

Melville Equipment Corp Pty Ltd

"Proud Australian Manufacturers"



155 Hydraulic Woodborer

Operation, Training & Maintenance Manual



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Part Number - **Manual-155**

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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 Woodborer 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 Melville 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 155 Woodborer

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 MELVILLE 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, <u>will</u> result in <u>death or serious injury</u> .
	This safety alert and signal word indicates a potentially hazardous situation which, if not avoided, <u>could</u> result in <u>death or serious injury</u> .
	This safety alert and signal word indicates a potentially hazardous situation which, if not avoided, <u>may</u> result in <u>minor or moderate injury</u> .
	This signal word indicates a potentially hazardous situation which, if not avoided, <u>may</u> result in <u>property damage</u> .
	This signal word indicates a situation which, if not avoided, <u>will</u> result in <u>damage to the equipment</u> .
	This signal word indicates a situation which, if not avoided, <u>may</u> result in <u>damage to the equipment</u> .











3.2. Hazard Warning Signs

	<p>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.</p>
	<p>This is the fire risk symbol. It is used to alert you to the potential of a fire starting if ignition sources are present.</p>
	<p>This is the explosive risk symbols. It is used to alert you to the potential of an explosion /explosive substances present.</p>
	<p>This is the toxic hazard symbol. It is used to alert you to the presence of toxic substances.</p>
	<p>This is the corrosive risk symbol. It is used to alert you to the presence of corrosive substances.</p>
	<p>This is the electric shock risk symbols. It is used to alert you to the presence of an electrical supply.</p>
	<p>This is the battery symbol. It is used to alert you to the potential hazard of electrical supply, battery acid and leaking batteries.</p>


	<p>This is the hot surface symbol. It is used to alert you that the surfaces may be hot.</p>
	<p>This is the dangerous gases symbol. It is used to alert you to the presence of dangerous gases.</p>
	<p>This is the fluid under pressure symbol. It is used to alert you that there are fluids under pressure in this machinery.</p>
	<p>This is the sharp edges symbol. It is used to alert you to the presence of sharp edges or cutting hazard.</p>
	<p>This is the keep hands clear symbol. It is used to warn you to keep hands clear as there are pinch points present.</p>
	<p>This is the rotating parts symbols. It is used to warn you of rotating parts on the machinery. Keep clear of rotating parts.</p>

3.3. Personal Protection Symbols

	<p>This is the eye protection symbol. It is used when eye protection must be worn.</p>
	<p>This is the hearing protection symbol. It is used when hearing protection must be worn.</p>
	<p>This is the head protection symbol. It is used when head protection must be worn.</p>
	<p>This is the hand protection symbol. It is used when hand protection must be worn.</p>
	<p>This is the foot protection symbol. It is used when feet protection must be worn.</p>
	<p>This is the protective body clothing symbol. It is used when protective clothing must be worn.</p>

	<p>This is the face protection symbol. It is used when face protection must be worn.</p>
	<p>This is the long hair protection symbol. It is used when long hair is required to be contained or restrained.</p>

3.4. Prohibition Symbols

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



! CAUTION



Electrical shock can cause injury.

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

! WARNING



Attachment hoses must have a minimum working pressure rating of 3000psi. Do not use hoses and fittings that are not pressure rated.

! WARNING



Ignition sources can cause fires and severe burns.

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

! WARNING



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.

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

**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.

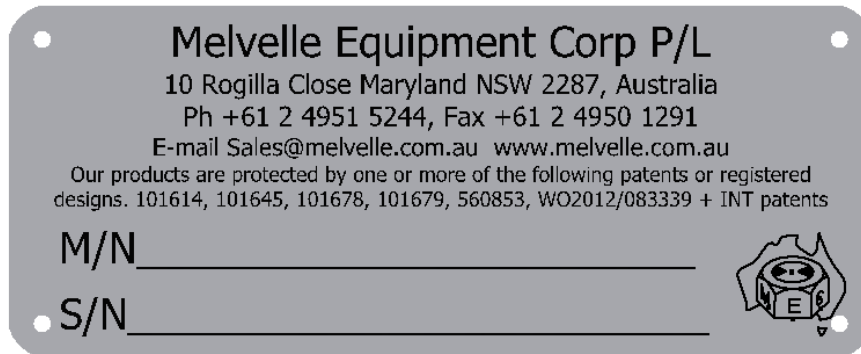
**Noise Hazard.**

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 – Melville Newcastle Sticker





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LAB0004 – Melville Achieving Excellence Sticker



LAB0007 – Danger – Moving Parts Sticker



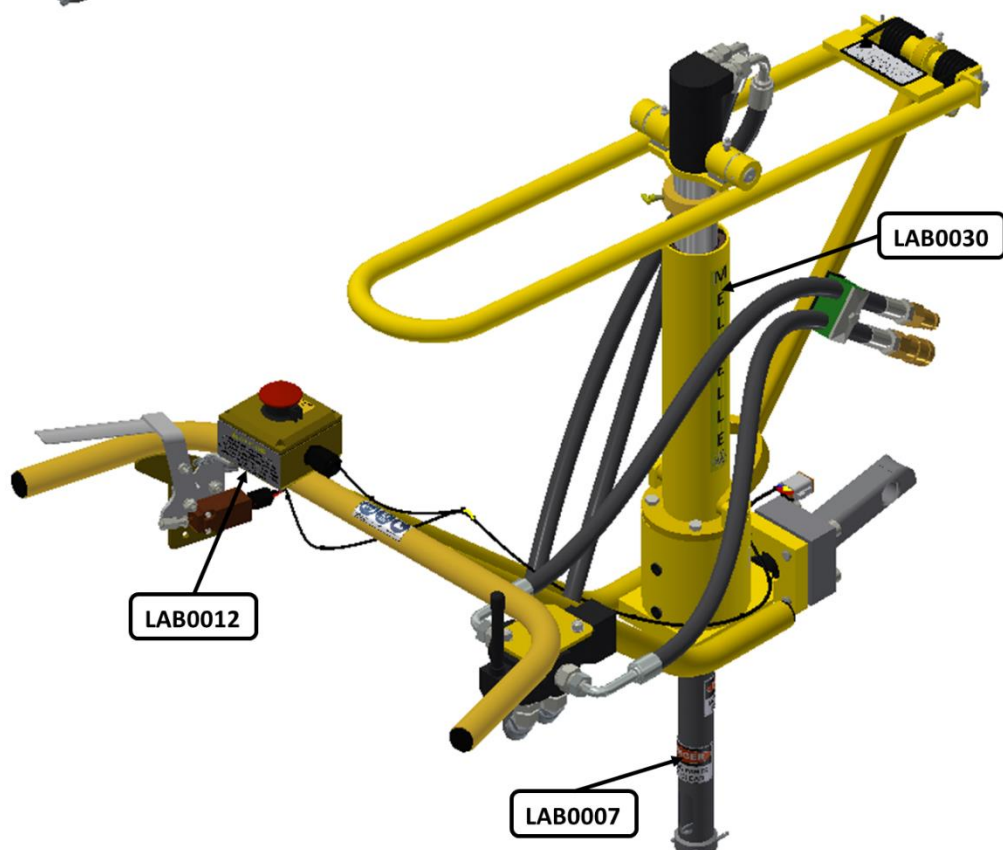
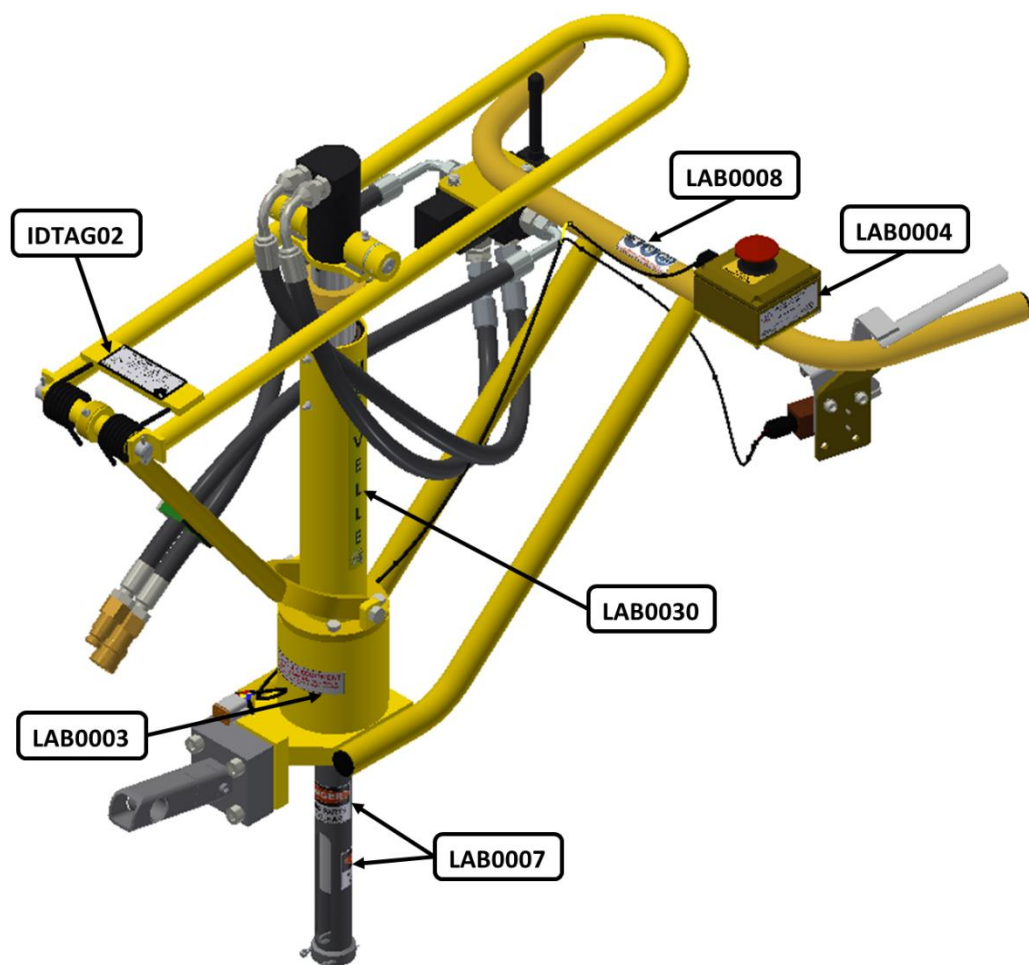
LAB0008 – Safety Label



LAB0030 - Large Melville Upright



5.1 Sticker Locations



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

Melville Equipment Corp Pty Ltd (MEC) supply Woodborers to the rail industry. The 155 Hydraulic Woodborer is designed to drill holes in a range of different styles of sleepers at various sizes.

The 155 Woodborer accepts various size and length drill bits that allow the holes in track sleepers to be tailored to the correct spikes and locks being fitted. The effectiveness of a spike holding a plate to the sleeper depends largely on the fit of the spike in the pre drilled hole. MEC can supply a drill and drill guide to suit all applications.

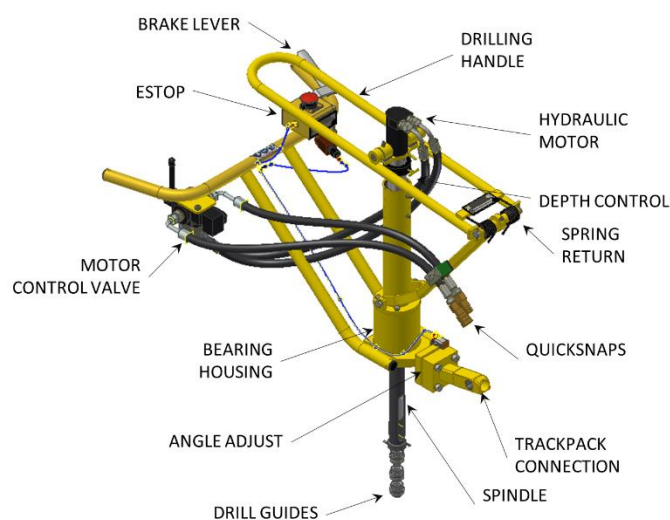
Another feature of the 155 Woodborer is the ability to drill various sleeper types and also to control the depth of drill. With a flexible drill attachment system the Woodborer can drill composite, hard wood and softwood sleepers with ease. The height adjustment sleeper also ensures the sleepers are not drilled through and consistent holes are given.

The final feature of the 155 Woodborer is the drill shroud. Most traditional drills leave the drill bit exposed at all times, while MEC's Woodborer the drill is covered by the lower drill shroud and ensures the operator is protected from all rotating elements.

By using the 155 Woodborer, injuries from traditional methods of drilling holes have been eliminated. These are (but not limited to):

- Back strain
- Repetitive strain injury
- Entanglement in rotating elements
- Shoulder injury through sudden machine jerking
- Injury through flying wood chips/shavings

The 155 has inherent safety features built into the design. This includes counterbalanced design (operator to lift <5kg during operation), emergency stops, hose covers, relevant guarding and lifting points (mechanical lifts). By providing equipment with these features ensure safe and efficient operation of MEC machinery.



8. Specifications

FP-155-A0- Hydraulic Woodborer

Engine	MEC Trackpack
Dimensions	1070mm long x 740mm wide x 1100mm high
Weight (wet)	46kg
Pressure (max)	138bar / 2000psi
Electrical System	12V
Hydraulic Oil ¹	ISO68
Hydraulic Hose Connection Size	½"
Drill Guide Sizes	16, 19, 21mm
Drill Speed(max)	940RPM
Drill Torque(max)	70Nm
Drill Depth (max)	260mm



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 drill holes for dog and lock spikes.
- 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

Overall Inspection

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

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

If engine oil contaminated, replace before use

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

Fuel

1. Check the level of fuel and add if required

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

Light (if applicable)

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



Hydraulic Hoses & Filter

1. Visually inspect the hoses and filter
2. Ensure there is no damage
3. If damaged, replace before use

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

Emergency Stop

1. Ensure Emergency Stop plug is electrically connected
2. Ensure the wires are free from damage and connections are clean and dry

Drill bit

1. Inspect drill bit for damage and wear before use
2. If damaged or excessive wear seen, replace moi

Feed Tube Guide

1. Ensure the feed tube slides freely and does not bind up.
2. If binding lubricate and check for damage. Contact MEC for further information.



9.3. Assembly Procedures



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

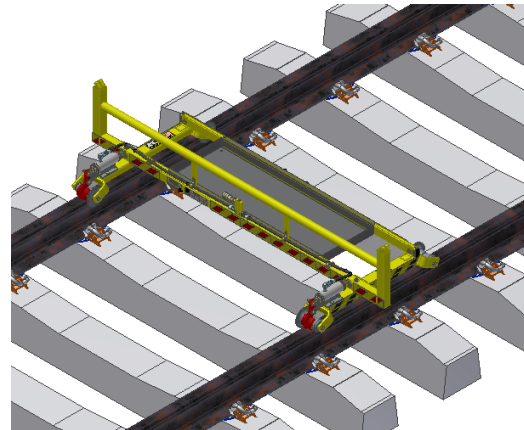
9.3.1. Braked Machine Trolley

1. Inspect the trolley and ensure it is not damaged and free from defects.



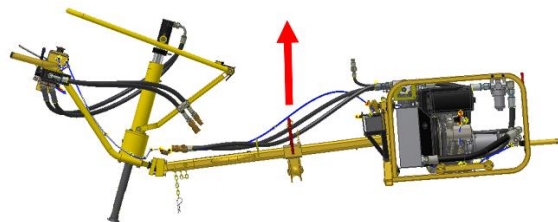
2. Assemble the trolley to the rail lines.

Refer to Braked Machine Trolley
Operation Manual for more information



9.3.2. Machine Assembly – Dedicated/Assembled Machine

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 woodborer and ensure it is not damaged and is free from defects.
3. A assembled woodborer Machine weighs approximately 200kg. Using a certified lifting device (min 250kg), attach slings or a lifting hook to the lifting point on the machine.

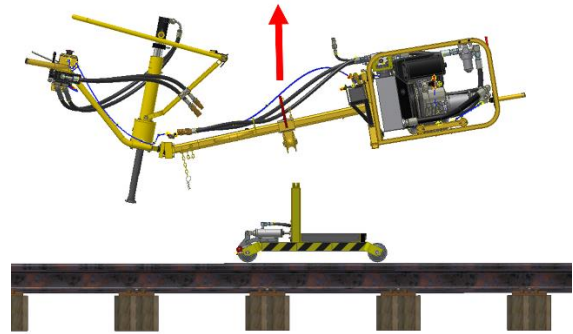


4. By following safe lifting procedures, lift the machine onto the trolley. The cross trolley rollers will sit onto the cross bar (tube).

⚠ 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.

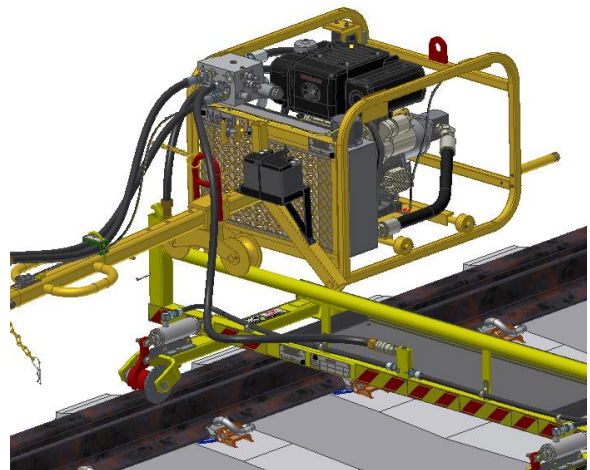
5. Remove the slings and/or hooks. The machine can now be moved to either rail for use. This is achieved by raising the head off the ground and sliding across the trolley. A second person may be required to assist and push the engine across the trolley.



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

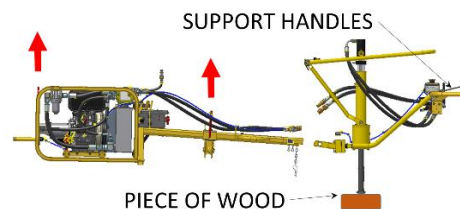


7. Connect the Brake hose to the Cylinder on the trolley.
8. The equipment is now ready for use.



9.3.3. Machine Assembly – Work head to 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 woodborer Head and Trackpack and ensure they are not damaged and are free from defects.
3. A Trackpack woodborer Head weighs approximately 50kg and a Trackpack weighs approximately 120kg.
4. Place work head onto ground by attaching slings around head as shown. Support by holding the handles and balancing on the end of the shroud. For best practise place the shroud on a piece of wood or similar to resist damage.
5. Adjust the pivot position (cross trolley rollers) to the correct position for the machine. For the woodborer this is the third 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. The Trackpack and work head are now attached and can be lifted onto the machine trolley (the same as a dedicated machine). Refer above for procedure on attaching to machine trolley.

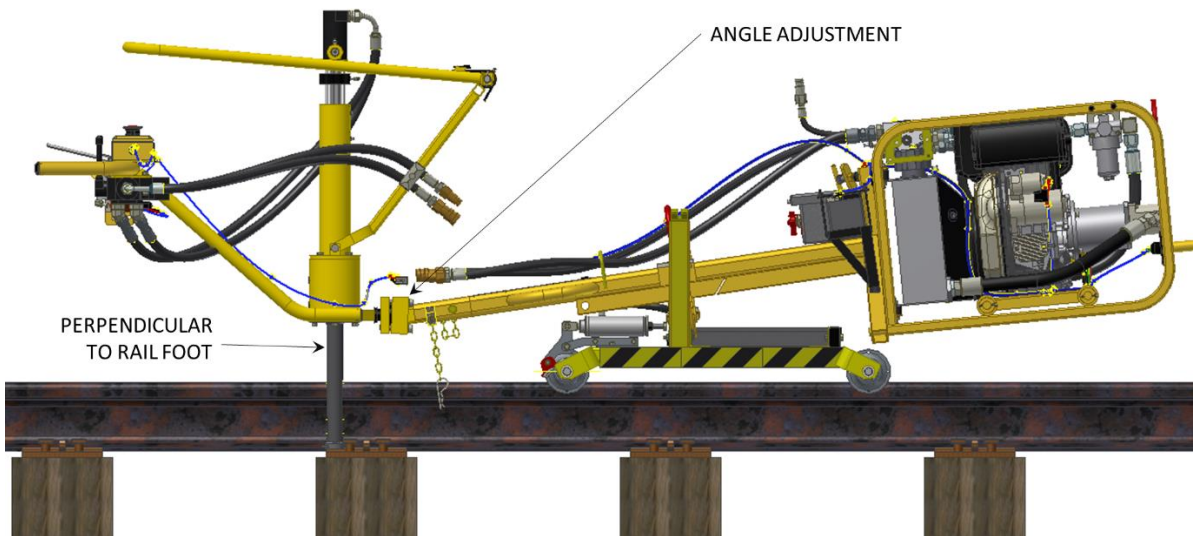


9.3.4. Machine Adjustment – Workhead Angle

The head angle adjustment is required to ensure the Woodborer is perpendicular with the rail and ensures the hole is drilled correctly in the sleeper. This is required as the rail height changes between rail sizes and hence, the angle of the Workhead. Not having the adjustment correct hinders the operation of the machine and operators will find it difficult to use the machinery.

To adjust the Workhead angle:

1. Ensure the Workhead is on the rail and connected to a Trackpack.
2. Lower the base of the drill guide to the position in which it will be drilling. For example on top of the Pandrol plate.
3. Loosen the 4 off 1/2" UNC socket head caps screw and ensure the drill shroud is set perpendicular to the sleeper.
4. Tighten the bolts and recheck if the shroud is still perpendicular.



9.3.5. Drill bit replacement

1. Ensure the machine is off and isolated.
2. Lower the drilling handle down and rotate the drill shaft by hand until the 3 drill bit retaining screws are visible in the shavings slot.
3. A second person may be required. Hold the drill down and undo the 3 locking screw and allow the drill bit to fall into the guide.
4. Depending on the drill/bit guide arrangement the drill may be removed from the side slot of the shroud. If not remove the 2 guide retaining split pins and remove as an assembly.
5. Replace drill bit and reassemble into shroud.
6. Tighten the 3 locking screws and refit guide with split pins.
7. Keeping the machine stationary move the drilling handle up and down to ensure the drill is running smoothly inside the guide and shroud.



9.4. 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.

9.4.1. Starting the Engine – Electric Start¹

1. Observe all safety precautions
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 (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
10. Move throttle to required rpm position, normally full throttle²
11. Power pack and hydraulic circuit are now in operation and tooling is able to be used. Refer to Equipment Operation for instructions on using tooling

¹ Refer to engine manual for detailed engine instructions and requirements

² During first 50hrs do not exceed 70% maximum rated power



9.4.2. Starting the Engine – Recoil Start¹

1. Observe all safety precautions
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. Hold the grip and pull the cord until compression is found
8. Completely rewind the cord (allow to retract)
9. Operate 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 throttle²
13. Power pack and hydraulic circuit are now in operation and tooling is able to be used.
Refer to Equipment Operation for instructions on using tooling

¹ Refer to engine manual for detailed engine instructions and requirements

² During first 50hrs do not exceed 70% maximum rated power

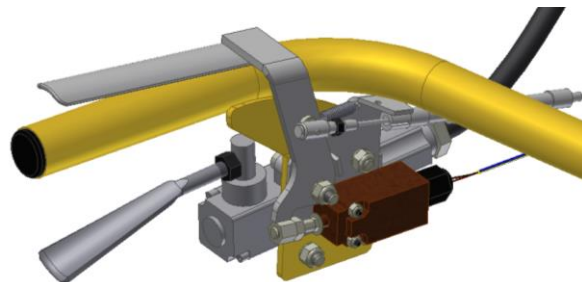


9.4.3. Equipment Operation – Releasing the Brake

All new machine trolleys are fitted with fail-safe brakes. These brakes are released by hydraulic pressure, supplied by connecting the 1/4" hydraulic hose line to the trolley as stated in assembly procedures.

To release the brake on the trolley:

1. Observe all safety precautions
2. Ensure all pre-operation checks have been conducted as per section 9.2
3. Ensure the Woodborer is on safe and steady grounding (no excessive slopes or dangerous terrain conditions)
4. Ensure all Assembly Procedures have been followed as per section 9.3.
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 sections 9.4.1 & 9.4.2
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.

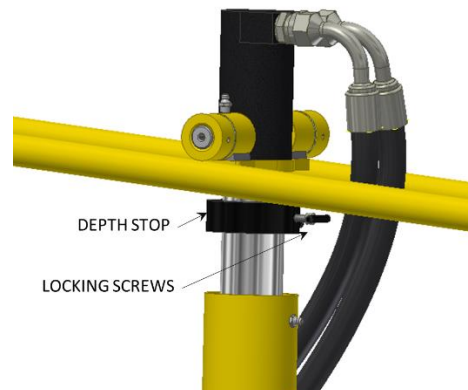


9.4.4. Equipment Operation – Setting the drill depth

The 155 woodborer has an inbuilt feature that allows for precision control over the depth of the hole drilled.

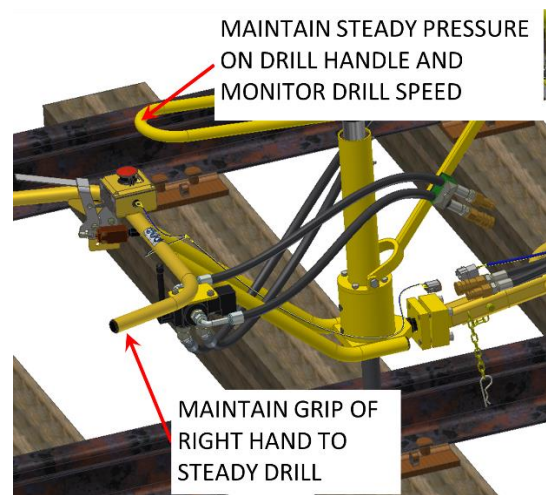
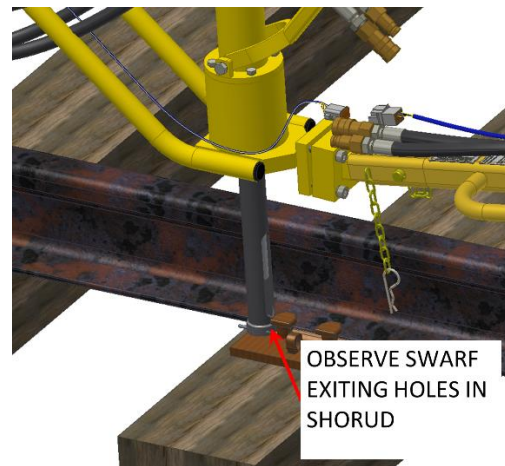
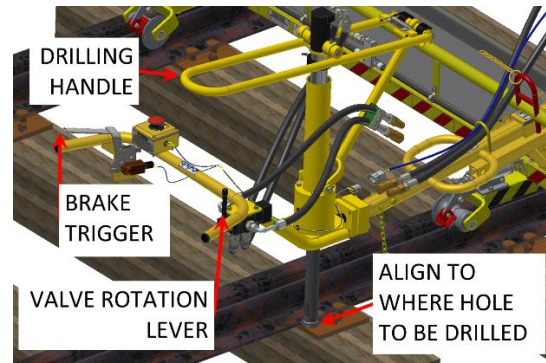
To set the depth of drill -

1. Observe all safety precautions and the machine is off and isolated.
2. Push down on the drilling handle until the drill bit is flush with the end of the drill guide.
3. Measure the distance between the top of the cylinder tube and the base of the depth stop. This will be the depth of hole drilled.
4. Adjust to the required depth by loosening the locking screws and sliding the stop up and down as required.



9.4.5. Equipment Operation – Drilling

1. Observe all safety precautions
2. Ensure all pre-operation checks, and assembly procedures have been conducted as per section 9.2 and 9.3 respectively.
3. Start the engine as per sections 9.4.1 & 9.4.2
4. Ensure the drilling handle is raised and operate the brake lever. By holding the 2 handles move the work head and position the drill guide where the hole is to be drilled.
5. With the work head in position release the brake handle but maintain grip of the left handle. Start the rotation of the drill spindle by moving the valve handle to its appropriate detent position using your right hand. Grab the right handle once rotation starts.
6. With the spindle rotating and the machine stationary in position, push down on the drilling handle with your left hand and commence drilling of the hole. Maintain steady pressure and observe the swarf exiting the holes in the shroud. If the swarf slows or the drill begins to slow release pressure and slowly bring the drill back up to clear the hole. Once clear reapply pressure until the drill depth is achieved. (It is recommended to drill with your left hand as the brake should be applied. This stops the machine rolling and limits the damage of drill bits)
7. Once the hole is drilled release the drilling handle and retract the drill back within the shroud. Release the drill handle and operate the brake handle and move to the next hole.



9.4.6. Stopping the Engine¹

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

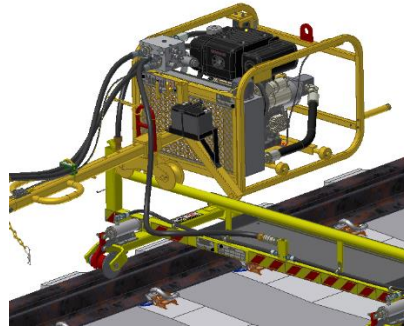
¹ Refer to engine manual for detailed engine instructions and requirements



9.5. Disassembly Procedures

Removal of Woodborer from Track

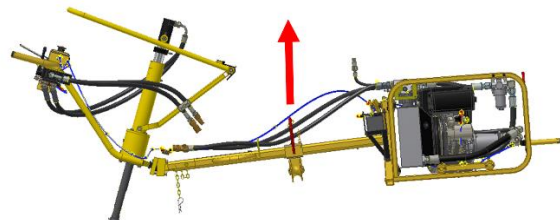
1. Observe all safety precautions
2. Ensure engine is off and no hydraulic oil is flowing to the work head.
3. Disconnect the brake hose from the trolley cylinder



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.

10. Storage & Transport

10.1. Storage of Woodborer

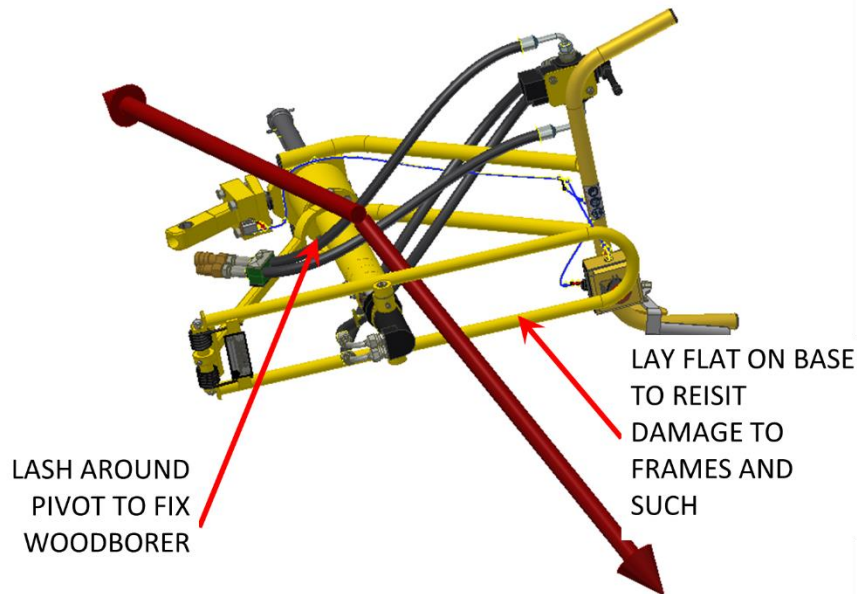
MEC equipment should be stored in a secure, safe, dry location to ensure the equipment is not damaged and maintained in good working order.

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.

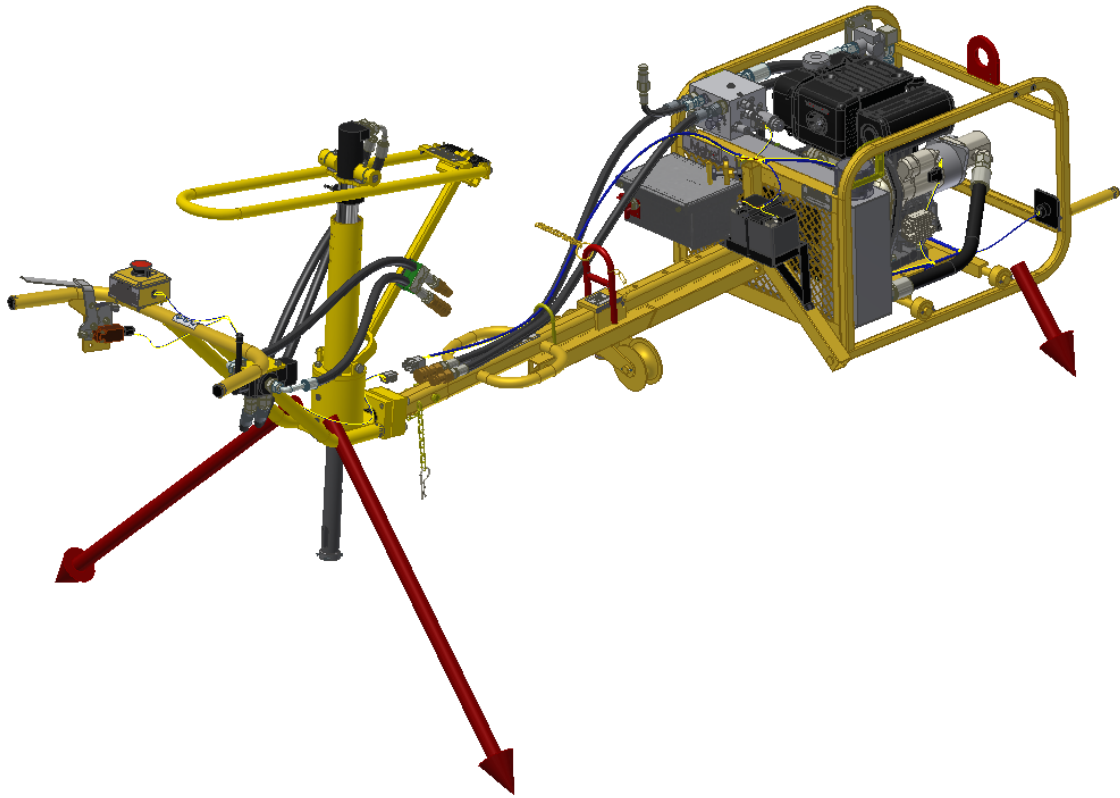
10.2. Transport of Woodborer

Place the equipment (dedicated machine or Trackpack Head) onto a flat surface (truck or trailer) and strap down ensuring the equipment is unable to move. By utilising the storage/transport frames will help to reduce damage and make it easier to store/transport. See below for recommended lashing points.

When strapping the equipment down, ensure that the straps are used on the main frames of the equipment to avoid damage. Ensure hoses/cables and other lighter parts of the machinery are not used to secure the equipment during transport.



FP-155-AO Suggested Transport Lashing Points.



Suggested Transport Lashing Points when connected to Track Pack.

11. 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, and are pushed together in a parallel motion to ensure the operator is not injured.
- 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 Woodborer 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 2500psi
- 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



12. Maintenance



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.

All maintenance to be carried out by a qualified, competent mechanical tradesperson.

12.1. Tools Required to Complete Maintenance

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

<ul style="list-style-type: none">• Allen Keys (various sizes)	
<ul style="list-style-type: none">• Hammer	
<ul style="list-style-type: none">• Pin Punch (1/8" or 4mm)	
<ul style="list-style-type: none">• Ruler and/or Vernier's	
<ul style="list-style-type: none">• Shifter or	
<ul style="list-style-type: none">• Spanners (various sizes)	



12.2. Maintenance Period¹

REGULAR SERVICE PERIOD*		Each use	Every 1 month or 10hrs	Every 3 months or 50hrs	Every 6 months or 250hrs	Every year or 500hrs
Perform at every indicated month or operating hour interval, whichever comes first.						
ITEM						
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				
Brake Lift Switch	Check	X				
Emergency Stop	Check	X				
Guards	Check	X				
Hydraulic motor	Check			X		
Telescoping tube	Check / lubricate		X			
Drill Shroud	Check	X				
Drill Rod	Check			X		
Drill Guide	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

¹ Refer to engine manual for detailed engine instructions and requirements



13. Troubleshooting¹

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
	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
Handle not operating	Tube galling in bush's	Ensure tube is greased
		Ensure tube is not damaged
		Bush's worn causing misalignment – replace bushing
Drill not rotating	Hydraulic motor damaged	Replace motor
	Drill rod binding in housing	Inspect bush's and replace as necessary
	Drill guide damaged or broken	Replace guide

¹ Refer to engine manual for detailed engine instructions and requirements



14. Further Documents

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

Further documents for the 155 Woodborer:

Document No.	Description	Type	Pg. #
155-OPRA	Operational Risk Assessment	Document	Error! Bookmark not defined.
108-215	Trolley to Power Pack Attachment	Drawing	48
143-48	Trackpack Boom Adjustment	Drawing	49
155-30	Hydraulic Woodborer Trackpack Head (FP-155-AO)	Drawing	50



14.1. Operational Risk Assessment

Machine: FP-155-AO Hydraulic Woodborer								Form No.:	
ABN								Issue Date	2/02/2016
WORKPLACE GENERIC HIRARC FORM								Version:	0
Company	MELVELLE EQUIPMENT CORP	Department / Workplace:	Melville Offices	Date of Assessment 03/02/2016	Commenced:	9am	Completed:	12md	
Scope of Assessment: Identify the risks and hazards associated with the operation of a rail maintenance machine to drill holes in rail road sleepers.									
Names of Risk Assessment Team: Gary Morris, Ben Derooy				Names of additional personnel consulted during Risk Assessment: Andrew Melville			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					MANAGEMENT ACTIONS	
			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	Comments	Refer to Action Plan
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	Risk Assessment Referred to:	
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	Risk Assessment Accepted by:	Andrew Melville
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	Risk Assessment findings recorded in the Project Design Folder	Design Team
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	Risk Assessment Findings communicated to:	Design Team, Melville Equipment Corp.
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		



Ref no	Description / hazard /	Raw Risk Rating (no controls)			Controls	Residual Risk Rating (after controls)			Is Risk Tolerable Y/N	Additional Controls Req	Action By / Name & date required
		Consequence (no controls)	Likelihood	Risk Level & Score		Consequence	Likelihood	Risk Level & Score			
	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	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		
	Fluid levels too high causing overflow and low causing machine damage	Significant	Likely	10	Pre-start checklist requiring operator to check fluid levels before operating machine	Significant	Rare	4	Y		
	Exposure to hazardous materials such as fuel and oils	Significant	Likely	10	Hazardous material documentation in manual, as well as operators MSDS sheets.	Significant	Rare	4	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 parallel to each other.	Minor	Rare	1	Y		
	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	Rare	6	Y		



Ref no	Description / hazard /	Raw Risk Rating (no controls)			Controls	Residual Risk Rating (after controls)			Is Risk Tolerable Y/N	Additional Controls Req	Action By / Name & date required
		Consequence (no controls)	Likelihood	Risk Level & Score		Consequence	Likelihood	Risk Level & Score			
	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		
	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		
	Injury through sudden release of drill handle	Minor	Possible	3	Operating procedure provided in manual	Minor	Rare	1	Y		
	Injury through pinch points between height stop and cylinder tube	Minor	Likely	7	Operating procedure provided in manual	Minor	Rare	1	Y		
	Entanglement in Drill bit	Serious	Possible	12	Machine fitted with drill shroud.	Serious	Rare	6	Y		
	Injury through flying drill swarf	Minor	Likely	7	Shroud controls swarf release	Minor	Rare	1	Y		
	Pinch point through contact with spring in pivot joint	Minor	Likely	7	Operating procedure provided in manual	Minor	Rare	1	Y		



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

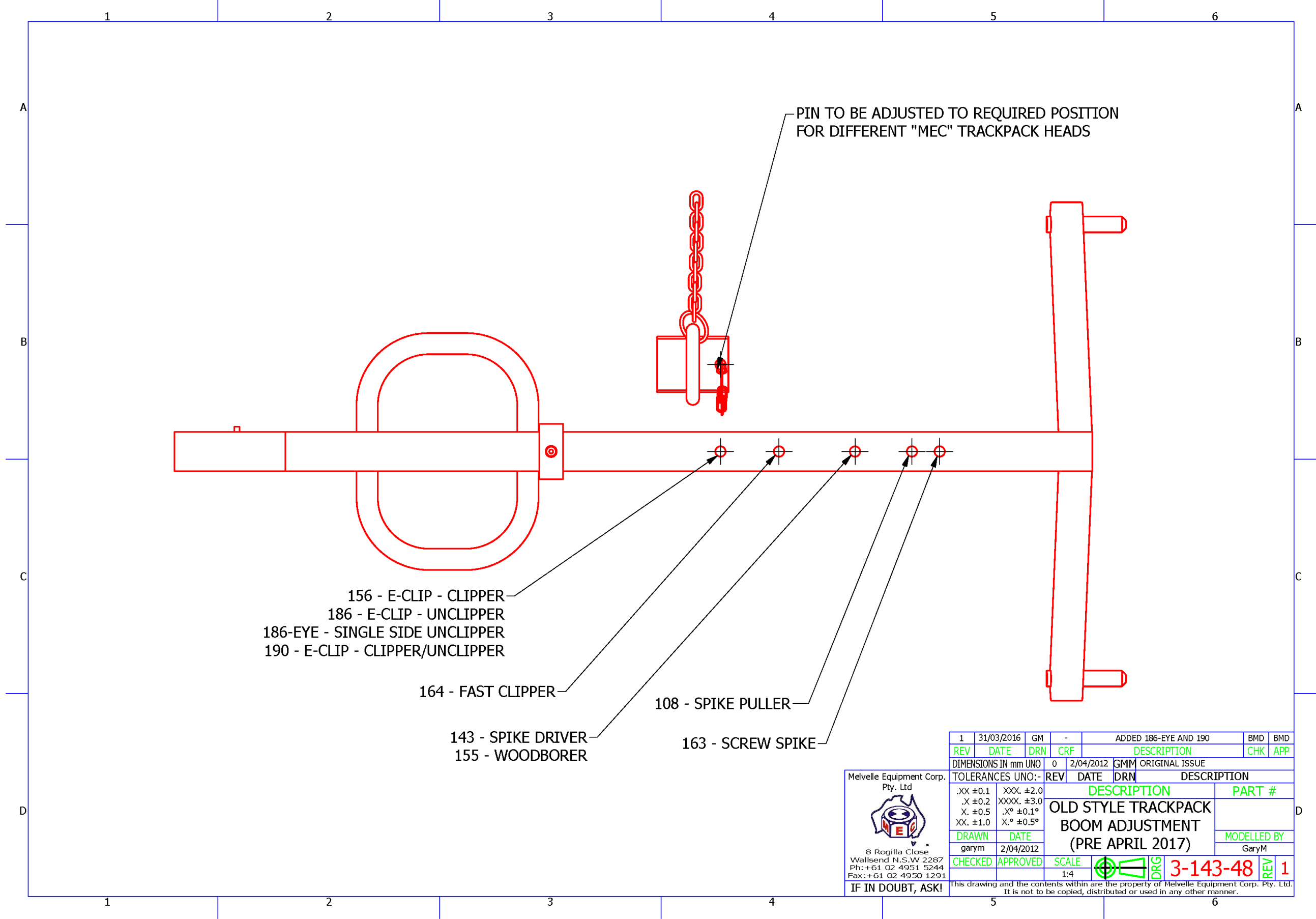
Melville Equipment Corp.
Pty. Ltd

8 Rogilla Close
Wallsend N.S.W 2287
Ph: +61 02 4951 5244
Fax: +61 02 4950 1291


1	26/04/2017	BB	-	UPDATED TO CURRENT EQUIPMENT						
REV	DATE	DRN	CRF	DESCRIPTION			CHK	APP		
DIMENSIONS IN mm UNO				0	2/04/2012	GMM ORIGINAL ISSUE				
TOLERANCES UNO:-				REV	DATE	DRN	DESCRIPTION			
.XX ±0.1	XXX. ±2.0	<div>TROLLEY TO POWERPACK ATTACHMENT</div>			PART #					
.X ±0.2	XXXX. ±3.0									
X. ±0.5	X° ±0.1°									
XX. ±1.0	X.° ±0.5°									
DRAWN	DATE	<div>SCALE</div>			MODELLED BY					
garym	2/04/2012									
CHECKED	APPROVED									
IF IN DOUBT, ASK!				1:8	<div>DRG</div>			REV 1		

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14.3. Trackpack Boom Adjustment



1		31/03/2016		GM		-		ADDED 186-EYE AND 190				BMD		BMD	
REV		DATE		DRN		CRF		DESCRIPTION				CHK		APP	
DIMENSIONS IN mm UNO				0		2/04/2012		GMM		ORIGINAL ISSUE					
TOLERANCES UNO:-				REV		DATE		DRN		DESCRIPTION					
.XX ±0.1				XXX. ±2.0		DESCRIPTION				PART #					
.X ±0.2				XXXX. ±3.0		OLD STYLE TRACKPACK BOOM ADJUSTMENT (PRE APRIL 2017)				MODELLED BY GaryM					
X. ±0.5				X.º ±0.1º											
XX. ±1.0				X.º ±0.5º											
DRAWN		DATE		garym		2/04/2012									
CHECKED		APPROVED		SCALE		1:4				DRG		3-143-48		REV 1	
IF IN DOUBT, ASK!				This drawing and the contents within are the property of Melville Equipment Corp. Pty. Ltd. It is not to be copied, distributed or used in any other manner.											



14.4. Hydraulic Woodborer Trackpack Head (FP-155-A0)

Exploded view diagram of the Hydraulic Woodborer Trackpack Head (FP-155-A0). The diagram shows the main assembly and two detail views. The main assembly view shows the head assembly with various components labeled with numbers. The detail views show specific components and their assembly positions.

84	1	PPE SAFETY STICKER	LAB0008
83	1	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004
82	2	LARGE MELVELLE UPRIGHT	LAB0030
81	1	WOOD BORER HEAD WIRING HARNESS WITH ESTOP	1550047
62	4	U DRIVE SCREW	UDSCREW
61	6	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08
60	8	5/16" SPRING WASHER	SW05
59	2	SPLIT PIN 3/16" x 2" LG	SF0332
58	2	SOCKET HEAD CAP SCREW M8 x 50	SHM0850
57	1	SOCKET HEAD CAP SCREW M8 x 35	SHM0835
56	1	SOCKET HEAD CAP SCREW M8 x 20	SHM0820
55	3	SOCKET HEAD CAP SCREW M6 x 16	SHM0616
54	4	SOCKET HEAD CAP SCREW 1/2 UNC X 2.75 LONG	SHC0844
53	4	SEL LOK PIN 3/16" X 1-1/2" ZINC	RL8738
52	2	PRESSURE PLUG 3/8" BSP	PPBS06
51	1	ORING 2-1/2 x 2-3/4 x 1/8 CS - 70 DURO	OR2230-70
50	3	NUT M8 NYLOC	NM08N
49	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
48	2	H082 + MCF-1408 + 01220 + MCF90M-1408	H082-01325-005
47	2	H082 + MCBM-0808 + 00860 + MCF90S-1408	H082-00960-034
45	1	GRUB SCREW 1/4 UNF * 1/4 LG	GRSF0404
44	3	GREASE NIPPLE 1/8 BSP CH29	GRNIP02
43	2	FLAT WASHER - ENGINEERS - 3/4" X 1-1/2" ZINC	FW12
42	5	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
41	2	CIRCLIP EXTERNAL 24mm	CRCF024
40	2	ELBOW 45 M/M 1/2" BSPP X 7/8" JIC	CF38-0814
39	2	NIPPLE 1/2" BSPP X 7/8" JIC	CF2-0814
38	2	NIPPLE 3/8" BSPP X 7/8" JIC	CF2-0614
37	4	PLASTIC CAP TO SUIT 25NB PIPE	CAPRND-1-1/4"
36	4	BOLT M8 25LG	BM0825
35	4	BOLT M8 150LG	BM08150
34	1	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113
32	2	SPRING EXTENSION WASHER FOR USE WITH FEED HANDLE	1550046
31	1	RH TORSION SPRING - HOLLOW SPINDLE	1550041
30	1	LH TORSION SPRING - HOLLOW SPINDLE	1550040
29	1	MOTOR HYD GEROTOR 32cc MOTOR - EPM	1550037
28	1	FEED HANDLE LINKAGE	1550032
27	2	HANDLE PIVOT PIN	1550029
26	1	DIRECTIONAL CONTROL VALVE INC RELIEF	1550026
25	1	DRIVE KEY	1550025
24	1	FEED HANDLE FABRICATION	1550024
23	1	DRIVE SPINDLE	1550022
22	1	DRILL GUIDE SHROUD	1550020
21	1	CLAMP PIVOT AND QUICK RELEASE BOOM MNT	1550019
20	2	FLA SEAL	1550016
19	1	TOP MOTOR MOUNT PLATE	1550014
18	1	BRG HSG BOTTOM COVER PLATE	1550013
17	1	BEARING HOUSING TOP COVER AND GUIDE TUBE	1550012
16	1	ALUMINIUM BEARING HOUSING	1550011
15	1	BEARING INSIDE HOUSING	1550010
14	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
13	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
12	2	GEARBOX HANDLE LINKAGE PIVOT BOLTS	1400085
11	1	DRILL GUIDE SUIT 21mm DRILL	1400084
10	1	DRILL GUIDE SUIT 19mm DRILL	1400055
9	1	DRILL GUIDE SUIT 16mm DRILL	1400053
8	1	SPRING HANDLE AXLE	1400039
7	2	HANDLE-SPRING BUSH	1400037
6	2	ADJUSTMENT COLLAR LOCKING T SCREWS	1400028
5	1	DEPTH SET ADJUSTMENT COLLAR	1400027
4	1	TOP FEED TUBE FABRICATION	1400022
3	1	HOSE CLAMP DOUBLE 22mm - BOLT GROUP 3 CLAMPS	1081101-04
2	1	HOSE CLAMP DOUBLE 22mm - TOP PLATE GROUP 3	1081101-03
1	2	HOSE CLAMP DOUBLE 22mm - 3AWS	1081101-01

ITEM QTY DESCRIPTION PART NUMBER

MATERIAL/CUT LIST

7 30/06/2016 BB 1195 FIXED FROM REMOVED DRIVE SCREWS

6 25/08/2015 JMC 1116 Q ANNUAL FROM 150015 TO 1512

5 11/09/2015 JMC ADDED CHANGING 1/4 TO THIS STAGE OF ASSEMBLY

4 12/05/15 BB 990 FIXED HOSE LENGTH AS PER QIF 990

3 07/05/2014 BB 790 ADDED WIRING HARNESS PER QIF 790

2 4/08/2014 GM 072 ADDED BRACE TRIGGER MONO VALVE

1 04/05/2014 AD 736 REPAIRED AS PER QIF 736

REV DATE DRN QIF DESCRIPTION CHK APP

DESIGNED BY: JMC 28/05/2012 QM ORIGINAL ISSUE

TOLERANCES UNLESS OTHERWISE SPECIFIED: XX ±0.1 XXX ±0.2 XXXX ±0.3 XXXX ±0.4 XXXX ±0.5 XXXX ±0.6 XXXX ±0.7 XXXX ±0.8 XXXX ±0.9 XXXX ±1.0

SCALE 1:1

CHECKED APPROVED SCALE 1:1

DATE 28/05/2012

ADDITION APPROVED

1-155-30

7

IF IN DOUBT, ASK!

