



TOHORA ENTERPRISES
Heavy Transport Compliance Specialists

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Light trailer braking.

Addendum to Report on testing in New Zealand to demonstrate UN/ECE Reg. 13 equivalence



Report TEL 08040 – NZB

Trailquip Hygo3 hydraulic coupling

Prepared By;
Tohora Enterprises Ltd

Date: 21/03/2023

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Brief

Tohora Enterprises (TEL) has been asked to review the information regarding the comparison between the current Hygo 2 light trailer hydraulic coupling and the new Hygo 3 hydraulic coupling used as part of the Trailparts Hygo overrun braking systems fitted to Class TB (2) trailer (2500kg-3500kg GVM), as tested to provide assurance that this locally sourced braking system meets the performance and technical requirements of the light trailer braking requirements in UN/ECE Reg 13 and therefore qualify for an exemption from clause 2.4(3) of the LTR Light-vehicle Brakes (in NZ) or qualify for Australian SARN (Sub Assembly Registration Number) approval.

Reference Documents

TEL Reports

- | | |
|-------------------------------|--|
| Report TEL 05027- A; | Light trailer braking; Report on testing in NZ to demonstrate equivalence to UN/ECE Reg.13 and Sarn approval (Disc) |
| Report TEL 05027- A; | Light trailer braking; Report on testing in NZ to demonstrate equivalence to UN/ECE Reg.13 and Sarn approval (Drum) |
| Report TEL 05027- NZA; | Light trailer braking; Report on testing in NZ to demonstrate equivalence to UN/ECE Reg.13 and Sarn approval (Disc) |
| Report TEL 05027- NZB; | Light trailer braking; Report on testing in NZ to demonstrate equivalence to UN/ECE Reg.13 and Sarn approval (Drum) |

Relevant NZ Land Transport Rules:

Land Transport Rule: Light-vehicle Brakes 2002

Other Relevant NZ Transport Agency Documents;

NZTA In Service Certification Vehicle Inspection Requirements Manual (VIRM)

Other relevant documents

UN/ECE Regulation 13

Light trailer braking requirements. Testing in New Zealand to demonstrate equivalence to UN/ECE Reg. 13 (Tohora Enterprises Ltd)

Comparison of components

The Hygo 2, and Hygo 3, systems were compared and the differences noted. These differences were checked against the operation of the Hygo 2 system to understand whether there was any reason to believe that the design modifications would have any bearing on the performance of the braking system.

There are two areas of the design that have the potential to affect the way the braking system operates and therefore affect its operational equivalence to UN/ECE Regulation 13.

- The coupling head, body and cylinder mounting, have been reconfigured.
- The manual park brake, including its breakaway function have been relocated with an altered distance from the pivot to its mounting point.

A comparative study of the Hygo 2 and Hygo 3 coupling heads showed that the bore and stroke of the hydraulic cylinder as well as the system mounted brake master cylinder remain unchanged.

Also, while the relative location of the manual park brake/breakaway brake has been altered there has been no change to the operational geometry of the system and this is confirmed in the mounting instructions supplied by the manufacturer.

Conclusion

Given that there is no operational changes caused by the design modifications, including the operation of the breakaway brake as demonstrated (see figure 2), TEL is of the opinion that there is no reason to believe that the equivalence testing carried out using the Hygo 2 system would not be the same as if carried out using the Hygo 3 system. TEL is therefore happy to attach this report, TEL 08040 as an addendum to the TEL 05027 series of reports confirming that the Hygo 3 system is operationally equivalent to the Hygo 2 system tested.

Supporting Information

Information provided to support this report and its conclusion include;

1. Illustrative photos including the breakaway operation
2. Drawings of the Hygo 2 and Hygo 3 Coupling assemblies.

Name_ Stephen Arthur Bullôt

Signed



Certifier ID

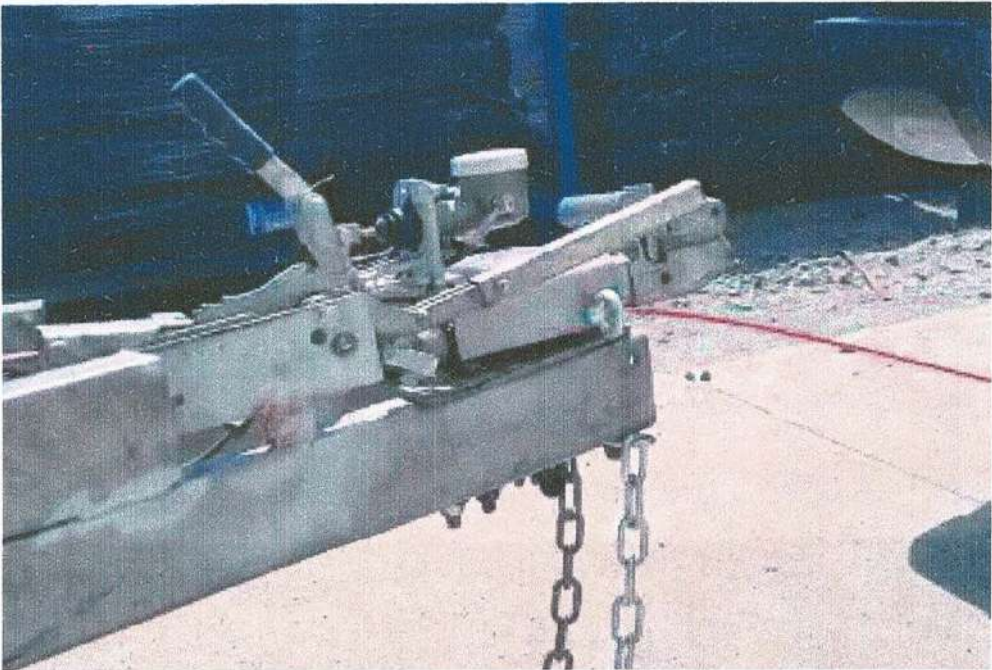
SAB

Tohora Enterprises Ltd
Tohora.ent@gmail.com
021 02267176

Figure 1; Hygo 3 coupling plus breakaway brake mount (Note breakaway cable guide)



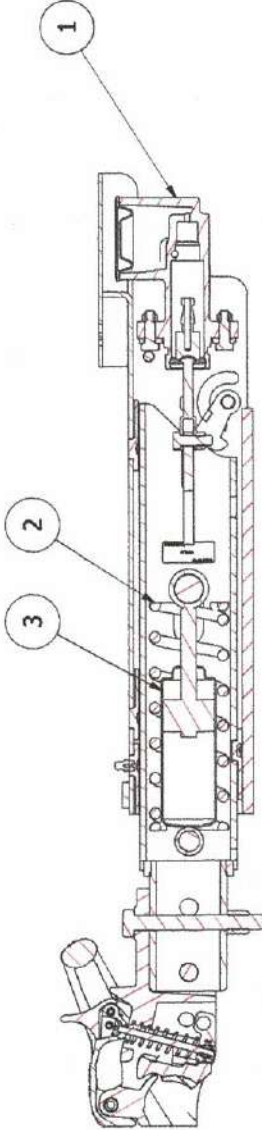
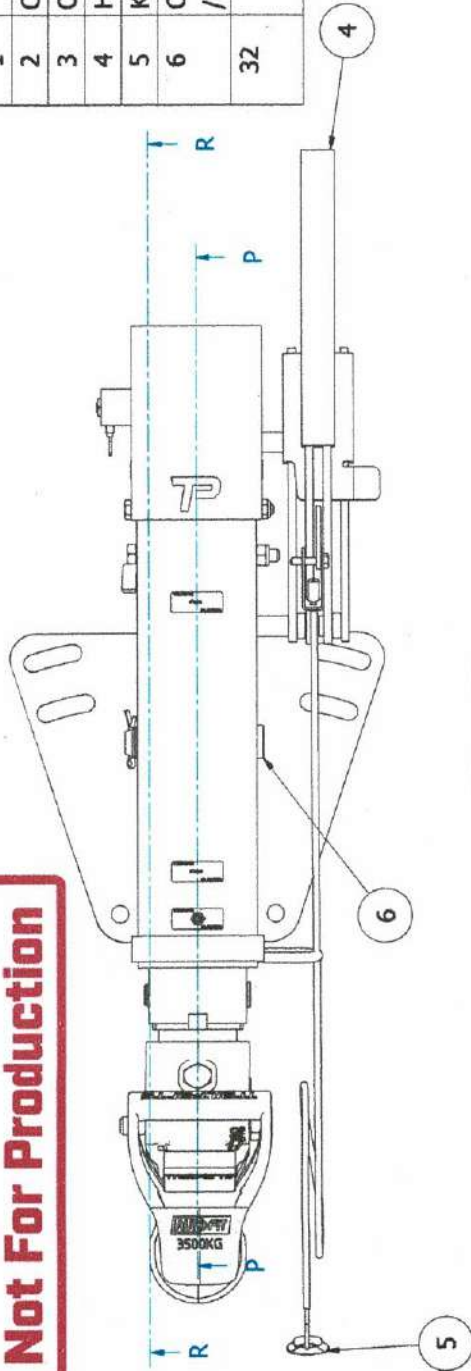
Figure 2 – Hygo 3 breakaway brake activation. Note breakaway cable guide



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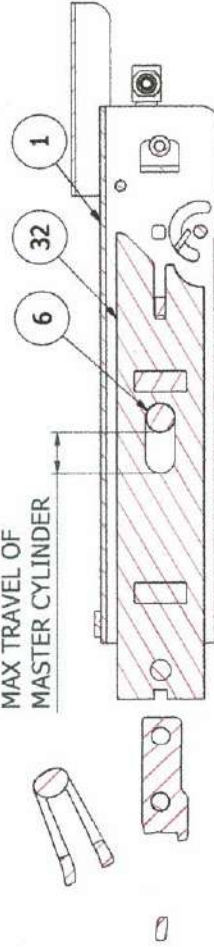
Parts List

ITEM	DESCRIPTION	PART #	QTY
1		C3401A HYG0	1
2	C2000 Series Coupling - Main Spring	C20001-MS	1
3	C2000 Series Coupling - Damper	C2000-SA	1
4	Hygo Coupling Handbrake Assembly	C2000-HB	1
5	Knott / Replacement breakaway cable	CKFGB	1
6	C2000 HYG0 COUPLING MAIN DRAW / DAMPER PIN	C20001-MDP	1
32		C20002M_30_ C27_FAB	1

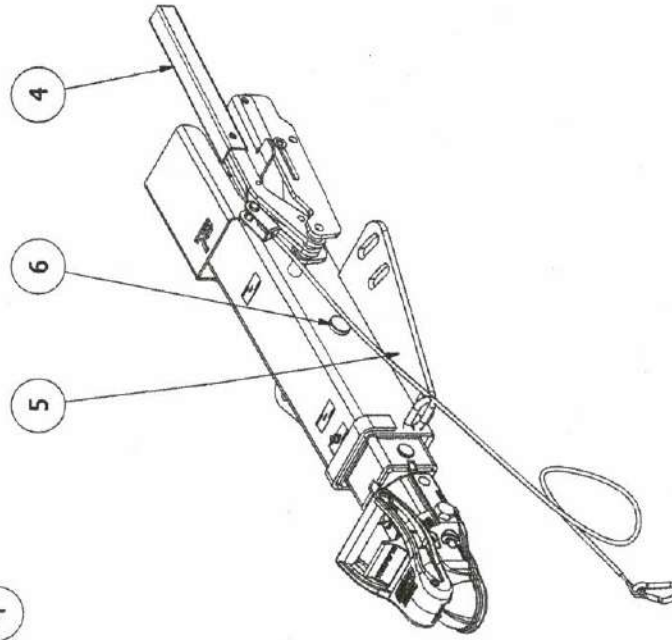


SECTION ON P-P

31.8
MAX TRAVEL OF
MASTER CYLINDER



SECTION ON R-R



32mm OFFSET FROM BRAKE MASTER CYLINDER
SHOWN TRANSFERRED FROM COUPLING THROUGH
MAIN DRAW BAR PIN

TOLERANCES - GENERAL		TOLERANCES - MACHINED COMPONENTS	
Dimensions up to and including 25mm	D +0.15, -0	Distance between centres of drilled holes	D ±0.1
Dimensions between 25mm and 250mm	D ±0.20	Distance from centre of drilled hole to machined face	D ±0.1
Dimensions over 250mm	D ±0.40	Distance over parallel machined faces	D ±0.1
Angular dimensions	MAX 1.7°	Diameter of turned components	MAX 0.1
		Regular dimensions	MAX 0.1

CASTING		WELDING	
Supplier discretion allowed, only suggested castings shown		Symbols to AS 1101.3 - 2005	
Supplier responsible for casting allowance and machine allowance		Unless otherwise specified,	
See IGES and/or STEP files provided		all welding to AWS 1554.1:2004	

Trailparts™		Trailparts™	
BRUNO R	DATE 27/07/2021	GERARD S	DATE 27/07/2021
CHECKED	APPROVED	CHECKED	APPROVED
STATUS		STATUS	
REVIEW		REVIEW	

MATERIAL

FINISH / COATING

MASS

22.606 kg

CATEGORY

C - Couplings



THIRD ANGLE PROJECTION

3500KG LARGE SHAFT COUPLING OFFSETS
FOR MASTER CYLINDER FOR COMPARISON
TO HYG0 MK2 SHEET 3 OF 3

0000235

ISSUE

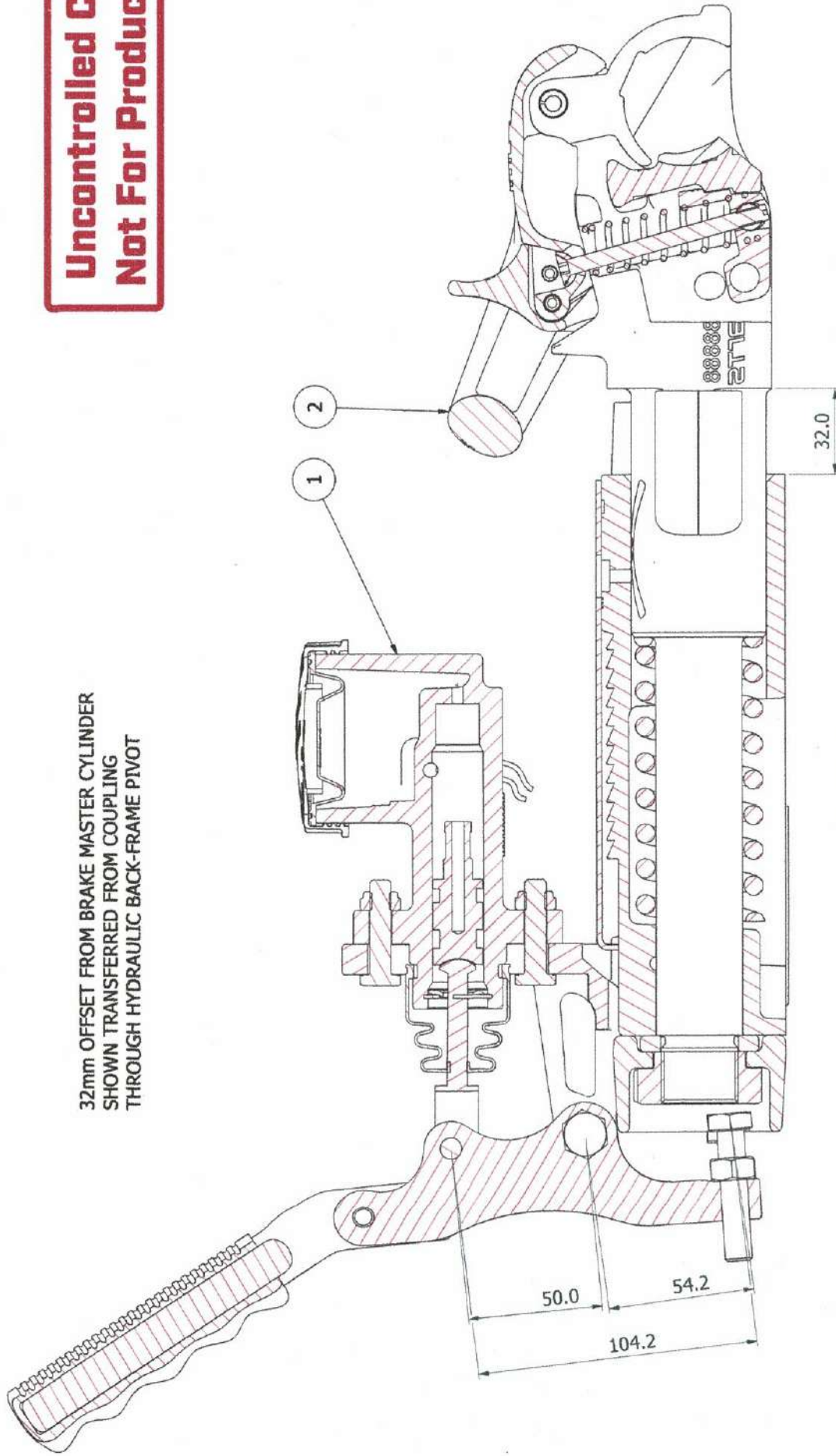
A

Parts List

ITEM	DESCRIPTION	PART #	QTY
1	HYDRAULIC BACK-FRAME AND 3/4" MASTER CYLINDER ASSEMBLY	C28F34A	1
2	3500KG AUTOFIT COUPLING TO SUIT HYDRAULIC BRAKES	C16H	1

32mm OFFSET FROM BRAKE MASTER CYLINDER
SHOWN TRANSFERRED FROM COUPLING
THROUGH HYDRAULIC BACK-FRAME PIVOT

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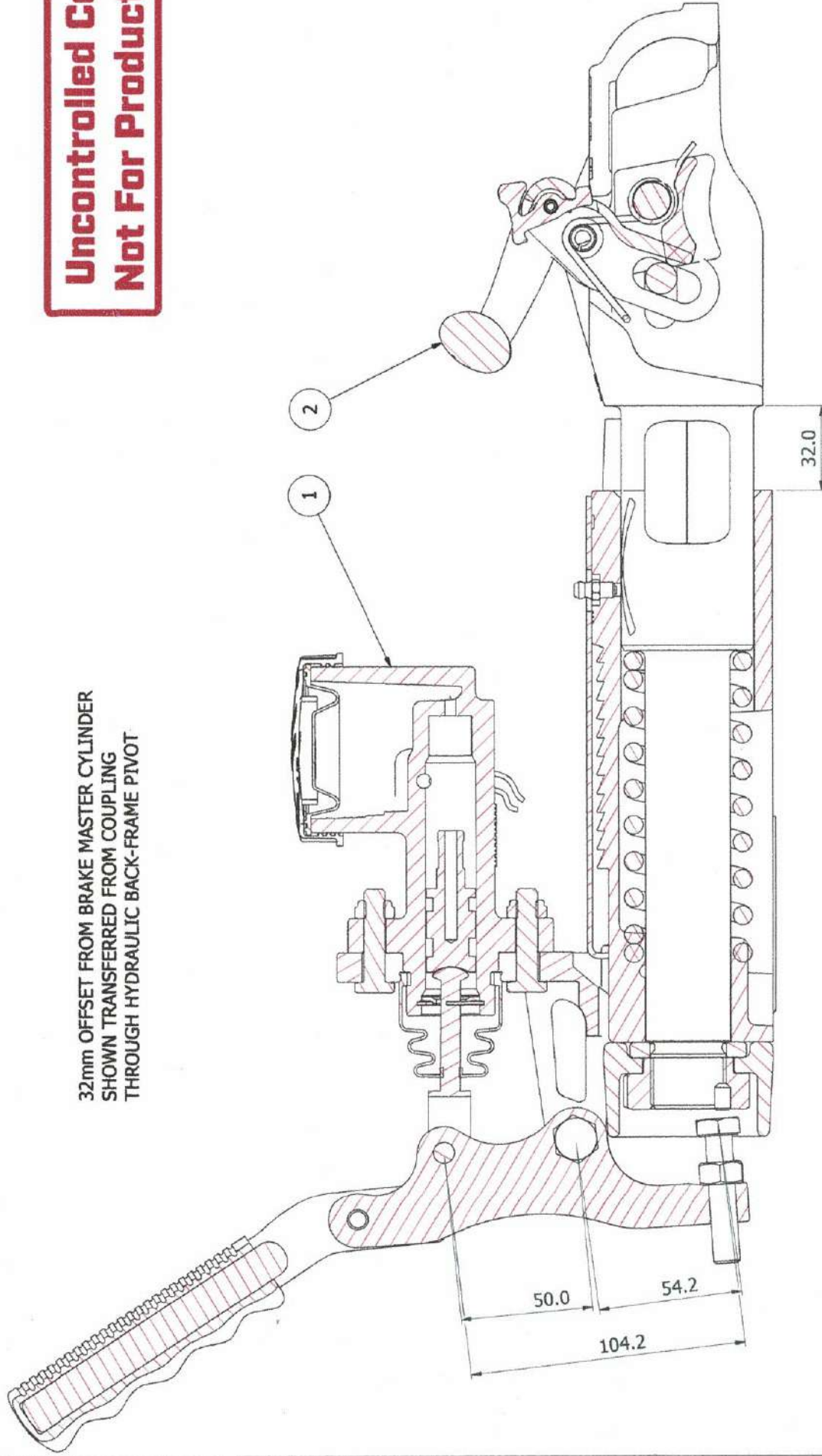
SECTION ON N-N

REV	DATE	REVISION DETAIL	BY	APPD	TOLERANCES - GENERAL		TOLERANCES - MACHINED COMPONENTS		Trailparts™		MATERIAL	
					Dimensions up to and including 20mm D ± 0.20 Dimensions between 20mm and 2500mm D ± 0.40 Dimensions over 2500mm D ± 0.70 Angular dimensions MAX 1.0°	D ± 0.1 Distance between centres of drilled holes D ± 0.1 Distance from centre of drilled hole to machined face D ± 0.1 Distance over parallel machined faces D ± 0.1 Diameter of turned components MAX 0.5°	D ± 0.1 Distance between centres of drilled holes D ± 0.1 Distance from centre of drilled hole to machined face D ± 0.1 Distance over parallel machined faces D ± 0.1 Diameter of turned components MAX 0.5°	FINISH / COATING	DATE	DATE	FINISH / COATING	
A	12/05/2021								BRUNO R	27/07/2021	17.194 kg	17.194 kg
					CHECKED		APPROVED		CATEGORY		C - Couplings	
					WELDING		CASTING		THIRD ANGLE PROJECTION		ISSUE	
					Symbols to AS 1501.3 - 2005 Unless otherwise specified, all welding to NZS 554.1:2004		Supplier discretion allowed, only suggested callings shown Supplier responsible for casting shrinkage and machine allowance See IGDS and/or STEP files provided		GERARD S		0000235	
					STATUS		REVIEW		TO HYGO MK2 SHEET 1 OF 3		A	

Parts List			
ITEM	DESCRIPTION	PART #	QTY
1	HYDRAULIC BACK-FRAME AND 3/4" MASTER CYLINDER ASSEMBLY	C28F34A	1
2	3500KG 50mm BALL AUTO-LOCK OVER-RIDE COUPLING ASSEMBLY	C2250	1

32mm OFFSET FROM BRAKE MASTER CYLINDER
SHOWN TRANSFERRED FROM COUPLING
THROUGH HYDRAULIC BACK-FRAME PIVOT

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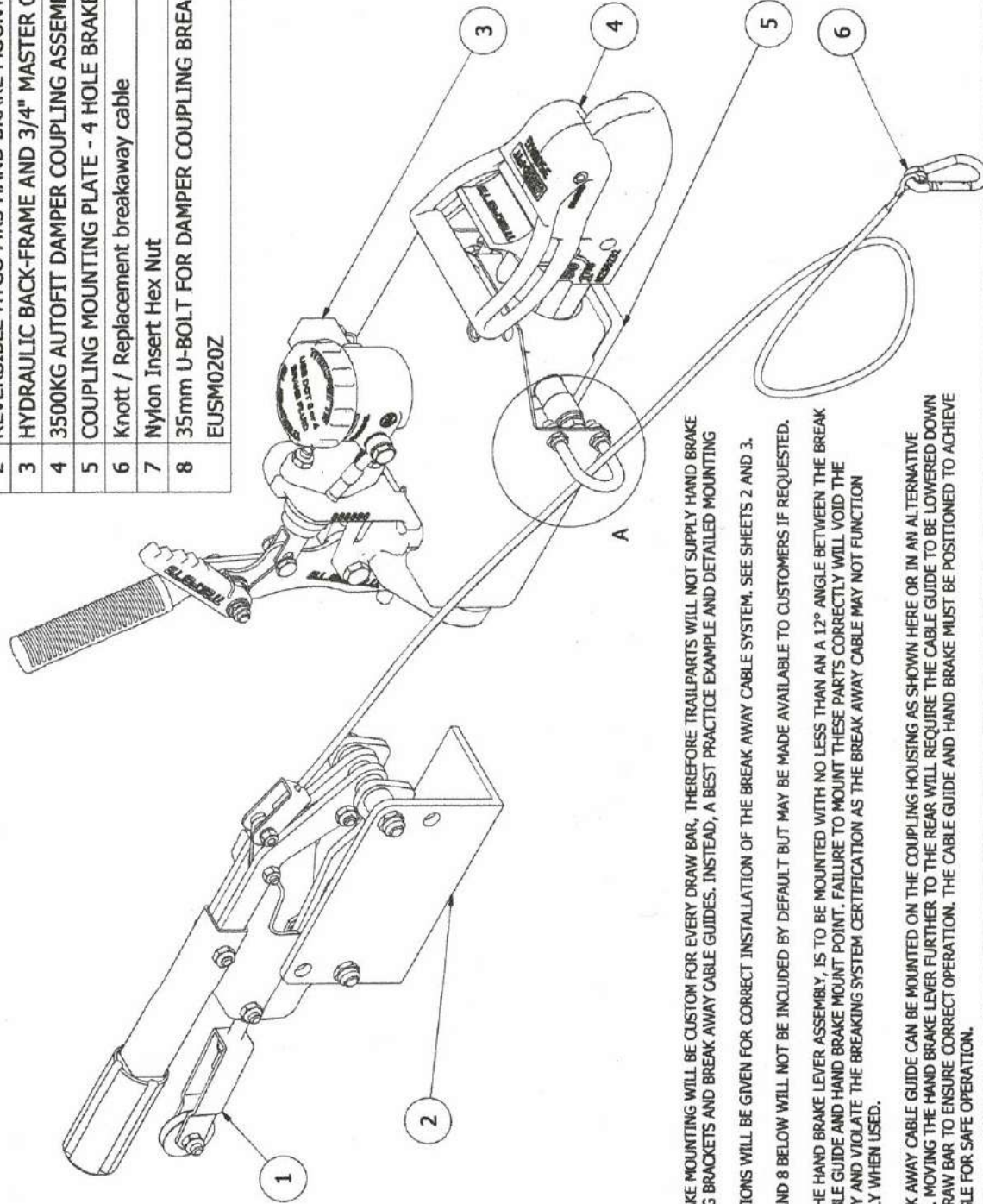


SECTION ON M-M

REVISED BY	DATE	REVISION DETAIL	BY	DATE	REVISION DETAIL
A	11/07/2021				
<p>TOLERANCES - GENERAL Dimensions up to and including 20mm D ± 0.25 Dimensions between 20mm and 250mm D ± 0.40 Dimensions over 250mm D ± 0.50 Angular dimensions MAX 1.0°</p> <p>TOLERANCES - MACHINED COMPONENTS D ± 0.1 Distance between centres of drilled holes D ± 0.1 Distance from centres of drilled hole to machined face D ± 0.1 Distance over parallel machined faces D ± 0.1 Diameter of turned components MAX 0.2° Regular dimensions</p> <p>CASTING Supplier discretion allowed, only suggested castings shown Supplier responsible for casting shrinkage and machine allowance See IGES and/or STEP file provided</p> <p>WELDING Symbolic to AS 1101.3 - 2005 Unless otherwise specified, all welding to NIS1554.1:2004</p>					
<p>TrailParts Innovative Trailer Solutions</p> <p>OWNER: BRUNO R DATE: 27/07/2021 CHECKED: APPROVED: GERARD S</p> <p>STATUS REVIEW</p> <p>MATERIAL FINISH / COATING: PLATE 16.803 kg CATEGORY: C - Couplings  THIRD ANGLE PROJECTION</p>					
<p>3500KG LARGE SHAFT COUPLING OFFSETS FOR MASTER CYLINDER FOR COMPARISON TO HYGO MK2 SHEET 2 OF 3</p> <p>00000235</p> <p>ISSUE A</p>					

Parts List

ITEM	DESCRIPTION	PART #	QTY
1	HYGO MK3 HAND BRAKE ASSEMBLY	0000599	1
2	REVERSIBLE HYGO MK3 HAND BRAKE MOUNT	C2828_08	1
3	HYDRAULIC BACK-FRAME AND 3/4" MASTER CYLINDER ASSEMBLY	C28F34A	1
4	3500KG AUTOFIT DAMPER COUPLING ASSEMBLY	C16HD	1
5	COUPLING MOUNTING PLATE - 4 HOLE BRAKED	Z6835	1
6	Knott / Replacement breakaway cable	CKFGB	1
7	Nylon Insert Hex Nut	ISO 10511 - M8	4
8	35mm U-BOLT FOR DAMPER COUPLING BREAKAWAY CABLE	0000597	1
	EUSM020Z		



DETAIL A

HAND BRAKE MOUNTING WILL BE CUSTOM FOR EVERY DRAW BAR, THEREFORE TRAILPARTS WILL NOT SUPPLY HAND BRAKE MOUNTING BRACKETS AND BREAK AWAY CABLE GUIDES. INSTEAD, A BEST PRACTICE EXAMPLE AND DETAILED MOUNTING INSTRUCTIONS WILL BE GIVEN FOR CORRECT INSTALLATION OF THE BREAK AWAY CABLE SYSTEM. SEE SHEETS 2 AND 3.

PARTS 2 AND 8 BELOW WILL NOT BE INCLUDED BY DEFAULT BUT MAY BE MADE AVAILABLE TO CUSTOMERS IF REQUESTED.

PART 1, THE HAND BRAKE LEVER ASSEMBLY, IS TO BE MOUNTED WITH NO LESS THAN A 12° ANGLE BETWEEN THE BREAK AWAY CABLE GUIDE AND HAND BRAKE MOUNT POINT. FAILURE TO MOUNT THESE PARTS CORRECTLY WILL VOID THE WARRANTY AND VIOLATE THE BREAKING SYSTEM CERTIFICATION AS THE BREAK AWAY CABLE MAY NOT FUNCTION CORRECTLY WHEN USED.

THE BREAK AWAY CABLE GUIDE CAN BE MOUNTED ON THE COUPLING HOUSING AS SHOWN HERE OR IN AN ALTERNATIVE POSITION. MOVING THE HAND BRAKE LEVER FURTHER TO THE REAR WILL REQUIRE THE CABLE GUIDE TO BE LOWERED DOWN ON THE DRAW BAR TO ENSURE CORRECT OPERATION. THE CABLE GUIDE AND HAND BRAKE MUST BE POSITIONED TO ACHIEVE A 12° ANGLE FOR SAFE OPERATION.

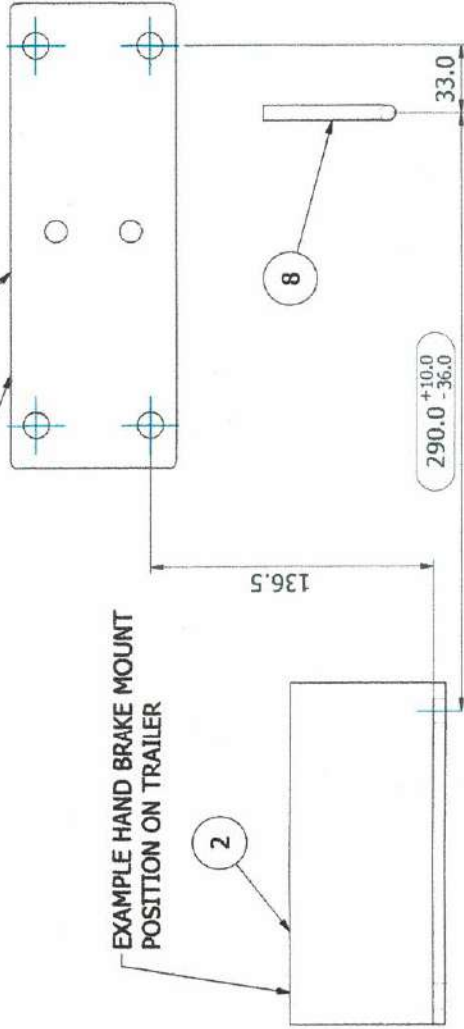
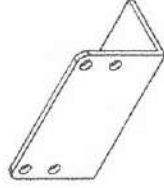
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REV	DATE	BY	APPD	REVISION DETAIL	DAMPER COUPLING WITH HAND BRAKE AND MASTER CYLINDER ASSEMBLY SHEET 1 OF 3									
A	12/05/2021				00000559									
TOLERANCES - GENERAL					MATERIAL									
Dimensions up to and including 50mm					FINISH / COATING									
Dimensions between 50mm and 100mm					MASS									
Dimensions between 100mm and 2500mm					CATEGORY									
Dimensions over 2500mm					23.532 kg									
Angular dimensions					C - Couplings									
WELDING - Symbols to AS 1591.3:2005					THIRD ANGLE PROJECTION									
Unless otherwise specified, all welding to NZS1554.1:2014														
CASTING - Supplier discretion allowed, suggested castings shown P.O. Box 74, Dargaville, New Zealand, and must not be					STATUS									
Supplier responsible for casting shrinkage and machine allowance copied or reproduced nor must goods be manufactured					REVIEW									
See 1005 and/or STEP files provided					GERARD S									
See 1005 and/or STEP files provided					14/03/2023									
COPYRIGHT					BRUNO R									
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See 1005 and/or STEP files provided					MASS									
See 1005 and/or STEP files provided					23.532 kg									
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See 1005 and/or STEP files provided					MASS									
See 1005 and/or STEP files provided					23.532 kg									
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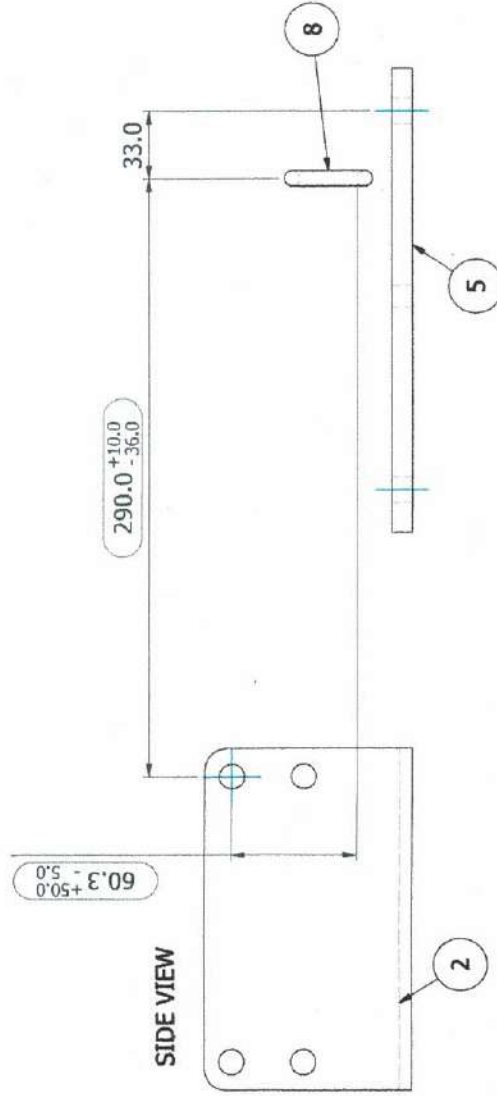
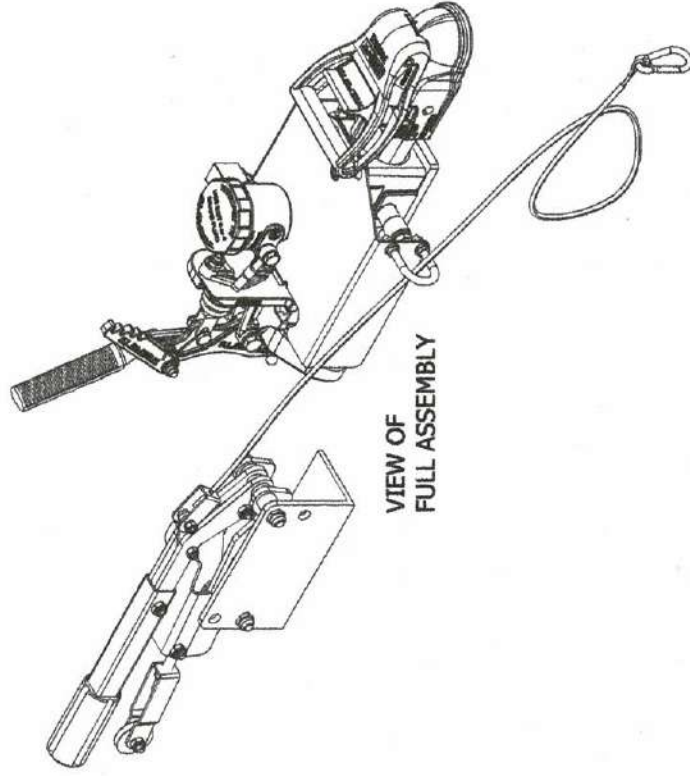
Parts List

ITEM	DESCRIPTION	PART #	QTY
2	REVERSIBLE HYGO MK3 HAND BRAKE MOUNT	C2828_08	1
8	35mm U-BOLT FOR DAMPER COUPLING BREAKAWAY CABLE EUSM020Z	0000597	1
5	COUPLING MOUNTING PLATE - 4 HOLE BRAKED	Z6835	1

PLAN VIEW

COUPLING MOUNT PLATE
BOLT POSITIONS ON TRAILERVIEW OF
MOUNTING PARTS ONLY

SIDE VIEW

VIEW OF
FULL ASSEMBLY

TOLERANCES - GENERAL		MACHINED COMPONENTS - TO ISO 2768	
Dimensions up to and including 5mm	D ±0.5	Distance between centres of drilled holes	D ±0.1
Dimensions between 5mm and 50mm	D ±0.5	Distance from centre of drilled hole to machined face	D ±0.1
Dimensions between 50mm and 250mm	D ±1.0	Distance over parallel machined faces	D ±0.1
Dimensions over 250mm	D ±1.0	Diameter of turned components	D ±0.1
Angular dimensions	MAX 1.0°	Angular dimensions	MAX 0.5°

WELDING - Symbols to AS 1101.1:2005

Unless otherwise specified, all welding to NIS 554.1:2014

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See IGES and/or STEP files provided

(10/05/2021)

Trailparts
Innovative Trailer SolutionsDRAWN
BRUNO R
DATE
14/03/2023CHECKED
GERARD SSTATUS
REVIEW

MATERIAL

FINISH / COATING

MASS

23.532 kg

CATEGORY

C - Couplings

THIRD ANGLE PROJECTION

DAMPER COUPLING WITH HAND BRAKE AND
MASTER CYLINDER ASSEMBLY SHEET 3 OF 3

0000559

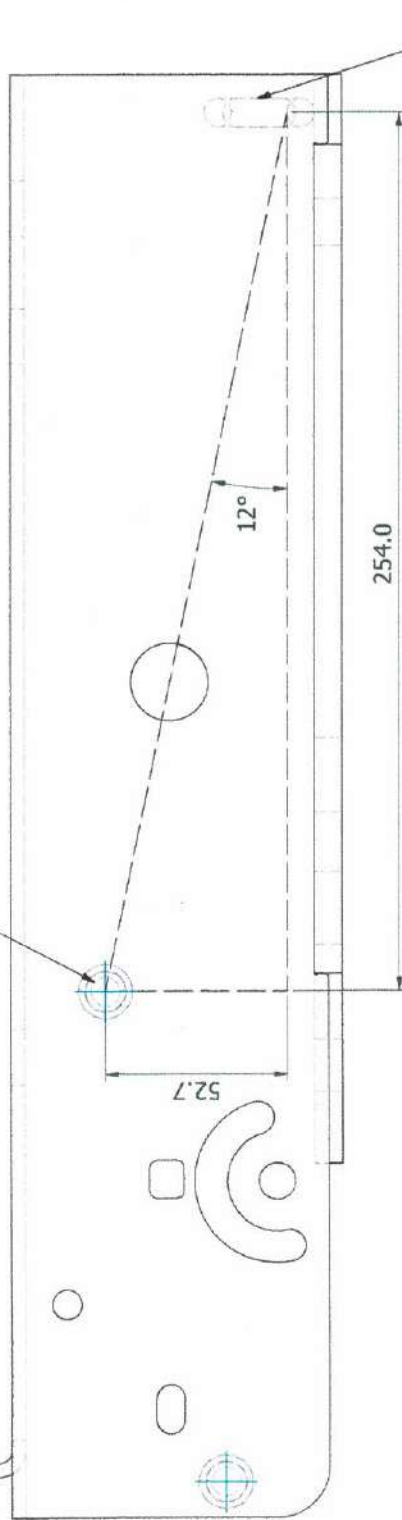
ISSUE

A

HYGO MK2

THE CURRENTLY CERTIFIED SOLUTION SHOWING
ANGLE OF BREAK AWAY CABLE MOUNT TESTED
AND PREVIOUSLY APPROVED

HAND BRAKE FORWARD
MOUNT POINT



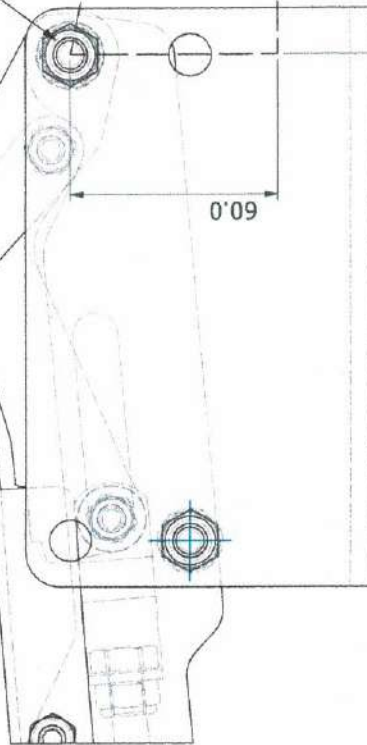
HYGO MK3

UN-CERTIFIED PROPOSED SOLUTION.
MINIMUM BREAK AWAY CABLE MOUNT
ANGLE OF 12° WILL BE STIPULATED AS AN
INSTALLATION REQUIREMENT UPON
SALE OF PARTS.

HAND BRAKE FORWARD
MOUNT POINT

BREAK AWAY
CABLE GUIDE

12° MINIMUM ANGLE
FOR SAFE OPERATION OF
BREAK AWAY CABLE



290.0

CABLE GUIDE TO BE MOUNTED ON TRAILER DRAW BAR IF ANGLE CAN'T BE
ACHIEVED WITH SHOWN MOUNT POSITION ON COUPLING COVER.

Trailparts Innovative Trailer Solutions		MATERIAL	DAMPER COUPLING WITH HAND BRAKE AND MASTER CYLINDER ASSEMBLY SHEET 2 OF 3	
DESIGN	BRUNO R	FINISH / COATING	MASS	23.532 kg
CHECKED	14/03/2023	MASS	CATEGORY	C - Couplings
APPROVED	GERARD S	APPROVED	THIRD ANGLE PROJECTION	ISOLE
STATUS	REVIEW	THIRD ANGLE PROJECTION	ISOLE	0000559
C:\Vault\WP\Workspace\Couplings\CT640000559.dwg				A