



Tonka

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Transmission

| Gear | Diameter (inch) | Number of teeth | Circular Pitch |
|-------|-----------------|-----------------|----------------|
| One | 5 | 28 | 0.5610 |
| Two | 7 | 38 | 0.5787 |
| Three | 9 | 48 | 0.5890 |

Table 1: Front gear assembly specifications

| Gear | Diameter (inch) | Number of teeth | Circular Pitch |
|-------|-----------------|-----------------|----------------|
| One | 4 | 28 | 0.4488 |
| Two | $3\frac{1}{2}$ | 24 | 0.4581 |
| Three | $3\frac{1}{4}$ | 21 | 0.4862 |
| Four | 3 | 18 | 0.5236 |
| Five | $2\frac{3}{4}$ | 16 | 0.5400 |
| Six | $2\frac{1}{4}$ | 14 | 0.5049 |

Table 2: Rear gear assembly specifications

| Gear | Diameter (inch) | Number of teeth |
|-------|-----------------|-----------------|
| Upper | $1\frac{3}{4}$ | 11 |
| Lower | $1\frac{3}{4}$ | 11 |

Table 3: Derailleur gear assembly specifications

| Front gear | Rear gear | Gear Ratio |
|------------|-----------|------------|
| One | One | 1.0000:1 |
| One | Two | 1.1667:1 |
| One | Three | 1.3333:1 |
| One | Four | 1.5556:1 |
| One | Five | 1.7500:1 |
| One | Six | 2.0000:1 |
| Two | One | 1.3571:1 |
| Two | Two | 1.5833:1 |
| Two | Three | 1.8095:1 |
| Two | Four | 2.1111:1 |
| Two | Five | 2.3750:1 |
| Two | Six | 2.7143:1 |
| Three | One | 1.7143:1 |
| Three | Two | 2.0000:1 |
| Three | Three | 2.2857:1 |
| Three | Four | 2.6667:1 |
| Three | Five | 3.0000:1 |
| Three | Six | 3.4286:1 |

Table 4: All possible gear ratios

Linkages

Bearings