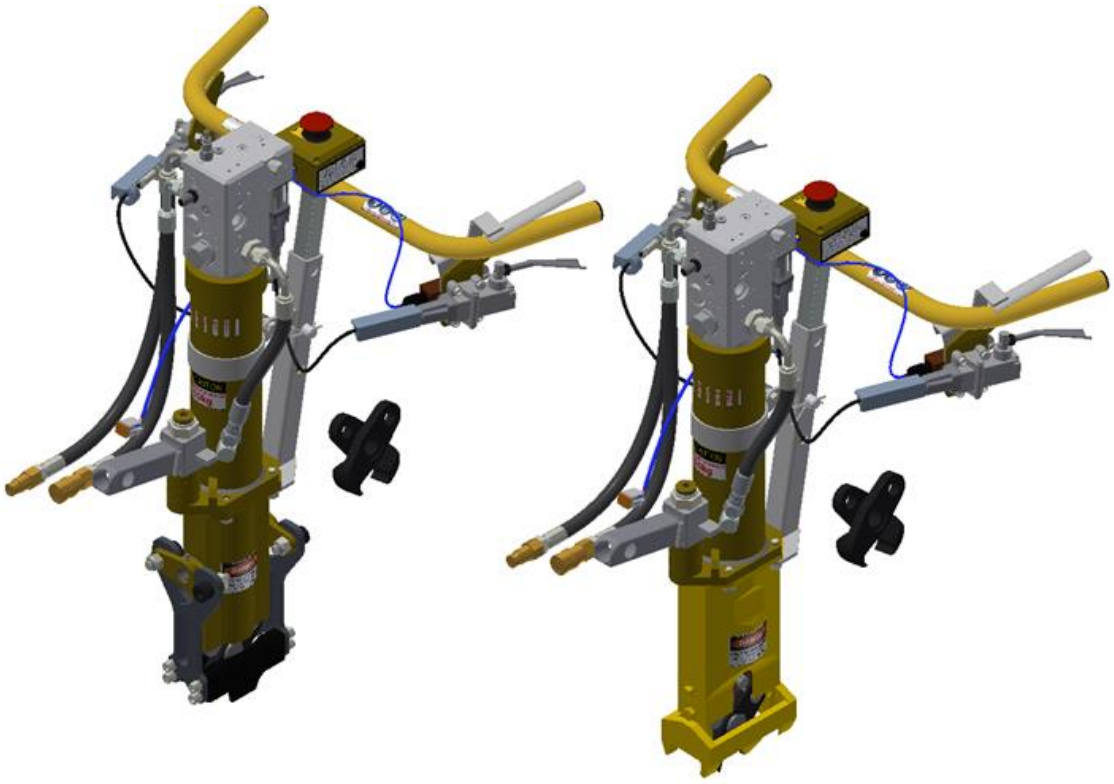
Melvelle Equipment Corp Pty Ltd

"Proud Australian Manufacturers"

108 - Spike Puller

Operation Manual



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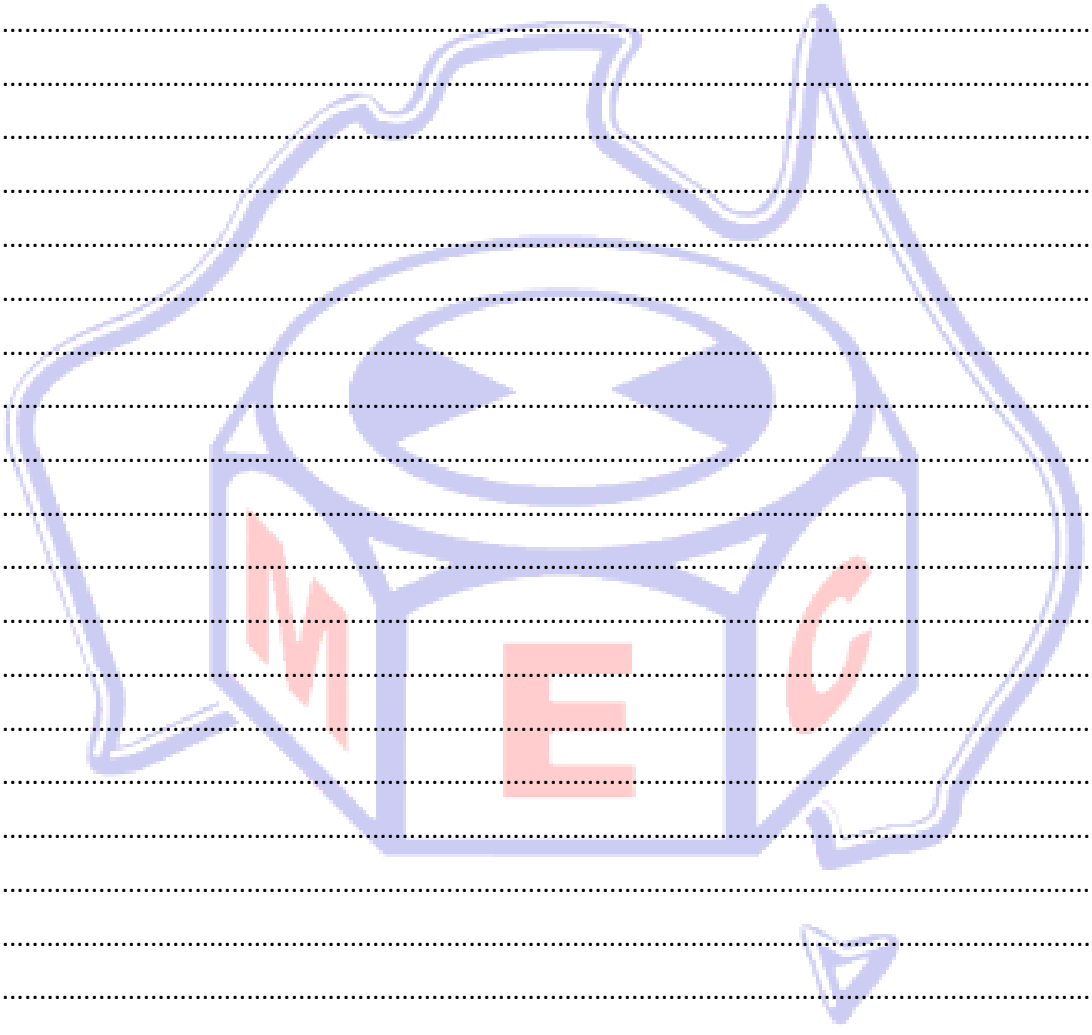

Document Edition: 1.3

Updated Date: 14th February 2020

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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 Spike Puller 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 108 Spike Puller

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.

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.

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.

WARNING

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

WARNING

Wear personal protective equipment around this machinery.
For example: safety glasses, hearing protection, head protection, protective clothing and safety shoes at all times.

WARNING

Accidental Starts can cause severe death or injury.
Disable engine by disconnecting negative (-) battery cable. Ensure machinery is started in the neutral position.

WARNING

Rotating parts can cause severe injury
Stay away whilst machine is in operation. Ensure ALL guarding is in place and secured before operation.

WARNING

Hot parts can cause severe burns.
Do not touch machinery whilst in operation.

WARNING

Carbon monoxide can cause severe nausea, fainting or death.
Avoid inhaling exhaust fumes and never operate the engine in a closed or refined area.

WARNING

Fuel can cause fires and severe burns.
Do not fill the fuel tank while the engine is hot or running.

WARNING

Explosive gas can cause fires and severe acid burns.
Charge battery only in a well-ventilated area. Keep sources of ignition away.

WARNING

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.

WARNING

Clamping parts can cause severe injury.
Stay away whilst machine is in operation. Ensure ALL guarding is in place and secured before operation.

WARNING

Loose hair, clothing and jewellery can cause severe injury.

CAUTION

Electrical shock can cause injury. Do not touch wires whilst engine is running.

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

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

WARNING

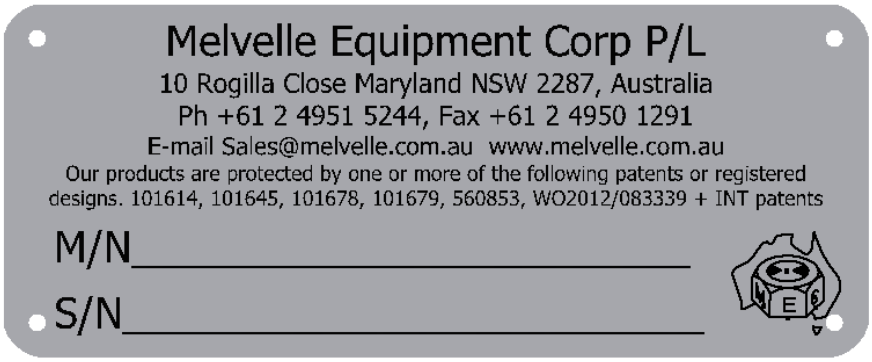
Ignition sources can cause fires and severe burns. There is <u>not</u> to be a fire, naked flame, ignition sources or smoking around any MEC machinery.

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.

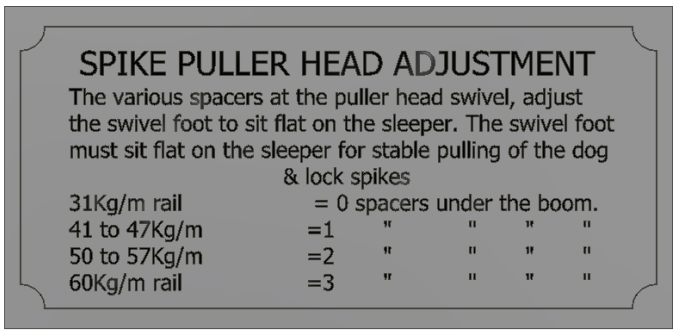
5. Equipment Stickers & Tags

Below are the stickers and tags utilised on this equipment.



IDTAG02 – Model & Serial No. Tag

IDTAG12 – Emergency Stop Warning Label



IDRLHEI - Rail Height Spacer Tag

LAB0003 – Melvelle Newcastle Sticker

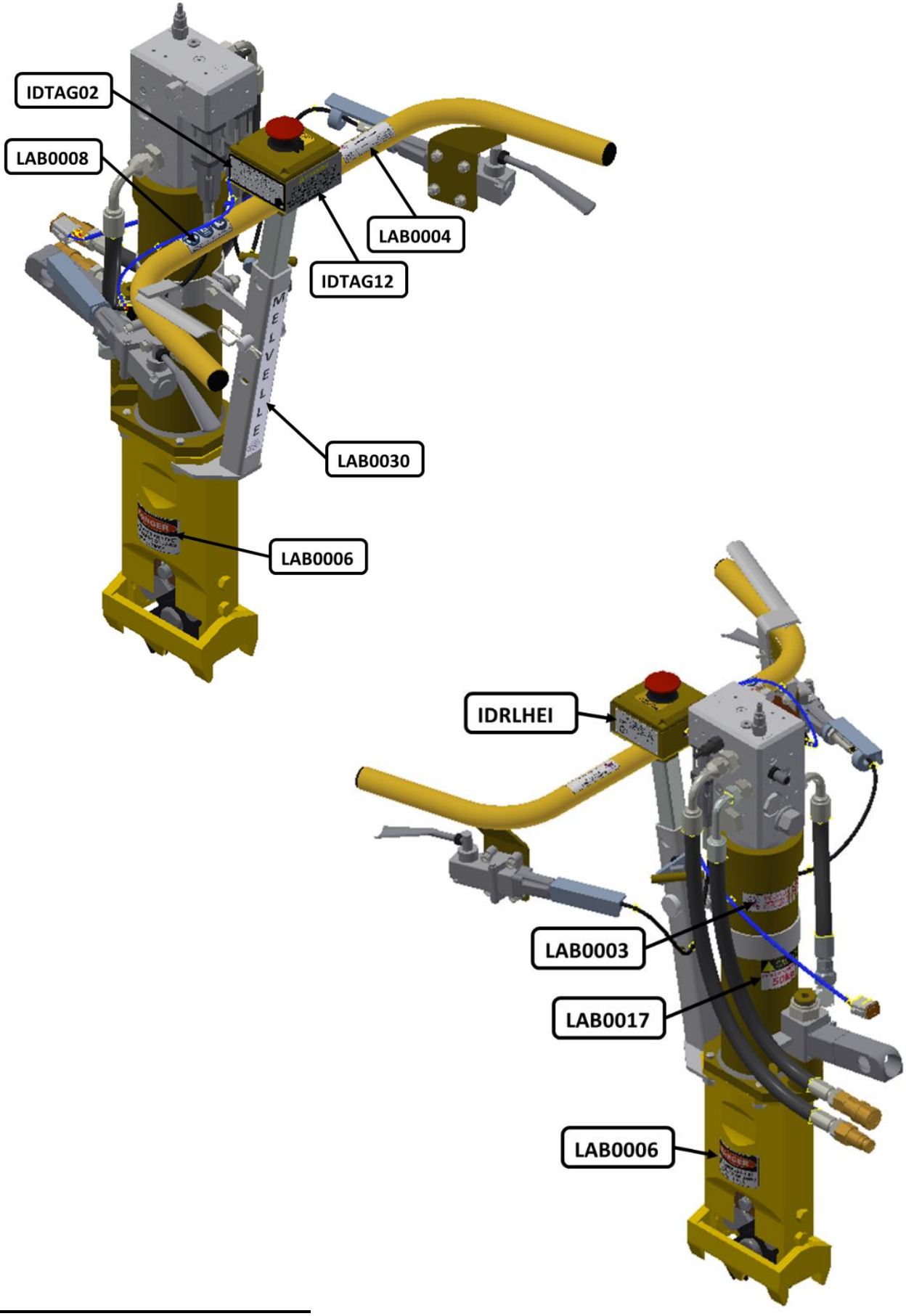
LAB0004 – Melvelle Achieving Excellence Sticker

LAB0006 – Danger – Keep Hands and Feet Clear Sticker

LAB0008 – Safety Label

LAB0017 - Approximate Weight 50Kg

5.1. Sticker Location



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
- Dedicated machines have a dedicated Emergency Stop to the power pack – they are wired into the machine
- Trackpacks fitted with a wiring harness **WIIL 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

7. Introduction

Melvelle Equipment Corp Pty Ltd (MEC) supply spike pullers to the rail industry. The 108 spike puller is designed to remove both dog and lock spikes used in fastening rail plates to sleepers. The 108 spike puller has the ability to be used on rail sizes from 31kg/m to 68kg/m rail with a variety of rail plates.

The 108 work head removes both dog and lock spikes using hydraulic force rather than operator exertion. This significantly improves efficiency and eliminates manual handling hazards associated with removing rail spikes.

Producing 9.5 tonnes of force, spikes in swollen sleepers are easily removed. The 108 spike puller can remove spikes quickly and with ease reducing removal time and effort.

The 108 work head is packed with features making it a valuable tool for track maintenance and construction. They include:

- Quick change between style of jaws (dog and lock spike)
- Maintenance free – no greasing
- Ergonomic, height adjustable handles
- Precisely balanced – only 3-5 kg on operator
- Lifting bar

With safety being Melvelle's 1st priority the 108 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
- All hydraulic hoses are fitted with hose protection

8. Specifications

8.1. FP-108-AU

Engine	13HP Honda® Petrol Recoil Start
Dimensions	2000mm long x 740mm wide x 1100mm high
Weight (wet)	130kg
Pressure System (max)	182.5bar / 2650psi
Pump Flow	32.5L/min
Fuel Type	Petrol
Battery	N/A
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½”
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	62bar / 900psi

8.2. FP-108-BR

Engine	13HP Honda® Petrol Electrical Start
Dimensions	2000mm long x 740mm wide x 1100mm high
Weight (wet)	140kg
Pressure System (max)	182.5bar / 2650psi
Pump Flow	32.5L/min
Fuel Type	Petrol
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½”
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	62bar / 900psi

8.3. FP-108-EE

Engine	7HP Yanmar® Diesel Electric Start
Dimensions	2000mm long x 740mm wide x 1100mm high
Weight (wet)	145kg
Pressure System (max)	182.5bar / 2650psi
Pump Flow	30L/min
Fuel Type	Diesel
Battery	12V
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½”
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	62bar / 900psi

8.4. FP-108-YE

Engine	7HP Yanmar® Diesel Electric Start
Dimensions	2200mm long x 740mm wide x 1000mm high
Weight (wet)	167kg
Pressure System (max)	150.5bar / 2182.8psi @ 15 L/min (2200 rpm)
Pump Flow	24L/min @ 100 Bar/1450 psi (3600 rpm)
Fuel Type	Diesel
Battery	12V
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½"
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	55bar / 800psi

8.5. FP-108-EN /F

Engine	MEC Trackpack
Dimensions	500mm long x 400mm wide x 1100mm high
Weight (wet)	41kg
Pressure (max)	182.5bar / 2650psi
Pump Flow	32.5L/min
Fuel Type	MEC Trackpack
Battery if Applicable	12V
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½"
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	62bar / 900psi

8.6. FP-108-TP/F

Engine	MEC Trackpack
Dimensions	500mm long x 400mm wide x 1100mm high
Weight (wet)	56kg
Pressure (max)	182.5bar / 2650psi
Pump Flow	32.5L/min
Fuel Type	MEC Trackpack
Battery if Applicable	12V
Hydraulic Oil*	ISO68
Hydraulic Hose Connection Size	½"
Pressure Settings:	
Pressure set on Relief	182.5bar / 2650psi
Pressure set on Kickdown	55bar / 800psi

*The type of hydraulic oil depends on ambient air temperatures. ISO68 is a good, general purpose oil for ambient conditions between 10-30°C. If the ambient temperature is between 0-10°C use the next lighter oil grade. If the ambient temperature is between 30-50°C, use the next heavier oil grade.

9. Operation

9.1. 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. 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

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

Halogen 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

Emergency Stop

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

Jaws

1. Inspect both jaws for damage and wear before use
2. Ensure the jaws are free to slide and rotate
3. If damaged or excessive wear seen, replace jaws as a pair

Braking System

1. If an electric brake switch is being used ensure the wires are free from damage and connections are clean and dry.

2. If a manual pull style cable is being used ensure the cable is free from kinks and damage and the adjustment is correct

3. Ensure the brake lever operates smoothly and freely.

4. Ensure the brake hose is free from damage and connects to the trolley.

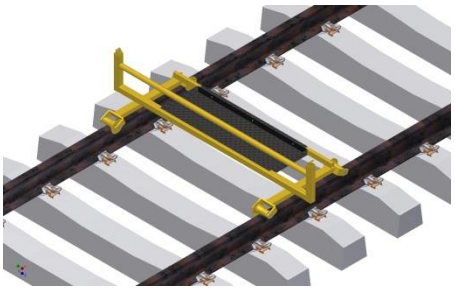
9.2. Assembly Procedures

WARNING

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

9.2.1. Machine Trolley

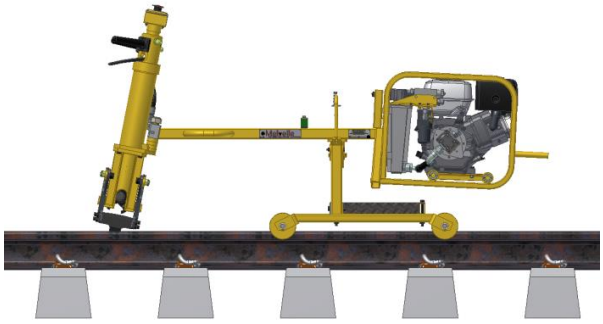
1. Inspect the trolley and ensure it is not damaged and free from defects.

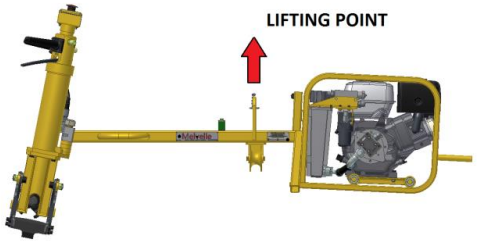


2. The machine trolley weighs approximately 36kg. Using a minimum of 2 people or certified lifting device, lift the trolley onto the rail lines. This can be achieved by lifting from the cross bar (tube).
3. Ensure the trolley sits stationary until the Spike Puller is assembled to it.

9.2.2. Machine Assembly – Dedicated 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 Spike Puller and ensure it is not damaged and is free from defects.
3. A dedicated Spike Puller Machine weighs approximately 150kg. Using a certified lifting device (min 200kg), 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).





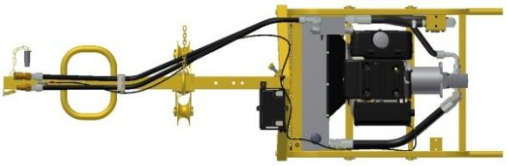
⚠ CAUTION

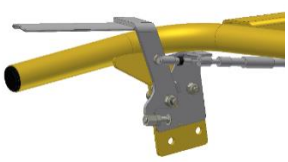
When placing the machine onto the trolley, ensure hands are clear of the cross trolley rollers and cross bar (tube) as personal injury may occur.

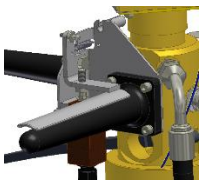
5. By attaching the Spike puller to the trolley, the head will rest on the ground and stop the trolley from moving.
6. Remove the slings and/or hooks. The machine can now be moved to either rail for use. This is achieved by raising the head off the ground and sliding across the trolley. A second person may be required to assist and push the engine across the trolley.
7. Attach the chain to the trolley to ensure the machine will not roll during operation.
   The machine is now ready for use.

9.2.3. 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 Spike puller Head and Trackpack and ensure they are not damaged and are free from defects.
3. A Trackpack Spike puller Head weighs approximately 45 kg and a Trackpack weighs approximately 100kg.
4. Place the work head onto ground standing upright (Follow safe lifting procedures)
5. Adjust the pivot position (cross trolley rollers) to the correct position for the machine. For the Spike puller this is the second hole from the engine (refer further document drawing for pin locations). Attach slings to the Trackpack.
6. By following safe lifting procedures, lift the Trackpack using slings ensuring it is kept level and easy to move.
7. Using at least two people hold the Work head steady and 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. Lower the Trackpack to the ground and remove the slings.
8. Connect the hydraulic quick snaps, electrical connector plug as well as the manual pull brake cable if fitted to the track pack.
9. The Trackpack and work head are now attached and can be lifted onto the machine trolley. Refer above for procedure on attaching to machine trolley.







9.2.4. Machine Adjustment – Rail Size

The Spike puller machine has the ability to be utilised on 31-68kg rail and those in between. This is achieved through the use of predetermined spacers under the front pivot pin for each of the rail sizes. These are:

Rail Size	Spacer placement
31kg/m	No Spacers under the boom
41-47kg/m	1 spacer under the boom
53-57kg/m	2 spacers under the boom
60-68kg/m	3 spacers under the boom

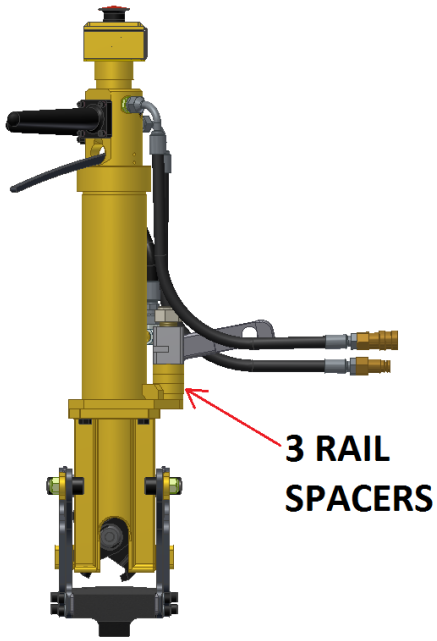
To adjust the Spike Puller:

1. Ensure the machine is off and safe to be worked on.

2. Support Work head and loosen nut at end of boom that allows rotation of the Work head

3. Separate the head and boom and place the correct number of spacers from the table above onto the work head pin. Slide the boom back onto the head and place the rest of the spacers onto of the boom so the spacers are not lost. Tighten the nut back up.

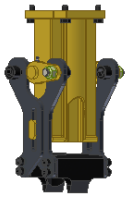
4. For correct alignment the workhead must be square and perpendicular to the sleeper. Incorrect adjustment can lead to excessive kicking of the machine.



9.2.5. Jaw Selection

The Spike Puller machine has the ability to both remove lock spikes and dog spikes with the use of different jaws (Note: Machine is originally supplied with both sets of jaws)

1. Support the work head of the machine so clear access can be gained to the lower portion of the work head
2. Remove the lower swivelling jaw assembly by the 4 bolts
3. Remove the pin holding the jaws together and swap out with the correct jaws as shown below.
4. Reassemble the jaw housing



Lock Spike Jaw

Dog Spike Jaw

9.3. Operation Procedures

9.3.1. Starting the Engine – Electric Start[1]

1. Observe all safety precautions
2. Ensure all pre-operation checks have been conducted
3. Ensure the Spike Puller is on safe and steady grounding (no excessive slopes or dangerous terrain conditions)
4. Attach tooling hoses to power pack. Ensure the snap connectors are clean and tool is in 'NEUTRAL' position (trigger in fully down position)
5. Ensure Emergency Stop is electrically connected to power pack and not engaged
6. Ensure Fuel Solenoid switch is down (if applicable)
7. Place the throttle at 50% power
8. Turn the key to its first position (on position)
9. Turn key to second position (starting position). Hold until engine starts and the release, allowing the key to return to its first position
10. Place throttle in idle (min) position and allow engine to warm up – refer manufacturers manual for required times
11. Move throttle to required rpm position, normally full throttle[2]
12. 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

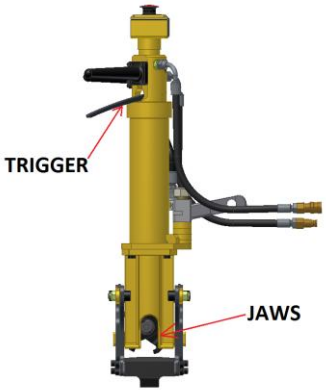
9.3.2. Starting the Engine – Recoil Start[1]

1. Observe all safety precautions
2. Ensure all pre-operation checks have been conducted
3. Ensure the Spike Puller is on safe and steady grounding (no excessive slopes or dangerous terrain conditions)
4. Attach tooling hoses to power pack. Ensure the snap connectors are clean and tool is in 'NEUTRAL' position (trigger fully down)
5. Ensure Emergency Stop is electrically connected to power pack and not engaged
6. Ensure Fuel Solenoid switch is down (if applicable)
7. Place the throttle at 50% power
8. Turn the key to its first position (on position)
9. Hold the grip and pull the cord until compression is found
10. Completely rewind the cord (allow to retract)
11. Operate the decompression lever (push down)
12. Using two hands, firmly and quickly pull the cord to start
13. Place throttle in idle (min) position and allow engine to warm up – refer manufacturers manual for required times
14. Place throttle at required rpm position, normally full throttle[2]
15. 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

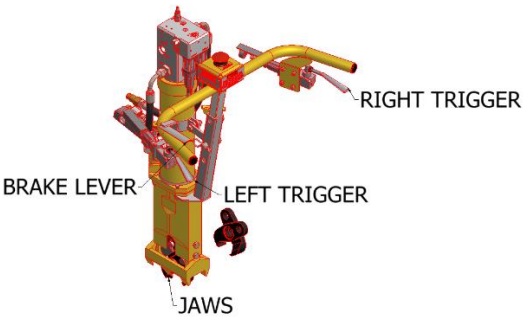
9.3.3. Equipment Operation – Spike pulling old version

1. Observe all safety precautions
2. Ensure all pre-operation checks have been conducted
3. Ensure the Spike Puller is on safe and steady grounding (no excessive slopes or dangerous terrain conditions)
4. Ensure the correct spacers are under the workhead. (Refer pre operation checks for details)
5. Start the engine as per Starting the Engine instructions (listed above)
6. Pull the trigger up to the first position to extend the cylinder down to expose the jaws.
7. Depress the brake lever and place the Work head over the Spike making contact between the jaws and the spike. Squeeze the trigger to engage the cylinder and to pull the spike out. NOTE - Actual equipment operation is performed between the top position and middle position of the trigger. Bottom position is only for starting/stopping the engine (neutral position)
8. Release the trigger to lower the jaws and allow the spike to fall onto the ground
9. Move onto the next spike and repeat the process.

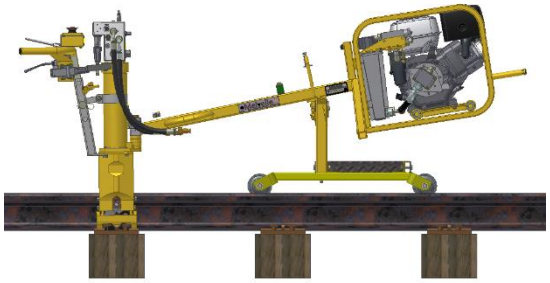


9.3.4. Equipment Operation – Spike Pulling Dead man handle

1. Observe all safety precautions
2. Ensure all pre-operation checks have been conducted
3. Ensure the Spike Puller is on safe and steady grounding (no excessive slopes or dangerous terrain conditions)
4. Ensure the correct spacers are under the workhead. (Refer pre operation checks for details)
5. Start the engine as per starting the engine instructions (listed above)



6. Pull the left trigger up to extend the cylinder down to expose the jaws.
7. Depress the brake lever and place the Work head over the Spike making contact between the jaws and the spike. Squeeze the right trigger to engage the cylinder and to pull the spike out. Allow the cylinder to travel to the top of its stroke to ensure the jaws open to release the spike.
8. Release the right trigger to lower the jaws back down to expose the jaws.
9. Move onto the next spike and repeat the process.



9.3.5. 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

9.3.6. 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 Further Documents for details
5. Using a certified lifting device to >200kg, lift the machinery to required position

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

10. 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

11. Maintenance

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 lines	Check		X			
Fuel Filter	Change					X
Air cleaner	Clean		X			
Engine cooling fins	Clean					X
Rocker arms clearance	Check & set					X (2)
Injectors	Clean & set					X (2)
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)		X (4)
Battery	Check	X				
Grease Nipples	Fill			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

12. 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
	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
Cylinder Will not extend	Damaged spool	Check/replace spool/seals
	No oil flow	Check circuit and pressures
	Damaged seals	Replace seals
	Damaged rod or piston	Inspect for straightness. Replace if out of tolerance.

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

13. Further Documents

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

Further documents for the 108 Spike Puller:

13.1. Operational Risk Assessment

	Machine: FP-108 - SPIKE PULLER								Form No.: :	
	ABN								Issue Date	26/04/2012
	WORKPLACE GENERIC HIRARC FORM								Version:	0

Company	**MELVELLE EQUIPMENT CORP**	**Department / Workplace:**	**Melvelle Offices**	**Date of Assessment 26-4-2012**	**Commenced:**	9am	**Completed:**	10am

Scope of Assessment: Identify the risks and hazards associated with the operation of a rail maintenance machine to remove spikes from railway sleepers in situ tracks.

Names of Risk Assessment Team: Gary Morris, Adrian Gersbach	**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,

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**

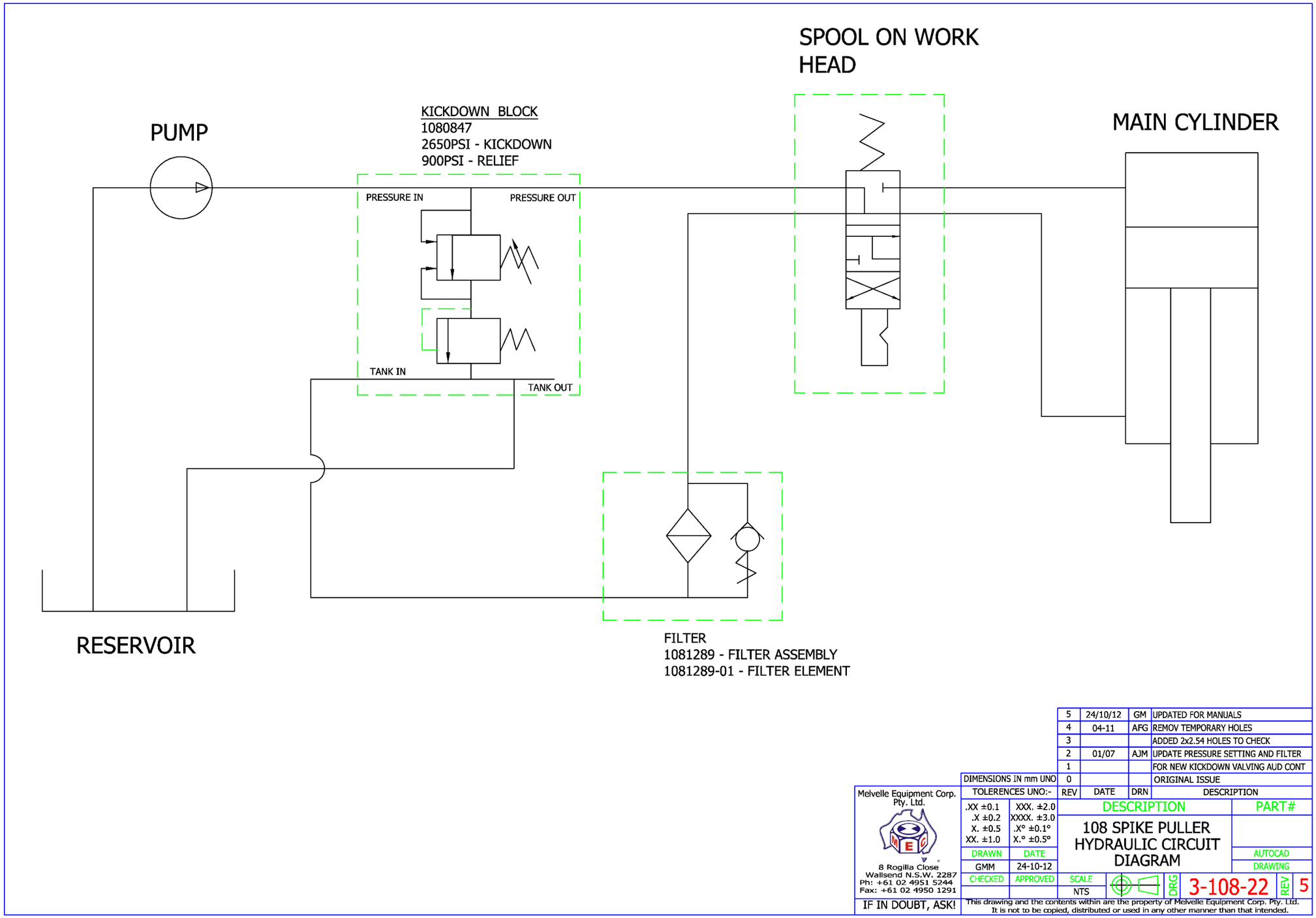
LEGEND	**ACTION REQUIRED**	**NOTIFY**
LOW 1-6	Tolerable - Manage by Routine Procedures	
MEDIUM 7-13	Risk reduction required to "As low as Reasonably Practicable" ALARP	Design Team/Engineer
HIGH 14-20	Immediate action required to reduce risk. Authorisation required before proceeding on task	CEO
EXTREME 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	Serious	Rare	6	Y	Document lifting points	
	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	Documented in trackpack manual	
	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	Pre start checklist	
	Exposure to hazardous materials such as fuel and oils	Significant	Likely	10	Hazardous material documentation in MSDS.	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		
	Inhalation of exhaust fumes	Significant	Possible	9	Operation in a ventilated area	Significant	Rare	4	Y		
	Injury can occur through connection of quick snap connections	Minor	Possible	3	Must be connected parellel to each other.	Minor	Rare	1	Y		
	General machine operation	Significant	Likely	10	Procedures developed such as prestart checklist	Significant	Rare	4	Y	Pre start checklist	
	Injury through oil injection through hydraulic failure	Serious	Possible	12	Checking of all hydraulics eg Hose's for damage	Serious	Rare	6	Y	Procedure on hose checks	
	Loud noise from engine and machine causing permanent hearing damage	Serious	Likely	15	Manufacturer specifications rate the motor at 94dba at 1m.Motor fitted with muffler. Operator required 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	
	Crushing injury through falling machine if incorrectly supported	Serious	Likely	15	Correctly secured to rail trolley and powerpack (if applicabe)	Serious	Rare	6	Y		
	Pinch points exist through the connection of power pack to trolley and powerpack to work head	Significant	Possible	9	Procedure shown 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,	Serious	Rare	6	Y		
	Injury through Kicking/jerking of machine under incorrect alignment	Minor	Likely	7	Correct training in machine use through manual. Use of correct head alignment spacers for rail height	Minor	Unlikely	2	Y		
	Injury of crushing through Workhead being in engaged position	Serious	Likely	15	Correct training of operation of machine. Handle spring loaded to leave machine in neutral position	Serious	Rare	6	Y		
	Pinch points exist on workhead's swiveling foot	Significant	Likely	10	Correct operation procedures.	Significant	Rare	4	Y		

13.2. 108 Spike Puller Hydraulic circuit diagram



REV	DATE	DRN	DESCRIPTION
5	24/10/12	GM	UPDATED FOR MANUALS
4	04-11	AFG	REMOV TEMPORARY HOLES
3			ADDED 2x2.54 HOLES TO CHECK
2	01/07	AJM	UPDATE PRESSURE SETTING AND FILTER
1			FOR NEW KICKDOWN VALVING AUD CONT
0			ORIGINAL ISSUE

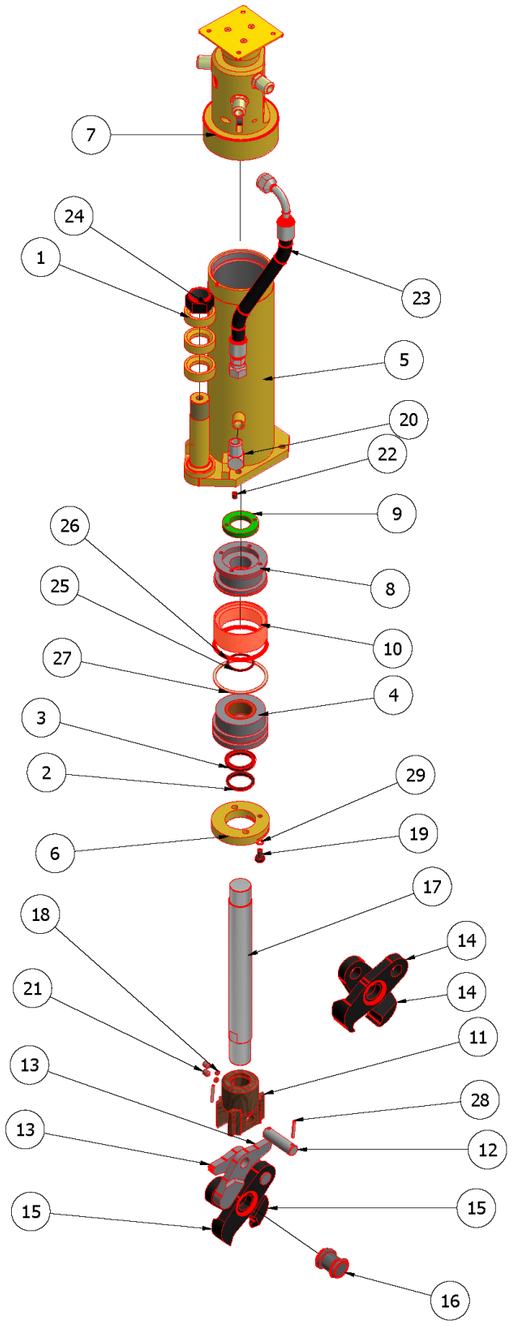
Melvelle Equipment Corp. Pty. Ltd.
8 Rogilla Close
Wallsend N.S.W. 2287
Ph: +61 02 4951 5244
Fax: +61 02 4950 1291
IF IN DOUBT, ASK!

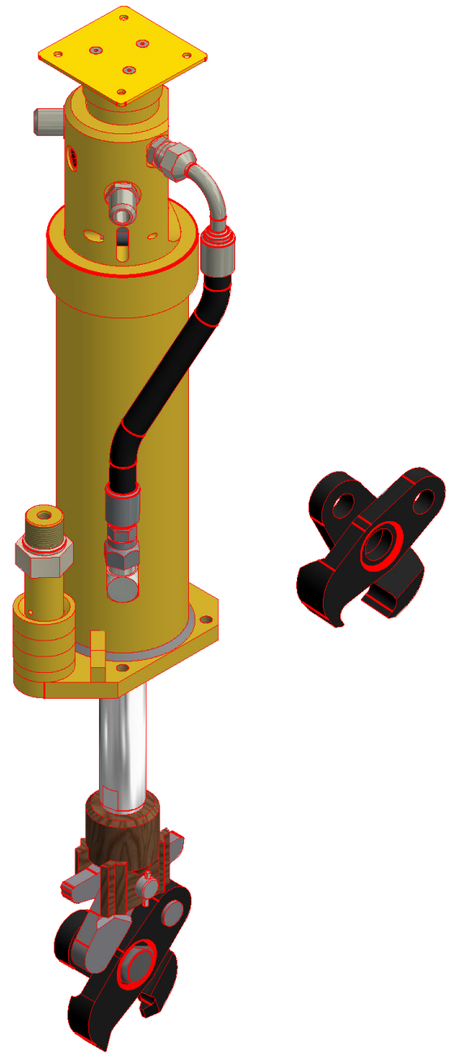
DIMENSIONS IN mm UNO
TOLERENCES UNO:-
.XX ±0.1 XXX. ±2.0
.X ±0.2 XXXX. ±3.0
X. ±0.5 .X° ±0.1°
XX. ±1.0 X.° ±0.5°

DESCRIPTION: 108 SPIKE PULLER HYDRAULIC CIRCUIT DIAGRAM
PART#:
AUTOCAD DRAWING:
DRAWN: GMM 24-10-12
CHECKED: APPROVED:
SCALE: NTS
DRG: 3-108-22 REV: 5

13.3. MEC Base Level Head (Main Parts)

NOTES
SKOTCH KEY PISTON
TO PISTON LOCK NUT





ITEM	QTY	DESCRIPTION	PART NUMBER
29	1	5/16" SPRING WASHER	SW05
28	2	SEL LOK PIN 3/16in x 1-1/4in	R18732
27	1	BACK UP WASHER 3-1/8` x 3-1/2`	OR8338
26	1	ORING 3-1/8" x 3-1/2" x 3/16" CS	OR2338
25	1	O RING	OR2222
24	1	NUT 1-1/4` UNF HALF NYLOC	N20NFNH
23	1	H082 + MCJF-1408 + 00302 + MCJF90M-01408	H082-00400-005
22	1	GRUB SCREW M8 x 10	GRSM0810
21	2	GRUB SCREW 3/8" UNC x 3/8" LG	GRSC0606
20	1	ELBOW 90 M/M 3/8"BSPT X 7/8"JIC	CB56-0614
19	1	BOLT METRIC M8 X 16LG ZINC GR8.8	BM0816
18	2	CLEVIS LOCK COPPER SCREW THREAD	1081237
17	1	PISTON ROD 8T	1081224
16	1	JAW PIVOT ASSEMBLY	1080508
15	2	JAWS DOG SPIKE JAWS	1080507
14	2	JAWS-LOCK SPIKE	1080506
13	2	JAW SPIKE RELEASE CAMS	1080505
12	1	SPIKE PULLER CLEVIS PIN	1080502
11	1	SPIKE PULLER CLEVIS	1080501
10	1	PISTON SEAL 8T	1080311
9	1	PISTON LOCKNUT	1080309
8	1	PISTON 8T	1080306
7	1	VALVE HEAD ASSEMBLY	1080098
6	1	GLAND LOCKNUT-3.5DIA CYL 8T AND BOLT	1080049
5	1	CYLINDER 3.5ID MODEL 8T	1080045
4	1	GLAND BODY-MODEL 8T	1080041
3	1	U CUP GLAND SEAL	1080037
2	1	GLAND ROD WIPER 1.5DIA	1080035
1	3	CYLINDER RAIL HEIGHT ADJUST RINGS	1080016

MATERIAL/CUT LIST

REV	DATE	DRN	DESCRIPTION
5	18/2/2014	GM	REMOVED FOOT. ADDED TO TOP LEVEL AS CRF858
4	15/7/11	GM	CHANGED TO SELF LEVELLING HEAD AS CRF334
3	21/10/2010	GM	MOVED TO INVENTOR DRAWING
2	5/3/2008	KH	CLOSED BOTTOM OF VALVE HEAD AND REMOVED BRONZE BUSH
1			ADDED QUICK CHANGE BOOM MOUNT
0	21/10/2010		ORIGINAL ISSUE

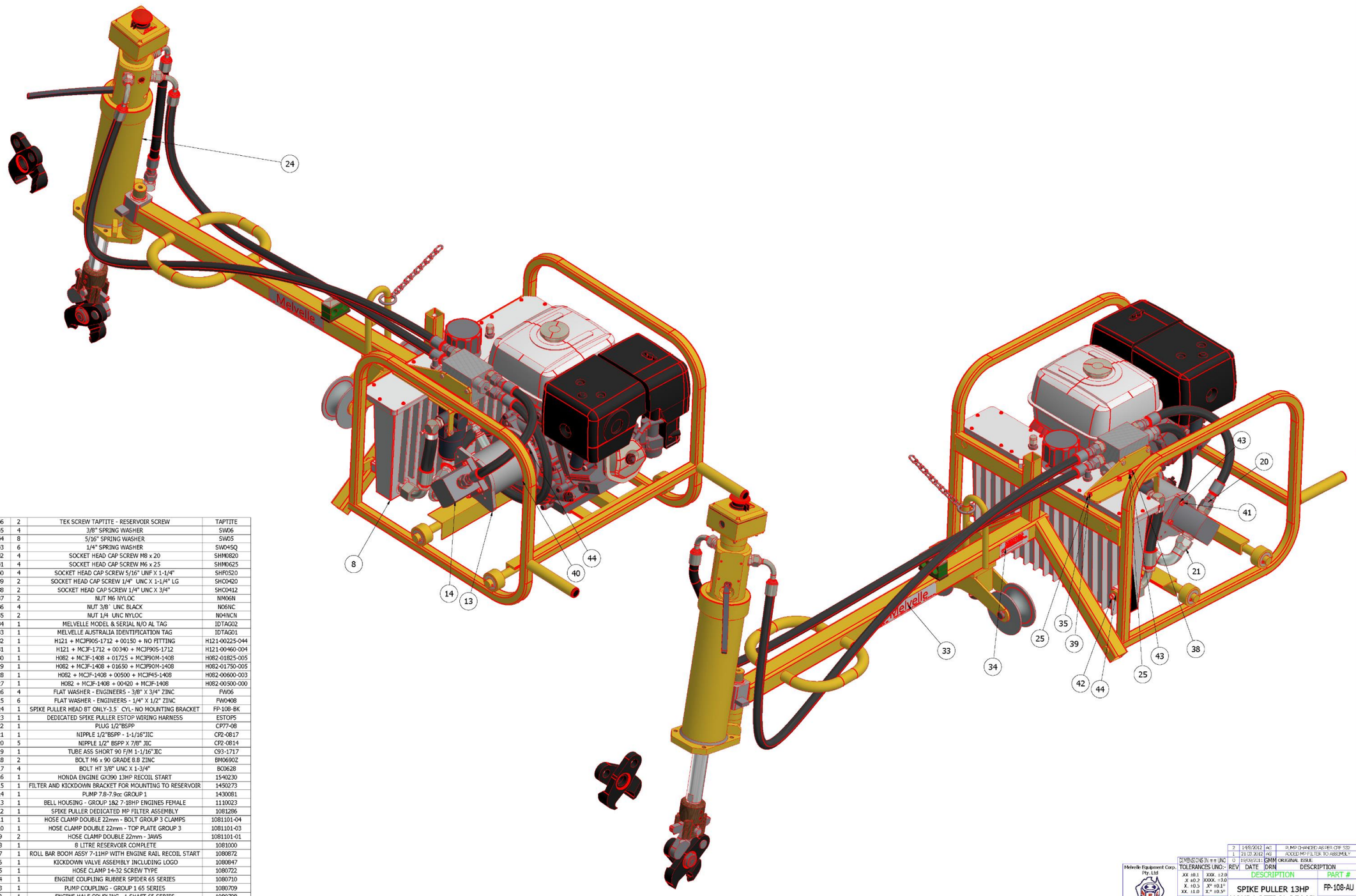
DIMENSIONS IN mm UNO
TOLERANCES UNO:- .XX ±0.1 .X ±0.2 X. ±0.5 XX. ±1.0 XXX. ±2.0 XXXX. ±3.0 .X° ±0.1° X.° ±0.5°

Melrelle 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!

DESCRIPTION: SPIKE PULLER HEAD 8T ONLY-3.5` CYL- NO MOUNTING BRACKET
PART #: FP-108-BK
DRAWN: garyM 21/10/2010
MODELLED BY: garyM
CHECKED: AG
APPROVED: AG
SCALE:
DRG: 2-108-101
REV: 5

13.4. Honda Petrol Recoil Start Dedicated Machine



ITEM	QTY	DESCRIPTION	PART NUMBER
46	2	TEK SCREW TAPTITE - RESERVOIR SCREW	TAPTITE
45	4	3/8" SPRING WASHER	SW06
44	8	5/16" SPRING WASHER	SW05
43	6	1/4" SPRING WASHER	SW045Q
42	4	SOCKET HEAD CAP SCREW M8 x 20	SHM0820
41	4	SOCKET HEAD CAP SCREW M6 x 25	SHM0625
40	4	SOCKET HEAD CAP SCREW 5/16" UNF X 1-1/4"	SHF0520
39	2	SOCKET HEAD CAP SCREW 1/4" UNC X 1-1/4" LG	SHC0420
38	2	SOCKET HEAD CAP SCREW 1/4" UNC X 3/4"	SHC0412
37	2	NUT M6 NYLOC	NM06N
36	4	NUT 3/8" UNC BLACK	N06NC
35	2	NUT 1/4 UNC NYLOC	N04NCN
34	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
33	1	MELVELLE AUSTRALIA IDENTIFICATION TAG	IDTAG01
32	1	H121 + MCJF90S-1712 + 00150 + NO FITTING	H121-00225-044
31	1	H121 + MCJF-1712 + 00340 + MCJF90S-1712	H121-00460-004
30	1	H082 + MCJF-1408 + 01725 + MCJF90M-1408	H082-01825-005
29	1	H082 + MCJF-1408 + 01650 + MCJF90M-1408	H082-01750-005
28	1	H082 + MCJF-1408 + 00500 + MCJF45-1408	H082-00600-003
27	1	H082 + MCJF-1408 + 00420 + MCJF-1408	H082-00500-000
26	4	FLAT WASHER - ENGINEERS - 3/8" X 3/4" ZINC	FW06
25	6	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
24	1	SPIKE PULLER HEAD 8T ONLY-3.5" CYL- NO MOUNTING BRACKET	FP-108-BK
23	1	DEDICATED SPIKE PULLER ESTOP WIRING HARNESS	ESTOP5
22	1	PLUG 1/2"BSPP	CP77-08
21	1	NIPPLE 1/2"BSPP - 1-1/16"JIC	CP2-0817
20	5	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814
19	1	TUBE ASS SHORT 90 F/M 1-1/16" JIC	C93-1717
18	2	BOLT M6 x 90 GRADE 8.8 ZINC	BM0690Z
17	4	BOLT HT 3/8" UNC X 1-3/4"	BC0628
16	1	HONDA ENGINE GX390 13HP RECOIL START	1540230
15	1	FILTER AND KICKDOWN BRACKET FOR MOUNTING TO RESERVOIR	1450273
14	1	PUMP 7.8-7.9cc GROUP 1	1430081
13	1	BELL HOUSING - GROUP 1&2 7-18HP ENGINES FEMALE	1110023
12	1	SPIKE PULLER DEDICATED MP FILTER ASSEMBLY	1081286
11	1	HOSE CLAMP DOUBLE 22mm - BOLT GROUP 3 CLAMPS	1081101-04
10	1	HOSE CLAMP DOUBLE 22mm - TOP PLATE GROUP 3	1081101-03
9	2	HOSE CLAMP DOUBLE 22mm - JAWS	1081101-01
8	1	8 LITRE RESERVOIR COMPLETE	1081000
7	1	ROLL BAR BOOM ASSY 7-11HP WITH ENGINE RAIL RECOIL START	1080872
6	1	KICKDOWN VALVE ASSEMBLY INCLUDING LOGO	1080847
5	1	HOSE CLAMP 14-32 SCREW TYPE	1080722
4	1	ENGINE COUPLING RUBBER SPIDER 65 SERIES	1080710
3	1	PUMP COUPLING - GROUP 1 65 SERIES	1080709
2	1	ENGINE HALF COUPLING - 1 SHAFT 65 SERIES	1080708
1	1	PUMP HEAT GASKET - GRP 1	1080058

MATERIAL/CUT LIST

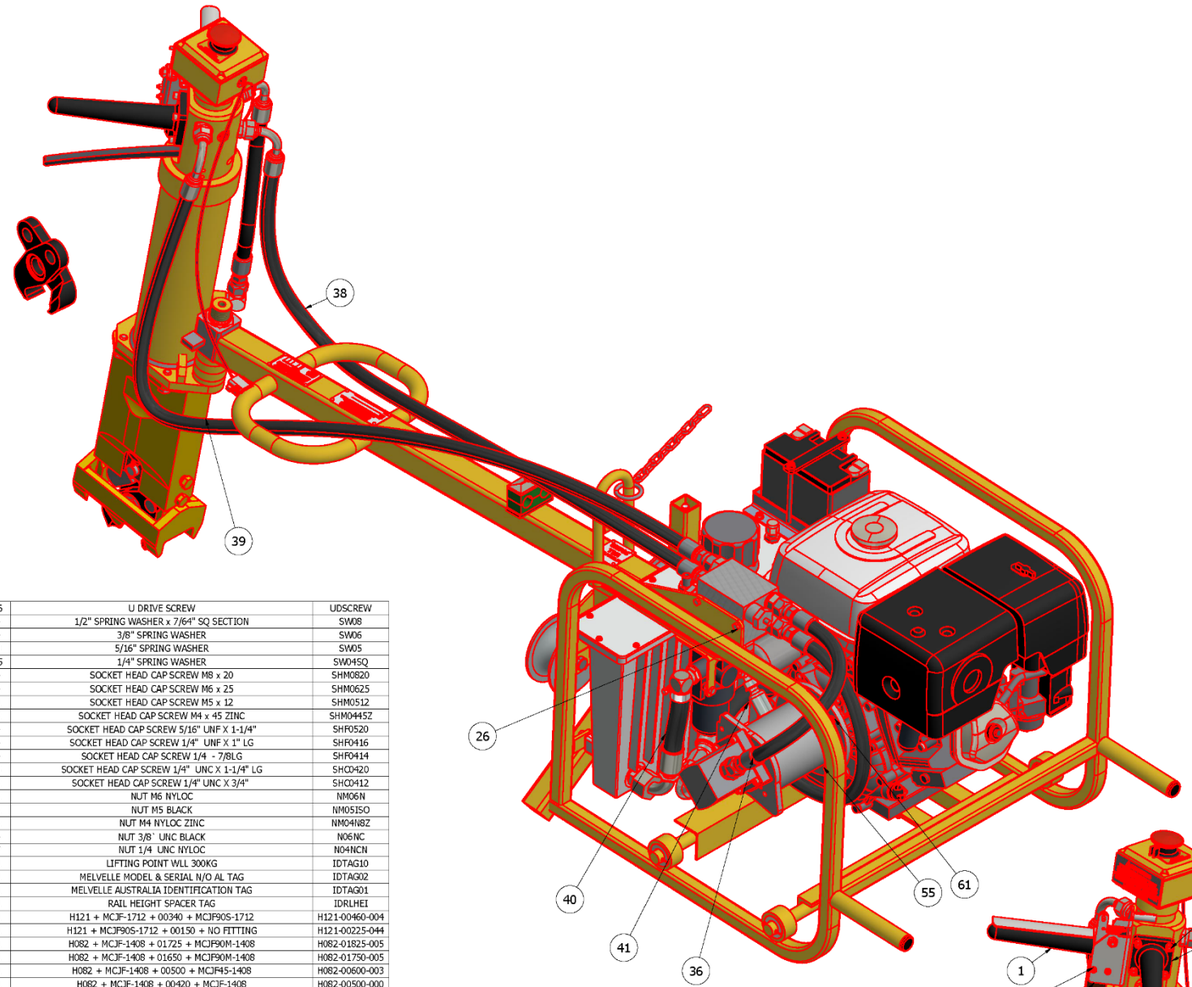
REV	DATE	DRN	DESCRIPTION
2	14/8/2012	AC	PUMP CHANGED AS PER ECR 320
1	21/2/2012	AG	ADDED MP FILTER TO ASSEMBLY
0	19/03/2011	GMM	ORIGINAL ISSUE

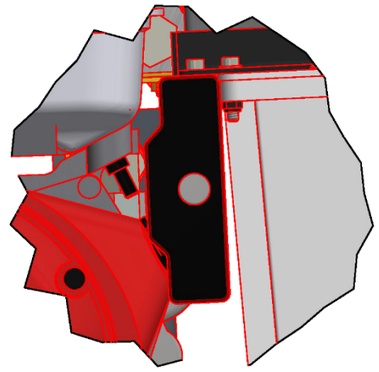
Melvelle Equipment Corp. Pty. Ltd
8 Rogilla Close
Wallsend N.S.W 2287
Ph: +61 02 4951 5244
Fax: +61 02 4950 1291

DIMENSIONS IN mm UNC
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°
IF IN DOUBT, ASK!

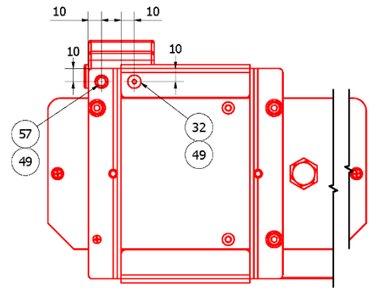
DESCRIPTION: SPIKE PULLER 13HP HONDA PETROL RECOIL
PART #: FP-108-AU
DRAWN: garym 19/04/2011
MODELLED BY: garym
CHECKED
APPROVED
SCALE: 1:4
DWG NO: 1-108-202
REV: 2

13.5. Honda Petrol Electric Start Dedicated Machine

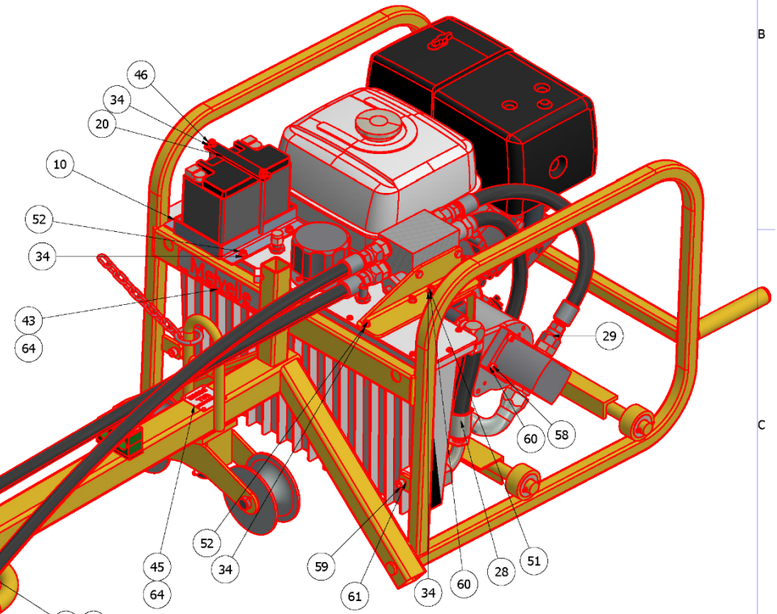


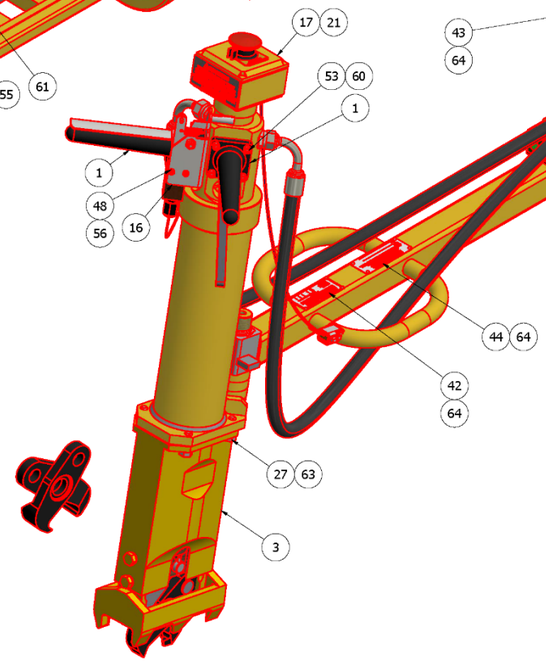


KEY START MOUNTING (2:3)



SWITCH MOUNTING DETAILS
SCALE: 1 : 2





ITEM	QTY	DESCRIPTION	PART NUMBER
64	16	U DRIVE SCREW	UDSCREW
63	4	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08
62	4	3/8" SPRING WASHER	SW06
61	8	5/16" SPRING WASHER	SW05
60	15	1/4" SPRING WASHER	SW04SQ
59	4	SOCKET HEAD CAP SCREW M8 x 20	SHM0820
58	4	SOCKET HEAD CAP SCREW M6 x 25	SHM0625
57	1	SOCKET HEAD CAP SCREW M5 x 12	SHM0512
56	2	SOCKET HEAD CAP SCREW M4 x 45 ZINC	SHM0445Z
55	4	SOCKET HEAD CAP SCREW 5/16" UNF X 1-1/4"	SHF0520
54	4	SOCKET HEAD CAP SCREW 1/4" UNF X 1" LG	SHF0416
53	4	SOCKET HEAD CAP SCREW 1/4 - 7/8LG	SHF0414
52	5	SOCKET HEAD CAP SCREW 1/4" UNC X 1-1/4" LG	SHC0420
51	2	SOCKET HEAD CAP SCREW 1/4" UNC X 3/4"	SHC0412
50	2	NUT M6 NYLOC	NM06N
49	2	NUT M5 BLACK	NM05ISO
48	2	NUT M4 NYLOC ZINC	NM04N8Z
47	4	NUT 3/8` UNC BLACK	N06NC
46	7	NUT 1/4 UNC NYLOC	N04NCN
45	1	LIFTING POINT WLL 300KG	IDTAG10
44	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
43	1	MELVELLE AUSTRALIA IDENTIFICATION TAG	IDTAG01
42	1	RAIL HEIGHT SPACER TAG	IDRLHEI
41	1	H121 + MCJF-1712 + 00340 + MCJF90S-1712	H121-00460-004
40	1	H121 + MCJF90S-1712 + 00150 + NO FITTING	H121-00225-044
39	1	H082 + MCJF-1408 + 01725 + MCJF90M-1408	H082-01825-005
38	1	H082 + MCJF-1408 + 01650 + MCJF90M-1408	H082-01750-005
37	1	H082 + MCJF-1408 + 00500 + MCJF45-1408	H082-00600-003
36	1	H082 + MCJF-1408 + 00420 + MCJF-1408	H082-00500-000
35	4	FLAT WASHER - ENGINEERS - 3/8" X 3/4" ZINC	FW06
34	11	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
33	1	SPIKE PULLER HEAD 8T ONLY-3.5` CYL- NO MOUNTING BRACKET	FP-108-BK
32	1	COUNTER SUNK CAP SCREWS M5 X 10	CSM0510
31	1	PLUG 1/2"BSPP	CP77-08
30	1	NIPPLE 1/2"BSPP - 1-1/16"JIC	CP2-0817
29	5	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814
28	1	TUBE ASS SHORT 90 F/M 1-1/16"JIC	C93-1717
27	4	BOLT M12 x 30	BM1230
26	2	BOLT M6 x 90 GRADE 8.8 ZINC	BM0690Z
25	4	BOLT HT 3/8" UNC X 1-3/4"	BC0628
24	1	HONDA ENGINE GX390 13HP -18AMPELECTRIC START ENGINE 1" SHAFT	1540687
23	1	BATTERY 12V SEALED 120AH DEKA	1540412
22	1	FILTER AND KICKDOWN BRACKET FOR MOUNTING TO RESERVOIR	1450273
21	1	HONDA TP COMPLETE WIRING HARNESS	1430125
20	1	BATTERY BOX TOP CLAMP	1430113
19	1	PUMP 7.8-7.9cc GROUP 1	1430081
18	1	BELL HOUSING - GROUP 1&2 7-18HP ENGINES FEMALE	1110023
17	1	SPIKE PULLER HEAD WIRING HARNESS WITH ESTOP	1081353
16	1	BRAKE TRIGGER ASSEMBLY FOR SPIKE PULLER	1081349
15	1	SPIKE PULLER DEDICATED MP FILTER ASSEMBLY	1081286
14	1	HOSE CLAMP DOUBLE 22mm - BOLT GROUP 3 CLAMPS	1081101-04
13	1	HOSE CLAMP DOUBLE 22mm - TOP PLATE GROUP 3	1081101-03
12	2	HOSE CLAMP DOUBLE 22mm - JAWS	1081101-01
11	1	8 LITRE RESERVOIR COMPLETE	1081000
10	1	BATTERY BOX SUIT DEKA BATTERY	1080864
9	1	KICKDOWN VALVE ASSEMBLY INCLUDING LOGO	1080847
8	1	HOSE CLAMP 14-32 SCREW TYPE	1080722
7	1	ENGINE COUPLING RUBBER SPIDER 65 SERIES	1080710
6	1	PUMP COUPLING - GROUP 1 65 SERIES	1080709
5	1	ENGINE HALF COUPLING - 1 SHAFT 65 SERIES	1080708
4	1	ROLL BAR BOOM ASSY 7-11HP WITH ENGINE RAIL ELECTRIC START	1080702
3	1	JAW HOUSING ASSEMBLY- SWIVEL FOOT STYLE	1080500
2	1	PUMP HEAT GASKET - GRP 1	1080058
1	2	CYLINDER HANDLES RUBBER	1080011

MATERIAL/CUT LIST

REV	DATE	DRN	DESCRIPTION
3	6/07/2015	BB	FIXED HOSES & WIRING AND HANDLES AS PER LAST BUILD AND CRF 147
2	14/08/12	AG	CHANGED PUMP AS PER CRF 532
1	21.08.2012	AG	XXXXXXXXXXXXXXXX AS PER CRF 525
0	13/09/2011	GMM	ADDED MP FILTER TO ASSEMBLY
			ORIGINAL ISSUE

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DIMENSIONS IN mm UNC
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°

DESCRIPTION: SPIKE PULLER 13HP HONDA PETROL ELECTRIC START
PART #: FP-108-BR
DRAWN: gwm 13/09/2011
CHECKED: APPROVED:
SCALE: 1:4
DWG: 1-108-203 REV: 3
MODELLED BY: gwm

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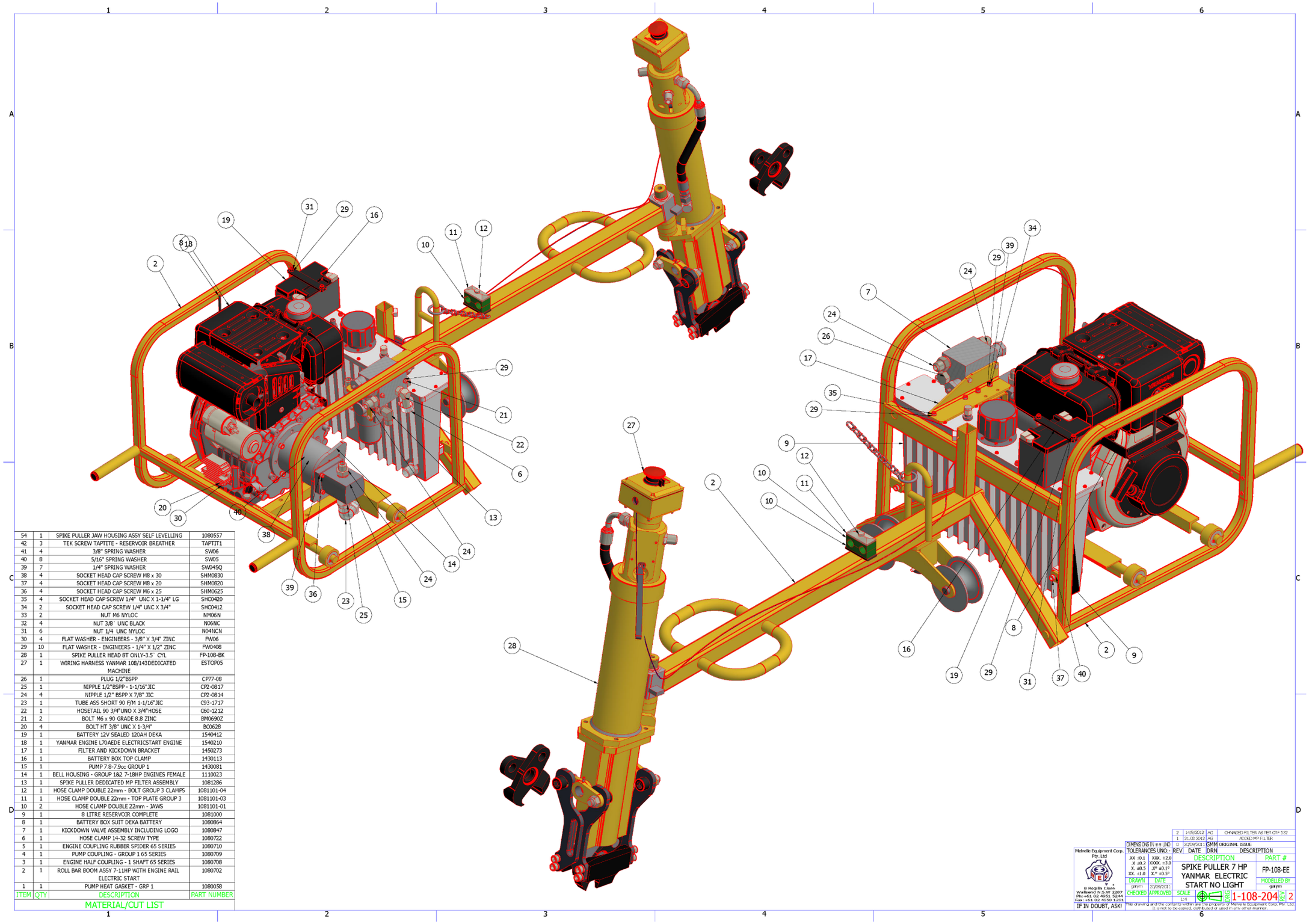
13.6. Yanmar Diesel Electric Start Dedicated Machine



ITEM	QTY	DESCRIPTION	PART NUMBER
54	1	SPIKE PULLER JAW HOUSING ASSY SELF LEVELLING	1080557
42	3	TEK SCREW TAPTITE - RESERVOIR BREATHER	TAPTIT1
41	4	3/8" SPRING WASHER	SW06
40	8	5/16" SPRING WASHER	SW05
39	7	1/4" SPRING WASHER	SW04SQ
38	4	SOCKET HEAD CAP SCREW M8 x 30	SHM0830
37	4	SOCKET HEAD CAP SCREW M8 x 20	SHM0820
36	4	SOCKET HEAD CAP SCREW M6 x 25	SHM0625
35	4	SOCKET HEAD CAP SCREW 1/4" UNC X 1-1/4" LG	SHC0420
34	2	SOCKET HEAD CAP SCREW 1/4" UNC X 3/4"	SHC0412
33	2	NUT M6 NYLOC	NM06N
32	4	NUT 3/8" UNC BLACK	N06NC
31	6	NUT 1/4 UNC NYLOC	N04NCN
30	4	FLAT WASHER - ENGINEERS - 3/8" X 3/4" ZINC	FW06
29	10	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
28	1	SPIKE PULLER HEAD 8T ONLY-3.5" CYL	FP-108-BK
27	1	WIRING HARNESS YANMAR 108/143DEDICATED MACHINE	ESTOP05
26	1	PLUG 1/2"BSPP	CP77-08
25	1	NIPPLE 1/2"BSPP - 1-1/16"JIC	CP2-0817
24	4	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814
23	1	TUBE ASS SHORT 90 F/M 1-1/16"JIC	C93-1717
22	1	HOSETAIL 90 3/4"UNO X 3/4"HOSE	C60-1212
21	2	BOLT M6 x 90 GRADE 8.8 ZINC	BM0690Z
20	4	BOLT HT 3/8" UNC X 1-3/4"	BC0628
19	1	BATTERY 12V SEALED 120AH DEKA	1540412
18	1	YANMAR ENGINE L70AEDE ELECTRICSTART ENGINE	1540210
17	1	FILTER AND KICKDOWN BRACKET	1450273
16	1	BATTERY BOX TOP CLAMP	1430113
15	1	PUMP 7.8-7.9cc GROUP 1	1430081
14	1	BELL HOUSING - GROUP 1&2 7-18HP ENGINES FEMALE	1110023
13	1	SPIKE PULLER DEDICATED MP FILTER ASSEMBLY	1081286
12	1	HOSE CLAMP DOUBLE 22mm - BOLT GROUP 3 CLAMPS	1081101-04
11	1	HOSE CLAMP DOUBLE 22mm - TOP PLATE GROUP 3	1081101-03
10	2	HOSE CLAMP DOUBLE 22mm - JAWS	1081101-01
9	1	8 LITRE RESERVOIR COMPLETE	1081000
8	1	BATTERY BOX SUIT DEKA BATTERY	1080864
7	1	KICKDOWN VALVE ASSEMBLY INCLUDING LOGO	1080847
6	1	HOSE CLAMP 14-32 SCREW TYPE	1080722
5	1	ENGINE COUPLING RUBBER SPIDER 65 SERIES	1080710
4	1	PUMP COUPLING - GROUP 1 65 SERIES	1080709
3	1	ENGINE HALF COUPLING - 1 SHAFT 65 SERIES	1080708
2	1	ROLL BAR BOOM ASSY 7-11HP WITH ENGINE RAIL ELECTRIC START	1080702
1	1	PUMP HEAT GASKET - GRP 1	1080058

MATERIAL/CUT LIST

REV	DATE	DRN	DESCRIPTION
2	14/9/2012	AG	CHANGED FILTER AS PER ECP 532
1	21.08.2012	AG	ADDED MP FILTER
0	20/09/2011	GMM	ORIGINAL ISSUE

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DIMENSIONS IN mm UNO
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°

DESCRIPTION: SPIKE PULLER 7 HP YANMAR ELECTRIC START NO LIGHT
PART #: FP-108-EE
DRAWN: garym 20/09/2011
MODELLED BY: garym
CHECKED
APPROVED
SCALE 1:2
SIZE A3
DWG NO 1-108-204
REV 2

13.7. FP-108-YE - Yanmar Diesel Electric Start Dedicated Machine

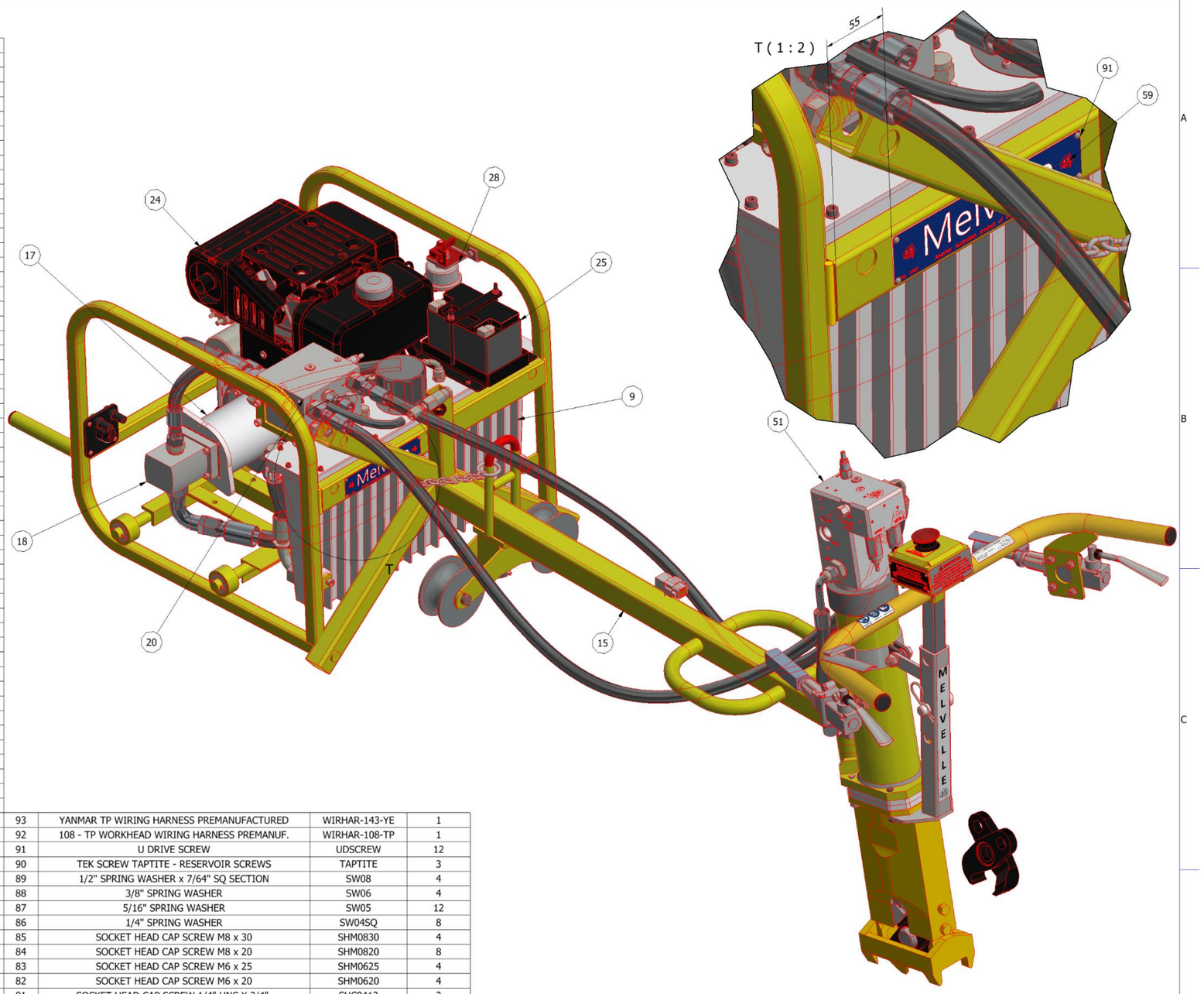
1 OF 5 — FIT DETAIL
SHEET # — SHEET DESCRIPTION

ITEM	DESCRIPTION	PART NUMBER	ITEM QTY
73	NUT 1/4 UNC NYLOC	N04NCN	2
72	HOSE END MEGA CRIMP FEMALE - 1-1/16"JIC X 3/4"HOSE	MCJF-1712	2
71	HOSE END MEGA CRIMP FEMALE - 7-8 JIC X 3-4 HOSE	MCJF-1412	1
70	HOSE END MEGA CRIMP FEMALE - 7/8"JIC X 1/2"HOSE	MCJF-1408	4
69	HOSE END MEGA CRIMP FEMALE - 9/16"JIC X 1/4"HOSE	MCJF-0904	1
68	HOSE END MEGA CRIMP FEMALE 90 -1-1/16"JIC X 3/4"HOSE	MCJF90S-1712	2
67	HOSE END MEGA CRIMP FEMALE 90 - 7/8"JIC X 1/2"HOSE	MCJF90S-1408	1
66	HOSE END MEGA CRIMP FEMALE 90 - 9/16"JIC X 1/4"HOSE	MCJF90S-0904	1
65	HOSE END MEGA CRIMP FEMALE 90 - 7/8"JIC X 1/2"HOSE	MCJF90M-1408	1
64	LARGE MELVELLE UPRIGHT	LAB0030	1
63	PPE SAFETY STICKER	LAB0008	1
62	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004	1
61	ESTOP WARNING LABEL REVERSED	IDTAG12	1
60	MELVELLE MODEL & SERIAL N-O AL TAG	IDTAG02	1
59	MELVELLE AUSTRALIA IDENTIFICATION TAG	IDTAG01	1
58	RAIL HEIGHT SPACER TAG	IDRLHEI	1
57	H042 + MCJF-0904 + 01941 + MCBM-0604	H042-02000-008	1
56	FLAT WASHER - ENGINEERS - M4	FWM04	2
55	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408	8
54	FLAT WASHER - ENGINEERS - 1/2" X 1" ZINC	FW08	6
53	FLAT WASHER - ENGINEERS - 3/8" X 3/4" ZINC	FW06	4
52	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05	7
51	SPIKE PULLER HEAD DUAL HANDLE -8T - NO BRACKET	FP-108-BK-DT	1
50	PILOT LED, GREEN, 12V, IP40, 16mm PANEL MOUNT	ELECT228	1
49	PILOT LED, RED, 12V, IP40, 16mm PANEL MOUNT	ELECT227	1
48	LS3 LIMIT SWITCH	ELECT100	1
47	EMERGENCY STOP ENCLOSURE AND BUTTON - YELLOW	ELECT69	1
46	COUNTER SUNK CAP SCREW M4 x 35 ZINC	CSM0435Z	2
45	PLUG 3/8"BSPP	CP77-06	1
44	ELBOW 90 MM 3/8"BSPP X 9/16"JIC	CP56-0609	1
43	NIPPLE 1/2"BSPP - 1-1/16"JIC	CP2-0817	2
42	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814	4
41	NIPPLE 1/4" BSPP X 9/16" JIC	CP2-0409	1
40	TUBE ASS SHORT 90 F/M 1-1/16"JIC	C93-1717	1
39	BOLT METRIC M8 x 30 ZINC GR8.8	BM08030-88Z	7
38	BOLT METRIC M12 X 55 LG ZINC GR8.8	BM1255-88Z	2
37	BOLT HT M12 X 50	BM1250	2
36	BOLT M12 x 45 ZP HT	BM1245Z	2
35	BOLT M6 x 20 HT	BM0620	2
34	BOLT HT 3/8" UNC X 1-3/4"	BC0628	4
33	CONTROL CABLE ACTUATOR - TRIGGER END ASS	1860120	2
32	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113	1
31	HANDLE LOCKING PIN	1860027	1
30	TOP HANDLE FABRICATION	1860024	1
29	REMOTE CONTROL TRIGGER-M10	1640035	2
28	LOCKOUT ISOLATER MOUNT PLATE	1560166	1
27	OIL PRESSURE SWITCH - 1/8TH BSP X 10 PSI	1540816	1
26	BATTERY ISOLATOR SWITCH - INCLUDING RED LOCKOUT	1540813	1
25	BATTERY 12V SEALED 120AH DEKA	1540412	1
24	YANMAR ENGINE L70N6 ELECTRIC START ENGINE	1540210	1
23	TEE BOLT LOCKING NUT	1450284	1
22	1/2" TEE LOCKING BOLT 2" LONG	1450283	1
21	CONTROL CABLE END CAP MOUNTS TO 1450165	1450166	2
20	BRAKE MANIFOLD - ELECTRIC SOLENOID	1430119	1
19	BATTERY BOX TOP CLAMP	1430113	1
18	PUMP 7.8-7.9cc GROUP 1	1430081	1
17	BELL HOUSING - GROUP 1&2 7-18HP ENGINES FEMALE	1110023	1
16	FILTER MOUNTING BRACKET	1081466	1
15	ROLL BOOM ASSY WITH 7HP YANMAR ELECTRIC START	1081465	1
14	SWIVEL FOOT JAW HOUSING SPACER PROFILE	1081400-01	2
13	CABLE GUARD FOR THIN CABLES	1081369	2
12	CABLE ADAPTER TRIGGER TO CABLE	1081364	2
11	BASE HANDLE EXTENSION SPIKE PULLER	1081325	1
10	SPIKE PULLER DEDICATED MP FILTER ASSEMBLY	1081286	1
9	8 LITRE RESERVOIR COMPLETE	1081000	1
8	BATTERY BOX SUIT DEKA BATTERY	1080864	1
7	HOSE CLAMP 14-32 SCREW TYPE	1080722	1
6	ENGINE COUPLING RUBBER SPIDER 65 SERIES	1080710	1
5	PUMP COUPLING - GROUP 1 65 SERIES	1080709	1
4	ENGINE HALF COUPLING - 1 SHAFT 65 SERIES	1080708	1
3	JAW HOUSING ASSEMBLY- SWIVEL FOOT STYLE	1080500	1
2	PUMP HEAT GASKET - GRP 1	1080058	1
1	MALE 3/8" FLUSH FACED SNAP CONNECTOR	1020342	1

PARTS LIST

ITEM	DESCRIPTION	PART NUMBER	ITEM QTY
93	YANMAR TP WIRING HARNESS PREMANUFACTURED	WIRHAR-143-YE	1
92	108 - TP WORKHEAD WIRING HARNESS PREMANUF.	WIRHAR-108-TP	1
91	U DRIVE SCREW	UDSCREW	12
90	TEK SCREW TAPTITE - RESERVOIR SCREWS	TAPTITE	3
89	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08	4
88	3/8" SPRING WASHER	SW06	4
87	5/16" SPRING WASHER	SW05	12
86	1/4" SPRING WASHER	SW04SQ	8
85	SOCKET HEAD CAP SCREW M8 x 30	SHM0830	4
84	SOCKET HEAD CAP SCREW M8 x 20	SHM0820	8
83	SOCKET HEAD CAP SCREW M6 x 25	SHM0625	4
82	SOCKET HEAD CAP SCREW M6 x 20	SHM0620	4
81	SOCKET HEAD CAP SCREW 1/4" UNC X 3/4"	SHC0412	2
80	R CLIP 4mm	RCLIP04	1
79	NUT M16 FINE THIN NUT (ZINC)	NM16HF	2
78	NUT M12 NYLOC	NM12N	2
77	NUT M8 NYLOC	NM08N	7
76	NUT M6 NYLOC	NM06N	4
75	NUT M4 NYLOC - A270 SS (304)	NM04N-304	2
74	NUT 3/8` UNC BLACK	N06NC	4

PARTS LIST



REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
0	28/10/2021	-	-	ORIGINAL ISSUE	-	-

Melvelle Equipment Corp. Pty. Ltd
10 Rogilla Close
Wallsend N.S.W 2287
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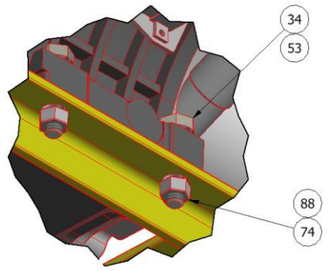
TOLERANCES UNO:- DIMENSIONS IN mm UNO
.XX ±0.1 XXX. ±2.0
.X ±0.2 XXXX. ±3.0
X. ±0.5 .X° ±0.1°
XX. ±1.0 X.° ±0.5°

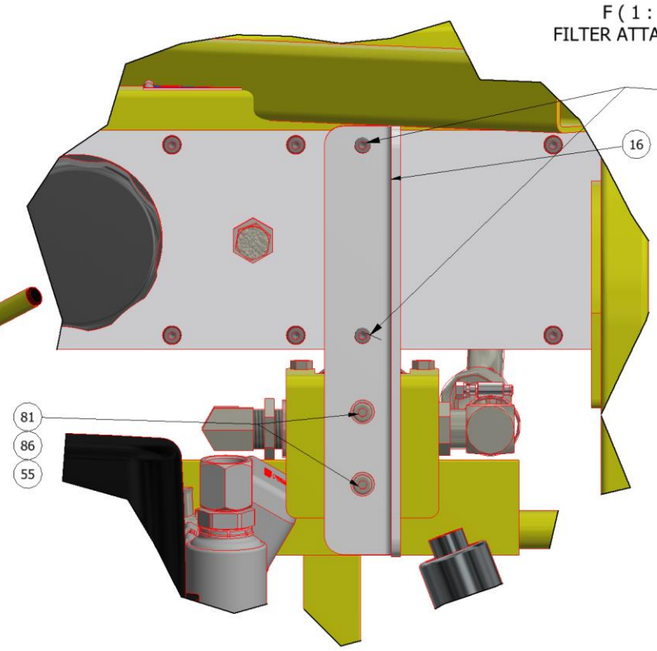
DESCRIPTION: SPIKE PULLER 7HP YANMAR ELECTRIC START WITH BRAKES
PART #: FP-108-YE
DRAWN: BenH 28/10/2021
MODELLED BY: garym
CHECKED: BB
APPROVED: BB
SCALE: 1:1
DWG: 2-108-567
REV: 0

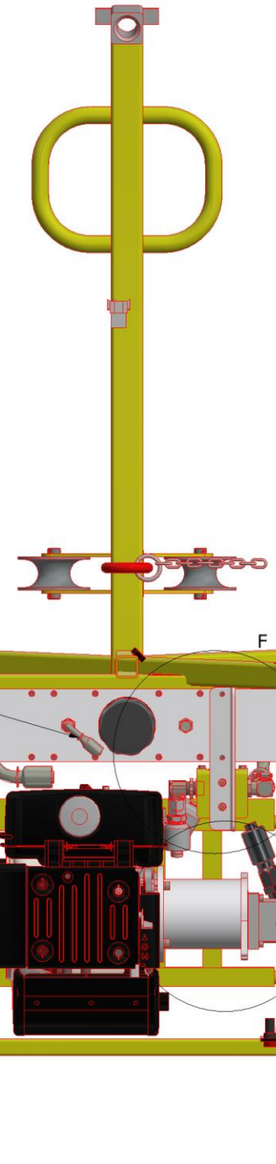
2 OF 5	FIT DETAIL
SHEET #	SHEET DESCRIPTION

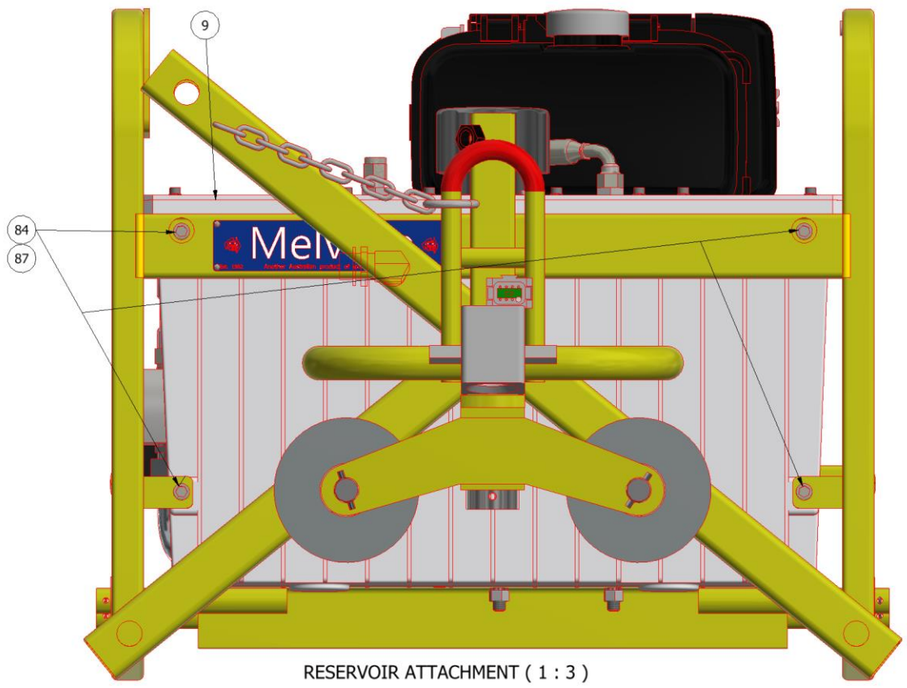
E (1 : 2)
MOTOR BOLTS



F (1 : 2)
FILTER ATTACHMENT

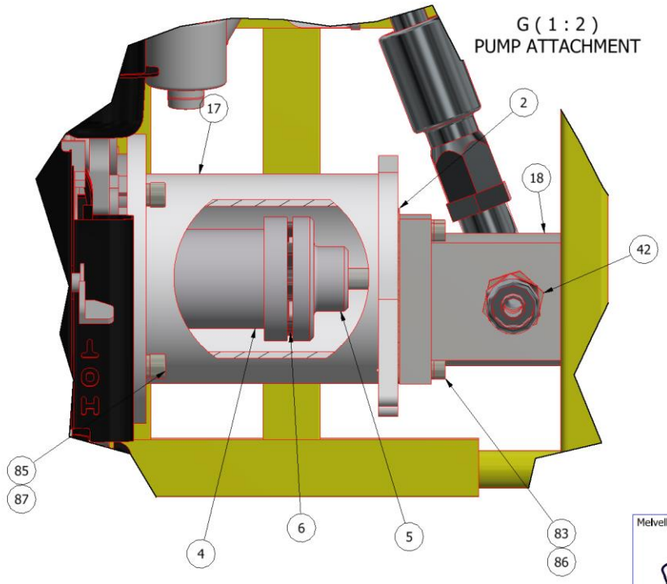






RESERVOIR ATTACHMENT (1 : 3)

G (1 : 2)
PUMP ATTACHMENT



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 XXX. ±3.0 .X° ±0.1° X.° ±0.5°	DESCRIPTION SPIKE PULLER 7HP YANMAR ELECTRIC START WITH BRAKES	PART # FP-108-YE
	DRAWN	DATE		MODELLED BY
	BenH	28/10/2021		garym
	CHECKED	APPROVED	SCALE	DRG 2-108-567 REV 0
	BB	BB	1:5	
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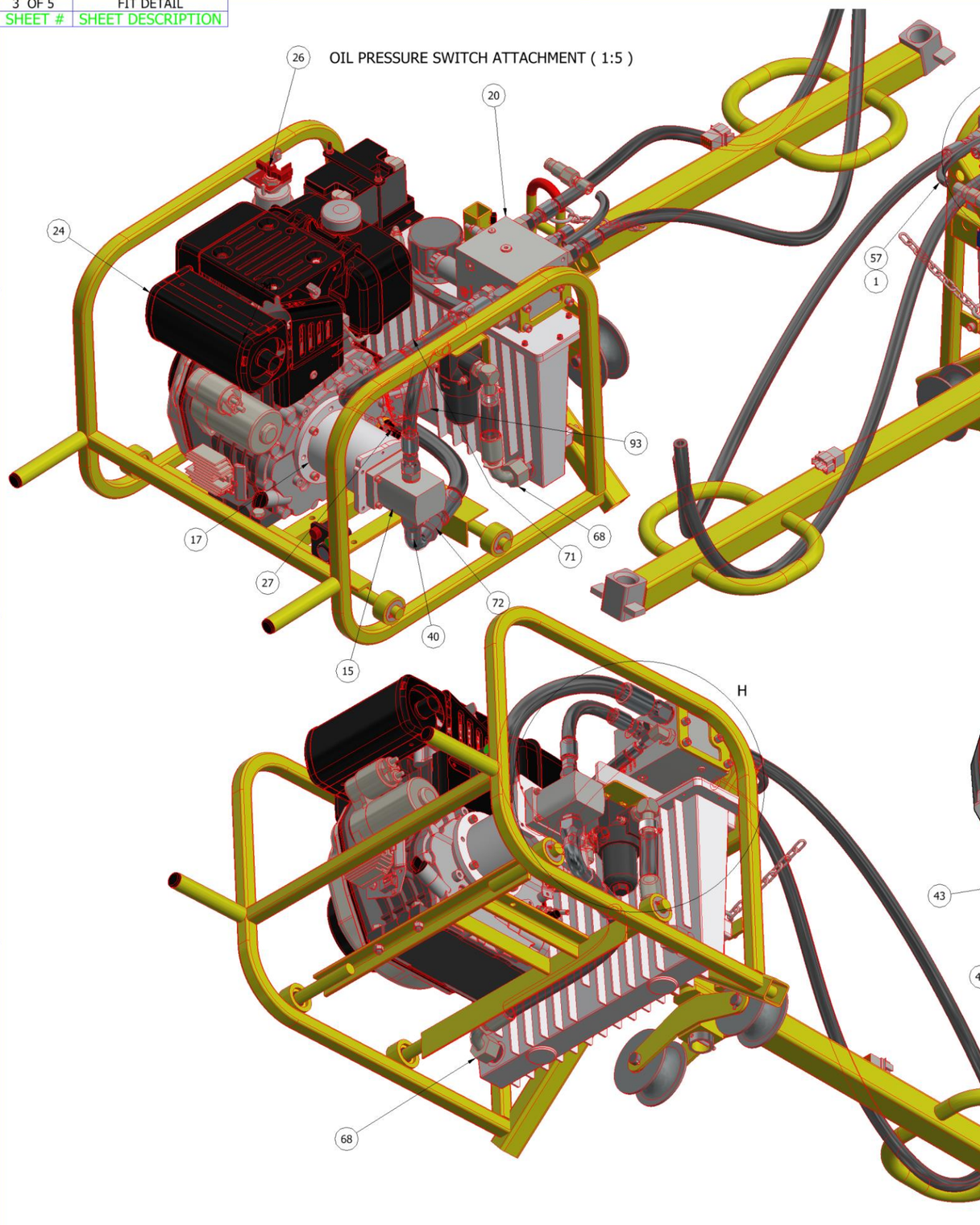
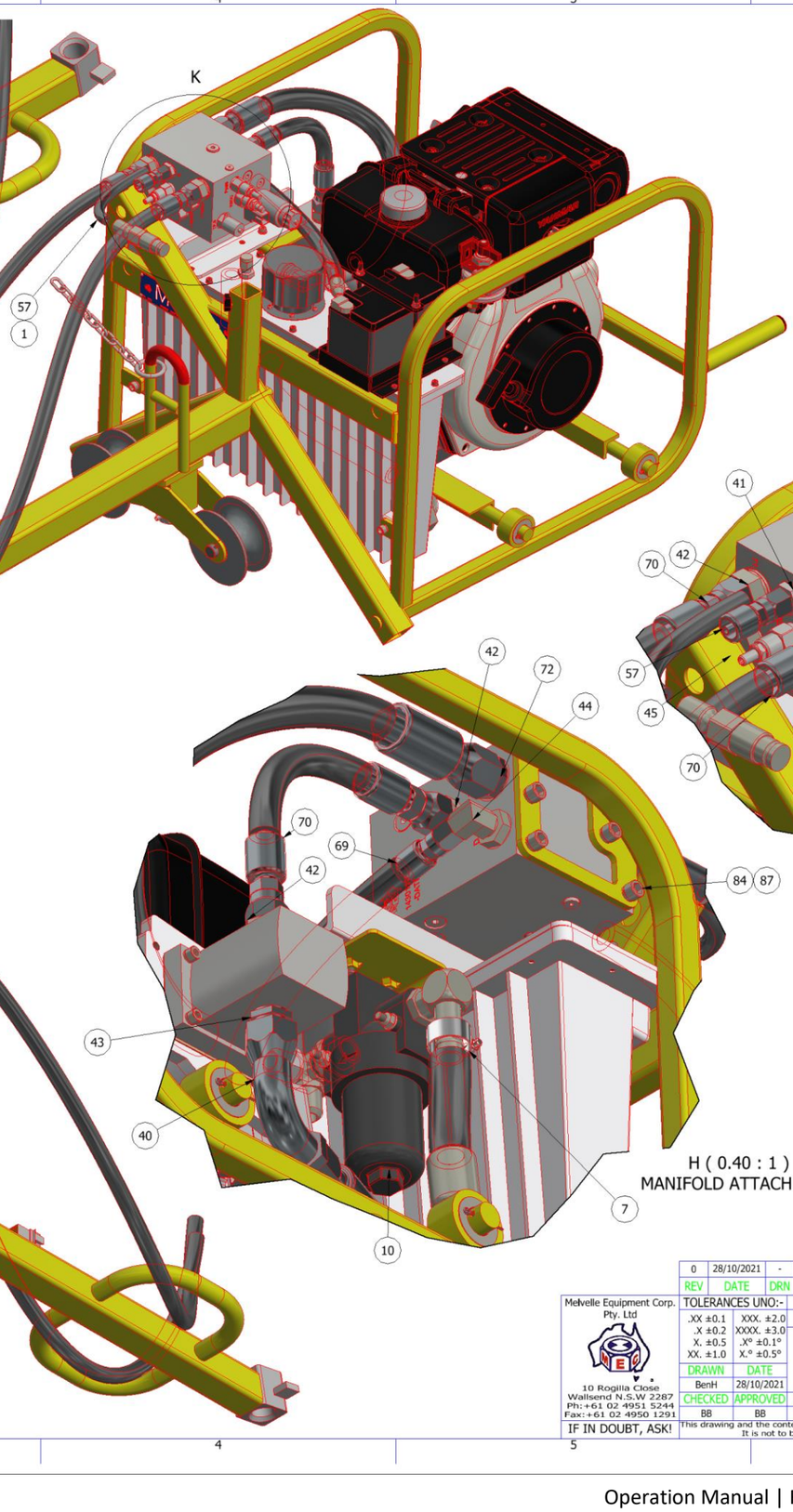
3 OF 5	FIT DETAIL
SHEET #	SHEET DESCRIPTION

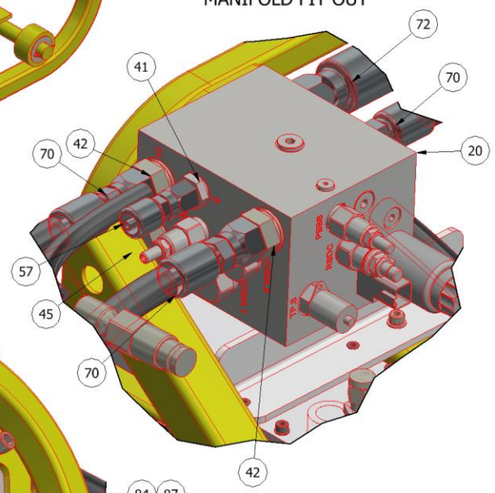
OIL PRESSURE SWITCH ATTACHMENT (1:5)



K



K (0.40 : 1)
MANIFOLD FIT OUT



H

H (0.40 : 1)
MANIFOLD ATTACHMENT

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
0	28/10/2021	-	-	ORIGINAL ISSUE	-	-

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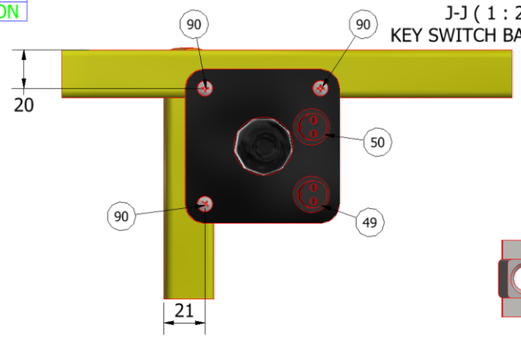
10 Rogilla Close
Wallsend N.S.W 2287
Ph:+61 02 4951 5244
Fax:+61 02 4950 1291

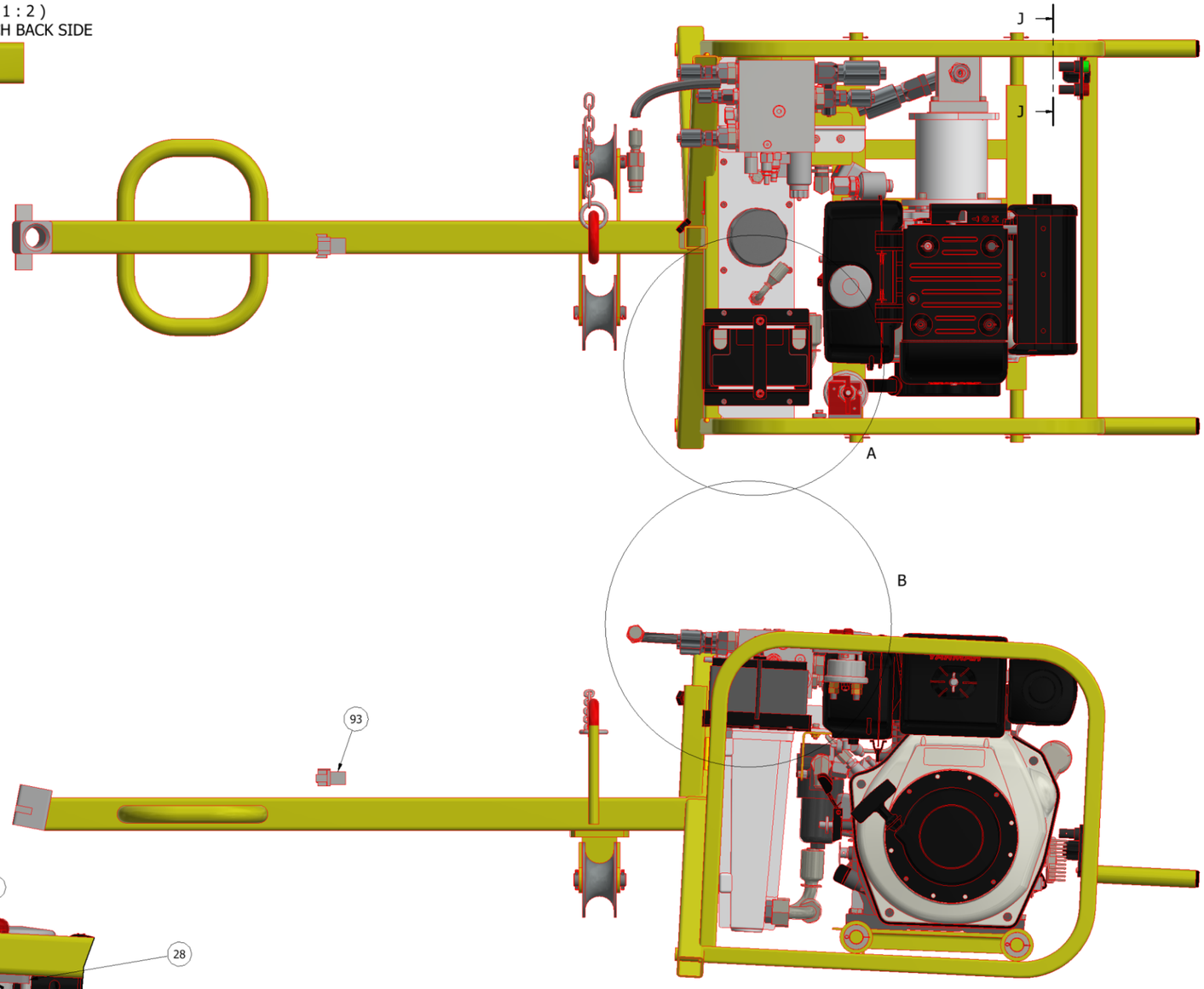
IF IN DOUBT, ASK!

TOLERANCES UNO:-		DIMENSIONS IN mm UNO	
.XX ±0.1	XXX. ±2.0	DESCRIPTION	PART #
.X ±0.2	XXXX. ±3.0	SPIKE PULLER 7HP YANMAR ELECTRIC START WITH BRAKES	FP-108-YE
X. ±0.5	.X° ±0.1°		
XX. ±1.0	X.° ±0.5°		MODELLED BY garym
DRAWN	DATE		
BenH	28/10/2021		
CHECKED	APPROVED	SCALE	DRG 2-108-567 REV 0
BB	BB	1:5	

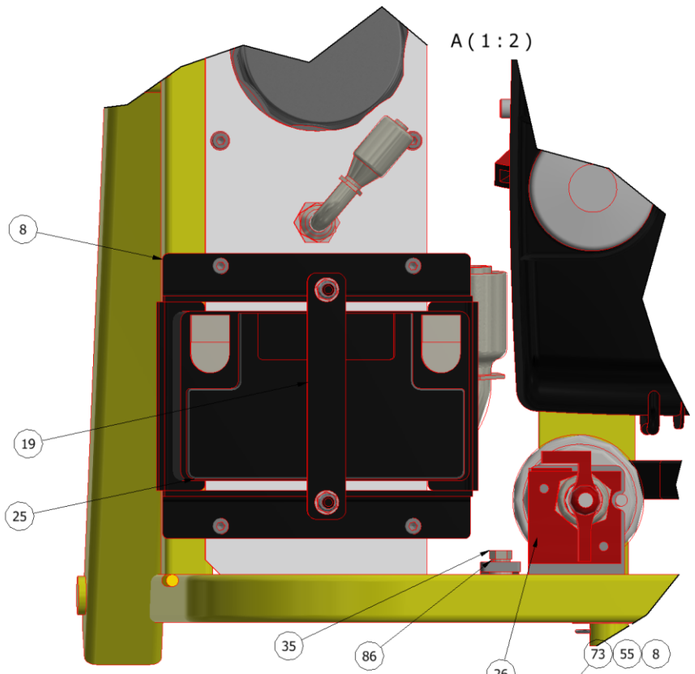
4 OF 5	FIT DETAIL
SHEET #	SHEET DESCRIPTION

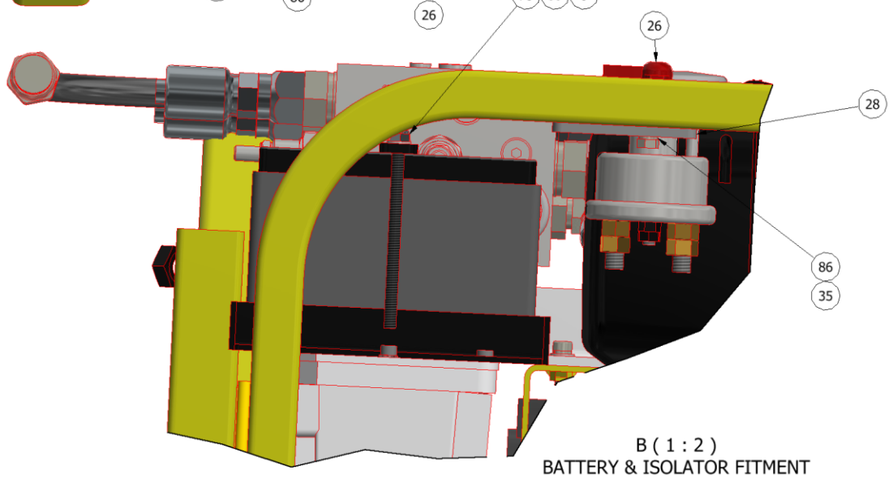


J-J (1 : 2)
KEY SWITCH BACK SIDE



A (1 : 2)





B (1 : 2)
BATTERY & ISOLATOR FITMENT

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
0	28/10/2021	-	-	ORIGINAL ISSUE	-	-

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TOLERANCES UNO:-		DIMENSIONS IN mm UNO	
.XX ±0.1	XXX. ±2.0	DESCRIPTION	PART #
.X ±0.2	XXXX. ±3.0	SPIKE PULLER 7HP YANMAR ELECTRIC START WITH BRAKES	FP-108-YE
X. ±0.5	.X° ±0.1°		
XX. ±1.0	X.° ±0.5°		
DRAWN	DATE		MODELLED BY
BenH	28/10/2021		garym
CHECKED	APPROVED	SCALE	DRG 2-108-567 REV 0
BB	BB	1:5	

5 OF 5	FIT DETAIL
SHEET #	SHEET DESCRIPTION

L

L (2:5)

M (1:4)
LEFT TRIGGER

M

N

N (1 : 2)

R (1:3)

R

W

W (0.40 : 1)

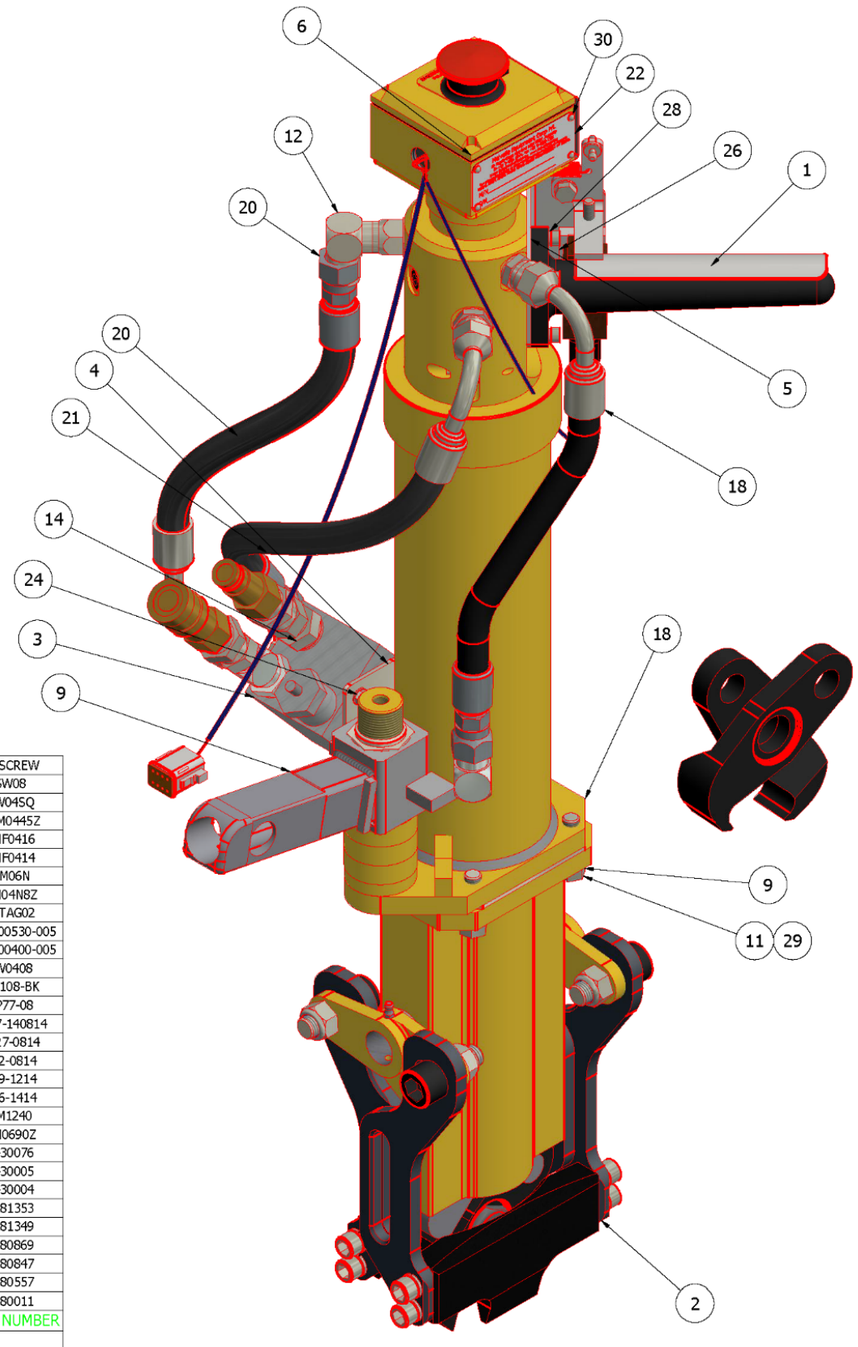
P

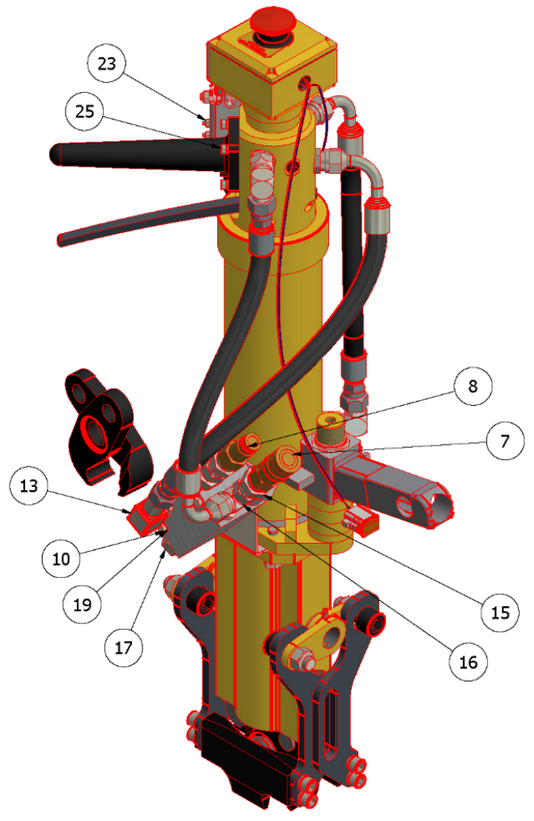
P (2:5)
RIGHT TRIGGER

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: SPIKE PULLER 7HP YANMAR ELECTRIC START WITH BRAKES	PART #: FP-108-YE
	DRAWN: BenH	DATE: 28/10/2021		MODELLED BY: garym
	CHECKED: BB	APPROVED: BB	SCALE: 1:5	DRG: 2-108-567 REV: 0
IF IN DOUBT, ASK!	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.			

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
0	28/10/2021	-	-	ORIGINAL ISSUE	-	-

13.8. MEC Trackpack Head





ITEM	QTY	DESCRIPTION	PART NUMBER
30	4	U DRIVE SCREW	UDSCREW
29	4	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08
28	8	1/4" SPRING WASHER	SW04SQ
27	2	SOCKET HEAD CAP SCREW M4 x 45 ZINC	SHM0445Z
26	4	SOCKET HEAD CAP SCREW 1/4" UNF X 1" LG	SHF0416
25	4	SOCKET HEAD CAP SCREW 1/4 - 7/8LG	SHF0414
24	2	NUT M6 NYLOC	NM06N
23	2	NUT M4 NYLOC ZINC	NM04N8Z
22	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
21	1	H082 + MCJF-1408 + 00428 + MCJF90M-1408	H082-00530-005
20	1	H082 + MCJF-1408 + 00298 + MCJF90M-1408	H082-00400-005
19	4	FLAT WASHER - ENGINEERS - 1/4" X 1/2" ZINC	FW0408
18	1	SPIKE PULLER HEAD 8T ONLY-3.5` CYL- NO MOUNTING BRACKET	FP-108-BK
17	2	PLUG 1/2"BSPP	CP77-08
16	1	TEE MALE 7/8"JIC X 1/2"BSPP X 7/8"JIC	CP67-140814
15	2	ADAPT M/F 1/2"BSPP X 7/8"JIC	CP27-0814
14	1	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814
13	1	ELBOW 90 M/M 3/4"UNO X 7/8"JIC	C59-1214
12	1	ADAPTOR 90 M/F 7/8"JIC X 7/8"JIC	C46-1414
11	4	BOLT HT M12 X 40	BM1240
10	2	BOLT M6 x 90 GRADE 8.8 ZINC	BM0690Z
9	1	TRACK PACK SD67/8T QUICK CHANGE END	1430076
8	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
7	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
6	1	SPIKE PULLER HEAD WIRING HARNESS WITH ESTOP	1081353
5	1	BRAKE TRIGGER ASSEMBLY FOR SPIKE PULLER	1081349
4	1	MOUNT BRACKET FOR KICKDOWN ONTO SPIKE PULLER	1080869
3	1	KICKDOWN VALVE ASSEMBLY INCLUDING LOGO	1080847
2	1	SPIKE PULLER JAW HOUSING ASSY SELF LEVELLING	1080557
1	2	CYLINDER HANDLES RUBBER	1080011

MATERIAL/CUT LIST

REV	DATE	DRN	DESCRIPTION
3	28/08/201 5	JMC	CHANGED FROM M12x30 AS PER CRF1240
2	1/10/2014	GM	UPDATED TO BRAKE STYLE
1	18/2/2014	GM	ADDED SELF LEVELLING FOOT AS CRF858
0	20/09/2011	GMM	ORIGINAL ISSUE

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

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DESCRIPTION: 8T SPIKE PULLER TRACKPACK HEAD w/MOUNT BRACKET
PART #: FP-108-EN
MODELLED BY: garym
DRAWN: garym 20/09/2011
CHECKED: AG
APPROVED: AG
SCALE: 1:2.5
DRG: 2-108-207
REV: 3

13.9. Trolley to Power Pack Attachment

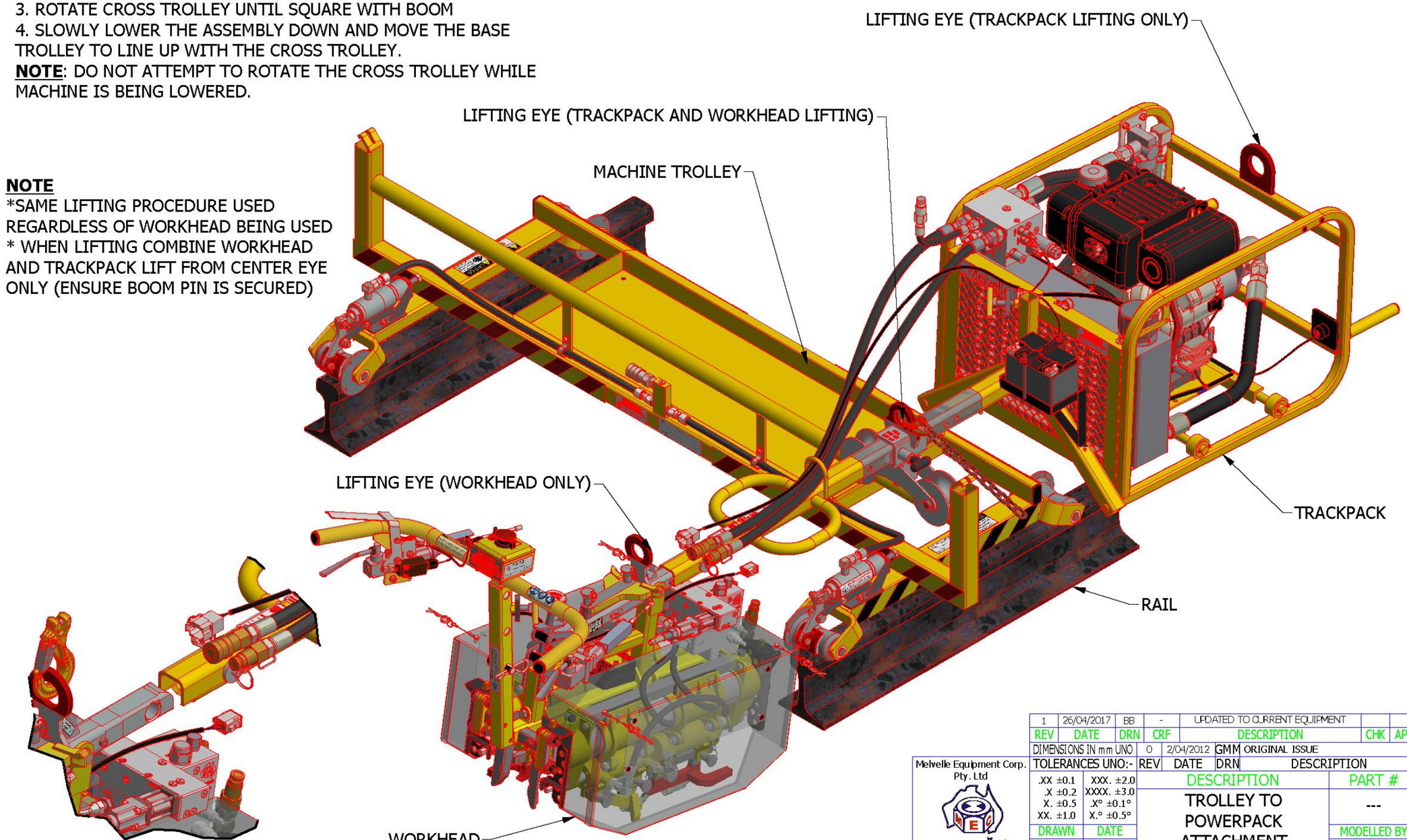
LOWERING POWERPACK AND WORK HEAD ONTO TROLLEY

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	2/04/2012	GMM	ORIGINAL ISSUE

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°				

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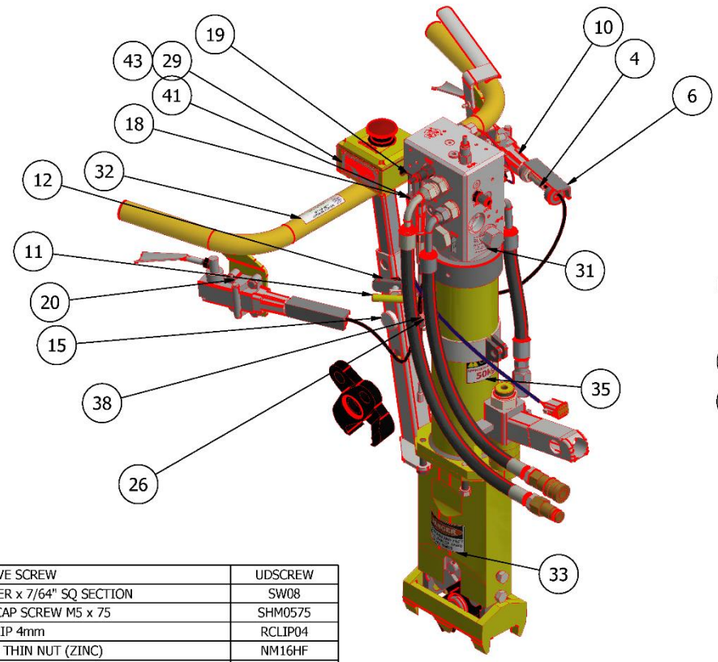
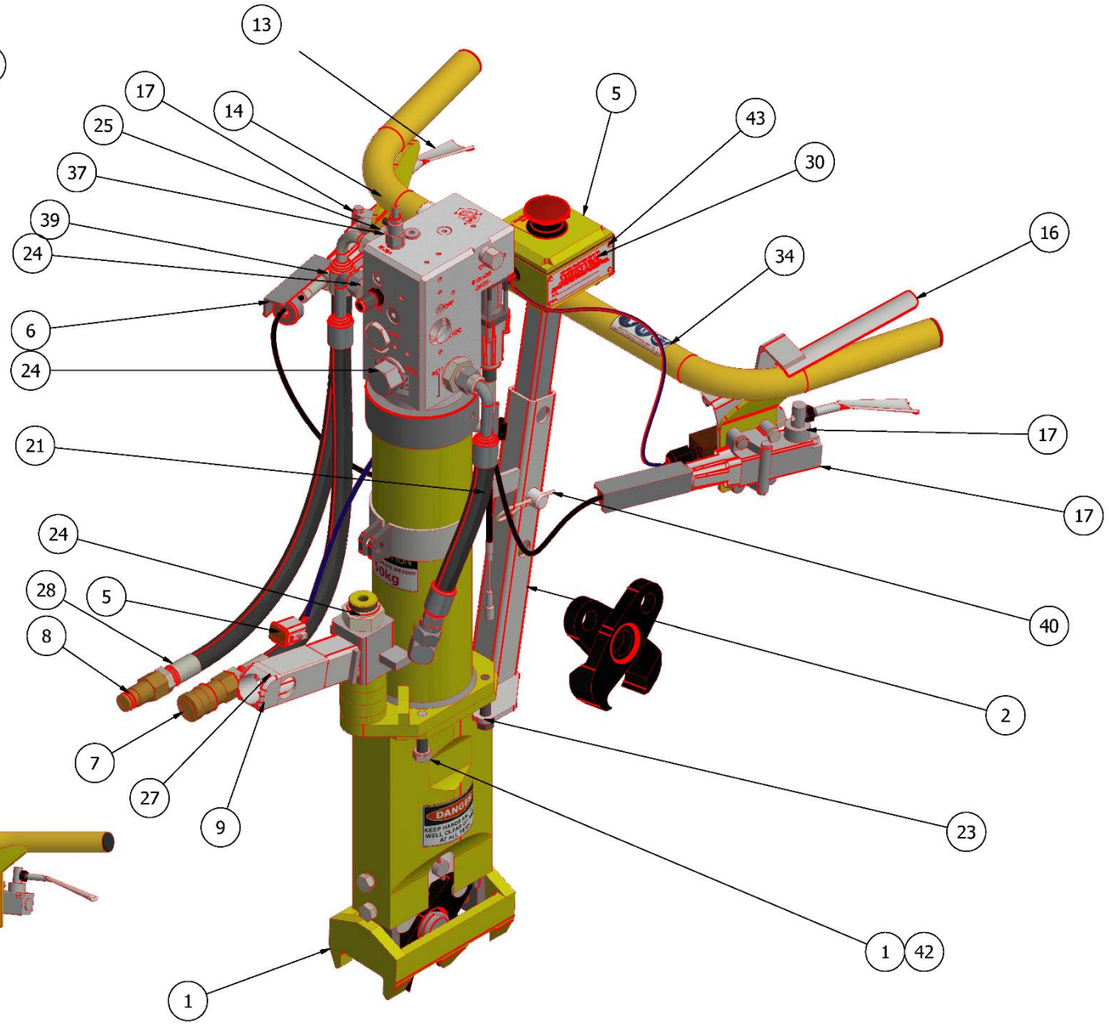
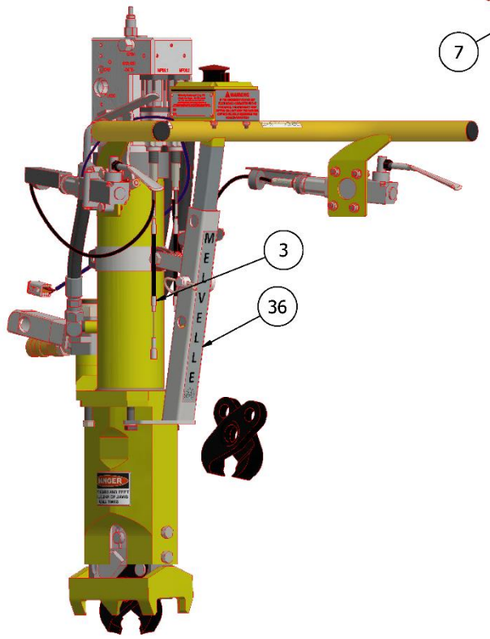
DESCRIPTION	PART #
TROLLEY TO POWERPACK ATTACHMENT	---
DRAWN: garym, DATE: 2/04/2012	MODELLED BY: garym
CHECKED:	APPROVED:
SCALE: 1:8	DRG: 3-108-215 REV: 1

13.10. Track pack head with swivel foot







ITEM	QTY	DESCRIPTION	PART NUMBER
		PARTS LIST	
43	8	U DRIVE SCREW	UDSCREW
42	4	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08
41	8	SOCKET HEAD CAP SCREW M5 x 75	SHM0575
40	1	R CLIP 4mm	RCLIP04
39	2	NUT M16 FINE THIN NUT (ZINC)	NM16HF
38	1	NUT M12 NYLOC	NM12N
37	7	NUT M8 NYLOC	NM08N
36	1	LARGE MELVELLE UPRIGHT	LAB0030
35	1	APPROXIMATE WEIGHT 50KG STICKER	LAB0017
34	1	PPE SAFETY STICKER	LAB0008
33	2	DANGER KEEP HANDS AND FEET CLEAR STICKER	LAB0006
32	1	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004
31	1	MELVELLE NEWCASTLE STICKER	LAB0003
30	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
29	1	RAIL HEIGHT SPACER TAG	IDRLHEI
28	1	H082 + MCBM-0808 + 00400 + MCJF90M-1408	H082-00500-035
27	1	H082 + MCBM-0808 + 00400 + MCJF90S-1408	H082-00500-034
26	6	FLAT WASHER - ENGINEERS - 1/2" X 1" ZINC	FW08
25	7	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
24	1	SPIKE PULLER HEAD DUAL TRIGGER - 8T CYL- NO MOUNTING BRACKET	FP-108-BK-DT
23	2	BOLT METRIC M12 X 55 LG ZINC GR8.8	BM1255-88Z
22	2	BOLT HT M12 X 50	BM1250
21	1	BOLT HT M12 X 45	BM1245
20	7	BOLT METRIC M8 x 35 ZINC GR8.8	BM08035-88Z
19	2	CABLE MOUNT PLATE WITH TAPPED HOLES	1900020
18	2	CABLE MOUNT PLATE WITH HOLES	1900019
17	2	CONTROL CABLE ACTUATOR - TRIGGER END ASS	1860120
16	1	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113
15	1	HANDLE LOCKING PIN	1860027
14	1	TOP HANDLE FABRICATION	1860024
13	2	REMOTE CONTROL TRIGGER-M10	1640035
12	1	TEE BOLT LOCKING NUT	1450284
11	1	1/2" TEE LOCKING BOLT 2" LONG	1450283
10	4	CONTROL CABLE END CAP MOUNTS TO 1450165	1450166
9	1	TRACK PACK SD67/8T QUICK CHANGE END	1430076
8	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
7	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
6	2	CABLE GUARD FOR THIN CABLES	1081369
5	1	WIRING HARNESS DUAL HANDLE SPIKE PULLER	1081366
4	4	CABLE ADAPTER TRIGGER TO CABLE	1081364
3	2	TRIGGER CABLE FOR SPIKE PULLER	1081363
2	1	BASE HANDLE EXTENSION SPIKE PULLER	1081325
1	1	JAW HOUSING ASSEMBLY- SWIVEL FOOT STYLE	1080500

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
4	2/14/2020	DB	-	ADDED TRIGGER CABLES, PART 1081363		
3	12/5/2019	DB	1464	SHM0835 CHANGED TO BM0835-88Z ON TRIGGER HANDLES		
2	7/07/2017	BB	1601	ADDED STICKERS TO MODEL AND MOVED SPACER TAG FROM TRACKPACK		
1	22/10/2015	BB	1233	CHANGED TO STANDARD HANDLE AND ADDED WIRING AND CABLE DETAIL	GM	GM
0	20/07/2015	GM	-	ORIGINAL ISSUE	BMD	BMD

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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

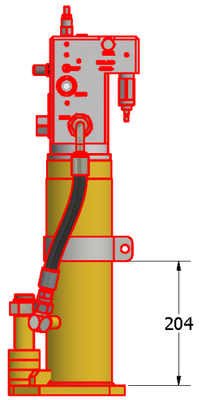
DESCRIPTION	PART #
DUAL TRIGGER SPIKE PULLER TRACKPACK HEAD SWIVEL FOOT 8T	FP-108-TPF

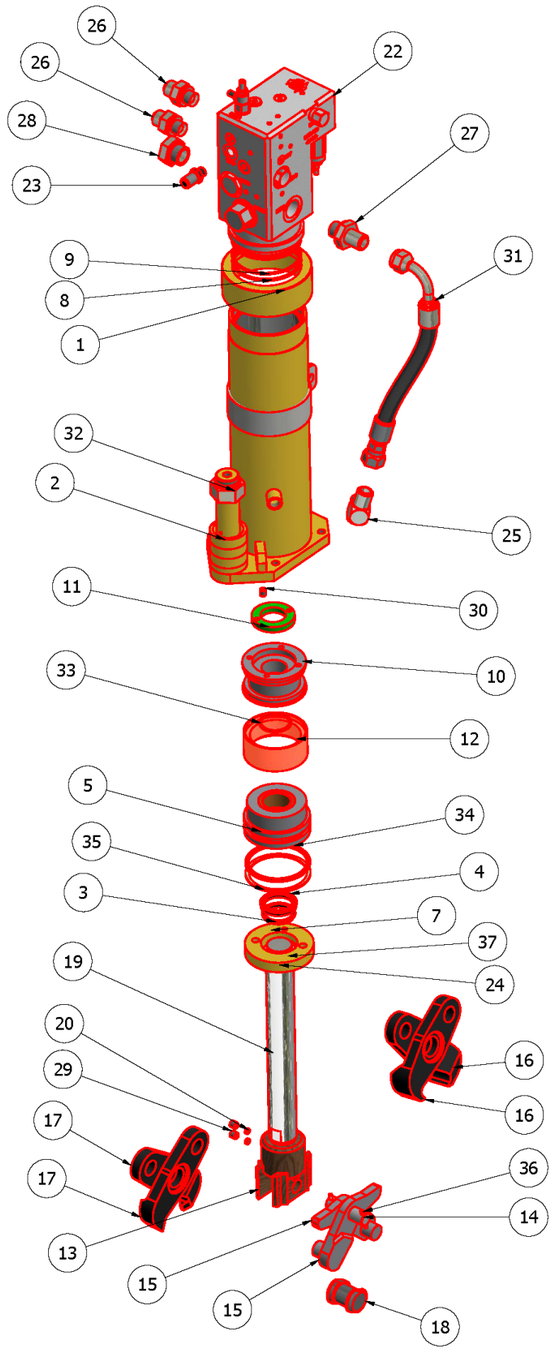
DRAWN	DATE	MODELLED BY
garym	7/20/2015	garym
CHECKED	APPROVED	SCALE
BMD	BMD	1:4

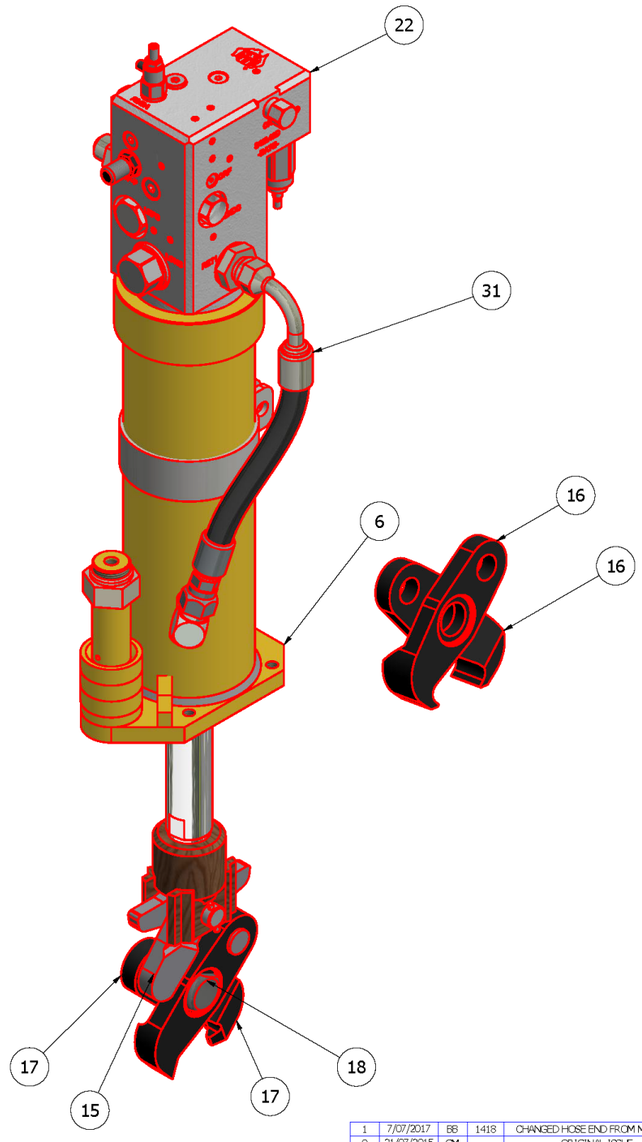
DRG 2-108-388 REV 4

13.11. Lower level Track pack head dual handle

NOTES
SKOTCH KEY PISTON
TO PISTON LOCK NUT







ITEM	QTY	DESCRIPTION	PART NUMBER
37	1	5/16" SPRING WASHER	SW05
36	2	SEL LOK PIN 3/16in x 1-1/4in	R18732
35	1	BACK UP WASHER 3-1/8` x 3-1/2`	OR8338
34	1	ORING 3-1/8" x 3-1/2" x 3/16" CS	OR2338
33	1	O RING	OR2222
32	1	NUT 1-1/4` UNF HALF NYLOC	N20NFNH
31	1	H082 + MCJF-1408 + 00210 + MCJF90S-1408	H082-00310-004
30	1	GRUB SCREW M8 x 10	GRSM0810
29	2	GRUB SCREW 3/8" UNC x 3/8" LG	GRSC0606
28	1	PLUG 3/4" BSPP	CP77-12
27	1	NIPPLE 3/4" BSPP X 7/8" JIC	CP2-1214
26	2	NIPPLE 1/2" BSPP X 7/8" JIC	CP2-0814
25	1	ELBOW 90 M/M 3/8"BSPT X 7/8"JIC	CB56-0614
24	1	BOLT METRIC M8 X 16LG ZINC GR8.8	BM0816
23	1	TEST POINT COUPLING 1/4"BSPP	1860034
22	1	SPIKE PULLER DUAL HANDLE MANIFOLD	1081368
21	1	CYLINDER CLAMP BRACKET SPIKE PULLER	1081326
20	2	CLEVIS LOCK COPPER SCREW THREAD	1081237
19	1	PISTON ROD 8T	1081224
18	1	JAW PIVOT ASSEMBLY	1080508
17	2	JAWS DOG SPIKE JAWS	1080507
16	2	JAWS-LOCK SPIKE	1080506
15	2	JAW SPIKE RELEASE CAMS	1080505
14	1	SPIKE PULLER CLEVIS PIN	1080502
13	1	SPIKE PULLER CLEVIS	1080501
12	1	PISTON SEAL 8T	1080311
11	1	PISTON LOCKNUT	1080309
10	1	PISTON 8T	1080306
9	1	VALVE HEAD CYLINDER BACK UP RING	1080125
8	1	VALVE HEAD CYLINDER O RING	1080124
7	1	GLAND LOCKNUT-3.5DIA CYL 8T AND BOLT	1080049
6	1	CYLINDER 3.5ID MODEL 8T NO GROOVE	1080045-NG
5	1	GLAND BODY-MODEL 8T	1080041
4	1	U CUP GLAND SEAL	1080037
3	1	GLAND ROD WIPER 1.5DIA	1080035
2	3	CYLINDER RAIL HEIGHT ADJUST RINGS	1080016
1	1	CYLINDER CAP NUT	1080009

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
1	7/07/2017	BB	1418	CHANGED HOSE END FROM MCJF90M		
0	21/07/2015	GM	-	ORIGINAL ISSUE	BMD	BMD

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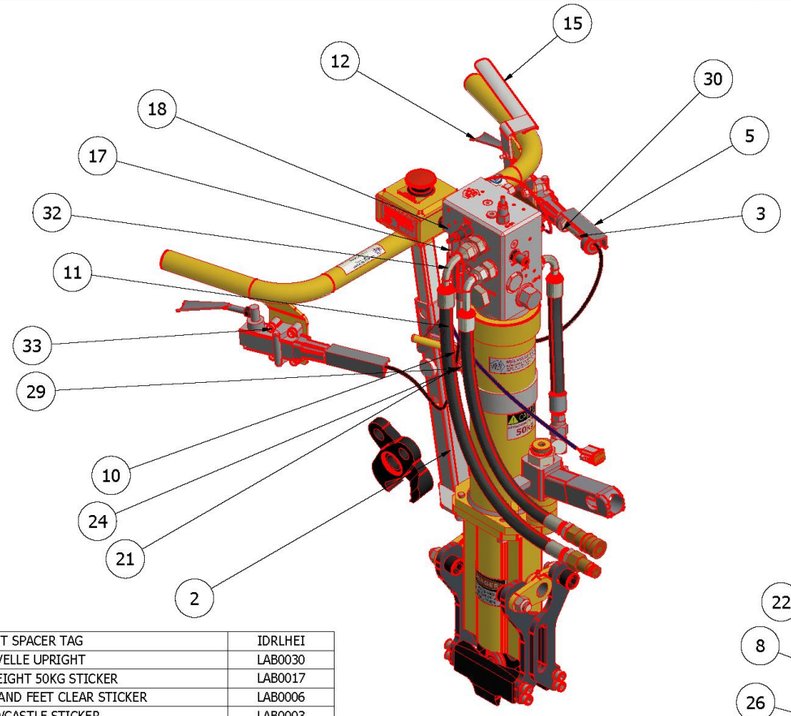
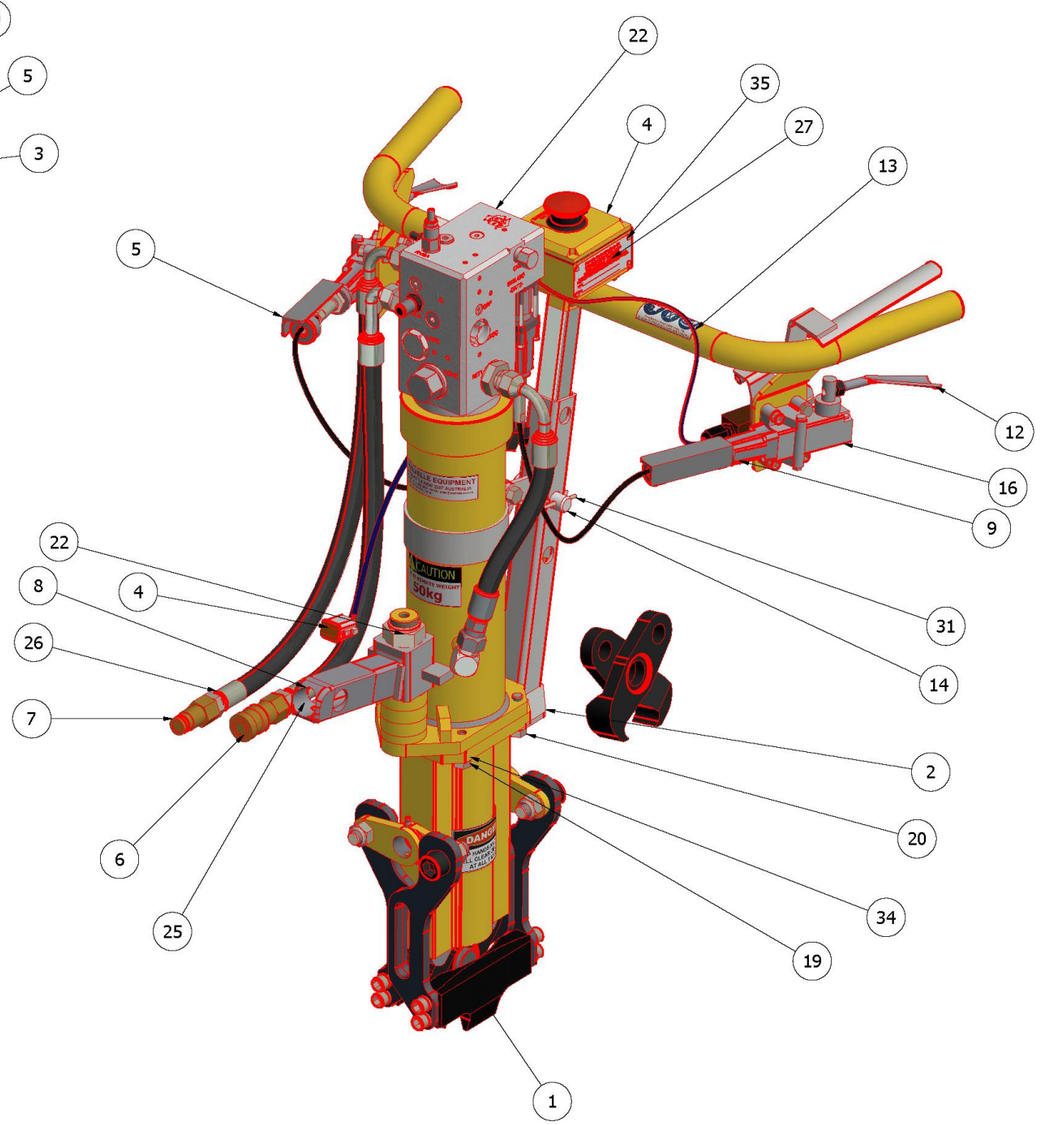
TOLERANCES UNO:- DIMENSIONS IN mm UNO
.XX ±0.1 XXX. ±2.0
.X ±0.2 XXXX. ±3.0
X. ±0.5 X.° ±0.1°
XX. ±1.0 X.° ±0.5°

DESCRIPTION: SPIKE PULLER HEAD DUAL TRIGGER - 8T CYL- NO MOUNTING BRACKET
PART #: FP-108-BK-DT
DRAWN: garym 20/07/2015
MODELLED BY: garyM
CHECKED
APPROVED
SCALE: 1:3
DRG: 2-108-389 REV: 1

13.12. Track pack head sliding leg housing





ITEM	QTY	DESCRIPTION	PART NUMBER
67	1	RAIL HEIGHT SPACER TAG	IDRLHEI
66	1	LARGE MELVELLE UPRIGHT	LAB0030
65	1	APPROXIMATE WEIGHT 50KG STICKER	LAB0017
68	2	DANGER KEEP HANDS AND FEET CLEAR STICKER	LAB0006
63	1	MELVELLE NEWCASTLE STICKER	LAB0003
62	1	PPE SAFETY STICKER	LAB0008
61	1	MELVELLE ACHIEVING EXCELLENCE STICKER	LAB0004
35	8	U DRIVE SCREW	UDSCREW
34	4	1/2" SPRING WASHER x 7/64" SQ SECTION	SW08
33	7	SOCKET HEAD CAP SCREW M8 x 35	SHM0835
32	8	SOCKET HEAD CAP SCREW M5 x 75	SHM0575
31	1	R CLIP 4mm	RCLIP04
30	2	NUT M16 FINE THIN NUT (ZINC)	NM16HF
29	1	NUT M12 NYLOC	NM12N
28	7	NUT M8 NYLOC	NM08N
27	1	MELVELLE MODEL & SERIAL N/O AL TAG	IDTAG02
26	1	H082 + MCBM-0808 + 00400 + MCJP90M-1408	H082-00500-035
25	1	H082 + MCBM-0808 + 00400 + MCJP90S-1408	H082-00500-034
24	6	FLAT WASHER - ENGINEERS - 1/2" X 1" ZINC	FW08
23	7	FLAT WASHER - ENGINEERS - 5/16" X 5/8" ZINC	FW05
22	1	SPIKE PULLER HEAD DUAL TRIGGER - 8T CYL- NO MOUNTING BRACKET	FP-108-BK-DT
21	1	BOLT HT M12 X 45	BM1245
20	2	BOLT HT M12 X 40	BM1240
19	2	BOLT M12 x 30	BM1230
18	2	CABLE MOUNT PLATE WITH TAPPED HOLES	1900020
17	2	CABLE MOUNT PLATE WITH HOLES	1900019
16	2	CONTROL CABLE ACTUATOR - TRIGGER END ASS	1860120
15	1	CLIPPER BRAKE TRIGGER ASSEMBLY	1860113
14	1	HANDLE LOCKING PIN	1860027
13	1	TOP HANDLE FABRICATION	1860024
12	2	REMOTE CONTROL TRIGGER-M10	1640035
11	1	TEE BOLT LOCKING NUT	1450284
10	1	1/2" TEE LOCKING BOLT 2" LONG	1450283
9	4	CONTROL CABLE END CAP MOUNT	1450166
8	1	TRACK PACK SD67/8T QUICK CHANGE END	1430076
7	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP MALE	1430005
6	1	SNAP CONNECTOR FLUSH FACED 1/2 BSPP FEMALE	1430004
5	2	CABLE GUARD FOR THIN CABLES	1081369
4	1	WIRING HARNESS DUAL HANDLE SPIKE PULLER	1081366
3	4	CABLE ADAPTER TRIGGER TO CABLE	1081364
2	1	BASE HANDLE EXTENSION SPIKE PULLER	1081325
1	1	SPIKE PULLER JAW HOUSING ASSY SELF LEVELLING	1080557

PARTS LIST

REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
2	7/07/2017	BB	1601	ADDED STICKERS TO MODEL AND MOVED SPACER TAG FROM TRACKPACK		
1	22/10/2015	BB	1233	CHANGED TO STANDARD HANDLE AND ADDED WIRING AND CABLE DETAIL	GM	GM
0	21/07/2015	GM	-	ORIGINAL ISSUE	BMD	BMD

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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: DUAL TRIGGER SPIKE PULLER TRACKPACK HEAD SLIDING LEG 8T

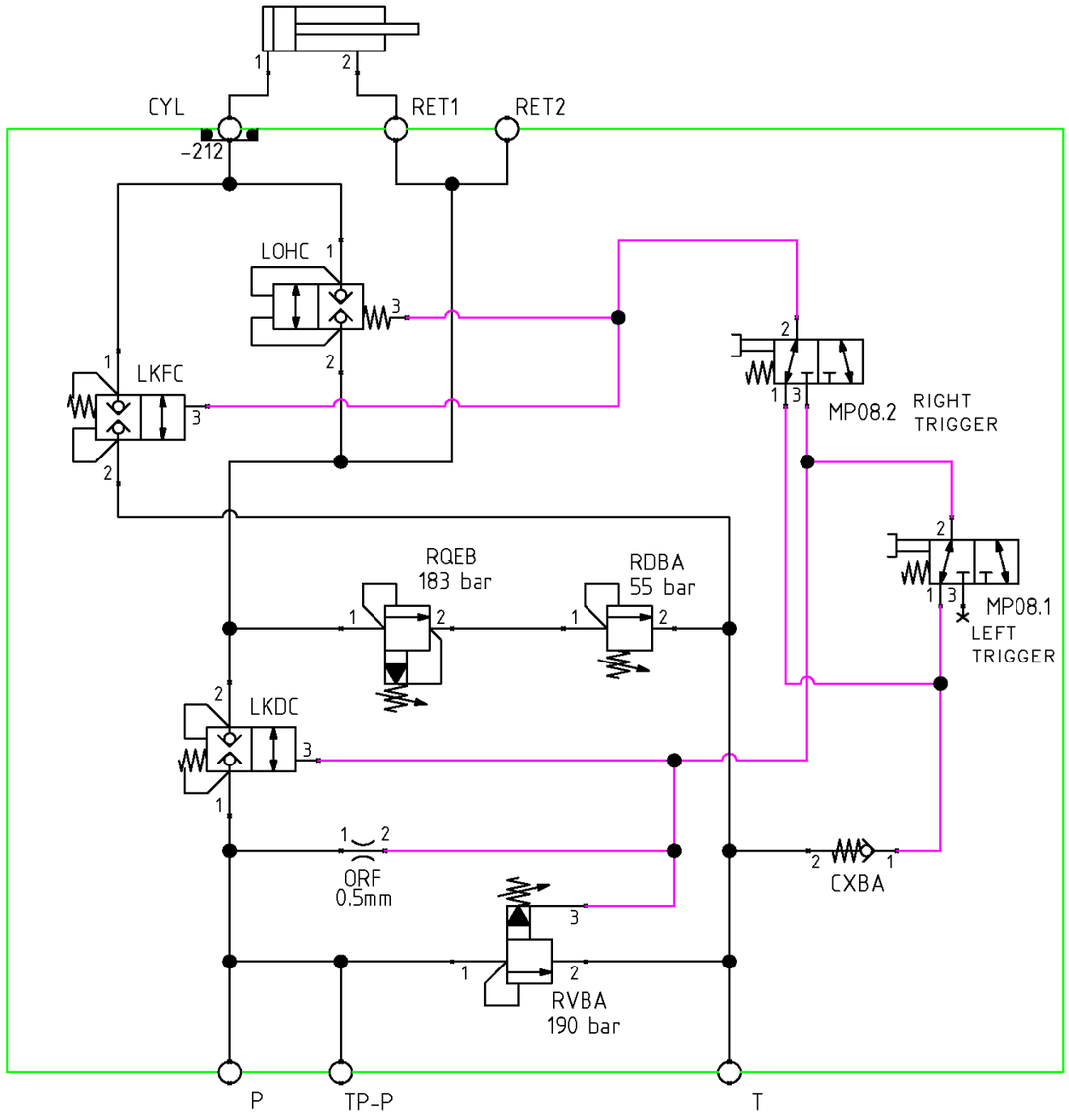
PART #: FP-108-TP

DRAWN: garym 21/07/2015

MODELLED BY: garym

CHECKED | APPROVED | SCALE | DRG 2-108-390 | REV 2

13.13. Hydraulic circuit diagram dual trigger manifold

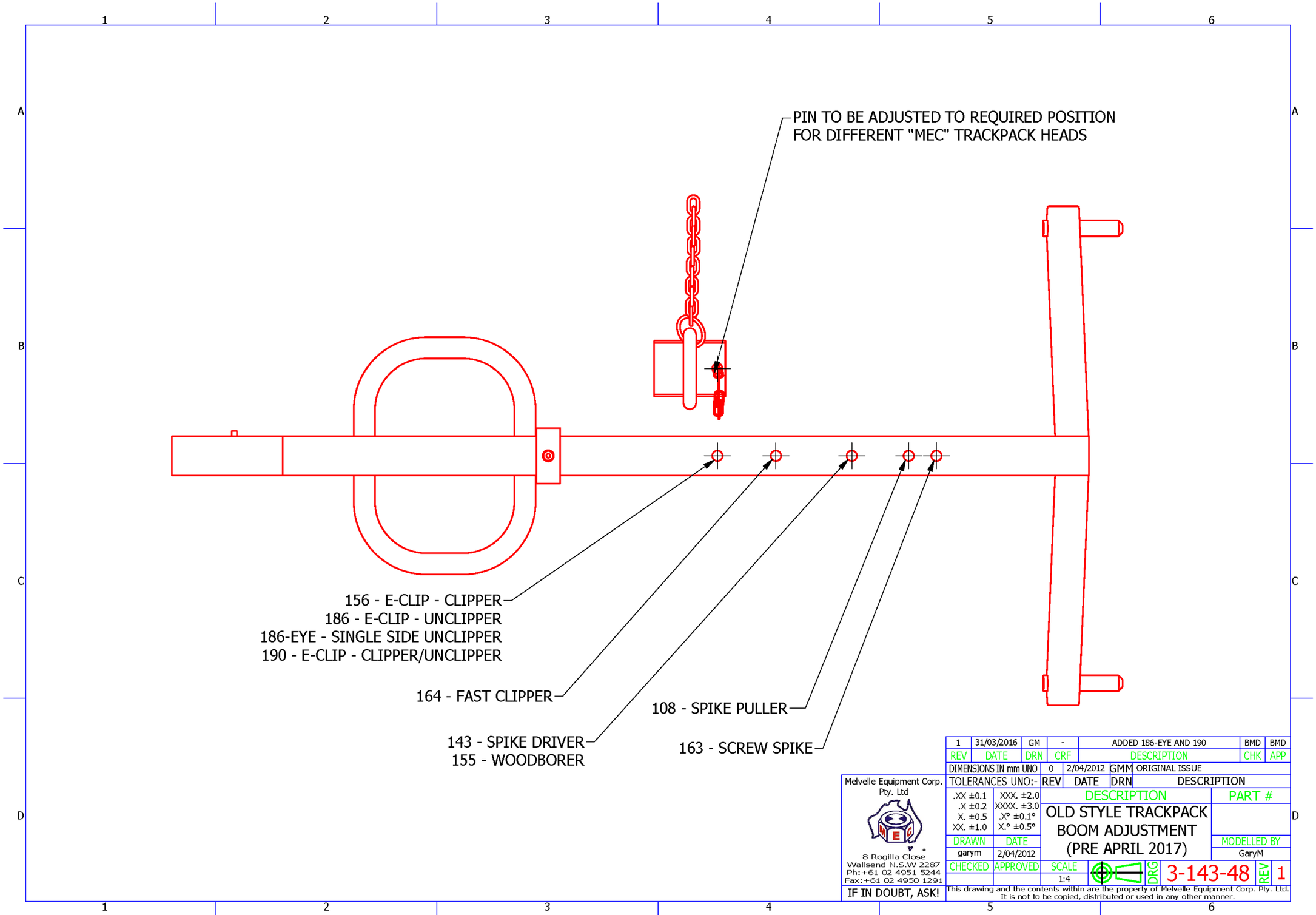


NOTES - TO SET PRESSURES

1) ALL PRESSURE SETTINGS WILL BE MEASURED FROM TEST POINT TP-P. A ELECTRONIC PRESSURE GAUGE WITH MAXIMUM PRESSURE RECALL IS RECOMMENDED.
2) TURN RQEB IN UNTIL MAXIMUM PRESSURE WILL BE ACHIEVED. SQUEEZE THE LEFT TRIGGER AND SET RVBA TO 190 BAR. NOTE THE ENGINE MAY WANT TO STALL AT THIS PRESSURE. RESET THE LEFT TRIGGER TO ALLOW THIS PRESSURE TO BE REACHED.
3) NEXT SET RQEB. FIRST TURN THE VALVE OUT A FEW TURNS THEN BEGIN TO SET BY SQUEEZING THE LEFT TRIGGER AND WATCHING THE PRESSURE RISE QUICKLY. CONTINUALLY RESET THE LEFT TRIGGER WHILE TURNING IN RQEB UNTIL THE VALVE IS UNLOADING AT 183 BAR.
4) TO SET RDBA SQUEEZE THE LEFT HAND TRIGGER UNTIL THE SYSTEM UNLOADS AND IS SITTING UNDER THE RELIEF PRESSURE. SET THIS VALVE TO 55 BAR.
5) ALL VALVES SHOULD NOW BE SET. BY SQUEEZING THE LEFT TRIGGER, THEN OPERATING THE RIGHT TRIGGER ENSURE THE CYLINDER EXTENDS AND RETRACTS FREELY.

Melvelle Equipment Corp. Pty. Ltd.	DIMENSIONS IN mm UNO	0	31/07/2015	GM	ORIGINAL ISSUE
	TOLERENCES UNO:-	REV	DATE	DRN	DESCRIPTION
8 Rogilla Close Wallsend N.S.W. 2287 Ph: +61 02 4951 5244 Fax: +61 02 4950 1291	.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: 108 SPIKE PULLER HYDRAULIC CIRCUIT DIAGRAM			PART#: FP-108-TP/F
	DRAWN: GM	DATE: 31/07/2015			AUTOCAD DRAWING
	CHECKED: BMD	APPROVED: BMD	SCALE: NTS	DRG: 3-108-393	REV: 0
IF IN DOUBT, ASK!	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 than that intended.				

13.14. Trackpack Boom Adjustment



REV	DATE	DRN	CRF	DESCRIPTION	CHK	APP
1	31/03/2016	GM	-	ADDED 186-EYE AND 190	BMD	BMD
DIMENSIONS IN mm UNO		0	2/04/2012	GMM ORIGINAL ISSUE		

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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)			
X. ±0.5	.X° ±0.1°				
XX. ±1.0	X.° ±0.5°				
DRAWN	DATE				MODELLED BY
garym	2/04/2012				GaryM
CHECKED	APPROVED	SCALE	DRG	3-143-48	REV 1
		1:4			