | — | 2.875† | — | — | 5.750† | — | — | — | — |
| 19 | 54 | 2.842 | — | — | 1.521† | — | 2.281† | 3.042† | 3.650† | 4.563† | — | — | — | — |
| 14 | 40 | 2.857 | .563† | .844† | 1.125† | 1.350 | 1.688 | 2.250† | 2.700 | 3.375 | 4.500† | 5.400 | 6.750 | — |
| 21 | 60 | 2.857 | — | — | 1.688† | 2.025† | 2.531† | 3.375 | 4.050† | 5.063† | 6.750 | — | — | 13.500† |
| 28 | 80 | 2.857 | 1.125† | 1.688† | — | 2.700† | 3.375 | — | 5.400 | 6.750 | — | 10.800* | 13.500 | — |
| 23 | 66 | 2.870 | — | — | 1.854† | — | — | 3.708† | — | — | — | — | — | — |
| 25 | 72 | 2.880 | — | 1.516† | 2.021† | 2.425† | — | 4.042† | 4.850† | — | — | — | — | — |
| 26 | 75 | 2.885 | — | 1.578† | — | — | — | — | 5.050† | — | — | — | — | — |
| 18 | 52 | 2.889 | .729† | 1.094† | — | — | 2.188† | — | — | 4.375† | — | — | — | — |
| 19 | 55 | 2.895 | — | — | — | 1.850† | — | — | 3.700† | — | — | — | — | — |
| 11 | 32 | 2.909 | .448† | .672† | .896† | 1.100† | 1.375† | 1.833† | 2.200† | 2.750† | 3.667† | — | 5.500† | — |
| 22 | 64 | 2.909 | — | 1.344† | 1.792† | 2.150† | 2.688† | 3.583† | 4.300† | 5.375 | — | — | 10.750† | — |
| 12 | 35 | 2.917 | — | — | — | 1.175 | — | — | 2.350 | — | — | 4.700 | — | — |
| 24 | 70 | 2.917 | — | 1.469† | 1.958† | 2.350 | — | — | 4.700 | — | — | 9.400 | — | — |
| 13 | 38 | 2.923 | — | — | — | — | 1.594† | 2.125† | 2.550† | — | — | — | — | — |
| 26 | 76 | 2.923 | — | — | — | — | — | — | — | 6.375† | — | — | — | — |

† = 14 1/2° only * = 20° only.

F

**2.933-3.529 RATIO** Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 15 | 44 | 2.933 | .615† | .922† | 1.229† | — | 1.844† | 2.458† | — | 3.688 | — | — | 7.375 | — |
| 17 | 50 | 2.941 | — | — | — | 1.675† | — | — | 3.350† | — | — | — | — | — |
| 19 | 56 | 2.947 | — | — | 1.563† | — | 2.344† | 3.125 | — | 4.688† | — | — | — | — |
| 22 | 65 | 2.955 | — | — | — | — | — | — | 4.350† | — | — | — | — | — |
| 23 | 68 | 2.957 | — | — | — | — | 2.844† | — | — | — | — | — | — | — |
| 11 | 33 | 3.000 | — | — | .917† | — | — | — | — | — | 3.750† | — | — | — |
| 12 | 36 | 3.000 | .500† | .750† | 1.000† | 1.200† | 1.500 | 2.000 | 2.400† | 3.000 | 4.000 | — | 6.000 | 8.000† |
| 13 | 39 | 3.000 | — | — | 1.083† | — | — | — | — | — | — | — | — | — |
| 14 | 42 | 3.000 | — | — | 1.167† | — | — | 2.333 | 2.800† | 3.500† | 4.667 | — | 7.000† | 9.333† |
| 15 | 45 | 3.000 | — | — | 1.250† | 1.500 | — | — | 3.000 | — | — | 6.000 | — | — |
| 16 | 48 | 3.000 | .667† | 1.000† | 1.333† | 1.600† | 2.000 | 2.667 | 3.200 | 4.000 | 5.333 | — | 8.000 | 10.667† |
| 18 | 54 | 3.000 | .750† | — | .1.500† | — | 2.250† | 3.000 | 3.600† | 4.500† | 6.000 | — | 9.000† | 12.000† |
| 20 | 60 | 3.000 | .833† | 1.250† | 1.667† | 2.000 | 2.500 | 3.333 | 4.000 | 5.000 | 6.667† | 8.000 | 10.000 | 13.333† |
| 22 | 66 | 3.000 | .917† | — | 1.833† | — | — | 3.667† | — | — | — | — | — | — |
| 24 | 72 | 3.000 | 1.000† | 1.500† | 2.000† | 2.400† | 3.000 | 4.000 | 4.800† | 6.000 | 8.000 | — | 12.000 | 16.000† |
| 25 | 75 | 3.000 | — | 1.563† | — | 2.500† | — | — | 5.000† | — | — | — | — | — |
| 26 | 78 | 3.000 | — | — | — | — | — | 4.333† | — | — | — | — | — | — |
| 28 | 84 | 3.000 | 1.167† | — | 2.333† | 2.800† | 3.500† | 4.667 | 5.600† | 7.000† | — | — | 14.000† | — |
| 23 | 70 | 3.043 | — | — | 1.938† | 2.325† | — | — | — | — | — | — | — | — |
| 21 | 64 | 3.048 | — | — | 1.771† | 2.125† | 2.656† | 3.542† | 4.250† | 5.313† | 7.083† | — | — | — |
| 18 | 55 | 3.056 | — | — | — | 1.825† | — | — | 3.650 | — | — | 7.300† | — | — |
| 17 | 52 | 3.059 | — | — | — | — | 2.156† | — | — | 4.313† | — | — | — | — |
| 13 | 40 | 3.077 | — | .828† | 1.104† | 1.325† | 1.656† | 2.208† | 2.650† | 3.313† | — | — | — | — |
| 26 | 80 | 3.077 | 1.104† | 1.656† | — | — | 3.313† | — | 5.300† | 6.625† | — | — | — | — |
| 11 | 34 | 3.091 | — | — | — | — | 1.406† | 1.875† | — | — | — | — | — | — |
| 22 | 68 | 3.091 | — | — | — | — | 2.813† | — | — | 5.625† | — | — | — | — |
| 21 | 65 | 3.095 | — | — | — | — | — | — | 4.300† | — | — | — | — | — |
| 18 | 56 | 3.111 | .771† | 1.156† | 1.542† | — | 2.313 | 3.083† | — | 4.625 | — | — | 9.250 | — |
| 27 | 84 | 3.111 | — | — | 2.313† | — | — | — | — | — | 9.250 | — | — | — |
| 25 | 78 | 3.120 | — | — | — | — | — | 4.292† | — | — | — | — | — | — |
| 16 | 50 | 3.125 | — | 1.031† | — | 1.650 | — | — | 3.300 | — | — | 6.600 | — | — |
| 24 | 75 | 3.125 | — | 1.547† | — | 2.475† | — | — | 4.950† | — | — | — | — | — |
| 23 | 72 | 3.130 | — | — | 1.979† | 2.375† | 2.969† | 3.958† | — | — | — | — | — | — |
| 14 | 44 | 3.143 | .604† | .906† | 1.208† | — | 1.813† | 2.417† | — | 3.625 | — | — | 7.250 | — |
| 21 | 66 | 3.143 | — | — | 1.813† | — | — | 3.625 | — | — | 7.250 | — | — | — |
| 19 | 60 | 3.158 | — | — | 1.646† | 1.975† | 2.469† | 3.292† | 3.950† | 4.938† | — | — | — | — |
| 12 | 38 | 3.167 | — | — | — | — | 1.563† | 2.083† | 2.500† | — | — | — | — | — |
| 24 | 76 | 3.167 | — | — | — | — | — | — | — | 6.250† | — | — | — | — |
| 17 | 54 | 3.176 | — | — | 1.479† | — | 2.219† | 2.958† | 3.550† | 4.438† | — | — | — | — |
| 11 | 35 | 3.182 | — | — | — | 1.175† | — | — | 2.350† | — | — | 4.700† | — | — |
| 22 | 70 | 3.182 | — | 1.438† | 1.917† | 2.300† | — | — | 4.600† | — | — | — | — | — |
| 15 | 48 | 3.200 | .656† | .984† | 1.313† | 1.575† | 1.969 | 2.625 | 3.150 | 3.938 | 5.250 | — | 7.875 | 10.500† |
| 20 | 64 | 3.200 | — | 1.313† | 1.750† | 2.100† | 2.625 | 3.500† | 4.200† | 5.250 | 7.000† | — | 10.500 | — |
| 25 | 80 | 3.200 | — | 1.641† | — | 2.625 | — | — | 5.250 | — | — | 10.500 | — | — |
| 14 | 45 | 3.214 | — | — | 1.229† | 1.475 | — | — | 2.950 | — | — | 5.900 | — | — |
| 13 | 42 | 3.231 | — | — | 1.146† | — | — | 2.292 | 2.750† | 3.438† | — | — | — | — |
| 26 | 84 | 3.231 | 1.146† | — | 2.292† | — | 3.438† | 4.583† | 5.500† | 6.875† | — | — | — | — |
| 17 | 55 | 3.235 | — | — | — | 1.800† | — | — | 3.600† | — | — | — | — | — |
| 21 | 68 | 3.238 | — | — | — | — | 2.781† | — | — | 5.563† | — | — | — | — |
| 12 | 39 | 3.250 | — | — | 1.063† | — | — | — | — | — | — | — | — | — |
| 16 | 52 | 3.250 | .708† | 1.063† | — | — | 2.125† | — | — | 4.250† | — | — | — | — |
| 20 | 65 | 3.250 | — | — | — | — | — | — | 4.250† | — | — | — | — | — |
| 24 | 78 | 3.250 | — | — | — | — | — | 4.250† | — | — | — | — | — | — |
| 23 | 75 | 3.261 | — | — | — | 2.450† | — | — | — | — | — | — | — | — |
| 11 | 36 | 3.273 | .490† | .734† | .979† | 1.200† | 1.500† | 2.000† | 2.400† | 3.000† | 4.000† | — | 6.000† | 8.000† |
| 22 | 72 | 3.273 | .979† | 1.469† | 1.958† | 2.350† | 2.938† | 3.917† | 4.700† | 5.875 | — | — | 11.750† | — |
| 17 | 56 | 3.294 | — | — | 1.521† | — | 2.281† | 3.042† | — | 4.563† | — | — | — | — |
| 20 | 66 | 3.300 | .896† | — | 1.792† | — | — | 3.583 | — | — | 7.167† | — | — | — |
| 12 | 40 | 3.333 | .542† | .813† | 1.083† | 1.300 | 1.625 | 2.167† | 2.600 | 3.250 | 4.333† | 5.200 | 6.500 | — |
| 15 | 50 | 3.333 | — | 1.016† | — | 1.625 | — | — | 3.250 | — | — | 6.500 | — | — |
| 18 | 60 | 3.333 | .813† | 1.219† | 1.625† | 1.950 | 2.438 | 3.250 | 3.900 | 4.875 | 6.500 | 7.800 | 9.750 | 13.000† |
| 21 | 70 | 3.333 | — | — | 1.896† | 2.275† | — | — | 4.550† | — | — | — | — | — |
| 24 | 80 | 3.333 | 1.083† | 1.625† | — | 2.600 | 3.250 | — | 5.200 | 6.500 | — | 10.400 | 13.000 | — |
| 25 | 84 | 3.360 | — | — | 2.271† | 2.725 | — | 4.542† | 5.450† | — | — | — | — | — |
| 19 | 64 | 3.368 | — | — | 1.729† | 2.075† | 2.594† | 3.458† | 4.150† | 5.188† | — | — | — | — |
| 16 | 54 | 3.375 | .729† | — | 1.458† | — | 2.188† | 2.917 | 3.500† | 4.375† | 5.833 | — | 8.750† | 11.667† |
| 13 | 44 | 3.385 | — | .891† | 1.188† | — | 1.781† | 2.375† | — | 3.563† | — | — | — | — |
| 23 | 78 | 3.391 | — | — | — | — | — | 4.208† | — | — | — | — | — | — |
| 20 | 68 | 3.400 | — | — | — | — | 2.750† | — | — | 5.500† | — | — | — | — |
| 22 | 75 | 3.409 | — | 1.516† | — | 2.425† | — | — | 4.850† | — | — | — | — | — |
| 19 | 65 | 3.421 | — | — | — | — | — | — | 4.200† | — | — | — | — | — |
| 14 | 48 | 3.429 | .646† | .969† | 1.292† | 1.550† | 1.938 | 2.583 | 3.100 | 3.875 | 5.167 | — | 7.750 | 10.333† |
| 21 | 72 | 3.429 | — | — | 1.938† | 2.325† | 2.906† | 3.875 | 4.650† | 5.813† | 7.750 | — | — | 15.500† |
| 16 | 55 | 3.438 | — | — | — | 1.775† | — | — | 3.550 | — | — | 7.100† | — | — |
| 11 | 38 | 3.455 | — | — | — | — | 1.563† | 2.083† | 2.500† | — | — | — | — | — |
| 22 | 76 | 3.455 | — | — | — | — | — | — | — | 6.125† | — | — | — | — |
| 13 | 45 | 3.462 | — | — | 1.208† | 1.450† | — | — | 2.900† | — | — | — | — | — |
| 15 | 52 | 3.467 | .698† | 1.047† | — | — | 2.094† | — | — | 4.188† | — | — | — | — |
| 19 | 66 | 3.474 | — | — | 1.771† | — | — | 3.542† | — | — | — | — | — | — |
| 23 | 80 | 3.478 | — | — | — | 2.575† | 3.219† | — | — | — | — | — | — | — |
| 12 | 42 | 3.500 | — | — | 1.125† | — | — | 2.250 | 2.700† | 3.375† | 4.500 | — | 6.750† | 9.000† |
| 16 | 56 | 3.500 | .750† | 1.125† | 1.500† | — | 2.250 | 3.000† | — | 4.500 | — | — | 9.000 | — |
| 20 | 70 | 3.500 | — | 1.406† | 1.875† | 2.250 | — | — | 4.500 | — | — | 9.000 | — | — |
| 24 | 84 | 3.500 | 1.125† | — | 2.250† | 2.700 | 3.375† | 4.500 | 5.400† | 6.750† | 9.000 | — | 13.500† | 18.000† |
| 17 | 60 | 3.529 | — | — | 1.604† | 1.925† | 2.406† | 3.208† | 3.850† | 4.813† | — | — | — | — |

† = 14 1/2° only * = 20° only.

**⚠WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

3.545-4.615 RATIO

| GEAR COMBINATIONS No. Teeth | | Ratio | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 11 | 39 | 3.545 | — | — | 1.042† | — | — | — | — | — | — | — | — | — |
| 22 | 78 | 3.545 | — | — | — | — | — | 4.167† | — | — | — | — | — | — |
| 18 | 64 | 3.556 | — | 1.281† | 1.708† | 2.050† | 2.563 | 3.417† | 4.100† | 5.125 | 6.833† | — | 10.250 | — |
| 14 | 50 | 3.571 | — | 1.000† | — | 1.600 | — | — | 3.200 | — | — | 6.400 | — | — |
| 21 | 75 | 3.571 | — | — | — | 2.400† | — | — | 4.800† | — | — | — | — | — |
| 19 | 68 | 3.579 | — | — | — | — | 2.719† | — | — | 5.438† | — | — | — | — |
| 15 | 54 | 3.600 | .719† | — | 1.438† | — | 2.156† | 2.875 | 3.450† | 4.313† | 5.750 | — | 8.625† | 11.500† |
| 20 | 72 | 3.600 | .958† | 1.438† | 1.917† | 2.300† | 2.875 | 3.833 | 4.600† | 5.750 | 7.667† | — | 11.500 | 15.333† |
| 18 | 65 | 3.611 | — | — | — | — | — | — | 4.150† | — | — | — | — | — |
| 21 | 76 | 3.619 | — | — | — | — | — | — | — | 6.063† | — | — | — | — |
| 11 | 40 | 3.636 | .531† | .797† | 1.063† | 1.300† | 1.625† | 2.167† | 2.600† | 3.250† | 4.333† | 5.200† | 6.500† | — |
| 22 | 80 | 3.636 | 1.063† | 1.594† | — | 2.550† | 3.188† | — | 5.100† | 6.375 | — | — | 12.750† | — |
| 23 | 84 | 3.652 | — | — | 2.229† | 2.675† | 3.344† | 4.458† | — | — | — | — | — | — |
| 12 | 44 | 3.667 | .583† | .875† | 1.167† | — | 1.750† | 2.333† | — | 3.500 | — | — | 7.000 | — |
| 15 | 55 | 3.667 | — | — | — | 1.750† | — | — | 3.500 | — | — | 7.000† | — | — |
| 18 | 66 | 3.667 | .875† | — | 1.750† | — | — | 3.500 | — | — | 7.000 | — | — | — |
| 19 | 70 | 3.684 | — | — | 1.854† | 2.225† | — | — | 4.450† | — | — | — | — | — |
| 13 | 48 | 3.692 | — | .953† | 1.271† | 1.525† | 1.906† | 2.542 | 3.050† | 3.813† | — | — | — | — |
| 14 | 52 | 3.714 | .688† | 1.031† | — | — | 2.063† | — | — | 4.125† | — | — | — | — |
| 21 | 78 | 3.714 | — | — | — | — | — | 4.125† | — | — | — | — | — | — |
| 15 | 56 | 3.733 | .740† | 1.109† | 1.479† | — | 2.219 | 2.958† | — | 4.438 | — | — | 8.875 | — |
| 12 | 45 | 3.750 | — | — | 1.188† | 1.425 | — | — | 2.850 | — | — | 5.700 | — | — |
| 16 | 60 | 3.750 | .792† | 1.188† | 1.583† | 1.900 | 2.375 | 3.167 | 3.800 | 4.750 | 6.333 | 7.600 | 9.500 | 12.667† |
| 20 | 75 | 3.750 | — | 1.484† | — | 2.375† | — | — | 4.750† | — | — | — | — | — |
| 17 | 64 | 3.765 | — | — | 1.688† | 2.025† | 2.531† | 3.375† | 4.050† | 5.063† | — | — | — | — |
| 18 | 68 | 3.778 | — | — | — | — | 2.668† | — | — | 5.375† | — | — | — | — |
| 19 | 72 | 3.789 | — | — | 1.896† | 2.275† | 2.844† | 3.792† | 4.550† | 5.688† | — | — | — | — |
| 20 | 76 | 3.800 | — | — | — | — | — | — | — | 6.000† | — | — | — | — |
| 21 | 80 | 3.810 | — | — | — | 2.525† | 3.156† | — | 5.050† | 6.313† | — | — | — | — |
| 11 | 42 | 3.818 | — | — | 1.104† | — | — | 2.250† | 2.700† | 3.375† | 4.500† | — | 6.750† | 9.000† |
| 22 | 84 | 3.818 | 1.104† | — | 2.208† | 2.650† | 3.313† | 4.417† | 5.300† | 6.625† | — | — | 13.250† | — |
| 17 | 65 | 3.824 | — | — | — | — | — | — | 4.100† | — | — | — | — | — |
| 13 | 50 | 3.846 | — | .984† | — | 1.575† | — | — | 3.150† | — | — | — | — | — |
| 14 | 54 | 3.857 | .708† | — | 1.417† | — | 2.125† | 2.833 | 3.400† | 4.250† | 5.667 | — | 8.500† | 11.333† |
| 17 | 66 | 3.882 | — | — | 1.729† | — | — | 3.458† | — | — | — | — | — | — |
| 18 | 70 | 3.889 | — | 1.375† | 1.833† | 2.200 | — | — | 4.400 | — | — | 8.800 | — | — |
| 20 | 78 | 3.900 | — | — | — | — | — | 4.083† | — | — | — | — | — | — |
| 14 | 55 | 3.929 | — | — | — | 1.725† | — | — | 3.450 | — | — | 6.900† | — | — |
| 19 | 75 | 3.947 | — | — | — | 2.350† | — | — | 4.700† | — | — | — | — | — |
| 11 | 44 | 4.000 | .573† | .859† | 1.146† | — | 1.750† | 2.333† | — | 3.500† | — | — | 7.000† | — |
| 12 | 48 | 4.000 | .625† | .938† | 1.250† | 1.500† | 1.875 | 2.500 | 3.000 | 3.750 | 5.000 | — | 7.500 | 10.000† |
| 13 | 52 | 4.000 | — | 1.016† | — | — | 2.031† | — | — | 4.063† | — | — | — | — |
| 14 | 56 | 4.000 | .729† | 1.094† | 1.458† | — | 2.188 | 2.917† | — | 4.375 | — | — | 8.750 | — |
| 15 | 60 | 4.000 | .781† | 1.172† | 1.563† | 1.875 | 2.344 | 3.125 | 3.750 | 4.688 | 6.250 | 7.500 | 9.375 | 12.500† |
| 16 | 64 | 4.000 | — | 1.250† | 1.667† | 2.000† | 2.500 | 3.333† | 4.000† | 5.000 | 6.667† | — | 10.000 | — |
| 17 | 68 | 4.000 | — | — | — | — | 2.656† | — | — | 5.313† | — | — | — | — |
| 18 | 72 | 4.000 | .938† | 1.406† | 1.875† | 2.250† | 2.813 | 3.750 | 4.500† | 5.625 | 7.500 | — | 11.250 | 15.000† |
| 19 | 76 | 4.000 | — | — | — | — | — | — | — | 5.938† | — | — | — | — |
| 20 | 80 | 4.000 | 1.042† | 1.563† | — | 2.500 | 3.125 | — | 5.000 | 6.250 | — | 10.000 | 12.500 | — |
| 21 | 84 | 4.000 | — | — | 2.188† | 2.625† | 3.281† | 4.375 | 5.250† | 6.563† | 8.750 | — | — | 17.500† |
| 16 | 65 | 4.063 | — | — | — | — | — | — | 4.050† | — | — | — | — | — |
| 11 | 45 | 4.091 | — | — | 1.167† | 1.425† | — | — | 2.850† | — | — | 5.700† | — | — |
| 19 | 78 | 4.105 | — | — | — | — | — | 4.042† | — | — | — | — | — | — |
| 17 | 70 | 4.118 | — | — | 1.813† | 2.175† | — | — | 4.350† | — | — | — | — | — |
| 16 | 66 | 4.125 | .854† | — | 1.708† | — | — | 3.417 | — | — | 6.833 | — | — | — |
| 13 | 54 | 4.154 | — | — | 1.396† | — | 2.094† | 2.792 | 3.350† | 4.188† | — | — | — | — |
| 12 | 50 | 4.167 | — | .969† | — | 1.550 | — | — | 3.100 | — | — | 6.200 | — | — |
| 18 | 75 | 4.167 | — | 1.453† | — | 2.325† | — | — | 4.650† | — | — | — | — | — |
| 20 | 84 | 4.200 | 1.083† | — | 2.167† | 2.600 | 3.250† | 4.333 | 5.200† | 6.500† | 8.667† | — | 13.000† | 17.333† |
| 19 | 80 | 4.211 | — | — | — | 2.475† | 3.094† | — | 4.950† | 6.188† | — | — | — | — |
| 18 | 76 | 4.222 | — | — | — | — | — | — | — | 5.875† | — | — | — | — |
| 13 | 55 | 4.231 | — | — | — | 1.700† | — | — | 3.400† | — | — | — | — | — |
| 17 | 72 | 4.235 | — | — | 1.854† | 2.225† | 2.781† | 3.708† | 4.450† | 5.563† | — | — | — | — |
| 16 | 68 | 4.250 | — | — | — | — | 2.625† | — | — | 5.250† | — | — | — | — |
| 15 | 64 | 4.267 | — | 1.234† | 1.646† | 1.975† | 2.469 | 3.292† | 3.950† | 4.938 | 6.583† | — | 9.875 | — |
| 14 | 60 | 4.286 | .771† | 1.156† | 1.542† | 1.850 | 2.313 | 3.083 | 3.700 | 4.625 | 6.167 | 7.400 | 9.250 | 12.333† |
| 13 | 56 | 4.308 | — | 1.078† | 1.438† | — | 2.156† | 2.875† | — | 4.313† | — | — | — | — |
| 12 | 52 | 4.333 | .667† | 1.000† | — | — | 2.000† | — | — | 4.000† | — | — | — | — |
| 15 | 65 | 4.333 | — | — | — | — | — | — | 4.000† | — | — | — | — | — |
| 18 | 78 | 4.333 | — | — | — | — | — | 4.000† | — | — | — | — | — | — |
| 11 | 48 | 4.364 | .615† | .922† | 1.229† | 1.500† | 1.875† | 2.500† | 3.000† | 3.750† | 5.000† | — | 7.500† | 10.000† |
| 16 | 70 | 4.375 | — | 1.344† | 1.792† | 2.150 | — | — | 4.300 | — | — | 8.600 | — | — |
| 15 | 66 | 4.400 | .844† | — | 1.688† | — | — | 3.375 | — | — | 6.750 | — | — | — |
| 17 | 75 | 4.412 | — | — | — | 2.300† | — | — | 4.600† | — | — | — | — | — |
| 19 | 84 | 4.421 | — | — | 2.146† | 2.575† | 3.219† | 4.292† | 5.150† | 6.438† | — | — | — | — |
| 18 | 80 | 4,444 | 1.021† | 1.531† | — | 2.450 | 3.063 | — | 4.900 | 6.125 | — | 9.800 | 12.250 | — |
| 17 | 76 | 4.471 | — | — | — | — | — | — | — | 5.813† | — | — | — | — |
| 12 | 54 | 4.500 | .688† | — | 1.375† | — | 2.063† | 2.750 | 3.300† | 4.125† | 5.500 | — | 8.250† | 11.000† |
| 16 | 72 | 4.500 | .917† | 1.375† | 1.833† | 2.200† | 2.750 | 3.667 | 4.400† | 5.500 | 7.333 | — | 11.000 | 14.667† |
| 15 | 68 | 4.533 | — | — | — | — | 2.594† | — | — | 5.188† | — | — | — | — |
| 11 | 50 | 4.545 | — | .953† | — | 1.550† | — | — | 3.100† | — | — | 6.200† | — | — |
| 14 | 64 | 4.571 | — | 1.219† | 1.625† | 1.950† | 2.438 | 3.250† | 3.900† | 4.875 | 6.500† | — | 9.750 | — |
| 12 | 55 | 4.583 | — | — | — | 1.675† | — | — | 3.350 | — | — | 6.700† | — | — |
| 17 | 78 | 4.588 | — | — | — | — | — | 3.958† | — | — | — | — | — | — |
| 13 | 60 | 4.615 | — | 1.141† | 1.521† | 1.825† | 2.281† | 3.042 | 3.650† | 4.563† | — | — | — | — |

† = 14 1/2° only  * = 20° only.

F

**4.643-7.000 RATIO** Table No. 1

## RATIO AND CENTER DISTANCE — SPUR GEARS

| GEAR COMBINATIONS No. Teeth | | RATIO | CENTER DISTANCE Diametral Pitch | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driver | Driven | | 48 | 32 | 24 | 20 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| 14 | 65 | 4.643 | — | — | — | — | — | — | 3.950† | — | — | — | — | — |
| 12 | 56 | 4.667 | .708† | 1.063† | 1.417† | — | 2.125 | 2.833† | — | 4.250 | — | — | 8.500 | — |
| 15 | 70 | 4.667 | — | 1.328† | 1.771† | 2.125 | — | — | 4.250 | — | — | 8.500 | — | — |
| 18 | 84 | 4.667 | 1.063† | — | 2.125† | 2.550 | 3.188† | 4.250 | 5.100† | 6.375† | 8.500 | — | 12.750† | 17.000† |
| 16 | 75 | 4.688 | — | 1.422† | — | 2.275† | — | — | 4.550† | — | — | — | — | — |
| 17 | 80 | 4.706 | — | — | — | 2.425† | 3.031† | — | 4.850† | 6.063† | — | — | — | — |
| 14 | 66 | 4.714 | .833† | — | 1.667† | — | — | 3.333 | — | — | 6.667 | — | — | — |
| 11 | 52 | 4.727 | .656† | .984† | — | — | 2.000† | — | — | 4.000† | — | — | — | — |
| 16 | 76 | 4.750 | — | — | — | — | — | — | — | 5.750† | — | — | — | — |
| 15 | 72 | 4.800 | .906† | 1.359† | 1.813† | 2.175† | 2.719 | 3.625 | 4.350† | 5.438 | 7.250 | — | 10.875 | 14.500† |
| 14 | 68 | 4.857 | — | — | — | — | 2.563† | — | — | 5.125† | — | — | — | — |
| 16 | 78 | 4.875 | — | — | — | — | — | 3.916† | — | — | — | — | — | — |
| 11 | 54 | 4.909 | .677† | — | 1.354† | — | 2.063† | 2.750† | 3.300† | 4.125† | 5.500† | — | 8.250† | 11.000† |
| 13 | 64 | 4.923 | — | 1.203† | 1.604† | 1.925† | 2.406† | 3.208† | 3.850† | 4.813† | — | — | — | — |
| 17 | 84 | 4.941 | — | — | 2.104† | 2.525† | 3.156† | 4.208† | 5.050† | 6.313† | — | — | — | — |
| 11 | 55 | 5.000 | — | — | — | 1.675† | — | — | 3.350† | — | — | 6.700† | — | — |
| 12 | 60 | 5.000 | .750† | 1.125† | 1.500† | 1.800 | 2.250 | 3.000 | 3.600 | 4.500 | 6.000 | 7.200 | 9.000 | 12.000† |
| 13 | 65 | 5.000 | — | — | — | — | — | — | 3.900† | — | — | — | — | — |
| 14 | 70 | 5.000 | — | 1.313† | 1.750† | 2.100 | — | — | 4.200 | — | — | 8.400 | — | — |
| 15 | 75 | 5.000 | — | 1.406† | — | 2.250† | — | — | 4.500† | — | — | — | — | — |
| 16 | 80 | 5.000 | 1.000† | 1.500† | — | 2.400 | 3.000 | — | 4.800 | 6.000 | — | 9.600 | 12.000 | — |
| 15 | 76 | 5.067 | — | — | — | — | — | — | — | 5.688† | — | — | — | — |
| 13 | 66 | 5.077 | — | — | 1.646† | — | — | 3.292 | — | — | — | — | — | — |
| 11 | 56 | 5.091 | .698† | 1.047† | 1.396† | — | 2.125† | 2.833† | — | 4.250† | — | — | 8.500† | — |
| 14 | 72 | 5.143 | .896† | 1.344† | 1.792† | 2.150† | 2.688 | 3.583 | 4.300† | 5.375 | 7.167 | — | 10.750 | 14.333† |
| 15 | 78 | 5.200 | — | — | — | — | — | 3.875† | — | — | — | — | — | — |
| 13 | 68 | 5.231 | — | — | — | — | 2.531† | — | — | 5.063† | — | — | — | — |
| 16 | 84 | 5.250 | 1.042† | — | 2.083† | 2.500 | 3.125† | 4.167 | 5.000† | 6.250† | 8.333 | — | 12.500† | 16.667† |
| 12 | 64 | 5.333 | — | 1.188† | 1.583† | 1.900† | 2.375 | 3.167† | 3.800† | 4.750 | 6.333† | — | 9.500 | — |
| 15 | 80 | 5.333 | .990† | 1.484† | — | 2.375 | 2.969 | — | 4.750 | 5.938 | — | 9.500 | 11.875 | — |
| 14 | 75 | 5.357 | — | 1.391† | — | 2.225† | — | — | 4.450† | — | — | — | — | — |
| 13 | 70 | 5.385 | — | 1.297† | 1.729† | 2.075† | — | — | 4.150† | — | — | — | — | — |
| 12 | 65 | 5.417 | — | — | — | — | — | — | 3.850† | — | — | — | — | — |
| 14 | 76 | 5.429 | — | — | — | — | — | — | — | 5.625† | — | — | — | — |
| 11 | 60 | 5.455 | .740† | 1.109† | 1.479† | 1.800† | 2.250† | 3.000† | 3.600† | 4.500† | 6.000† | 7.200† | 9.000† | 12.000† |
| 12 | 66 | 5.500 | .813† | — | 1.625† | — | — | 3.250 | — | — | 6.500 | — | — | — |
| 13 | 72 | 5.538 | — | 1.328† | 1.771† | 2.125† | 2.656† | 3.542 | 4.250† | 5.313† | — | — | — | — |
| 14 | 78 | 5.571 | — | — | — | — | — | 3.833† | — | — | — | — | — | — |
| 15 | 84 | 5.600 | 1.031† | — | 2.063† | 2.475† | 3.094† | 4.125 | 4.950† | 6.188† | 8.250 | — | 12.375† | 16.500† |
| 12 | 68 | 5.667 | — | — | — | — | 2.500† | — | — | 5.000† | — | — | — | — |
| 14 | 80 | 5.714 | .979† | 1.469† | — | 2.350 | 2.938 | — | 4.700 | 5.875 | — | 9.400 | 11.750 | — |
| 13 | 75 | 5.769 | — | 1.375† | — | 2.200† | — | — | 4.400† | — | — | — | — | — |
| 11 | 64 | 5.818 | — | 1.172† | 1.563† | 1.900† | 2.375† | 3.167† | 3.800† | 4.750† | 6.333† | — | 9.500† | — |
| 12 | 70 | 5.833 | — | 1.281† | 1.708† | 2.050 | — | — | 4.100 | — | — | 8.200 | — | — |
| 13 | 76 | 5.846 | — | — | — | — | — | — | — | 5.563† | — | — | — | — |
| 11 | 65 | 5.909 | — | — | — | — | — | — | 3.800† | — | — | — | — | — |
| 11 | 66 | 6.000 | .802† | — | 1.604† | — | — | 3.250† | — | — | 6.500† | — | — | — |
| 12 | 72 | 6.000 | .875† | 1.313† | 1.750† | 2.100† | 2.625 | 3.500 | 4.200† | 5.250 | 7.000 | — | 10.500 | 14.000† |
| 13 | 78 | 6.000 | — | — | — | — | — | 3.792† | — | — | — | — | — | — |
| 14 | 84 | 6.000 | 1.021† | — | 2.042† | 2.450 | 3.063† | 4.083 | 4.900† | 6.125† | 8.167 | — | 12.250† | 16.333† |
| 13 | 80 | 6.154 | — | 1.453† | — | 2.325† | 2.906† | — | 4.650† | 5.813† | — | — | — | — |
| 11 | 68 | 6.182 | — | — | — | — | 2.500† | — | — | 5.000† | — | — | — | — |
| 12 | 75 | 6.250 | — | 1.359† | — | 2.175† | — | — | 4.350† | — | — | — | — | — |
| 12 | 76 | 6.333 | — | — | — | — | — | — | — | 5.500† | — | — | — | — |
| 11 | 70 | 6.364 | — | 1.266† | 1.688† | 2.050† | — | — | 4.100† | — | — | 8.200† | — | — |
| 13 | 84 | 6.462 | — | — | 2.021† | 2.425† | 3.031† | 4.042 | 4.850† | 6.063† | — | — | — | — |
| 12 | 78 | 6.500 | — | — | — | — | — | 3.750† | — | — | — | — | — | — |
| 11 | 72 | 6.545 | .865† | 1.297† | 1.729† | 2.100† | 2.625† | 3.500† | 4.200† | 5.250† | 7.000† | — | 10.500† | 14.000† |
| 12 | 80 | 6.667 | .958† | 1.438† | — | 2.300 | 2.875 | — | 4.600 | 5.750 | — | 9.200 | 11.500 | — |
| 11 | 75 | 6.818 | — | 1.344† | — | 2.175† | — | — | 4.350† | — | — | — | — | — |
| 11 | 76 | 6.909 | — | — | — | — | — | — | — | 5.500† | — | — | — | — |
| 12 | 84 | 7.000 | 1.000† | — | 2.000† | 2.400 | 3.000† | 4.000 | 4.800† | 6.000† | 8.000 | — | 12.000† | 16.000† |

† = 14 1/2° only * = 20° only.

**WARNING** See Table No. 2, Page F-49 for Minimum Recommended Gear Sizes.

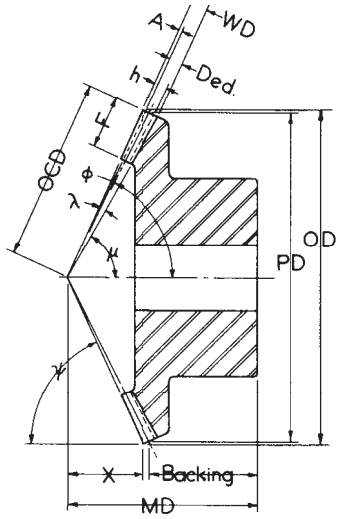
F

## BEVEL AND MITER GEARS

**BROWNING®** Bevel and Miter Gears are generated with the Coniflex* straight tooth form which permits slight adjustment of Gears in assembly and deflection under load. This helps provide even distribution of tooth load, longer life and quieter operation.

Bevel and Miter Gears are used for power transmission between intersecting shafts at 90° and are recommended for low speed, high torque applications where pitch line velocity does not exceed 1000 FPM. Bevel Gears have a ratio range from 1 1/2:1 to 6:1. Miter Gears are 1:1 ratio.

Bevel Gear sets of different ratios are not interchangeable and must be used in pairs as shown in the Rating Table.




## RULES AND FORMULAE FOR BEVEL AND MITER GEARS (Gleason* System)

| TO OBTAIN | FORMULA | |
|---|---|---|
| | PINION (p) | GEAR (G) |
| Pitch Diameter (PD) | $PD_p = \frac{\dagger}{p}$ | $PD_G = \frac{T}{P}$ |
| Tangent of Pitch Angle (Ø) | $\tan \varnothing_p = \frac{\dagger}{T}$ or $\varnothing_p = 90° - \varnothing_G$ | $\tan \varnothing_G = \frac{T}{\dagger}$ or $\varnothing_G = 90° - \varnothing_p$ |
| Outer Cone Distance (OCD) | $OCD = \frac{PD}{2 \sin \varnothing}$ | |
| Addendum (A) | $A_p = h - A_G$ | $A_G = \frac{.54}{P} + \frac{.46}{P (T/\dagger)^2}$ |
| Working Depth (h) | $h = \frac{2}{P}$ | |
| Outside Diameter (OD) | $OD_p = PD_p + 2A_p \cos \varnothing_p$ | $OD_G = PD_G + 2A_G \cos \varnothing_G$ |

| TO OBTAIN | FORMULA | |
|---|---|---|
| | PINION (p) | GEAR (g) |
| Pitch Apex to Crown (X) | $X_p = \frac{PD_G}{2} - A_p \sin \varnothing_p$ | $X_G = \frac{PD_p}{2} - A_G \sin \varnothing_G$ |
| * Whole Depth (WD) | $WD = \frac{2.188}{P}$ | |
| Dedendum (Ded) | $Ded_p = WD - A_p$ | $Ded_G = WD - A_G$ |
| Face Angle ($\psi$) | $\psi_p = \varnothing_p + \lambda_G$ | $\psi_G = \varnothing_G + \lambda_p$ |
| Dedendum Angle ($\lambda$) | $\lambda_p = \tan^{-1} \frac{Ded_p}{X \text{ OCD}}$ | $\lambda_G = \tan^{-1} \frac{Ded_G}{X \text{ OCD}}$ |
| Root Angle ($\mu$) | $\mu_p = \varnothing - \lambda_p$ | $\mu_G = \varnothing - \lambda_G$ |
| Mounting Distance (MD) | $MD = \frac{PD_G}{2}$ + backing | $MD = \frac{PD_p}{2}$ + backing |
| Desired Face (F) | $F = (.3)\ OCD$ | |

Where: † = No. teeth of Pinion & T = No. teeth of Gear
P = Diametral Pitch & PD = Pitch Diameter
*The actual whole depth is .002 greater than calculated

### EXAMPLE — Bevel Gear

A right angle drive is required for a 3 HP, 600 RPM pinion shaft. The desired driven speed is 300 RPM. The mounting distance of the pinion must be 4 3/4". The drive is to operate 8 hours a day, under heavy shock load and lubricated by grease. Driving shaft is 1 1/8", 1/4" x 1/8" Keyway. Driven shaft is 1 3/8", 5/16" X 5/32" Keyway.

A. Overload Service Factor, Tables 2 & 3, Page F-48 8-10 Hours operation—Heavy Shock = 1.4
Grease = .4
Service Factor = 1.8

B. Required Horsepower: 1.8 x 3 = 5.4

C. Ratio = $\frac{600}{300}$ = 2

D. Look For 5.4 H.P. and 2 ratio at the 600 R.P.M. column on Page F-49. A 6 Pitch Bevel Gear Set gives 5.74 H.P.

E. Check mounting distance and bore, Page F-44. MD = 4.750 for pinion, 1 1/8 bore with Keyway available.

F. List Drive Components
1, YSB6B36-20 (Rebore to 1 3/8", 5/16" x 5/32" Keyway)
1, YSB6F18-20 x 1 1/8", 1/4" x 1/8" Keyway.

The same basic procedure is used to select Miter Gear drives. For higher Horsepower capacities see Hardened Miter Gears.

* Coniflex and Gleason are believed to be the trademarks and/or trade names of The Gleason Works Corporation, and are not owned or controlled by Emerson Power Transmission.

**Table No. 1**

## Ratings for Unhardened Steel Bevel Gears

| Part* Number | Pitch | Ratio | No. Teeth | Mounting Distance | HORSEPOWER AT PINION R.P.M. 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **YSB20B20-20** | 20 | 2 | 20 | .688 | .007 | .01 | .03 | .04 | .07 | .10 | .13 | .18 |
| **YSB20B10-20** | | | 10 | .750 | | | | | | | | |
| **YSB16B24-15** | 16 | 1.5 | 24 | 1.188 | .02 | .05 | .09 | .12 | .23 | .30 | .38 | .49 |
| **YSB16B16-15** | | | 16 | 1.250 | | | | | | | | |
| **YSB16B24-20** | 16 | 2 | 24 | 1.000 | .01 | .02 | .05 | .06 | .12 | .16 | .20 | .27 |
| **YSB16B12-20** | | | 12 | 1.125 | | | | | | | | |
| **YSB16B32-20** | 16 | 2 | 32 | 1.188 | .03 | .06 | .12 | .17 | .31 | .41 | .51 | .67 |
| **YSB16B16-20** | | | 16 | 1.500 | | | | | | | | |
| **YSB16B48-30** | 16 | 3 | 48 | 1.313 | .04 | .08 | .15 | .22 | .39 | .53 | .66 | .84 |
| **YSB16B16-30** | | | 16 | 2.000 | | | | | | | | |
| **YSB16B64-40** | 16 | 4 | 64 | 1.375 | .05 | .10 | .18 | .25 | .46 | .62 | .77 | .99 |
| **YSB16B16-40** | | | 16 | 2.500 | | | | | | | | |
| **YSB16B96-60** | 16 | 6 | 96 | 1.688 | .06 | .13 | .24 | .34 | .61 | .83 | 1.02 | 1.31 |
| **YSB16B16-60** | | | 16 | 3.750 | | | | | | | | |
| **YSB14B28-20** | 14 | 2 | 28 | 1.375 | .04 | .07 | .13 | .18 | .33 | .43 | .57 | .71 |
| **YSB14B14-20** | | | 14 | 1.625 | | | | | | | | |
| **YSB12B27-15** | 12 | 1.5 | 27 | 1.750 | .08 | .15 | .30 | .40 | .69 | .91 | 1.10 | 1.36 |
| **YSB12B18-15** | | | 18 | 1.875 | | | | | | | | |
| **YSB12B36-20** | 12 | 2 | 36 | 1.875 | .10 | .19 | .36 | .51 | .89 | 1.18 | 1.43 | 1.77 |
| **YSB12B18-20** | | | 18 | 2.375 | | | | | | | | |
| **YSBF12B36-20** | 12 | 2 | 36 | 1.500 | .09 | .17 | .32 | .46 | .80 | 1.06 | 1.28 | 1.58 |
| **YSBF12B18-20** | | | 18 | 2.250 | | | | | | | | |
| **YSB12B48-20** | 12 | 2 | 48 | 2.000 | .16 | .32 | .59 | .83 | 1.40 | 1.80 | 2.12 | 2.55 |
| **YSB12B24-20** | | | 24 | 2.875 | | | | | | | | |
| **YSB12B54-30** | 12 | 3 | 54 | 1.750 | .12 | .23 | .44 | .62 | 1.07 | 1.42 | 1.71 | 2.11 |
| **YSB12B18-30** | | | 18 | 3.000 | | | | | | | | |
| **YSB12B72-40** | 12 | 4 | 72 | 2.000 | .12 | .24 | .46 | .66 | 1.13 | 1.49 | 1.79 | 2.22 |
| **YSB12B18-40** | | | 18 | 3.750 | | | | | | | | |
| **YSB12B72-60** | 12 | 6 | 72 | 1.750 | .08 | .16 | .31 | .43 | .79 | 1.07 | 1.32 | 1.69 |
| **YSB12B12-60** | | | 12 | 3.750 | | | | | | | | |
| **YSB10B30-15** | 10 | 1.5 | 30 | 2.250 | .17 | .33 | .61 | .87 | 1.46 | 1.88 | 2.22 | 2.69 |
| **YSB10B20-15** | | | 20 | 2.500 | | | | | | | | |
| **YSB10B40-20** | 10 | 2 | 40 | 2.500 | .21 | .42 | .77 | 1.04 | 1.83 | 2.37 | 2.79 | 3.38 |
| **YSB10B20-20** | | | 20 | 3.125 | | | | | | | | |
| **YSB10B50-20** | 10 | 2 | 50 | 2.625 | .29 | .58 | 1.05 | 1.45 | 2.38 | 3.00 | 3.47 | — |
| **YSB10B25-20** | | | 25 | 3.375 | | | | | | | | |
| **YSB10B60-30** | 10 | 3 | 60 | 2.750 | .25 | .50 | .91 | 1.29 | 2.15 | 2.77 | 3.26 | 3.93 |
| **YSB10B20-30** | | | 20 | 4.375 | | | | | | | | |
| **YSB10B60-40** | 10 | 4 | 60 | 2.250 | .16 | .32 | .60 | .85 | 1.47 | 1.94 | 2.34 | 2.90 |
| **YSB10B15-40** | | | 15 | 3.875 | | | | | | | | |
| **YSB10B90-60** | 10 | 6 | 90 | 2.500 | .20 | .40 | .76 | 1.08 | 1.86 | 2.45 | 2.95 | 3.36 |
| **YSB10B15-60** | | | 15 | 5.500 | | | | | | | | |
| **YSB8B40-20** | 8 | 2 | 40 | 2.875 | .38 | .76 | 1.38 | 1.92 | 3.15 | 3.97 | 4.61 | — |
| **YSB8B20-20** | | | 20 | 4.000 | | | | | | | | |
| **YSB8B48-30** | 8 | 3 | 48 | 2.375 | .30 | .60 | 1.12 | 1.60 | 2.63 | 3.39 | 3.99 | 4.82 |
| **YSB8B16-30** | | | 16 | 4.250 | | | | | | | | |
| **YSB8B64-40** | 8 | 4 | 64 | 2.750 | .32 | .64 | 1.18 | 1.66 | 2.78 | 3.57 | 4.19 | 5.05 |
| **YSB8B16-40** | | | 16 | 5.250 | | | | | | | | |
| **YSB8B72-40** | 8 | 4 | 72 | 3.250 | .52 | 1.04 | 1.88 | 2.57 | 4.39 | 5.58 | 6.50 | 7.77 |
| **YSB8B18-40** | | | 18 | 5.750 | | | | | | | | |
| **YSB6B36-20** | 6 | 2 | 36 | 3.500 | .72 | 1.44 | 2.65 | 3.60 | 5.74 | 7.15 | 8.24 | — |
| **YSB6B18-20** | | | 18 | 4.750 | | | | | | | | |
| **YSB6B42-20** | 6 | 2 | 42 | 3.750 | .90 | 1.80 | 3.26 | 4.37 | 6.82 | 8.34 | — | — |
| **YSB6B21-20** | | | 21 | 5.000 | | | | | | | | |
| **YSB6B48-20** | 6 | 2 | 48 | 3.438 | 1.16 | 2.32 | 4.17 | 5.53 | 8.43 | 10.16 | — | — |
| **YSB6B24-20** | | | 24 | 5.438 | | | | | | | | |
| **YSB6B45-30** | 6 | 3 | 45 | 3.000 | .62 | 1.23 | 2.23 | 3.10 | 4.08 | 6.40 | 7.42 | — |
| **YSB6B15-30** | | | 15 | 5.250 | | | | | | | | |
| **YSB6B60-40** | 6 | 4 | 60 | 3.250 | .72 | 1.45 | 2.62 | 3.63 | 5.91 | 7.45 | 8.63 | — |
| **YSB6B15-40** | | | 15 | 6.750 | | | | | | | | |

***Part Numbers shown are for Minimum Bore Gears; Ratings shown also apply for Finished Bore Gears of same pitch and number of teeth.**

F

**Table No. 1** **Ratings for Unhardened Steel Bevel Gears**

| Part* Number | Pitch | Ratio | No. Teeth | Mounting Distance | HORSEPOWER AT PINION R.P.M. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
| **YSB5B30-20** | 5 | 2 | 30 | 3.500 | .81 | 1.61 | 2.94 | 4.00 | 6.37 | 7.94 | 9.13 | — |
| **YSB5B15-20** | | | 15 | 4.375 | | | | | | | | |
| **YSB5B45-30** | 5 | 3 | 45 | 3.750 | 1.05 | 2.10 | 3.83 | 5.20 | 8.28 | 10.29 | 11.82 | — |
| **YSB5B15-30** | | | 15 | 5.875 | | | | | | | | |
| **YSB5B60-40** | 5 | 4 | 60 | 3.750 | 1.37 | 2.74 | 5.01 | 6.81 | 10.84 | 13.46 | 15.46 | — |
| **YSB5B15-40** | | | 15 | 7.500 | | | | | | | | |
| **YSB4B32-20** | 4 | 2 | 32 | 4.250 | 1.76 | 3.52 | 6.31 | 8.37 | 12.82 | 15.50 | — | — |
| **YSB4B16-20** | | | 16 | 6.000 | | | | | | | | |
| **YSB4B42-30** | 4 | 3 | 42 | 4.000 | 1.58 | 3.15 | 5.69 | 7.62 | 11.90 | 14.53 | — | — |
| **YSB4B14-30** | | | 14 | 7.250 | | | | | | | | |
| **YSB4B56-40** | 4 | 4 | 56 | 4.250 | 1.92 | 3.84 | 6.94 | 9.29 | 14.46 | 17.65 | — | — |
| **YSB4B14-40** | | | 14 | 9.000 | | | | | | | | |
| **YSB3B30-20** | 3 | 2 | 30 | 5.500 | 3.81 | 7.61 | 12.64 | 16.76 | 24.62 | — | — | — |
| **YSB3B15-20** | | | 15 | 7.250 | | | | | | | | |

***Part Numbers shown are for Minimum Bore Gears; Ratings shown also apply for Finished Bore Gears of same pitch and number of teeth.**

**Table No. 2** **Ratings for Unhardened Steel Miter Gears**

| Part* Number | Pitch | No. Teeth | Mounting Distance | HORSEPOWER AT PINION R.P.M. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
| **YSM24B24** | 24 | 24 | .906 | — | — | .005 | .01 | .01 | .02 | .02 | .03 |
| **YSM20B12** | 20 | 12 | .671 | — | .01 | .02 | .02 | .04 | .06 | .08 | .11 |
| **YSM16B12** | 16 | 12 | .813 | .01 | .02 | .04 | .05 | .09 | .13 | .16 | .21 |
| **YSM16B16** | 16 | 16 | 1.063 | .02 | .04 | .08 | .11 | .20 | .26 | .33 | .42 |
| **YSM16B20** | 16 | 20 | 1.250 | .03 | .07 | .13 | .18 | .31 | .42 | .51 | .64 |
| **YSM16B24** | 16 | 24 | 1.375 | .05 | .09 | .18 | .25 | .43 | .57 | .69 | .85 |
| **YSM14B14** | 14 | 14 | 1.063 | .02 | .04 | .07 | .10 | .19 | .25 | .31 | .40 |
| **YSM12B15** | 12 | 15 | 1.250 | .04 | .08 | .15 | .21 | .38 | .50 | .61 | .77 |
| **YSM12B18** | 12 | 18 | 1.500 | .06 | .12 | .22 | .32 | .54 | .72 | .86 | 1.07 |
| **YSM12B21** | 12 | 21 | 1.750 | .09 | .17 | .32 | .46 | .78 | 1.02 | 1.22 | 1.49 |
| **YSM12B24** | 12 | 24 | 1.875 | .11 | .23 | .42 | .59 | .98 | 1.26 | 1.49 | 1.79 |
| **YSM12B30** | 12 | 30 | 2.313 | .19 | .37 | .68 | .84 | 1.52 | 1.92 | 2.23 | 2.62 |
| **YSM10B20** | 10 | 20 | 2.000 | .13 | .26 | .48 | .68 | 1.14 | 1.47 | 1.73 | 2.09 |
| **YSM10B25** | 10 | 25 | 2.438 | .22 | .43 | .78 | 1.08 | 1.77 | 2.23 | 2.58 | 3.04 |
| **YSM8B24** | 8 | 24 | 2.563 ▲ | .36 | .73 | 1.32 | 1.79 | 2.85 | 3.54 | 4.06 | 4.68 |
| **YSM8B28** | 8 | 28 | 3.250 | .51 | 1.01 | 1.82 | 2.44 | 3.81 | 4.64 | 5.27 | 6.04 |
| **YSM8B32** | 8 | 32 | 3.625 | .66 | 1.32 | 2.36 | 3.14 | 4.77 | 5.75 | 6.44 | 7.26 |
| **YSM6B24** | 6 | 24 | 3.625 | .83 | 1.66 | 2.96 | 3.93 | 5.97 | 7.20 | 8.08 | 9.10 |
| **YSM6B27** | 6 | 27 | 4.125 | 1.07 | 2.13 | 3.72 | 4.99 | 7.36 | 8.77 | 9.72 | 10.88 |
| **YSM5B25** | 5 | 25 | 4.625 | 1.56 | 3.13 | 5.44 | 7.02 | 10.30 | 12.18 | 13.46 | 14.97 |
| **YSM4B24** | 4 | 24 | 5.500 | 2.76 | 5.52 | 9.04 | 11.72 | 15.33 | 16.66 | 19.29 | 23.03 |
| **YSM4B28** | 4 | 28 | 6.000 | 3.51 | 7.00 | 11.57 | 14.70 | 20.26 | 23.23 | 24.95 | 27.10 |

***Part Numbers shown are for Minimum Bore Gears; Ratings shown also apply for Finished Bore Gears of same pitch and number of teeth.**
**▲YSM8F24 Finished Bore Gears have 2.750" Mounting Distance.**

**Table No. 3** **Ratings for Hardened Steel Miter Gears**

| Part Number | Pitch | No. Teeth | Mounting Distance | HORSEPOWER AT PINION R.P.M. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
| **YSM16F16H** | 16 | 16 | 1.063 | .03 | .07 | .12 | .17 | .30 | .41 | .51 | .66 |
| **YSM12F15H** | 12 | 15 | 1.250 | .06 | .12 | .24 | .33 | .59 | .78 | .96 | 1.21 |
| **YSM12F18H** | 12 | 18 | 1.500 | .09 | .18 | .35 | .49 | .85 | 1.23 | 1.35 | 1.67 |
| **YSM12F21H** | 12 | 21 | 1.750 | .13 | .27 | .50 | .72 | 1.22 | 1.60 | 1.90 | 2.32 |
| **YSM12F30H** | 12 | 30 | 2.313 | .29 | .58 | 1.06 | 1.46 | 2.38 | 3.01 | 3.49 | 4.10 |
| **YSM10F20H** | 10 | 20 | 2.000 | .21 | .41 | .75 | 1.07 | 1.79 | 2.30 | 2.70 | 3.26 |
| **YSM10F25H** | 10 | 25 | 2.438 | .34 | .68 | 1.22 | 1.69 | 2.77 | 3.49 | 4.04 | 4.76 |
| **YSM8F24H** | 8 | 24 | 2.563 ▲ | .57 | 1.13 | 2.06 | 2.80 | 4.45 | 5.52 | 6.34 | 7.32 |
| **YSM8F28H** | 8 | 28 | 3.250 | .80 | 1.58 | 2.85 | 3.82 | 5.96 | 7.25 | 8.23 | 9.44 |
| **YSM8F32H** | 8 | 32 | 3.625 | 1.03 | 2.06 | 3.69 | 4.90 | 7.46 | 8.98 | 10.06 | 11.35 |
| **YSM6F24H** | 6 | 24 | 3.625 | 1.30 | 2.59 | 4.63 | 6.13 | 9.33 | 11.25 | 12.62 | 14.23 |
| **YSM5F25H** | 5 | 25 | 4.625 | 2.44 | 4.88 | 8.50 | 10.98 | 16.10 | 19.04 | 21.04 | 23.40 |
| **YSM4F24H** | 4 | 24 | 5.500 | 4.31 | 8.62 | 14.12 | 18.31 | 23.95 | 26.04 | 30.14 | 35.99 |

**▲Mounting Distance shown is for 3/4" Bore Only ; Gears with 1" and 1 1/4" Bores have Mounting Distance of 2.750".**
**Ratings below Heavy Line are not recommended as Pitch Line Velocity exceeds 1000 feet per minute.**

F

Spiral Bevel and Miter Gears have continuous pitch line contact and therefore run more smoothly and quietly than straight tooth gears. They must be run in sets of mating gears with opposite hand spiral. In Browning® stock spiral gear sets the pinion has left hand spiral and the gear has right hand spiral.

**Table No. 1**

## Ratings for Hardened Steel Spiral Bevel Gears

| Part No. | Pitch | Ratio | No. Teeth | Mounting Dimension | HORSEPOWER AT PINION R.P.M. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
| **YSBS14F32RH-20** | 14 | 2 | 32 | 1.375 | .12 | .24 | .46 | .70 | 1.33 | 1.99 | 2.65 | 3.76 |
| **YSBS14F16LH-20** | | | 16 | 1.625 | | | | | | | | |
| **YSBS10F34RH-20** | 10 | 2 | 34 | 1.875 | .38 | .75 | 1.43 | 2.19 | 4.10 | 6.14 | 8.19 | 12.78 |
| **YSBS10F17LH-20** | | | 17 | 2.375 | | | | | | | | |
| **YSBS8F34RH-20** | 8 | 2 | 34 | 2.500 | .71 | 1.31 | 2.62 | 3.97 | 7.53 | 11.04 | 14.67 | 21.41 |
| **YSBS8F17LH-20** | | | 17 | 3.125 | | | | | | | | |

**Table No. 2**

## Ratings for Hardened Steel Spiral Miter Gears

| Part No. | Pitch | No. Teeth | Mounting Dimension | HORSEPOWER AT VARIOUS R.P.M. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 | 100 | 200 | 300 | 600 | 900 | 1200 | 1800 |
| **YSMS12F15RH YSMS12F15LH** | 12 | 15 | 1.250 | .06 | .13 | .25 | .36 | .68 | 1.02 | 1.35 | 1.98 |
| **YSMS12F18RH YSMS12F18LH** | 12 | 18 | 1.500 | .09 | .18 | .35 | .52 | 1.00 | 1.51 | 1.98 | 2.91 |
| **YSMS10F20RH YSMS10F20LH** | 10 | 20 | 2.000 | .26 | .50 | .97 | 1.47 | 2.36 | 3.48 | 4.59 | 6.67 |
| **YSMS10F25RH YSMS10F25LH** | 10 | 25 | 2.437 | .48 | .87 | 1.67 | 2.51 | 4.83 | 7.06 | 9.29 | 13.75 |
| **YSMS8F28RH YSMS8F28LH** | 8 | 28 | 3.250 | .99 | 2.10 | 4.11 | 6.07 | 11.91 | 13.14 | 17.46 | 25.56 |
| **YSMS7F21RH YSMS7F21LH** | 7 | 21 | 2.750 | .70 | 1.36 | 2.60 | 3.84 | 7.40 | 8.22 | 10.96 | 16.44 |
| **YSMS6F24RH YSMS6F24LH** | 6 | 24 | 3.625 | 1.48 | 2.93 | 5.66 | 8.36 | 12.33 | 18.22 | 23.15 | 35.11 |
| **YSMS5F25RH YSMS5F25LH** | 5 | 25 | 4.625 | 2.80 | 5.44 | 10.83 | 15.64 | 22.56 | 33.39 | 42.86 | 63.61 |

BROWNING® Stock Gears are held to accurate tolerances by rigid quality control. This is made possible by the use of the most modern machinery for manufacturing and constant inspection. Each gear is easily identified by a legible part number marked on the part itself. Gears are rust-proofed and individually packaged. Each carton is clearly labelled with part number and all necessary specifications for identification of the contents, making it unnecessary to open the carton for inspection.

The Browning method of assigning clear and concise Part Numbers to all gear components provides all the essential information for identification:

## SPUR GEARS:

**NSS1624** (Minimum Bore Type)
N = 14 1/2° Pressure Angle
SS = Steel Spur
16 = Diametral Pitch
24 = No. Teeth

**NSS16F24** x 3/4 [Finished Bore Type)
N = 14 1/2° Pressure Angle
SS = Steel Spur
16 = Diametral Pitch
F = Finished Bore
24 = No. Teeth
3/4 = Bore, W/Kw. & S. S.

**NCS16H96** (Bushing Type)
N = 14 1/2° Pressure Angle
CS = Cast Iron Spur
16 = Diametral Pitch
H = H Bushing
96 = No. Teeth

## CHANGE GEARS:

**NCG1696**
N = 14 1/2° Pressure Angle
CG = Change Gear
16 = Diametral Pitch
96 = No. Teeth

## NON-METALLIC GEARS:

**NFS1016**
N = 14 1/2° Pressure Angle
F = Fiber
S = Spur
10 = Diametral Pitch
16 = No. Teeth

## RACK:

**2YSR12 x 3/4**
2 = Two Ft. Length
Y = 20° Pressure Angle
S = Steel
R = Rack
12 = Pitch
3/4 = Thickness

## BEVEL GEARS:

**YSB12F18-20 x 3/4**
Y = 20° Pressure Angle
SB = Steel Bevel
12 = Diametral Pitch
F = Finished Bore
18 = No. Teeth
20 = 2:1 Ratio
3/4 = 3/4 Bore, W/Kw. & S.S.

**YSBF12B36-20**
Y = 20° Pressure Angle
SB = Steel Bevel
F = Short Face Length
12 = Diametral Pitch
B = Min. Bore, No Kw. or S.S.
36 = No. Teeth
20 = 2:1 Ratio

**Y5BS14F32RH-20 x 7/8**
Y = 20° Pressure Angle
SB = Spiral Bevel
S = Steel
14 = Diametral Pitch
F = Finished Bore
32 = No. Teeth
R = Right Hand Spiral or (L -Left Hand Spiral)
H = Hardened Teeth
20 = 2:1 Ratio
7/8 = Bore, W/Kw. and S.S.

## MITER GEARS:

**YSM12F21H x 5/8**
Y = 20° Pressure Angle
SM = Steel Miter
12 = Diametral Pitch
F = Finished Bore
21 = No. Teeth
H = Hardened (No "H" if unhardened)
5/8 = Bore, W/Kw. & S.S.

**YSM12B24**
Y = 20° Pressure Angle
SM = Steel Miter
12 = Diametral Pitch
B = Min. Bore, no Kw. or S.S.
24 = No. Teeth

**YSMS10F2ORH x 3/4**
Y = 20° Pressure Angle
SM = Spiral Miter
S = Steel
10 = Diametral Pitch
F = Finished Bore
20 = No, Teeth
R = Right Hand Spiral or (L -Left Hand Spiral)
H = Hardened Teeth
3/4 = Bore, W/Kw. and S.S.

F