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Improving Sandvik's Spare Parts Manuals

– Sandvik Mining and Construction Oy

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Improving Sandvik’s Spare Parts Manuals

- Sandvik Mining and Construction Oy

This thesis was done for Sandvik Mining and Construction Oy’s Turku department. The goal for this thesis was to review Sandvik’s different division’s spare parts manuals and figure out their weaknesses. According to the findings of said review was there to be proposals for future improvements.

The first part of the thesis handles reference manuals that were sort out to be a sort of a guide line for the review and to be compared to in the improvement process. Sandvik spare parts manuals were then studied based on said reference manuals.

At the end, there are to be proposals for improvement based on found weaknesses in the current spare parts manuals.

Keywords:

Spare parts, manual, mining industry

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Tiamaria Lamponen

Sandvikin varaosakäsikirjojen kehittäminen

- Sandvik Mining and Construction Oy

Opinnäytetyö tehtiin Sandvik Mining and Construction Oy:n Turun toimipisteelle. Työn tavoitteena oli tarkastella Sandvikin eri divisioonien tämänhetkisiä varaosakäsikirjoja ja selvittää niiden heikkouksia. Löytyneiden puutteiden perusteella oli tarkoituksena tarjota kehotusehdotuksia.

Opinnäytetyön alkupuolella käsitellään ensin referenssikäsikirjoja. Tämän jälkeen alkaa varsinaisten Sandvikin eri divisioonien varaosakäsikirjojen käsittely referenssikäsikirjojen pohjalta.

Työn loppuvaiheessa esitetään parannusehdotuksia Sandvikin varaosakäsikirjoille selvinneiden puutteiden perusteella.

Asiasanat:

Varaosat, käsikirjat, kaivostekniikka

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1 Introduction

Sandvik Mining and Construction is a widely known and valued supplier for many kinds of mining equipment, spare parts, and tools. Sandvik Mining and construction also offers different types of services regarding mining operations and equipment repairment for its customers. Sandvik is one of the leading companies in the mining industry and therefor well-liked by customers. (Sandvik 2022.)

Sandvik Mining and Construction has many different divisions within itself. In this thesis the focus is on the following: Load and Haul, Underground Drills, Boom Surface Drills and Rotary Drills. (Sandvik 2022.)

2 Introducing the project

This thesis is compiled to help improve the state of the current Sandvik spare parts manuals. In this thesis there will be comparisons between Sandvik's spare parts manuals and certain chosen reference manuals. Based on the results obtained, there will be some proposals for improvement for the future.

2.1 Starting point

Since there is a project in place to improve the current spare parts manuals, there is clearly something lacking or something wrong with them. To begin the improvement, process all weaknesses must be identified and localized in a way that makes the process reasonable.

2.2 Studying reference manuals and comparing them to Sandvik's manuals

The next step on the project is to study the reference manuals. How functional they are and how the user-friendliness is achieved.

When there is a good enough of a picture of what the reference manuals are like there will be comparisons between them and the Sandvik manuals.

2.3 End goal

The goal of this thesis is to locate the problem areas in the current Sandvik spare parts manuals and propose improvement ideas for the future.

3 Comparison between the reference manuals and Sandvik's manuals

The first step is to take a look at all the reference manuals and Sandvik manuals provided. The manuals need to be studied thoroughly so there can be an educated handling and comparison on them.

3.1 The reference manuals

The reference manuals and the companies behind them will remain anonymous. In this thesis they will be referred to as company A and company B from this point forward.

3.1.1 Company A

Let's first focus on Company A's spare parts manuals and their different qualities.

Structure

The structure of company A's spare parts manuals are very logical. All of them start with the table of contents which makes it easy to navigate and look for specific information needed at the time. (Company A, spare parts manuals 12.12.2022).

Illustration quality

Company A uses both 2D and 3D imagery. The illustrations are high enough resolution so that the parts are easily identifiable. There are some split views and illustrations from different angles when it is necessary to identify the different components of the parts clearly. The spare parts manuals don't appear

to have many exploded-view illustrations which can be seen as a minus when it comes to easy identifications of certain complicated components. (Company A, spare parts manuals 12.12.2022).

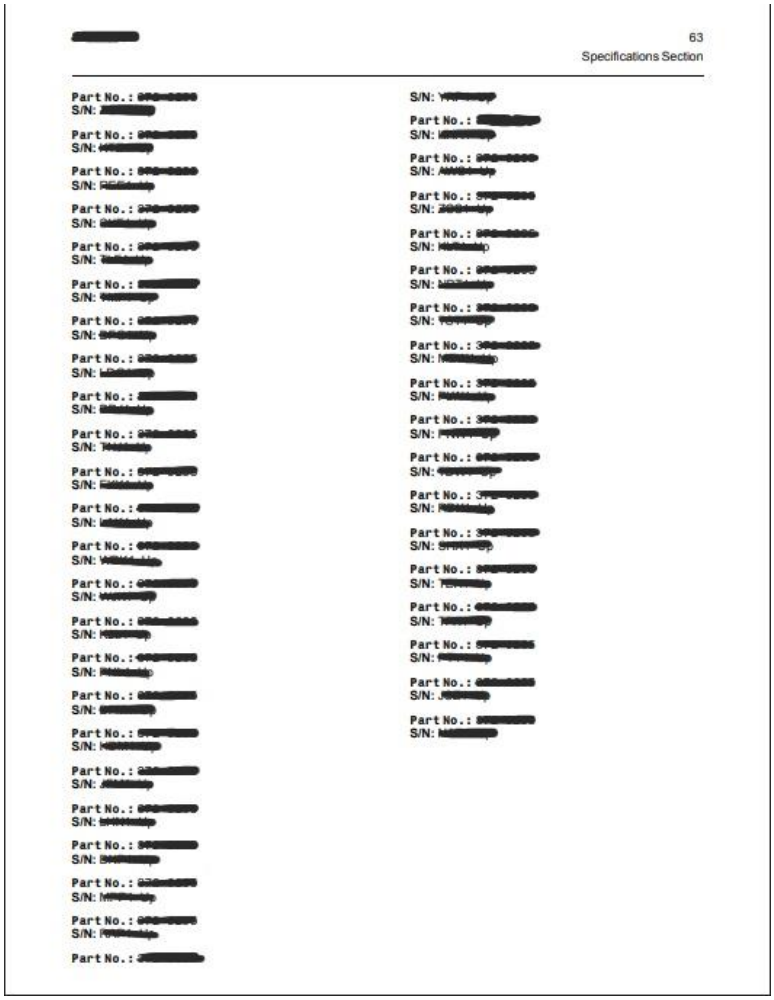
All the illustrations are black and white which makes sense since the manuals themselves are also black and white. This can be seen as either a pro or a con. (Company A, spare parts manuals 12.12.2022).

Pro in the sense that in many cases the black and white image is clearer and easier to read especially when printed onto paper. (Company A, spare parts manuals 12.12.2022).

Con in the case when there are a lot of small different components next to each other. On those cases it may be beneficial to have different colors to indicate different types of parts. This only really works on the electronical versions of the manuals where you can zoom-in on to the image. Since if a colorful illustration is printed onto a standard piece of paper, it can easily become quite blurry and hard to read. (Company A, spare parts manuals 12.12.2022).

Information given

The details given per types of parts in company A’s spare parts manuals is quite comprehensive. Sometimes the long list of part numbers and serial numbers in between the illustration pages can make the reading experience of the manual a bit difficult. It’s not certain if such lists are even necessary since the specific part numbers are also listed on the illustration pages next to the image. (Company A, spare parts manuals 12.12.2022).



Picture 1. An example of the long list of part and serial numbers.

3.1.2 Company B

Let’s now focus on Company B’s spare parts manuals and their qualities in the same manner as above.

Structure

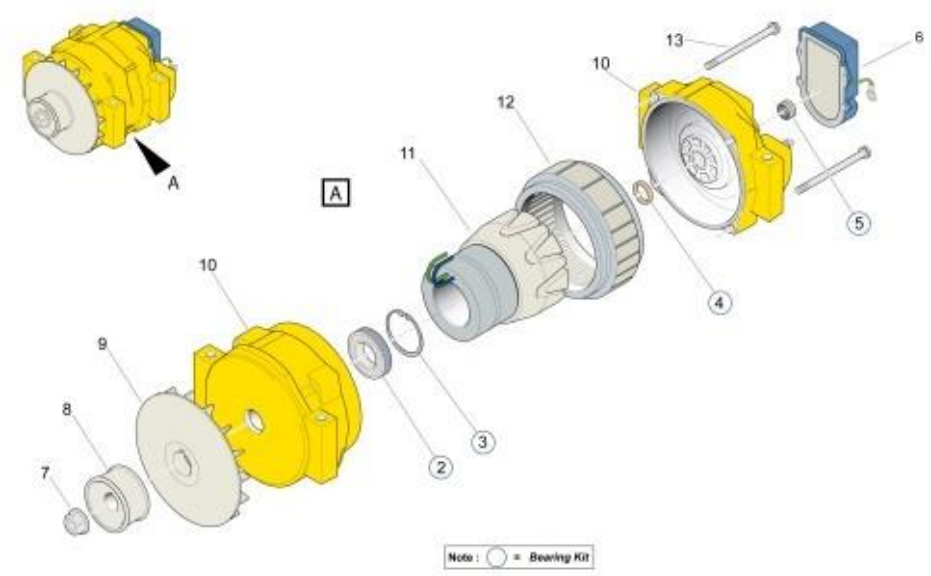
Company B’s spare parts manual’s structure is very logical. It follows the typical pattern with the table of contents being the starting point. It’s very easy to locate specific information needed at the time. In company B’s manual on the electronic version there is also a side menu where all the main components are

listed. The user can easily just click any one of them they might need to use at time, and the menu sends the user right to the page the information is located at. (Company B, spare parts manuals 12.12.2022).

That is something company A's manuals were lacking since they were made in more of the standard pdf document form.

Illustration quality

Company B uses mostly 3D imagery, and they utilize more color in their illustrations. With that been said the company also uses black and white imagery on certain illustrations. The illustrations are good quality, and the parts are easily identifiable. The company uses good number of split views and exploded-view illustrations which makes looking for specific parts much easier for the user. (Company B, spare parts manuals 12.12.2022).



Picture 2. An example of the colorful exploded-view illustrations.

The use of different colors in the illustration is a smart move especially on the electronic versions of the spare parts manuals. The colorful illustrations in this specific manual are well executed and serve a clear purpose. The different colors represent specific types of parts and make them easier to identify. Also,

since the manual itself is made in color it would be a bit strange if the illustrations were only in black and white. The company itself has a specific color palette it's known for. The same colors are used on the illustration which makes the manual feel more personalized to the company. (Company B, spare parts manuals 12.12.2022).

As stated, before with company A whether having colorful imagery or not can be either a pro or con depending on the user and their personal preferences.

Information given

The information given on company B's manual is very detailed. There is not too much, nor too little information given. All the details make sense, and everything needed is clearly presented. All necessary information like part names and numbers are clearly listed after every illustration which makes the manual very user-friendly. (Company B, spare parts manuals 12.12.2022).

3.2 Sandvik's spare parts manuals and the actual comparisons

Lastly let's look at Sandvik's own spare parts manuals and see how they compare to the reference manuals above.

3.2.1 Load and Haul spare parts manual

Structure

Sandvik's Load and Haul division's spare parts manual has a very typical structure. It has a simple and straightforward table of contents in the beginning which makes the manual easy to navigate for the user. (Sandvik, spare parts manuals 12.12.2022).

The spare parts manual also has a similar side menu on the electronic version as previously mentioned. It takes the user straight to the illustration page of the component the user is looking for. This makes the user experience even more enjoyable since the user doesn't have to scroll down to find the illustrations they are looking for. (Sandvik, spare parts manuals 12.12.2022).

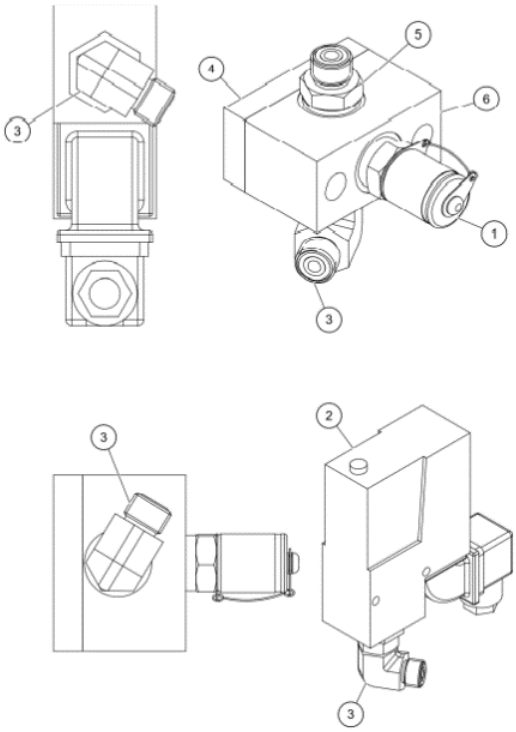
Structure vice this particular Sandvik spare parts manual is very similar to company B's spare parts manual and therefor very purposeful compared to what's on the market.

Illustration quality

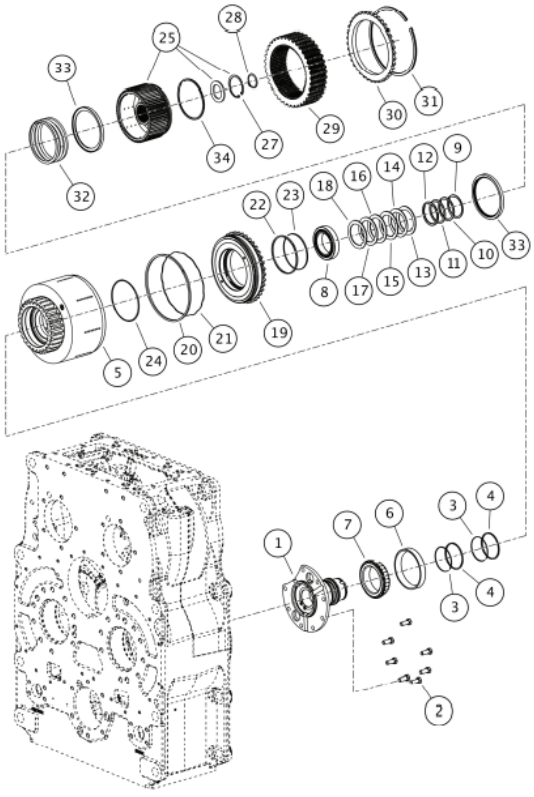
Load and Haul divisions spare parts manual has good quality illustrations, and the parts are easy to identify. The manual utilizes both 2D and 3D imagery. The illustrations are mainly black and white, but some illustrations of bigger components utilize colorful imagery as well. (Sandvik, spare parts manuals 12.12.2022).

The manual has a good amount of split view illustrations and exploded-view illustrations. Having those type of illustrations can be very beneficial for the user since then even the most complicated parts can be more easily identified. (Sandvik, spare parts manuals 12.12.2022).

The spare parts manual doesn't have much consistency between the illustrations. This is something that should be focused on more in the future developments. (Sandvik, spare parts manuals 12.12.2022).



Picture 3. An example of the split view illustrations.



Picture 4. An example of the exploded-view illustrations.

The parts seem to be illustrated in the same way as in the reference manuals which is good news for the user. When the illustrations are done in a standardized manner the parts are easier to identify by the user. Simple and easy to read illustrations are also good for the user-friendliness.

Something worth mentioning about Load and Haul divisions spare parts manual's illustrations is that there are some incorrect ones. Sometimes the illustration is missing all together. That is something that needs to be focused on going forward. (Sandvik, spare parts manuals 12.12.2022).

Item	Part No.	Name	Qty	Uom
1	56023736	Switch accessory	1	each
2	04730779	Switch, Rocker	1	each
3	56009600	Push Button	1.00	each
4	56018367	Seal	1.00	each
5	08003325	Relay	1	each
6	56016046	Shell, Connector	2.00	each
7	55014892	Locking Part, Contact	2.00	each
8	08002284	Contact, Connector	4.00	each

Picture 5. An example of an incorrect illustration.

Information given

Load and Haul division's manual is very straightforward. All necessary information is easy to locate, and the manual doesn't have excess information that would make the reading experience for the user less favorable. (Sandvik, spare parts manuals 12.12.2022).

The necessary part numbers and names are listed clearly after the illustration page. The parts are also clearly marked on the illustration page which makes

identifying specific parts easier for the user. (Sandvik, spare parts manuals 12.12.2022).

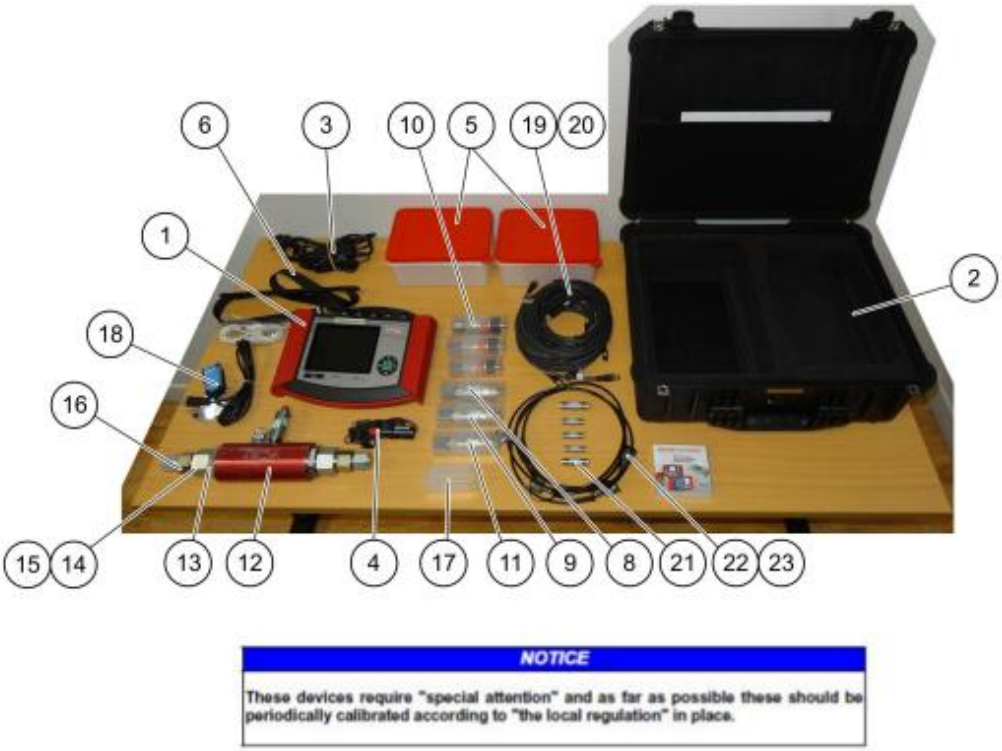
3.2.2 Underground drills spare parts manual

Structure

The Underground Drills division's spare parts manual is very logical and straightforward. It follows the same structure as the manual before with the table of contents being in the beginning. This manual also has the convenient and user-friendly side menu to help navigate within the manual. (Sandvik, spare parts manuals 12.12.2022).

Illustration quality

The illustration quality of this manual is similar to the previously mentioned Sandvik spare parts manual. The manual utilizes both 2D and 3D illustrations of which most are black and white. Unlike the previous Sandvik manual and the reference manuals this particular one also uses actual photos of the items in the manual. (Sandvik, spare parts manuals 12.12.2022).

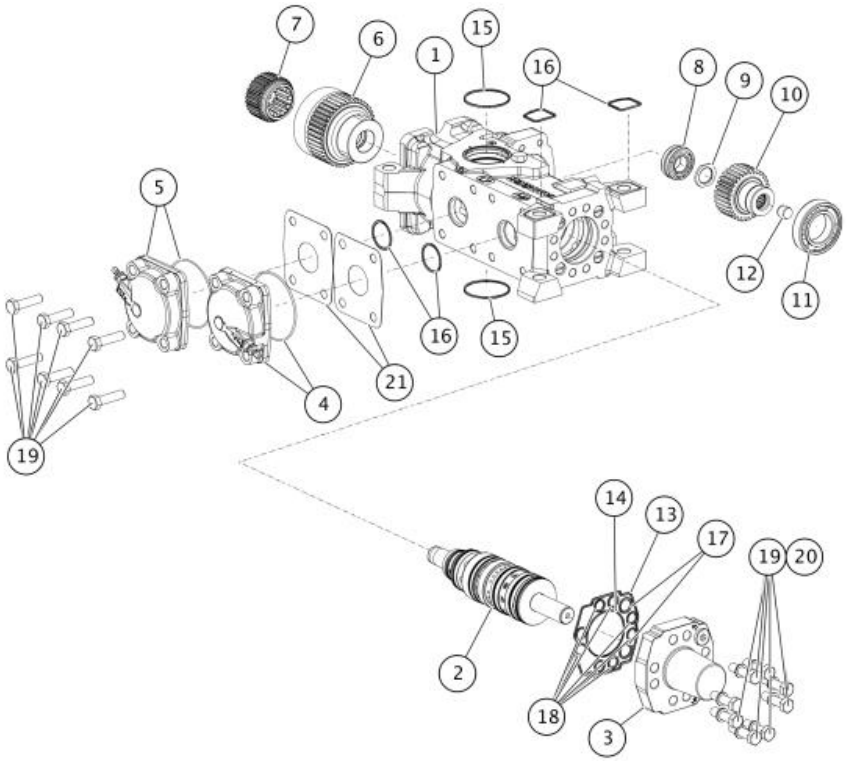


Picture 6. An example of the colorful photographs 1/2.

In the electronic version this can be beneficial for the user because the parts are depicted the exact same way, they look in real life. But on the other hand, using colorful photographs is not so smart idea if the manual is used as a printed version by the customer. In that case it can make the parts harder to identify. (Sandvik, spare parts manuals 12.12.2022).

Picture 7. An example of the colorful photographs 2/2.

The Underground Drills spare parts manual uses a good amount of split view illustrations and even has many exploded-view illustrations like seen on the previous Sandvik spare parts manual. (Sandvik, spare parts manuals 12.12.2022).



Picture 8. An example of the exploded-view illustrations.

Like the spare parts manual mentioned prior this one is also lacking on the consistency of the illustrations. (Sandvik, spare parts manuals 26.01.2023)

Information given

This particular manual has a lot of illustrations which makes the parts quite easy to identify by the user. All the necessary information such as part names and numbers are listed clearly after each illustration or photo. However, the large number of colorful photos makes the manual a bit chaotic and hard to read. The photos can also make the manual appear less professional in the eyes of the consumer. (Sandvik, spare parts manuals 12.12.2022).

3.2.3 Boom surface drills spare parts manual

Structure

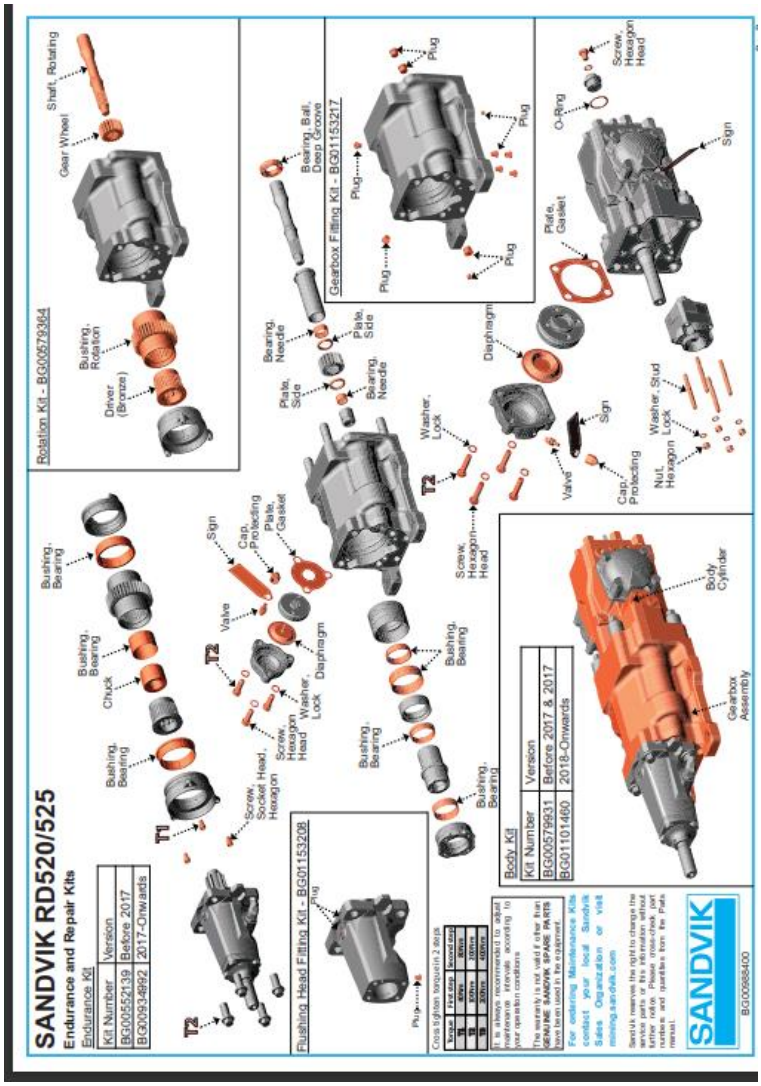
The Boom Surface drills spare parts manual follows the already quite standard Sandvik structure. It begins with the simple table of contents and has the convenient side menu for the electronic version. (Sandvik, spare parts manuals 12.12.2022).

Illustration quality

The manual utilizes both colorful and black and white illustrations in both 2D and 3D formats. This manual also utilizes a lot of colorful photos in the beginning much like the Sandvik spare parts manual displayed prior to this one. Whether it’s a good or a bad thing depends on the consumer and in what format they choose to utilize the manual. In the electronic version it can work well enough, in the printed version not so much. (Sandvik, spare parts manuals 12.12.2022).

This manual also has a good amount of split view illustrations and those exploded-view illustrations that were mentioned prior on some of the Sandvik spare parts manuals. The illustrations are easy to read and parts within them easy to identify. (Sandvik, spare parts manuals 12.12.2022).

As has become almost a standard for Sandvik, also this spare parts manual has very inconsistent illustration styles. Also as mentioned on a prior spare parts manual this manual also has some illustrations completely missing. (Sandvik, spare parts manuals 12.12.2022).



Picture 9. An example of the colorful exploded-view illustrations.

Information given

The manual lists all the necessary information related to the parts after every illustration. The various parts on the components illustrated are clearly marked to the illustrations as well. (Sandvik, spare parts manuals 12.12.2022).

The manual does not have any unnecessary information however the large number of colorful photos in the beginning of the spare parts manual makes it somewhat unprofessional looking and harder to read much like on the

Underground Drills manual mentioned prior. (Sandvik, spare parts manuals 12.12.2022).

Picture 10. An example of the colorful photographs.

3.2.4 Rotary drills spare parts manual

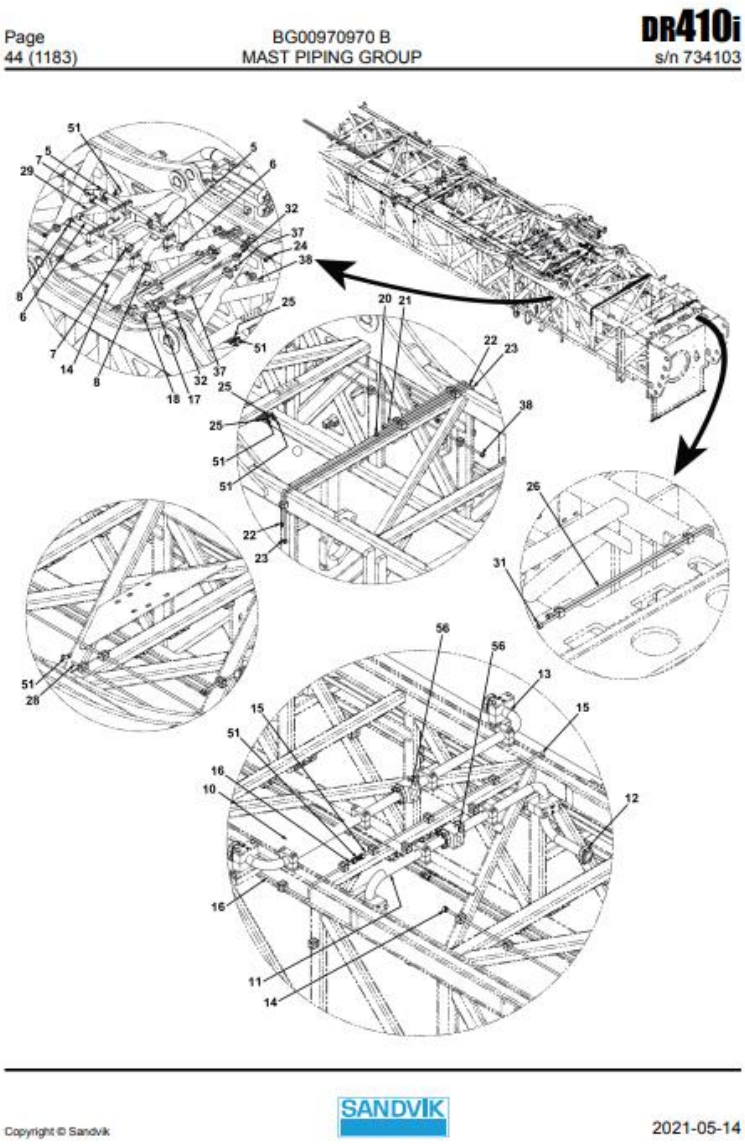
Structure

As per usual the manual starts with the table of contents. The manual also has the convenient side menu which appears to be a standard part of Sandvik's spare parts manuals. (Sandvik, spare parts manuals 12.12.2022).

The manual's structure is very similar to all the other Sandvik spare parts manuals.

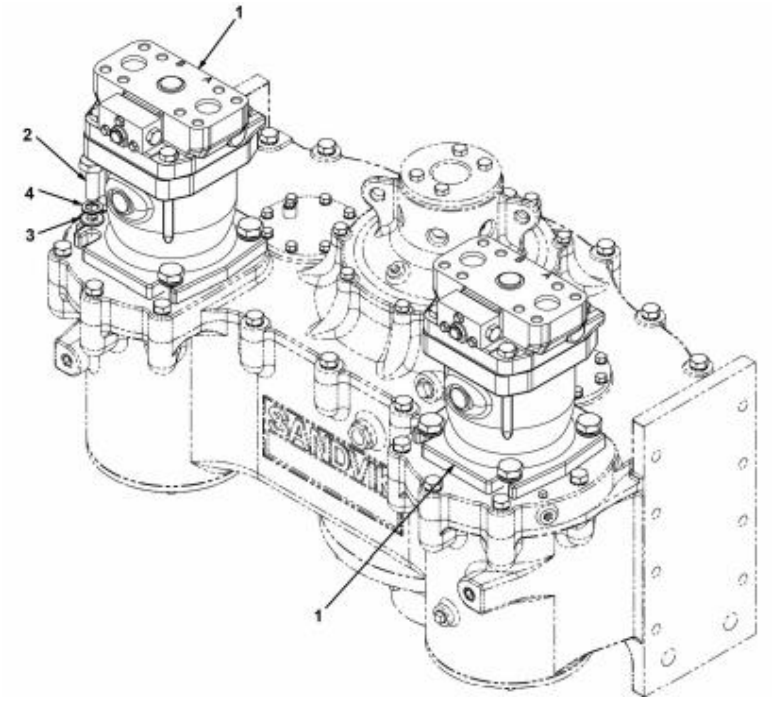
Illustration quality

The illustration quality on this spare parts manual is slightly worse than on the prior one's. When very big components are depicted, the illustration can become a bit blurry and therefor the parts are not as easily identified. (Sandvik, spare parts manuals 12.12.2022)



Picture 11. An example of the illustration becoming blurry when depicting large components.

The manual utilizes both 2D and 3D illustrations. It appears to be that this spare parts manual in particular utilizes more 3D illustrations than the prior one's, which could be quite beneficial for the user. (Sandvik, spare parts manuals 12.12.2022).



Picture 12. An example of the 3D black and white illustrations.

This manual does not offer the colorful photos unlike some of the Sandvik spare parts manuals presented before. This can be seen as a pro or a con depending on the user. If thought of from the perspective that the manual most likely will be used both in an electronic and printed form, this is a very smart move. Also, the manual looks more professional and more homogeneous with the reference manuals this way. (Sandvik, spare parts manuals 12.12.2022).

The manual uses a good amount of split view illustrations but is lacking on the exploded-view illustrations. This is something some of the other Sandvik spare parts manuals had going for them.

Consistency issues with the illustration styles can be seen on this spare parts manual as well. Also, the missing illustrations seem to be a reoccurring issue. (Sandvik, spare parts manuals 12.12.2022)

Information given

The manual does not appear to have any unnecessary information. All the parts are clearly marked on the illustrations and the necessary information is listed after every illustration. (Sandvik, spare parts manuals 12.12.2022).

The information given lines up quite well with all the other Sandvik spare parts manuals and reference manuals alike.

4 Proposals for future improvements

Information wise the Sandvik spare parts manuals are very similar to the reference manuals chosen for this project. All the necessary information is easy to find and logically written.

The biggest obstacles in the Sandvik spare parts manuals have got to do with the illustration's styles and qualities. The illustrations should be more unified between the different divisions within Sandvik. That way the company sends a more professional image of itself to the customers.

One of the most eye-catching weaknesses in the Sandvik spare parts manuals are the colorful photographs shown in for example the Underground drills division's spare parts manual. Firstly, since this happens only on some of the spare parts manuals, it makes them less cohesive with the rest of the Sandvik spare parts manuals. Also, the photographs can easily present the spare parts manual as less professional to the customer than some of the other spare parts manuals on the market. So, abandoning the photographs from the official spare parts manuals is worth of considering.

Something that could also be very beneficial to the costumer is having more variety in the illustrations. Combining 2D and 3D imagery and adding more exploded-view illustrations could be very helpful for the customer to identify different parts more clearly. Also, the option of creating more of an interactive experience for the customer on the electronic spare parts manuals could also be explored more in the future.

On the other hand, paying more attention to the consistency between the illustrations could be beneficial. It could be wise to stick to strictly black and white illustrations. The spare parts manuals could still have both 2D and 3D illustrations but lean more towards the 2D and only utilize 3D when deemed necessary. Also, the exploded-view illustrations should only be applied when necessary to avoid excess illustrations that can confuse the customer.

Since the market is leaning more and more to the electronic direction it would be very beneficial for Sandvik to start to invest more of its time and resources to the electronic spare parts manuals. Even though some of the customers will continue to use the more traditional paper manuals it's important for the company to stay up to date on the progression of the industry.

It would be beneficial to inspect the spare parts manuals regularly to make sure the information is up to date and that there are no obvious inconsistencies. That way Sandvik would not need to have another big intervention like this in the future regarding the information shared on the spare parts manuals.

5 Closing chapter

During the writing of this thesis some obvious weaknesses have been spotted in the spare parts manuals. The weaknesses have been identified and there has been some proposals for future improvements.

This thesis was done to be a part of Sandvik's project to improve its spare parts manuals. The thesis writing process turned out to be more demanding than estimated in the beginning, but the end result was still as desired.

References

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