

# STANDARD OPERATING PROCEDURE

**Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)**

Document Number: 960C-SOP-513

Original Approval Date: AUG 27, 2014

Revision Number: 3

Page 1 of 8


Latest Revision Date: MAY 10, 2022

Next Revision Date: MAY 10, 2025

Document Approval Level: 4

\*This document is not controlled if printed.\*

## HYDRAULIC HOSE MANUFACTURING – SKIVING (MANULI HOSE ASSEMBLIES)

3	APP	May 10, 2022	Approved	Andre Brule	J. Owens	T. Siver 
2	APP	Nov 25, 2019	Approved	Andre Brule	Tammy Siver	Stan Miller
<b>Rev</b>	<b>Status</b>	<b>Rev. Date</b>	<b>Status Description</b>	<b>Prepared by</b>	<b>Reviewed by</b>	<b>Approved by</b>

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)		Document Number: 960C-SOP-513
Original Approval Date: AUG 27, 2014	Revision Number: 3	Page 2 of 8
Latest Revision Date: MAY 10, 2022	Next Revision Date: MAY 10, 2025	Document Approval Level: 4

\*This document is not controlled if printed.\*

*The following is a step-by-step procedure on how to complete a specific task or meet a facility specific requirement. Standard Operating Procedures (SOPs) are written for all identified critical tasks. By virtue of the hazard or complexity associated with critical tasks it is paramount that the SOP be followed as written. SOPs contain a listing of high-level hazards associated with the task, for detailed hazard analysis reference the applicable Task Hazard Assessments. SOPs do not replace the requirements contained in the company Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that the worker shall understand before work commences.*

## 1.0 PURPOSE

- To establish a company standard to safely and effectively carry out work as it applies to the skiving of hydraulic hoses, so it is done in a manner that minimizes risk to people, equipment, production, and the environment.

## 2.0 SCOPE AND APPLICATION

- This document applies to all company Heavy Construction Mining operations. Ensure all site-specific requirements are being met or exceeded before performing the task.

## 3.0 HAZARDS AND CONTROLS

- Rotating and moving parts causing personal injury and/or property damage.
  - Use, hose clamp, guards, eye protection, gloves and coveralls when using the skiving machine.
  - Never place your body in the line of fire and maintain a safe distance from any moving and/or rotating parts. Ensure the lid is closed before operating the skiving machine.
  - Do not wear loose/baggy clothing, dangling accessories, jewelry and other similar items that could get caught in the rotating equipment.

**NOTE:** Immediately remove your foot from the machine actuation foot pedal should the hose begin to rotate in the clamp. Ensure proper clamping of the hose prior to operating skiver, failure to do could result in severe injury.

- Not qualified and/or trained to operate skiving machine and/or manual skiver.
  - Only competent and trained workers will operate the skiving machine and/or manual skiver.
  - Always refer to the manufacturers procedure on setting up and using skivers.
  - Supervisors will ensure workers are trained and competent prior to operating the skiving machine and/or manual skiver.
- Exposed frayed wires causing punctures, cuts and lacerations.
  - Inspect the hose prior to lifting, ensure you handle the hose in areas that does not have any exposed wires.
  - Make sure that any exposed wires do not come in contact with any part of your body during the skiving process.
  - Use proper gloves and PPE when handling hoses.

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)		Document Number: 960C-SOP-513
Original Approval Date: AUG 27, 2014	Revision Number: 3	Page 3 of 8
Latest Revision Date: MAY 10, 2022	Next Revision Date: MAY 10, 2025	Document Approval Level: 4

\*This document is not controlled if printed.\*

**NOTE:** If hoses cannot be safely handled during the skiving process, wrap the end of the hose with tape or plastic wrap ensuring that all frayed wires are covered over.

- Overuse and repetitive motion causing personal injury.
  - Support and move heavy hose by; establishing good body positions and mechanics, utilize overhead crane to maneuver heavy hoses into position.
  - When using the manual skiver ensure body is in an upright position with good ergonomics. Take micro breaks as needed, if there is more than one hose technician during the task share the workload throughout the shift to prevent injuries from occurring.

## 4.0 CHECKLIST

- Attend all preparatory meetings (IE: daily PSI; job scope; review of JSA's and SOPs for the job)
- Complete FLRA cards before starting the work.
- Ensure all personnel involved in the task are aware of the hazards and the controls to be used, as identified in the SOP's; JSA's; and FLRA's
- Conduct a pre-job inspection of all equipment to be worked on and tools to be used.
- Standard of Training required for working on this job: On-the job training.**

## 5.0 DEFINITIONS

### 5.1 Company

North American Construction Group (NACG) divisions, departments, or subsidiaries.

### 5.2 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees, and third-party processors.

### 5.3 HSE

Refers to the Health, Safety & Environment department

## 6.0 PROCEDURE

### 6.1 Skive Machine Procedures

**NOTE:** Supervisor and workers will discuss the task and plan the safest way to approach the work. Workers will complete an FLRA card to identify hazards with the task and in the area prior to commencing work.

- (a) Prior to skiving the hose, visually inspect the end of the hose to ensure it has been cut squarely, the wires are not corroded, and the rubber has not deteriorated. If this is the case or if in doubt, discard that section of hose.



# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)		Document Number: 960C-SOP-513
Original Approval Date: AUG 27, 2014	Revision Number: 3	Page 4 of 8
Latest Revision Date: MAY 10, 2022	Next Revision Date: MAY 10, 2025	Document Approval Level: 4

\*This document is not controlled if printed.\*

## 6.1.1 External Skiving – Machine

- (a) Skive externally first if hose requires internal and external skiving. (The reason for this is the mandrel that is inserted internally during external skiving operation will not properly support the hose if internal rubber is removed first).
- (b) Select the appropriate outside skiving mandrel tool, according to hose size and install tool in the machine.
- (c) Use digital calipers to mark outside skive length on hose as per Production Instruction (PI) tag.
- (d) Lubrication can be applied to the mandrel at the operator's discretion. For example, large diameter hoses can be more difficult to push onto the rotating mandrel and more difficult to keep from rotating with the rotating mandrel, in these cases lubrication is appropriate.
- (e) Set machine to "EX" external skive, start rotation of skiving machine.

**Note:** For spiral reinforced hose ensure that the rotation of the machine is in the same direction as the wires on the hose.

- (f) Push hose onto the mandrel up to the skiving knife adjust the knife depth by turning the depth adjustment knob so that only some of the rubber will be removed on the first cut ensure that the knife will not dig into the reinforcement.
- (g) Adjust the distance of the clamp from the machine so that when you clamp the hose you will be able to insert the hose onto the mandrel the rest of the distance required to fully skive the outside of the hose.
- (h) Adjust the torque pressure of the clamp using the lobe nut. Close the clamp onto the hose by pulling the clamp closing handle. When satisfied that the hose is properly clamped begin the rotation of the blade by depressing the foot pedal switch.
- (i) Ensure that the skiving knife is not digging into the wire reinforcement and that the hose is not turning in the clamp. If it is stop by removing your foot from the pedal switch. Adjust the knife depth, clamping force and possibly lubrication of the mandrel. When the knife and clamp is properly adjusted, make your first cut of rubber by pushing the clamped hose onto mandrel up to the skive depth marked on the outside of the hose. You can push on the clamp or the hose itself to exert the pushing force required to push the hose onto the mandrel.
- (j) After you have successfully removed the first cut of rubber from the outside of the hose adjust the knife deeper and take another cut, continue this process until the wire reinforcement is revealed. The object is to remove as much rubber as possible without damaging the wire reinforcement.
- (k) Measure skive length with digital calipers and verify that skive length is correct according to the PI Tag.
- (l) You can now skive the other end of the hose. As the clamping force, knife depth and the requirement for lubrication have been established on the first end you should be able to skive the hose without making further adjustments to the machine.
- (m) If you are unable to properly clamp the hose in the skive machine when externally skiving, you must use a manual hand skiving method to skive the hose (see 6.2).

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)		Document Number: 960C-SOP-513
Original Approval Date: AUG 27, 2014	Revision Number: 3	Page 5 of 8
Latest Revision Date: MAY 10, 2022	Next Revision Date: MAY 10, 2025	Document Approval Level: 4

\*This document is not controlled if printed.\*

**NOTE:** If the hose begins to turn remove your foot from the pedal to stop the machine.

- (n) External skive only hose should then be cleaned with Styrofoam projectiles as per PI Tag.

## 6.1.2 Internal Skiving – Machine

- (a) Internal skiving change mandrel to the internal skive tool which is already preset for the internal skive depth and skive length, turn machine directional dial to the right “IN” internal skive.
- (b) Lubricate the mandrel and push hose onto mandrel up to the internal skive knife.
- (c) Adjust the distance of the clamp from the machine so that when you clamp the hose you will be able to insert the hose onto the mandrel the rest of the distance required to fully skive the inside of the hose.
- (d) Adjust the torque pressure of the clamp using the lobe nut. Close the clamp onto the hose by pulling the clamp closing handle. When satisfied that the hose is properly clamped begin the rotation of the blade by depressing the foot pedal switch.
- (e) Measure skive length with digital calipers and verify that skive length is correct according to the PI Tag.
- (f) Push the hose into the knife slowly, ensure the skiving knife is not digging into the wire reinforcement continue feeding the hose into skiving knife until bottomed out on mandrel.
- (g) Remove hose and visually inspect if all the rubber is removed. If rubber remains repeat steps 5 and 6 if after repeating steps 5 and 6 the rubber remains adjustment to the skiving knife depth position will be required. You may also use the manual tool to remove any small amount of rubber remaining. The objective is to remove as much rubber as possible without damaging the wire reinforcement.

**NOTE:** Ensure that the skiving knife is not digging into the wire reinforcement and that the hose is not turning in the clamp. If it is stop by removing your foot from the pedal switch.

- (h) If you are unable to keep the clamped hose from turning in the skive machine when internally skiving, you must use a manual hand skiving method to skive the hose (see section 6.2).
- (i) Measure internal skive length with digital calipers and verify that skive length is correct according to the PI Tag.
- (j) Internal skive hose should then be cleaned with Styrofoam projectiles.

## 6.2 Manual Skiving

**NOTE:** Hand skiving should be used for removing any small amount of rubber that remains after the hose has been skived by the machine. If you are unable to skive the hose in the machine, then a supervisor must be consulted before proceeding with a manual skiving process.

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)		Document Number: 960C-SOP-513
Original Approval Date: AUG 27, 2014	Revision Number: 3	Page 6 of 8
Latest Revision Date: MAY 10, 2022	Next Revision Date: MAY 10, 2025	Document Approval Level: 4

\*This document is not controlled if printed.\*

## 6.2.1 External Skiving – Manual

- (a) External skiving, use digital calipers to mark outside skive length on hose as per Production Instruction (PI) tag.
- (b) Lubricate the inside of the hose.
- (c) Lubricate the mandrel to be inserted inside the hose and insert mandrel.
- (d) Clamp externals skive tool to the outside of the hose.
- (e) Ensure Proper body ergonomics before using the manual skiving tool and take micro breaks when needed.
- (f) Turn skiving tool in the same direction as the wire reinforcement.
- (g) If rubber remains, adjust clamping force on tool and repeat steps 4 and 5.
- (h) Remove mandrel from inside of hose once you are satisfied that all rubber is removed.

## 6.2.2 Internal Skiving – Manual

- (a) Lubricate the inside of the hose.
- (b) Lubricate the mandrel on the skive tool.
- (c) Insert the mandrel into the hose until the skiving knife meets the rubber hose.
- (d) Rotate the tool in the same direction as the wire reinforcement.
- (e) When using the manual skiver ensure body is in an upright position with good ergonomics. Take micro breaks as needed, if there is more than one hose technician during the task share the workload throughout the shift to prevent injuries from occurring.
- (f) Once you have finish skiving remove the tool from the hose.
- (g) Internal skive hose should then be cleaned with Styrofoam projectiles.

## 7.0 NOTES

If this task is to be done by a method different than described in this SOP, the work must **STOP**, and the alternate method must be **DOCUMENTED** with an adequate hazard assessment tool such as a JSA. The document must be **APPROVED** by a supervisor before such procedures are implemented.

## 8.0 REFERENCES

- Manufacturer's Operation Manual
- Alberta OH&S Code 2009 Part 3 Section 12 – Following Specifications
- 950C-C-025 - Hand Tools Code
- 950C-C-050 - PPE General Code
- SOP 960C-SOP-504 - Hand Tools; Use of
- SOP 960C-SOP-505 - Hand Tools Powered Use

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)

Document Number: 960C-SOP-513

Original Approval Date: AUG 27, 2014

Revision Number: 3

Page 7 of 8

Latest Revision Date: MAY 10, 2022

Next Revision Date: MAY 10, 2025

Document Approval Level: 4

\*This document is not controlled if printed.\*

- SOP 960C-SOP-112 - Air Line Control and Dangers

## 9.0 APPENDICES

- Appendix A - Skiving Machine
- Appendix B - Manual Hand Skiving

# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)

Document Number: 960C-SOP-513

Original Approval Date: AUG 27, 2014

Revision Number: 3

Page 8 of 8

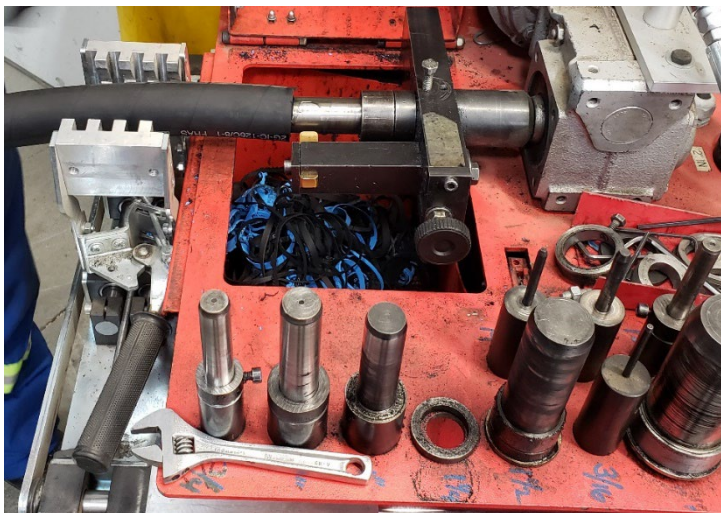
Latest Revision Date: MAY 10, 2022

Next Revision Date: MAY 10, 2025

Document Approval Level: 4

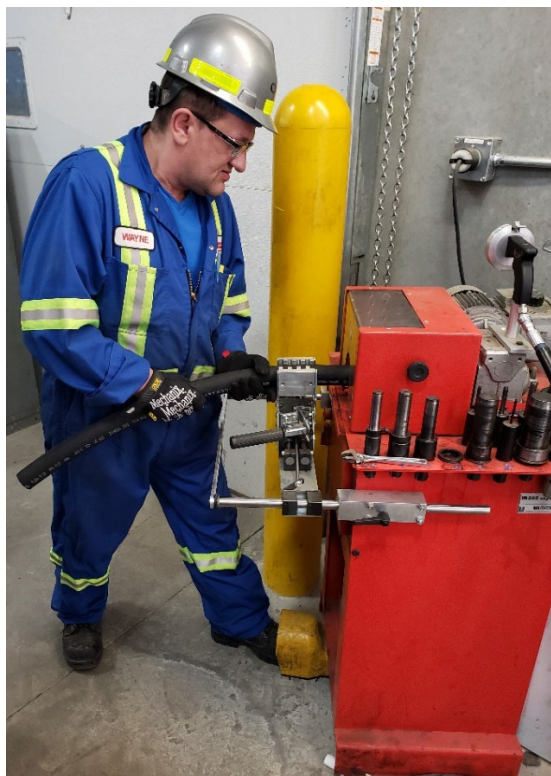
\*This document is not controlled if printed.\*

## Appendix A Skiving Machine Procedures



Visually inspect the end of the hose to ensure it has been cut correctly, the wires are not corroded and the rubber has not deteriorated.

Set the hose in position and ensure the clamp is secured properly before operation.



Before using the skiving machine ensure guide rails are out and lid is in place.

Keep clear of any moving/rotating Parts.

Ensure body is in an upright position with good ergonomics prior to operation.



# STANDARD OPERATING PROCEDURE

Hydraulic Hose Manufacturing - Skiving (Manuli Hose Assemblies)

Document Number: 960C-SOP-513

Original Approval Date: AUG 27, 2014

Revision Number: 3

Page 9 of 8

Latest Revision Date: MAY 10, 2022

Next Revision Date: MAY 10, 2025

Document Approval Level: 4

\*This document is not controlled if printed.\*

## Appendix B Manual Hand Skiving



Manual skiving is performed when you are unable to safely keep the hose from turning in the skive machine. You can use manual skiving to remove small amounts of rubber that are left over from skiving with machine.

When using the manual skiver ensure body is in an upright position with good ergonomics. Take micro breaks as needed, if there is more than one hose technician during the task share the workload throughout the shift to prevent injuries.