

链条功率选用

Selection of chain drive power

《滚子链传动选择指导》(GB/T 18150—2006 / ISO 10823:2004)标准已经公布。标准规定考虑链条实际传递功率时,应对主动链轮所传递的功率(即输入功率)进行修正。

实际传递功率(修正功率)=输入功率×工况系数×齿数系数

工况系数见下表所列,齿数系数= $(19/Z_s)^{1.08}$ (Z_s —小链轮齿数)

The standard of "Guidelines for the Selection of Roller Chain Drives"(GB/T 18150-2006 / ISO 10823:2004) had been issued. If you try to calculate the actual transmission power of chain, you must consider revising the transmission power of driving sprocket (input power).

Actual power(Corrected power)=input power×service factor×teeth factor
Service factor is listed in the following table.

Teeth factor = $(19/Z_s)^{1.08}$ (Z_s —tooth number of the small sprocket)

工况系数表 Service factor table

从动机械特性 Driven Mechanism Characteristic	主动机械特性 Driving Mechanism Characteristic		
	平稳运转 Smooth Running	轻微振动 Slight Vibration	中等振动 Medium Vibration
平稳运转 Smooth Running	1.0	1.1	1.3
中等振动 Medium Vibration	1.4	1.5	1.7
严重振动 Severe Vibration	1.8	1.9	2.1

世界各国历史悠久的链条工厂都制定有自己的链传动功率曲线和功率图。GB/T 18150—2006 / ISO 10823:2004标准也建立了特定条件下的功率曲线图,选择链条传动功率或由传动功率选择链条,前提是已知小链轮齿数和转速,链条实际传递的功率在功率曲线图的额定功率范围内,所选择的链条才是合适的。

现以某型农机传动部分和旋耕部分的传递功率,验算链条选择是否合理。

传动部分

小链轮转速 $n_s = 1351$ 转/分

小链轮齿数 $Z_s = 14$

经修正后的实际传递功率 =

10.944马力 = 8.16千瓦

由B系列滚子链功率曲线得知,选择08B-2

滚子链是合适的。

The chain factories with long history in the world have their own chain transmission power rating graph and power diagram. We can refer to the GB/T 18150-2006 / ISO 10823:2004 standard selecting the drive power or selecting chain according to the drive power, the condition is that we should know the tooth number of the small sprocket and its speed. Only if the actual power is within the range of rating power of the power rating graph, the selected chain is suitable.

Now we use the transmission part in walking tractor and the transmission power in rotary tillage to proof whether the chain selection is correct.

Chain drive part

Small sprocket speed $n_s = 1351$ r/min

Tooth number of small sprocket $Z_s = 14$

Actual power (Corrected power) = 10.944hp = 8.16kW

From B series horsepower rating graph, you will find selected 08B-2 chain is suitable.

旋耕部分

小链轮转速 $n_s = 199$ 转/分

小链轮齿数 $Z_s = 13$

经修正后的实际传递功率 =

9.888马力 = 7.37千瓦

由A系列滚子链功率曲线得知,选择12A-2

滚子链是不合适的,选型偏小,正确选用应采用16A-1滚子链或60H-2重载型滚子链。

Ratary tillage chain part

Small sprocket speed $n_s = 199$ r/min

Tooth number of small sprocket $Z_s = 13$

Actual power (Corrected power) = 9.888hp = 7.37kW

From A series horsepower rating graph, you will find selected 12A-2 chain is unsuitable. You should choose 16A-1 or 60H-2 heavy duty roller chain instead of 12A-2.

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功率曲线图 (A系列滚子链)

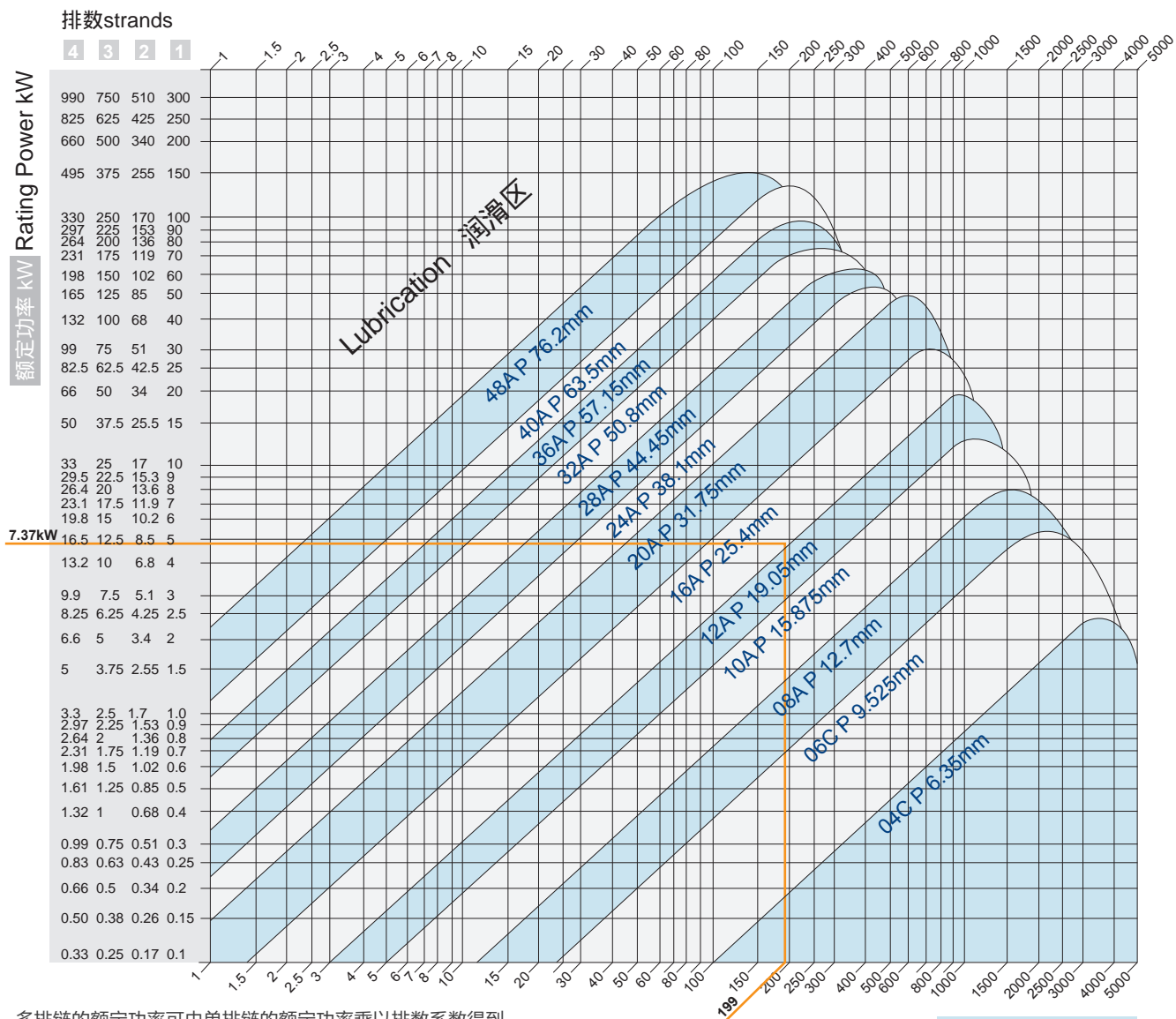
Power rating graph (A series roller chain)

本功率曲线图的特定条件主要是:

The main characteristics of this power graph are as follows:

- △小链轮齿数为19;
- △链条长度为120个节距;
- △传动比从1:3到3:1;
- △链传动的预期使用寿命为15000小时。

- For drive Zs=19
- Chain length: 120 pitches
- Transmission ratio: 1 : 3 to 3 : 1
- Service life of chain: 15000 hours



注: 多排链的额定功率可由单排链的额定功率乘以排数系数得到。
Note: The rating power of multiple strand chain can be obtained by multiplying the strand factor by the rating power of single strand chain.

小链轮转速 (r/min)
Small Sprocket Speed (r/min)

排数系数表 Strand factor table

排数 Number of strand	1	2	3	4	5	6
系数 Factor	1.0	1.7	2.5	3.3	4.1	4.9

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功率曲线图 (B系列滚子链)

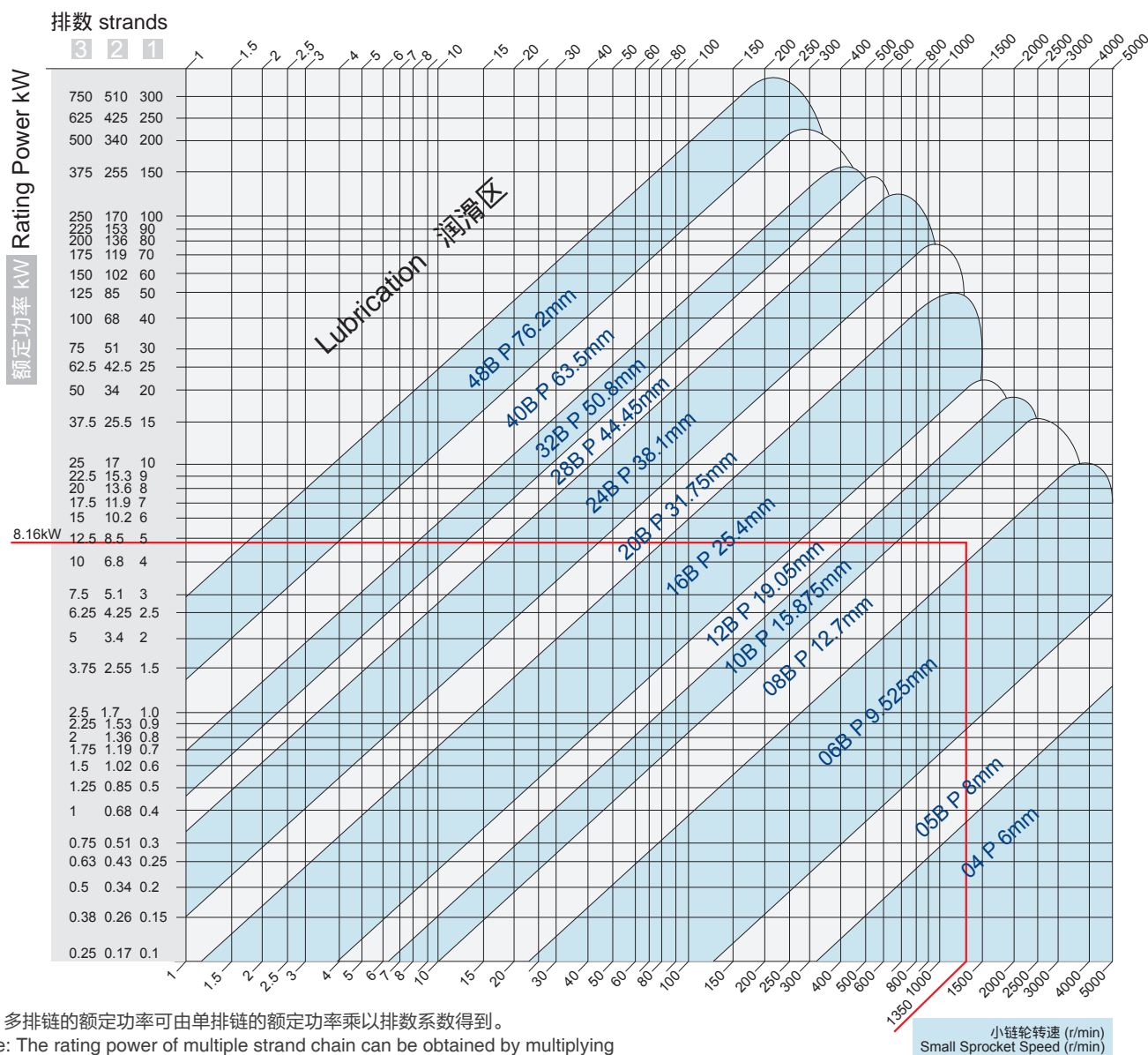
Power rating graph (B series roller chain)

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- △链传动的预期使用寿命为15000小时。

- For drive Zs=19
- Chain length: 120 pitches
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