

链传动维护保养

Maintenance for roller chain drive

■ 滚子链传动的维护保养

由于链传动应用的广泛性，阐明其常规的培养与维修方法是有实用意义的，培养与维修做的越好，链传动的故障就越少，实践表明，使用中如能遵守几条相当简单的培养与维护原则，就可以节约费用，延长使用寿命，充分发挥链传动的工作能力：

- 1.传动的各个链轮应当保持良好的共面性，链条通道应保持畅通；
- 2.链条松边垂度应保持适当。对可调中心距的水平和倾斜传动，链条垂度应保持为中心距的1%~2%左右，对垂直传动或受振动载荷、反向传动及动力制动时，应使链条垂度更小些。经常检查和调整链条松边垂度是链传动培养工作中的重要项目。
- 3.经常保持良好的润滑，这是培养工作中的重要项目。不管采用哪种润滑方式，最重要的能使润滑油脂很及时很均匀地分布到链条铰链的间隙中去。如无必要，尽量不采用粘度较大的重油或润滑脂，因为它们使用一段时间后易与尘土一起堵塞通往铰链摩擦表面的通路（间隙）。应定期将滚子链进行清洗去污，并经常检查润滑效果，必要时应拆开检查销轴和套筒，如摩擦表面呈棕色或暗褐色时，一般是供油不足，润滑不良。
- 4.链条链轮应保持良好的工作状态。
- 5.经常检查链轮轮齿工作表面，如发现磨损过快，及时调整或更换链轮。

滚子链传动故障维修指导

故障症状	可能的原因	维修措施
噪声过大	<ol style="list-style-type: none"> 1. 链轮不对正 2. 松边垂度不合适 3. 润滑不良 4. 链箱或支承松动 5. 链条或链轮磨损严重 6. 链条选型不当，节距过大 7. 链轮齿数太少 	<ol style="list-style-type: none"> 1. 重新对正链轮 2. 适当调整链条松边垂度 3. 改善润滑条件 4. 紧固链箱或支承 5. 更换磨损的链条或链轮 6. 链条重新选型，采用小节距 7. 增加链轮齿数，如不能重新设计
链条跳齿	<ol style="list-style-type: none"> 1. 链条太松，使垂度过大 2. 链条或链轮磨损严重 3. 严重超载 	<ol style="list-style-type: none"> 1. 适当张紧 2. 更换链条或链轮 3. 选用高强度链条，消除过载原因
链条脱不开链轮	<ol style="list-style-type: none"> 1. 链轮不对正 2. 链轮磨损严重 	<ol style="list-style-type: none"> 1. 重新对正链轮 2. 更换链轮
链条死节	<ol style="list-style-type: none"> 1. 链轮不对正 2. 链条铰链中有杂物 3. 润滑不良 4. 载荷过大 5. 链条锈蚀 6. 链板或附件干涉 	<ol style="list-style-type: none"> 1. 重新对正链轮 2. 清除铰链处杂物 3. 改善润滑条件 4. 减小载荷或改用强度适合的链条 5. 改用防锈蚀链条 6. 检查链条是否干涉

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滚子碎裂、 出现裂纹或变形	<ol style="list-style-type: none"> 1. 链条节距过大或链轮齿数太小 2. 链轮齿沟有杂物 3. 链条在链轮齿上爬位过高 4. 链条受冲击过大 	<ol style="list-style-type: none"> 1. 选用小节距链条或增加链轮齿数 2. 清除齿沟杂物或更新链条 3. 更换链条，适当张紧 4. 减小链条冲击
销轴旋转或 链板孔被拉长	<ol style="list-style-type: none"> 1. 链条过载 	<ol style="list-style-type: none"> 1. 消除过载原因，或更换大规格的链条
销轴断裂或链板沿 链板孔连线方向断裂	<ol style="list-style-type: none"> 1. 严重超载 	<ol style="list-style-type: none"> 1. 消除过载原因或重新选用大规格或强度更高的链条；如发现链轮有问题的征兆，必须更换链轮
链板断裂 	<ol style="list-style-type: none"> 1. 载荷大于链条动载承受能力 	<ol style="list-style-type: none"> 1. 选用大节距链条，或减小动态载荷
链板或链轮齿严重侧磨	<ol style="list-style-type: none"> 1. 链轮不共面或链轮端面跳动严重 2. 链轮支承刚度差 3. 链条扭曲严重 	<ol style="list-style-type: none"> 1. 提高加工与安装精度 2. 提高支承件刚度 3. 更换合适链条
外链节外侧擦伤	<ol style="list-style-type: none"> 1. 链条未张紧，发生跳动，从而与邻近物体碰撞 2. 链箱变形或内有杂物 	<ol style="list-style-type: none"> 1. 使链条适当张紧 2. 消除链箱变形，清除杂物
销轴磨损或 销轴与套筒胶合	<ol style="list-style-type: none"> 1. 润滑不良 2. 链条速度过高或载荷过大 	<ol style="list-style-type: none"> 1. 提供适当的润滑系统 2. 降低速度或载荷
链轮齿磨损严重	<ol style="list-style-type: none"> 1. 润滑不良 2. 链轮材质较差，齿面硬度不足 	<ol style="list-style-type: none"> 1. 改善润滑条件 2. 提高链轮材质和齿面硬度
卡簧、开口销等链条 止锁元件松脱	<ol style="list-style-type: none"> 1. 链条抖动过烈 2. 有障碍物磕碰 3. 止锁元件安装不当 	<ol style="list-style-type: none"> 1. 适当张紧或考虑增设导板托板 2. 消除障碍物 3. 改善止锁元件安装质量

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It's very practical to illustrate the conventional maintenance of roller chain drive because of its wide application in industry. Better maintenance, less failure. In practice, only following some simple maintenance principals, we can easily save costs and make its service life longer, and then making the operation more efficient.


1. Each sprocket in the driving system should have good coplanarity and the chain path should always be smooth.
2. The sagging of chain loose side should be suitable and for the adjustable center distance level and angle drive, the sagging should be 1%~2% of the center distance. For conditions of vertical drive and under vibration load, reverse drive and dynamic brake, the sagging should be smaller. It's very important to check and adjust the loose side sagging frequently in the chain drive maintenance.
3. Good lubrication is also very important. Whichever lubrication method you choose, the most important thing is to make the lubricating grease distribute evenly in each chain joint clearance. If not necessary, avoid selecting big viscosity heavy oil or lubricating grease since it will jam the clearances gone to joints friction surface with dust after a period of time. Periodically clean the roller chain and check its lubrication condition frequently. Disassembly the pin and bush, if necessary. If the friction surface is brown or dust color, it may be caused by insufficient lubrication.
4. Chains and sprockets should be always in good condition.
5. Frequently check the working surface of sprocket teeth, adjust or replace it when it's excessively worn.

Troubleshooting Instructions

Failure Symptom	Possible Causes	Actions
Very noisy	<ol style="list-style-type: none"> 1. Unalignment of sprockets 2. Unsuitable loose side sagging 3. Bad lubrication 4. Chain box or bearing loose 5. Excessive wear of chain or sprocket 6. Wrong selection of chain type and too big pitch 7. Too small number of sprocket teeth 	<ol style="list-style-type: none"> 1. Realignment of sprockets 2. Make suitable adjustment of chain loose side sagging 3. Improve lubrication conditions 4. Fasten chain box or bearing 5. Replace worn chains or sprockets. 6. Reselect chain type and adopt smaller pitch 7. Add chain teeth number or redesign it
Chain jumps off from sprocket teeth	<ol style="list-style-type: none"> 1. Chain is very loose which makes the sagging too big. 2. Excessive wear of chain or sprocket 3. Excessive overloading 	<ol style="list-style-type: none"> 1. Make suitable tensioning adjustment 2. Replace the chain or sprocket 3. Select high strength chain to avoid overloading
The chain can't be taken off from the sprocket.	<ol style="list-style-type: none"> 1. Unalignment of sprocket 2. Excessive wear of sprocket 	<ol style="list-style-type: none"> 1. Realignment of sprocket 2. Replace it
Dead link of chain	<ol style="list-style-type: none"> 1. Unalignment of sprocket 2. With foreign bodies in chain joints 3. Bad lubrication 4. Too big load 5. The corrosion of chain 6. The interferences between plates or attachments 	<ol style="list-style-type: none"> 1. Realignment of sprockets 2. Remove the foreign bodies of joints 3. Improve lubrication conditions 4. Reduce the load or adopt suitable chain 5. Choose anticorrosion chain 6. Check the interferences of chain

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Failure Symptom	Possible Causes	Actions
Roller cracked or deformed	<ol style="list-style-type: none"> 1. Too big chain pitch or too small number of sprocket teeth 2. Sprocket teeth have foreign bodies. 3. The chain climbs onto sprocket teeth too high. 4. Excessive chain impact load 	<ol style="list-style-type: none"> 1. Select small pitch chain or add sprocket teeth number 2. Remove all the foreign bodies or replace chain 3. Replace the chain and make appropriate tensioning 4. Reduce the impact of chain
Pin rotates or plate hole drawn long	<ol style="list-style-type: none"> 1. Chain overloaded 	<ol style="list-style-type: none"> 1. Eliminate the overloading causes or adopt large specification chain
Pin broken or plate broken along the hole connecting line direction	<ol style="list-style-type: none"> 1. Excessive overloading 	<ol style="list-style-type: none"> 1. Eliminate the overloading causes or adopt large specification or higher strength chain; if sprocket failure symptom found, replace it
Plates broken 	<ol style="list-style-type: none"> 1. The load above chain dynamic capacity 	<ol style="list-style-type: none"> 1. Selecting big pitch chain or reduce dynamic load
Excessive side-wear of plates or sprocket teeth	<ol style="list-style-type: none"> 1. Sprocket not coplanar or ending beat severely 2. Bad bearing stiffness of sprocket 3. Severe twist of chain 	<ol style="list-style-type: none"> 1. Increase machining and installation precision 2. Increase bearing parts stiffness 3. Replace chain
Outer link outside rubbed	<ol style="list-style-type: none"> 1. Chain not tensioned and jump, then to hit adjacent bodies 2. Chain box deformed or with foreign bodies inside 	<ol style="list-style-type: none"> 1. Make appropriate chain tensioning 2. Eliminate chain box deformation and remove foreign bodies
Pin worn or bush bonded with pin	<ol style="list-style-type: none"> 1. Bad lubrication 2. Chain speed too high or chain overloaded 	<ol style="list-style-type: none"> 1. Supply suitable lubrication system 2. Lower the speed or reduce the load
Excessive wear of sprocket	<ol style="list-style-type: none"> 1. Bad lubrication 2. Inferior material of sprocket and insufficient teeth surface hardness 	<ol style="list-style-type: none"> 1. Improve lubrication conditions 2. Improve sprocket material quality and its teeth surface hardness
Locking parts such as spring clip and cotter pin etc. become loose.	<ol style="list-style-type: none"> 1. Chain wobbling heavily 2. Knock with obstructions 3. Locking parts wrong installed 	<ol style="list-style-type: none"> 1. Make suitable tensioning or consider adding supporting board for guide plate 2. Remove all obstructions 3. Improve the installation quality of locking parts