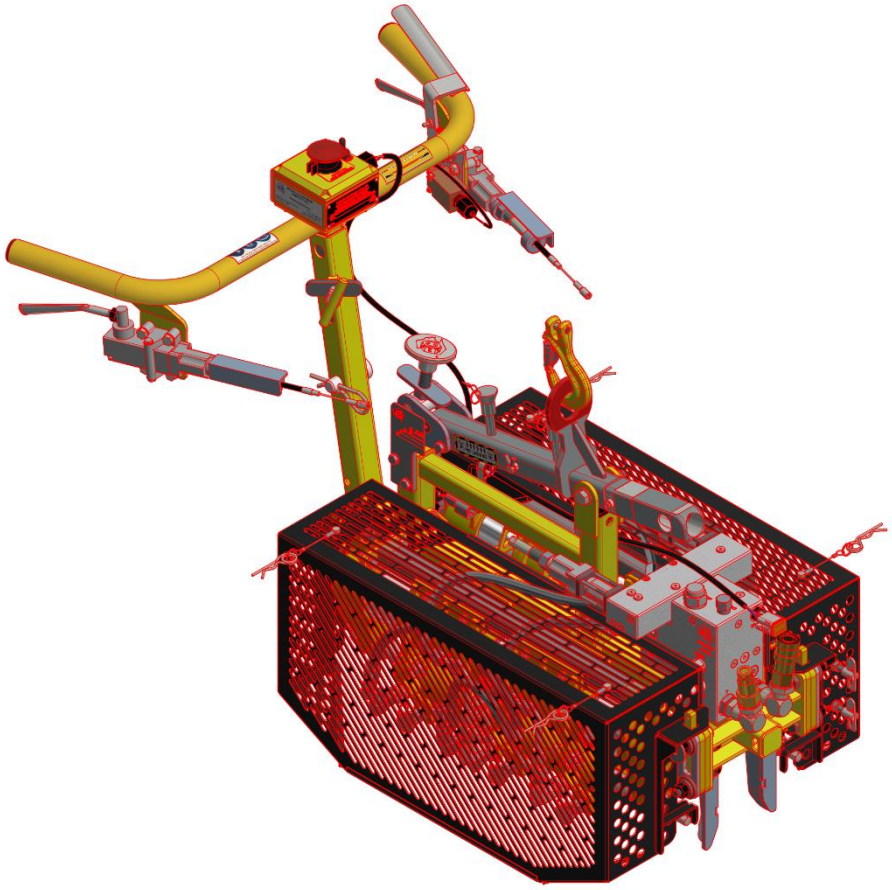
Melvelle Equipment Corp Pty Ltd

"Proud Australian Manufacturers"

190 E-Clip & PR Clip Inserter/Remover Operation, Training & Maintenance Manual



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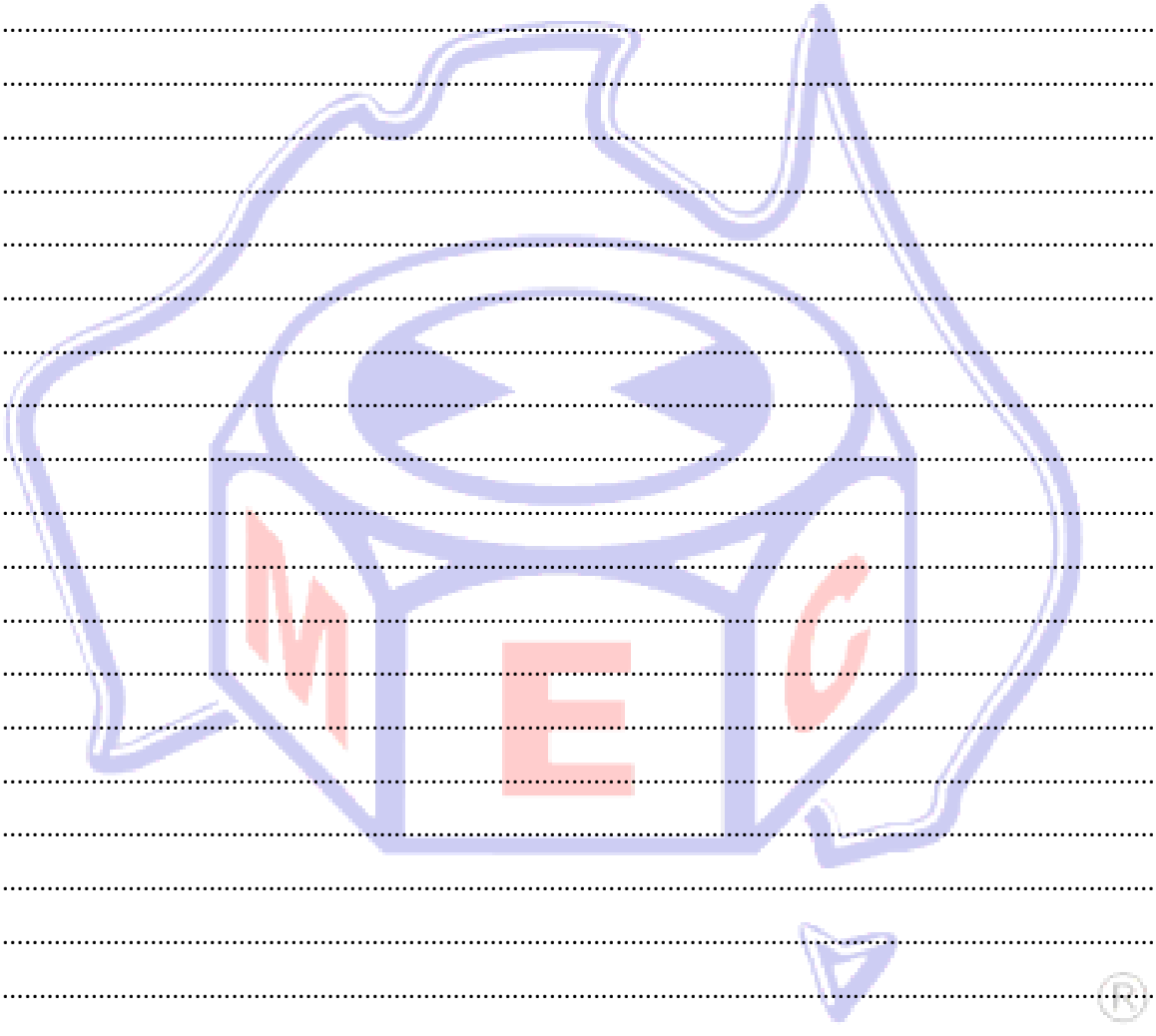

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1. Preface

Every attempt has been made to present accurate and current information within this manual. However, as product development on the 190 work head and components used within is continuous, the information contained herein may be subject to change without notice, and without incurring obligation.

The information provided within this manual is the sole property of Melvelle Equipment Corporation Pty Ltd (MEC) and as such, reproduction or replication of any material contained within is not allowed without the written consent of MEC.

Information provided within this manual assumes:

- The person(s) operating the machinery have read and understand this manual and other manuals provided for specific components
- The person(s) operating are properly trained and equipped to safely and professionally operate this machinery
- The person(s) operating utilise the correct attachments and/or tools, and are trained and equipped to use them safely and professionally

SERVICING THE 190 E & PR CLIP INSERTER/REMOVER

This manual contains safety, operation and periodic maintenance instructions. MEC recommends that servicing of equipment, other than periodic maintenance, must be performed by MEC or certified and authorised dealer. Please read the following warning.

SERIOUS INJURY OR DEATH COULD RESULT FROM THE IMPROPER REPAIR OR SERVICE OF THIS EQUIPMENT.

REPAIRS AND / OR SERVICE OF THIS EQUIPMENT MUST ONLY BE PERFORMED BY MELVELLE EQUIPMENT CORP. PTY LTD. OR CERTIFIED AND AUTHORISED DEALER.

THE USER SHALL NOT MODIFY THE DESIGN OR CONFIGURATION OF EQUIPMENT WITHOUT CONSULTING MEC

2. Safety Information

This operation and training manual is intended to complement existing site procedures.

The following site documentation must be reviewed by the trainee before commencing training:

- Safe Work Procedures (SWP)
- Isolation Procedures

If the training package information conflicts with existing site documentation, then the authorised site and/or end user is to consult with MEC in regards to any possible amendments or modifications required.

The following practices and procedures must be adhered to:

- Always complete Pre-Operation Checks prior to use and report any defects if found
- Only connect equipment with compatible MEC equipment
- Only operate the equipment for its intended purpose
- Never operate with guards missing or damaged
- PPE Equipment as a minimum should be worn at all times according to this manual and as per site specifications
- Ensure Isolation Procedures are followed prior to carrying out any maintenance
- If any faults or damage to this machine are found during pre-operation checks or operation, tag the machine “Out-of-Service” and follow site procedures

Following the above mentioned and the information contained within this manual will ensure safe, efficient operation of the equipment.

3. Safety Symbols

The safety symbols and signal words, as shown below, are used to emphasise all operator, maintenance and repair actions which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to the equipment.

3.1. Safety Symbols & Signal Words

This safety alert and signal word indicates a hazardous situation which, if not avoided, will result in death or serious injury.

This safety alert and signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

This safety alert and signal word indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

This signal word indicates a potentially hazardous situation which, if not avoided, may result in property damage.

This signal word indicates a situation which, if not avoided, will result in damage to the equipment.

This signal word indicates a situation which, if not avoided, may result in damage to the equipment.

3.2. Hazard Warning Signs

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all instructions to avoid possible injury or death.

This is the fire risk symbol. It is used to alert you to the potential of a fire starting if ignition sources are present.

This is the explosive risk symbols. It is used to alert you to the potential of an explosion /explosive substances present.

This is the toxic hazard symbol. It is used to alert you to the presence of toxic substances.

This is the corrosive risk symbol. It is used to alert you to the presence of corrosive substances.

This is the electric shock risk symbols. It is used to alert you to the presence of an electrical supply.

This is the battery symbol. It is used to alert you to the potential hazard of electrical supply, battery acid and leaking batteries.

This is the hot surface symbol. It is used to alert you that the surfaces may be hot.

This is the dangerous gases symbol. It is used to alert you to the presence of dangerous gases.

This is the fluid under pressure symbol. It is used to alert you that there are fluids under pressure in this machinery.

This is the sharp edges symbol. It is used to alert you to the presence of sharp edges or cutting hazard.

This is the keep hands clear symbol. It is used to warn you to keep hands clear as there are pinch points present.

This is the rotating parts symbols. It is used to warn you of rotating parts on the machinery. Keep clear of rotating parts.

3.3. Personal Protection Symbols

This is the eye protection symbol. It is used when eye protection must be worn.

This is the hearing protection symbol. It is used when hearing protection must be worn.

This is the head protection symbol. It is used when head protection must be worn.

This is the hand protection symbol. It is used when hand protection must be worn.

This is the foot protection symbol. It is used when feet protection must be worn.

This is the protective body clothing symbol. It is used when protective clothing must be worn.

This is the face protection symbol. It is used when face protection must be worn.

This is the long hair protection symbol. It is used when long hair is required to be contained or restrained.

3.4. Prohibition Symbols

This is the naked flame symbol. It is used when there is not to be a fire, naked flame, ignition sources and smoking nearby.

4. Safety Precautions

To ensure safe operation, please read and understand the following statements and their meanings. Also refer to supporting manuals from the engine manufacturer on specific operation and maintenance of the engine. This manual contains safety precautions which are outlined below.

Ensure all personnel operating this equipment are properly trained to ensure safe operation

Wear personal protective equipment around this machinery.

For example: safety glasses, hearing protection, head protection, protective clothing and safety shoes at all times.

Accidental starts can cause severe injury or death.

Disable engine by disconnecting negative

(-) battery cable. Ensure machinery is started in the neutral position.

Rotating parts can cause severe injury

Stay away whilst machine is in operation. Ensure ALL guarding is in place and secured before operation.

Hot parts can cause severe burns.

Beware of hot parts on the machinery – i.e. exhaust, engine, hoses, radiator, solenoids, exposed metal components, etc.

Carbon monoxide can cause severe nausea, fainting or death.

Avoid inhaling exhaust fumes and never operate the engine in a closed or refined area.

Fuel can cause fires and severe burns.

Do not fill the fuel tank while the engine is hot or running.

Explosive gas can cause fires and severe acid burns.

Charge battery only in a well-ventilated area. Keep sources of ignition away.

High Pressure fluids can puncture skin and cause severe injury or death.

Do not work on fuel or hydraulic system without proper training and safety equipment. Ensure all hose connections are tight.

Clamping parts can cause severe injury.

Stay away whilst machine is in operation. Ensure ALL guarding is in place and secured before operation.

Loose hair, clothing and jewellery can cause severe injury.

Ensure hair is restrained; loose clothing not to be worn and jewellery must be removed before operating the machinery.

Electrical shock can cause injury.

Do not touch wires whilst engine is running. Disconnect negative (-) battery cable before any work on wires.

Attachment hoses must have a minimum working pressure rating of 2500psi. Do not use hoses and fittings that are not pressure rated.

Ignition sources can cause fires and severe burns.

There is <u>not</u> to be a fire, naked flame, ignition sources or smoking around any MEC machinery.

Toxic and/or Hazardous substances utilised in this machinery.

Beware of toxic and/or hazardous substances used within this machinery. Do not inhale, swallow or touch toxic/hazardous substances.

Injury can occur due to terrain and operating speeds.

To ensure safe work is achieved, do not exceed walking pace whilst operating this equipment. Also note the terrain conditions (underfoot and rail conditions). Do not walk on sleepers or the rail head.

Electrification can occur if used on live third rail and/or fourth rail.

Do not use equipment on live third rail and/or fourth rail electrification.

Injury can occur through incorrect operation of the equipment.

Accumulator Hazard.

This machine utilises hammers that have a pressure accumulator.

Only operate the equipment for its intended use. Failure to do so may result in injury. Do not ride on or tow the equipment.

DO NOT disassemble hammers without consultation with MEC.

Vibration Hazard

Normal and proper use of this equipment will expose the operator to vibration. Vibration exposure may cause and/or contribute to injury throughout the body. Ensure proper procedures are followed for vibration exposure levels to reduce the risk of injury.

Refer to Specifications for vibration level data.

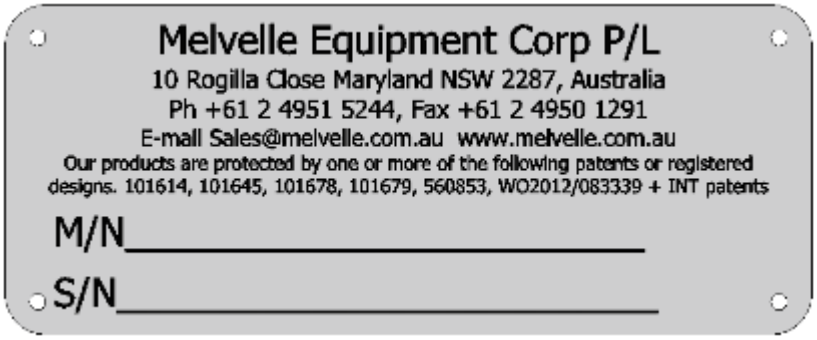
Noise Hazard.

Ensure adequate hearing protection is worn whilst using this machinery. High sound levels may cause permanent hearing loss.

Refer to Specifications for noise level data.

5. Equipment Stickers & Tags

Below are the stickers and tags utilised on this equipment.



IDTAG02 – Model & Serial No. Tag

IDTAG12 – Emergency Stop Warning Label

LAB0003 – Melvelle Newcastle Sticker

LAB0004 – Melvelle Achieving Excellence Sticker

LAB0006 – Danger – Keep Hands and Feet Clear Sticker

LAB0007 – Danger – Moving Parts Sticker

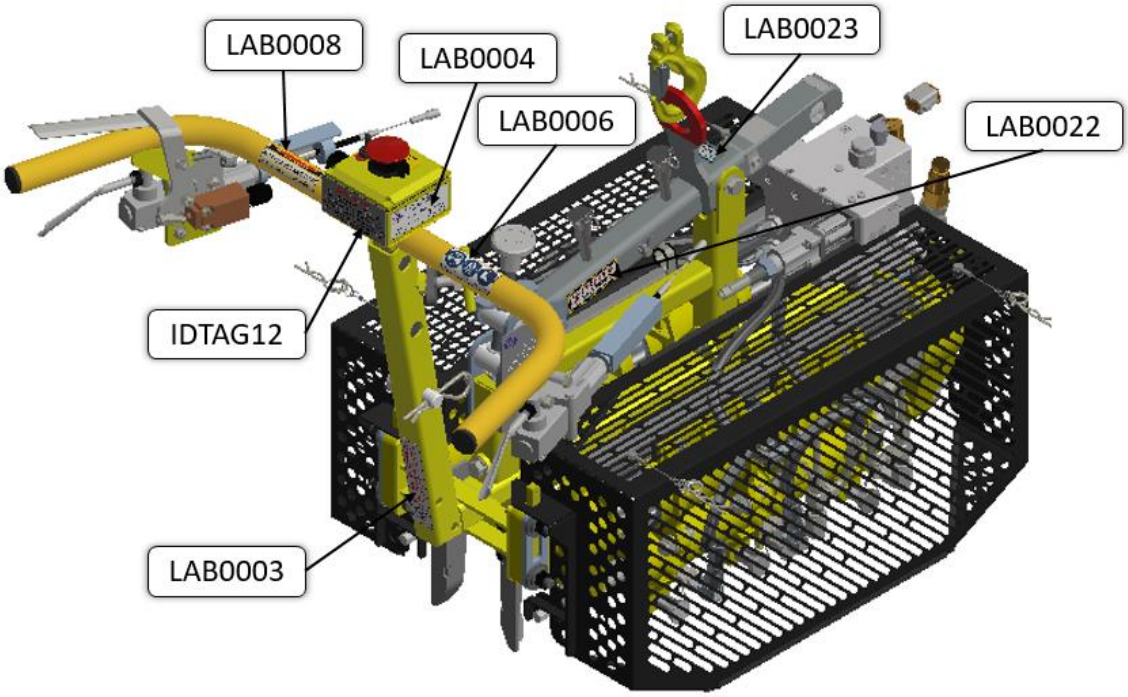
LAB0008 – Safety Label

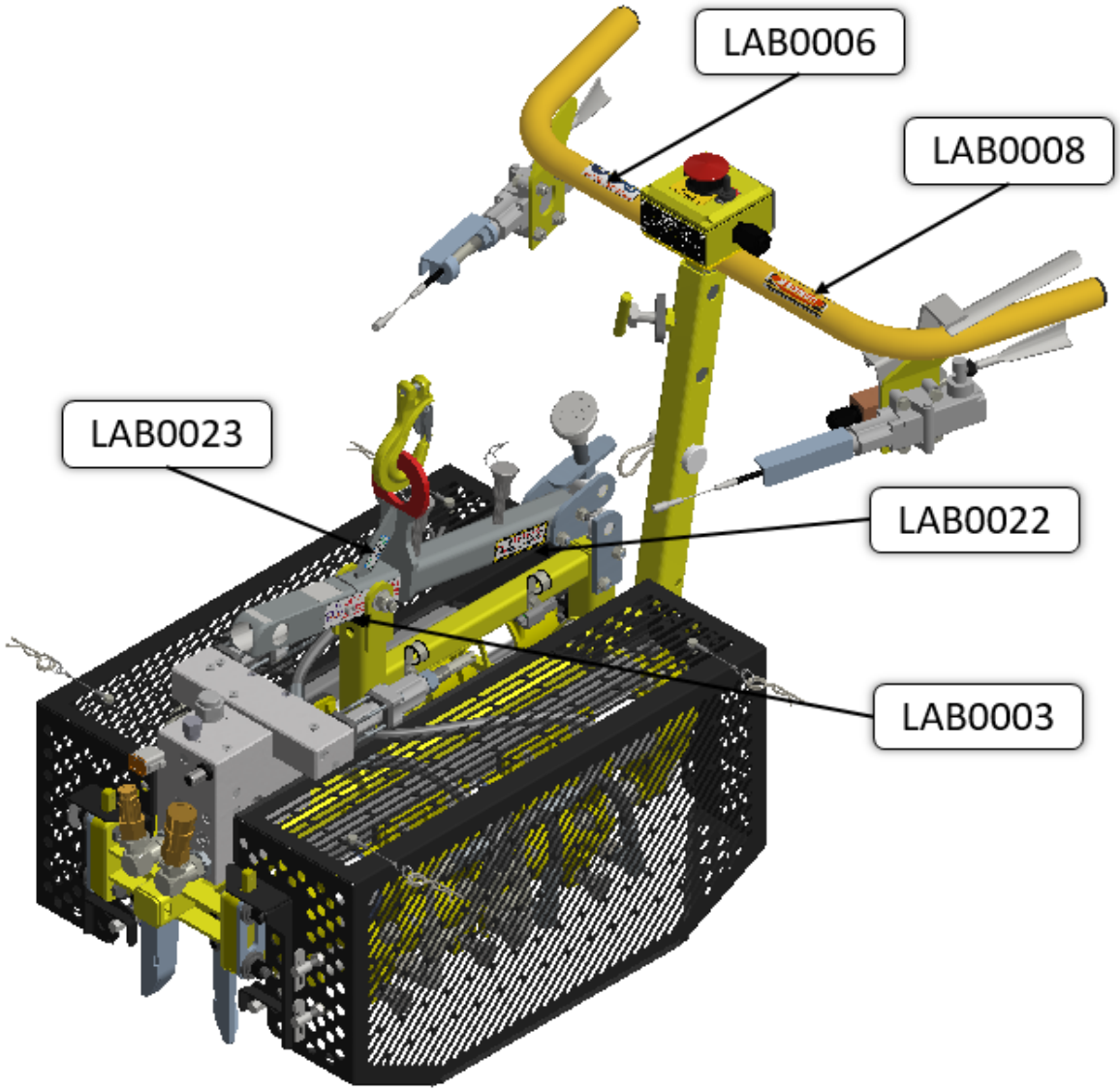
LAB0022 – NO LASHING POINT

LAB0023 – LASHING POINT

LAB0024 – LASHING POINT ONLY, NO LIFTING

5.1. Stickers & Tags Locations

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LAB0023
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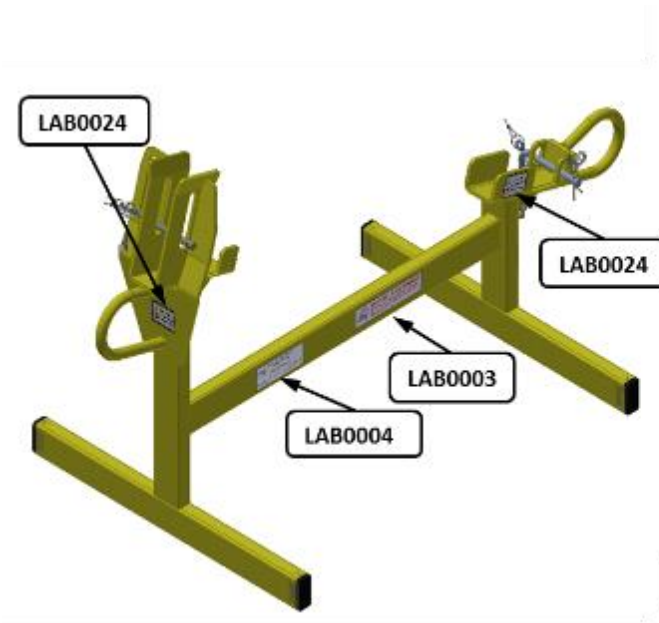
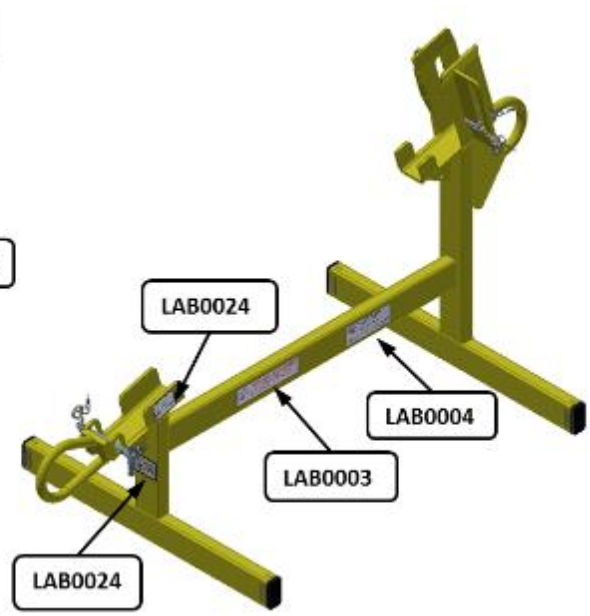
LAB0003


LAB0024
LAB0024
LAB0003
LAB0004


LAB0024
LAB0004
LAB0003
LAB0024

6. Emergency Stop

This machine has been fitted with an Emergency Stop to increase the operational safety of MEC machinery.

Important information about the Emergency Stop:

- The Emergency Stop is designed to stop the engine and hence the work head in Emergency situations

- Dedicated machines have a dedicated Emergency Stop to the power pack – they are wired into the machine

- Trackpacks fitted with a wiring harness will not operate unless a work head with an Emergency Stop is connected and the wiring harness connectors are joined

- The Emergency Stop **WILL NOT OPERATE** unless it is electrically connected to the power pack. For Trackpack heads, if the Trackpack is not fitted with a wiring harness and plug, the Emergency Stop will not work

- The Emergency Stop is not intended to be used for normal stopping of the machinery

7. Introduction

Melvelle Equipment Corp Pty Ltd (MEC) supply E (& PR)-Clip Inserter/Removers to the rail industry. The 190 work head is designed to remove and install E and PR Clips (elastic fasteners) that are used to fasten the rail to sleepers. The 190 has the ability to be used on rail sizes from 41kg/m to 68kg/m rail with steel, timber or concrete sleepers.

The 190 work head removes and installs E and PR clips using hydraulic force rather than operator exertion. This significantly improves efficiency and eliminates manual handling hazards associated with installing and removing E and PR clips.

With the floating jaws producing 4 tonne of force even galvanised clips are easily inserted. Working on both sides of the rail simultaneously, the 190 clips/unclips a sleeper in 10-15 second. The 190's unique positioning method allows sleepers to drop up to 20mm without missing or incorrectly engaging the clip, making it very well suited to real track conditions.

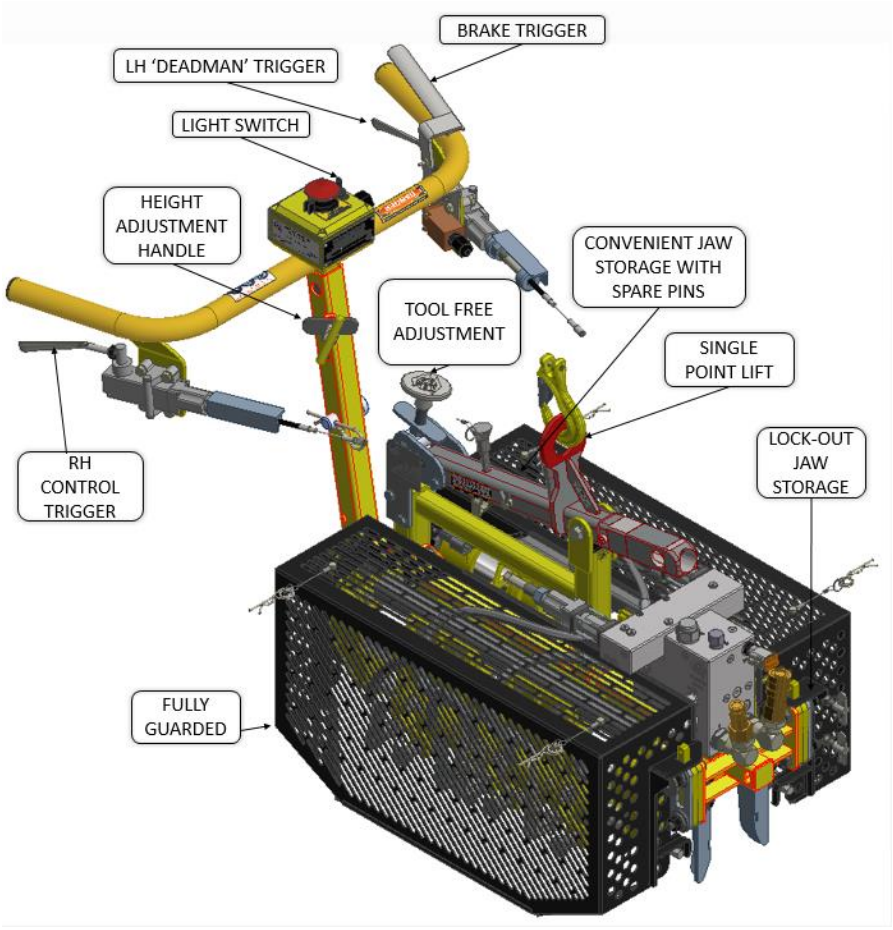
The 190 work head is packed with features making it a valuable tool for track maintenance and construction. They include:

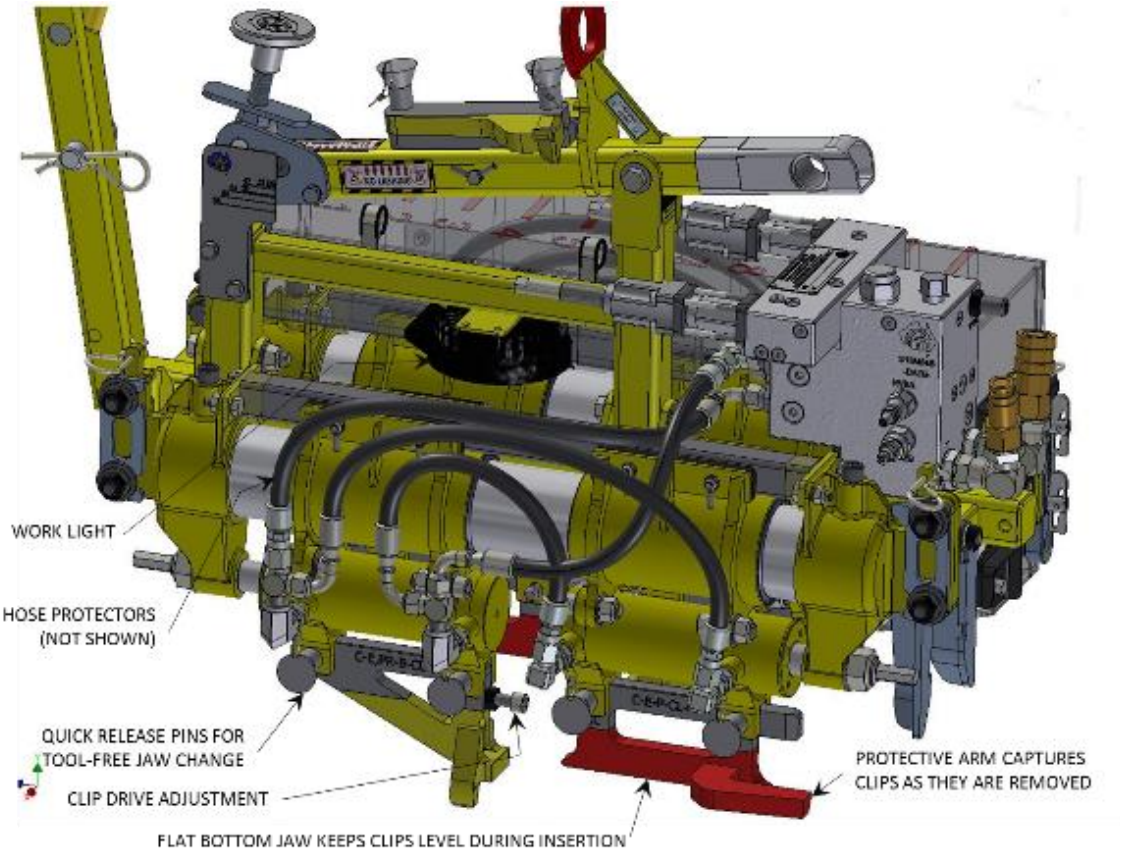
- Tool-free jaw change in 3 minutes
- Simple Tool-free set up on track[1]
- Convenient stowage of spare jaws, including spare pins
- Unique jaw design prevents clips rotating forward ensuring they are driven in correctly.
- Clip drive adjustment, preventing over/under drive
- Maintenance free – no greasing
- Single sided operation if required
- Work light
- Ergonomic, height adjustable handles
- Precisely balanced – only 3-5 kg on operator
- Stowage/transport frame and lifting bar
- Designated lift point for mechanical lifting

With safety being Melvelle's 1st priority the 190 workhead has been design with the following safety features:

- Fully guarded – there is no access to pinch or crush points.
- "dead man" switch requiring two handed operation.
- e-stop
- Clip retaining jaws – clips cannot fly off when unclipped due to the shape of the jaws.
- All hydraulic hoses are fitted with hose protection

[1] When shoulder-shoulder centres change (i.e. sleepers differ between states) a spanner is required to adjust width.


BRAKE TRIGGER
LH 'DEADMAN' TRIGGER
LIGHT SWITCH
HEIGHT ADJUSTMENT HANDLE
CONVENIENT JAW STORAGE WITH SPARE PINS
TOOL FREE ADJUSTMENT
SINGLE POINT LIFT
LOCK-OUT JAW STORAGE
RH CONTROL TRIGGER
FULLY GUARDED


WORK LIGHT
HOSE PROTECTORS (NOT SHOWN)
QUICK RELEASE PINS FOR TOOL-FREE JAW CHANGE
CLIP DRIVE ADJUSTMENT
PROTECTIVE ARM CAPTURES CLIPS AS THEY ARE REMOVED
FLAT BOTTOM JAW KEEPS CLIPS LEVEL DURING INSERTION

8. Specifications

8.1. FP-190-TP- Trackpack Workhead

Engine	MEC Trackpack
Dimensions	1100mm long x 740mm wide x 1000mm high
Weight (wet)	106kg
Pressure (max)	185bar / 2700psi
Battery	12V
Hydraulic Oil[1]	ISO68
Hydraulic Hose Connection Size	½”
Pressure Settings:	
Cylinder retract kick-down pressure	50 bar / 720psi
Cylinder extend Pressure	185 bar / 2700psi

8.2. FP-190-TP-02A - Trackpack Workhead

Engine	MEC Trackpack
Dimensions	1100mm long x 740mm wide x 1000mm high
Weight (wet)	234lb (106kg)
Pressure (max)	185bar / 2700psi
Battery	12V
Hydraulic Oil[1]	ISO68
Hydraulic Hose Connection Size	½”
Pressure Settings:	
Cylinder retract kick-down pressure	50 bar / 720psi
Cylinder extend Pressure	185 bar / 2700psi

9. Operation

Before use of the equipment, be aware of the operating environment and conditions for which the equipment is to be used. Ensure all users are trained to operate the machinery before operation.

9.1. Operating Conditions

The following outlines the duties and conditions for which the equipment is intended to be operated:

- Used on the intended rail line (gauge)
- Used within a possession
- Not to be used on third and/or fourth rail electrification
- Has the ability to be used in all environmental conditions providing the rail is clean and accessible (i.e. snow, extreme heat, etc may be considered hazardous to operation of the equipment)
- Equipment is designed to install & remove Pandrol ‘E’ Clip and ‘PR’ Clips (elastic fasteners) only
- Ensure operators are using hearing protection when using this machinery that is applicable to industry standards to reduce noise to acceptable levels
- Ensure operators adhere to industry accepted operating times for vibration exposure levels

9.2. Pre-Operation Checks

9.2.1.1. Overall Inspection

1. Check that the equipment is free from damage or defects
2. If damaged, DO NOT USE. Contact MEC for repairs

9.2.1.2. Engine Oil

1. Check the level and quality of the engine oil and add if required
2. If contaminated or old, engine oil will be dark (nearly black)
3. If contaminated with water, engine oil will be a milky colour
4. Refer to manufacturer's instructions for specific data
5. If engine oil contaminated, replace before use

9.2.1.3. Hydraulic Oil

1. Check the level and quality of the hydraulic oil and add if required
2. Oil level to be just above the centre cone, under the filter breather cover, by 2-20mm
3. If contaminated, hydraulic oil will be discoloured
4. If contaminated with water, hydraulic oil will be a milky colour
5. If hydraulic oil contaminated, replace before use

9.2.1.4. Fuel

1. Check the level of fuel and add if required

9.2.1.5. Battery (if applicable)

1. Visually inspect the condition of the battery
2. Ensure there is no damage, acid levels are OK and the battery leads are free from defects
3. If damaged, replace before use

9.2.1.6. Light

1. Visually inspect condition and leads of light
2. Ensure there is no damage and leads are free from defects
3. Before starting, ensure the light is off
4. If damaged, replace before use

9.2.1.7. Hydraulic Hoses & Filter

1. Visually inspect the hoses and filter

2. Ensure there is no damage

3. If damaged, replace before use

9.2.1.8. Guards & Stickers/Tags

1. Inspect all guards and stickers/tags are in place and secure – refer to further document drawings for locations

2. Ensure there is no damage

3. If damaged, DO NOT use machinery. Replace before use

9.2.1.9. Emergency Stop

1. Ensure Emergency Stop plug is electrically connected

2. Ensure the wires are free from damage and connections are clean and dry

9.2.1.10. Jaws

1. Inspect jaws for damage and wear before use
2. If damaged or excessive wear seen, replace jaw

9.3. Assembly Procedures

WARNING

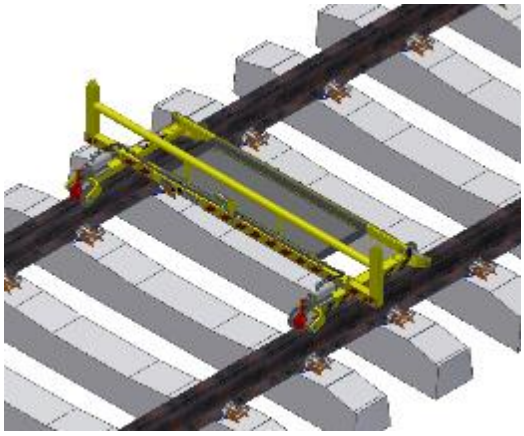
Before any assembly and/or maintenance are performed, ensure the work head and engine are off and in a neutral position

9.3.1. Braked Machine Trolley

1. Inspect the trolley and ensure it is not damaged and free from defects, and all pre operation checks are done as per section 9.2.

2. Assemble the trolley to the rail lines.

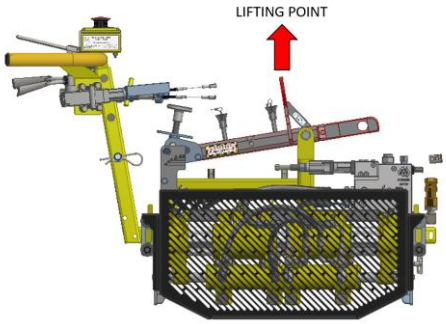
   Refer to Braked Machine Trolley Operation Manual for more information



9.3.2. Machine Assembly – Trackpack

1. Observe all safety precautions. Ensure the operation is being performed on safe and steady ground (no excessive slopes or dangerous terrain).

2. Inspect the 190 work head and Trackpack and ensure they are not damaged and are free from defects.



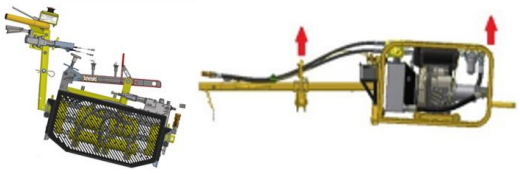
3. A 190 work head weighs approximately 106 kg and a Trackpack weighs approximately 120kg.

4. Lift work head from vehicle, keeping stowage frame attached. Place work head onto ground

5. Adjust the pivot position (cross trolley rollers) to the correct position for the machine. For the 190 this is the furthest hole from the engine (refer further document drawing for pin locations). Attach slings to the lifting lugs on the Trackpack.

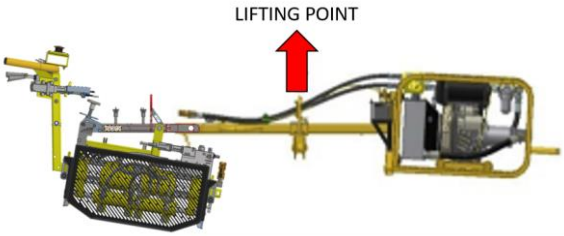
6. By following safe lifting procedures, lift the Trackpack using slings ensuring it is kept level and easy to move (For more information refer to the Trackpack Manual).

7. Guide the Trackpack towards the work head and align the square attachment (hayman-reese style) and slide the items together. Insert the locking pin between the items and lock in position with the R -Clip. Lower the Trackpack to the ground and remove the slings.



8. Connect the hydraulic quick snaps together. Connect the electrical deutsch plugs together to ensure the Emergency stop and brake is connected to the trackpack.

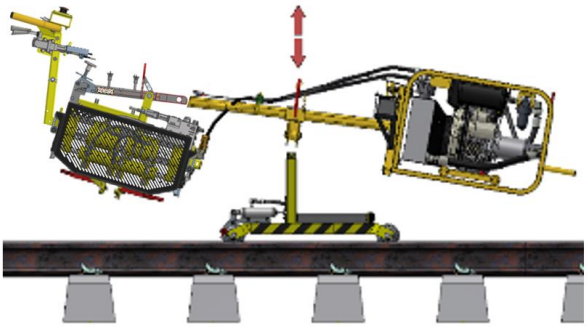
9. Un-pin the stowage frame and the trackpack / work head are now ready be lifted onto the machine trolley.



10. By following safe lifting procedures, lift the machine onto the trolley. The cross trolley rollers will sit onto the cross bar (tube).

CAUTION

When placing the machine onto the trolley, ensure hands are clear of the cross trolley rollers and cross bar (tube) as personal injury may occur.

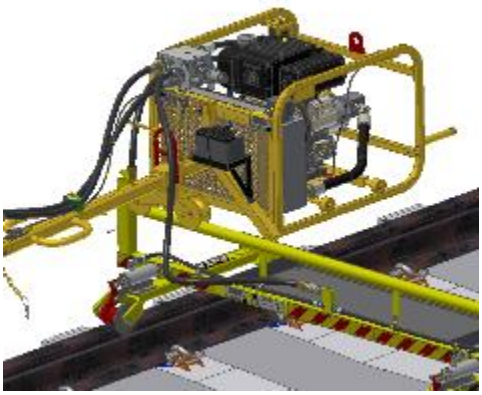


11. Remove the slings and/or hooks. The machine can now be moved to either rail for use. This is achieved by raising the head off the ground and sliding across the trolley. A second person may be required to assist and push the engine across the trolley.

12. Attach the chain to the trolley to ensure the machine will not roll during operation.

13. Connect the Brake hose to the Cylinder on the trolley.

14. The equipment is now ready for use.



9.3.3. Handle Adjustment

The adjustment of the handles is done to achieve a comfortable height for the operator whilst using the machine.

To adjust the handles:

1. Loosen the T-Bolt and locking nut.

2. Remove the R-Clip and adjustment bolt from the handles.

3. Stand in the operating position and lift/lower the handles to the required height.

4. Replace the adjustment bolt and R-clip.

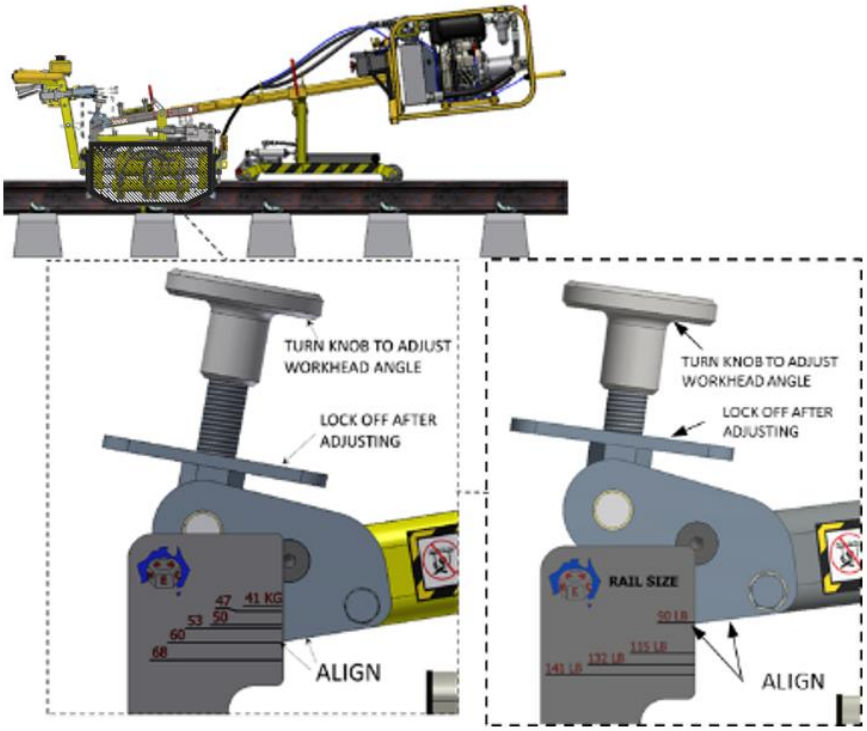
5. Tighten the T-Bolt and locking nut.

9.3.4. Machine Adjustment – Workhead Angle

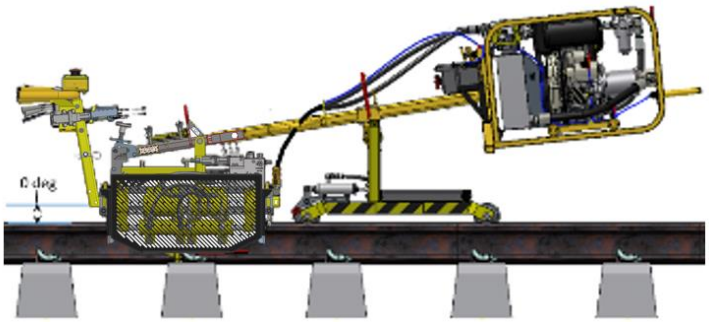
The head angle adjustment is required to ensure the 190 work head is level with the rail and ensures correct engagement with the clips. This is required as the rail height changes between rail sizes and hence, the angle of the work head. Incorrect work head angle hinders the operation of the machine and operators will find it difficult to use the machinery.

To adjust the Workhand angle:

1. Ensure the Workhead is on the rail and connected to a Trackpack. Turn knob to align edge to correct rail size. Tighten locking nut firmly by hand.

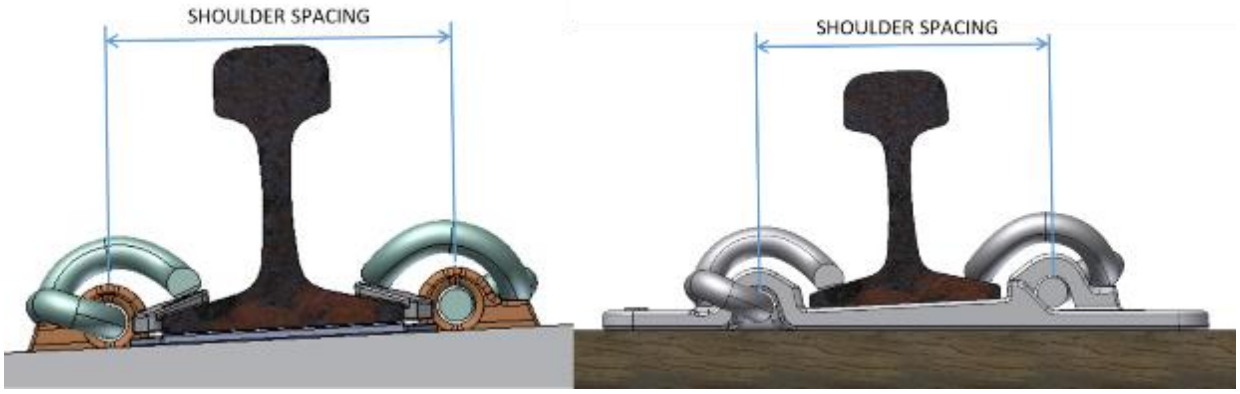


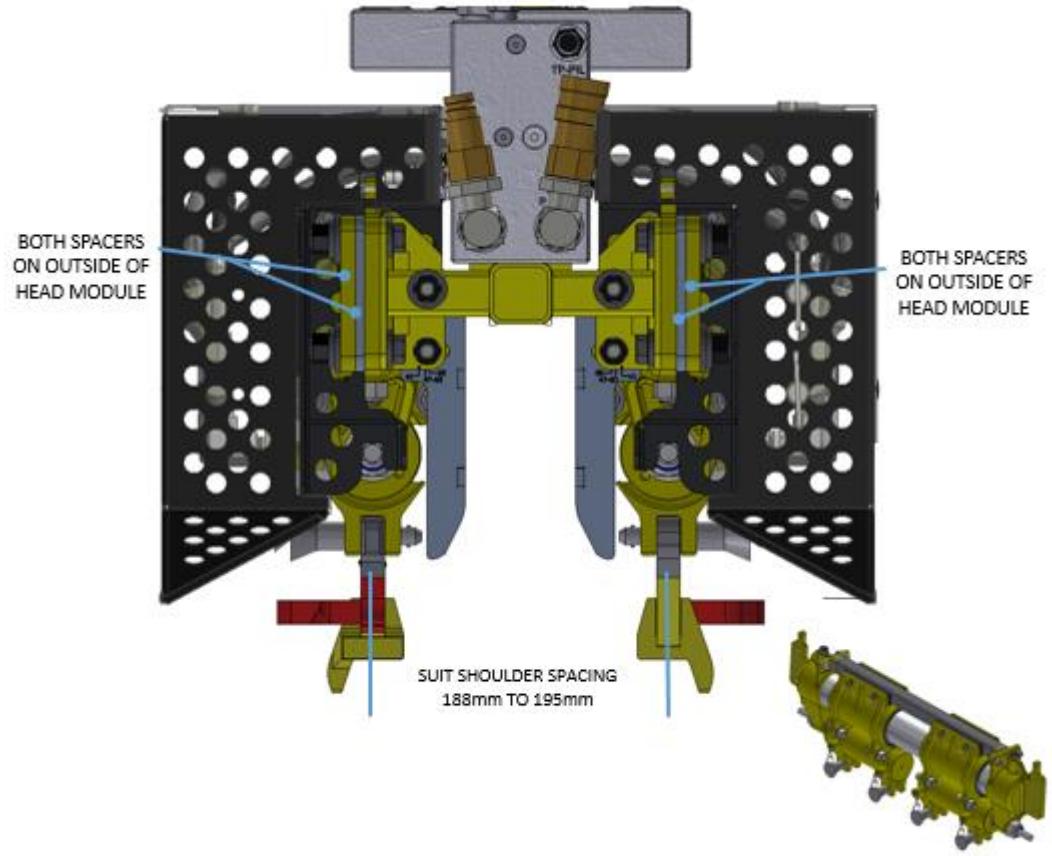
2. Following the above steps will align the work head parallel to the rail. Significantly worn rail may require a minor re-adjustment to ensure the work head is set parallel to the rail

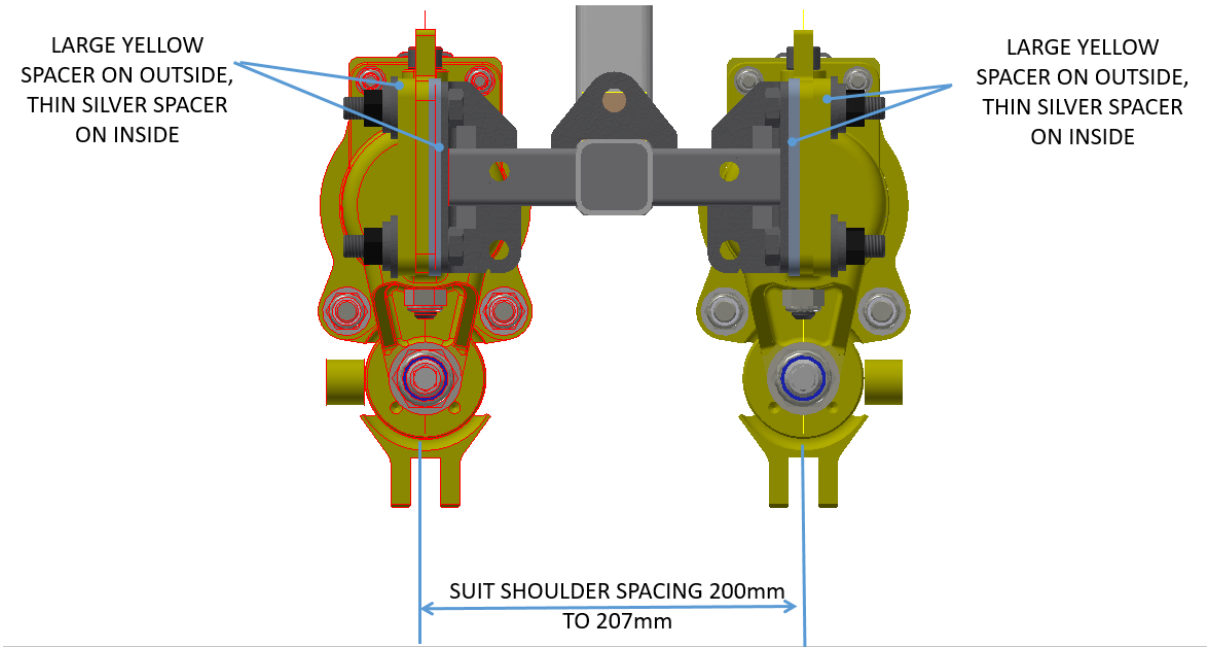


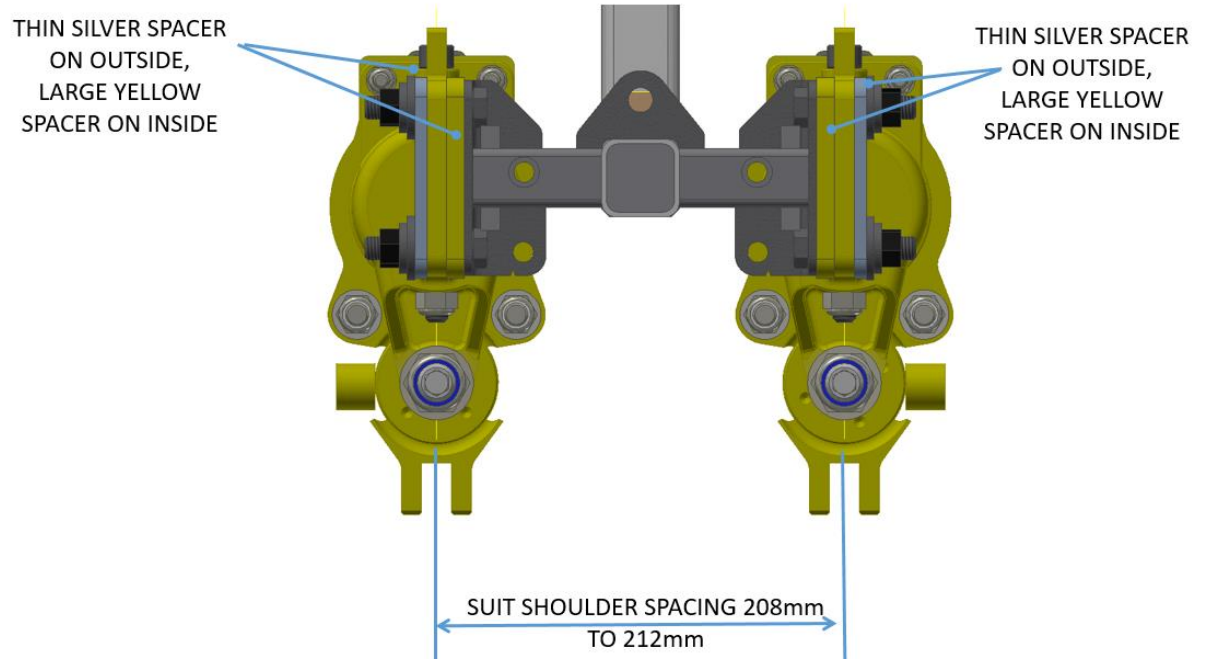
9.3.5. Machine Adjustment – Shoulder to Shoulder spacing

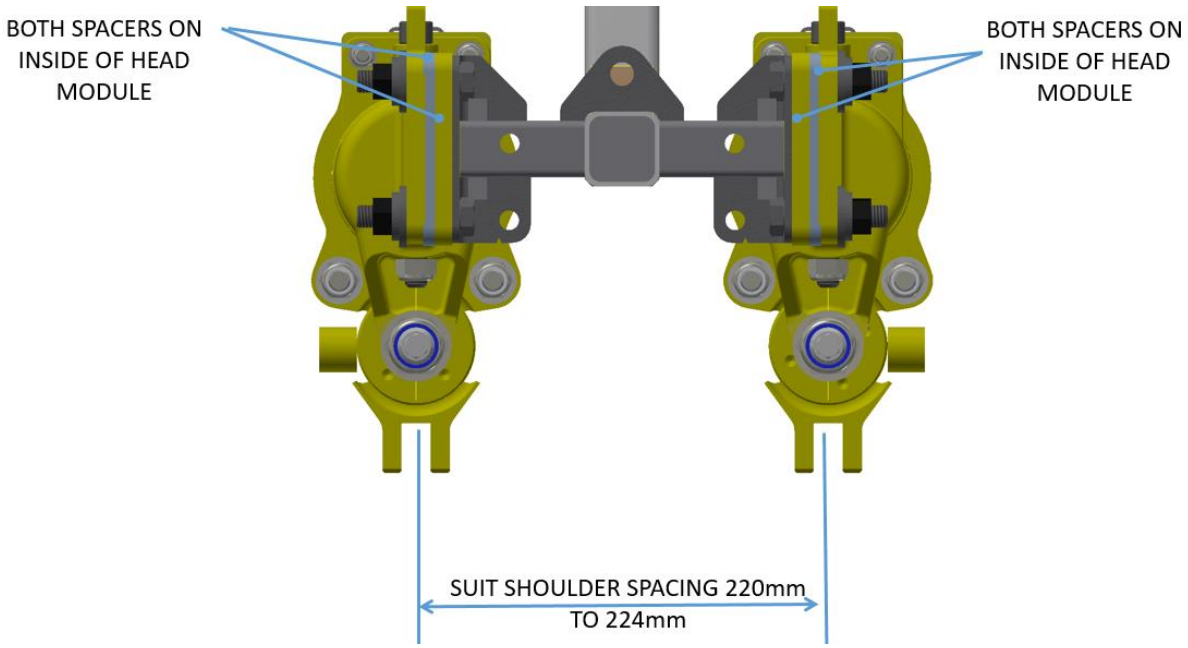
In Australia there is a variety of sleepers in use with a range of shoulder to shoulder spacing. To accommodate this variation the 190 work head has some simple slide in – slide out spacers as shown below.

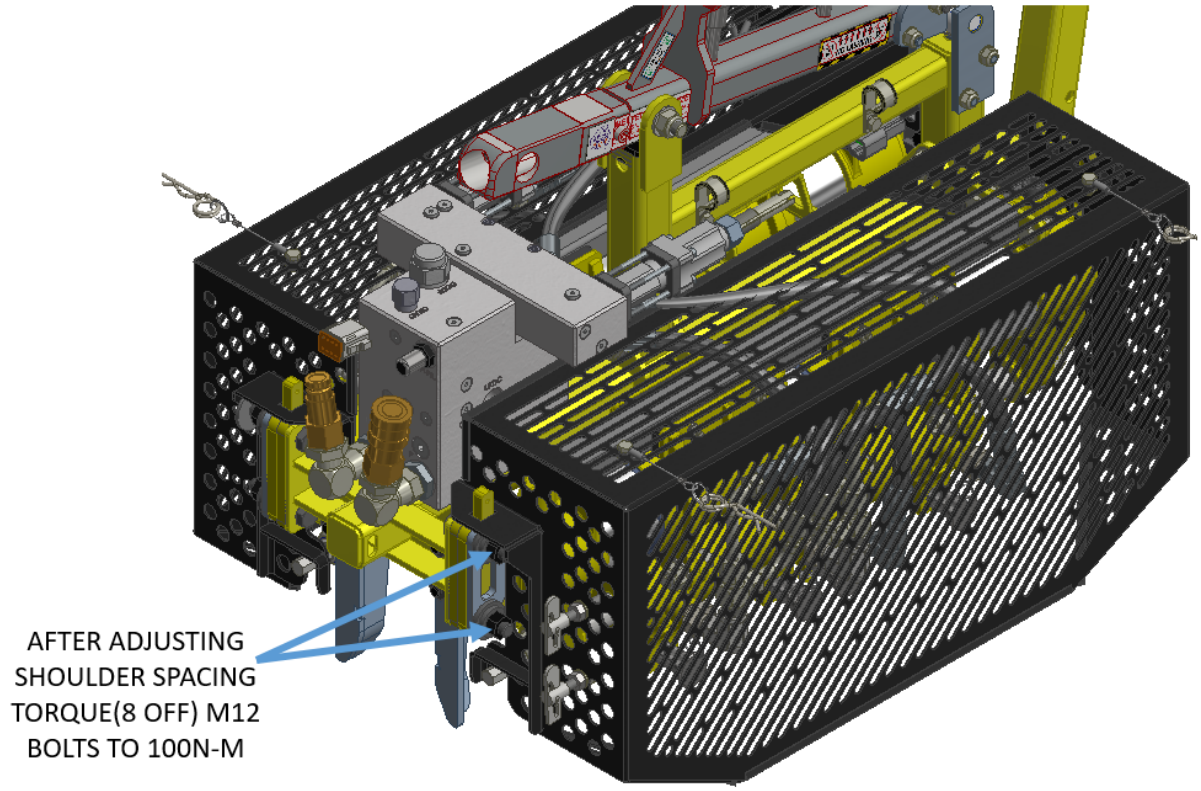




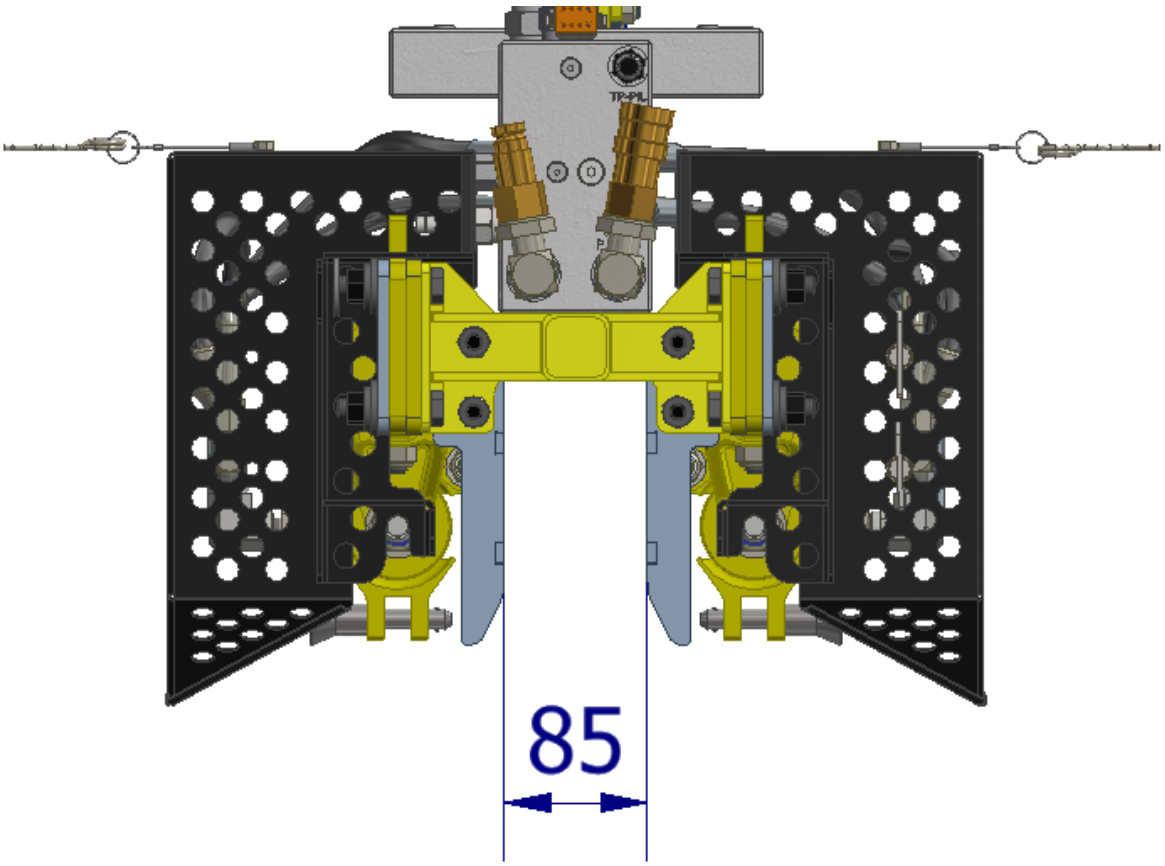

LARGE YELLOW SPACER ON OUTSIDE, THIN SILVER SPACER ON INSIDE
LARGE YELLOW SPACER ON OUTSIDE, THIN SILVER SPACER ON INSIDE
SUIT SHOULDER SPACING 200mm TO 207mm


THIN SILVER SPACER ON OUTSIDE, LARGE YELLOW SPACER ON INSIDE
THIN SILVER SPACER ON OUTSIDE, LARGE YELLOW SPACER ON INSIDE
SUIT SHOULDER SPACING 208mm TO 212mm



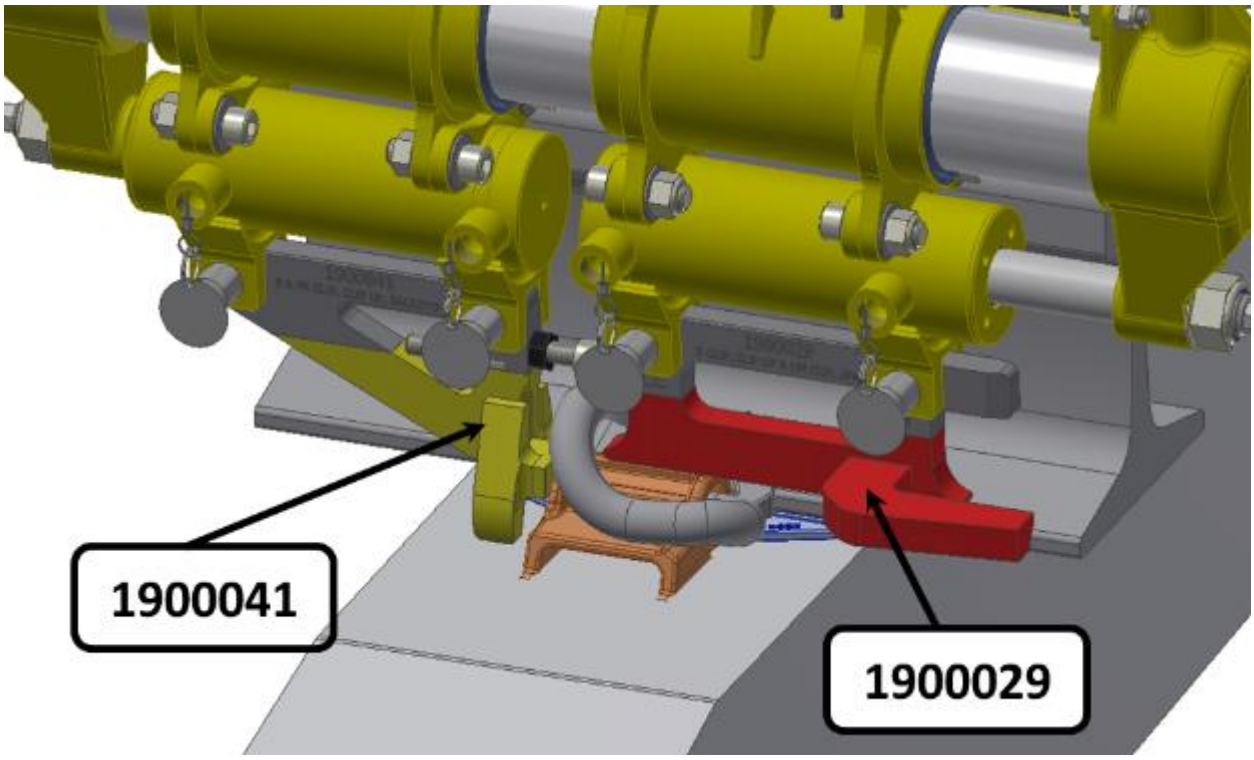


*The rail guides are set 85mm apart; this is to allow for use on all rail sizes 68KG and under

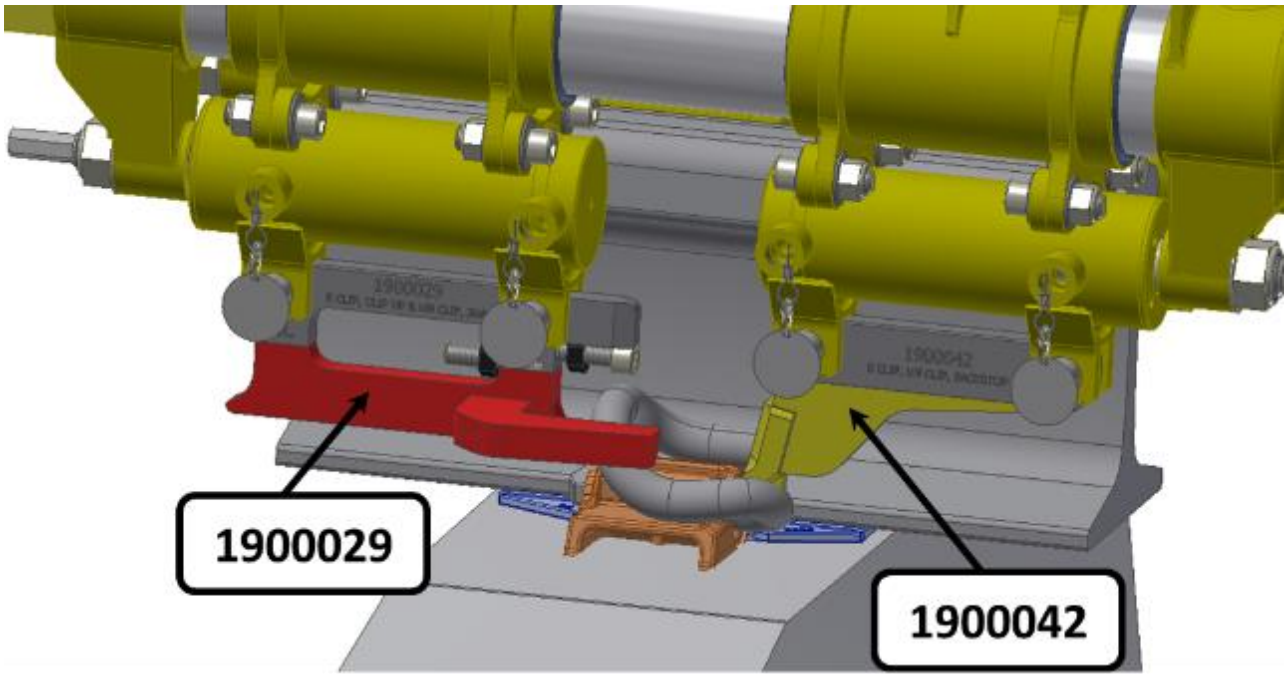

85

9.4. Jaw Assembly

9.4.1. Concrete Sleeper, E-clip – Clipping Up

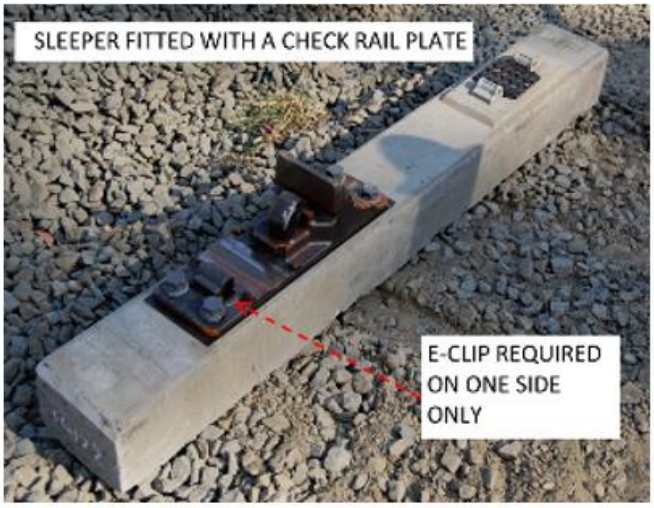


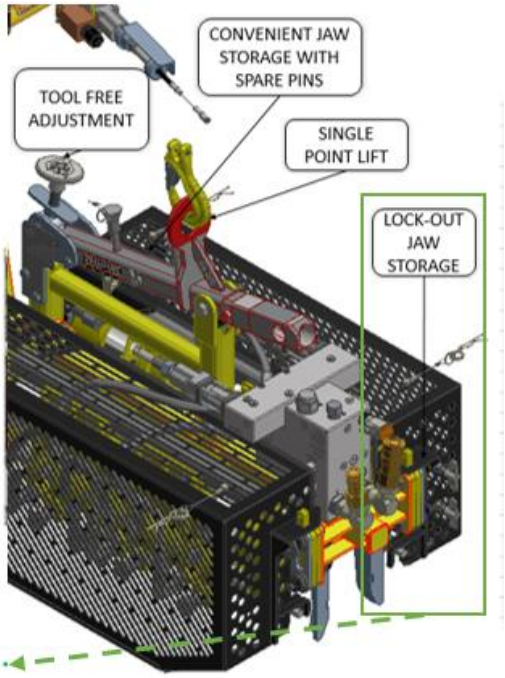
9.4.2. Concrete Sleeper, E-clip – Unclipping

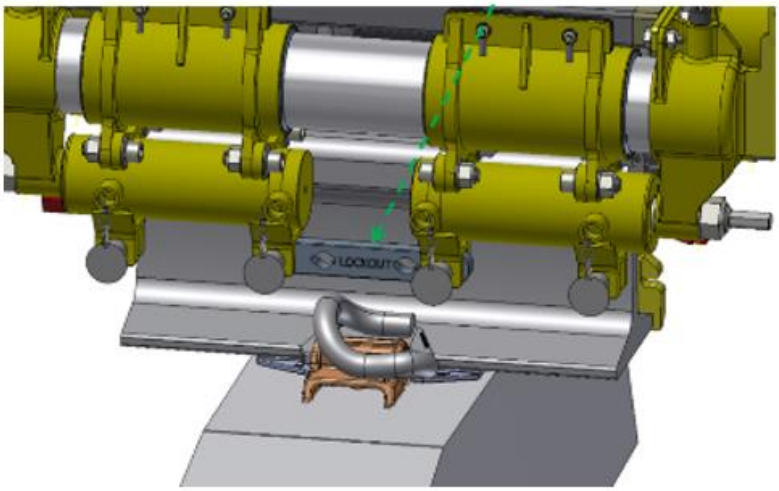


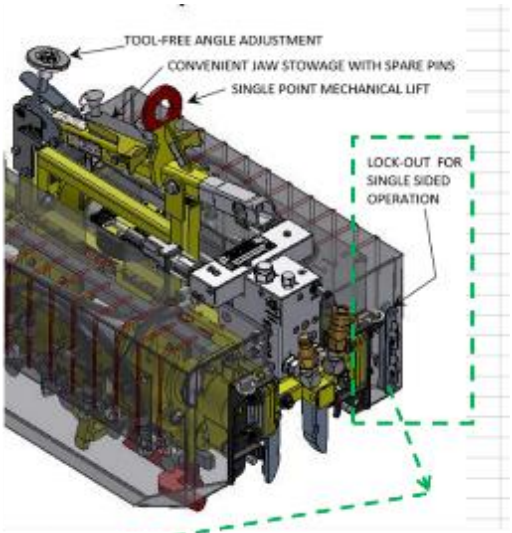
9.4.3. One sided Operation

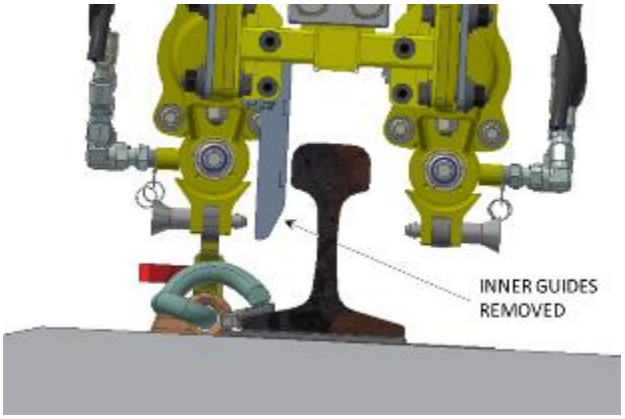
Some rail systems, such as check rail arrangements on tight bends, require single sided clipping. To achieve this, the 190 work head comes fitted with a “LOCKOUT” jaw which prevents one side of the unit from operating. It is safe to operate the machine with the “LOCKOUT” installed (as shown below) and the guard removed from the locked out side only. In some cases the inner rail guides may need to be removed as well. This will depend on the check rail used/positioned.





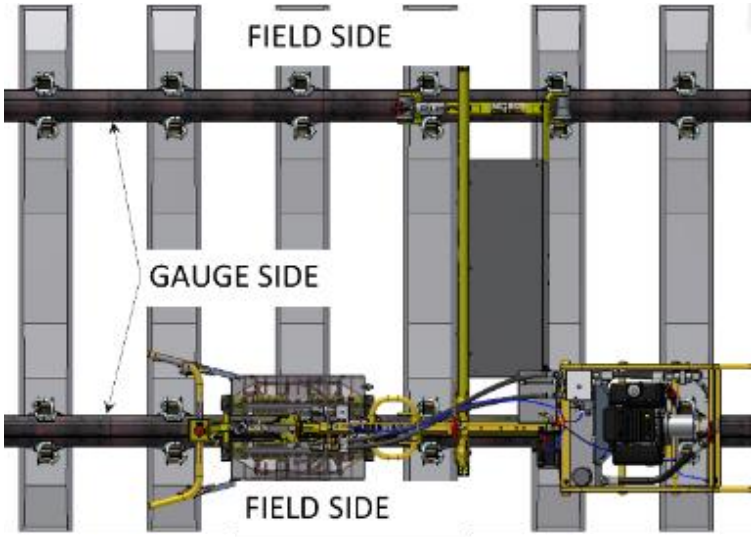





INNER GUIDES
REMOVED

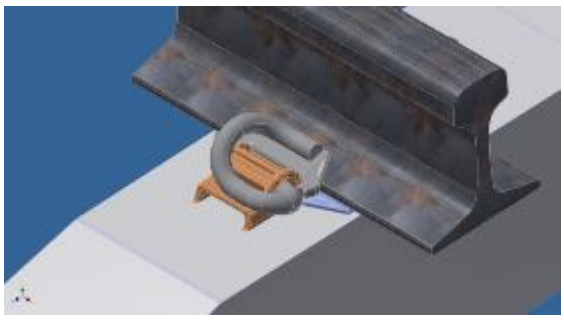
9.4.4. Timber/Composite Sleeper Terminology

The following jaw assembly guidelines for timber/composite sleepers refer to the “FIELD SIDE” and “GAUGE SIDE” of the rail. They are defined in the image below.

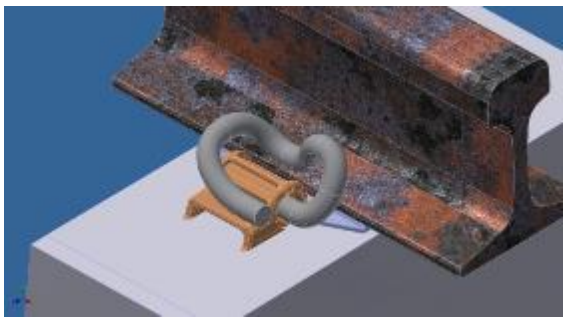


9.4.5. Clip Style Terminology – E-Clip/ PR-Clip

The following shows the difference between an E-clip and a PR-Clip which require different jaws. See section 15,**Error! Reference source not found.** for details on PR clips on both concrete and timber s leepers.



E-Clip

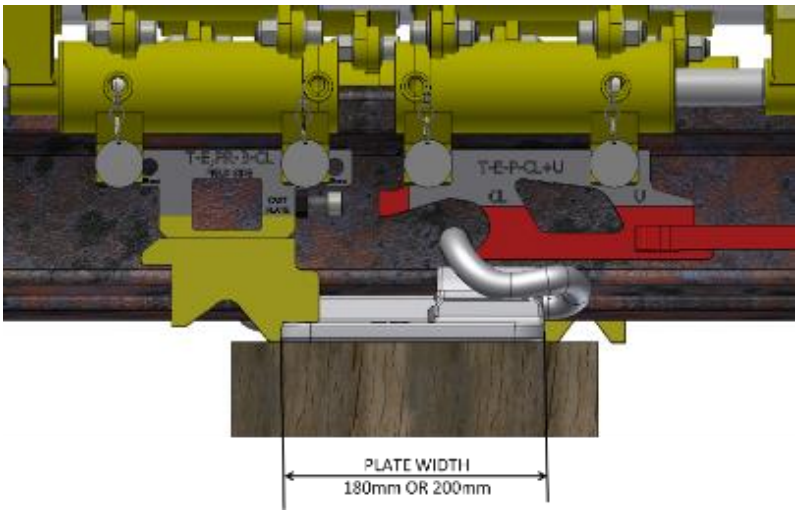


PR-Clip

9.4.6. Timber/Composite Sleeper Plate Variations

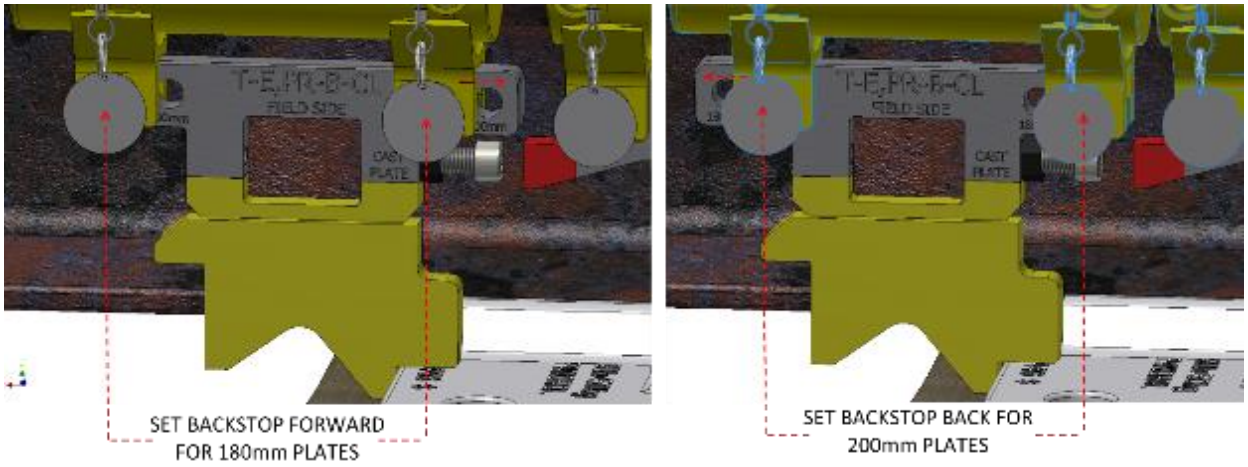
There a variety of sleeper plates currently in use. The 190 jaws accommodate the following variations:

Sleeper Plate Width

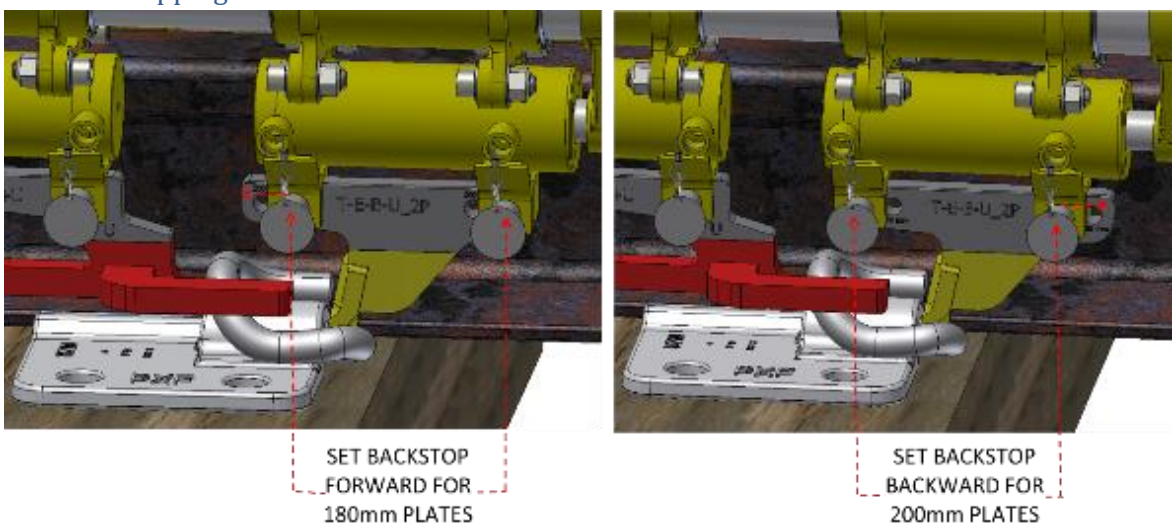


To accommodate this variation, 1 out of the 4 jaws in the set has 2 pinned positions:

Clipping up:



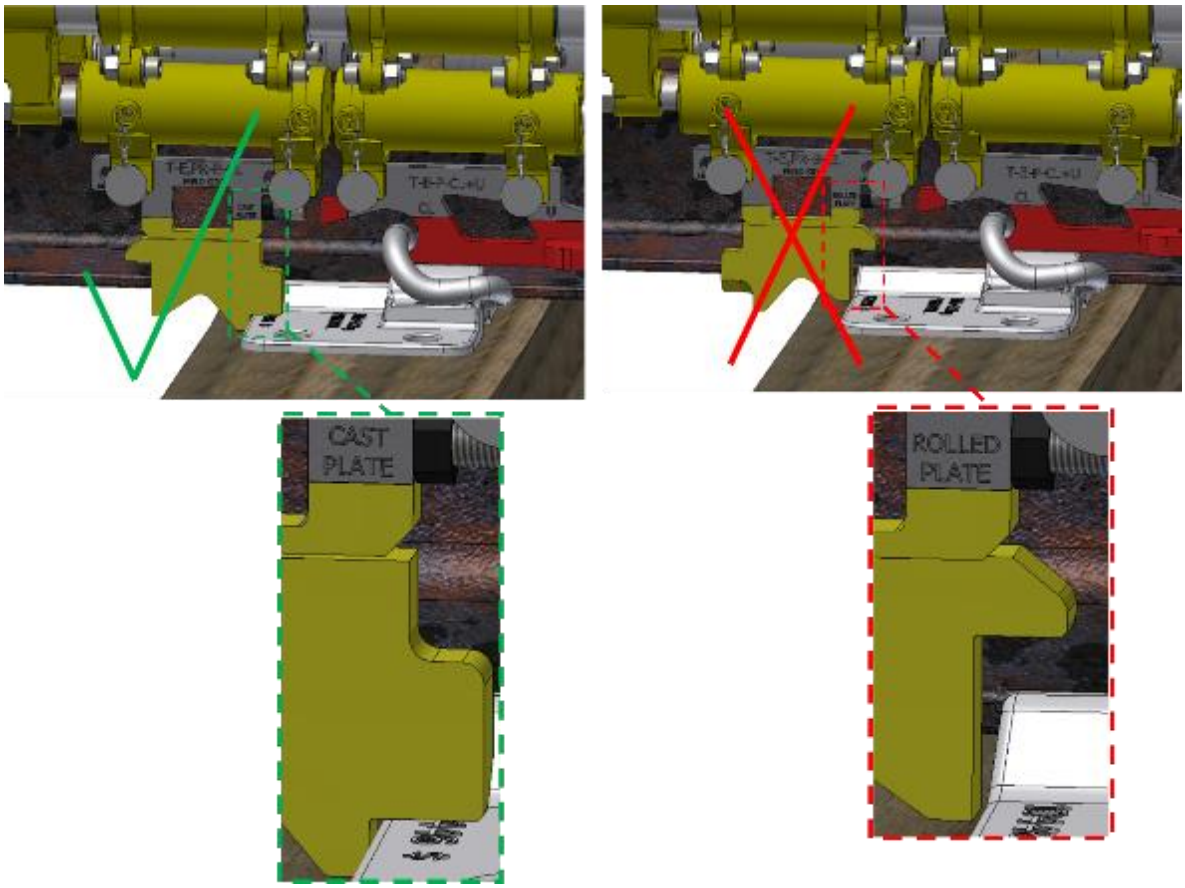
Un-clipping:



Rolled or Cast Sleeper Plates

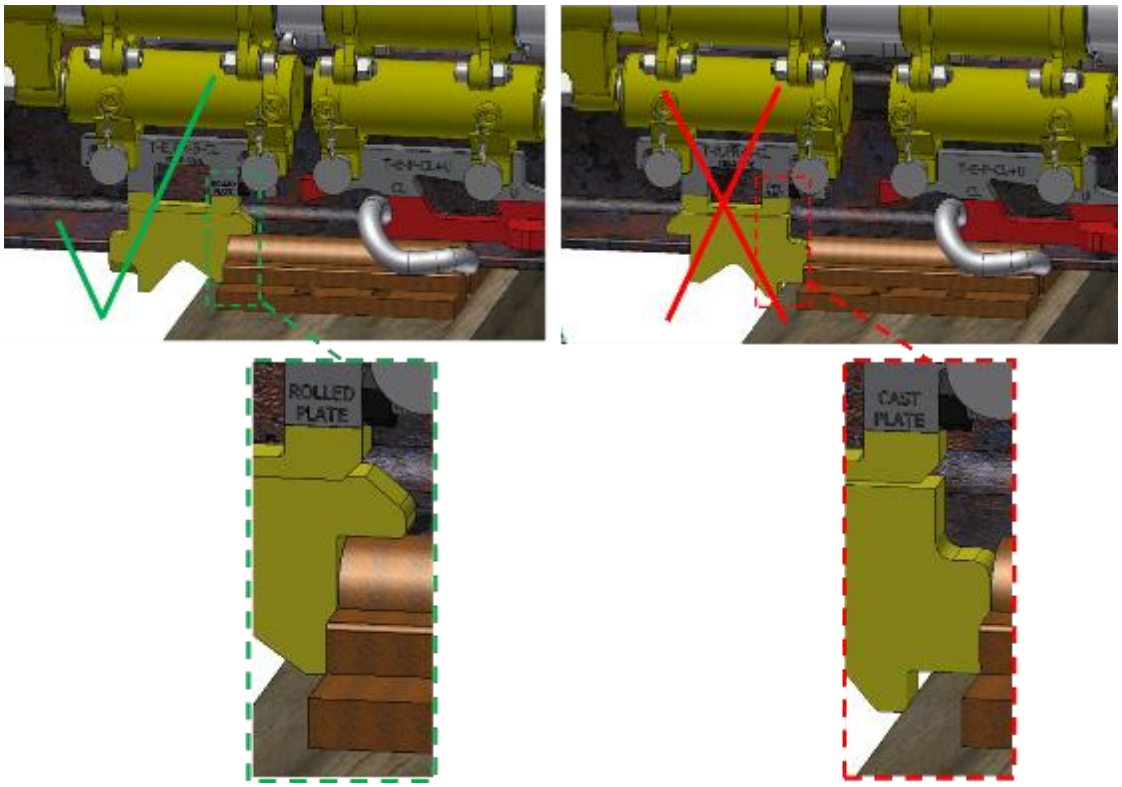
Cast Plate Backstop Orientation

A “FIELD” side backstop always stays on the “FIELD” side and a “GAUGE” side backstop always stays on the “GAUGE” side (see section 9.4.4). They are simply rotated 180 degrees for cast or rolled plates as shown below.



Rolled Plate Backstop Orientation

A “FIELD” side backstop always stays on the “FIELD” side and a “GAUGE” side backstop always stays on the “GAUGE” side (see section 9.4.4). They are simply rotated 180 degrees for cast or rolled plates as shown below.



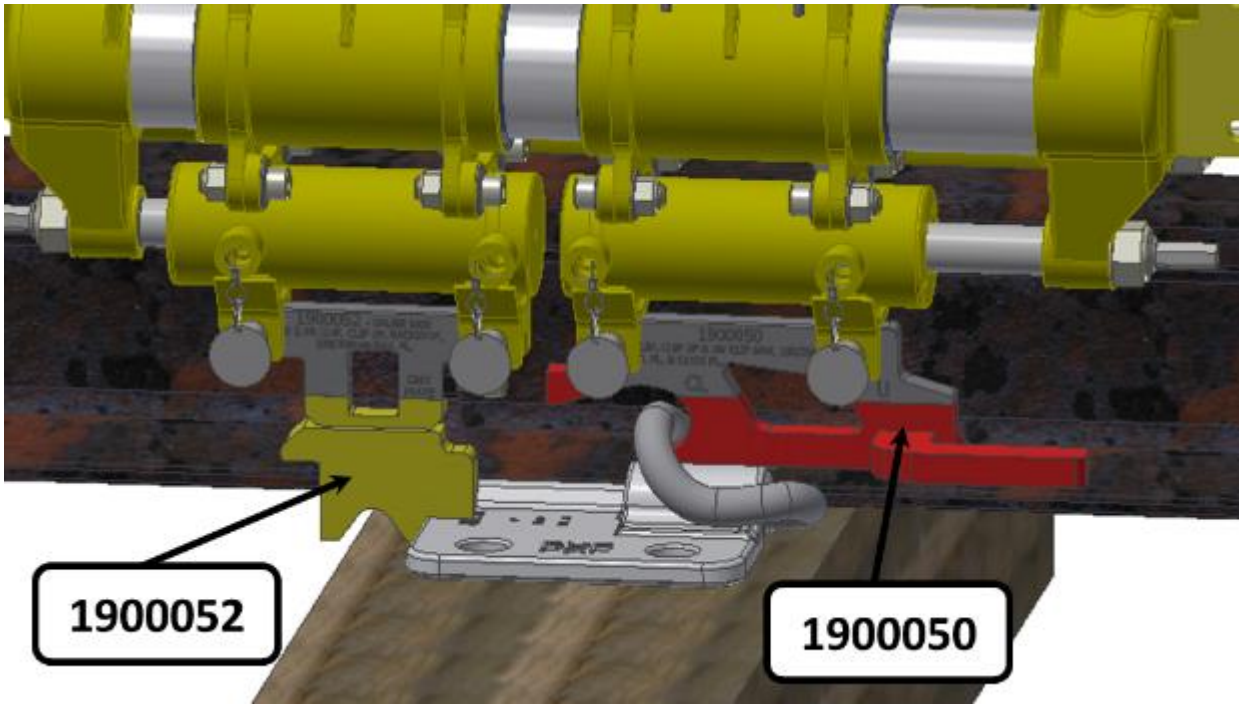
9.4.7. Special Track Plates

For information on special track jaws and backstops go to the following appendix sections.

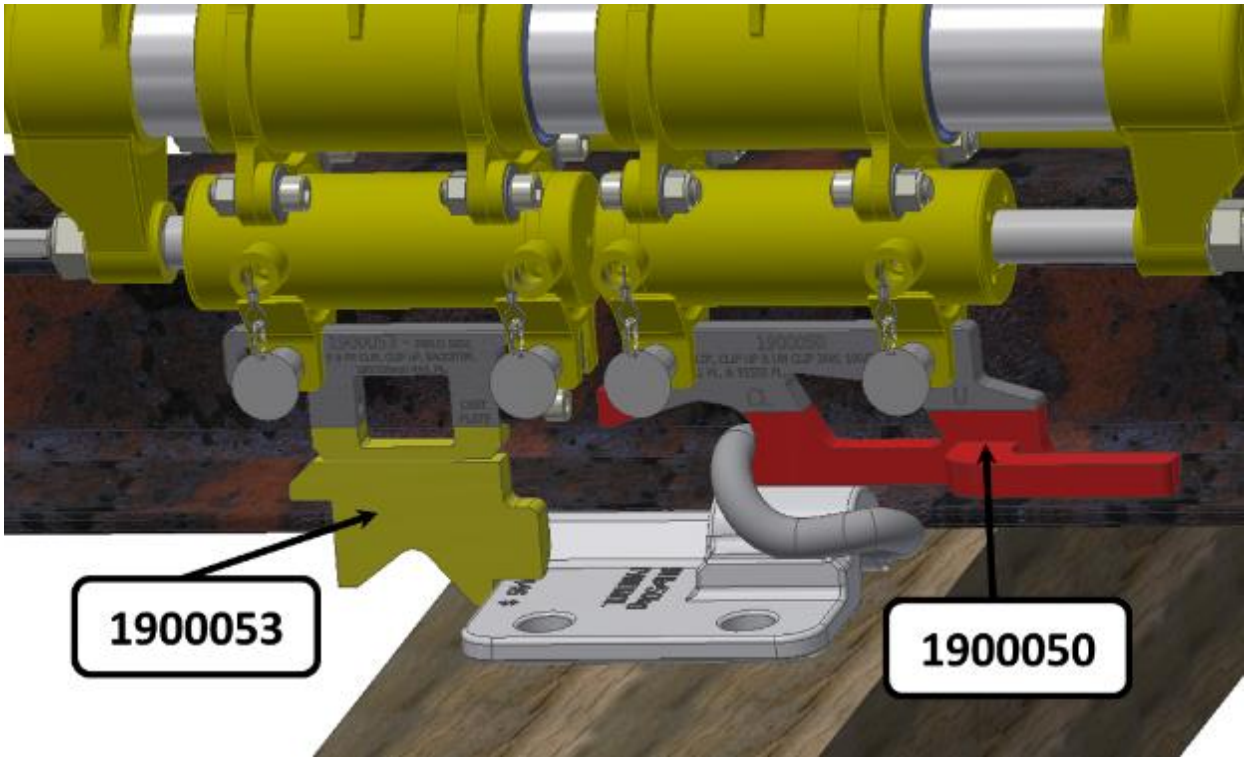
SPECIAL TRACK PLATE DECRIPTION	SECTION NUMBER
APPENDIX A – PR CLIP JAWS	15
APPENDIX B – 150MM (6”) SLEEPER PLATE E-CLIP JAWS	16
APPENDIX C – 216MM (8.5”) SLEEPER PLATE E-CLIP JAWS	17
APPENDIX D – 16” VICTOR PLATE E-CLIP JAWS	18
APPENDIX E - 18” VICTOR PLATE E-CLIP JAWS	19
APPENDIX F - PANDROL 91533 RAIL PLATE	20
APPENDIX G – DELKOR RAIL EGG RF167 & RF127 (ELASTIC RAIL FASTENER) & RF127	21

9.4.8. Timber/Composite Sleeper Cast Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

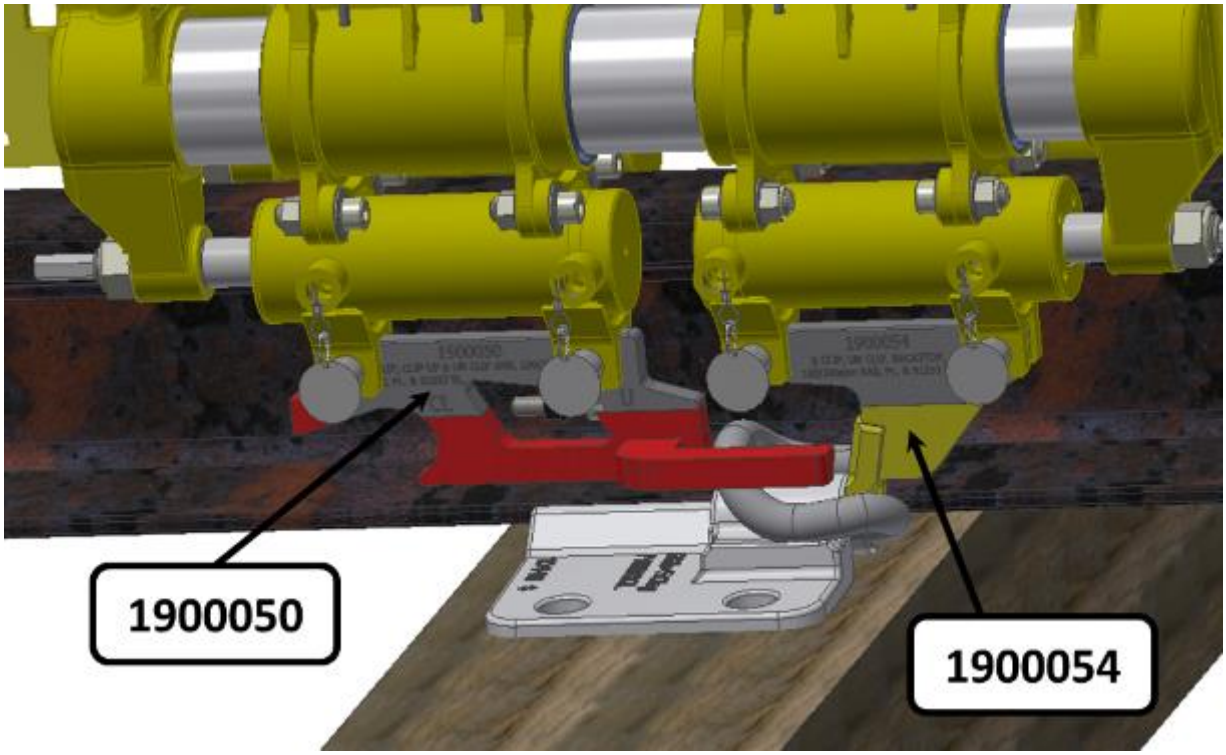


Field side (see section 9.4.4 and 9.4.6)

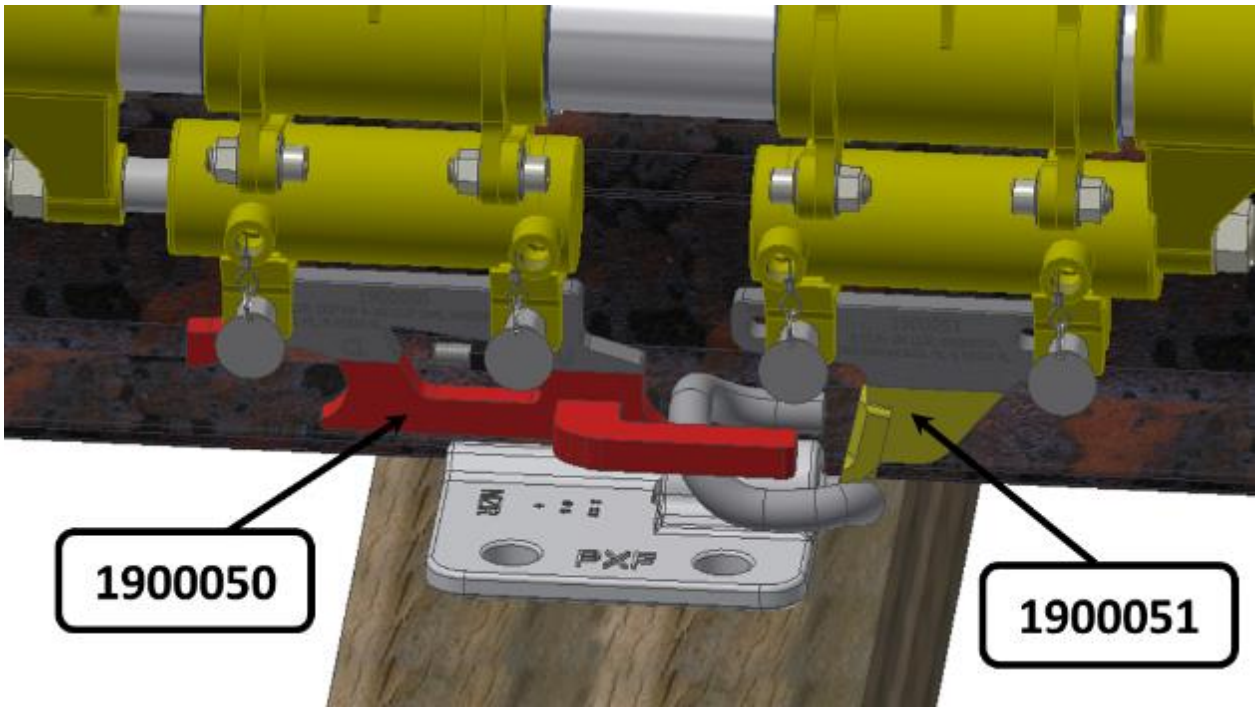


9.4.9. Timber/Composite Sleeper, Cast Plate, E-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

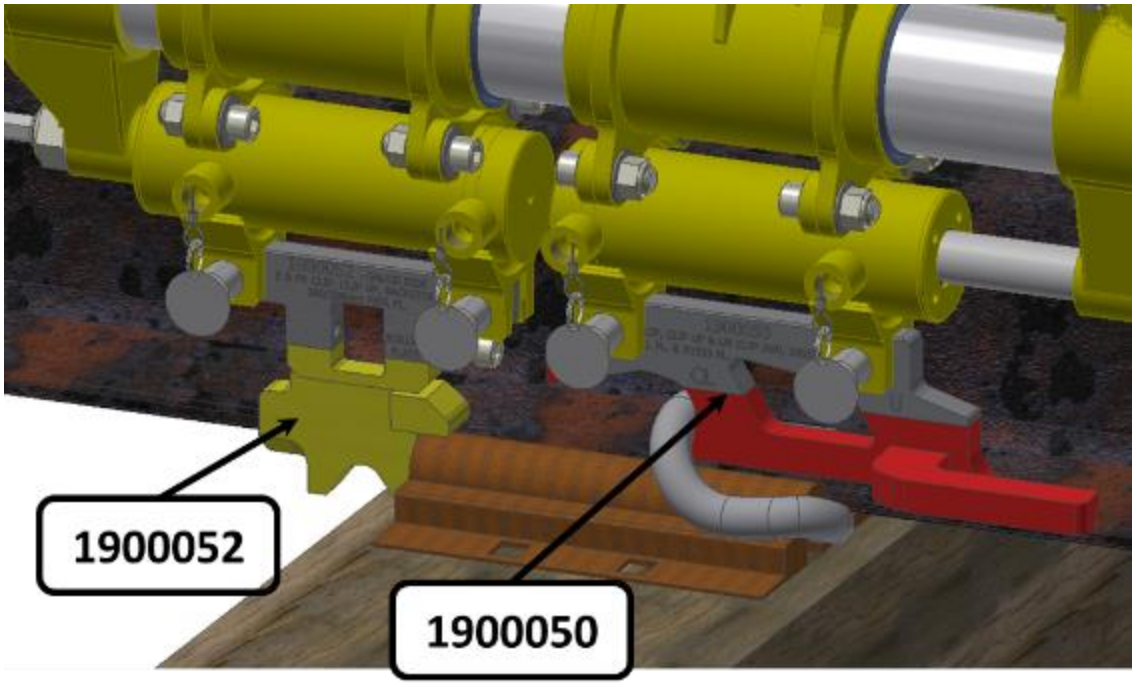


Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

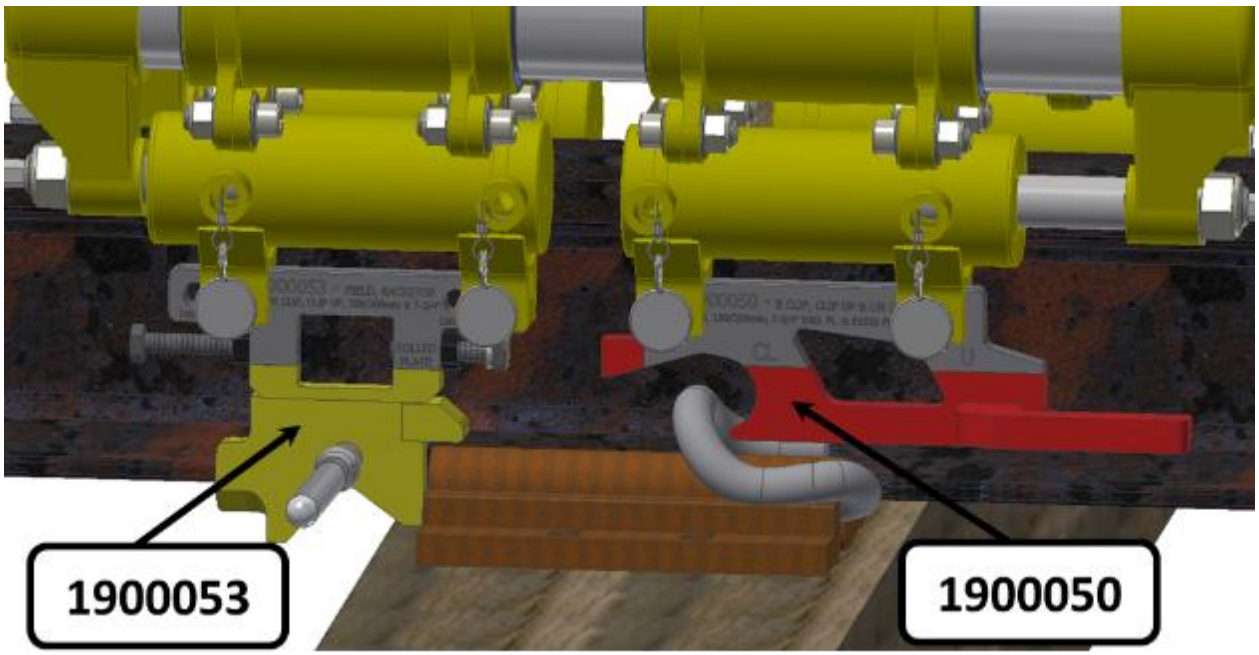


9.4.10. Timber/Composite, Rolled Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

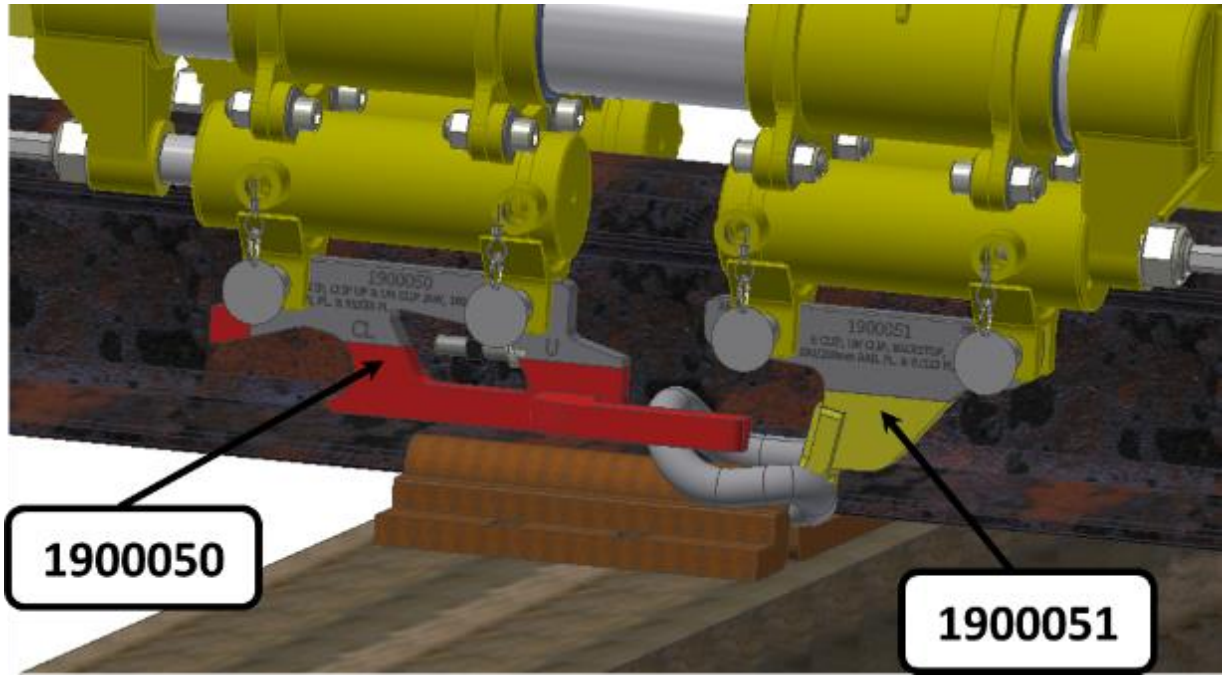


Field Side(see section 9.4.4 and 9.4.6)

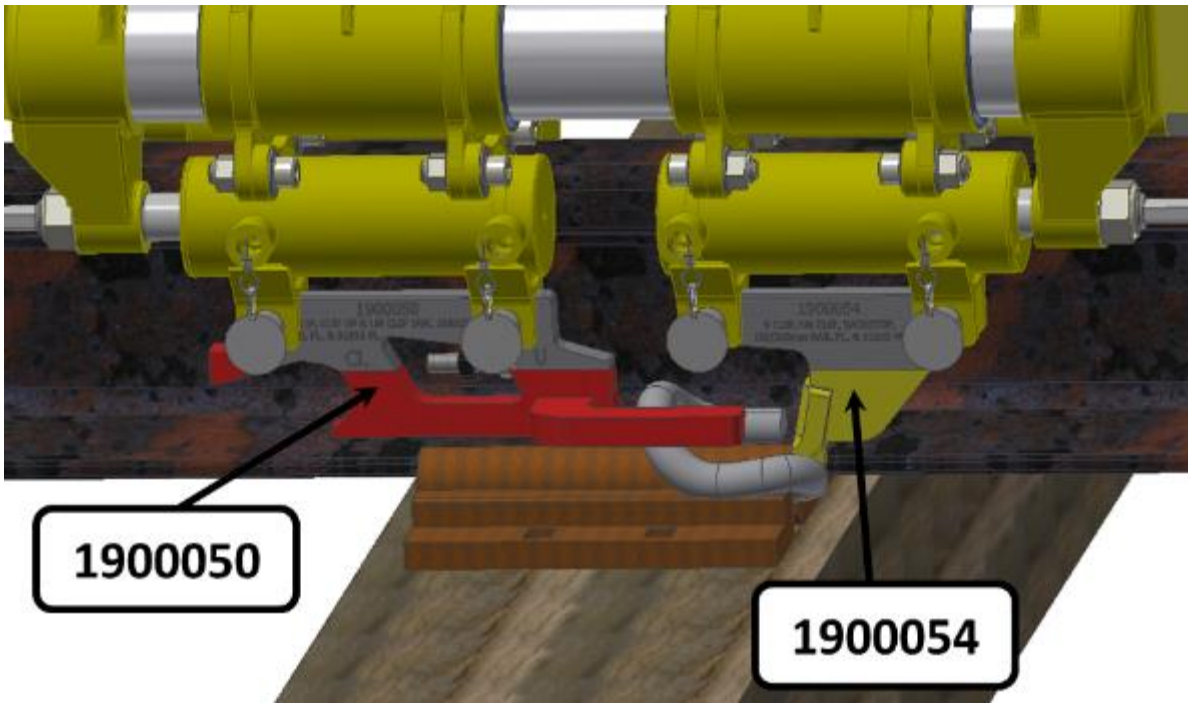


9.4.11. Timber/Composite, Rolled Plate, E-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



9.5. Operation Procedures

Only authorised personnel shall start, operate or interfere with the normal working of portable machines or trolleys. The user shall be careful to use the machine in the intended way, avoiding over-loading.

9.5.1. Starting the Engine – Electric Start[1]

1. Observe all safety precautions as per section 4.
2. Ensure all pre-operation checks have been conducted as per section 9.2.
3. Assemble the work head, track pack and trolley as per section 9.3.
4. Ensure Emergency Stop is electrically connected to power pack and not activated
5. Place the throttle at 50% power
6. Turn the key to its first position (on position)
7. Press the decompression lever and hold (if Diesel)
8. Turn key to second position (starting position). Hold until engine starts and the release, allowing the key to return to its first position.
    a. If Diesel, with the decompression lever pressed, the fly wheel will quickly gain momentum (2-3 seconds) as the starter motor is activated.
    b. With the engine spinning, release the decompression lever whilst maintaining the key in the start position.
    c. The engine will start almost immediately. Once started return key to first position.
    d. Note: if the track-pack has a push button start, ignore key first position steps. Pressing the push button is the same as the key second position
9. Place throttle in idle (min) position and allow engine to warm up – refer manufacturers manual for required times

[1] Refer to engine manual for detailed engine instructions and requirements

10. Move throttle to required rpm position, normally full throttle[1]

11. Power pack and hydraulic circuit are now in operation and tooling is able to be used.

9.5.2. Starting the Engine – Recoil Start[2]

1. Observe all safety precautions as per section 4.

2. Ensure all pre-operation checks have been conducted as per section 9.2.

3. Assemble the work head, track pack and trolley as per section 9.3.

4. Ensure Emergency Stop is electrically connected to power pack and not activated

5. Place the throttle at 50% power

6. Turn the key to its first position (on position) if applicable.

7. Hold the grip and pull the cord until compression is found

8. Completely rewind the cord (allow to retract)

9. Press the decompression lever (if Diesel)

10. Using two hands, firmly and quickly pull the cord to start

11. Place throttle in idle (min) position and allow engine to warm up – refer manufacturers manual for required times

12. Place throttle at required rpm position, normally full throttle[3]

13. Power pack and hydraulic circuit are now in operation and tooling is able to be used.

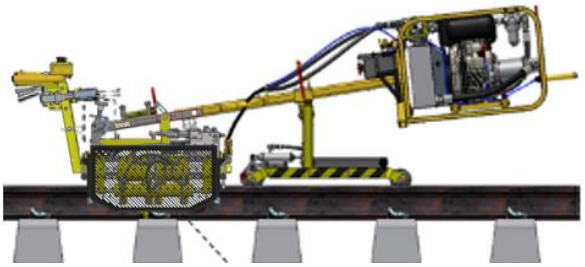
[1] During first 50hrs do not exceed 70% maximum rated power
[2] Refer to engine manual for detailed engine instructions and requirements
[3] During first 50hrs do not exceed 70% maximum rated power

9.5.3. Equipment Operation – Releasing the Brake

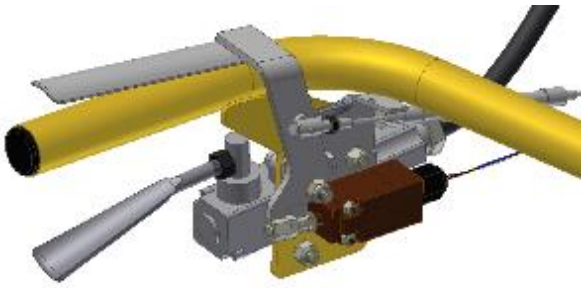
All new machine trolleys are fitted with fail-safe brakes. These brakes are released by hydraulic pressure, supplied by connecting the ¼" hydraulic hose line to the trolley as stated in assembly procedures.

To release the brake on the trolley:

1. Observe all safety precautions as per section 4
2. Ensure all pre-operation checks have been conducted as per section 9.2
3. Assemble to work head, track pack and trolley as per section 9.3
4. Ensure any necessary machine adjustments have been complete as per section 9.3.4



5. Ensure all hydraulic and electrical connectors are connected – these control the operation of the brakes and also the machine.
6. If there is a manual pull cable for the brake manifold (small flexible cable), connect this to the trigger – as shown.



7. To assemble a manual pull cable to the brake trigger, slide the cable through the outer cable holder. Pull down on the cable connection at the end of the cable to open and slide over the ball located on the trigger. The outer cable should locate on the back of the outer cable holder. Adjustment of the cable may be required before and after

assembly of the cable to the trigger.

8. Start the engine as per Starting the Engine instructions 9.5

9. To release the brakes, push down the trigger on top of the handles

10. The brakes will release and allow movement of the machine. For further information, please see trolley manual or contact MEC.

9.5.4. Equipment Operation – Un-Clipping

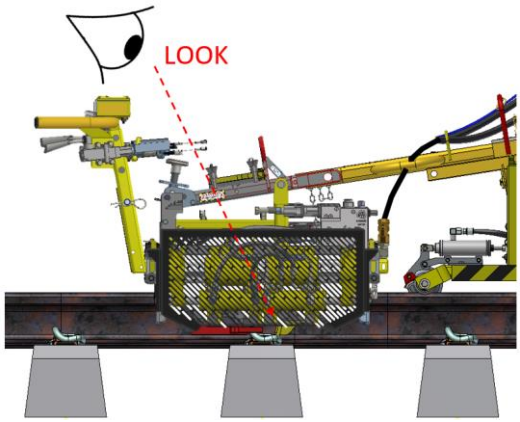
1. Observe all safety precautions as per section 4

2. Ensure all pre-operation checks have been conducted as per section 9.2

3. Assemble to work head, track pack and trolley as per section 9.3

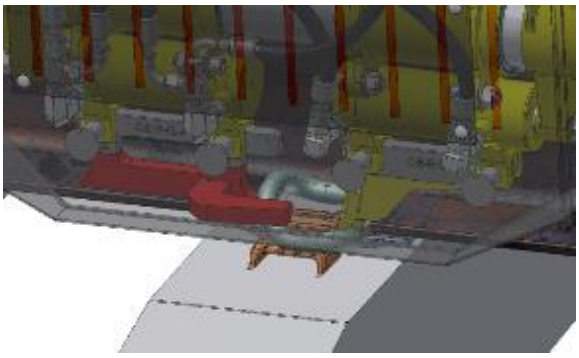
4. Ensure any necessary machine adjustments have been complete as per section 9.3.4

5. Ensure the correct jaws are installed in the correct orientation as per section 9.4



6. Start the engine as per Starting the Engine instructions 9.5

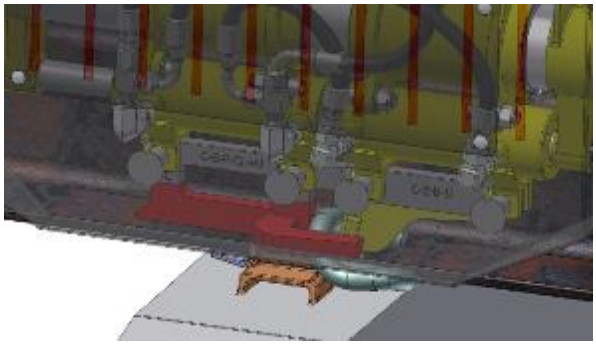
7. Squeeze and hold the left hand trigger. This will allow the cylinders to retract and the jaws to open.



8. Looking through the guard at the right hand (yellow) backstop (C-E-B-U), land the work head on the clip as shown. Allow the work head to tilt with the rail cant.

9. Whilst holding the left hand trigger, squeeze and hold the right hand trigger. The jaws will close and remove the clips.

10. Note: Release the right hand trigger once the engine starts to lug down. The engine will stall if the right hand trigger is not released.



11. Releasing the right hand trigger will retract the cylinders and open the jaws.

12. Note: With practice, the operator will not need to look through the guard but will be able to judge the correct landing position by feel.

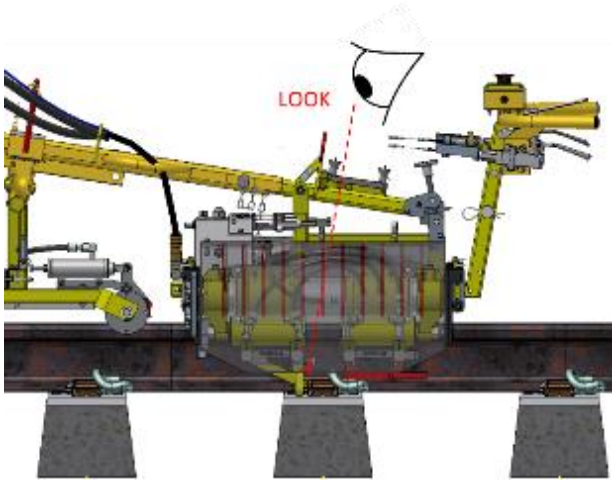
13. Note: In practice the operator's left hand generally remains fixed, activating both the left hand trigger and the brake trigger. The right hand simply controls the jaws – open/close.

14. To move to the next clips, activate the brake lift switch and push the machine to the required position

9.5.5. Equipment Operation – Clipping

1. Observe all safety precautions as per section 4

2. Ensure all pre-operation checks have been conducted as per section 9.2



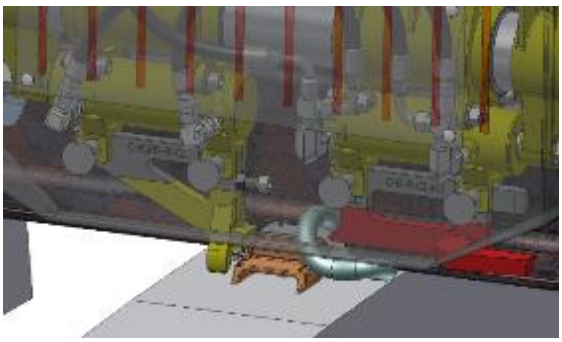
3. Assemble to work head, track pack and trolley as per section 9.3

4. Ensure any necessary machine adjustments have been complete as per section 9.3.4

5. Ensure the correct jaws are installed in the correct orientation as per section 9.4

6. Start the engine as per Starting the Engine instructions 9.5

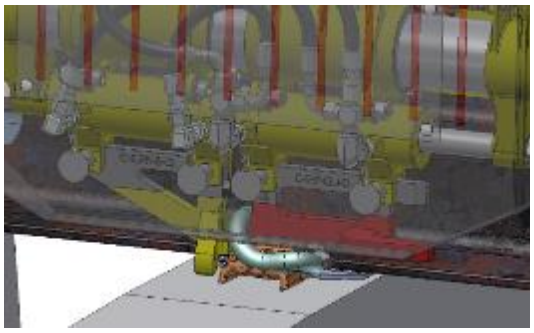
7. Squeeze and hold the left hand trigger. This will allow the cylinders to retract and the jaws to open.



8. Looking through the guard at the left hand (yellow) backstop (C-E,PR-B-CL), land the work head on the sleeper as shown. Allow the work head to tilt with the rail cant.

9. Whilst holding the left hand trigger, squeeze and hold the right hand trigger. The jaws will close and install the clips.

10. Note: Release the right hand trigger once the engine starts to lug down. The engine will stall if the right hand trigger is not released.



11. Releasing the right hand trigger will retract the cylinders and open the jaws.

12. To move to the next clips, activate the brake lift switch and push the machine to the required position

13. Note: In practice the operator's left hand generally remains fixed, activating both the left hand trigger and the brake trigger. The right hand simply controls the jaws – open/close.
14. With practice, the operator will not need to look through the guard but will be able to judge the correct landing position by feel

9.5.6. Stopping the Engine[1]

1. Place tooling and power pack to “NEUTRAL” position
2. Set the engine speed to idle (min) using accelerator
3. Turn the ignition key to OFF

[1] Refer to engine manual for detailed engine instructions and requirements

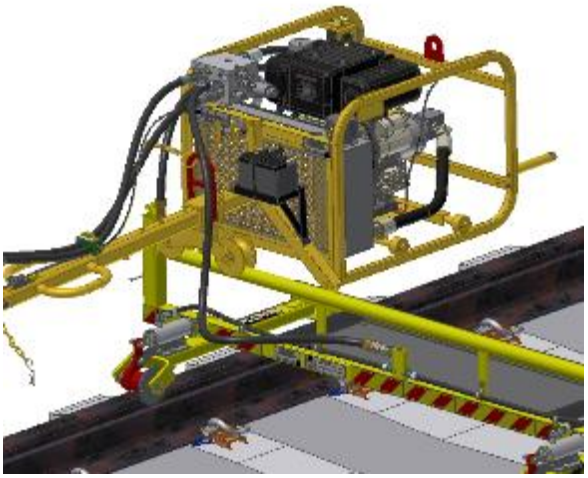
10. Disassembly Procedures

10.1. Removal of Machine from Track

1. Observe all safety precautions as per section 4

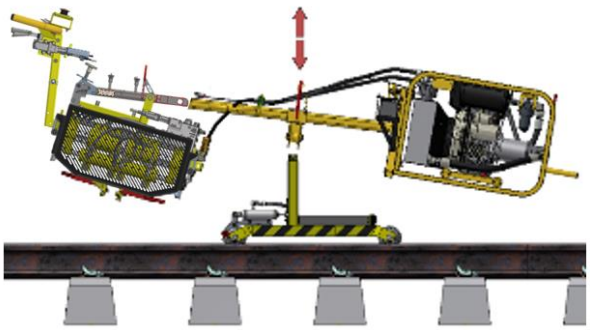
2. Ensure engine is off and no hydraulic flow is operating to cylinder

3. Disconnect the brake hose from the trolley cylinder



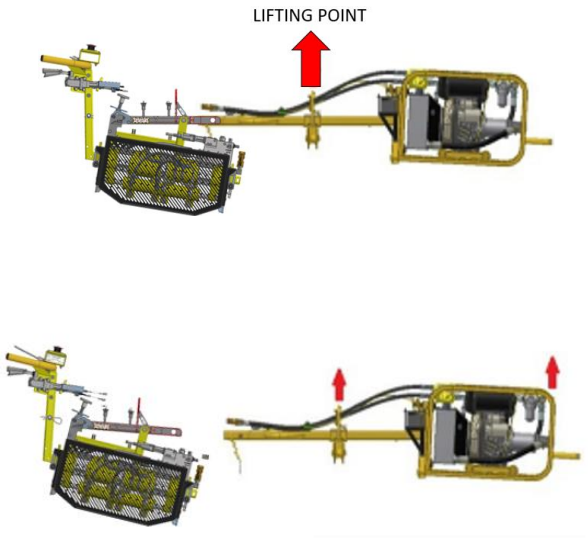
4. Disconnect the chain from the retaining profile to release the machine from the trolley

5. Lift and remove the workhead (and Trackpack) from the trolley using a certified lifting device (>250kg)

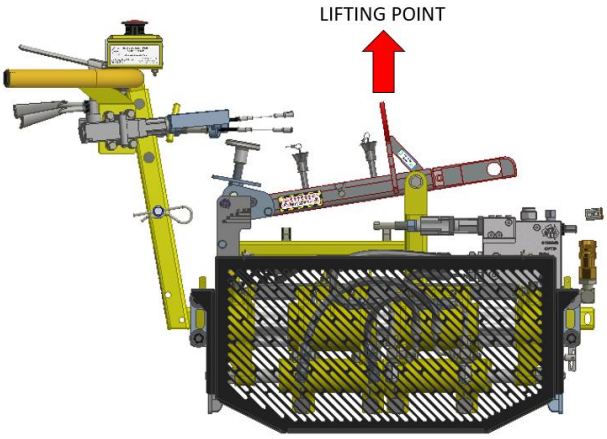


*Expected time for removal of trolley with workhead assembled is approximately five (5) minutes (using certified lifting devices). These times may increase or decrease depending on location, conditions, etc.

6. Whilst still coupled together, fit work head to stowage frame as per details below. The unit can now be safely loaded onto a truck/trailer for transport.



7. If required the unit can also be further separated as shown.



10.2. Lifting the Machinery

1. DO NOT manually lift machinery
2. Observe all safety precautions
3. Ensure all pre-operation checks have been conducted
4. Attach slings or hooks into lifting points on the machinery – see above
5. Using a certified lifting device to >250kg, lift the machinery to required position

11. Storage & Transport

11.1. Storage of E-Clip Machine

MEC equipment should be stored in a secure, safe, dry location to ensure the equipment is not damaged and maintained in good working order. If possible, machines may be placed onto racks or placed on the ground for storage. Storing the machines in the storage/transport frames will also help to keep the equipment free from damage and allow it to sit level.

Storage of the E-clip machine can either be done connected to a Trackpack or with the work head separate. In either case it is best to store the work head in its stowage frame. See below images for stowage frame operation.

11.2. Fitting work head to stowage frame

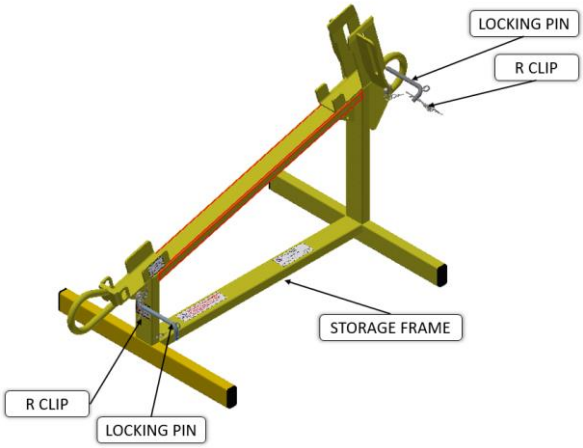
1. Ensure all locking pins are removed from the stowage frame and position on flat ground.

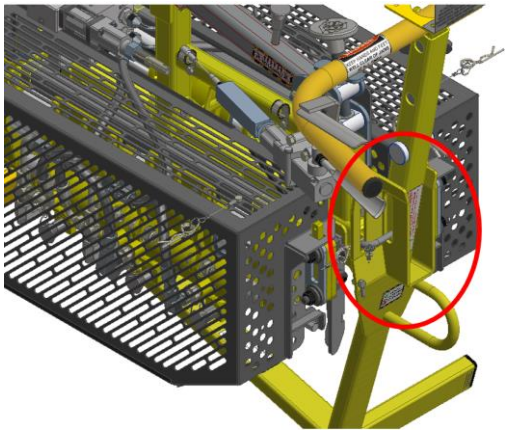
2. Lift work head, or assembled work head and Trackpack until the lowest point of the work head is approximately 700mm off the ground. Note the unit should lift close to horizontal to the ground for ease of assembly.

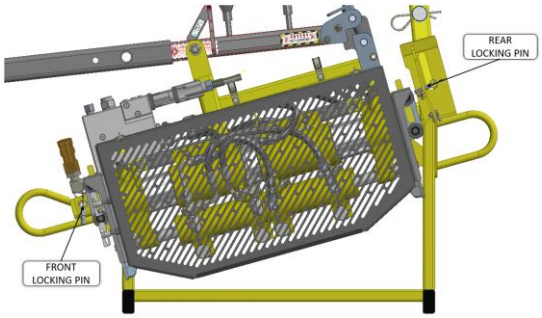
3. Slowly lower the unit down and guide the rear RHS section on the unit into the rear saddle. As the saddle engages continue to lower until the front saddle engages.

4. With the unit sitting in the stand insert the front and rear locking pins and retain the pins with the supplied R-clips.

5. With the stowage frame attached to the work head the unit can be transported to its storage location.







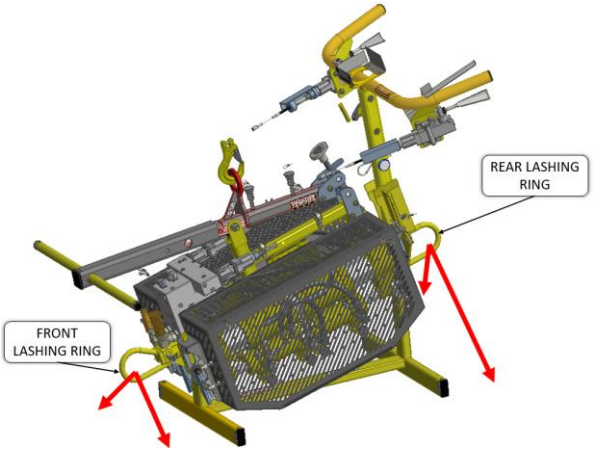
11.3. Transport of E-Clip Machine – Work head only

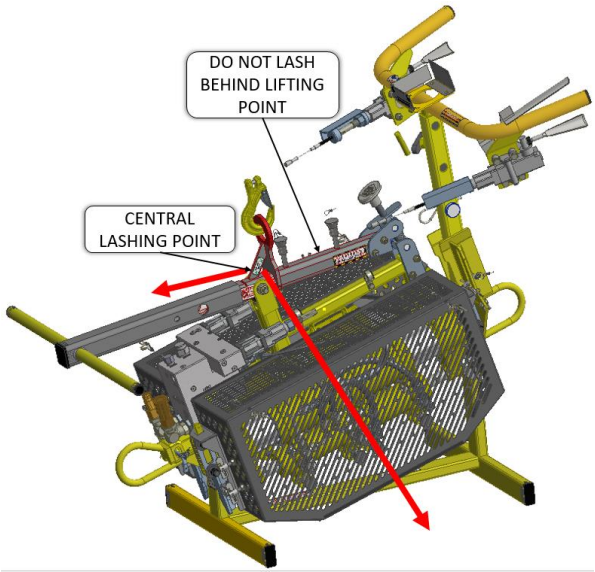
The best and safest way to transport the work head is in the supplied stowage frame. The stowage frame has tie down points and ensures no parts of the work head such as guards are damaged from incorrect lashing or unexpected movements during transport.

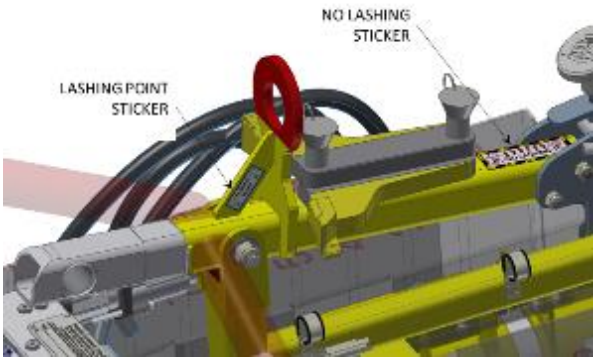
1. Ensure the work head is fitted and secured to the stowage frame.

2. There are 2 ways to hold the unit. The first and recommended way is to lash the stowage frame down. With the work head in the correct position lash the frame down using the front and rear lasing ring. This method is used when the lashing points are at ground level.

3. The second method is used when the lashing points are too high to use the lashing rings such as in a box trailer. Lash around the front of the Trackpack connection point. Note observe lashing and no lashing stickers.







12. Equipment Protection & Care

NOTICE

In addition to the Safety Precautions found in this manual and the supporting tool and engine manuals, observe the following for equipment protection and care

- Make sure all couplers/connectors are wiped clean before connection
- The hydraulic circuit control valve in “NEUTRAL” position when coupling or uncoupling hydraulic tools. Failure to do so may result in damage to the couplers and cause overheating of the hydraulic system
- Always store hoses coupled together in a ‘loop’ to stop hydraulic lock due to the hoses and hydraulic oil heating
- Always store the machine in a clean dry space, safe from damage or pilferage
- Make sure the power pack hydraulic circuit PRESSURE hose (male quick disconnect) is connected the PRESSURE hose for the tool (female quick disconnect) and vice versa for the RETURN hoses. Do not reverse circuit flow. This can cause damage to the internal seals of the equipment
- Always replace hoses, couplings and other components with replacement parts recommended by MEC. Hydraulic hoses must have a minimum working pressure of 2800psi
- Always keep critical tool markings such as warning stickers and tags legible
- Power pack and tooling repairs and/or service work must only be performed by MEC or certified and authorised dealer
- Do not use the power pack and/or tooling for applications for which it is not intended
- Ensure all bolts are tight and all covers/guards are fitted

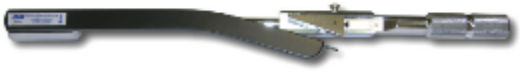
13. Maintenance

WARNING

Before any maintenance of the machine or trolley is performed, ensure the work head and engine are off and in a neutral position. Ensure all potential energy is released from the system (springs, cylinders, etc). Ensure maintenance is performed by a competent and authorised person.

13.1.1.1. Tools Required to Complete Maintenance

Below are initial tools required to complete general maintenance tasks. Additional tools may be required.

• Allen Keys (various)	
• Hammer	
• Pin Punch (1/8” or 4mm)	
• Ruler and/or Vernier’s	
• Shifter or	
• Spanners (various)	
• Tension wrench 20-120Nm and sockets	

13.2. Maintenance Period

REGULAR SERVICE PERIOD* Perform at every indicated month or operating hour interval, whichever comes first. ITEM		Each use	Every 1 month or 10hrs	Every 3 months or 50hrs	Every 6 months or 250hrs	Every year or 500hrs
Engine oil	Check level	X				
	Change			X (1)	X	
Engine oil filter	Change			X (1)		X
Fuel Level	Check/Fill	X				
Fuel Lines	Check		X			
	Replace					X
Fuel Filter	Check/Clean			X		
	Change					X
Air Filter	Check			X		
	Replace				X	
Engine cooling fins	Clean					X
Rocker arms clearance	Check & set					X (2)
Injectors	Clean & set					X (2)
Spark Plug	Check				X	
	Replace					X
Hydraulic oil Filter	Change			X (1)	X	
Hydraulic oil	Check	X				
	Change				X	
Hydraulic hoses	Check	X				
	Check/Change					X (3)
Hydraulic pump	Check			X (1) (4)		X (4)
Battery	Check	X				
Grease Nipples	Fill			X		

Brake Lift Switch	Check	X				
Emergency Stop	Check	X				
Guards	Check	X				
Cylinders	Check					X
Jaws	Check	X				
Trigger cables	Check			X		
Nuts, Bolts, Screws, Fittings	Check					X

*If heavy machine use, the service period may be less.

(1) First 50 hrs of use
(2) Only to be performed by MEC or certified and authorised dealer.
(3) A thorough inspection is required. If hoses undamaged, may leave in service. However, replace hoses every 3 years of operation.
(4) Flow and Pressure Check

14. Troubleshooting[1]

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine won't start	Refer to engine manual for details	
	Battery charge low	Charge battery
	Battery connections loose/not attached	Check battery connections
	Emergency Stop not connected	Check Emergency stop connection
	No engine oil	Check engine oil
	No fuel	Check fuel quantity
	Fuel filter blocked	Check fuel filter
	Fuel solenoid is off	Check fuel solenoid position
No hydraulic oil flow/little flow	No hydraulic oil	Check hydraulic oil level
	Pressure and Tank (return) hoses interchanged	Check connection.
	Operation lever in neutral	Check operation lever position
	Couplers or hoses blocked	Remove restriction
	Filter Blocked or Old	Replace filter
	Hoses leaking	Check hoses
	Contamination in relief valve	Clean relief valve
	Pump damaged	Check pump
Hydraulic oil overheating	Air obstruction	Remove obstruction to ensure sufficient air flow around heat exchanger
	Incorrect oil for operating temperature	Replace oil with correct grade for operating conditions
	Dirty/old oil	Replace oil

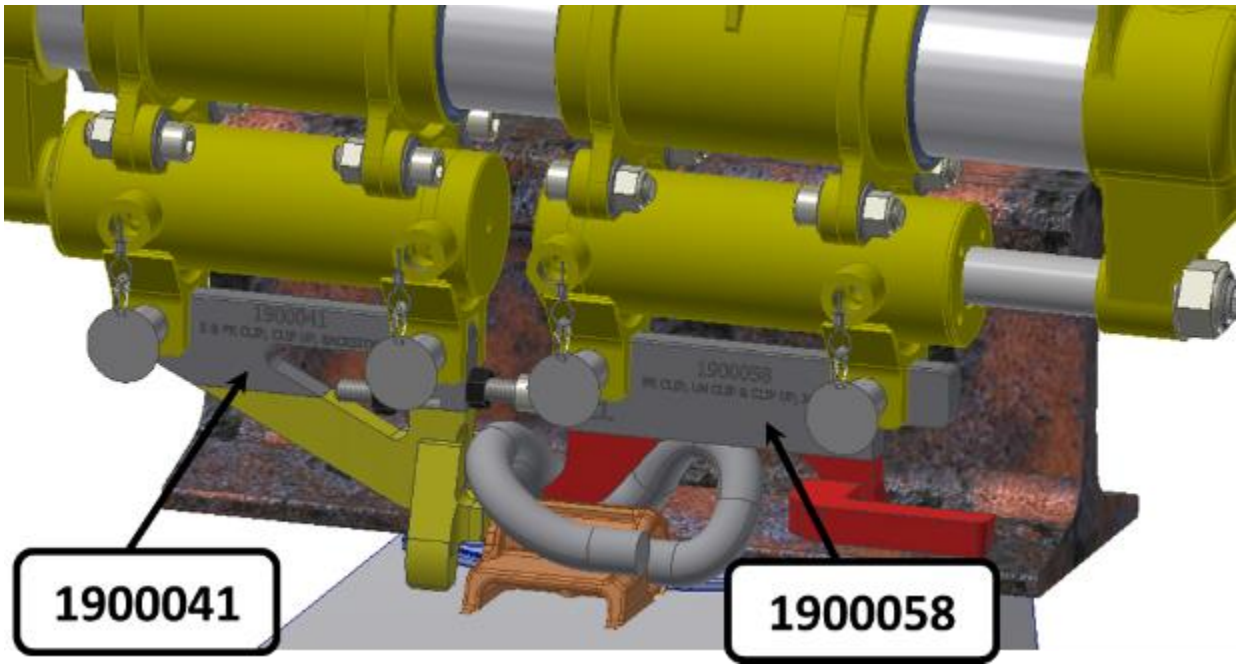
[1] Refer to engine manual for detailed engine instructions and requirements

	Tool valve closed	Change tool or valve to 'open centre'
Unable to connect hoses	Oil temperature and pressure increase in hoses	Allow hoses to cool
	Operation lever in operation position	Place lever in neutral
Emergency Stop does not work	Emergency Stop not connected to the machine	Connect Emergency Stop to the power pack
	Wiring and/or connections damaged	Inspect wiring and replace damaged parts
	Switch Damaged	Check/Replace switch
Cylinders do not operate	Air in hydraulic manifold	Bleed manifold
	No oil flow	See above
	Trigger cables not operating valves	Check cable adjustment, Check trigger valves are operating
Machine does not clip up	Head spacing incorrectly adjusted	Ensure shoulder width is set. Cylinders must be directly above shoulder eye on both sides.
	Head angle incorrectly adjusted	Ensure machine parallel with rail when sitting on sleeper
	Incorrect jaws selected	Select correct jaws from jaw selection criteria
	Sleeper too low	Machine can lift sleeper up to 20mm. Beyond this mechanical aids are required. Note – If the clip can sit in the shoulder eye the clipper can operate successfully.
	Machine fowls on guide or third rail	Insert lockout jaw and use as a single sided clipper.

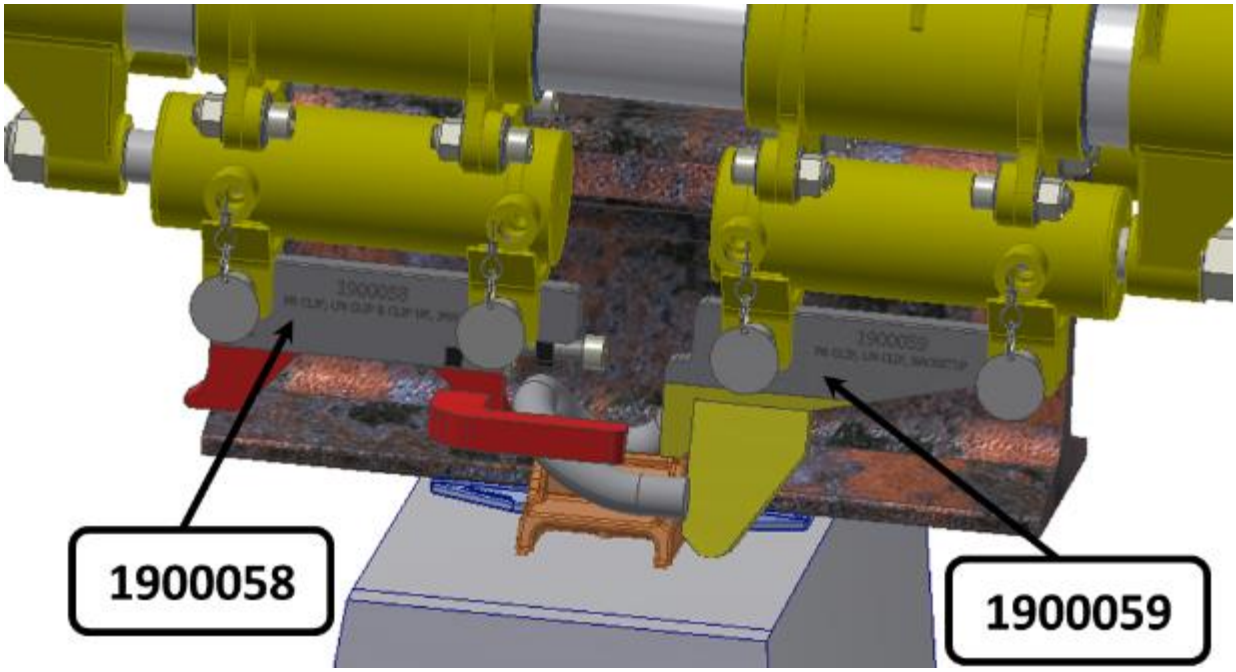
	Excessive ballast around backstop landing area	Clear ballast where backstop touches the sleeper and shoulder
Machine does not unclip	Head spacing incorrectly adjusted	Ensure shoulder width is set
	Head angle incorrectly adjusted	Ensure machine parallel with rail when sitting on sleeper
	Incorrect jaws selected	Select correct jaws from jaw selection criteria
	Clips rusted in beyond service life	Consult MEC to use 186 dedicated E-clip remover
	Machine fowls on guide or third rail	Insert lockout jaw and use as a single sided clipper.
	Excessive ballast around backstop landing area	Clear ballast where backstop touches the top of the clip and also where the pushing jaw engages.
Machine kicking or twisting excessively	Head spacing incorrectly adjusted	Ensure shoulder width is set
	Head angle incorrectly adjusted	Ensure machine parallel with rail when sitting on sleeper
	Rail guides incorrectly set	Reset position of rail guides

15. Appendix A – PR Clip Jaws

15.1. Concrete Sleeper, PR-clip – Clipping Up

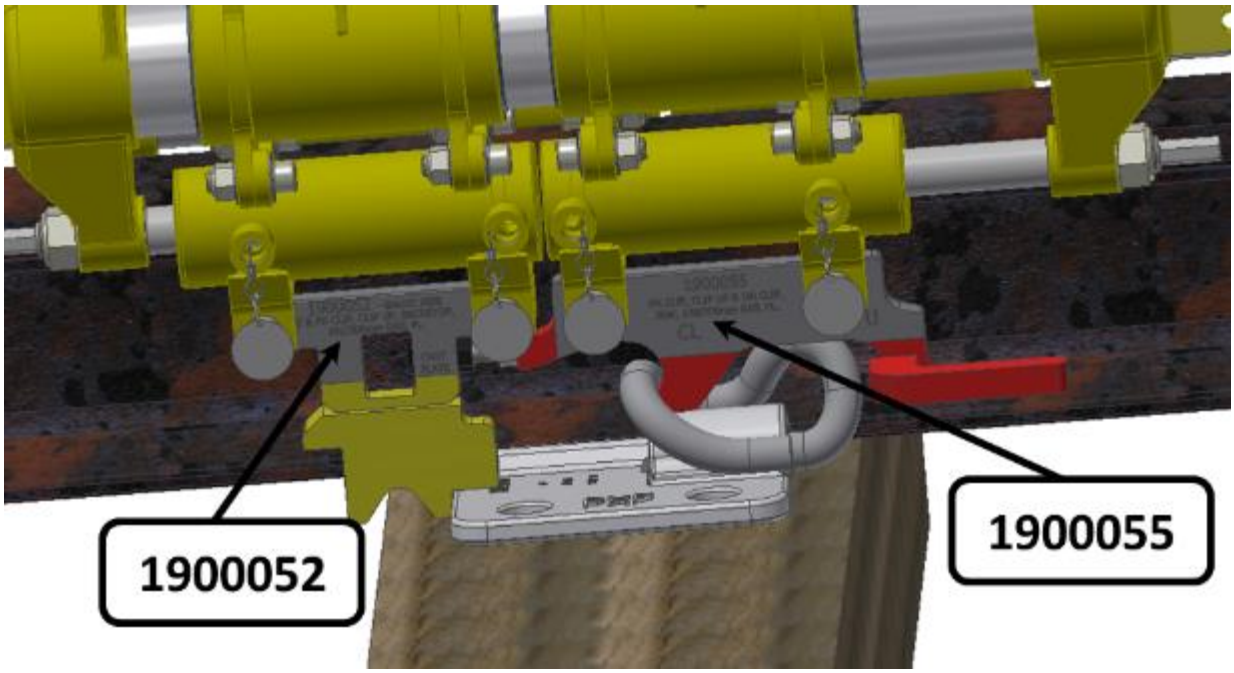


15.2. Concrete Sleeper, PR-clip - Unclipping

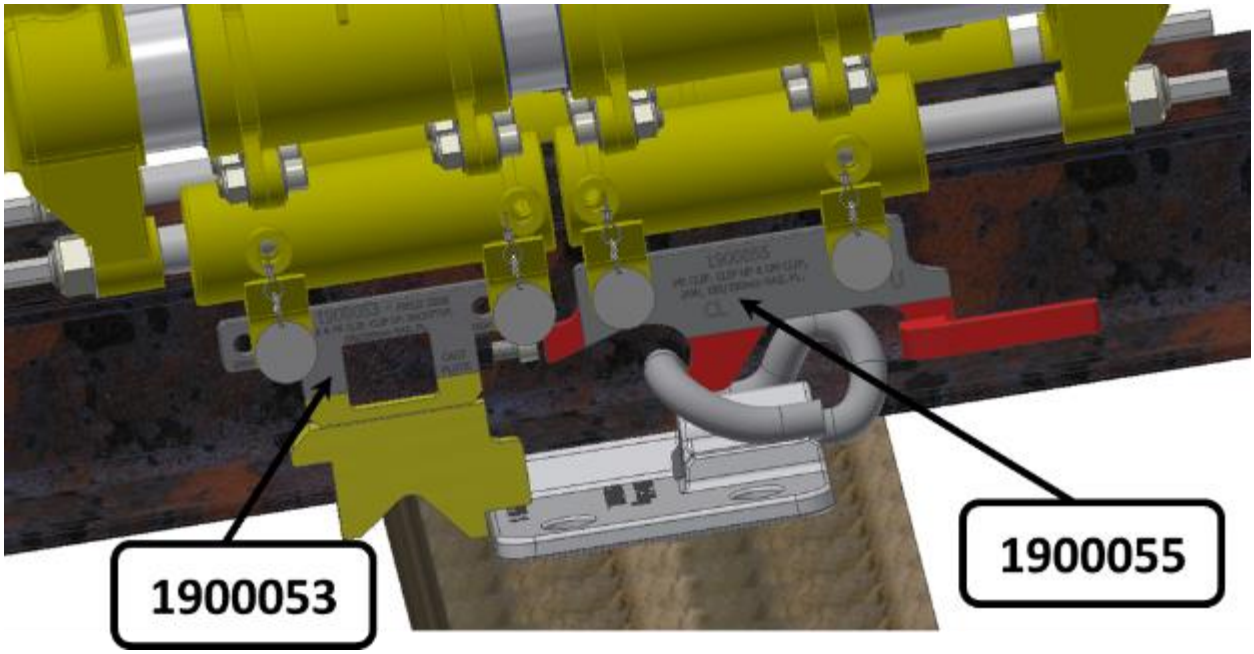


15.3. Timber/Composite Sleeper, Cast Plate, PR-clip – Clipping Up

Gauge side (see section 9.4.4 and 9.4.6)

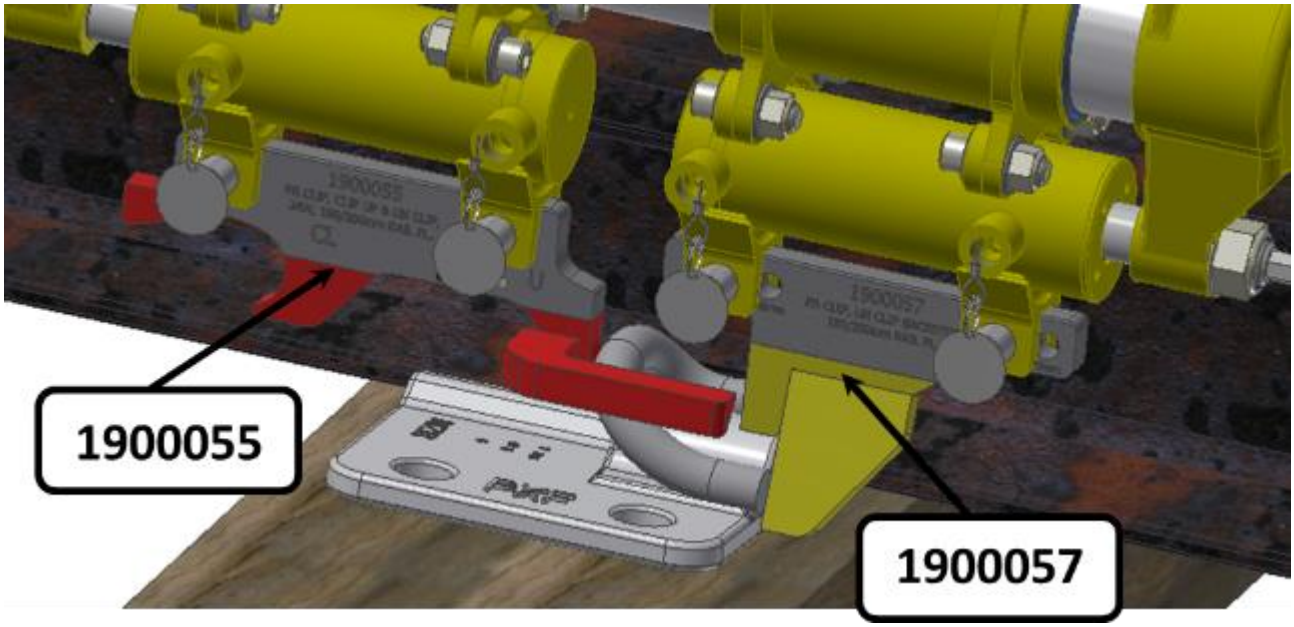


Field side(see section 9.4.4 and 9.4.6)

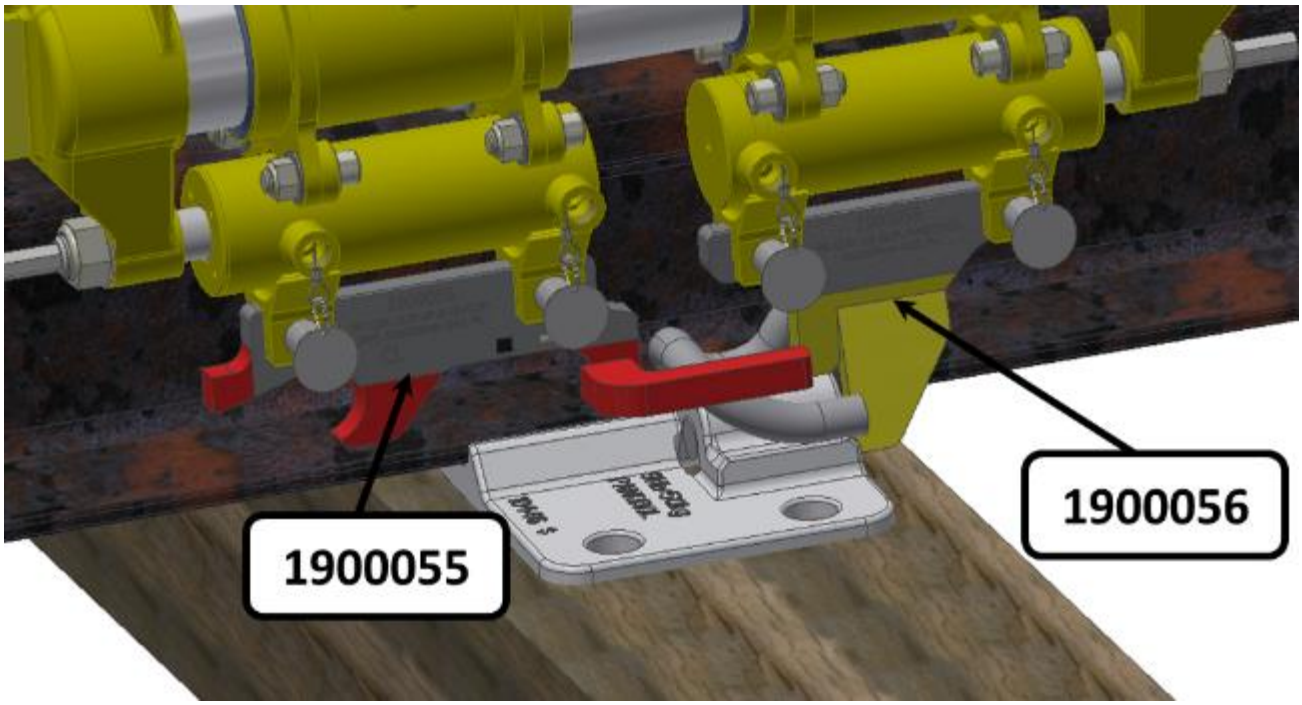


15.4. Timber/Composite Sleeper, Cast Plate, PR-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

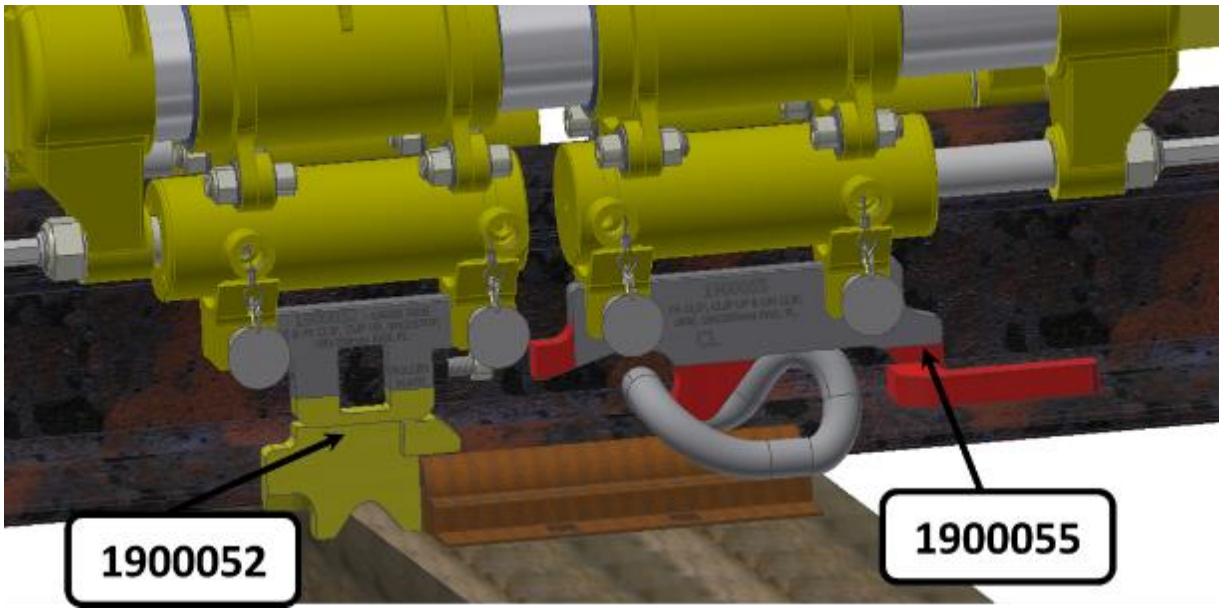


Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

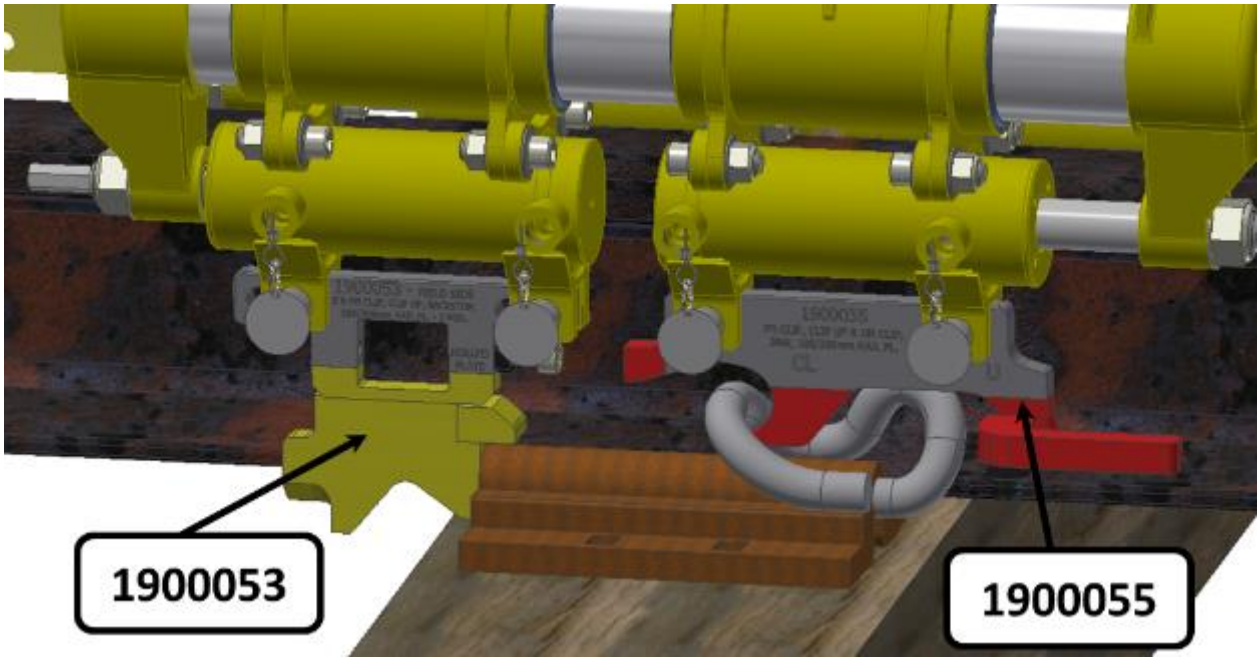


15.5. Timber/Composite Sleeper, Rolled Plate, PR-clip – Clipping Up

Gauge side (see section 9.4.4 and 9.4.6)

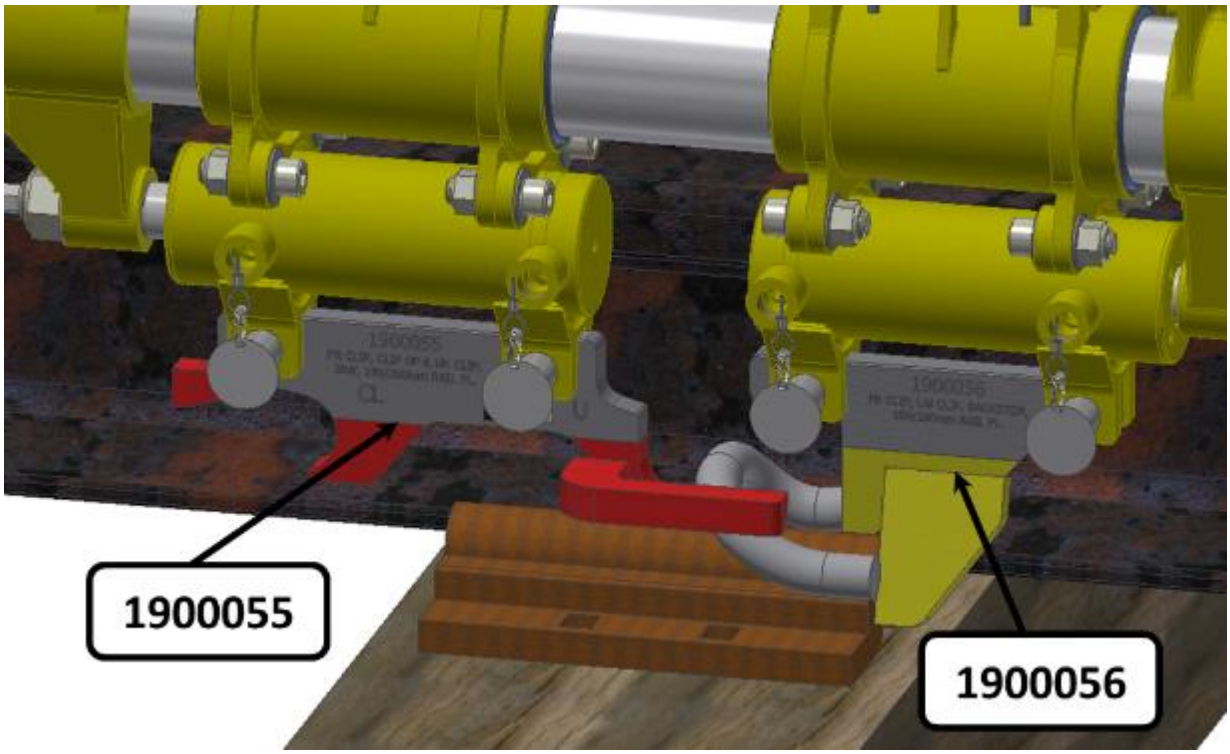


Field side (see section 9.4.4 and 9.4.6)

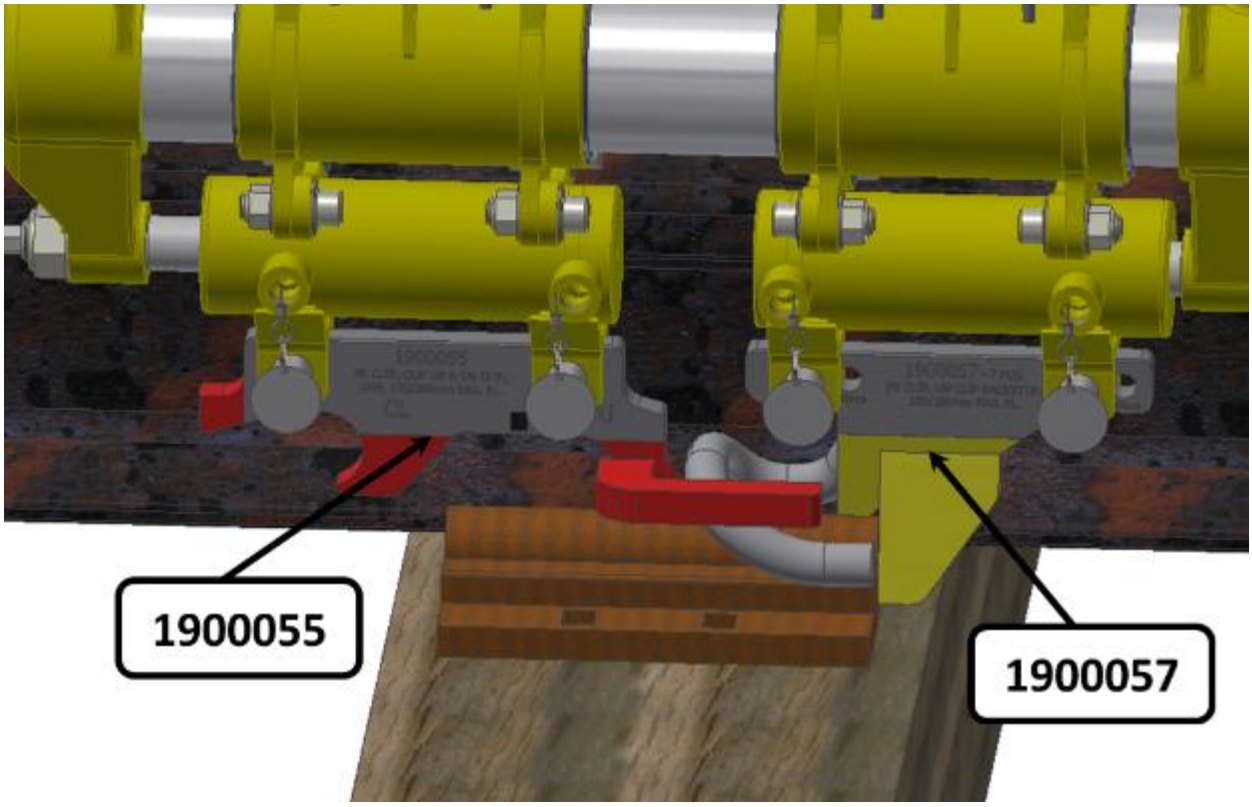


15.6. Timber/Composite Sleeper, Rolled Plate, PR-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

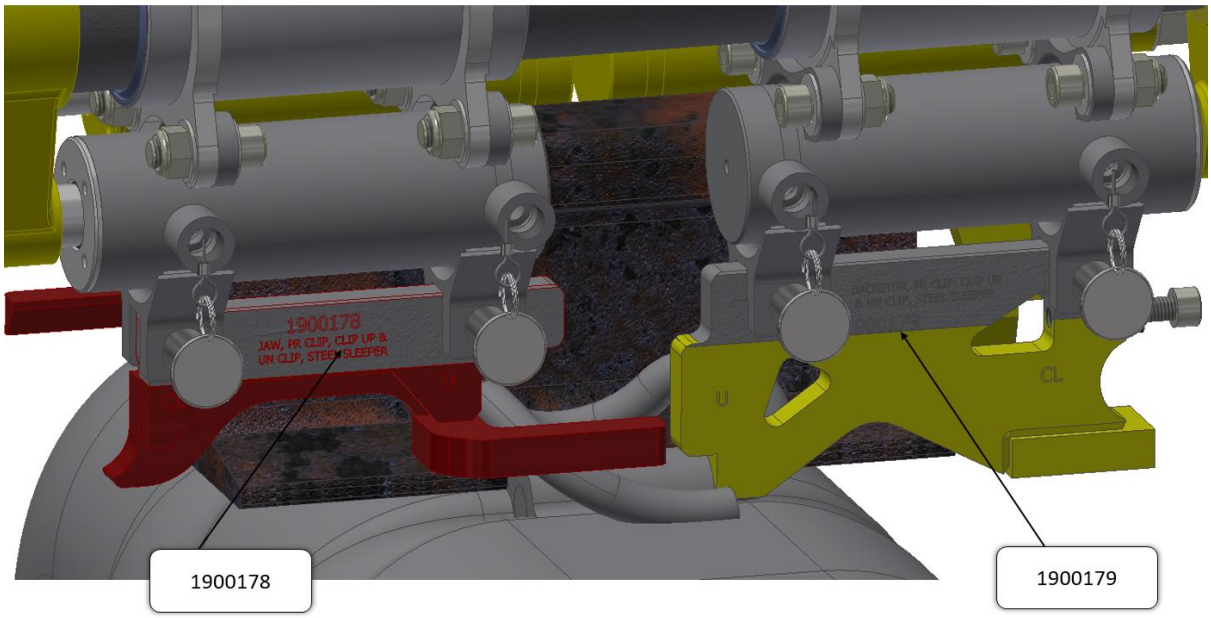


Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

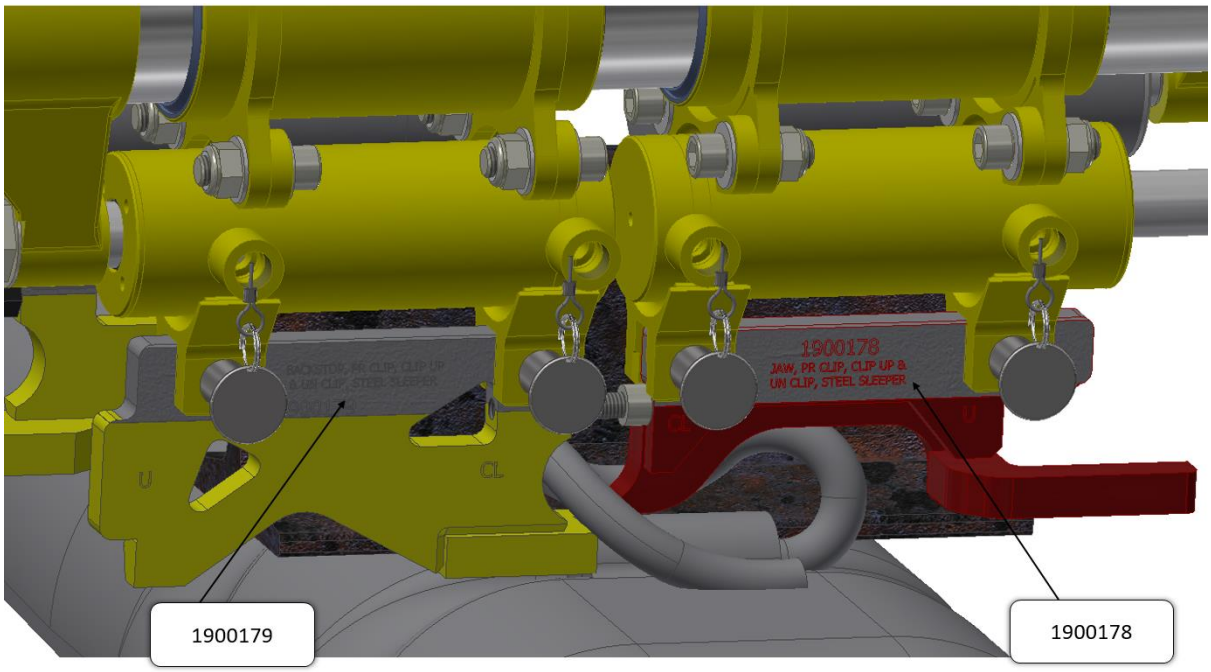


15.7. Steel Sleeper 80lb.C.R. , PR-clip – Unclipping and Un clipping

Unclipping - Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



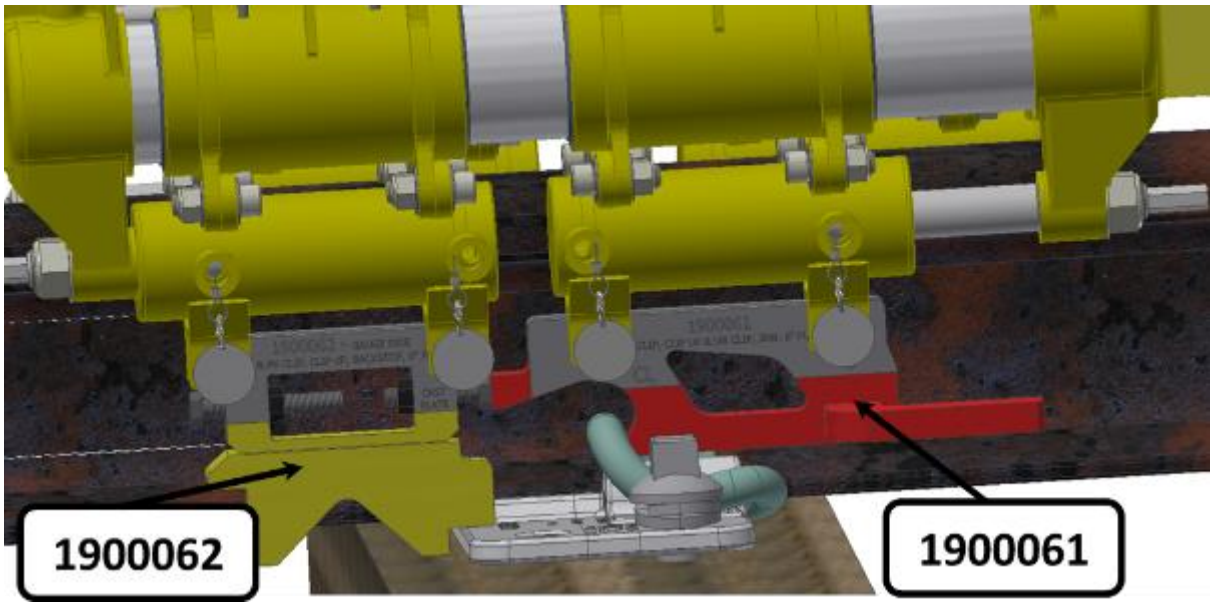
Clipping Up - Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



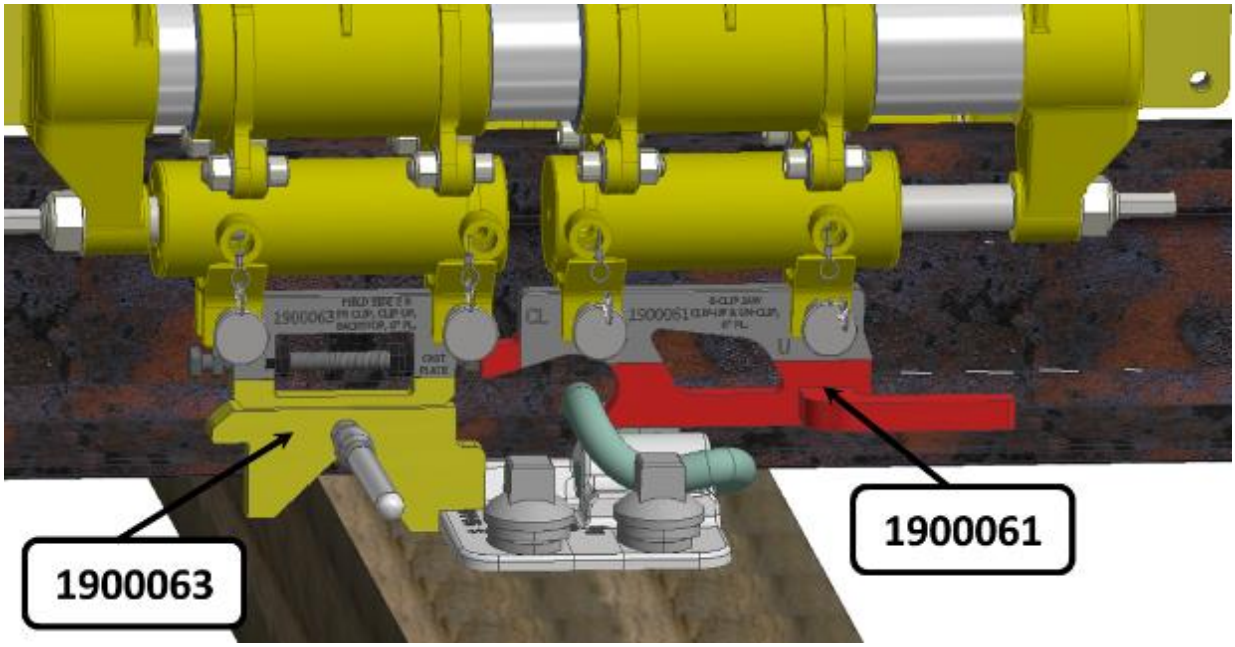
16. Appendix B – 150mm (6”) Sleeper Plate E-Clip Jaws

16.1. Timber/Composite Sleeper 150mm (6”) Cast Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

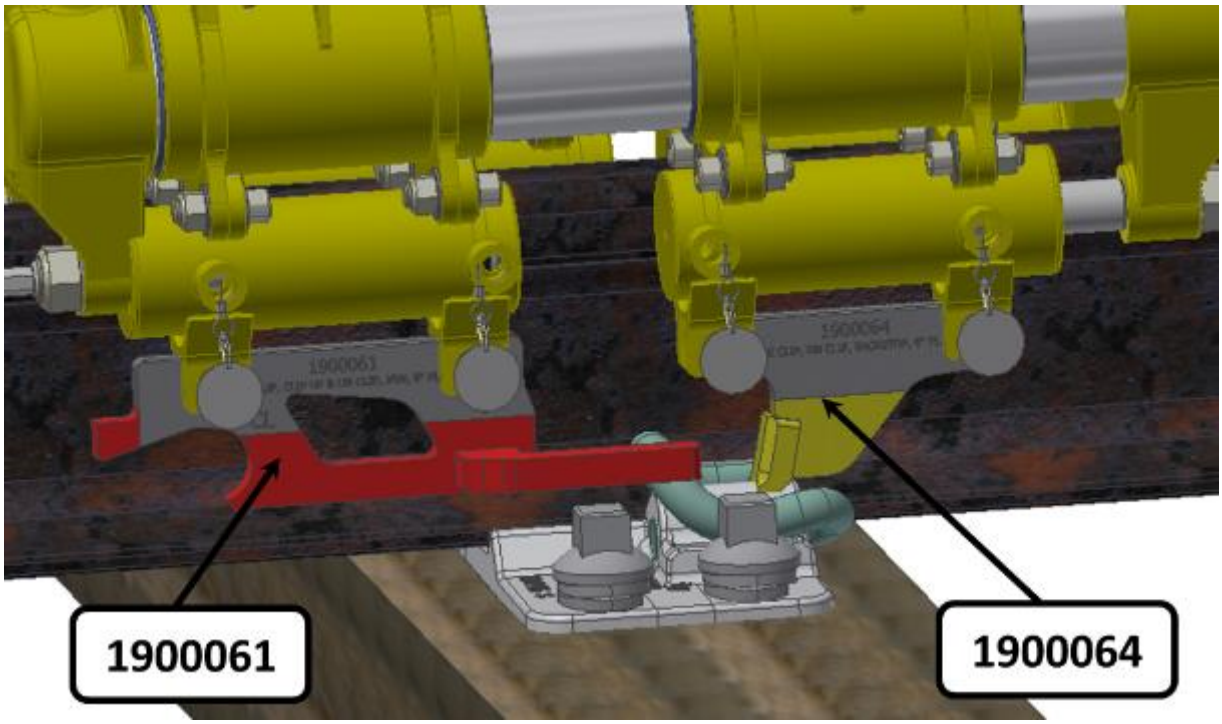


Field side (see section 9.4.4 and 9.4.6)



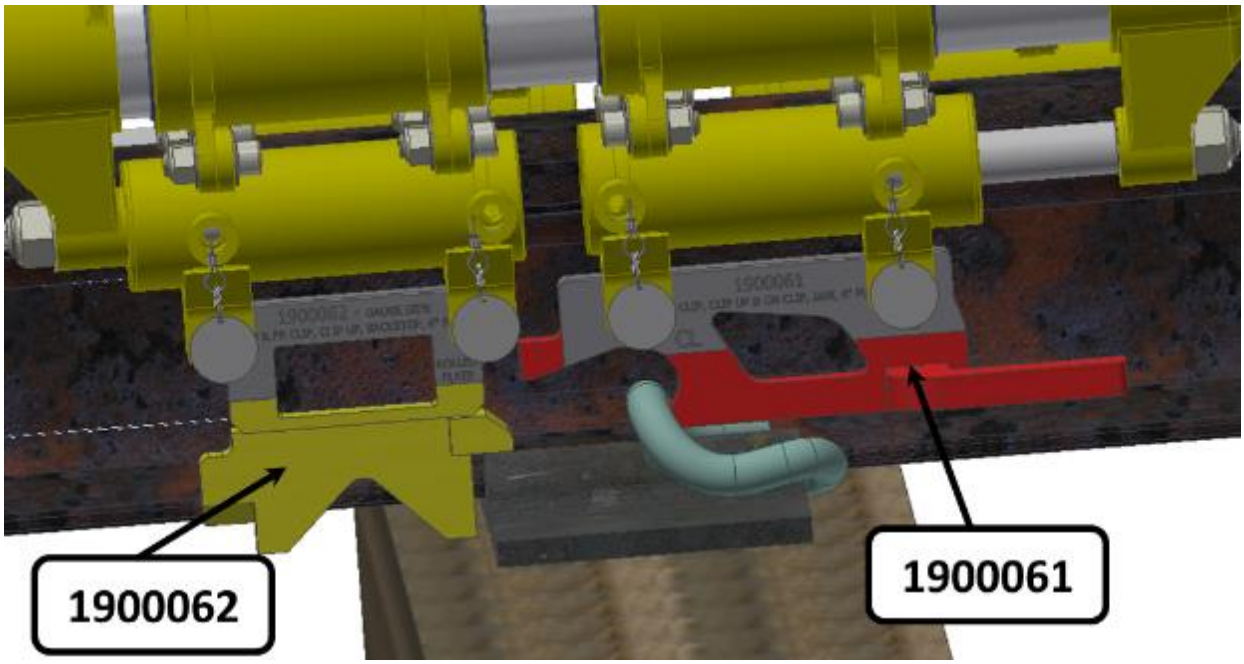
16.2. Timber/Composite Sleeper, 150mm (6”) Cast Plate, E-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

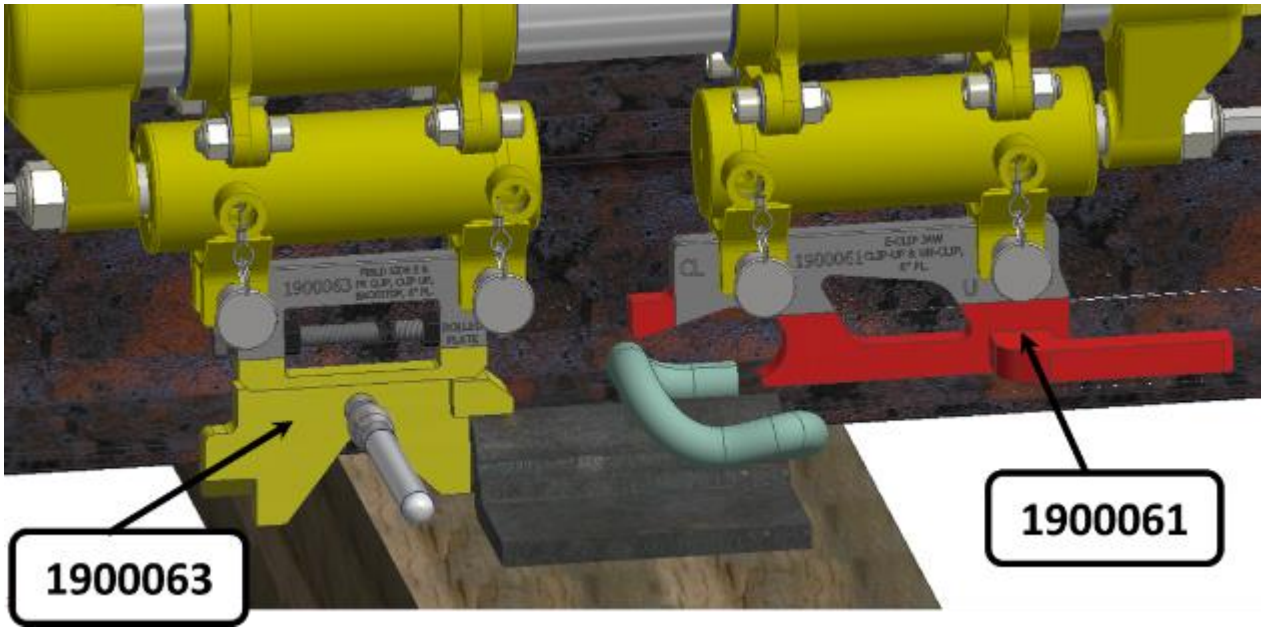


16.3. Timber/Composite, 150mm (6”) Rolled Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

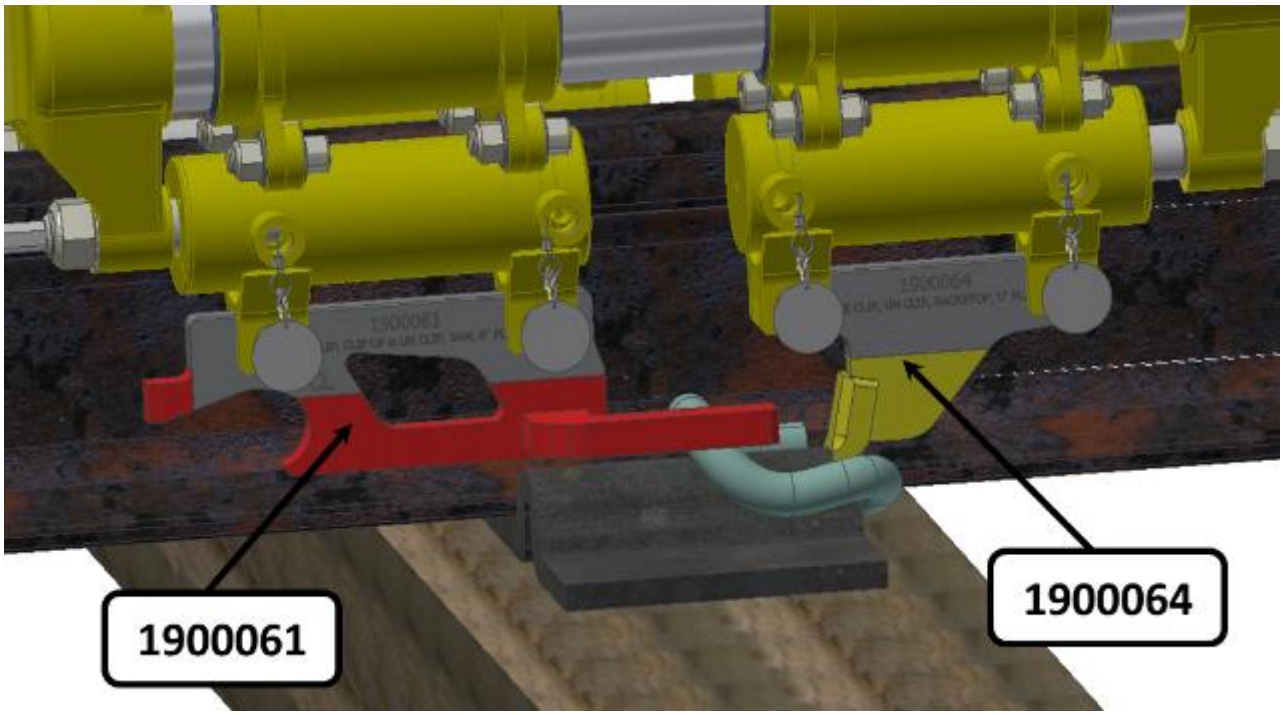


Field Side(see section 9.4.4 and 9.4.6)



16.4. Timber/Composite, 150mm (6”) Rolled Plate, E-clip – Unclipping

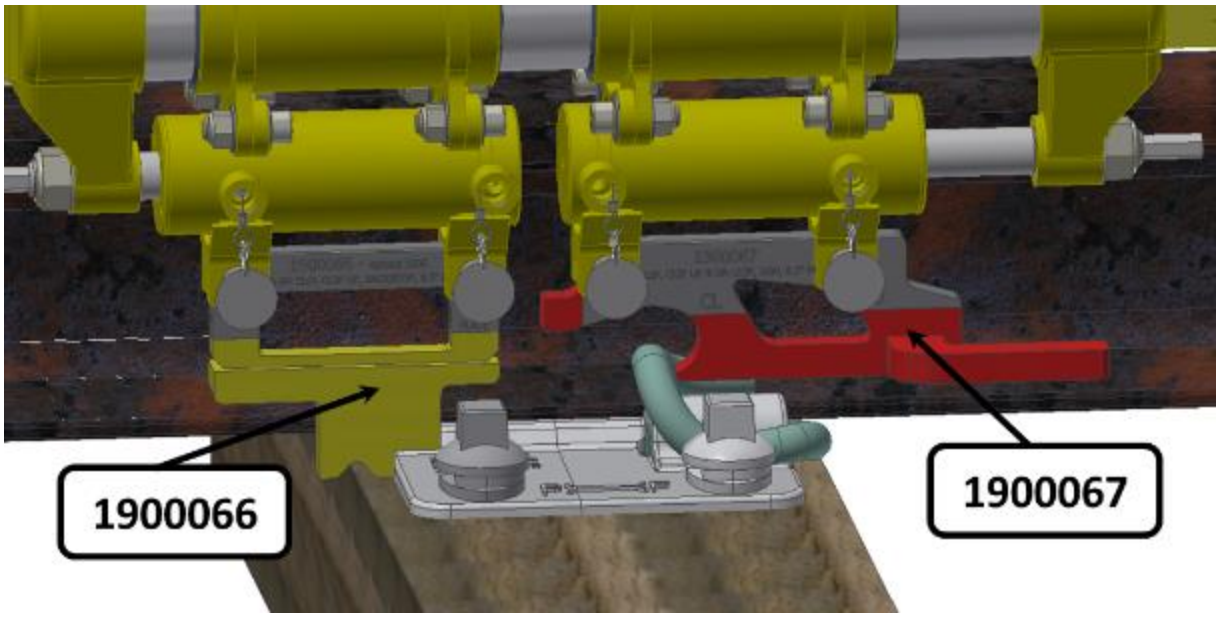
Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



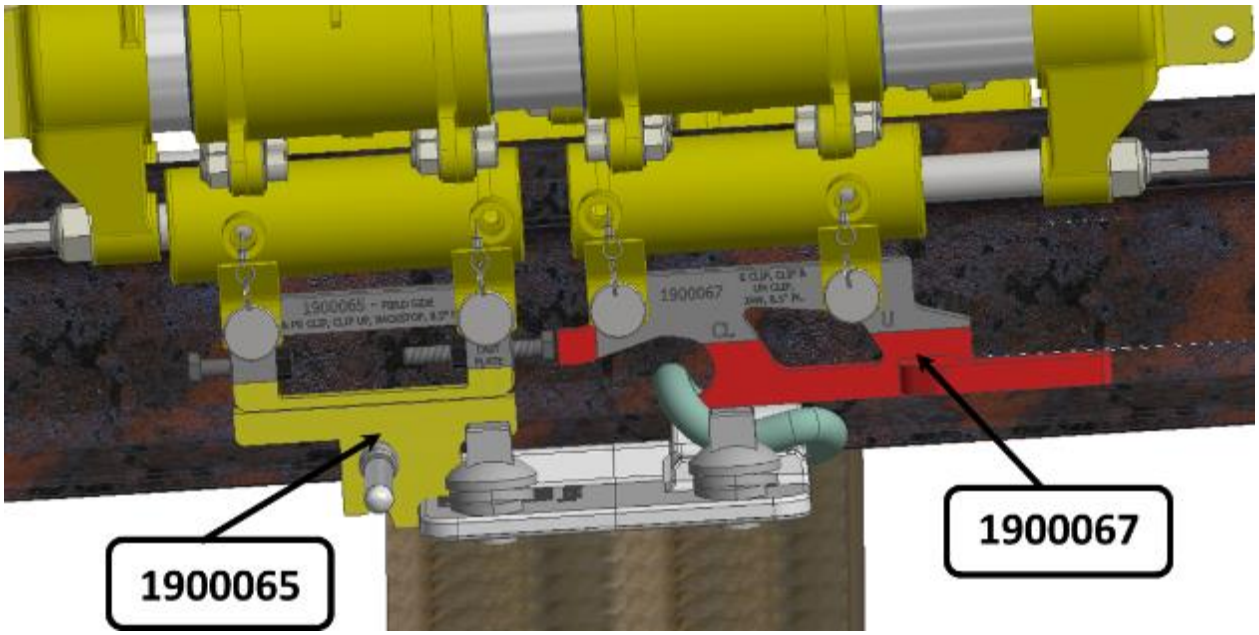
17. Appendix C – 216mm (8.5”) Sleeper Plate E-Clip Jaws

17.1.1. Timber/Composite Sleeper 216mm (8.5”) Cast Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

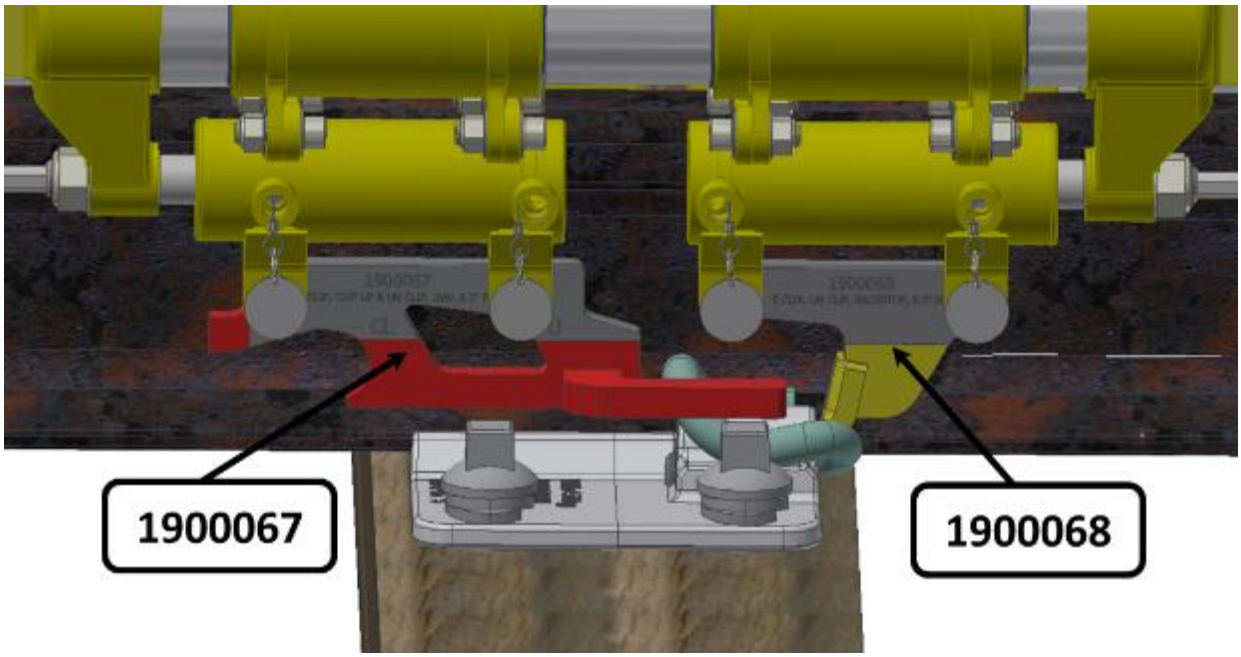


Field side (see section 9.4.4 and 9.4.6)



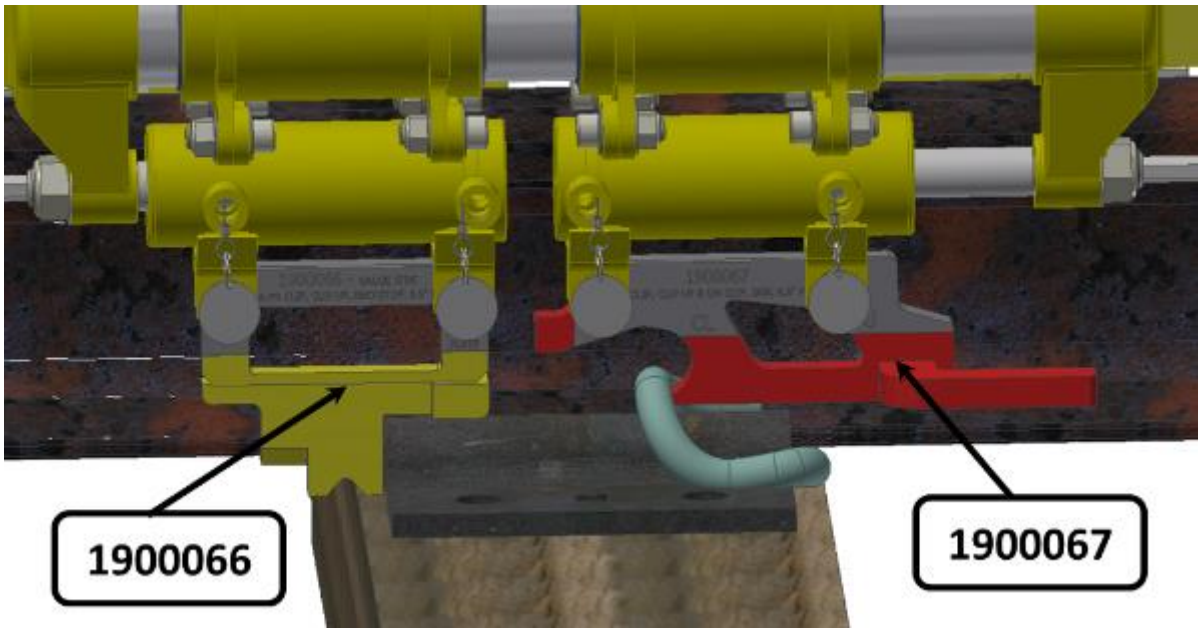
17.1.2. Timber/Composite Sleeper, 216mm (8.5”) Cast Plate, E-clip – Unclipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)

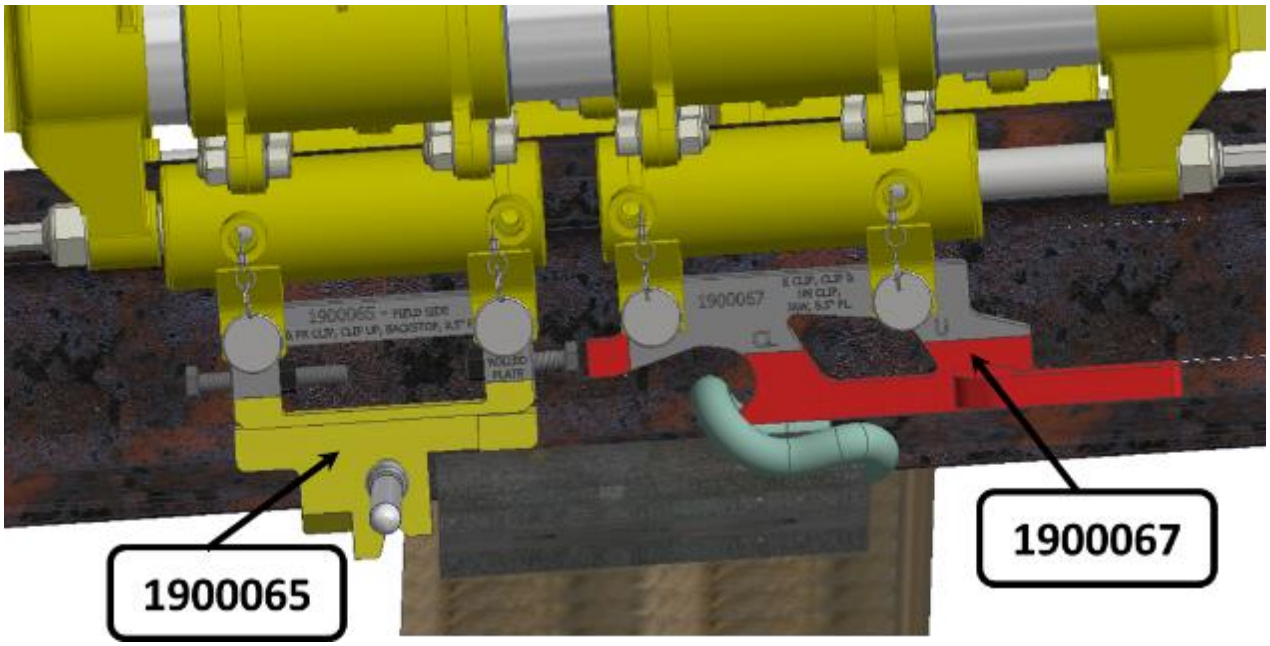


17.1.3. Timber/Composite, 216mm (8.5”) Rolled Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

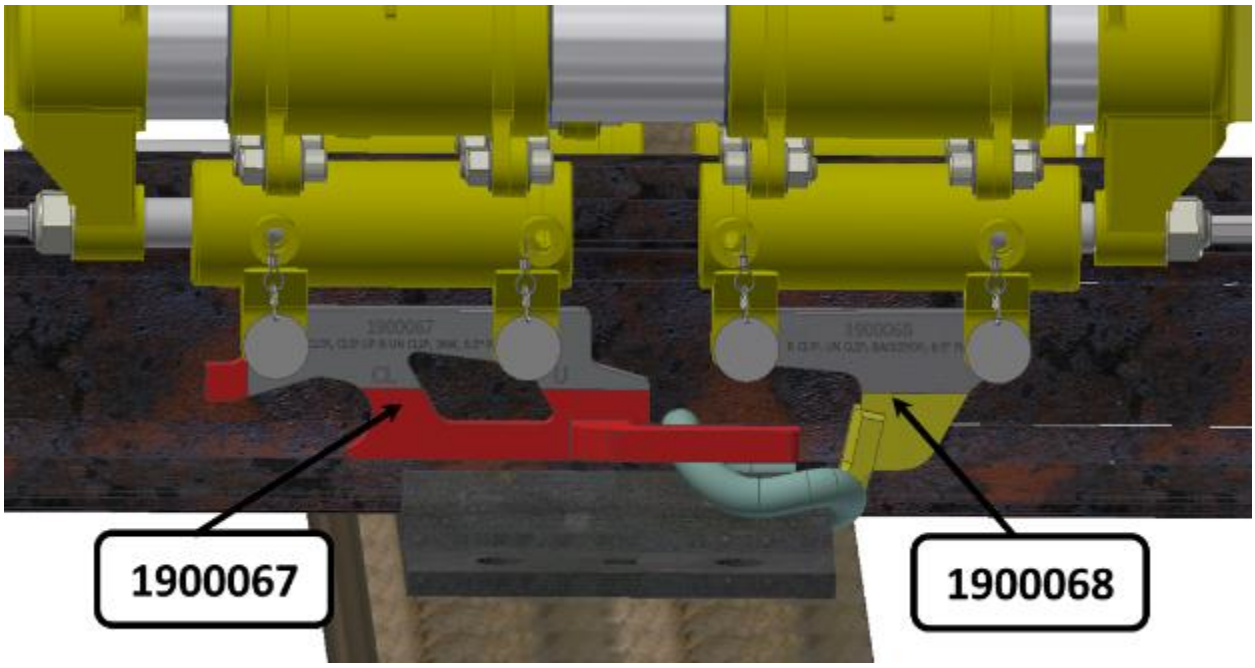


Field Side(see section 9.4.4 and 9.4.6)



17.1.4. Timber/Composite, 216mm (8.5”) Rolled Plate, E-clip – Unclipping

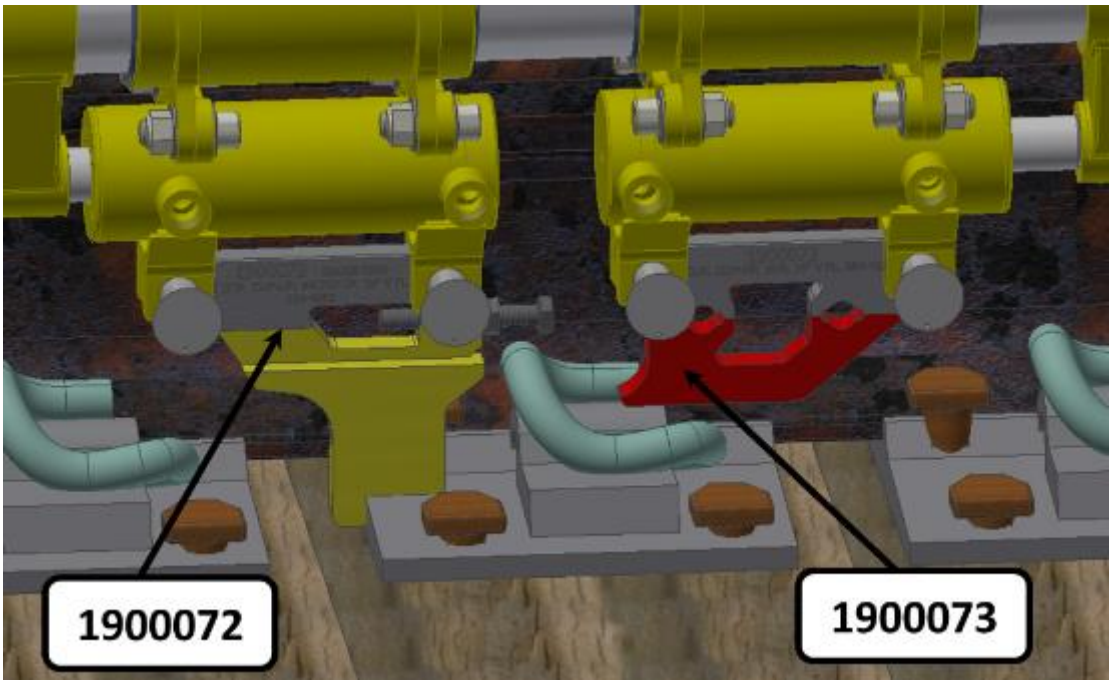
Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



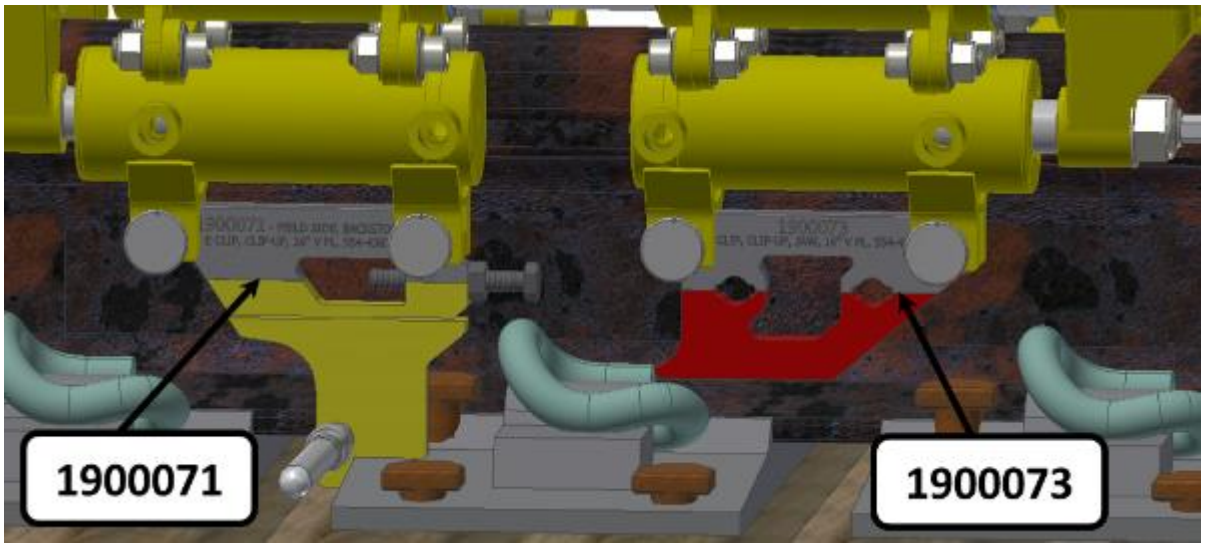
18. Appendix D – 16” Victor Plate E-Clip Jaws

18.1. Timber/Composite Sleeper 16” Victor Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

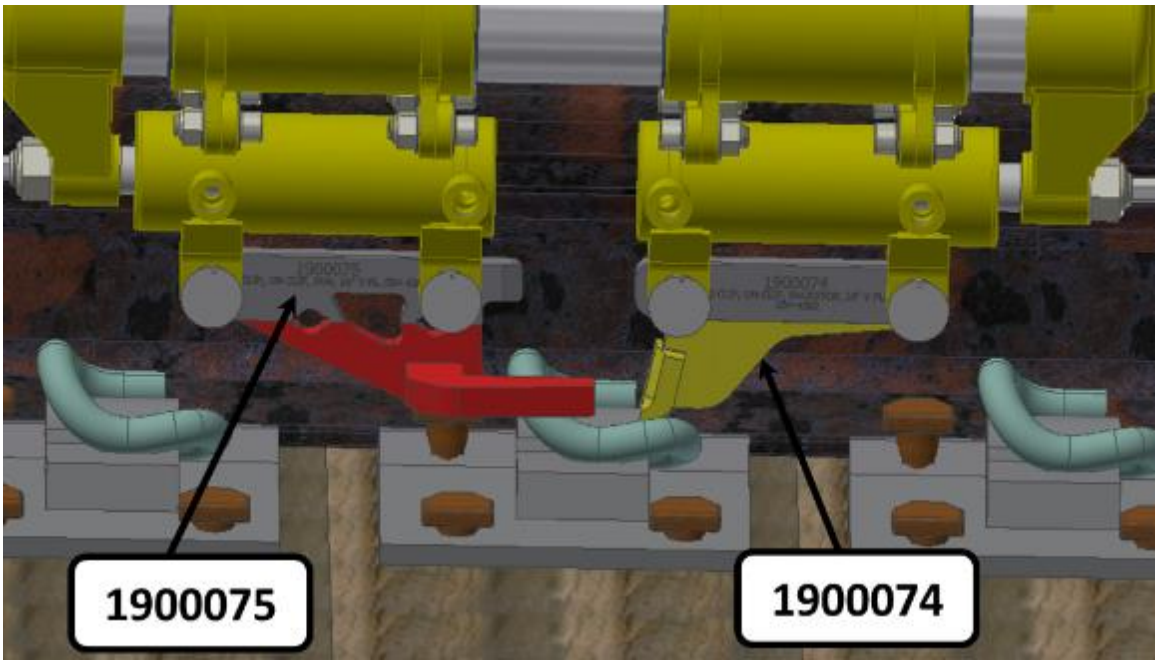


Field Side(see section 9.4.4 and 9.4.6)



18.2. Timber/Composite Sleeper 16” Victor Plate, E-clip – Un-Clipping

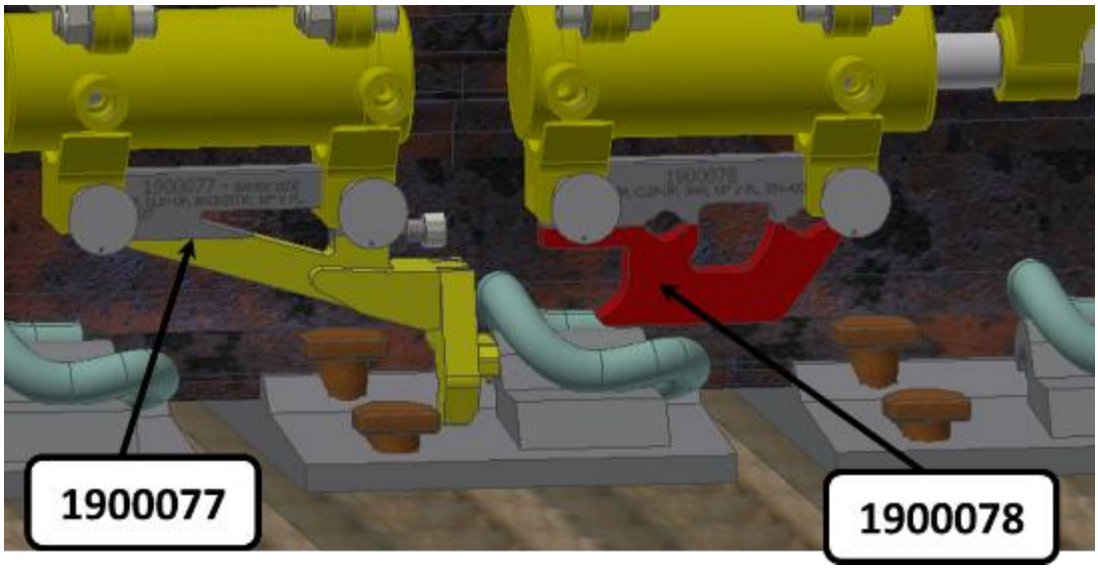
Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



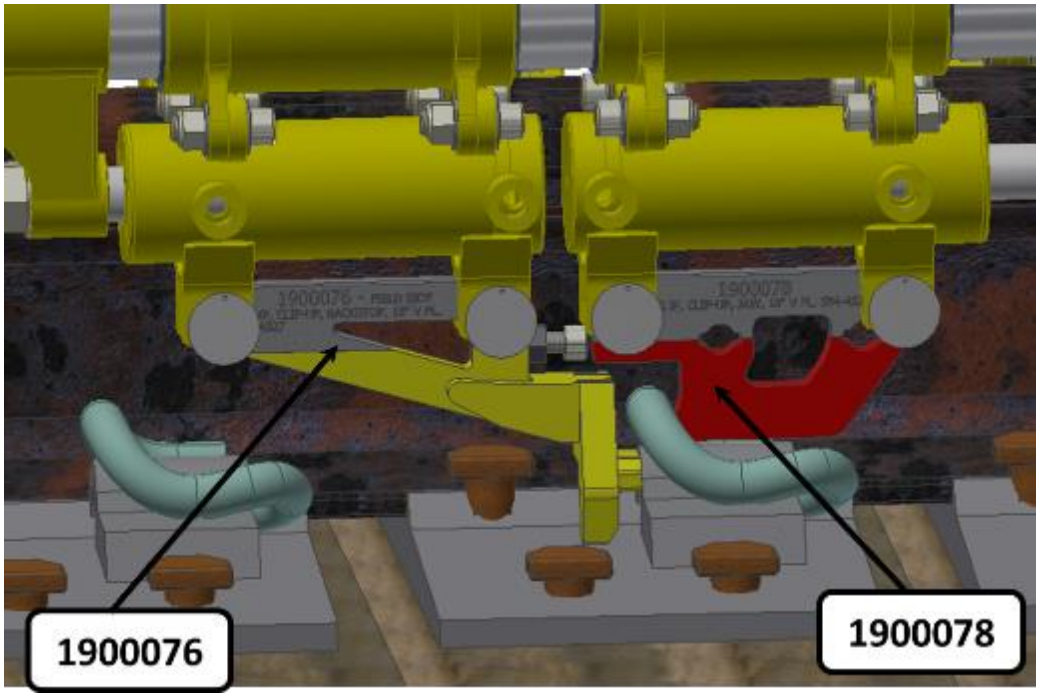
19. Appendix E - 18” Victor Plate E-Clip Jaws

19.1. Timber/Composite Sleeper 18” Victor Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

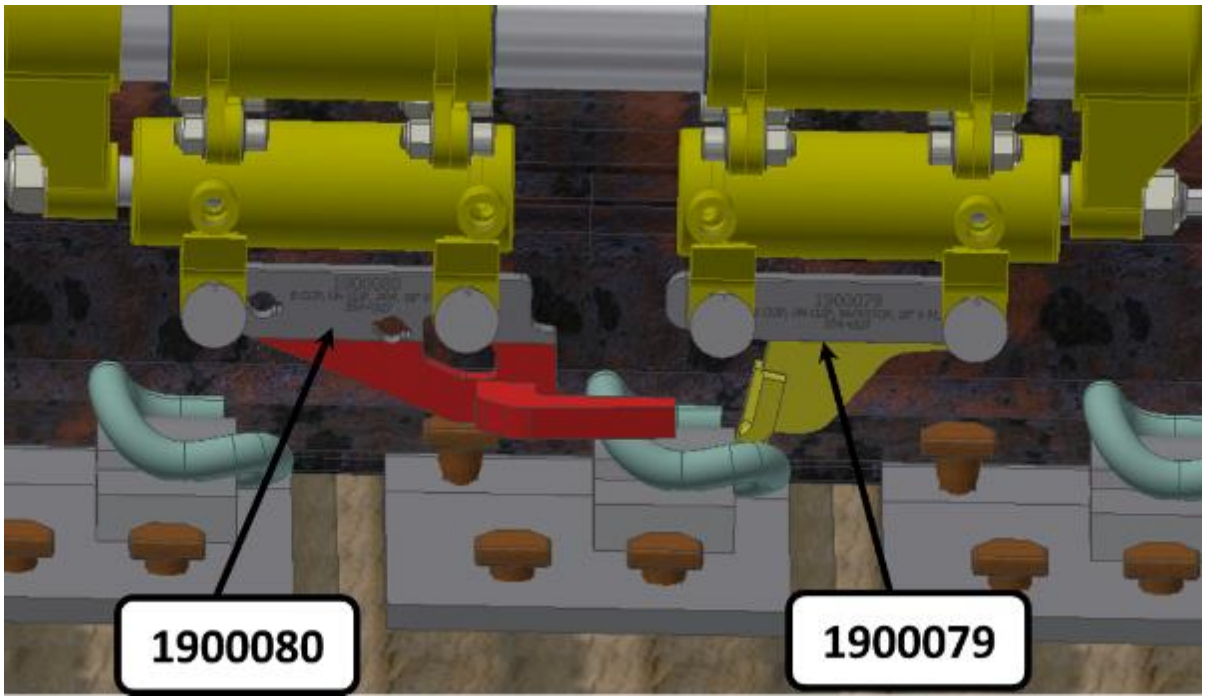


Field Side(see section 9.4.4 and 9.4.6)



19.2. Timber/Composite Sleeper 18” Victor Plate, E-clip – Un-Clipping

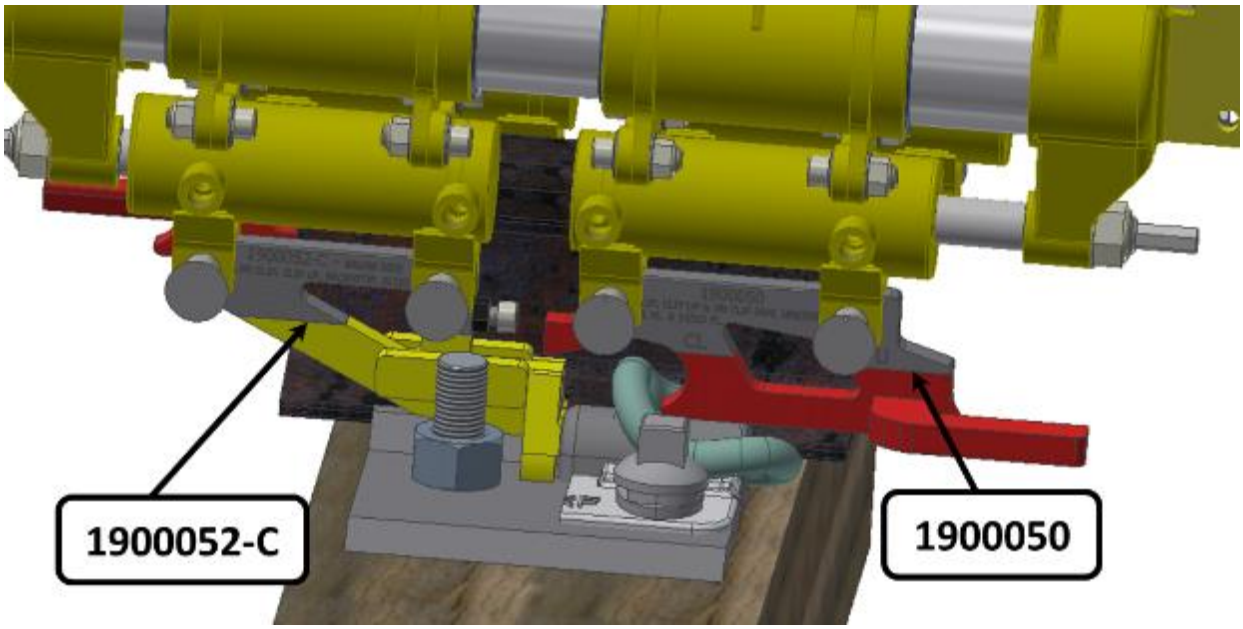
Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



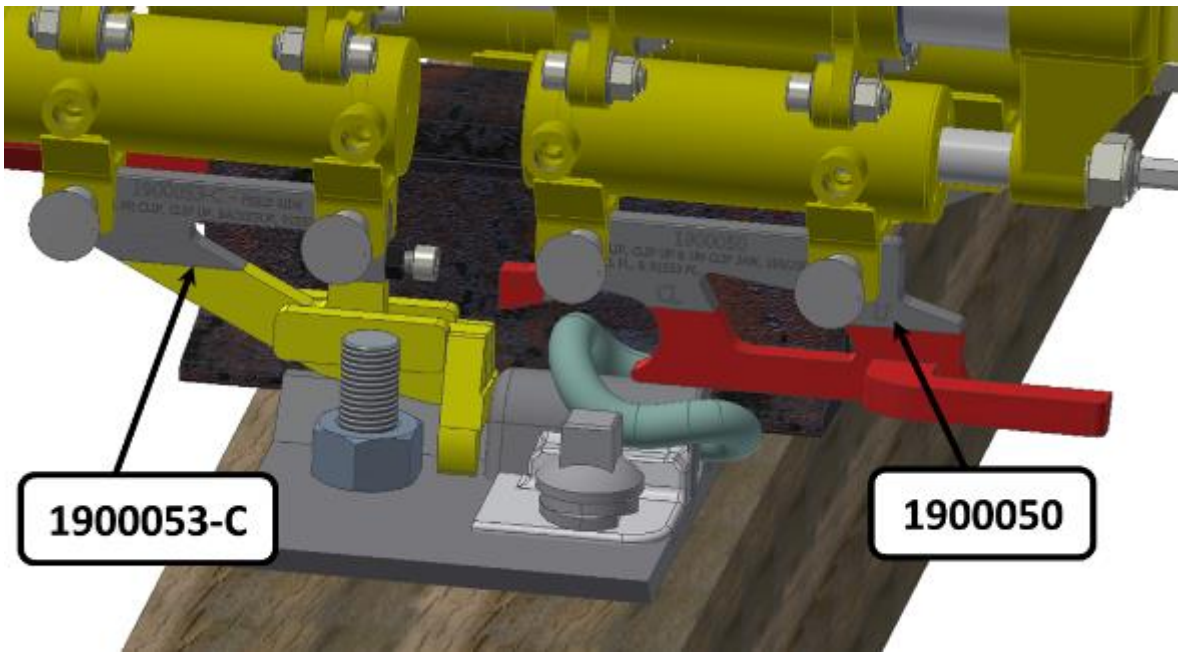
20. Appendix F - Pandrol 91533 Rail Plate

20.1. Timber/Composite Sleeper, Pandrol 91533 Rail Plate, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

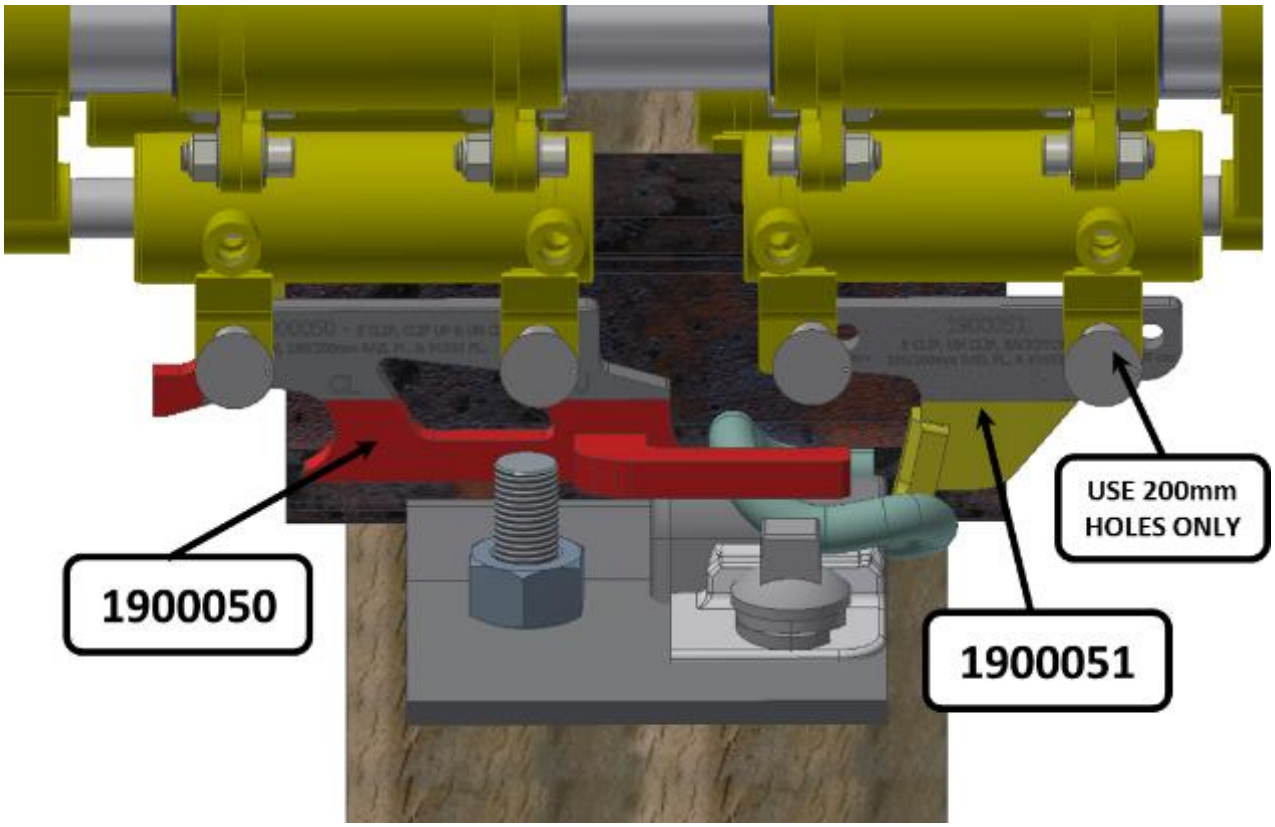


Field Side(see section 9.4.4 and 9.4.6)

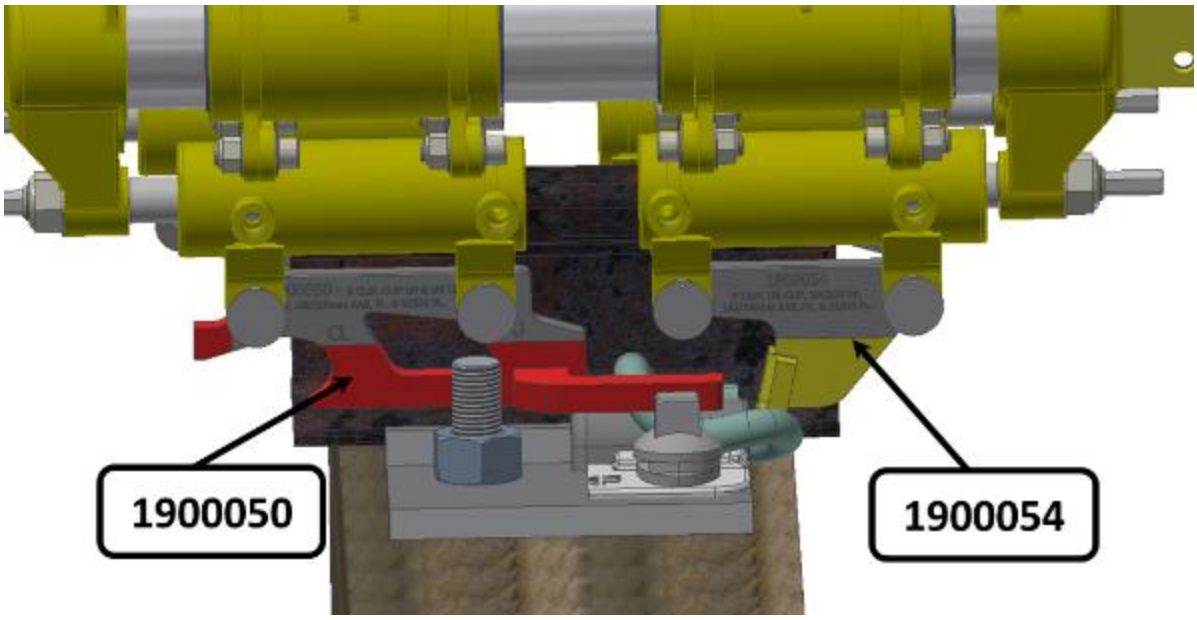


20.2. Timber/Composite Sleeper, Pandrol 91533 Rail Plate, E-clip – Un Clipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6) (ALWAYS USE ON 200mm HOLES)



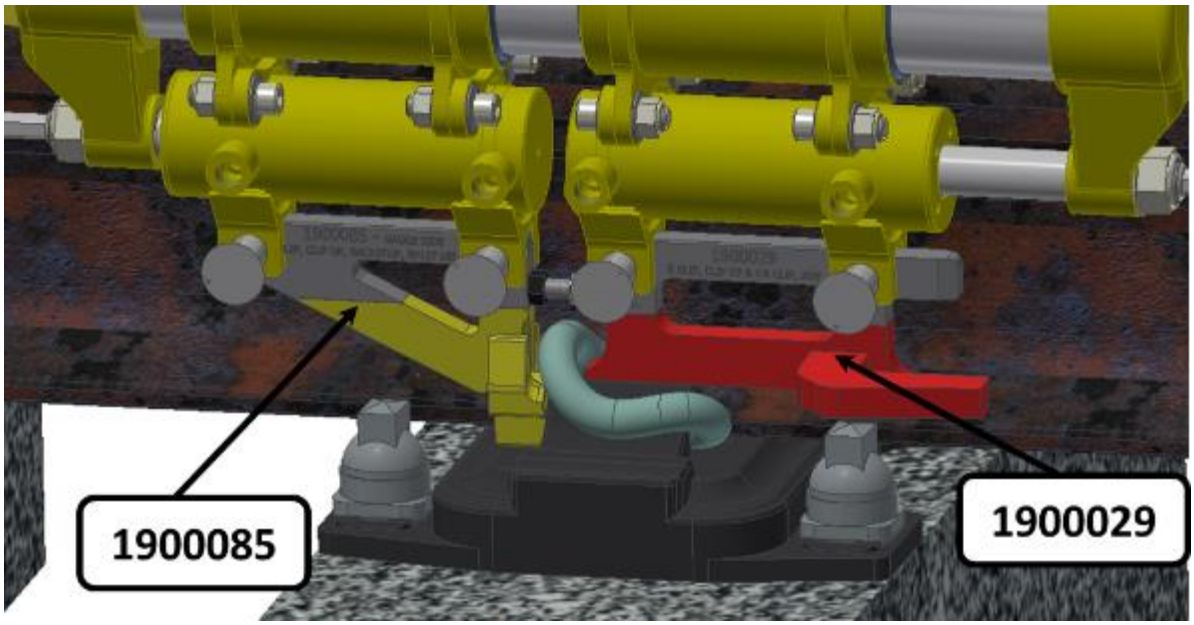
Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



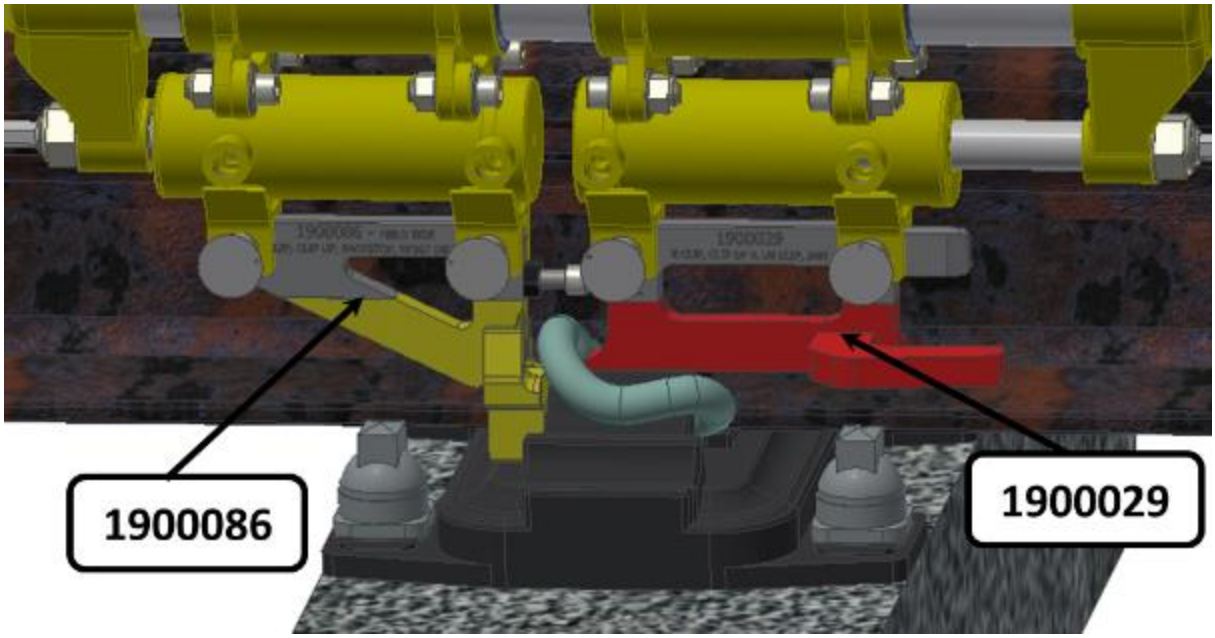
21. Appendix G – Delkor Rail Egg RF167 & RF127 (Elastic Rail Fastener)

21.1. Concrete Slab Track Sleeper, Delkor RF167, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

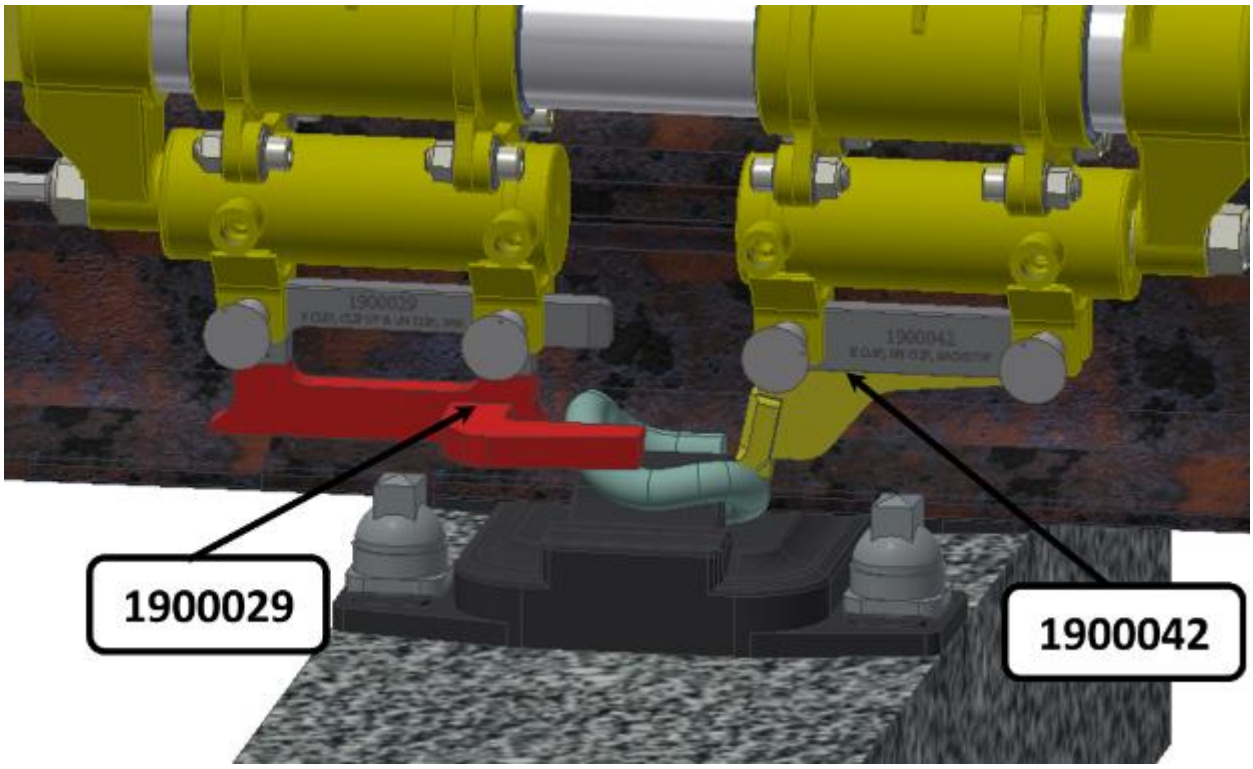


Field Side(see section 9.4.4 and 9.4.6)



21.2. Concrete Slab Track Sleeper, Delkor RF167, E-clip – Un Clipping

Either Gauge or Field Side (see section 9.4.4 and 9.4.6)



21.3. Concrete Slab Track Sleeper, Delkor RF127, E-clip – Clipping Up & Un Clipping

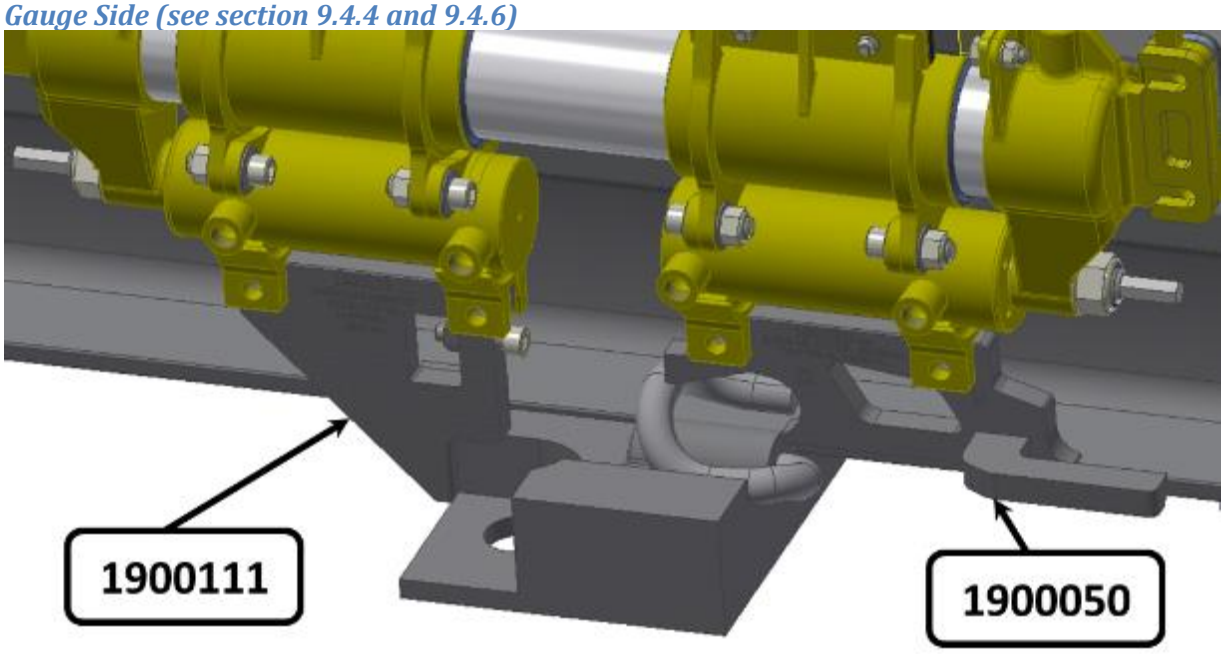
Jaws and Backstop assembly is identical to the RF167 plates, above. The 1900029 used as a jaw for both clipping up and un clipping on both gauge and field sides. The 1900042 used as a backstop on both sides when un clipping and the 1900085(gauge side) and 1900086(field side) as backstops when clipping up

22. Appendix H – LB-Foster Rubber Encapsulated plate. Stock 01-64-3331

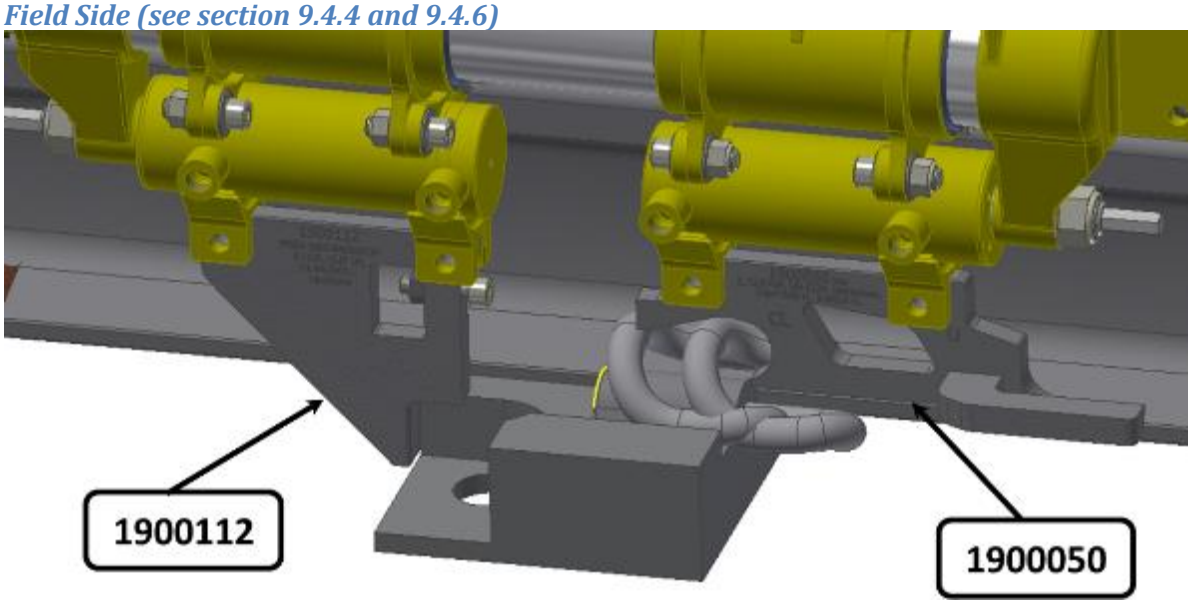
***Use 6mm spacer on both heads.

22.1. Clipping Up, Standard E-clips

Gauge Side (see section 9.4.4 and 9.4.6)

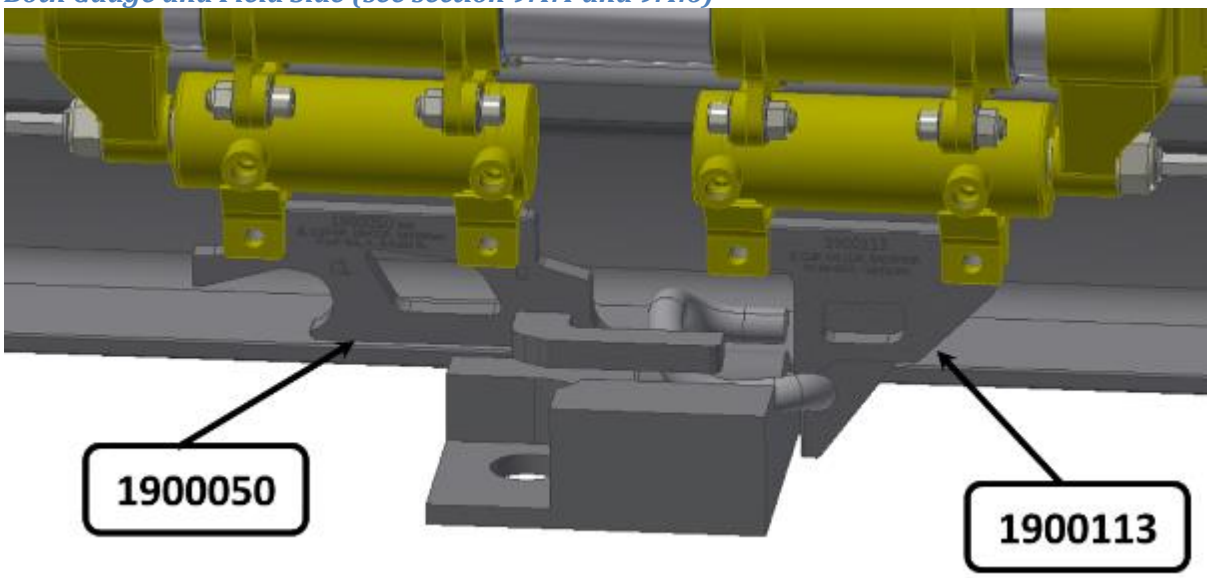


Field Side (see section 9.4.4 and 9.4.6)



22.2. Unclipping, standard E-clips

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)

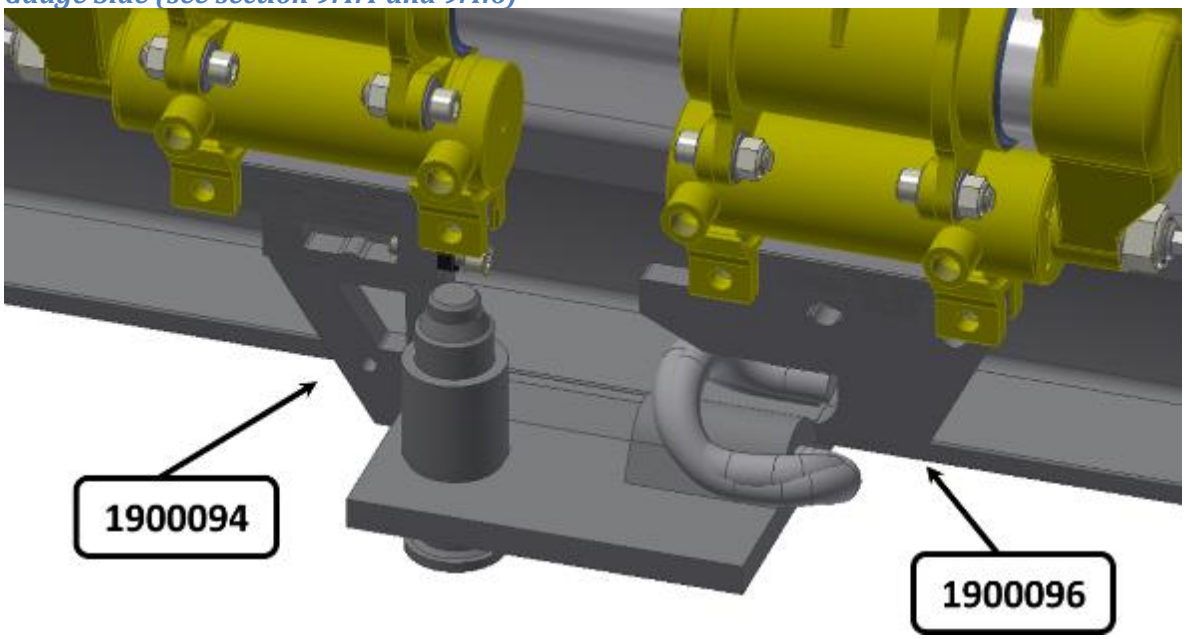


23. Appendix I – RF-A Plate. Stock 01-64-3342 & 01-64-3344.

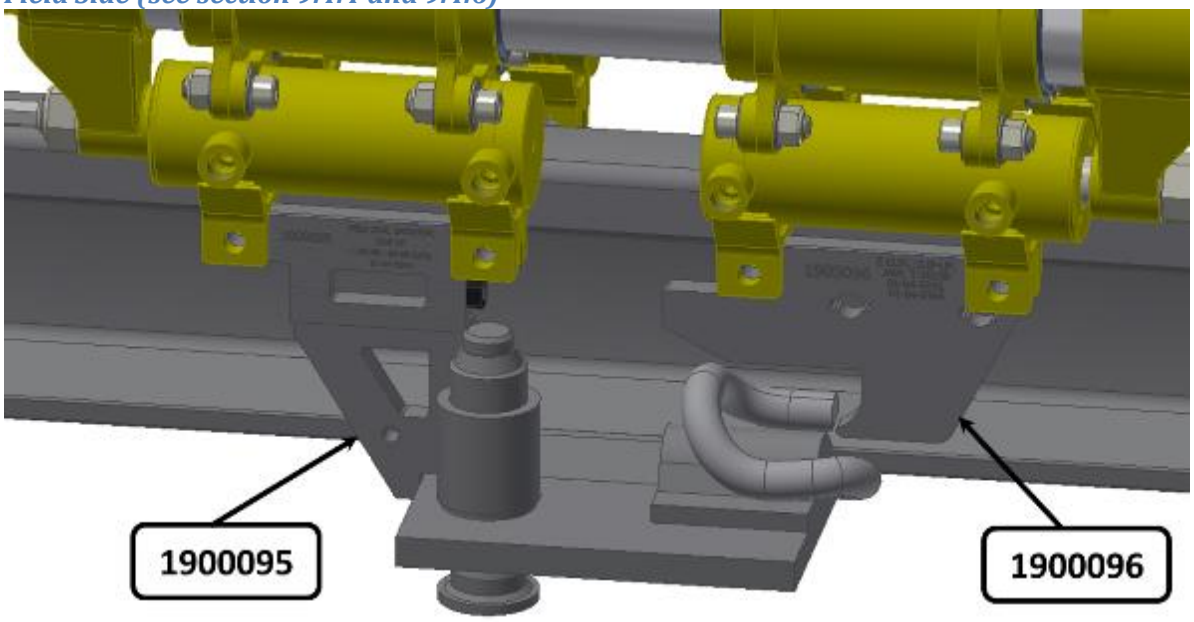
100-8lb rail - Use no spacer on both heads. (100-8LB rail, 130mm foot)
115lb rail - Use 3mm spacer on both heads (115LB rail, 139.7mm foot)

23.1. Clipping Up, standard E-clips

Gauge Side (see section 9.4.4 and 9.4.6)

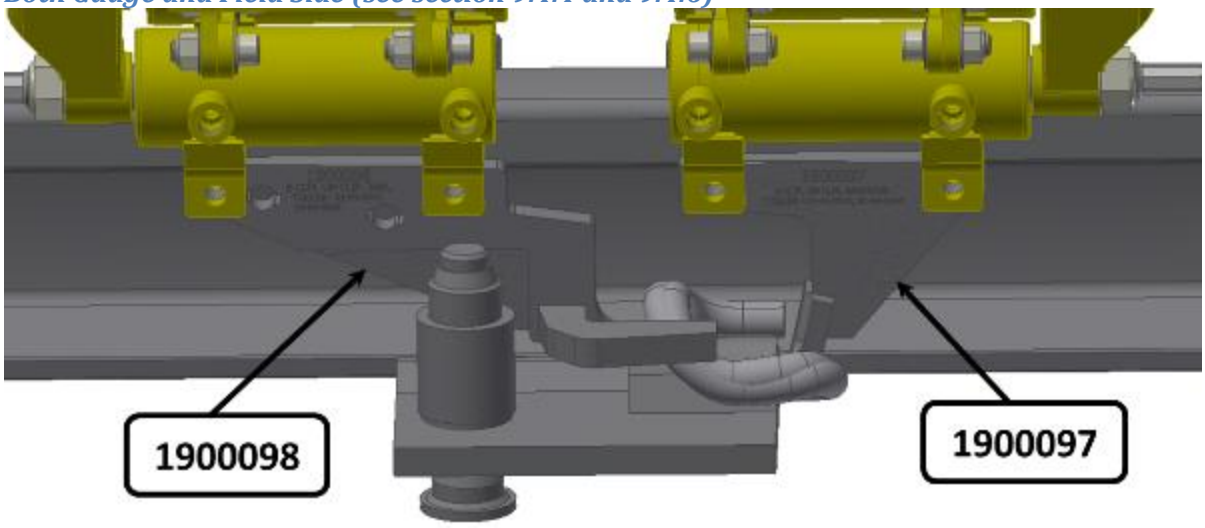


Field Side (see section 9.4.4 and 9.4.6)



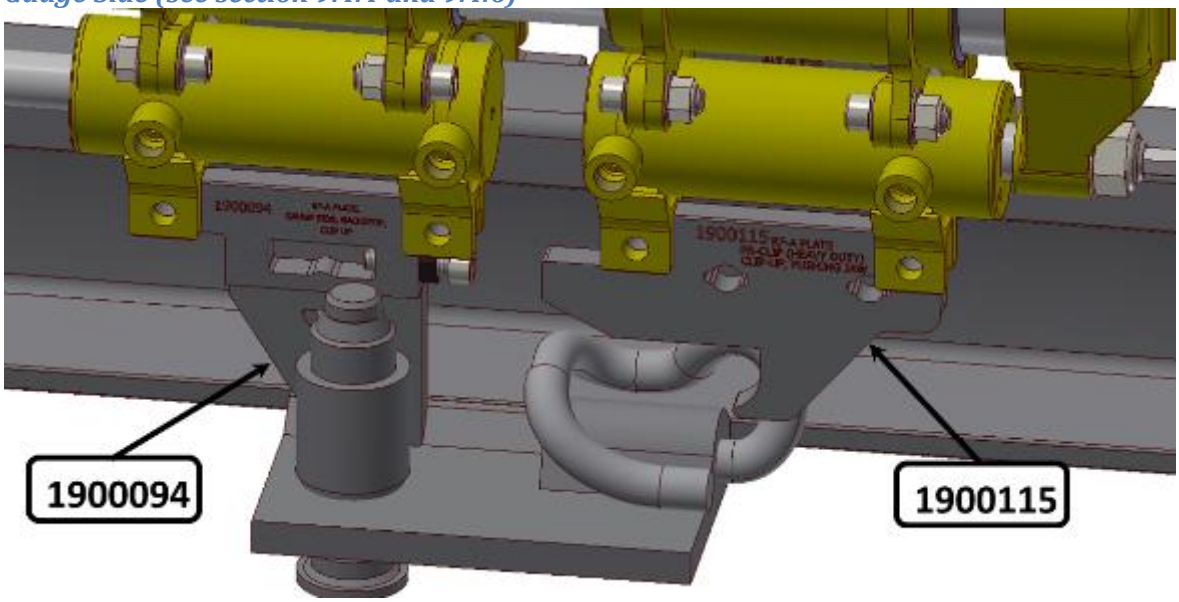
23.2. Unclipping, standard E-clips

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)

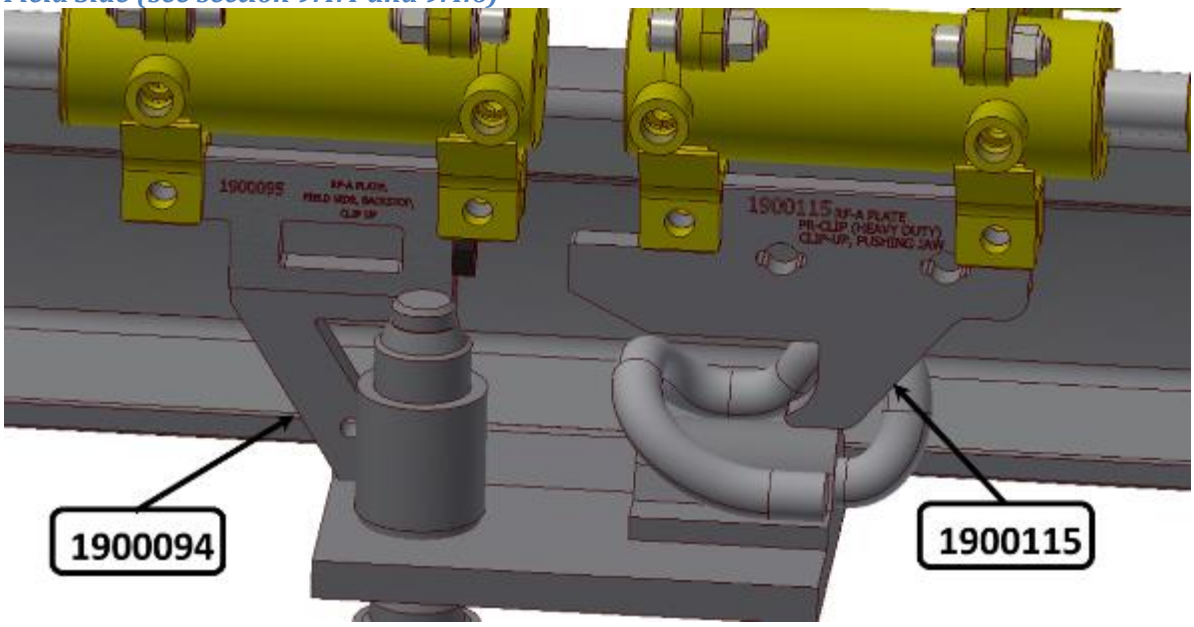


23.3. Clipping up, Heavy duty/PR clips

Gauge Side (see section 9.4.4 and 9.4.6)

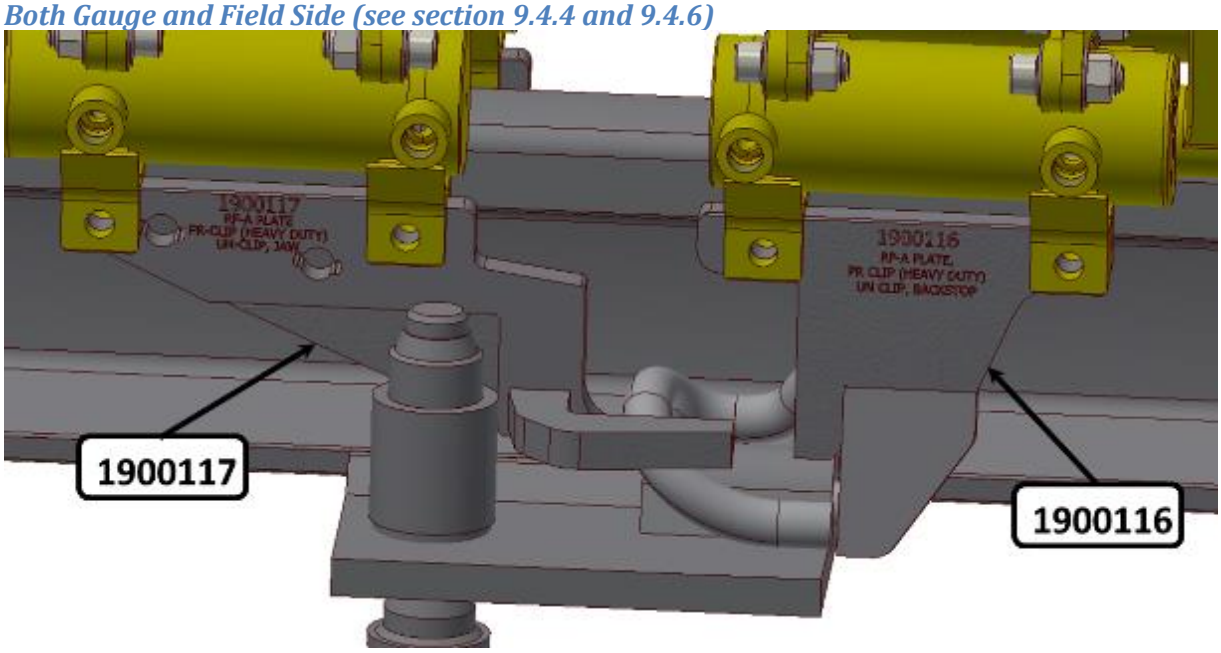


Field Side (see section 9.4.4 and 9.4.6)



23.4. Unclipping, Heavy duty PR clips

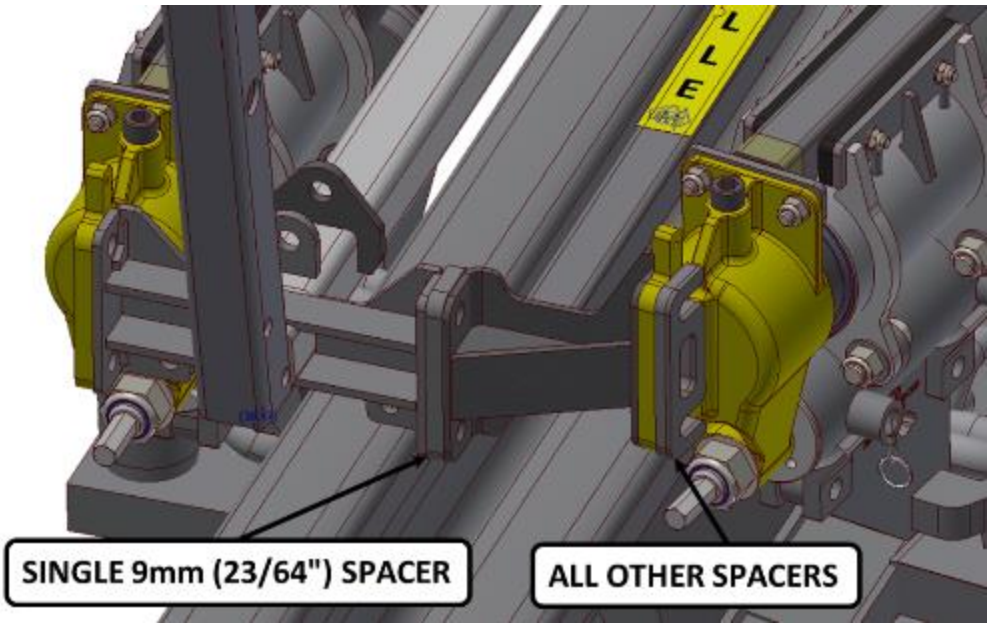
Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



24. Appendix J – RF-D plate with check rail. Stock 01-64-3347.

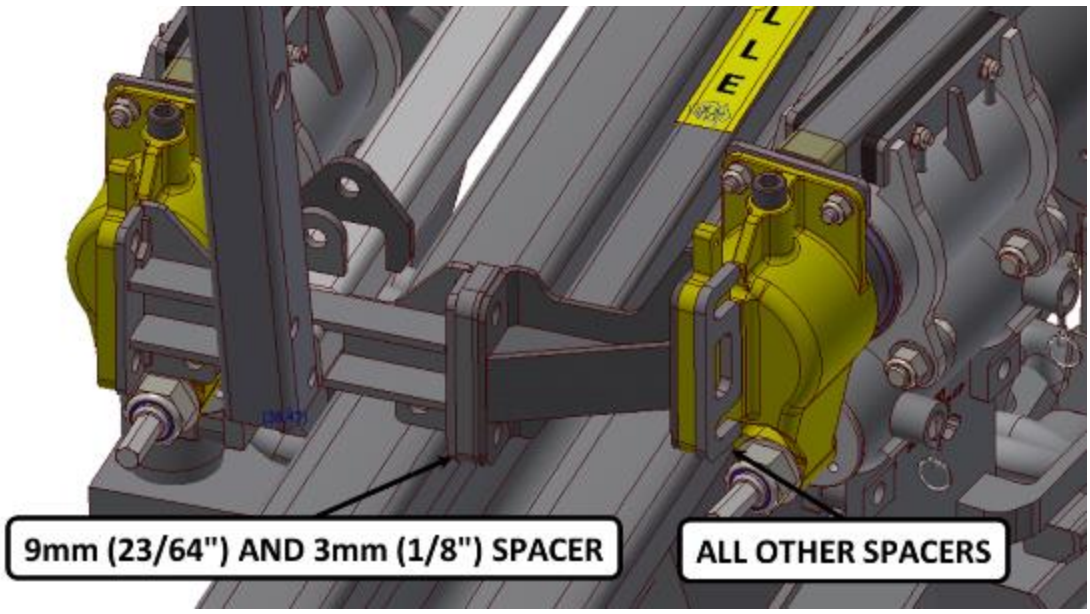
24.1. 100-8lb Rail set up frame as below

For the 100-8lb rail set up the angle frame (1900100) as below. Note spacer position is critical for correct alignment.

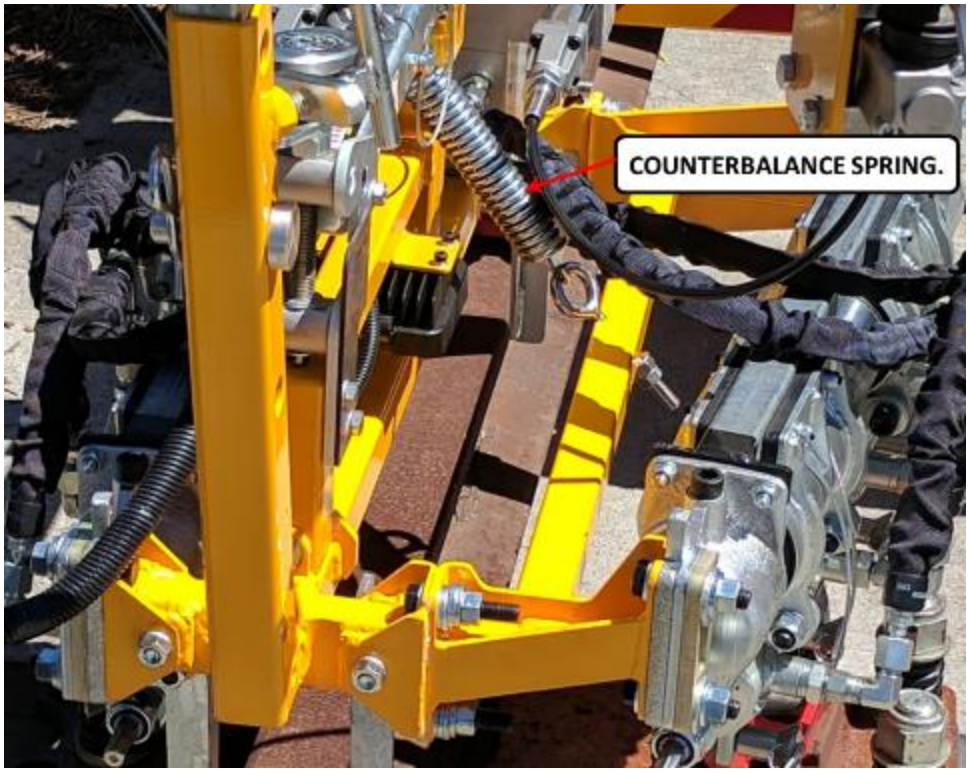


24.2. 115lb Rail set up frame as below

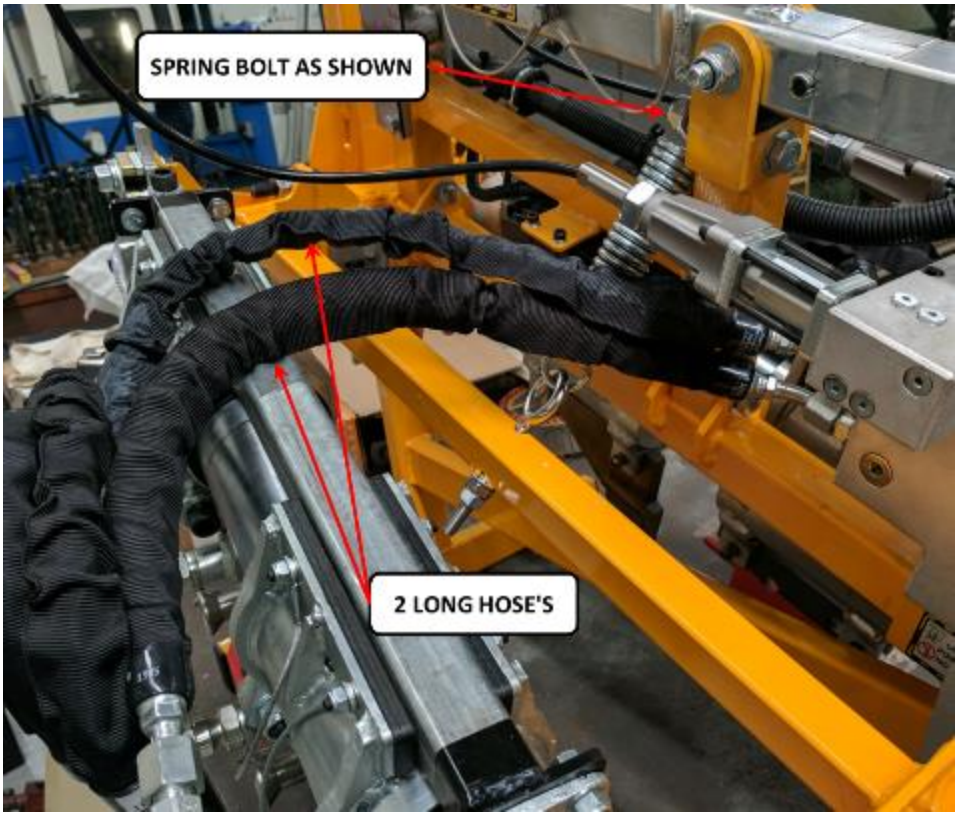
For the 115lb rail set up the angle frame as below. Note spacer position is critical for correct alignment.



Fit and set counterbalance spring as shown below.

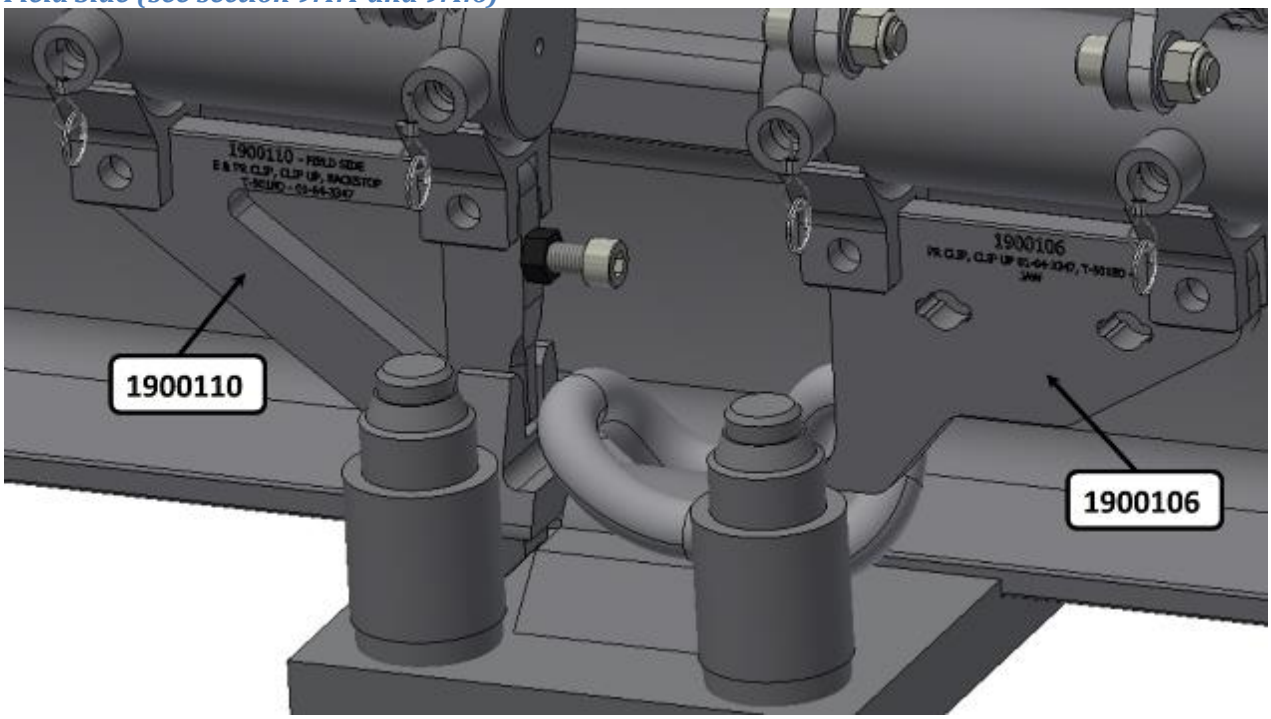


Swap short hose from manifold to cylinder to longer hose supplied in kit as shown below.

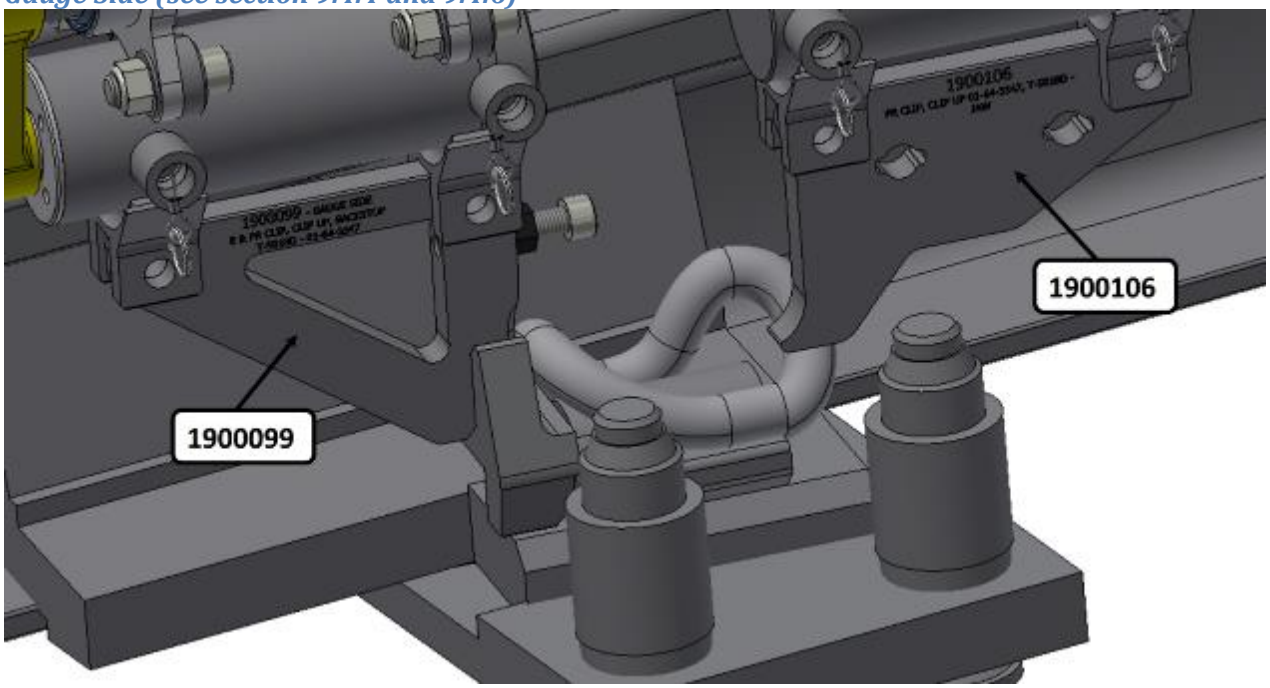


24.3. Clipping Up – Heavy duty PR-Clip

Field Side (see section 9.4.4 and 9.4.6)

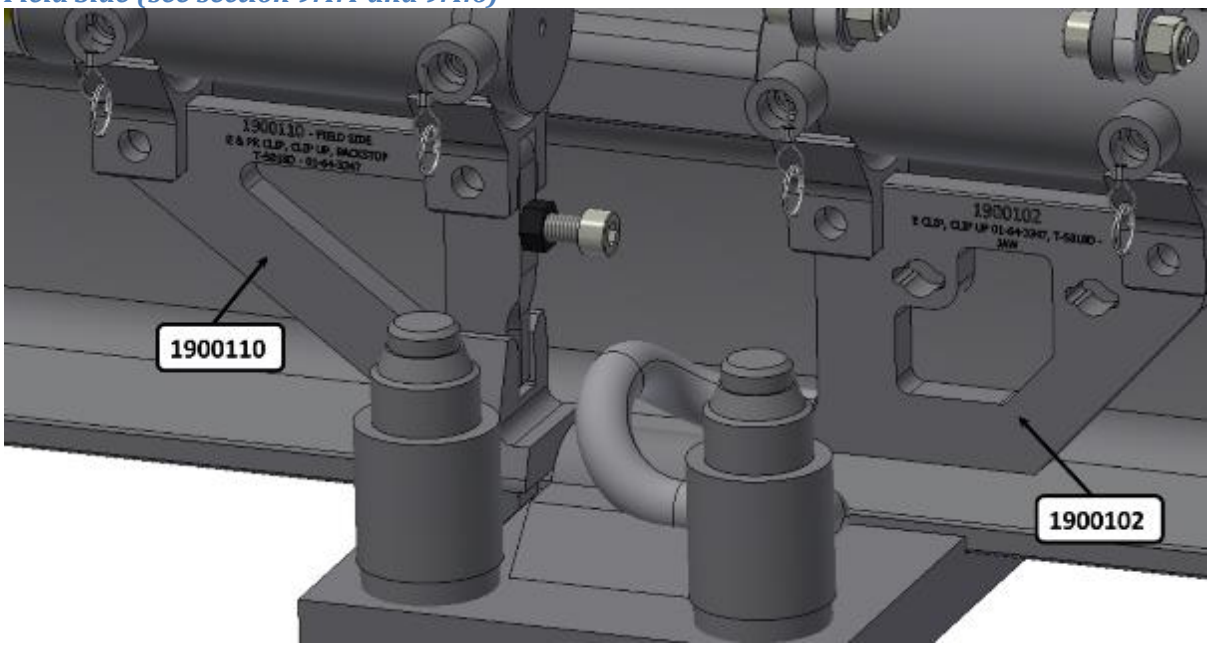


Gauge Side (see section 9.4.4 and 9.4.6)

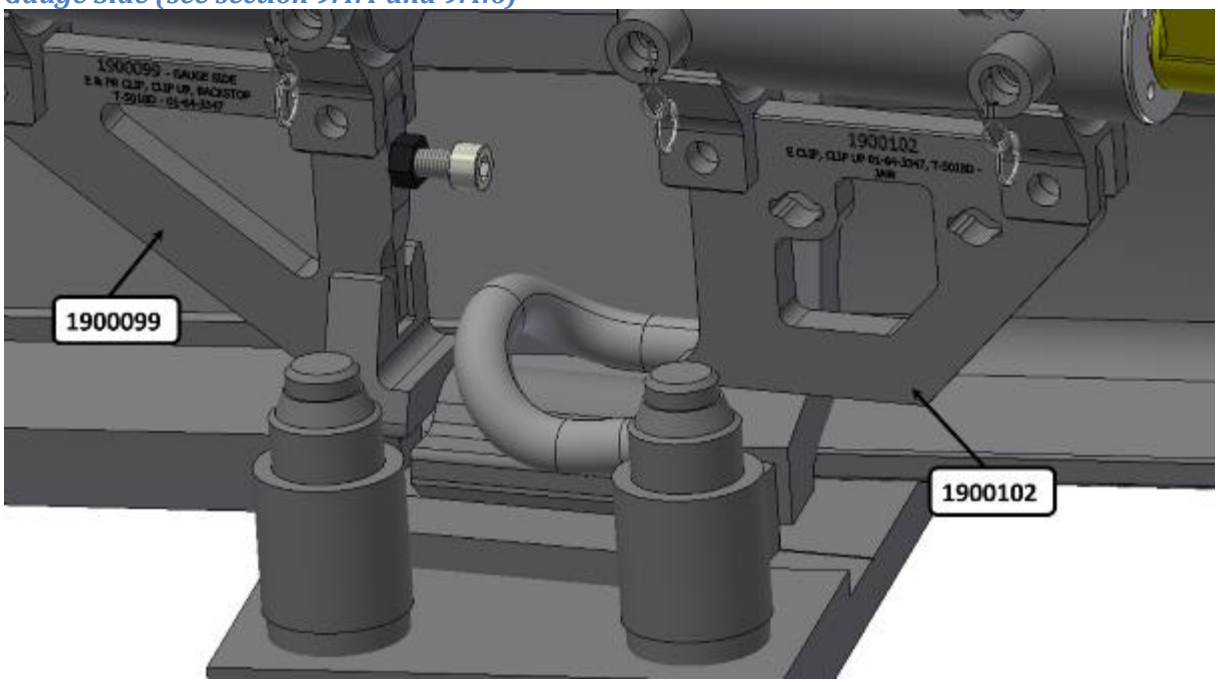


24.4. Clipping Up – Standard E-Clip

Field Side (see section 9.4.4 and 9.4.6)

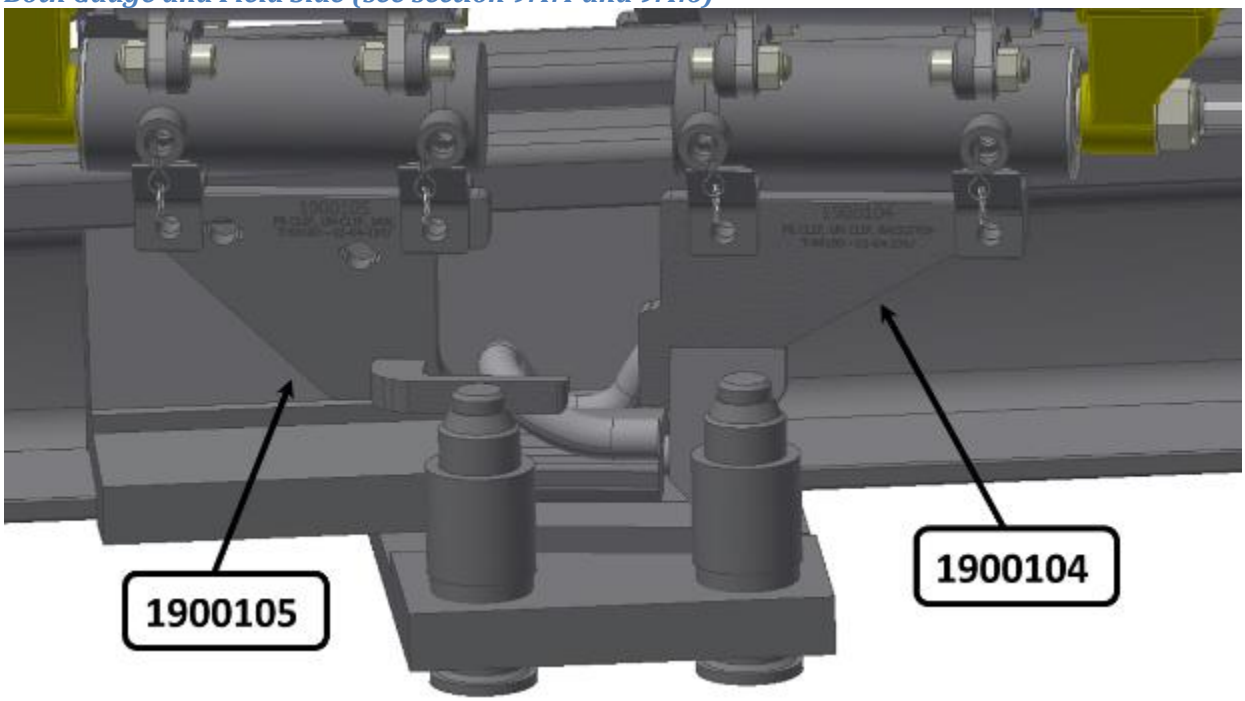


Gauge Side (see section 9.4.4 and 9.4.6)



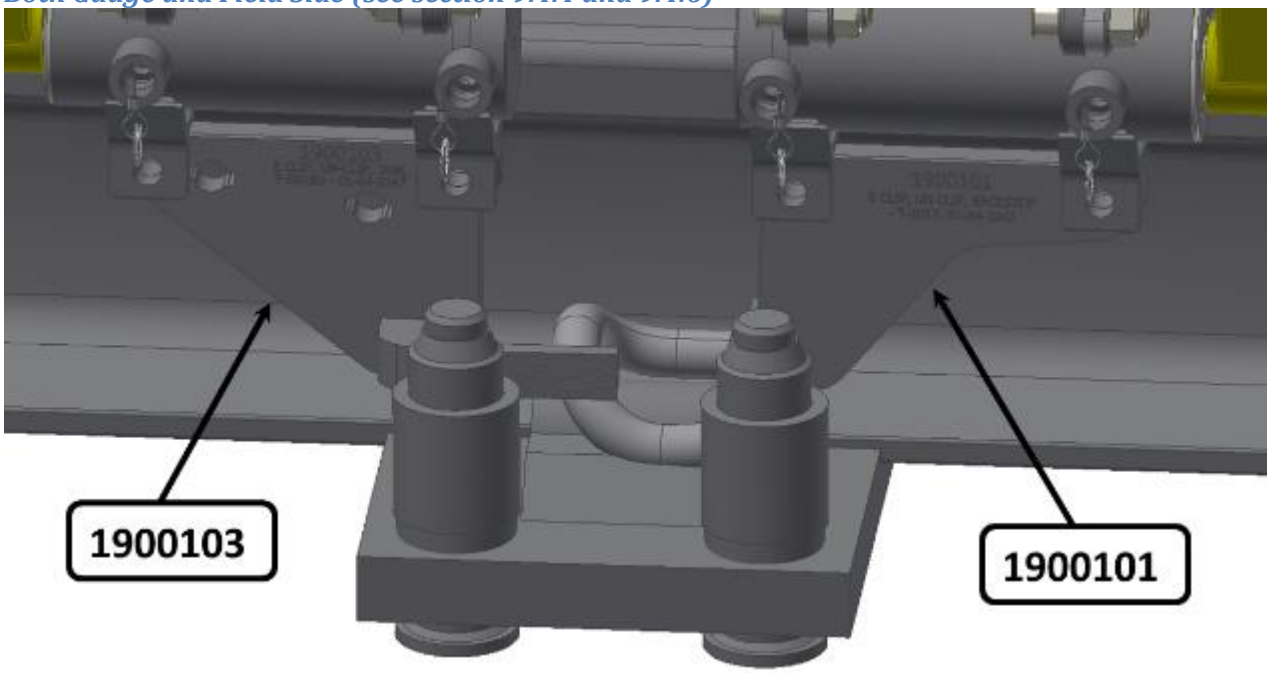
24.5. Unclipping – Heavy duty PR-Clip

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



24.6. Unclipping – Standard E-Clip

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)

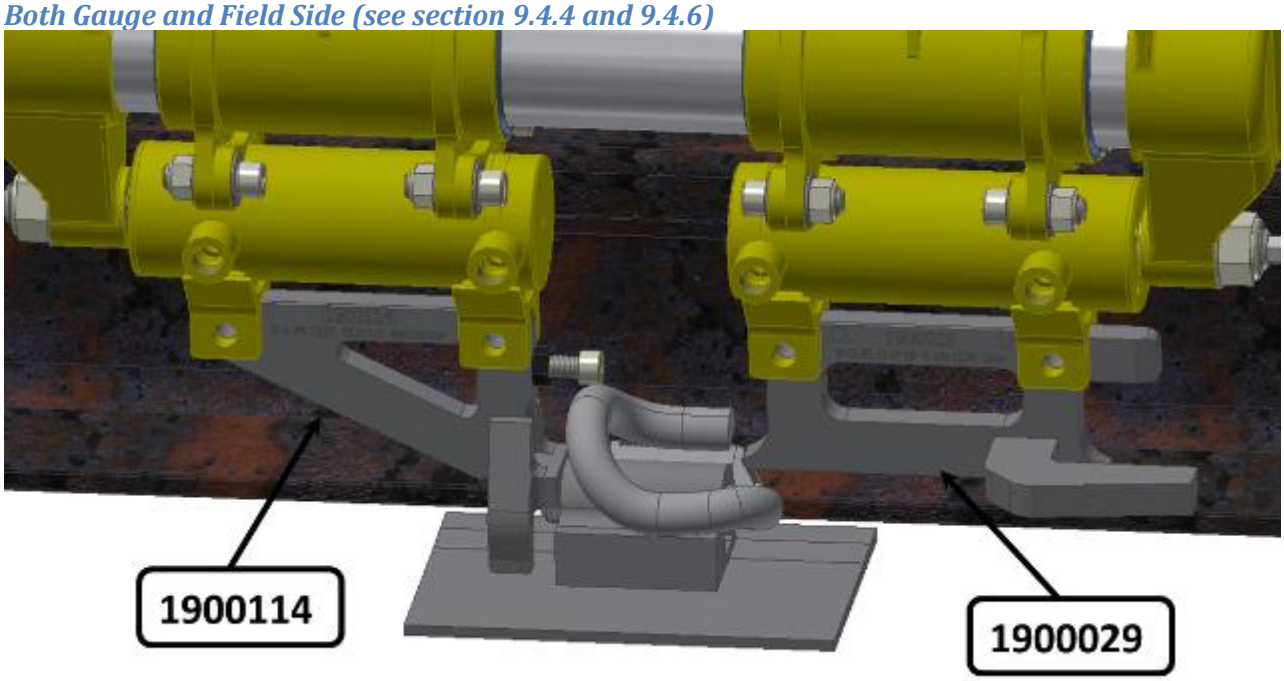


25. Appendix K – New York concrete Sleeper.

***Use 3mm spacer on both heads.

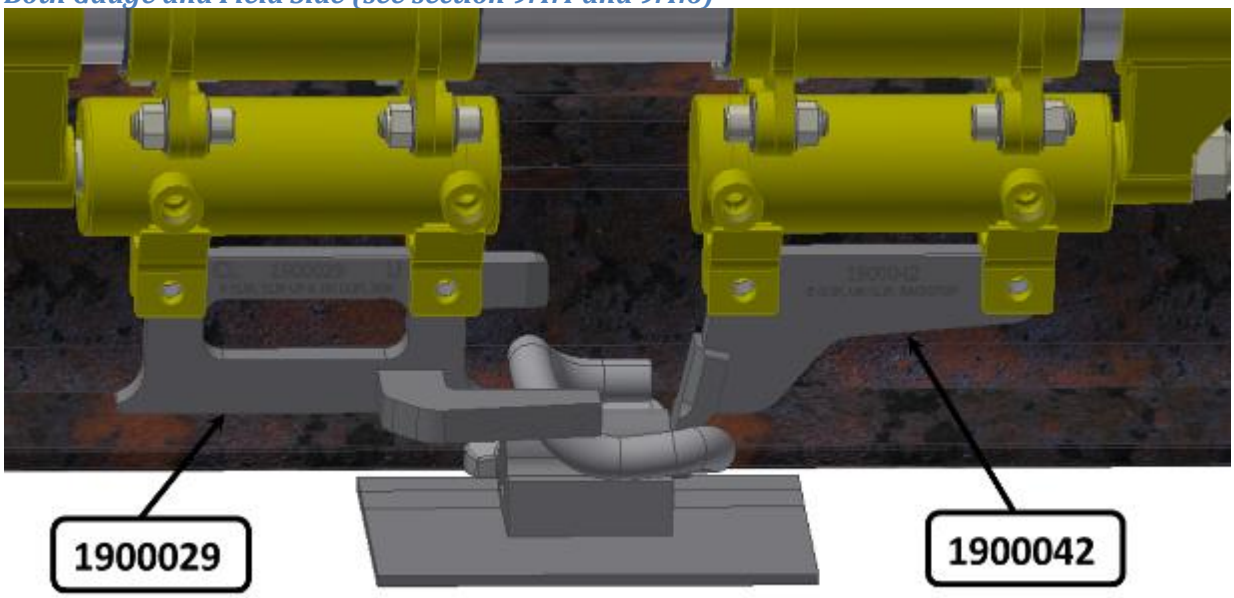
25.1. Clipping up Standard E-clip

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



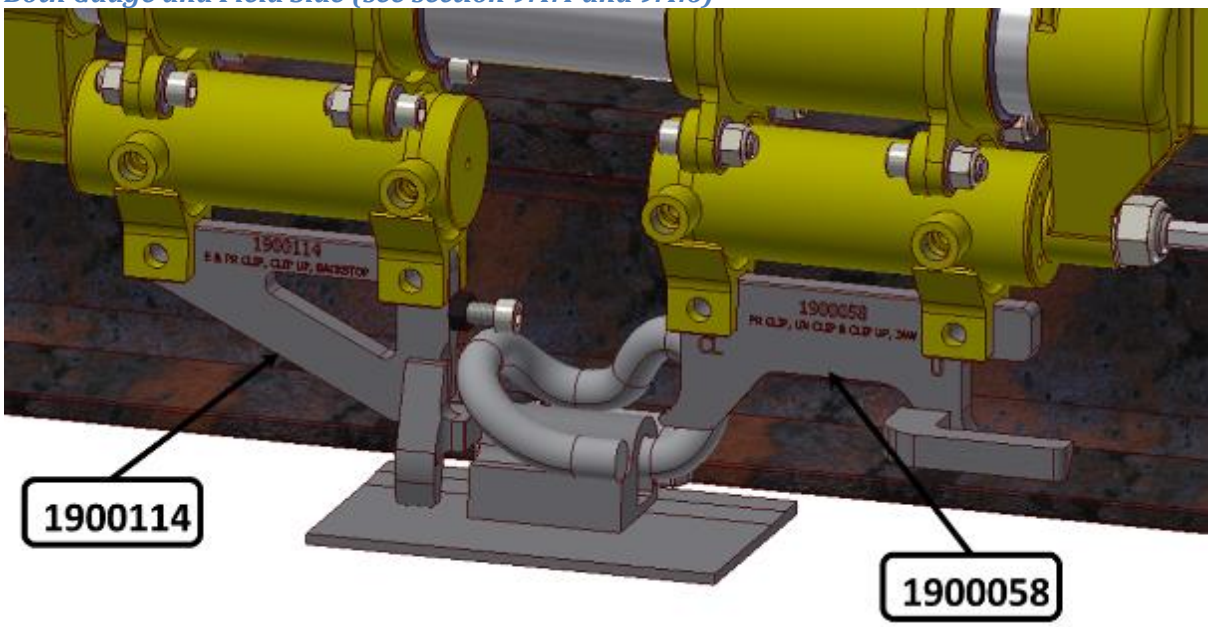
25.2. Unclipping Standard E-clip

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



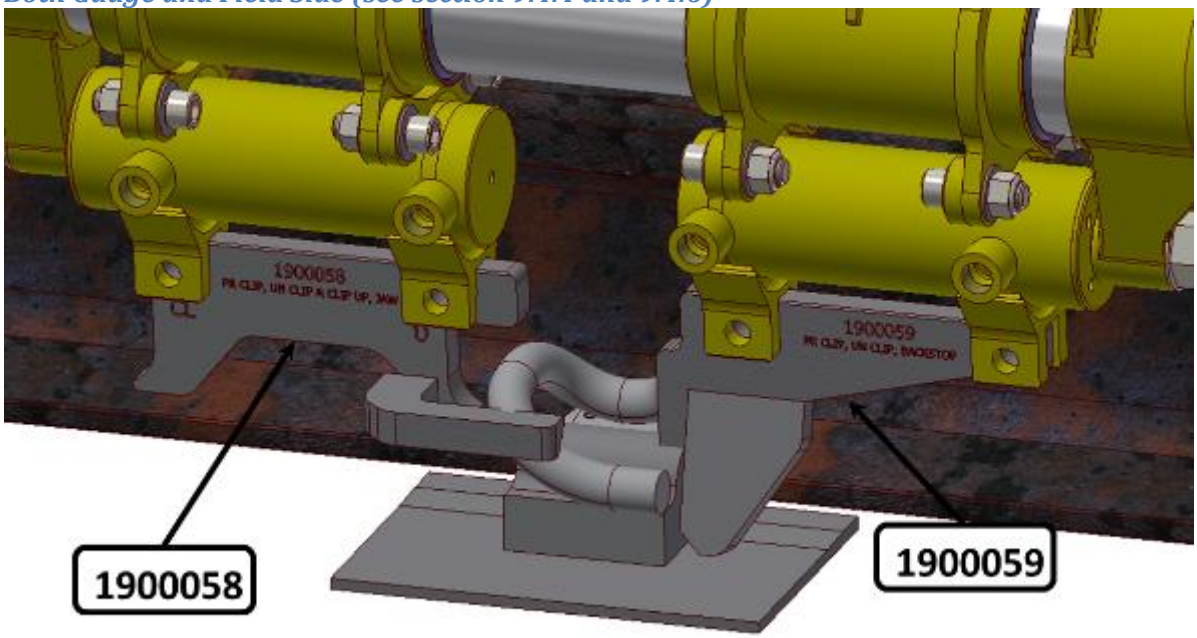
25.3. Clipping up Heavy duty PR-clip

Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



25.4. Unclipping Heavy duty PR-clip

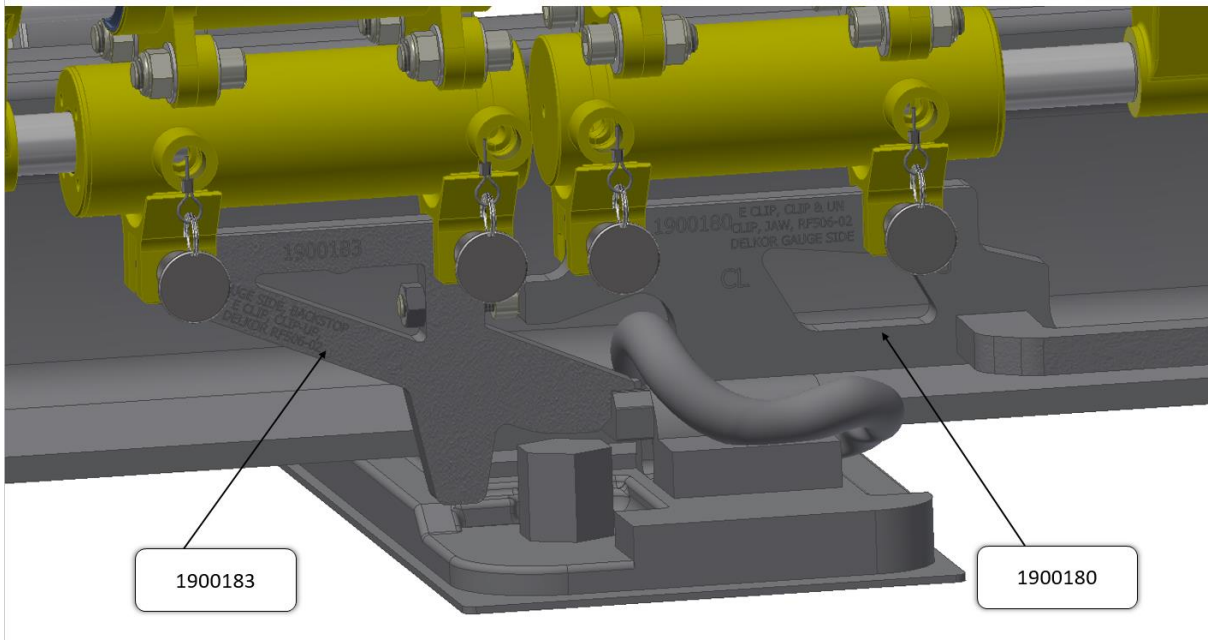
Both Gauge and Field Side (see section 9.4.4 and 9.4.6)



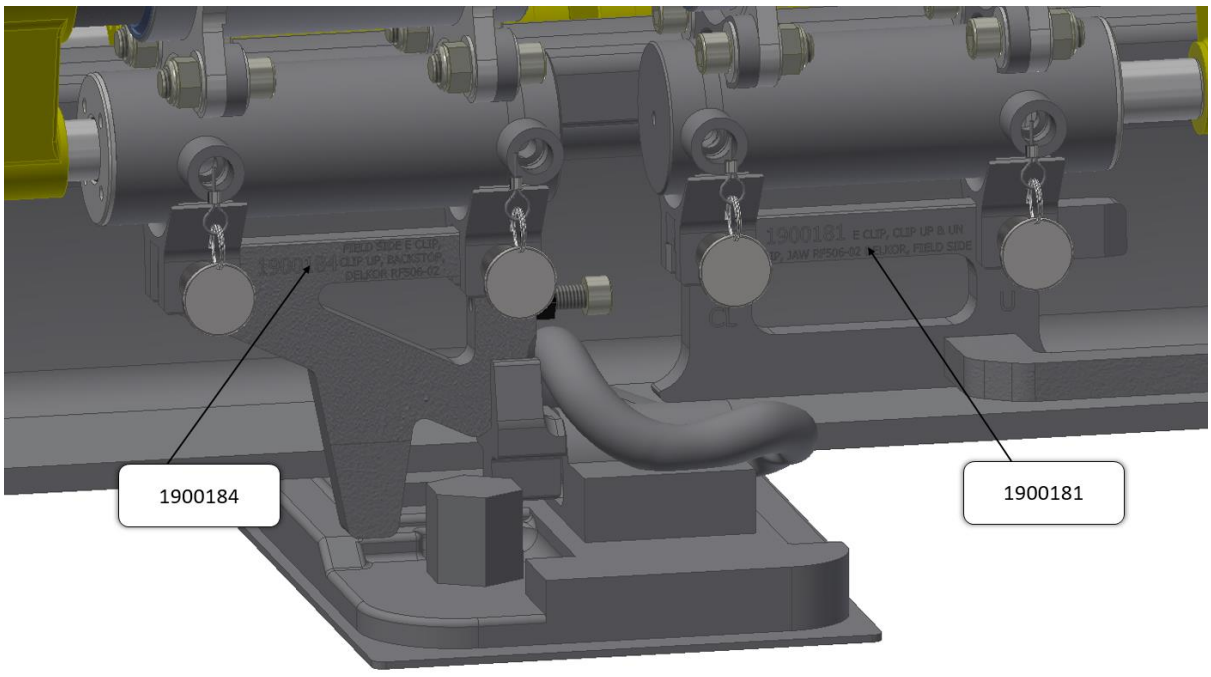
26. Appendix L – Delkor Rail RF506-02 (Elastic Rail Fastener)

26.1. Concrete Slab Track Sleeper, Delkor RF506-02, E-clip – Clipping Up

Gauge Side (see section 9.4.4 and 9.4.6)

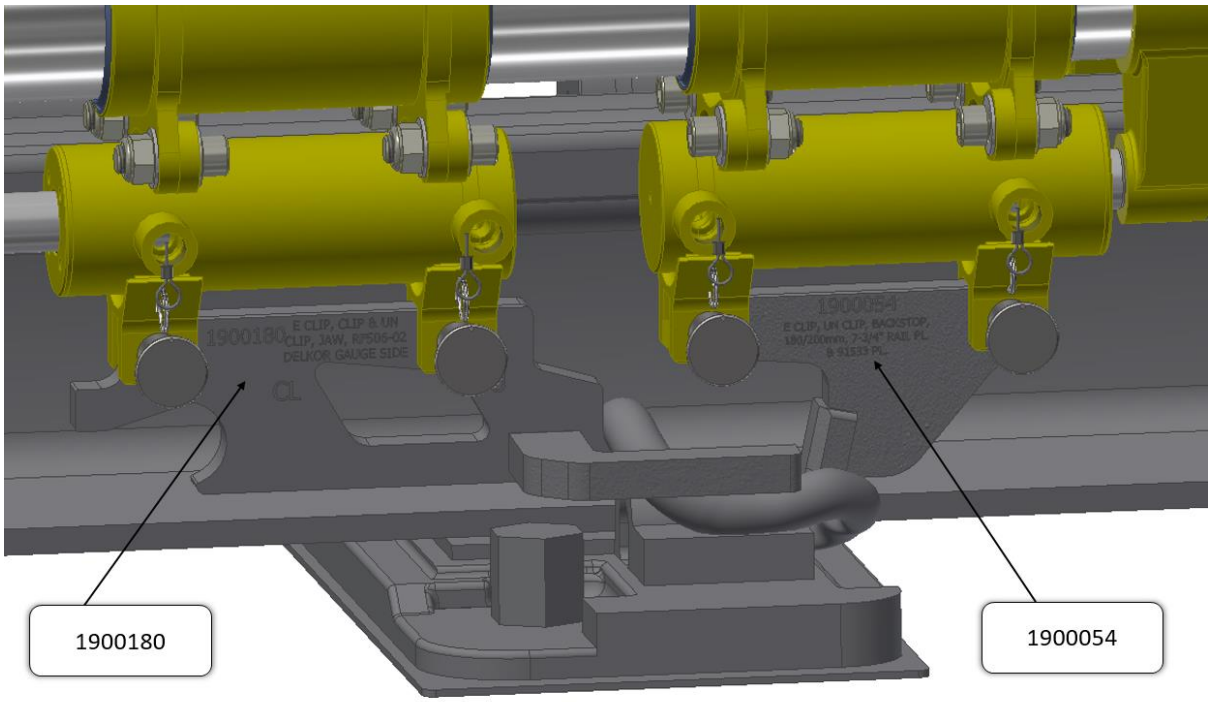


Field Side(see section 9.4.4 and 9.4.6)

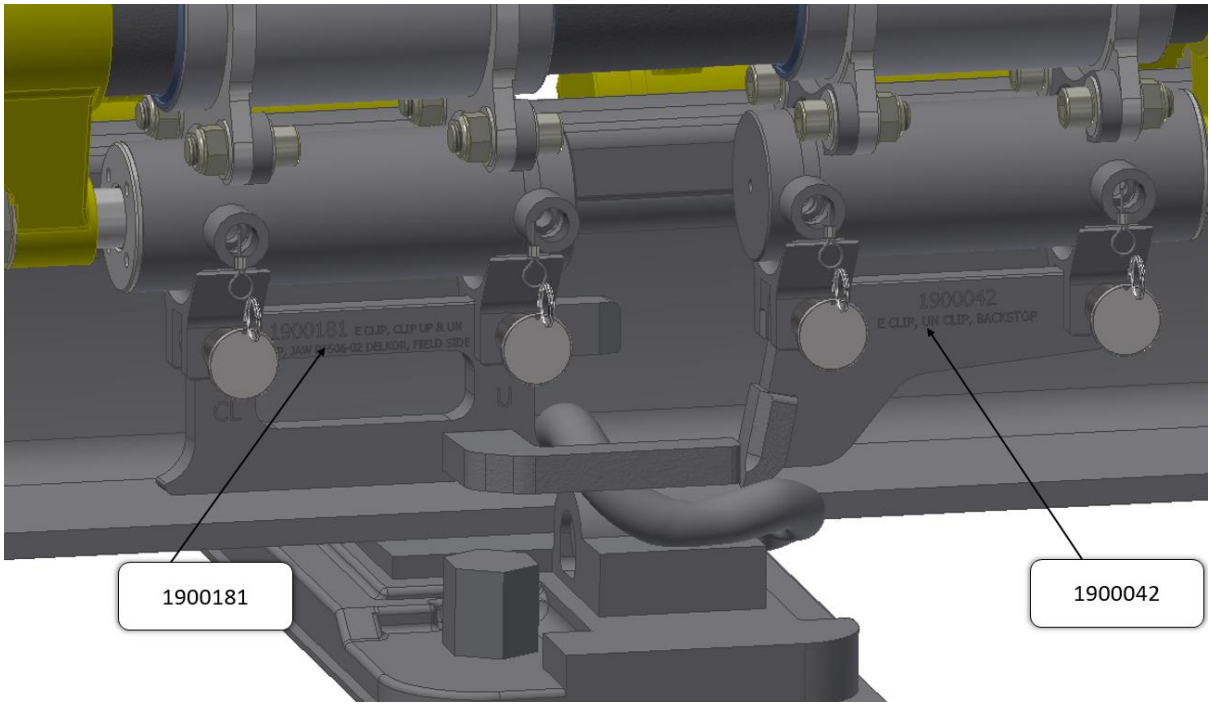


26.2. Concrete Slab Track Sleeper, Delkor RF506-02, E-clip – Un Clipping

Gauge Side (see section 9.4.4 and 9.4.6)



Field Side (see section 9.4.4 and 9.4.6)



27. Further Documents

27.1. Jaw Selection Guide

The following table summarizes where the different jaws are used. To use this table, select the sleeper/rail plate type and the type of clip. Browsing down that vertical column gives the appropriate jaws and their quantities

COMMON TRACK

				CONCRETE SLEEPER (CAST IN SHOULDER)		TIMBER/COMPOSITE SLEEPER (180/200mm)					
				E-CLIP	PR-CLIP	E-CLIP	PR-CLIP				
C-E-P-CL+U	JAW, E-CLIP	UP & UN	1900029	2							
C-E,PR-B-CL	BACKSTOP, E & P	CLIP-UP	1900041	2	2						
C-E-B-U	BACKSTOP, E-CLI		1900042	2							
						2		1900050	CLIP-UP & UN-CLIP	JAW, E-CLIP	T-E-P-CL+U
						1	1	1900052	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - GAUGE SIDE
						1	1	1900053	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - FIELD SIDE
						1		1900051	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U - 2 POS
						1		1900054	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U
C-PR-P-CL+U	JAW, PR-CLIP	UP & UN	1900058		2						
C-PR-B-U	BACKSTOP, PR-C		1900059		2						
							2	1900055	CLIP-UP & UN-CLIP	JAW, PR-CLIP	T-PR-P-CL+U
							1	1900057	UN-CLIP	BACKSTOP, PR-CLIP	T-PR-B-U - 2 POS
							1	1900056	UN-CLIP	BACKSTOP, PR-CLIP	T-PR-B-U
		LOCKOUT JAW	1900048	1	1	1	1				

QUANTITIES ARE PER WORKHEAD

SPECIAL TRACK

8.5" (216mm) RAIL PLATE		6" (150mm) RAIL PLATE		PANDROL 91533 RAIL PLATE *(OLYMPIC DAM)*		DELKOR RAIL EGG RF167 (ELASTIC RAIL FASTENER)		DELKOR RAIL RF506-02 (ELASTIC RAIL FASTENER)		STEEL SLEEPER 80lb.C.R. RAIL						
E-CLIP	PR-CLIP	E-CLIP	PR-CLIP	E-CLIP	PR-CLIP	E-CLIP	PR-CLIP	E-CLIP	PR-CLIP	E-CLIP	PR-CLIP					
				2								1900050	CLIP-UP & UN-CLIP	JAW, E-CLIP	T-E-P-CL+U
				1								1900052-C	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - GAUGE SIDE
				1								1900053-C	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - FIELD SIDE
				1								1900051	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U - 2 POS
				1								1900054	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U
		2										1900061	CLIP-UP & UN-CLIP	JAW, E-CLIP	T-E-P-CL+U
		1										1900062	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - GAUGE SIDE
		1										1900063	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - FIELD SIDE
		2										1900064	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U
2												1900067	CLIP-UP & UN-CLIP	JAW, E-CLIP	T-E-P-CL+U
1												1900066	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - GAUGE SIDE
1												1900065	CLIP-UP	BACKSTOP, E & PR CLIP	T-E,PR-B-CL - FIELD SIDE
1												1900068	UN-CLIP	BACKSTOP, E-CLIP	T-E-B-U
						2						1900029	CLIP-UP & UN-CLIP	JAW, E-CLIP	C-E-P-CL+U
						1						1900042	UN-CLIP	BACKSTOP, E-CLIP	C-E-B-U
						1						1900085	CLIP-UP	BACKSTOP, E-CLIP	GAUGE SIDE
						1						1900086	CLIP-UP	BACKSTOP, E-CLIP	FIELD SIDE
								1				1900180	CLIP-UP & UN-CLIP	JAW, E-CLIP	C-E-P-CL+U
								1				1900181	UN-CLIP	BACKSTOP, E-CLIP	C-E-B-U
								1				1900183	CLIP-UP	BACKSTOP, E-CLIP	GAUGE SIDE
								1				1900184	CLIP-UP	BACKSTOP, E-CLIP	FIELD SIDE
								1				1900054	CLIP-UP	BACKSTOP, E-CLIP	FIELD SIDE
								1				1900042	CLIP-UP	BACKSTOP, E-CLIP	FIELD SIDE
											2	1900178	CLIP-UP & UN-CLIP	JAW, E-CLIP	C-E-P-CL+U
											1	1900179	CLIP-UP & UN-CLIP	BACKSTOP, E-CLIP	C-E-B-U

QUANTITIES ARE PER WORKHEAD

VICTOR PLATES

18" VICTOR PLATE (554-4327)		16" VICTOR PLATE (554-4382)				
E-CLIP	PR-CLIP	E-CLIP	PR-CLIP			
		1		1900071	CLIP-UP	BACKSTOP, FIELD SIDE
		1		1900072	CLIP-UP	BACKSTOP, GAUGE SIDE
		2		1900073	CLIP-UP	JAW
		2		1900074	UN-CLIP	BACKSTOP
		2		1900075	UN-CLIP	JAW
1				1900076	CLIP-UP	BACKSTOP, FIELD SIDE
1				1900077	CLIP-UP	BACKSTOP, GAUGE SIDE
2				1900078	CLIP-UP	JAW
2				1900079	UN-CLIP	BACKSTOP
2				1900080	UN-CLIP	JAW

QUANTITIES ARE PER WORKHEAD

SPECIAL TRACK, NEW YORK

RFA #100/#115 01-64-3342, 01-64-3344		RFD #100/#115 01-64-3346, 01-64-3347		LB FOSTER 01-64-3331, 01-64-3340		CONCRETE SLEEPER		ROLLED TIE PLATE ("A") (7" or 7-3/4")				
E-CLIP/ (STD)	PR-CLIP (HEAVY)	E-CLIP (STD)	PR-CLIP (HEAVY)	E-CLIP (STD)	PR-CLIP (HEAVY)	E-CLIP (STD)	PR-CLIP (HEAVY)	E-CLIP (STD)	PR-CLIP (HEAVY)	JAW PART NO.	TASK	DESCRIPTION
1										1900094	CLIP UP	BACKSTOP GAUGE SIDE
1										1900095	CLIP UP	BACKSTOP FIELD SIDE
2										1900096	CLIP UP	PUSHING JAW
2										1900097	UNCLIP	BACKSTOP
2										1900098	UNCLIP	PUSHING JAW
	1									1900094	CLIP UP	BACKSTOP GAUGE SIDE
	1									1900095	CLIP UP	BACKSTOP FIELD SIDE
	2									1900115	CLIP UP	PUSHING JAW
	2									1900116	UNCLIP	BACKSTOP
	2									1900117	UNCLIP	PUSHING JAW
		1								1900099	CLIP UP	BACKSTOP GAUGE SIDE
		1								1900110	CLIP UP	BACKSTOP FIELD SIDE
		2								1900102	CLIP UP	PUSHING JAW
		2								1900101	UNCLIP	BACKSTOP
		2								1900103	UNCLIP	PUSHING JAW
			1							1900099	CLIP UP	BACKSTOP GAUGE SIDE
			1							1900110	CLIP UP	BACKSTOP FIELD SIDE
			2							1900106	CLIP UP	PUSHING JAW
			2							1900104	UNCLIP	BACKSTOP
			2							1900105	UNCLIP	PUSHING JAW
				2						1900050	CLIP UP AND UNCLIP	PUSHING JAW
				1						1900111	CLIP UP	BACKSTOP GAUGE SIDE
				1						1900112	CLIP UP	BACKSTOP FIELD SIDE
				2						1900113	UNCLIP	BACKSTOP
						2				1900029	CLIP UP AND UNCLIP	PUSHING JAW
						2				1900114	CLIP UP	BACKSTOP
						2				1900042	UNCLIP	BACKSTOP
							2			1900058	CLIP UP AND UNCLIP	PUSHING JAW
							2			1900114	CLIP UP	BACKSTOP
							2			1900059	UNCLIP	BACKSTOP
								2		1900050	CLIP UP AND UNCLIP	PUSHING JAW
								1		1900052	CLIP UP	BACKSTOP GAUGE SIDE
								1		1900053	CLIP UP	BACKSTOP FIELD SIDE, 2 POSITION
								1		1900051	UNCLIP	BACKSTOP
								1		1900054	UNCLIP	BACKSTOP 2 POSITION
									2	1900055	CLIP UP AND UNCLIP	PUSHING JAW
									1	1900052	CLIP UP	BACKSTOP GAUGE SIDE
									1	1900053	CLIP UP	BACKSTOP FIELD SIDE, 2 POSITION
									1	1900056	UNCLIP	BACKSTOP
									1	1900057	UNCLIP	BACKSTOP 2 POSITION

27.2. Drawings, Diagrams and Risk Assessment

Please refer to the further documents within for drawing, risk assessment and other related information.

Further documents for the 190 Pandrol E-Clipper:

27.2.1. Operational Risk Assessment

	Machine: FP-190-TP - Pandrol E-clip Inserter/Remover							Form No.: :	
	ABN							Issue Date	30/03/2016
	WORKPLACE GENERIC HIRARC FORM							Version:	0

Company	**MELVELLE EQUIPMENT CORP**	**Department / Workplace:**	**Melvelle Offices**	**Date of Assessment 30/03/2016**	**Commenced:**	9am	**Completed:**	12md

Scope of Assessment: Identify the risks and hazards associated with the operation of a rail maintenance machine to insert and remove pandrol e-clips from in situ tracks.

Names of Risk Assessment Team: Gary Morris, Ben Derooy	**Names of additional personnel consulted during Risk Assessment:**	**Identified limitations of risk assessment:** Only applies to risks identified as part of the operation of the machine.
		Information Sources / References: AS4024.1-2006 Safety of Machinery, AS4024-2601-Two Handed Control Device

RISK ASSESSMENT MATRIX

Potential Consequences			Likelihood				
			Almost Certain	Likely	Possible	Unlikely	Rare
Keyword	**Description Safety Health & Hygiene**	**Description Environmental**	*Expected to occur*	*Will occur occasionally*	*May Occur*	*Not expected to occur*	*Requires unusual chain of events*
Minor	First Aid Injury	On-site release immediately contained with business unit resources	**Medium 8**	**Medium 7**	**Low 3**	**Low 2**	**Low 1**
Significant	Medical Treated Injury or illness	On-site release or offsite release immediately contained with smelter resources	**High 14**	**Medium 10**	**Medium 9**	**Low 5**	**Low 4**
Serious	Lost Time Injury or illness	Off-site release causing nuisance or community complaint. Breach of license condition	**High 16**	**High 15**	**Medium 12**	**Medium 11**	**Low 6**
Severe	Fatality or Permanently disabling injury of illness	Off-site release with detrimental impact to environment or community. Repeated breach of license conditions	**Extreme 24**	**Extreme 22**	**High 20**	**High 18**	**Medium 13**
Disastrous	Multiple Fatalities or work-related fatal diseases	Toxic release off-site with detrimental impact to environment or community	**Extreme 25**	**Extreme 23**	**Extreme 21**	**High 19**	**High 17**

LEGEND	**ACTION REQUIRED**	**NOTIFY**
LOW 1-6	Tolerable - Manage by Routine Procedures	
MEDIUM 7-13	Risk reduction required to "As low as Reasonably Practicable" ALARP	Design Team/Engineer
HIGH 14-20	Immediate action required to reduce risk. Authorisation required before proceeding on task	CEO
EXTREME 21-25	Intolerable. Cease activity until controls in place to reduce risk. Immediate & urgent Senior Management Team action required	CEO

MANAGEMENT ACTIONS	
Comments	Refer to Action Plan
Risk Assessment Referred to:	Design Team
Risk Assessment Accepted by:	Andrew Melvelle
Risk Assessment findings recorded in the Project Design Folder	Design Team
Risk Assessment Findings communicated to:	Design Team, Melvelle Equipment Corp.

		Raw Risk Rating (no controls)				Residual Risk Rating (after controls)					
Ref no	Description / hazard / risk	Consequence (no controls)	Likelihood	Risk Level & Score	Controls	Consequence	Likelihood	Risk Level & Score	Is Risk Tolerable Y/N	Additional Controls Req	Action By / Name & date required
	Manual lifting of machine or segments of machine is dangerous to the operators back, and other areas	Serious	Likely	15	Use of lifting points for machines(crane) to lift the machine. No person to lift any machine at all . Lifting information supplied in manual	Serious	Rare	6	Y		
	Weight at handles through incorrect trackpack setup causing strain on operator (trackpack only)	Significant	Likely	10	Correctly adjust trackpack pin location. Details shown in manual	Significant	Rare	4	Y		
	Machine handles too low/high causing injury	Significant	Possible	9	Handles adjusted to the correct height. Procedure shown in manual	Significant	Rare	4	Y		
	Fluid levels too high causing overflow and low causing machine damage	Minor	Likely	7	Pre-start checklist requiring operator to check fluid levels before operating machine	Minor	Rare	1	Y		
	Exposure to hazardous materials such as fuel and oils	Minor	Likely	7	Hazardous material documentation in MSDS.	Minor	Rare	1	Y	MSDS	
	Fueling the fuel tank can lead to explosions, fires, and dangerous fumes being inhaled	Serious	Possible	12	Engine must only be re-filled when the power pack is stopped and in well ventilated area.	Serious	Rare	6	Y		
	Hand Injury can occur through connection of quick snap connections	Minor	Possible	3	Must be connected parellel to each other.	Minor	Rare	1	Y		
	Setting of height and backstops can lead to injury	Significant	Likely	10	Ensure machine is turned off and deadman employed. Use of manuals and procedures	Significant	Rare	4	Y	Procedure/manual	
	Injury through oil injection through hydraulic failure	Serious	Possible	12	Hose Protection installed. Maintenance/Inspection frequencies provided in manual	Serious	Rare	6	Y		
	Loud noise from engine and machine causing permanent hearing damage	Serious	Likely	15	Warning stickers instructing operator to wear hearing protection Operating instructions in Manual Instruct operator to wear hearing protection	Serious	Unlikely	11	Y		

		Raw Risk Rating (no controls)				Residual Risk Rating (after controls)					
Ref no	Description / hazard / risk	Consequence (no controls)	Likelihood	Risk Level & Score	Controls	Consequence	Likelihood	Risk Level & Score	Is Risk Tolerable Y/N	Additional Controls Req	Action By / Name & date required
	Serious burns can occur through the touching of hot surfaces	Significant	Likely	10	Include warning signs. Include warnings in training and operating manuals.	Significant	Unlikely	5	Y	Warning sticker list	
	Battery contains corrosive material. Operator can be exposed to injury from battery acid spills	Serious	Possible	12	Batteries securely mounted.Wear protective clothing when handling battery.	Serious	Rare	6	Y		
	Trip hazard through ballast and loose items on rail way	Significant	Likely	10	Correct training in railway safety	Significant	rare	4	Y	Railway Safety Card (RISI or equivalent)	
	Crushing injury through falling machine if incorrectly supported	Serious	Likely	15	Manual provides safe operating and handling instructions	Serious	Rare	6	Y		
	Pinch points exist through the connection of power pack to trolley and powerpack to work head	Significant	Possible	9	Procedure provided in manual on connection of powerpack, trolley, and work head. Gloves to be worn	Significant	Unlikely	5	Y	procedure shown in connection of items	
	Injury through crushing during clip extraction	Serious	Possible	9	Guarding of moving parts and pinch points, Use of 2 handed controls meaning hands are at a safe area, Training of pinch areas in manual	Serious	Rare	6	Y		
	Injury Through clip projectile	Significant	Possible	9	Guarding of Clip extraction Area	Significant	Rare	4	Y		
	Injury through Kicking of machine under incorrect alignment	Minor	Likely	7	Correct training in machine setup through manual.	Minor	Unlikely	2	Y		
	Hitting of ballast by machine causing projectiles	Minor	Likely	7	Guarding of machine. Adequate cleaning of ballast shown in manual	Minor	Unlikely	2	Y		
	Pinch point injury to hands when changing operating sides	Minor	Possible	3	Follow procedure in operating manual, ensuring PPE instructions followed.	Minor	Rare	1	Y	Procedure/manual	

27.2.2. Trolley to Power Pack Attachment

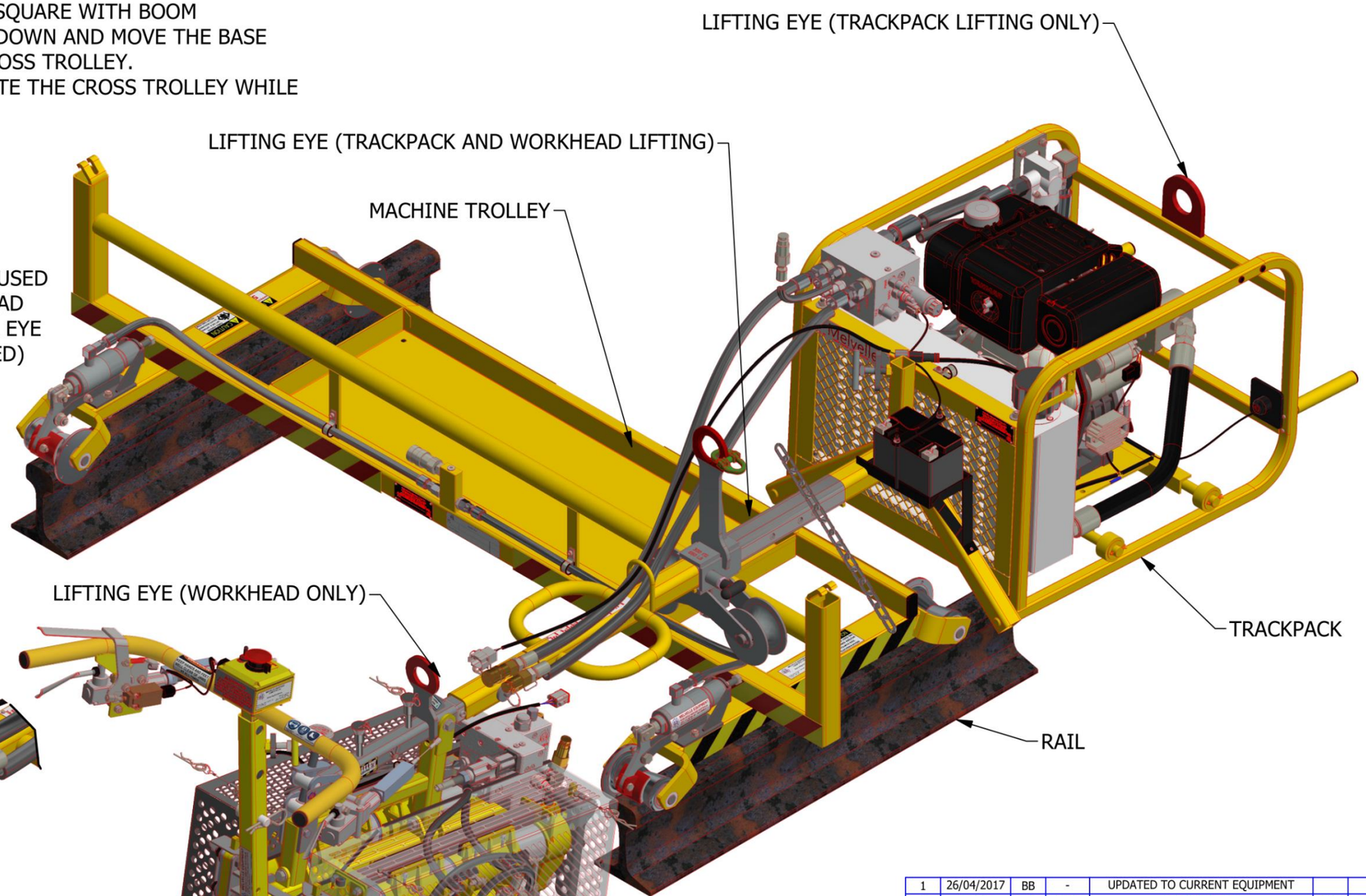
LOWERING POWERPACK AND WORK HEAD ONTO TROLLEY

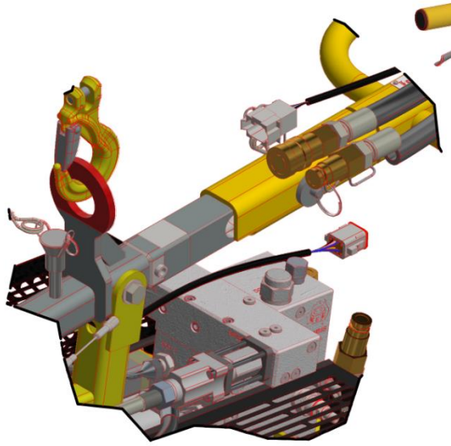
1. PLACE TROLLEY ONTO RAIL
2. LIFT POWERPACK AND WORKHEAD BY LIFTING EYE AS SHOWN
3. ROTATE CROSS TROLLEY UNTIL SQUARE WITH BOOM
4. SLOWLY LOWER THE ASSEMBLY DOWN AND MOVE THE BASE TROLLEY TO LINE UP WITH THE CROSS TROLLEY.

NOTE: DO NOT ATTEMPT TO ROTATE THE CROSS TROLLEY WHILE MACHINE IS BEING LOWERED.

NOTE

*SAME LIFTING PROCEDURE USED REGARDLESS OF WORKHEAD BEING USED
* WHEN LIFTING COMBINE WORKHEAD AND TRACKPACK LIFT FROM CENTER EYE ONLY (ENSURE BOOM PIN IS SECURED)





TRACKPACK TO WORK HEAD CONNECTION

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
1	26/04/2017	BB	-	UPDATED TO CURRENT EQUIPMENT		
DIMENSIONS IN mm UNO	0	4/2/2012	GMM	ORIGINAL ISSUE		

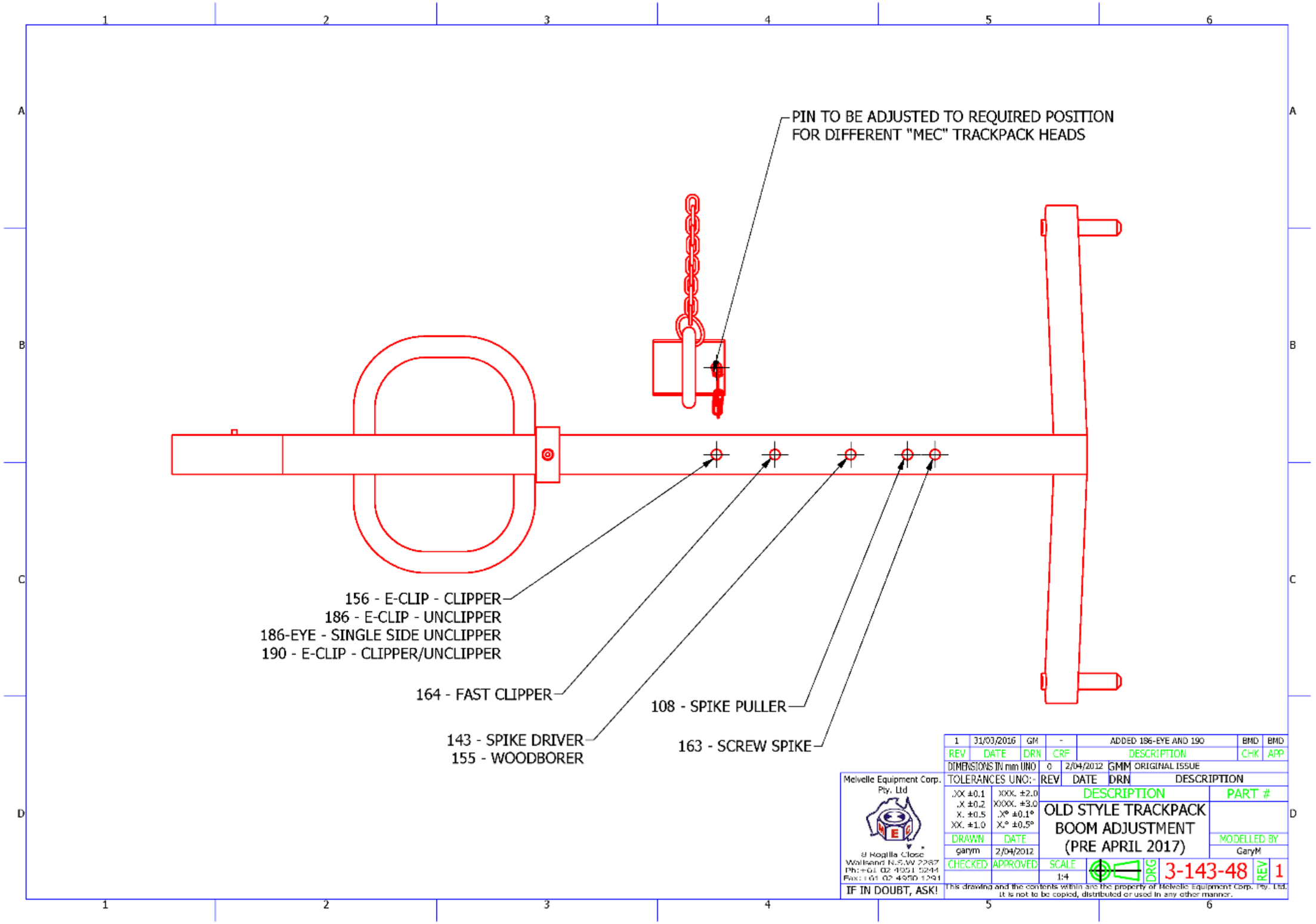
Melvelle Equipment Corp. Pty. Ltd
8 Rogilla Close
Wallsend N.S.W 2287
Ph:+61 02 4951 5244
Fax:+61 02 4950 1291
IF IN DOUBT, ASK!

TOLERANCES UNO:-		REV	DATE	DRN	DESCRIPTION
.XX ±0.1	XXX. ±2.0				
.X ±0.2	XXXX. ±3.0				
X. ±0.5	.X° ±0.1°				
XX. ±1.0	X.° ±0.5°				

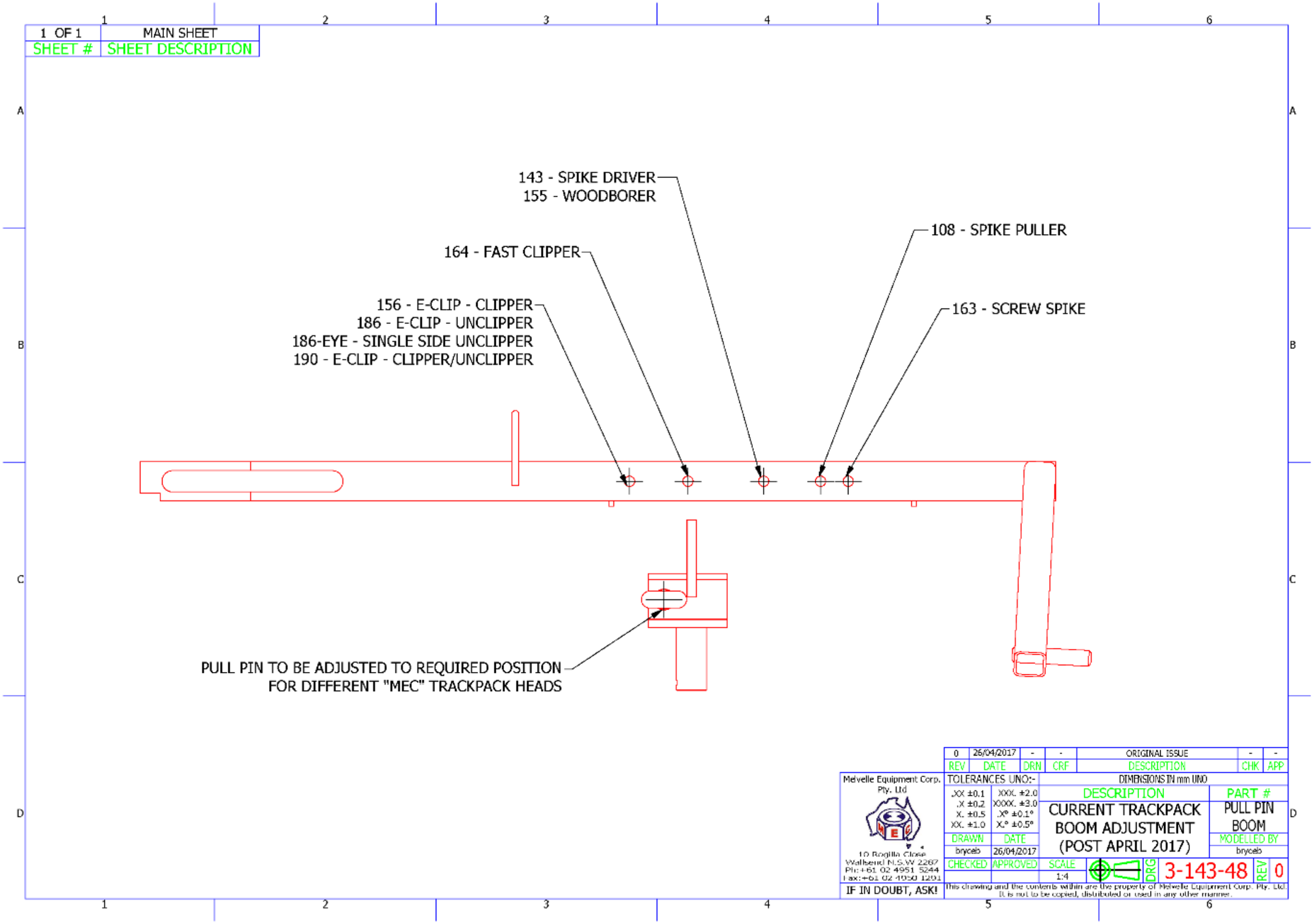
DESCRIPTION	PART #
TROLLEY TO POWERPACK ATTACHMENT	---
	MODELLED BY: garym

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRG	REV
garym	4/2/2012			1:8	3-108-215	1

27.2.3. Trackpack Boom Adjustment (Old Version – Pre April 2017)



27.2.4. Trackpack Boom Adjustment (Current Version – Post April 2017)

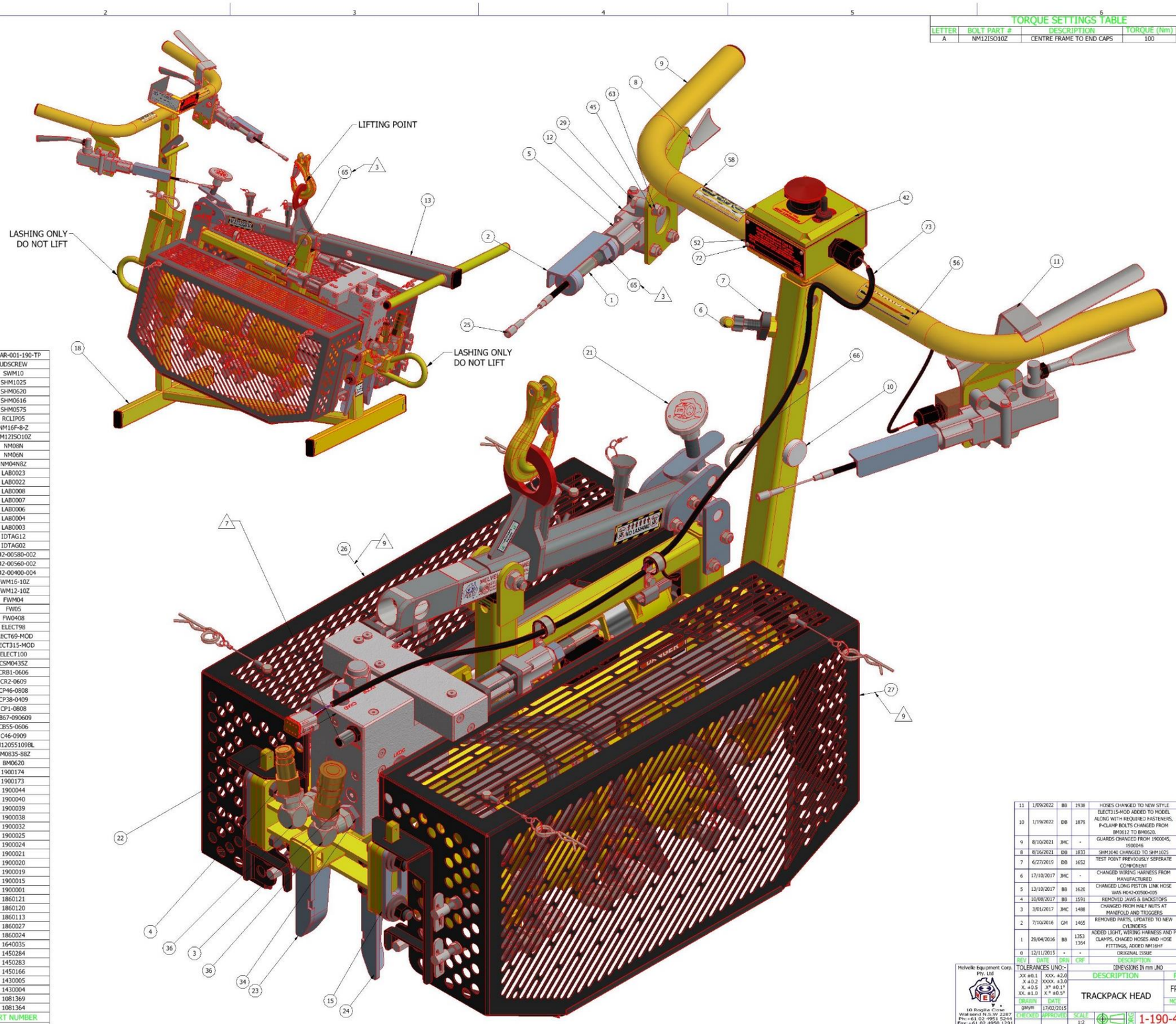


27.2.5. Trackpack Head Assembly Drawing

1 OF 3 | ASSEMBLY DETAILS
SHEET # | SHEET DESCRIPTION

TORQUE SETTINGS TABLE

LETTER	BOLT PART #	DESCRIPTION	TORQUE (Nm)	LOCTITE
A	NM12ISO10Z	CENTRE FRAME TO END CAPS	100	N/A



ITEM	QTY	DESCRIPTION	PART NUMBER
73	1	190-TP WORKHEAD WIRING HARNESS WITH LIGHT	WIRHAR-001-190-TP
72	4	U DRIVE SCREW	UDSCREW
71	2	10MM SPRING WASHERS	SWM10
70	2	SOCKET HEAD CAP SCREW M10 X 25	SHM1025
69	4	SOCKET HEAD CAP SCREW M6 x 20	SHM0620
68	4	SOCKET HEAD CAP SCREW M6 x 16	SHM0616
67	8	SOCKET HEAD CAP SCREW M5 x 75	SHM0575
66	1	R CLIP 5mm	RCL1P05
65	4	NUT M16 FINE, CL 8, ZINC	NM16F-8-Z
64	8	NUT M12x1.75, CL10, ZINC	NM12ISO10Z
63	7	NUT M8 NYLOC	NM08N
62	8	NUT M6 NYLOC	NM06N
61	2	NUT M4 NYLOC ZINC	NM04N8Z
60	2	LASHING POINT STICKER	LAB0023
59	2	NO LASHING POINT STICKER	LAB0022
58	1	PPE SAFETY STICKER	LAB0008
57	2	DANGER MOVING PARTS STICKER	LAB0007
56	1	DANGER KEEP HANDS AND FEET CLEAR STICKER	LAB0006
55	1	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004
54	2	MELVELLE NEWCASTLE STICKER	LAB0003
53	1	ESTOP WARNING LABEL REVERSED	IDTAG12
52	1	MELVELLE MODEL & SERIAL N-O AL TAG	IDTAG02
51	2	H042 + MCJF-0904 + 00495 + MCJF45S-0904	H042-00580-002
50	4	H042 + MCJF-0904 + 00485 + MCJF45S-0904	H042-00560-002
49	2	H042 + MCJF-0904 + 00330 + MCJF90S-0904	H042-00400-004
48	8	M16 HARDENED WASHER, CLASS 10, ZINC	FWM16-10Z
47	8	M12 HARDENED WASHER, CLASS 10, ZINC	FWM12-10Z
46	2	FLAT WASHER - ENGINEERS - M4	FWM04
45	14	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
44	10	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
43	2	PIPE/CABLE SUPPORT CLAMPS 22mm	ELECT98
42	1	EMERGENCY STOP BUTTON & LIGHT SWITCH	ELECT69-MOD
41	1	PANEL MOUNT LED WORK LIGHT 30W WITH PLUG	ELECT315-MOD
40	1	LS3 LIMIT SWITCH	ELECT100
39	2	COUNTER SUNK CAP SCREW M4 x 35 ZINC	CSM0435Z
38	4	NIPPLE 3/8"BSPP X 3/8"BSPT - ENCAPSULATED SEAL	CRB1-0606
37	4	NIPPLE 3/8"BSPP X 9/16"JIC - ENCAPSULATED SEAL	CR2-0609
36	2	ADAPTOR 90 M/F - 1/2"BSPP X 1/2"BSPP	CP46-0808
35	4	ELBOW 45 M/M 1/4" BSPP X 9/16" JIC	CP38-0409
34	2	NIPPLE M/M 1/2" X 1/2" BSPP	CP1-0808
33	4	TEE M/M/M 9/16"JIC X 3/8"BSPT X 9/16"JIC	CB67-090609
32	4	ELBOW 90 F/F - 3/8"BSPT X 3/8"BSPT	CB55-0606
31	6	ADAPTOR 90 M/F 9/16"JIC X 9/16"JIC	C46-0909
30	8	BOLT M12x55 HEX HEAD, 10.9, BLACK	BM12055109BL
29	7	BOLT METRIC M8 X 35 ZINC GR8.8	BM0835-88Z
28	2	BOLT M6 x 20 HT	BM0620
27	1	LH GUARD FABRICATION - SLOTTED DESIGN	1900174
26	1	RH GUARD FABRICATION - SLOTTED DESIGN	1900173
25	2	TRIGGER CABLE FOR 190 CLIPPER	1900044
24	2	GUIDE BRACKET - LH	1900040
23	2	GUIDE BRACKET - RH	1900039
22	1	190 E-CLIPPER HYDRAULIC MANIFOLD	1900038
21	1	RAIL HEIGHT ADJUSTER ASSEMBLY	1900032
20	4	SHOULDER-SHOULDER SPACER, SMALL	1900025
19	4	SHOULDER-SHOULDER SPACER, LARGE	1900024
18	1	TRANSPORT & STOWAGE FRAME	1900021
17	2	CABLE MOUNT PLATE WITH TAPPED HOLES	1900020
16	2	CABLE MOUNT PLATE WITH HOLES	1900019
15	2	HEAD ASSEMBLY	1900015
14	1	CENTER FRAME	1900001
13	1	CARRYING HANDLE FOR MEC WORKEADS	1860121
12	2	CONTROL CABLE ACTUATOR - TRIGGER END ASS	1860120
11	1	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113
10	1	HANDLE LOCKING PIN	1860027
9	1	TOP HANDLE FABRICATION	1860024
8	2	REMOTE CONTROL TRIGGER-M10	1640035
7	1	TEE BOLT LOCKING NUT	1450284
6	1	1/2" TEE LOCKING BOLT 2" LONG	1450283
5	4	CONTROL CABLE END CAP MOUNTS TO 1450165	1450166
4	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
3	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
2	2	CABLE GUARD FOR THIN CABLES	1081369
1	4	CABLE ADAPTER TRIGGER TO CABLE	1081364

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
11	1/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
10	1/19/2022	DB	1879	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0612 TO BM0620.	BB	BB
9	8/10/2021	JMC	-	GUARDS CHANGED FROM 1900045, 1900046	-	-
8	8/16/2021	DB	1833	SHM1040 CHANGED TO SHM1025	BB	BB
7	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	JMC	JMC
6	17/10/2017	JMC	-	CHANGED WIRING HARNESS FROM MANUFACTURED		
5	13/10/2017	BB	1620	CHANGED LONG PISTON LINK HOSE WAS H042-00500-005	BMD	BMD
4	10/08/2017	BB	1591	REMOVED JAWS & BACKSTOPS	BMD	BMD
3	3/01/2017	JMC	1488	CHANGED FROM HALF NUTS AT MANIFOLD AND TRIGGERS	BMD	BMD
2	7/10/2016	GM	1465	REMOVED PARTS, UPDATED TO NEW CYLINDERS	BB	BMD
1	29/04/2016	BB	1353 1364	ADDED LIGHT, WIRING HARNESS AND P CLAMPS, CHAGED HOSES AND HOSE FITTINGS, ADDED NM16HF	GM	GM
0	12/11/2015	-	-	ORIGINAL ISSUE	-	-

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Fax: +61 02 4950 1291
IF IN DOUBT, ASK!

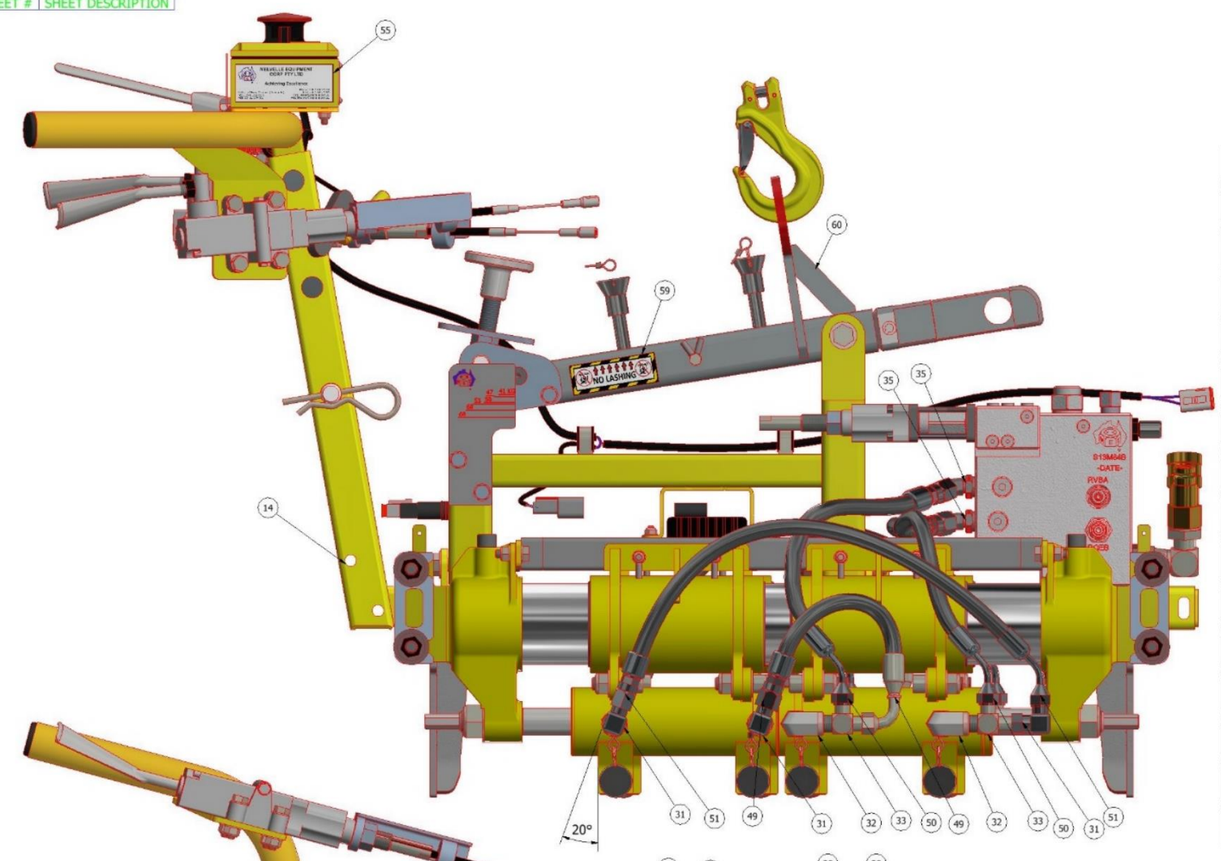
TOLERANCES UNO:-
.XX ±0.1 | XXX. ±2.0
.X ±0.2 | XXXX. ±3.0
X. ±0.5 | X° ±0.1°
XX. ±1.0 | X.° ±0.5°

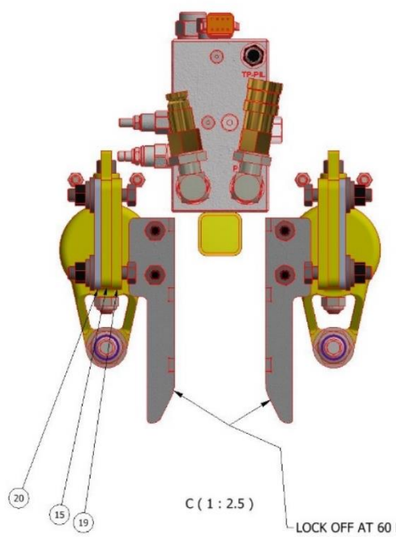
DIMENSIONS IN mm UNO

DESCRIPTION: TRACKPACK HEAD
PART #: FP-190-TP
DRAWN: garym | DATE: 17/02/2015
MODELLED BY: garym
CHECKED | APPROVED | SCALE: 1:2
1-190-48 REV 11

This drawing and the contents within are the property of Melvelle Equipment Corp. Pty. Ltd. It is not to be copied, distributed or used in any other manner.

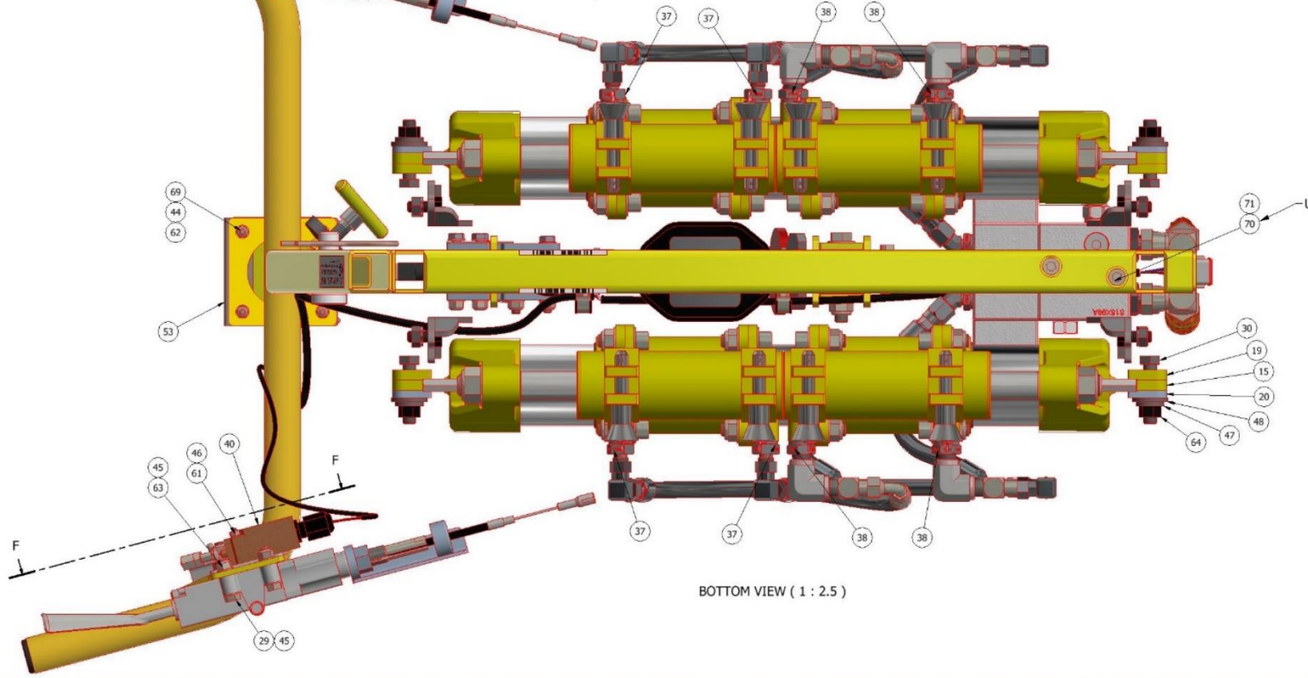
2 OF 3	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION





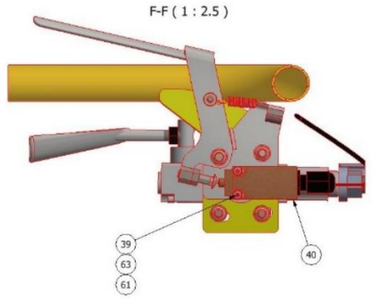
C (1 : 2.5)

LOCK OFF AT 60 KG
UNLESS INSTRUCTED OTHERWISE



USE LOCTITE 243 ON FINAL ASSEMBLY

BOTTOM VIEW (1 : 2.5)



F-F (1 : 2.5)

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
11	1/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
10	1/19/2022	DB	1879	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0612 TO BM0620.	BB	BB
9	8/10/2021	JMC	-	GUARDS CHANGED FROM 1900045, 1900046	-	-
8	8/16/2021	DB	1833	SHM1040 CHANGED TO SHM1025	BB	BB
7	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	JMC	JMC
6	17/10/2017	JMC	-	CHANGED WIRING HARNESS FROM MANUFACTURED		
5	13/10/2017	BB	1620	CHANGED LONG PISTON LINK HOSE WAS H042-00500-0105	BMD	BMD
4	10/08/2017	BB	1591	REMOVED JAWS & BACKSTOPS	BMD	BMD
3	3/01/2017	JMC	1488	CHANGED FROM HALF NUTS AT MANIFOLD AND TRIGGERS	BMD	BMD
2	7/10/2016	GM	1465	REMOVED PARTS, UPDATED TO NEW CYLINDERS	BB	BMD
1	29/04/2016	BB	1353 1364	ADDED LIGHT, WIRING HARNESS AND P CLAMPS. CHAGED HOSES AND HOSE FITTINGS, ADDED NM16HF	GM	GM
0	12/11/2015	-	-	ORIGINAL ISSUE	-	-

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Fax: +61 02 4950 1291

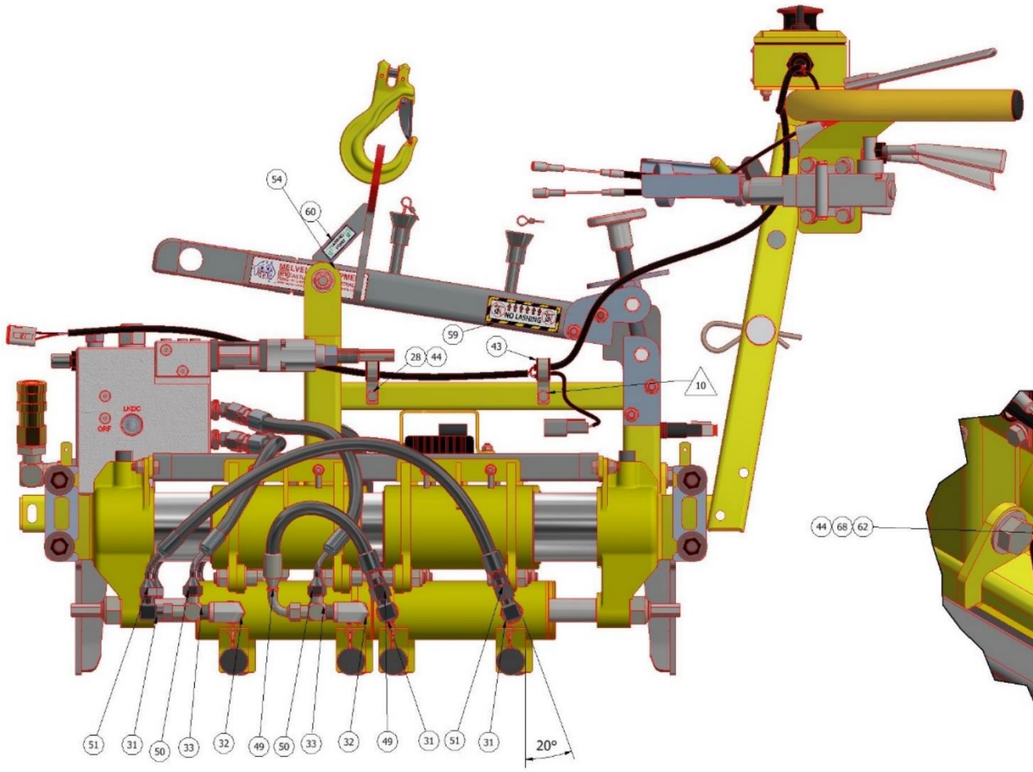
TOLERANCES UNO:-		DIMENSIONS IN mm UNO
XX ±0.1	XXX. ±2.0	DESCRIPTION: TRACKPACK HEAD
X ±0.2	XXXX. ±3.0	PART #: FP-190-TP
X. ±0.5	X° ±0.1°	MODELLED BY: garym
XX. ±1.0	X.° ±0.5°	
DRAWN: garym	DATE: 17/02/2015	
CHECKED:	APPROVED:	SCALE: 1:2.5

1-190-48 SH 11

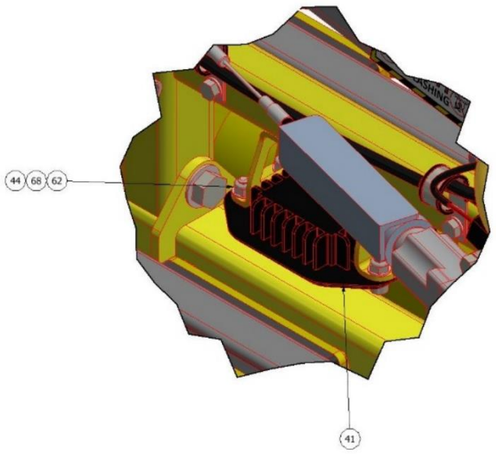
2 OF 3	PAGE 2
SHEET #	SHEET DESCRIPTION

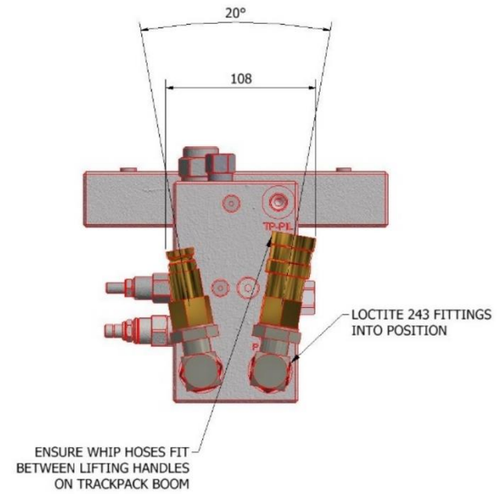
IF IN DOUBT, ASK!

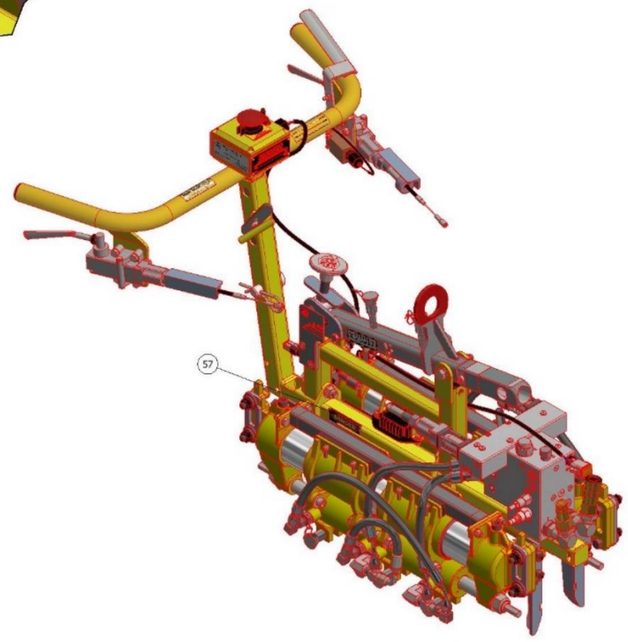
3 OF 3	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION

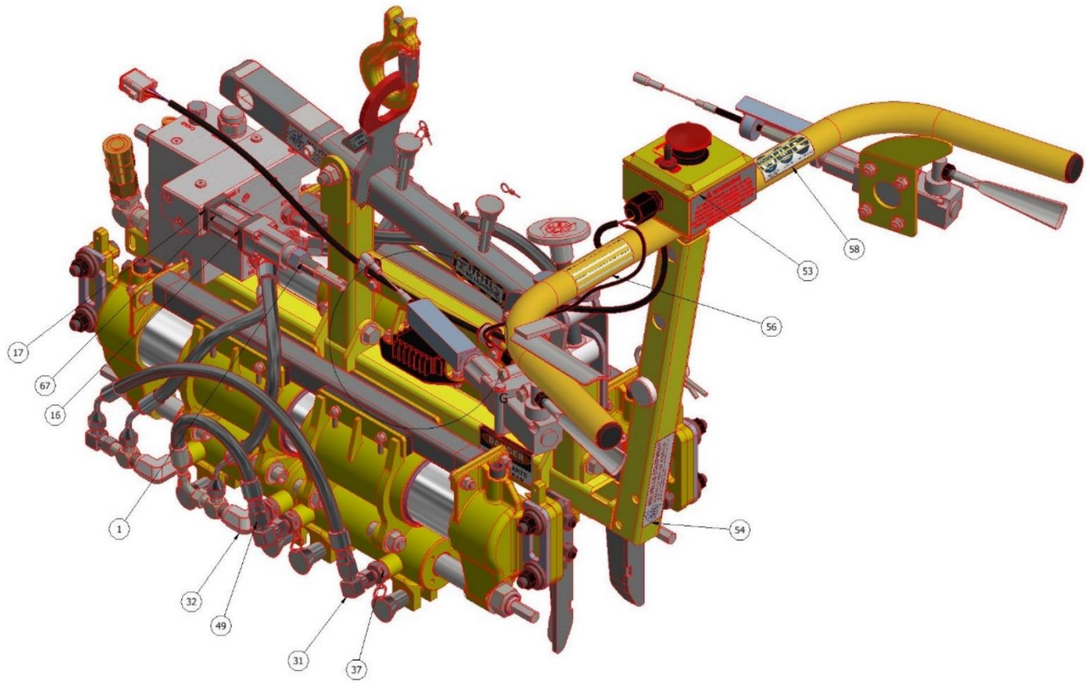


G (2 : 3)









REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
11	1/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
10	1/19/2022	DB	1879	ELECT15-HOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0612 TO BM0620.	BB	BB
9	8/10/2021	JMC	-	GUARDS CHANGED FROM 1900045, 1900046	-	-
8	8/16/2021	DB	1833	SHM1040 CHANGED TO SHM1025	BB	BB
7	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	JMC	JMC
6	17/10/2017	JMC	-	CHANGED WIRING HARNESS FROM MANUFACTURED		
5	13/10/2017	BB	1620	CHANGED LONG PISTON LINK HOSE WAS HD42-00500-035	BMD	BMD
4	10/08/2017	BB	1591	REMOVED JAWS & BACKSTOPS	BMD	BMD
3	3/01/2017	JMC	1488	CHANGED FROM HALF NUTS AT MANIFOLD AND TRIGGERS	BMD	BMD
2	7/10/2016	GM	1465	REMOVED PARTS, UPDATED TO NEW CYLINDERS	BB	BMD
1	29/04/2016	BB	1353 1364	ADDED LIGHT, WIRING HARNESS AND P CLAMPS, CHAGED HOSES AND HOSE FITTINGS, ADDED NM16HF	GM	GM
0	12/11/2015	-	-	ORIGINAL ISSUE	-	-

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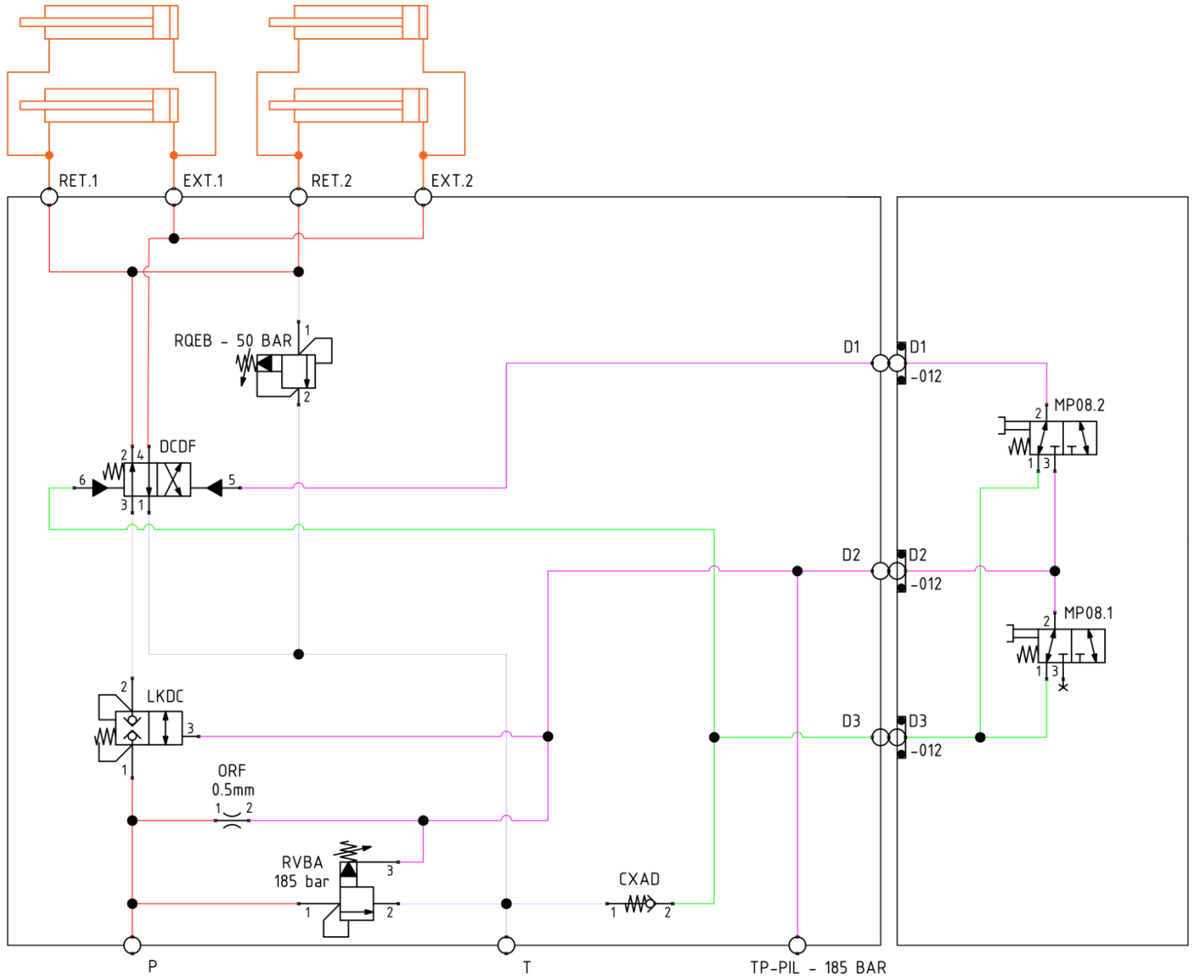
TOLERANCES UNO:-
.XX ±0.1 XXX. ±2.0
.X ±0.2 XXX. ±3.0°
.X. ±0.5 .X° ±0.1°
.XX. ±1.0 .X° ±0.5°

DIMENSIONS IN mm UNO

DESCRIPTION: TRACKPACK HEAD
PART #: FP-190-TP
MODELLED BY: garym
DRAWN: garym 17/02/2015
CHECKED
APPROVED
SCALE: 1:2.5
SIZE: A3
DWG NO: 1-190-48
REV: 11

27.2.6. Hydraulic Circuit Diagram



ITEM ID	INSTALLATION TORQUE
CXAD	20-25 lb.ft./27-34 Nm
DCDF	45-50 lb.ft./61-68 Nm
LKDC	30-35 lb.ft./41-47 Nm
MP08	20 lb.ft./27.1 Nm
RQEB	30-35 lb.ft./41-47 Nm
RVBA	20-25 lb.ft./27-34 N.

ITEM	QTY	DESCRIPTION	LENGTH	PART No.
MATERIAL/CUT LIST				

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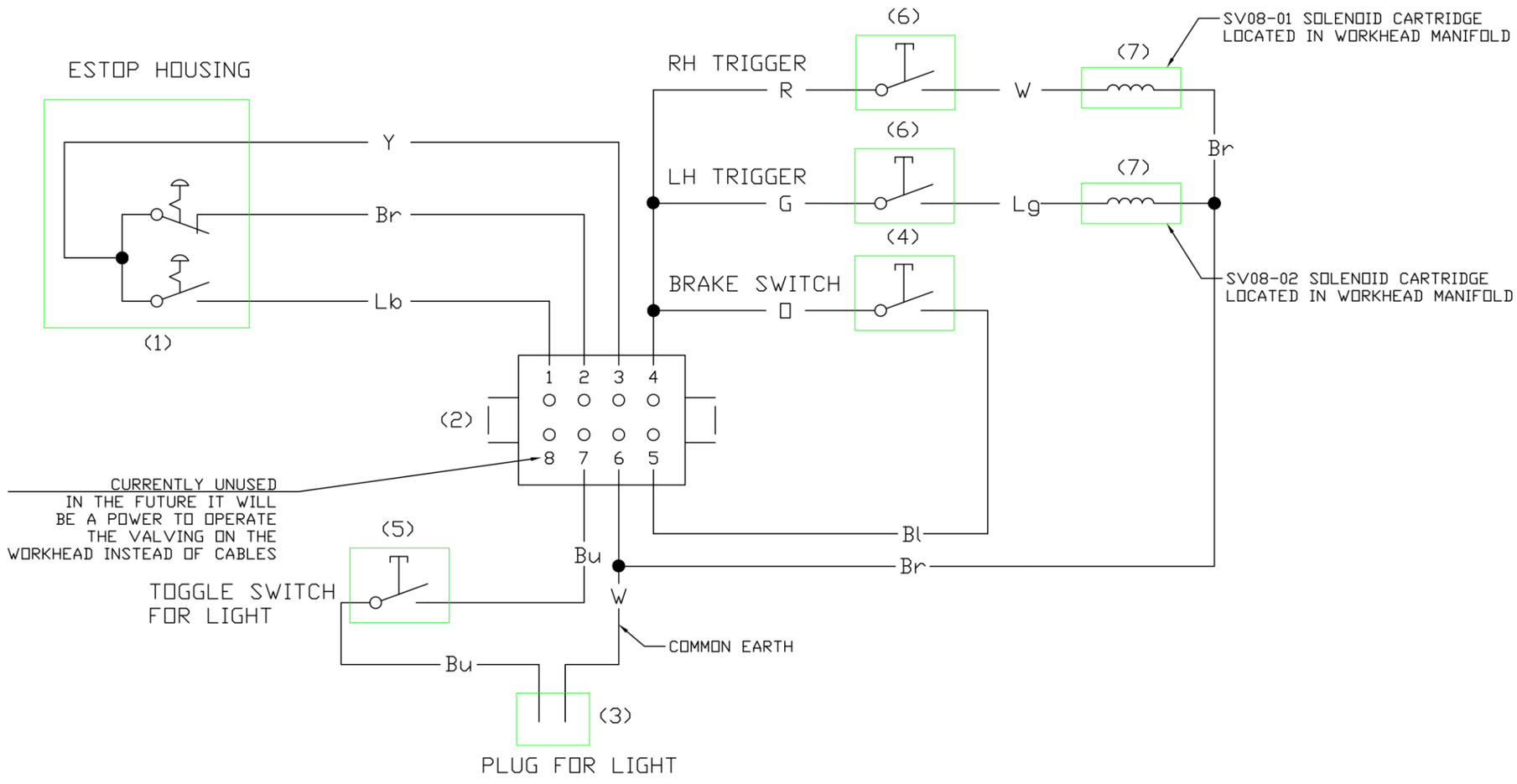
DIMENSIONS IN mm UNO	0	15/10/12	GM	ORIGINAL ISSUE	
TOLERENCES UNO:-	REV	DATE	DRN	DESCRIPTION	
.XX ±0.1 XXX. ±2.0 .X ±0.2 XXXX. ±3.0 X. ±0.5 .X° ±0.1° XX. ±1.0 X.° ±0.5°	DESCRIPTION				PART#
	190 CLIPPER HYDRAULIC CIRCUIT DIAGRAM				FP-190-TP
DRAWN / DATE					AUTOCAD
GM / 13/11/2015					DRAWING
CHECKED / APPROVED	SCALE			DRG	3-190-126 REV 0
GMM / GMM	NTS				

27.2.7. Electric Circuit diagram

Wire Colours			
Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light Blue
G	Green	Lg	Light Green
R	Red	P	Pink
W	White	Gr	Green
G/W	Green/White		



ITEM	QTY	DESCRIPTION	LENGTH	PART No.
7	2	ELECTRIC SOLENOID CARTRIDGE - 3-WAY SPOOL	N/A	1430124-02
6	2	LIMIT SWITCH FOR SOLENOID OPERATION	N/A	TBA
5	1	TOGGLE SWITCH ON/OFF WITH ON/OFF TAB	N/A	ELECT123
4	1	LS3 LIMIT SWITCH	N/A	ELECT100
3	1	DT2 FEMALE HOUSING 2 WAY	N/A	ELECT96
2	1	DT8 MALE HOUSING 8 WAY	N/A	ELECT92
1	1	EMERGENCY STOP ENCLOSURE	N/A	ELECT69

MATERIAL/CUT LIST

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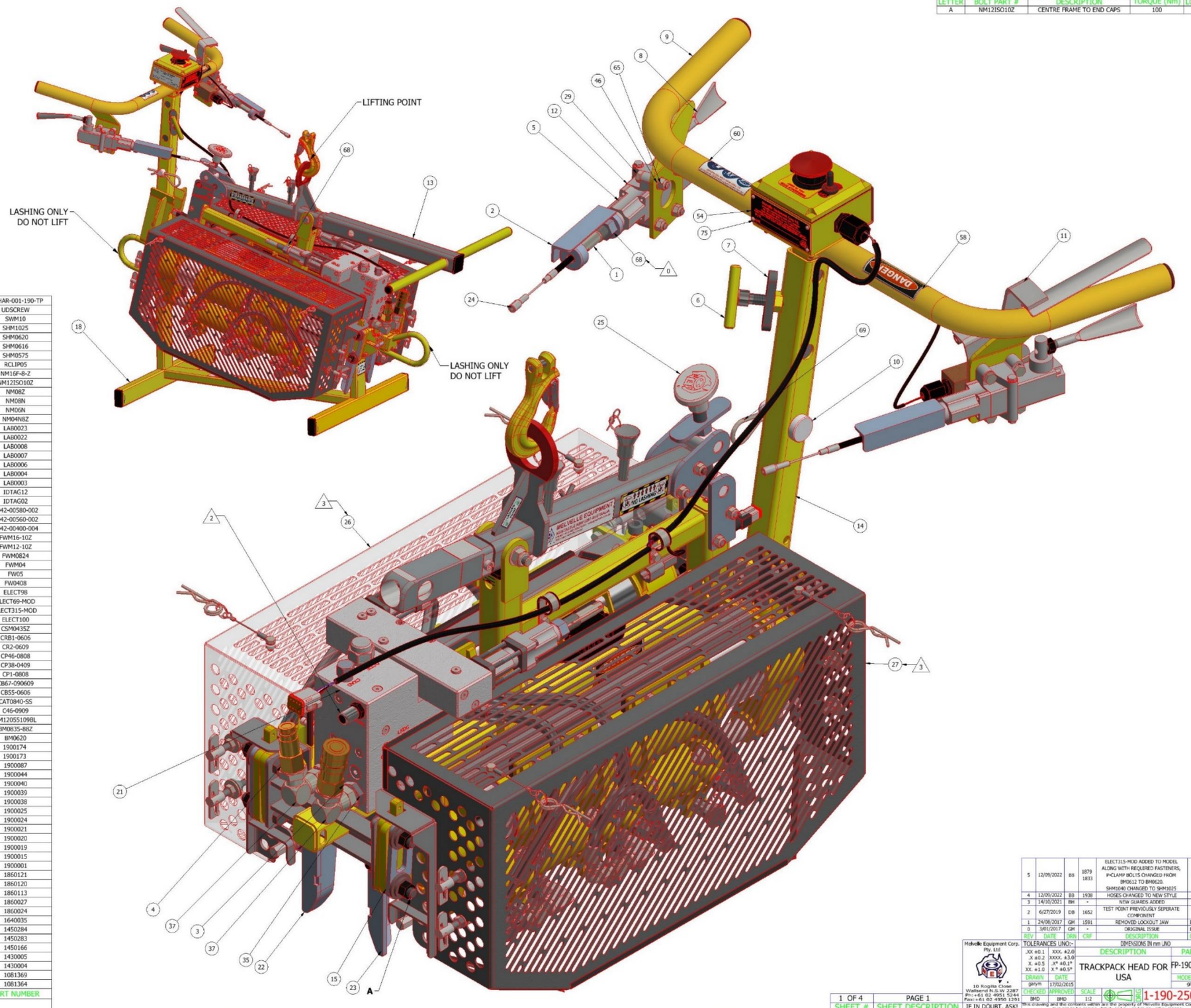
TOLERENCES UNO:-		DIMENSIONS IN mm UNO	
.XX ±0.1	XXX. ±2.0	DESCRIPTION	PART#
.X ±0.2	XXXX. ±3.0	TRACKPACK HEAD ELECTRIC SCHEMATIC	TP HEAD
X. ±0.5	.X° ±0.1°		
XX. ±1.0	X.° ±0.5°		AUTOCAD
DRAWN	DATE		
GM	13/11/2015		DRAWING
CHECKED	APPROVED	SCALE	DRG 3-190-127 REV 0
GaryM	AdrianG	NTS	

27.2.8. Trackpack Head Assembly Drawing - Imperial Version (USA)

1 OF 4	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION

TORQUE SETTINGS TABLE

LETTER	BOLT PART #	DESCRIPTION	TORQUE (Nm)	LOCTITE
A	NM12ISO10Z	CENTRE FRAME TO END CAPS	100	N/A



ITEM	QTY	DESCRIPTION	PART NUMBER
76	1	190-TP WORKHEAD WIRING HARNESS WITH LIGHT	WIRHAR-001-190-TP
75	4	U DRIVE SCREW	UDSCREW
74	2	10MM SPRING WASHERS	SWM10
73	2	SOCKET HEAD CAP SCREW M10 X 25	SHM1025
72	4	SOCKET HEAD CAP SCREW M6 x 20	SHM0620
71	4	SOCKET HEAD CAP SCREW M6 x 16	SHM0616
70	8	SOCKET HEAD CAP SCREW M5 x 75	SHM0575
69	1	R CLIP 5mm	RCLIP05
68	4	NUT M16 FINE, CL 8, ZINC	NM16F-8-Z
67	8	NUT M12x1.75, CL10, ZINC	NM12ISO10Z
66	6	NUT M8 ZINC	NM08Z
65	7	NUT M8 NYLOC	NM08N
64	8	NUT M6 NYLOC	NM06N
63	2	NUT M4 NYLOC ZINC	NM04N8Z
62	2	LASHING POINT STICKER	LAB0023
61	2	NO LASHING POINT STICKER	LAB0022
60	1	PPE SAFETY STICKER	LAB0008
59	2	DANGER MOVING PARTS STICKER	LAB0007
58	1	DANGER KEEP HANDS AND FEET CLEAR STICKER	LAB0006
57	1	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004
56	2	MELVELLE NEWCASTLE STICKER	LAB0003
55	1	ESTOP WARNING LABEL REVERSED	IDTAG12
54	1	MELVELLE MODEL & SERIAL N-O AL TAG	IDTAG02
53	2	H042 + MCJF-0904 + 00495 + MCJF45S-0904	H042-00580-002
52	4	H042 + MCJF-0904 + 00485 + MCJF45S-0904	H042-00560-002
51	2	H042 + MCJF-0904 + 00330 + MCJF90S-0904	H042-00400-004
50	8	M16 HARDENED WASHER, CLASS 10, ZINC	FWM16-10Z
49	8	M12 HARDENED WASHER, CLASS 10, ZINC	FWM12-10Z
48	12	FLAT WASHER - MUD GUARD - 8x24x2	FWM0824
47	2	FLAT WASHER - ENGINEERS - M4	FWM04
46	14	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
45	10	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
44	2	PIPE/CABLE SUPPORT CLAMPS 22mm	ELECT98
43	1	EMERGENCY STOP BUTTON & LIGHT SWITCH	ELECT69-MOD
42	1	PANEL MOUNT LED WORK LIGHT 30W WITH PLUG	ELECT315-MOD
41	1	LS3 LIMIT SWITCH	ELECT100
40	2	COUNTER SUNK CAP SCREW M4 x 35 ZINC	CSM0435Z
39	4	NIPPLE 3/8"BSPP X 3/8"BSPT - ENCAPSULATED SEAL	CRB1-0606
38	4	NIPPLE 3/8"BSPP X 9/16"JIC - ENCAPSULATED SEAL	CR2-0609
37	2	ADAPTOR 90 M/F - 1/2"BSPP X 1/2"BSPP	CP46-0808
36	4	ELBOW 45 M/M 1/4" BSPP X 9/16" JIC	CP38-0409
35	2	NIPPLE M/M 1/2" X 1/2" BSPP	CP1-0808
34	4	TEE M/M/M 9/16"JIC X 3/8"BSPT X 9/16"JIC	CB67-090609
33	4	ELBOW 90 F/F - 3/8"BSPT X 3/8"BSPT	CB55-0606
32	6	ANTI LUCE THREADED CATCH - M8 x 40, SS	CAT0840-SS
31	6	ADAPTOR 90 M/F 9/16"JIC X 9/16"JIC	C46-0909
30	8	BOLT M12x55 HEX HEAD, 10.9, BLACK	BM12055109BL
29	7	BOLT METRIC M8 X 35 ZINC GR8.8	BM0835-88Z
28	2	BOLT M6 x 20 HT	BM0620
27	1	LH GUARD FABRICATION - SLOTTED DESIGN	1900174
26	1	RH GUARD FABRICATION - SLOTTED DESIGN	1900173
25	1	RAIL HEIGHT ADJUSTER ASSEMBLY FOR USA	1900087
24	2	TRIGGER CABLE FOR 190 CLIPPER	1900044
23	2	GUIDE BRACKET - LH	1900040
22	2	GUIDE BRACKET - RH	1900039
21	1	190 E-CLIPPER HYDRAULIC MANIFOLD	1900038
20	4	SHOULDER-SHOULDER SPACER, SMALL	1900025
19	4	SHOULDER-SHOULDER SPACER, LARGE	1900024
18	1	TRANSPORT & STOWAGE FRAME	1900021
17	2	CABLE MOUNT PLATE WITH TAPPED HOLES	1900020
16	2	CABLE MOUNT PLATE WITH HOLES	1900019
15	2	HEAD ASSEMBLY	1900015
14	1	CENTER FRAME	1900001
13	1	CARRYING HANDLE FOR MEC WORKEADS	1860121
12	2	CONTROL CABLE ACTUATOR - TRIGGER END ASS	1860120
11	1	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113
10	1	HANDLE LOCKING PIN	1860027
9	1	TOP HANDLE FABRICATION	1860024
8	2	REMOTE CONTROL TRIGGER-M10	1640035
7	1	TEE BOLT LOCKING NUT	1450284
6	1	1/2" TEE LOCKING BOLT 2" LONG	1450283
5	4	CONTROL CABLE END CAP MOUNTS TO 1450165	1450166
4	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
3	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
2	2	CABLE GUARD FOR THIN CABLES	1081369
1	4	CABLE ADAPTER TRIGGER TO CABLE	1081364

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
5	12/09/2022	BB	1879 1833	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0612 TO BM0620. SHM1040 CHANGED TO SHM1025	BB	BB
4	12/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
3	14/10/2021	BH	-	NEW GUARDS ADDED	-	-
2	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	-	-
1	24/08/2017	GM	1591	REMOVED LOCKOUT JAW	BMD	BMD
0	1/01/2017	GM	-	ORIGINAL ISSUE	BMD	BMD

Melvelle Equipment Corp. Pty. Ltd	TOLERANCES UNO:-	DIMENSIONS IN mm UNO	
10 Rogha Close Wallsend N.S.W 2287 Ph:+61 02 4951 5244 Fax:+61 02 4950 1291 IF IN DOUBT, ASK!	.XX ±0.1 .X ±0.2 X. ±0.5 XX. ±1.0	XXX. ±2.0 XXXX. ±3.0 .X° ±0.1° X.° ±0.5°	DESCRIPTION: TRACKPACK HEAD FOR USA
	DRAWN: garym 17/02/2015		PART #: FP-190-TP-02A
	CHECKED: BMD	APPROVED: BMD	MODELLED BY: garym
		SCALE: 1:2	SIZE: A3 DWG NO: 1-190-250 REV: 5

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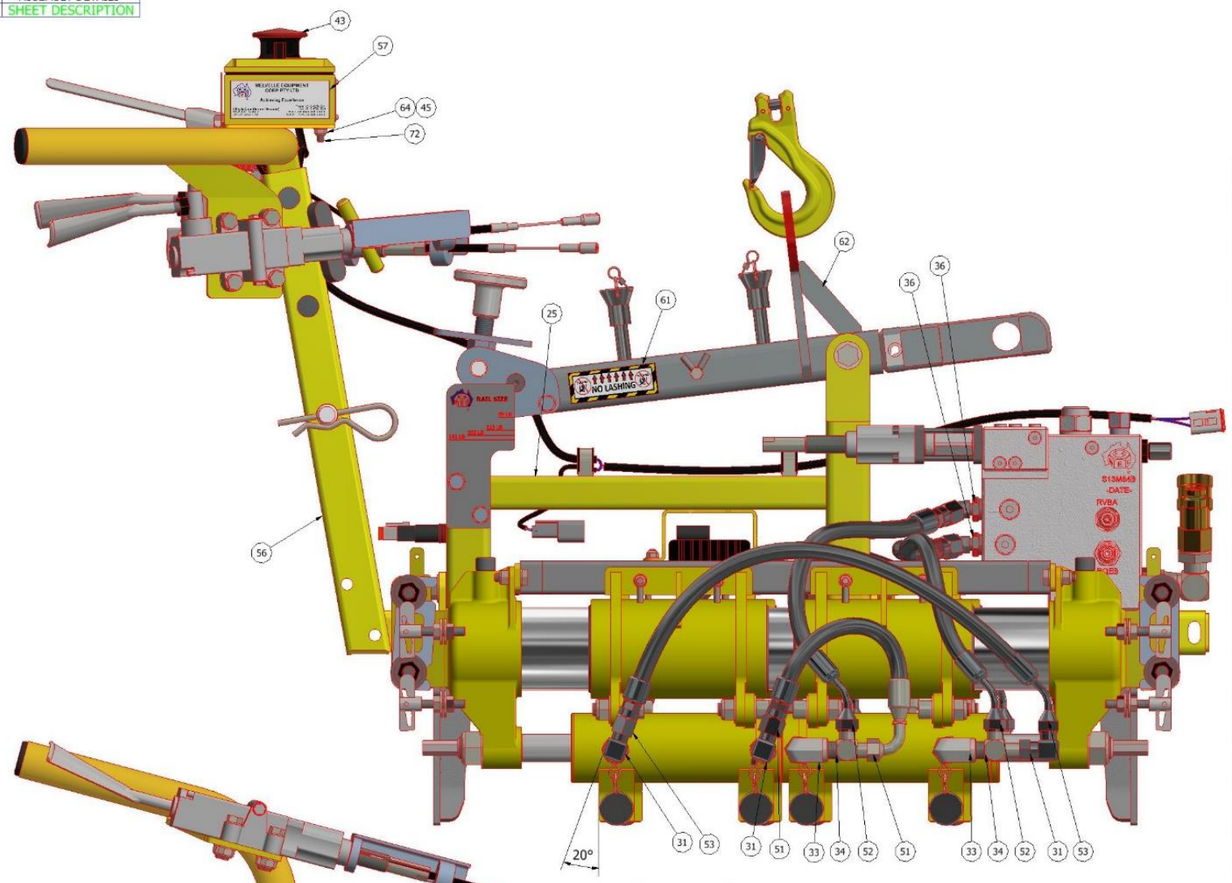
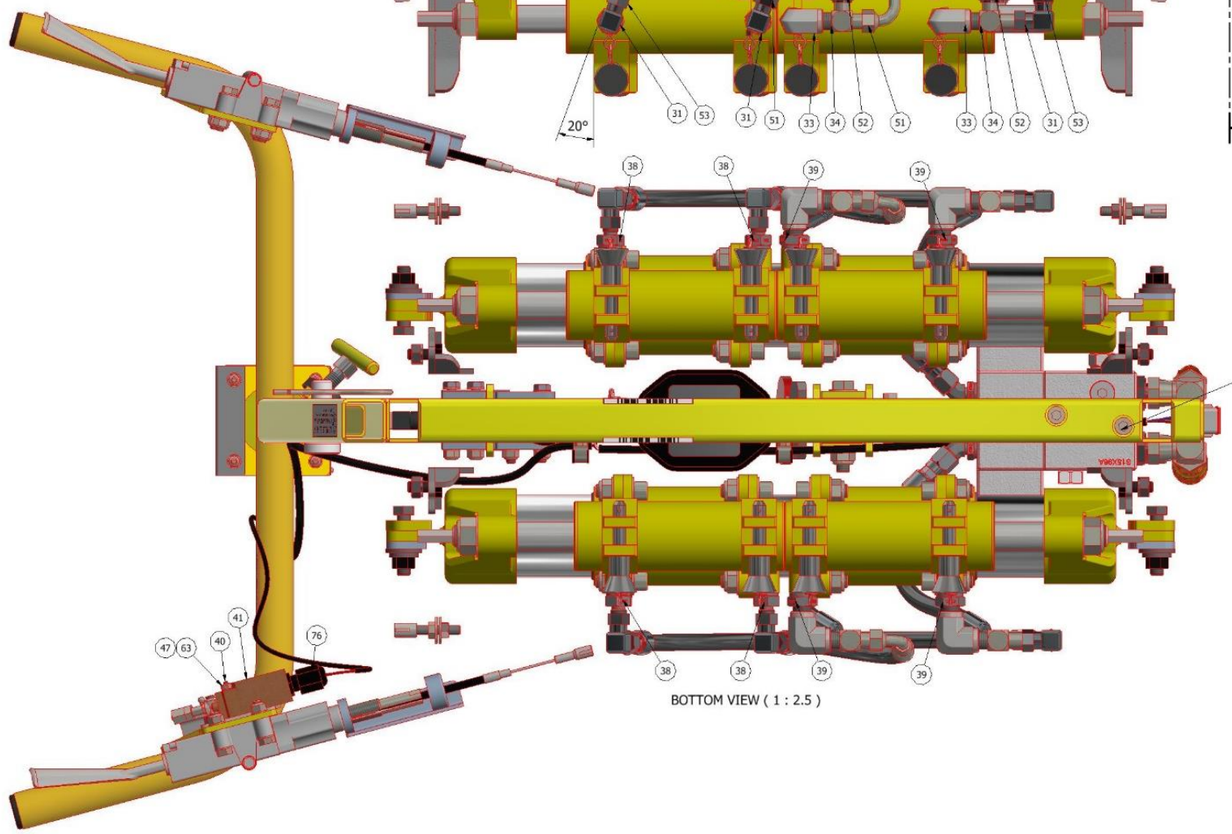
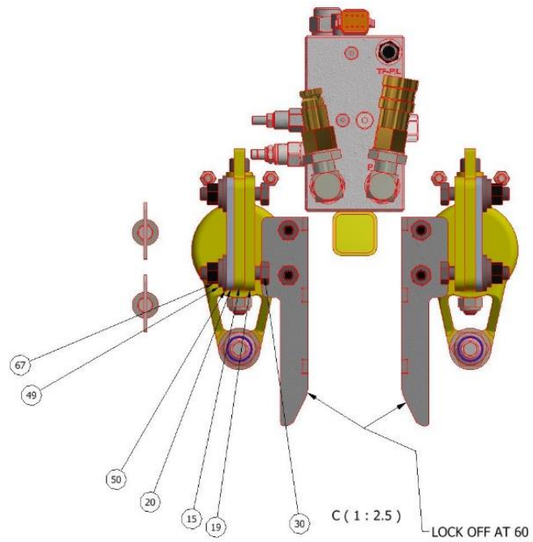
1 OF 4	PAGE 1
SHEET #	SHEET DESCRIPTION

2 OF 4	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION





BOTTOM VIEW (1 : 2.5)



C (1 : 2.5)

LOCK OFF AT 60 KG
UNLESS INSTRUCTED OTHERWISE

REV	DATE	DRW	CRF	DESCRIPTION	CHK	APP
5	12/09/2022	BB	1879 1833	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0612 TO BM0620. SHIM1040 CHANGED TO SHM1025	BB	BB
4	12/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
3	14/10/2021	BH	-	NEW GUARDS ADDED	-	-
2	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	-	-
1	24/08/2017	GM	1591	REMOVED LOCKOUT JAW	BMD	BMD
0	3/01/2017	GM	-	ORIGINAL ISSUE	BMD	BMD

TOLERANCES UNO:		DIMENSIONS IN mm UNO
XX ±0.1	XXX. ±2.0	DESCRIPTION / PART #
X ±0.2	XXXX. ±3.0	
X. ±0.5	X° ±0.1°	TRACKPACK HEAD FOR USA / FP-190-TP-02A
XX. ±1.0	X.° ±0.5°	
DRAWN	DATE	MODELLED BY
garym	17/02/2015	garym
CHECKED	APPROVED	SCALE
BMD	BMD	1:2.5

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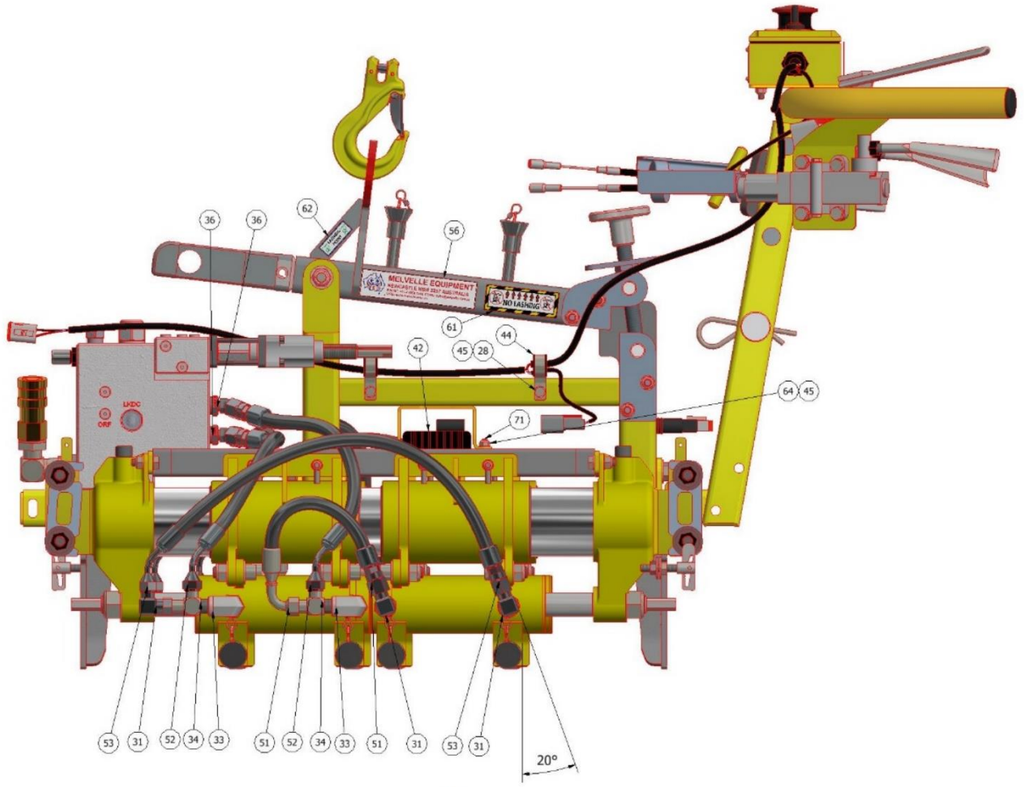
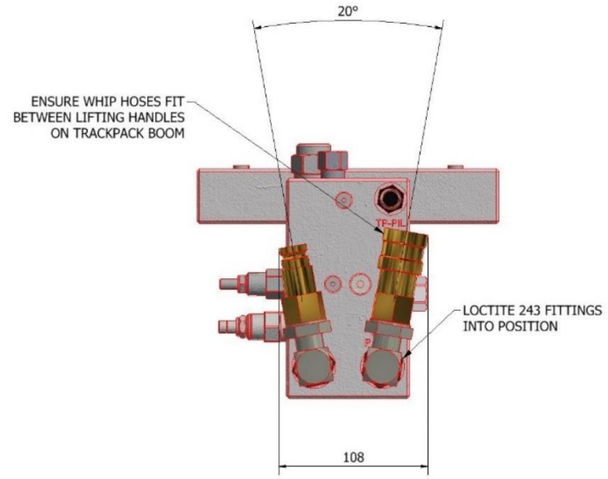
IF IN DOUBT, ASK!

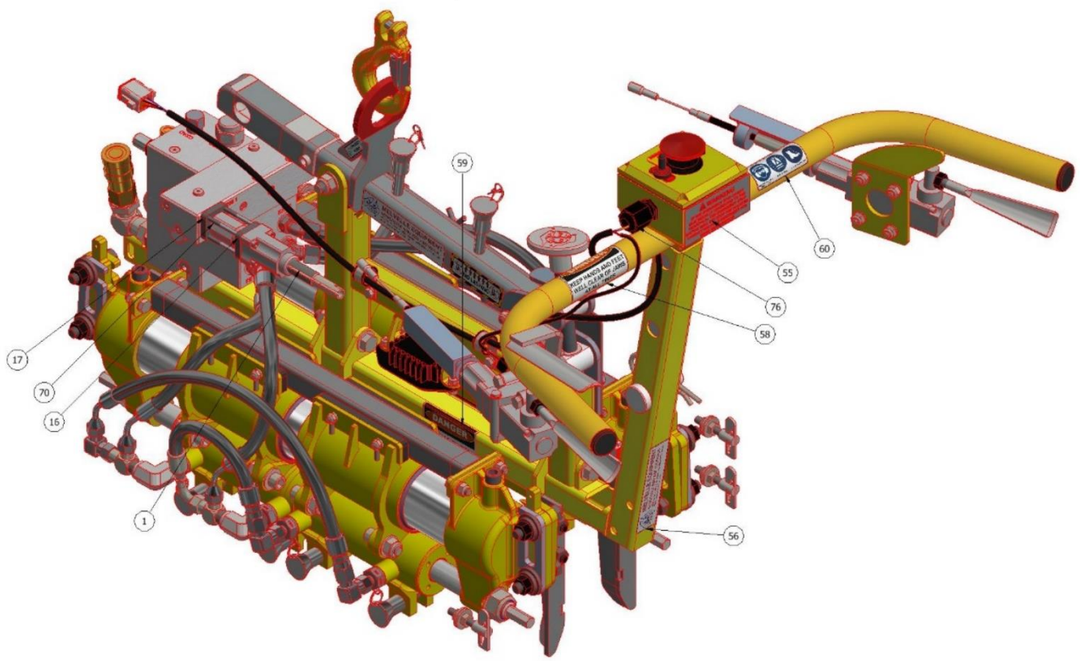
1-190-250 REV 5

2 OF 4	PAGE 2
SHEET #	SHEET DESCRIPTION

3 OF 4	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION







REV	DATE	DRN	CHK	DESCRIPTION	CHK	APP
5	12/09/2022	BB	1879 1833	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0812 TO BM0620. SHM1646 CHANGED TO SHM1025	BB	BB
4	12/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
3	14/10/2021	BH	-	NEW GUARDS ADDED	-	-
2	6/27/2019	DB	1652	TEST POINT FREVIOUSLY SEPERATE COMPONENT	-	-
1	24/08/2017	GM	1591	REMOVED LOCKOUT JAW	BMD	BMD
0	3/01/2017	GM	-	ORIGINAL ISSUE	BMD	BMD

TOLERANCES UNO:		DIMENSIONS IN mm UNO	
.XX ±0.1	XXX. ±2.0	DESCRIPTION	PART #
.X ±0.2	XXXX. ±3.0	TRACKPACK HEAD FOR USA	FP-190-TP-02A
.X. ±0.5	.X° ±0.1°		
.XX. ±1.0	.X.° ±0.5°		
DRAWN	DATE		MODELLED BY
glwym	17/02/2015		glwym
CHECKED	APPROVED	SCALE	
BMD	BMD	1:2.5	1-190-250 REV 5

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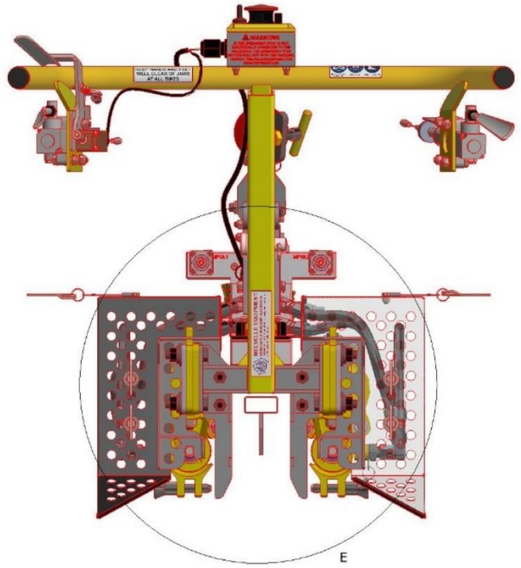
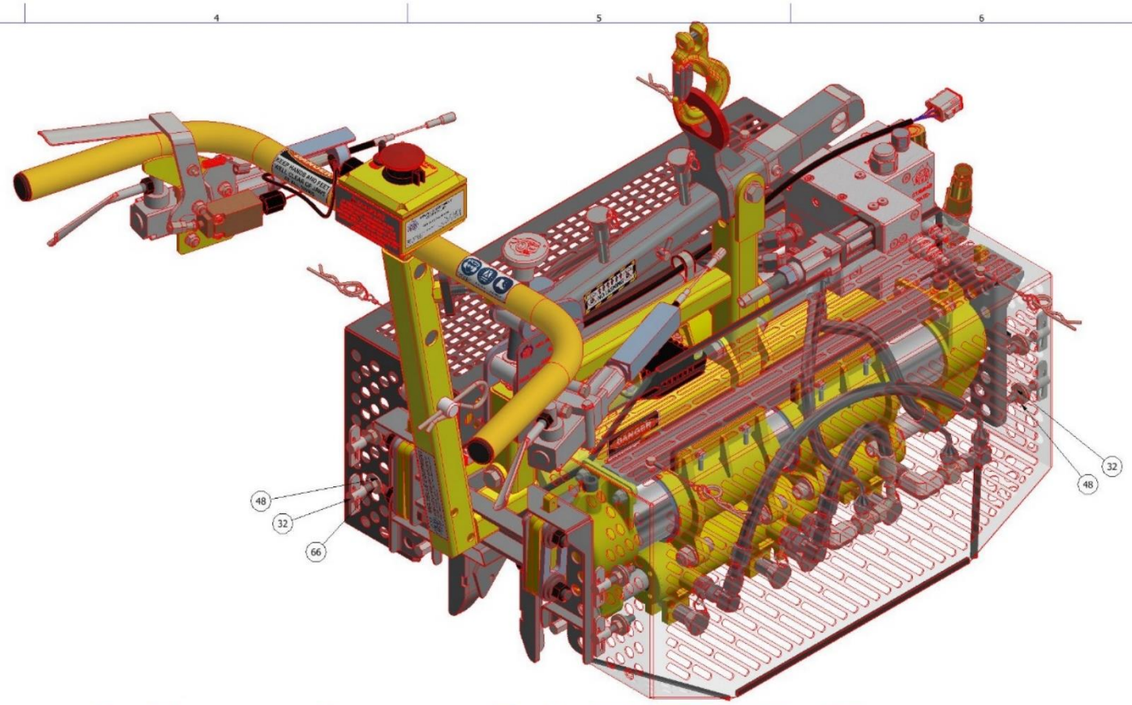
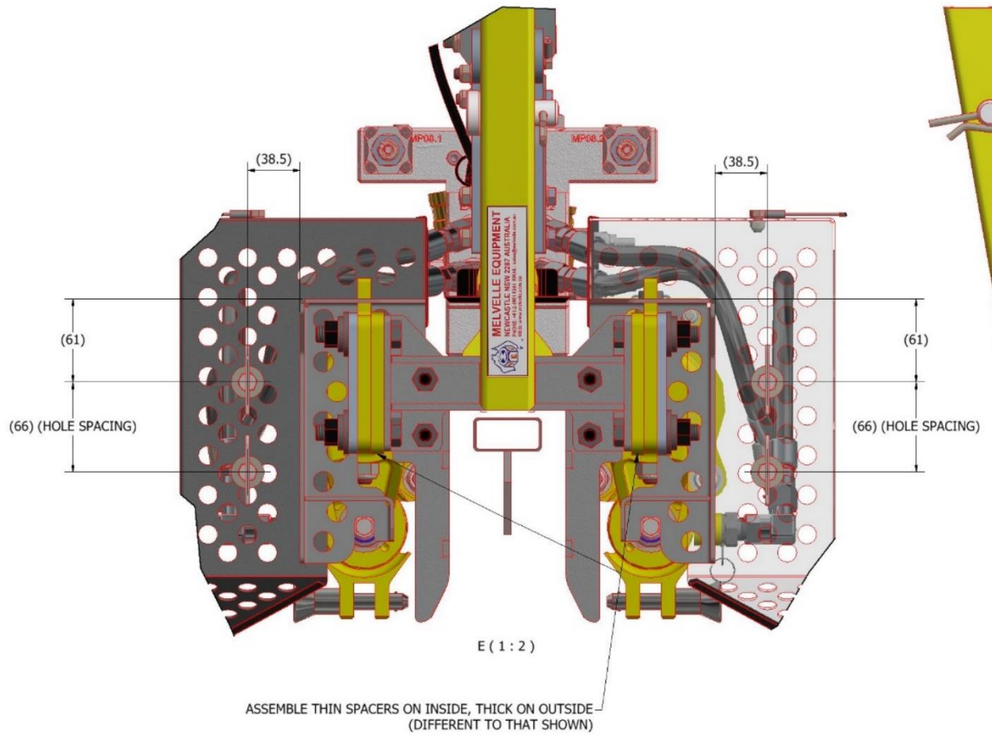
3 OF 4	PAGE 3
SHEET #	SHEET DESCRIPTION

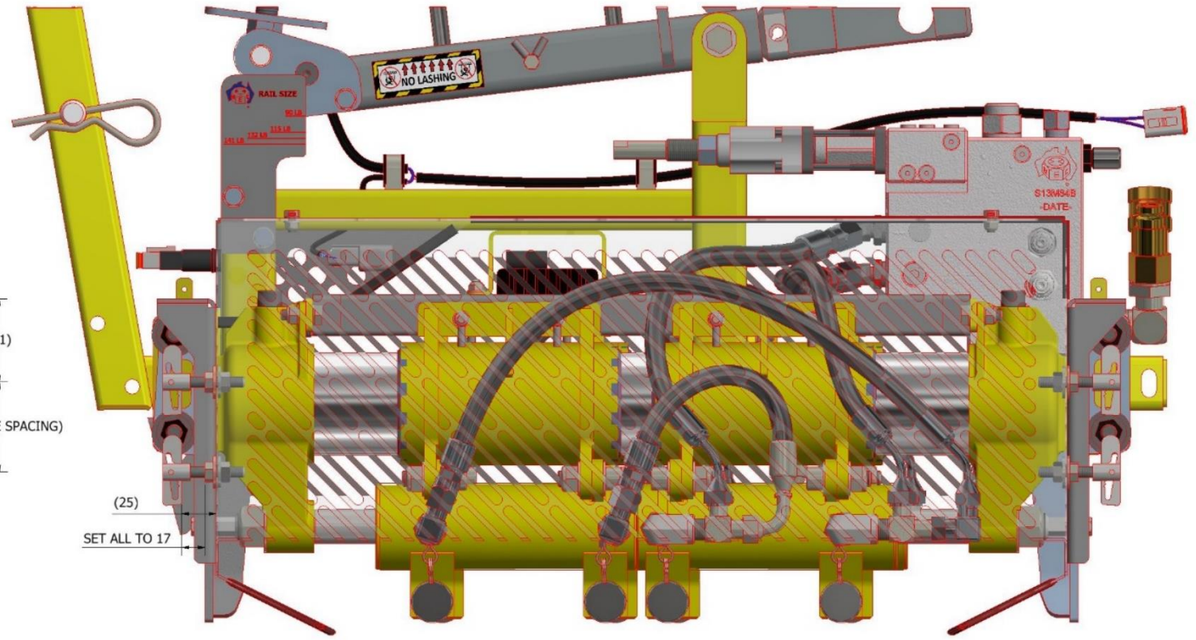
IF IN DOUBT, ASK!

4 OF 4	ASSEMBLY DETAILS
SHEET #	SHEET DESCRIPTION









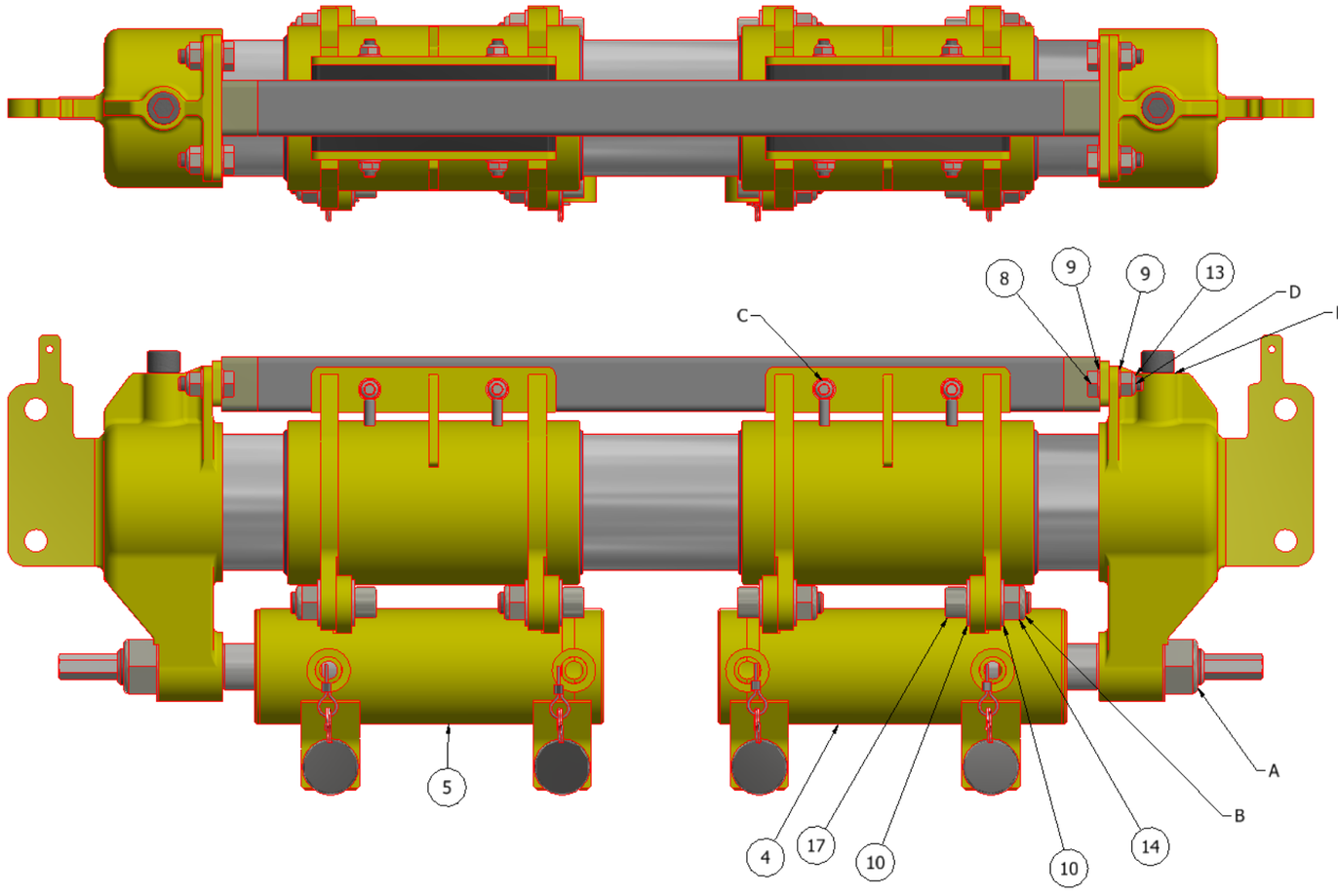
REV	DATE	DRN	CHK	DESCRIPTION	CHK	APP
5	12/09/2022	BB	1879 1833	ELECT315-MOD ADDED TO MODEL ALONG WITH REQUIRED FASTENERS, P-CLAMP BOLTS CHANGED FROM BM0812 TO BM0820. SHM1040 CHANGED TO SHM1025	BB	BB
4	12/09/2022	BB	1938	HOSES CHANGED TO NEW STYLE	BB	BB
3	14/10/2021	BH	-	NEW GUARDS ADDED	-	-
2	6/27/2019	DB	1652	TEST POINT PREVIOUSLY SEPERATE COMPONENT	-	-
1	24/08/2017	GM	1591	REMOVED LOCKOUT JAW	BMD	BMD
0	3/01/2017	GM	-	ORIGINAL ISSUE	BMD	BMD

Melvelle Equipment Corp. Pty. Ltd	TOLERANCES UNO:-	DIMENSIONS IN mm UNO		
10 Rogilla Close Wallsend N.S.W 2287 Ph:+61 02 4951 5244 Fax:+61 02 4950 1291	XX ±0.1 X ±0.2 X. ±0.5 XX. ±1.0	XXX. ±2.0 XXXX. ±3.0 X° ±0.1° X.° ±0.5°	DESCRIPTION: TRACKPACK HEAD FOR USA	PART #: FP-190-TP-02A
IF IN DOUBT, ASK!	DRAWN: ginym 17/02/2015			MODELLED BY: ginym
	CHECKED: BMD	APPROVED: BMD	SCALE: VAR	SIZE: A3 — DWG NO: 1-190-250 — REV: 5

4 OF 4	JAW RETAINING PINS
SHEET #	SHEET DESCRIPTION

27.2.9. Head assembly Drawing

TORQUE SETTINGS TABLE				
LETTER	BOLT PART #	DESCRIPTION	TORQUE (Nm)	LOCTITE
A	NM20N	PISTON ROD TO END CAP	120	N/A
B	NM12N	CYLINDER TO CARRIAGE	80	N/A
C	NM06N	CARRIAGE INSERTS AND LANYARDS	10	N/A
D	NM08N	TOP GUIDE ROD TO END CAPS	22	N/A
E	SHM12130-129BL	END CAPS TO CENTRE TUBE	80	243



ITEM	QTY	DESCRIPTION	PART NUMBER
18	4	LANYARD 1.5mm 7X7 SOFT LOOP TO STEEL EYE 250mm OAL	LANYARD0150250-SLSE7
17	8	SOCKET HEAD CAP SCREW M12 X 35	SHM1235
16	2	SOCKET HEAD CAP SCREW M12 X 130 GR12.9 BLACK	SHM12130-129BL
15	2	NUT M20 NYLOC	NM20N
14	10	NUT M12 NYLOC	NM12N
13	4	NUT M8 NYLOC	NM08N
12	4	KEY RING 19mm OD x 1.25mm CS NICKEL PLATED COPPER	KEYRING19125-CN
11	2	FLAT WASHER ENGINEERS 20mm	FWM20
10	16	FLAT WASHER - ENGINEERS - 1/2" X 1" ZINC	FW08
9	8	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
8	4	BOLT HT M8 X 25 ZINC	BM0825
7	4	QUICK RELEASE PIN, 12x40, SS - CHAMFERED/ LOCTITED	1900031
6	1	MAIN TUBE 75mm	1900016
5	1	CYLINDER ASSEMBLY LEFT HAND	1900009
4	1	CYLINDER ASSEMBLY RIGHT HAND	1900008
3	1	TOP GUIDE ROD FABRICATION	1900007
2	2	CARRIAGE FABRICATION	1900005
1	2	END CAP MACHINED	1900002

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
1	20/09/2016	BMD	-	WAS 40 Nm	BMD	BMD
0	30/11/2015			ORIGINAL ISSUE		

Melvelle Equipment Corp. Pty. Ltd
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Wallsend N.S.W 2287
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Fax:+61 02 4950 1291

TOLERANCES UNO:- DIMENSIONS IN mm UNO
.XX ±0.1 XXX. ±2.0
.X ±0.2 XXXX. ±3.0
X. ±0.5 .X° ±0.1°
XX. ±1.0 X.° ±0.5°

DESCRIPTION: HEAD ASSEMBLY
PART #: 1900015
DRAWN: garym 10/11/2014
MODELLED BY: bend
CHECKED: GM APPROVED: GM SCALE: 1:2
DRG: 2-190-31 REV: 1

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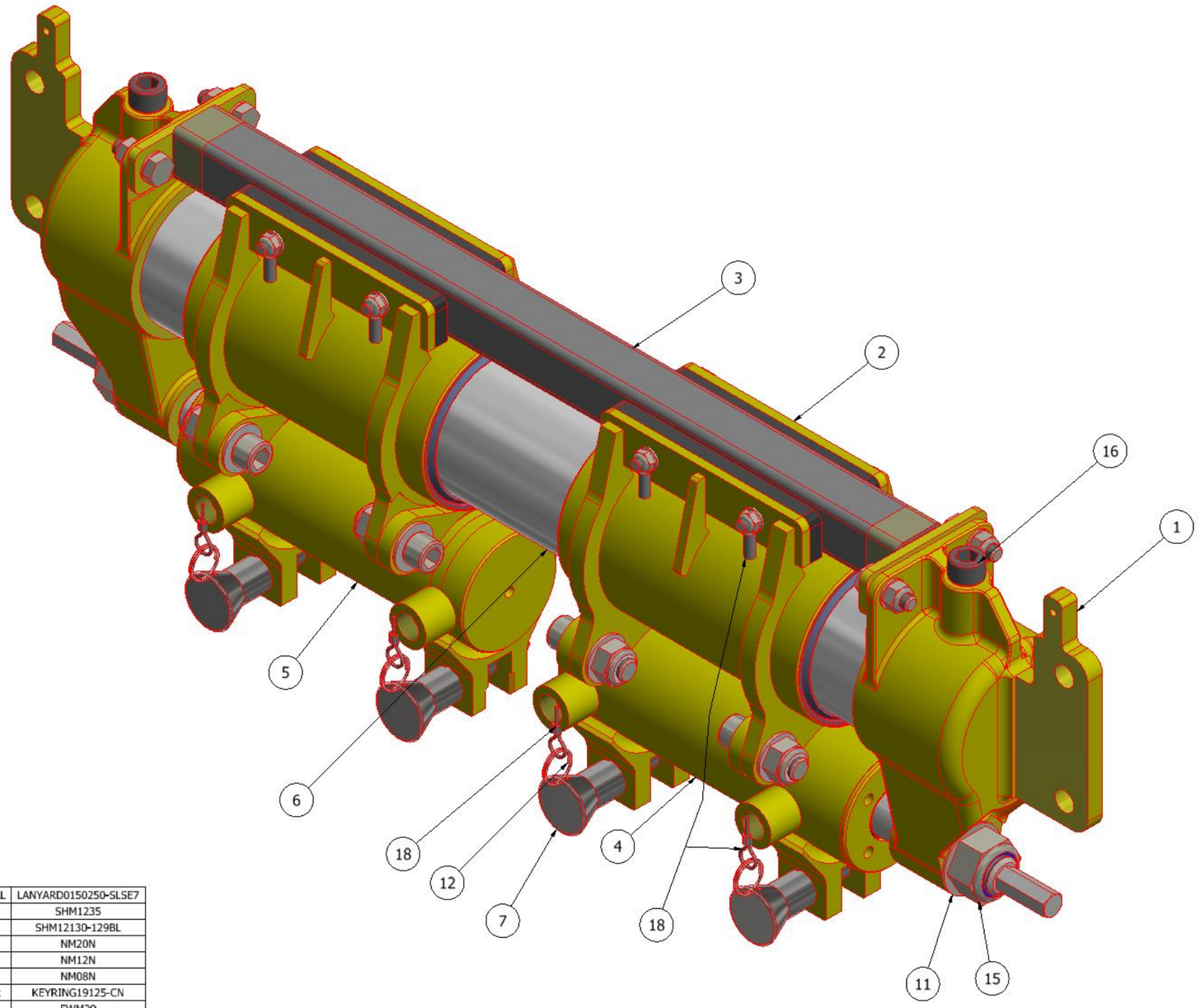
1 OF 2 SHEET # | MAIN ASSEMBLY SHEET DESCRIPTION | IF IN DOUBT, ASK!



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3	1	TOP GUIDE ROD FABRICATION	1900007
2	2	CARRIAGE FABRICATION	1900005
1	2	END CAP MACHINED	1900002

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
1	20/09/2016	BMD	-	WAS 40 Nm	BMD	BMD
0	30/11/2015			ORIGINAL ISSUE		

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.XX ±0.1 XXX. ±2.0
.X ±0.2 XXXX. ±3.0
X. ±0.5 .X" ±0.1"
XX. ±1.0 X." ±0.5"

DESCRIPTION: HEAD ASSEMBLY
PART #: 1900015
MODELLED BY: bend
DRAWN: garym 10/11/2014
CHECKED: GM
APPROVED: GM
SCALE: 2:3
DRG: 2-190-31
REV: 1

2 OF 2 SHEET #
ISO VIEW SHEET DESCRIPTION
IF IN DOUBT, ASK!