Engineering Services & Supplies Pty Ltd
Phone 1 800 074446
Visit our Web Site www.esseng.com.au

ESS Heavy Duty Tracker

MARTIN ENGINEERING

Installation Operations Manual

Revision	Description of Change	Changed By	Date
A	Added Final Checklist	AS	28/5/07
B	Updated Melbourne Address & Removed SA Address	SH	3/08/09
C	Corrected title to ESS Heavy Duty Tracker	SH	23/11/09
D	Final Checklist Updated Items 4 & 5 Reversed	SH	15/04/10
E	Drawing F0152 revised	SH	10/09/10
F	Updated drawings F0157 & F0156	KO	14/03/11
G	Mt Isa contact details removed	KO	21/06/12
H	Updated format of manual	KO	20/2/13
I	Updated Drawing F0157	KO	11/7/13
J	Inserted updated drawing F0156	KO	11/2/14
K	Updated office details	KO	11/3/14

ENGINEERING SERVICES and SUPPLIES

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TOLL FREE 1800 074 446 FROM ANYWHERE IN AUSTRALIA **VSS TOLL FREE 1800 300 877**		

WARRANTY NOTE

ESS* WARRANTS** the **Heavy Duty Tracker** to be free of defects both in materials and workmanship for a period of 12 months from the date of despatch of the product from the ***ESS factory. The warranty given by ***ESS*** in this regard will extend only to replacing or repairing product shown to be defective.

The warranty also is subject to the following restrictions:

(a) Installation of the product contrary to the instructions contained in the supplied manual will void such warranty absolutely;

(b) The warranty will not extend to any liability for injuries incurred and which result from the use of the product contrary to the instructions in the manual;

(c) Save as prescribed by law, ***ESS*** will not be liable for any damage sustained by a purchaser or a third party by way of consequential loss arising out of defects in the product.

You are asked to note that ***ESS*** offers purchasers a service whereby either:

(a) It will install the product and certify the correctness of such installation, or

(b) Certify the correctness or otherwise of the installation of the product by third parties.

This certification service is designed to ensure that you obtain the full benefit of the ***ESS*** warranty hereby provided. If you would like to take advantage of the installation certification service provided, please contact ***ESS*** regarding the service.

Refer to the Final Checklist at the back of this manual.

Visit the ***ESS*** website www.esseng.com.au to register your product warranty.

INDEX

SECTION 1 - SAFETY

The ***ESS*** Heavy Duty Tracker is designed to be quickly and easily installed and serviced by appropriate personnel.

Under no circumstances should servicing or installation of the tracker be carried out whilst the belt is in operation.

The conveyor must be shut down and locked out before any person enters or reaches into the conveyor enclosure.

Ensure that only suitably qualified and trained personel install and service this product. Ensure that all site and statutory safety procedures are followed.

SECTION 2 – INTRODUCTION

The ESS Tracker Belt Tracking System automatically senses and continuously corrects conveyor belt mis-tracking.

The patented tie rod alignment of the ESS Tracker translates the action of the guide rollers to the steering idler(s). The Tracker Upper Unit is used on the carry side of the conveyor, and the Lower Unit is used on the return side of the conveyor.

A few points need to be remembered for correct application of the ESS Tracker:

- The ESS Tracker is uni-directional and must not be used on a reversing conveyor.
- The ESS Tracker is driven by the belt edge. The belt edge must be uniform and in good condition.
- The Heavy Duty Tracker described in this manual is intended for conveyor belts 1500 to 2000mm wide, but may be used for narrower belts with minor modification. ESS recommends the Heavy Duty Tracker on high speed conveyors and where belt thickness is greater than normal.

SECTION 3 - PREPARATION FOR INSTALLATION

1. **CHECK INSTALLATION DRAWINGS** – Ensure that you have the correct drawings and equipment for your conveyor/s.

2. **PRE-ASSEMBLE THE TRACKERS AND MOUNTS** – Do this in your workshop or similar area, rather than at the conveyor. This will enable you to:

   (a) Verify all required equipment is present.

   (b) Familiarise yourself with the Tracker assembly.

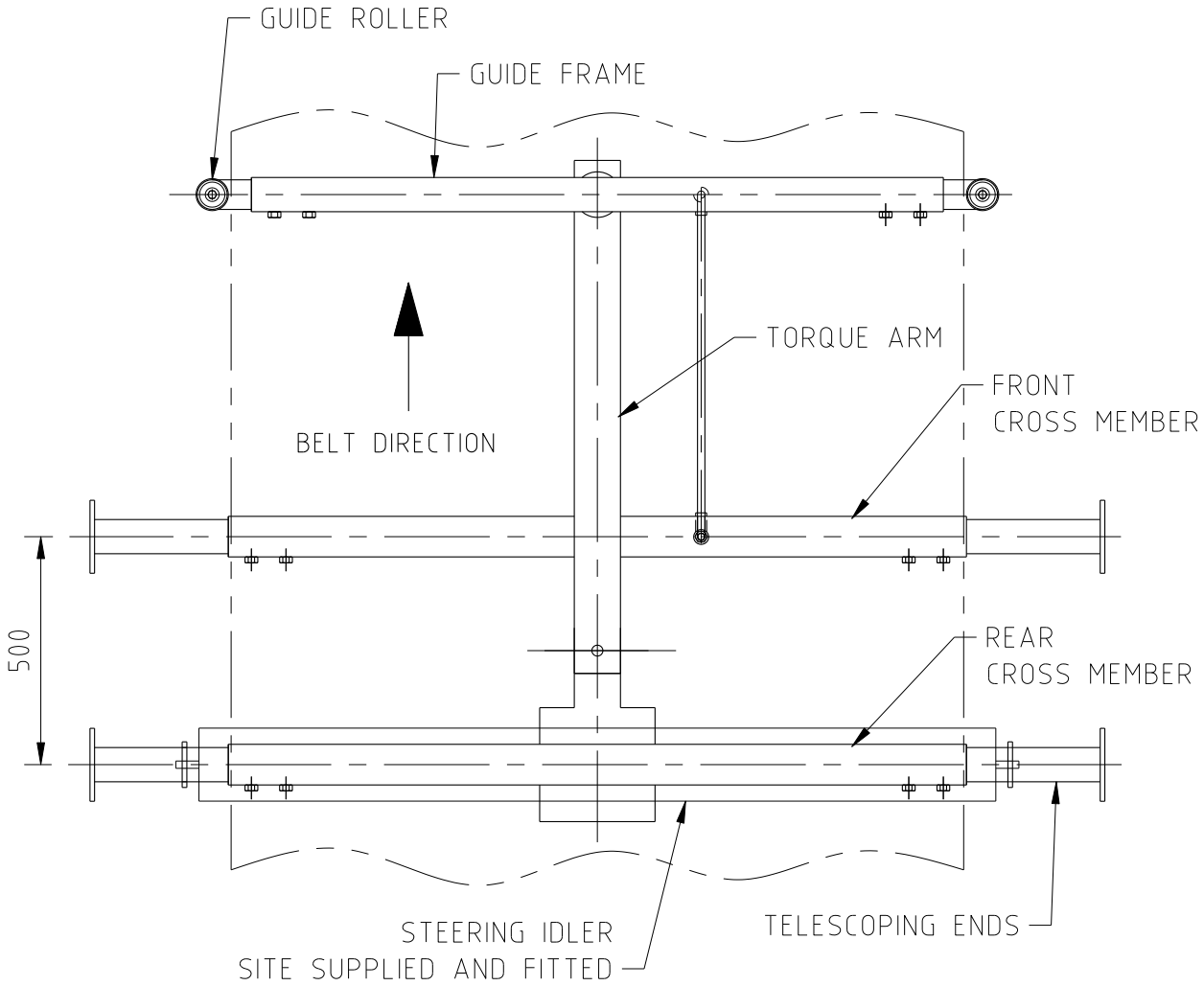
   (c) Allow you to plan the installation and prefabricate mounting brackets, reducing installation time.

3. **ASSEMBLE THE FOLLOWING TOOLS:**

- Spanners for M12 & M16 bolts
- Adjustable Wrenches
- Metric Allen Keys
- Measuring Tape and Steel Rule
- Electric Drill & Grinder (if allowable)
- Welding and Cutting Equipment
- Clamps
- Square, Level, Straight Edge
- Chalk or Marker
- Lead Lights, Flash Light
- Safety Equipment
- Scaffolding as required
- Grease gun
- Touch up paint

SECTION 4 – INSTALLATION

4.1 INSTALLATION OF THE ESS HEAVY DUTY TRACKER LOWER UNIT



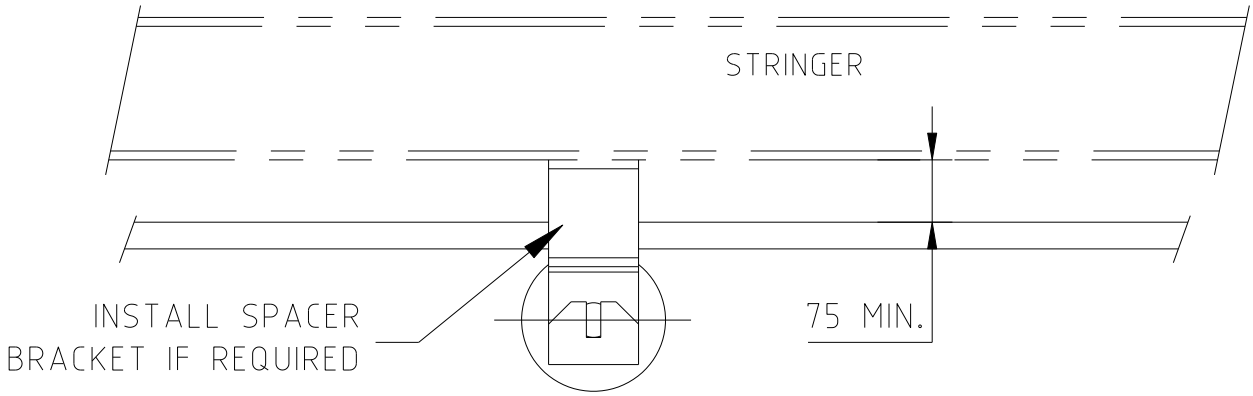
Step 1

Select the location for installation of the ESS Heavy Duty Tracker Unit. The Lower Unit should be installed three (3) to five (5) times the belt width before the tail pulley, any other major pulley or where the belt adjustment is required.

When installing multiple units, allow 20-50 metres between units, depending on the severity of the mistracking.

The Lower Tracker Unit requires clearance either side of the belt to allow location of the guide rollers, especially when the belt is mistracked. The belt line should be a minimum of 75mm below the stringers or support structure to ensure this clearance. If the belt has less than 75mm clearance, packing pieces or brackets should be installed on adjacent return idlers to lower the belt line. Continue this for at least four (4) return idler sets.

Where special or non-standard support structure is present, determine if suitable clearance is available before proceeding.



Step 2

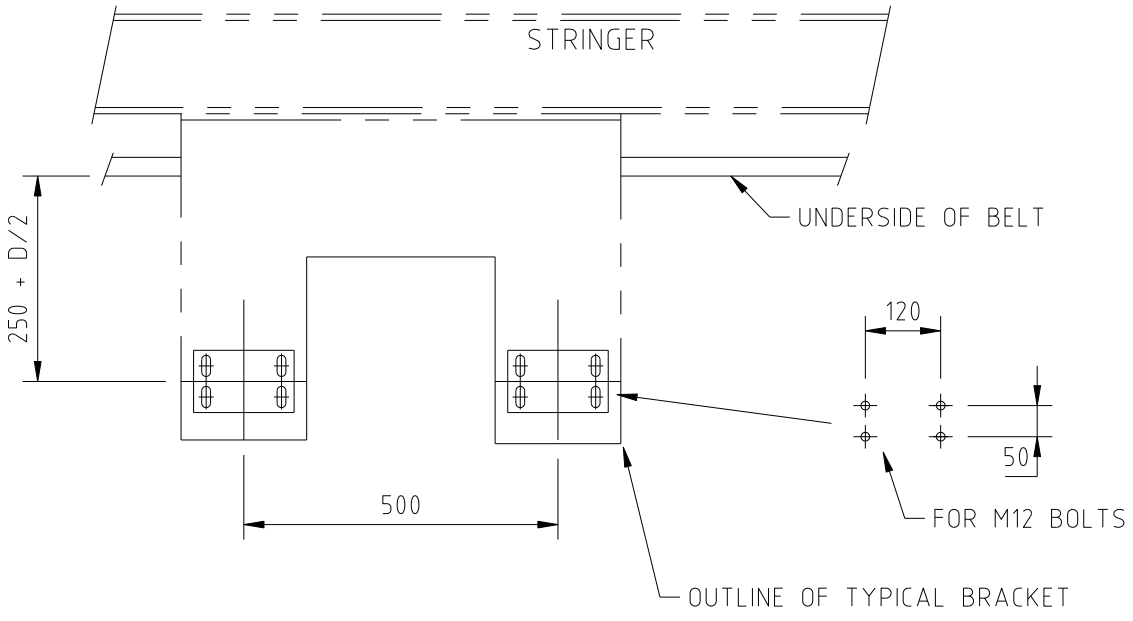
Remove the existing return idler at the installation position. Determine if the removed idler is to be used as the steering idler in the Tracker Unit. Any flat return idler in good condition can be used, but ESS recommends that a rubber lagged idler will have greater steering effect on the belt.

Step 3

Measure the diameter (D) of the steering idler to be used. This is important to determine the position of the Tracker Unit below the belt. The centre line of the cross member ends (and end brackets) should be 250 + D/2 millimetres below the underside of the existing belt line.

The front and rear cross members must be installed at 500mm centres. Fabricate suitable brackets if required or alternatively, ESS can provide special brackets for applications on request.

Install the brackets to the stringers or structure, ensuring that the brackets are accurately aligned to each other and the structure.

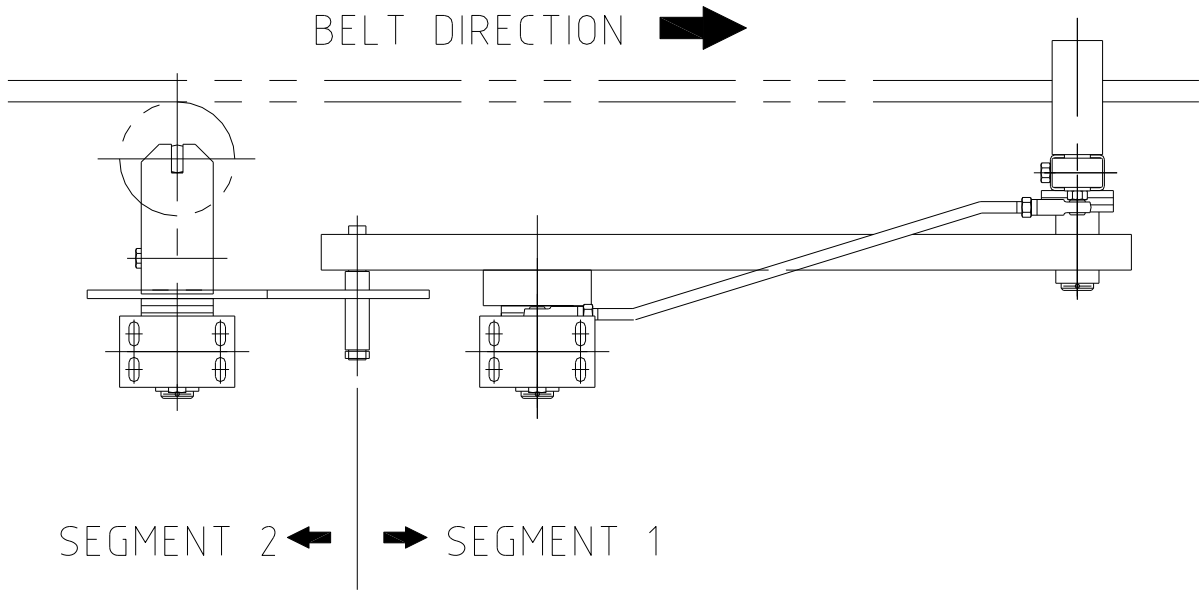


Step 4

Loosen the lock screws and remove the guide rollers from the Tracker assembly.

Measure the dimension between the inside of the mounting brackets from the previous step. Adjust the telescoping ends of the front and rear cross members to this dimension, ensuring that the extension is uniform on both sides.

Divide the Tracker assembly into two segments. The front cross member, torque arm and guide frame will form one segment. The rear cross member and steering roller will form the other. This step is to reduce the handling weight when lifting into position.



Take the front cross member and torque arm assembly (segment 1) and lift into place between the brackets, ensuring that the torque arm is downstream of the unit in terms of belt travel. Bolt this assembly into place on the pre-installed brackets, level and centre the torque arm.

Lift the rear cross member and roller assembly (segment 2) into place, engage the linkage pin into the slot, and bolt the assembly to the other set of holes or brackets.

NOTE: This step will involve a heavy lift, as it will be lifting the belt by about 20 to 25mm.

Step 5

Check that the steering roller is lifting the belt by approximately 20 to 25mm off the previous belt line. If not, adjust the height of the unit using the slotted holes in the cross member ends.

Check that the front and rear cross members are at 500mm centres both ends. Centre all members to the support structure (not the belt), and tighten all securing bolts.

Step 6

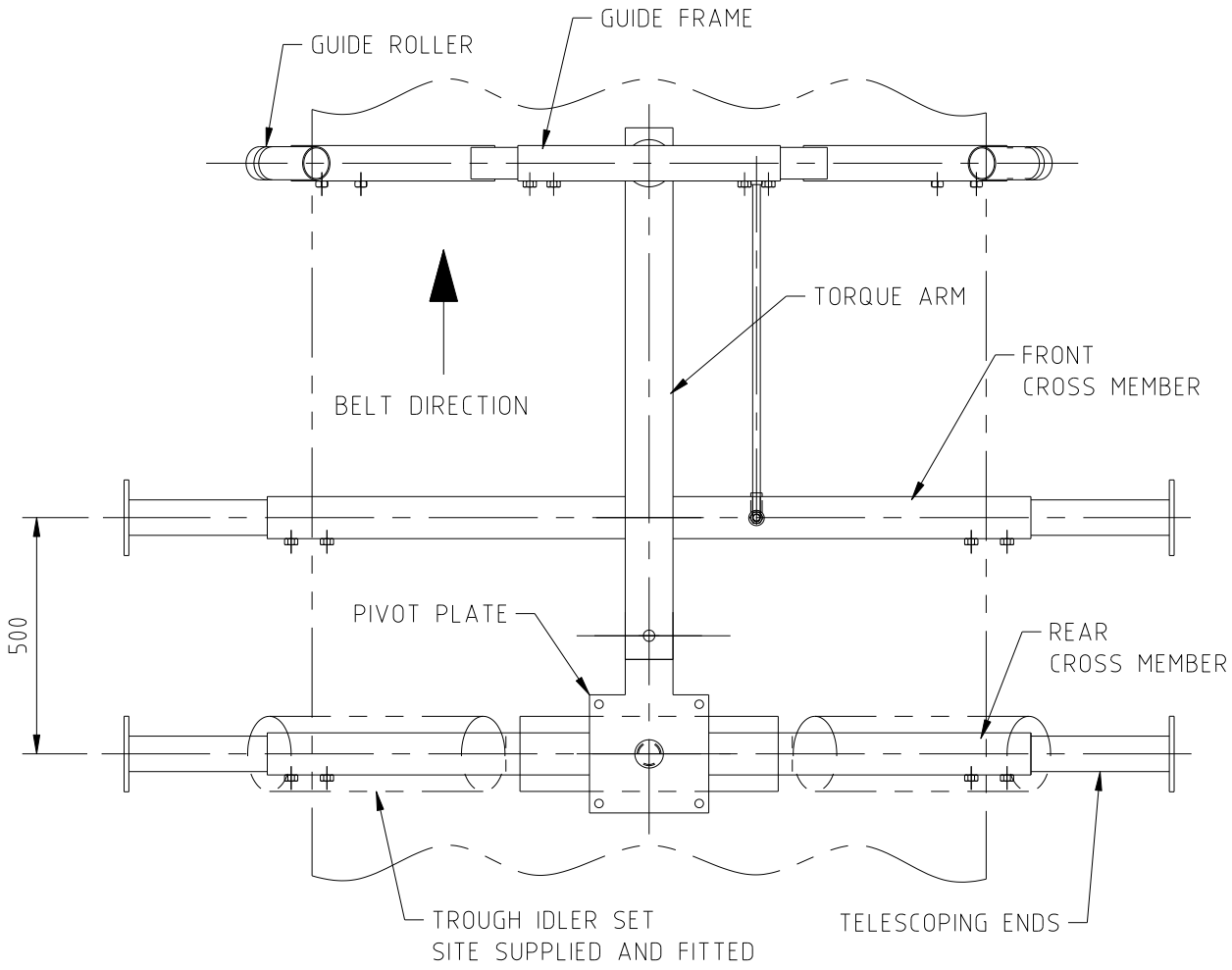
Adjust the ESS Tracker to the belt as follows.

Fit the guide rollers to the guide frame. Centre the guide frame to the belt (not the structure). If the belt is centred between the support structure, the guide frame should already be centred. If the belt is off centre, drag the guide frame so that it is centred to the belt. This action will cause the Tracker to react, and the steering roller will become angled to the belt.

Adjust the guide rollers to be within 3-6mm of the belt on each side and lock in place. The guide roller arms should be equally extended from the guide frame. If not, re-centre the guide frame and reset the guide rollers. Grease the three (3) pivot bearings, using appropriate grease gun.

The ESS Heavy Duty Tracker is now installed, and ready for service. The unit will immediately begin tracking the belt as soon as the belt is started.

INSTALLATION OF THE ESS HEAVY DUTY TRACKER UPPER UNIT



Step 1

Select the location for installation of the ESS Heavy Duty Tracker Unit. The upper unit should be installed after the loading area of the conveyor, or three (3) to five (5) times the belt width before the area where the belt adjustment is required.

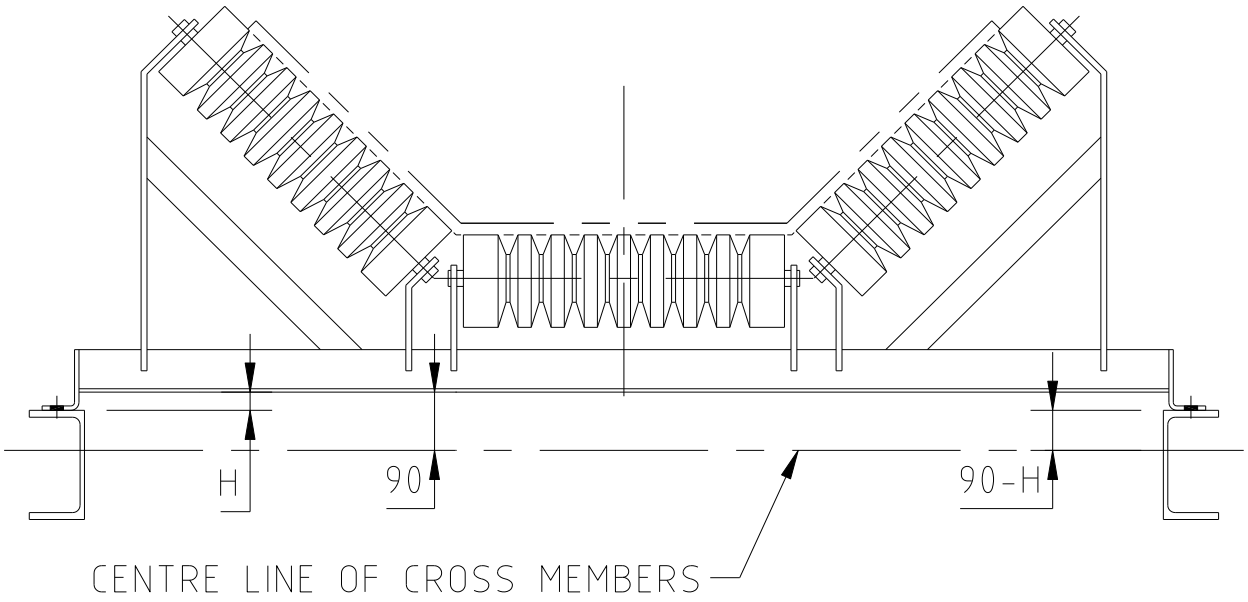
The Upper Unit cannot be installed in the skirted area of the converyor.

When installing multiple units, allow 20-50 metres between units, depending on the severity of the mistracking.

Step 2

At the selected installation point, identify the existing carry idler set, and measure the height of the underside of the idler cross member above the stringers or support structure. Call this dimension “H”.

Remove the idler set and retain for use in the Tracker Unit. Ensure that the individual rollers are in good condition – replace if necessary.

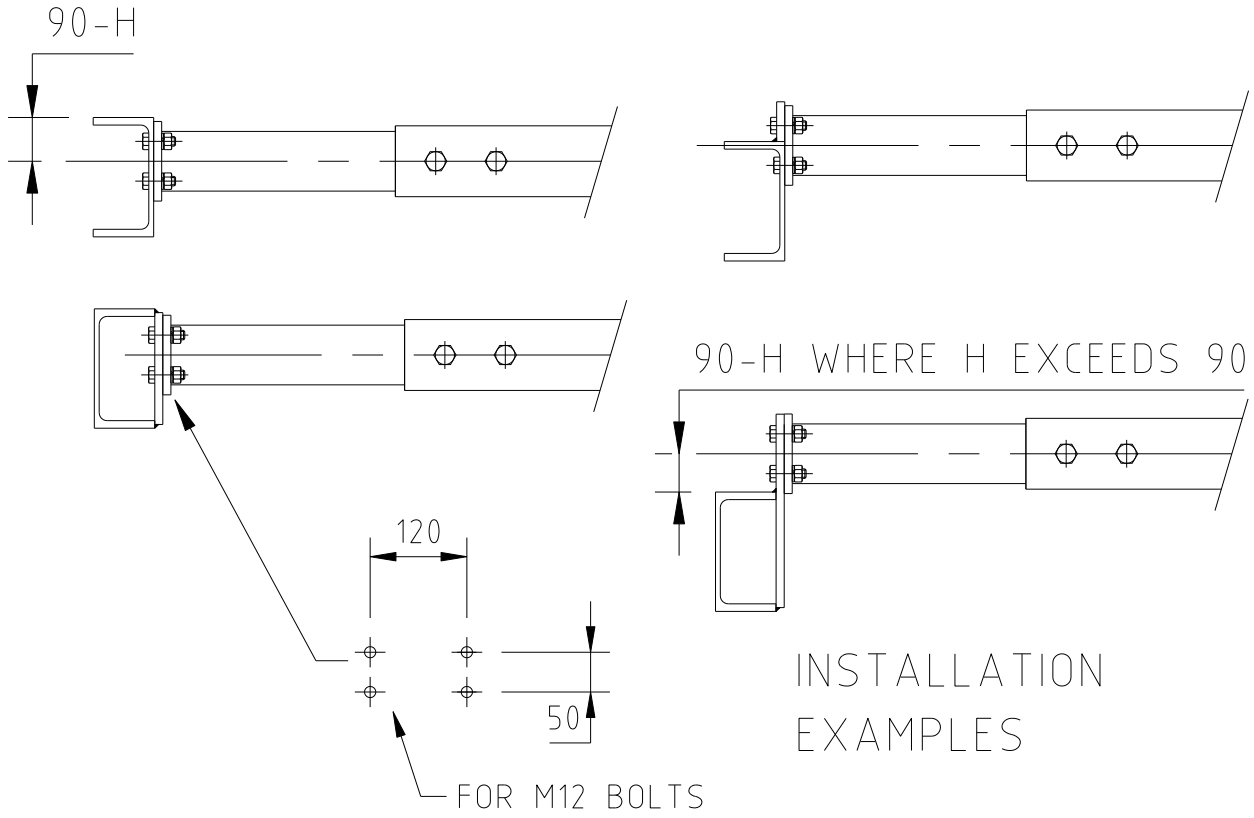


Step 3

Determine the position of the Tracker Unit cross members. The cross members will be installed at exactly 500mm centres, and the guide frame of the unit will trail the front cross member by a further 750mm. Ensure the cross members are located to allow clearance from adjacent idler sets.

The cross members should be installed so that the top face of the pivot plate on the rear cross member is level or marginally higher than the “H” dimension previously measured. The centre line of the cross member ends should be 90mm below the “H” dimension.

Mark out and drill mounting holes for the cross member ends on the existing stringers or structure. If cross member ends do not align with structure, or structure is not suitable for direct bolting, fabricate and install suitable mounting brackets. ESS can assist with special brackets for individual applications. Examples of mounting brackets follow.



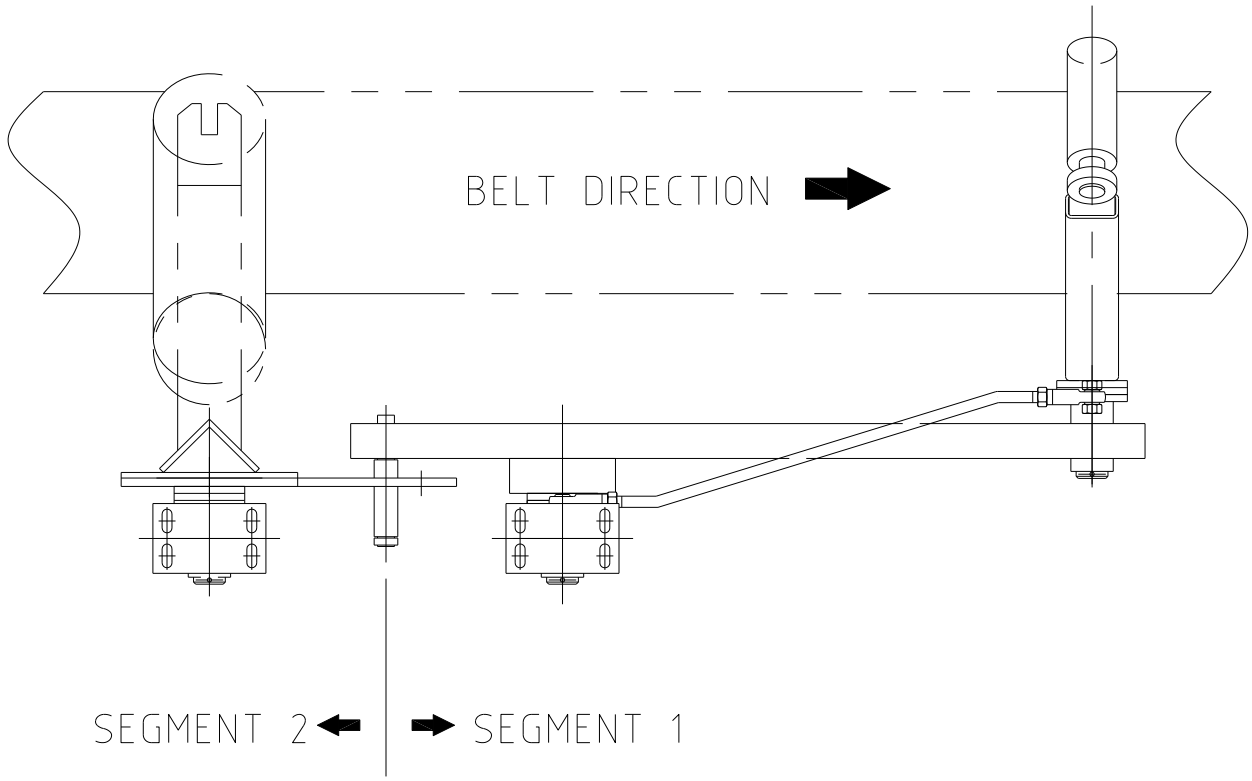
Step 4

Loosen the lock screws and remove the guide rollers complete with arms from the Tracker assembly.

Measure the dimension between the inside of the mounting brackets from the previous step. Adjust the telescoping ends of the front and rear cross members to this dimension, ensuring that the extension is uniform on both sides.

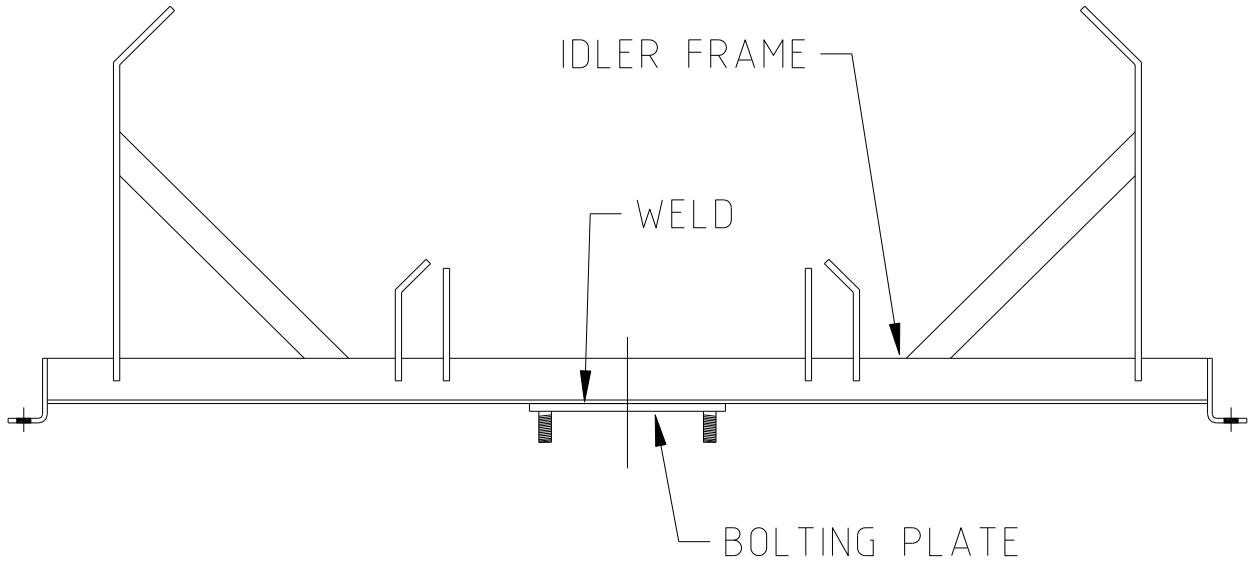
Divide the Tracker assembly into two (2) segments. The front cross member, torque arm and guide frame will form one segment. The rear cross member and pivot plate will form the other. This step is to reduce the handling weight when lifting into position.

Take the front cross member and torque arm assembly (segment 1) and lift into place between the brackets, ensuring that the torque arm is downstream of the unit in terms of belt travel. Bolt this assembly into place on the pre-installed brackets, level and centre the torque arm.



Step 5

Take segment 2 from the previous step, comprising the rear cross member and the pivot plate. The Tracker is supplied with a matching plate bolted to the pivot plate. Remove this bolted plate and position it centrally on the bottom of the removed idler frame, studs down, making sure it is square to the centre line of the frame. Weld the plate to the frame.



Step 6

Lift the segment 2 assembly into position between the brackets, engage the linkage pin in the slot and bolt the rear cross member in place. Fit the bolting plate and idler frame assembly to the pivot plate and secure in place. Fit the rollers to the idler frame. The rollers should sit slightly higher than adjacent idlers, and the ends of the idler frame should clear the stringer or support. If there is any interference of the idler frame with structure, cut the end overhangs from the frame – they will not be needed.

Check that the front and rear cross members are at 500mm centres both ends. Centre all members to the support structure (not the belt), and tighten all securing bolts and screws.

Step 7

Adjust the ESS Tracker to the belt as follows.

Fit the guide rollers to the guide frame. Centre the guide frame to the belt (not the structure). If the belt is centred between the support structures the guide frame should already be centred. If the belt is off centre, drag the guide frame so that it is centred to the belt. This action will cause the Tracker to react, and the steering roller will become angled to the belt.

Adjust the guide rollers to be within 3-6mm of the belt on each side and lock in place. The guide roller arms should be equally extended from the guide frame. If not, re-centre the guide frame and reset the guide rollers. Grease the three (3) pivot bearings, using an appropriate grease gun.

The ESS Heavy Duty Tracker is now installed, and ready for service. The unit will immediately begin tracking the belt as soon as the belt is started.

SECTION 5 - COMMISSIONING

Step 1

Manually move the guide rollers from side to side to check the system function. Ensure all bolts have been tightened adequately.

Step 2 - Is the belt empty?

Make sure there are no tools left on the belt.

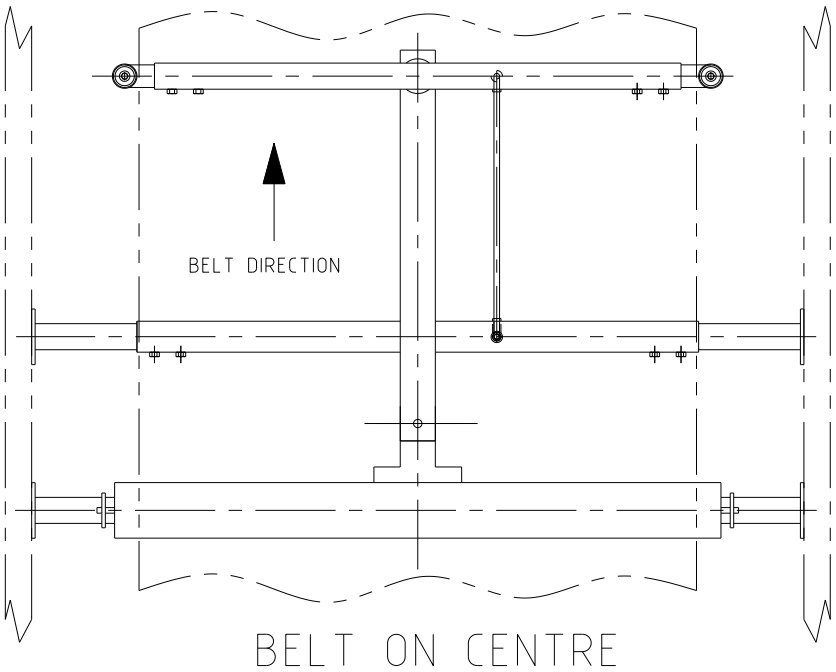
Step 3 - Start the conveyor

Follow the established safety rules.

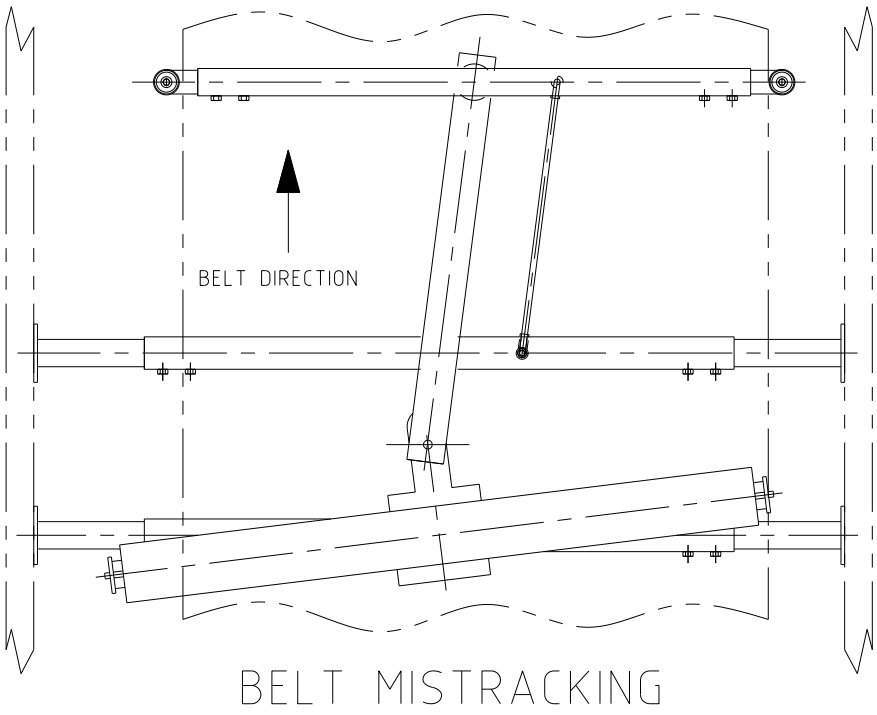
Step 4 - Observe the action of the Tracker

Check the Tracker action to ensure it is functioning correctly. Allow at least 10 revolutions of the belt.

If the conveyor belt is running on centre with no mistracking, the ESS Tracker should also be centred and the steering idler(s) should be square to the belt.



If the conveyor belt is mistracking, the ESS Tracker should be articulated around the front cross member pivot, and should be working to correct the tracking.



BELT MISTRACKING

If adjustment is required, turn off and lock out/tag out the energy source to the conveyor and conveyor accessories. Check and tighten all fasteners after running the belt.

Step 5 - Demonstrate the system to the Operating Supervisors and Crew

Call the Supervisors responsible for the maintenance and operation to the site. Make a short run of the system. Show the operator how to adjust the system.

Step 6 - Secure the system for production

Follow plant procedure to secure the conveyor for production.

SECTION 6 - OPERATOR TRAINING

The last step is the correct training of personnel to maintain and service the equipment or employ ESS on a contract basis to service and maintain ESS equipment keeping it in its optimum working condition.

If using your own personel to maintain the equipment, train them as follows;

1. Adhere to all local safety rules.

2. Give a “hands on” instruction with your conveyor system shut down.

3. Give a “hands on” instruction with your conveyor system running.

4. All services must be recorded and given to a person of responsibility.

5. Encourage the person being trained to look out for possible problems developing on the system.
   eg. Belt tracking excessively, tears or damage to the belt, excessive carry back, seized idlers, missing bolts etc. A warning to the Maintenance Department to rectify small problems can save the company a lot of money in repairs and production costs.

6. Impress how important it is to maintain and service ESS equipment correctly.

SECTION 7 - ROUTINE MAINTENANCE AND SERVICE

Regular inspections and servicing is the key to an efficient conveyor system. It is recommended that the tracker be inspected once per week. Actual intervals will vary considerably from plant to plant.

NOTE: Follow all plant safety procedures. Shut down and lock out the conveyor before attempting any maintenance.

Inspection

Inspect the condition of the Tracker. Check the pivot points and guide rollers for free movement.

If maintenance is required:

Step 1

Shut down and lock out the conveyor.

Step 2

Grease the service nipples on the torque arm and the front and rear cross frames. If required replace guide rollers.

Step 3

Remove locks or tags and restart belt. Observe Tracker action. Clean up work area.

SECTION 8 – TROUBLE SHOOTING

PROBLEM – **Mounts don't fit in desired location**

CAUSE	SOLUTION
Belt is too far below the stringers	Use alternative mounts available from ESS.
Belt returns between the stringers	The belt will need to be deflected into position along the length the tracker will be mounted.

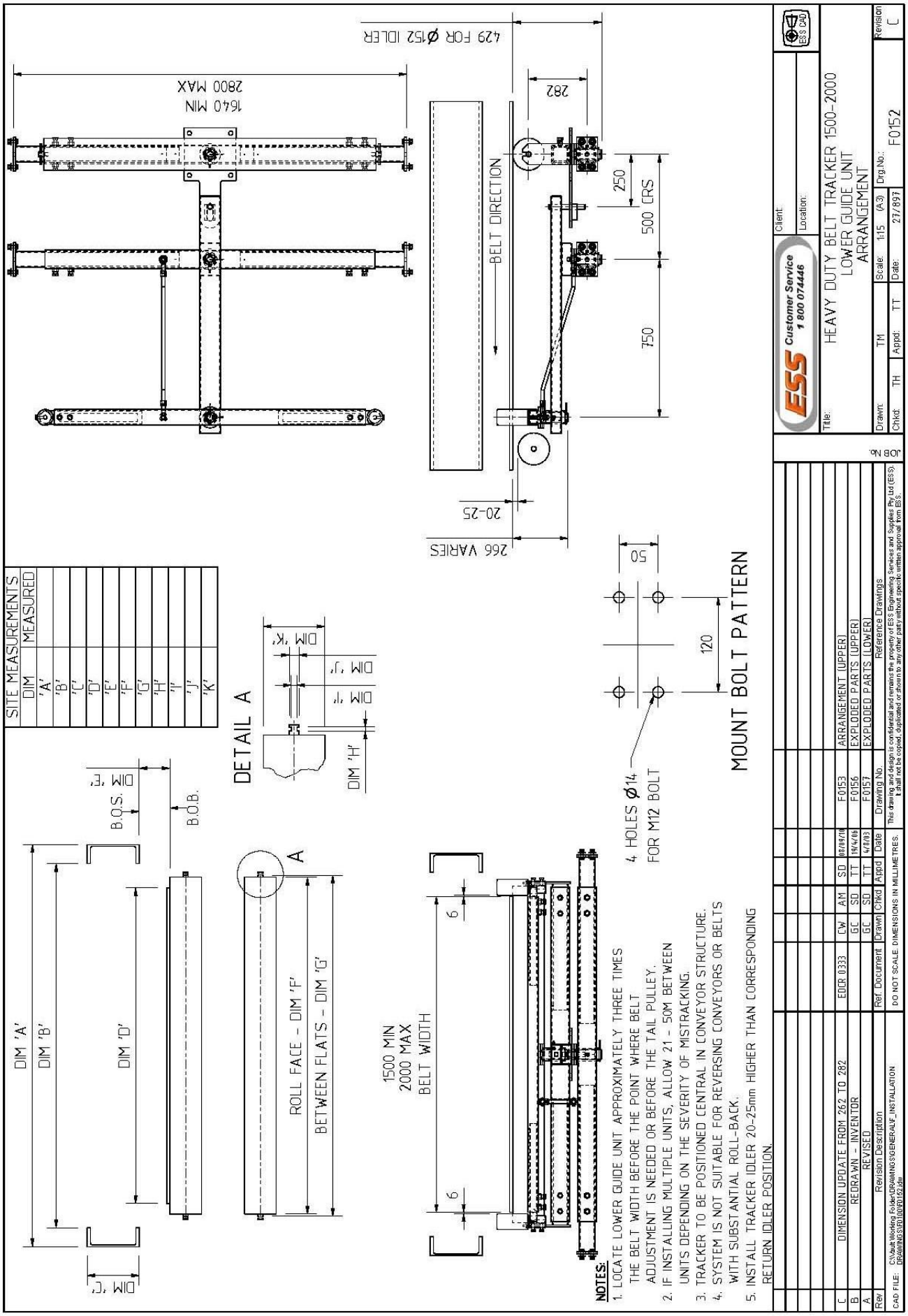
PROBLEM – Groove worn into the guide roller

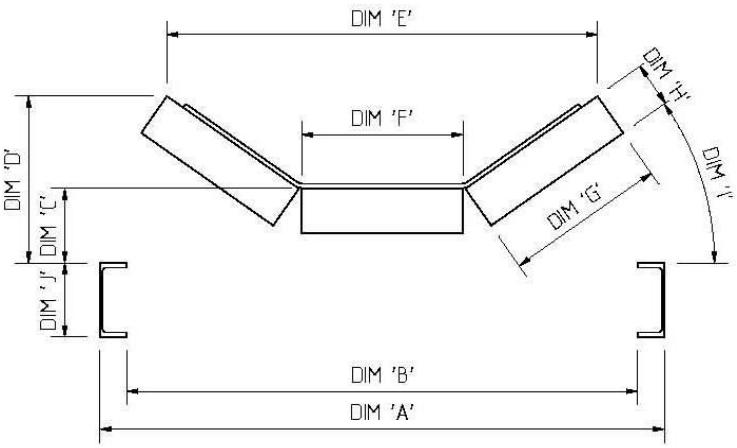
CAUSE	SOLUTION
Guide roller bearing may be seizing	Replace guide rollers.
Torque arm, Front or Rear pivot points may be seizing	Check pivot points, replace bushing and grease if required.

PROBLEM – Belt is not Tracking correctly

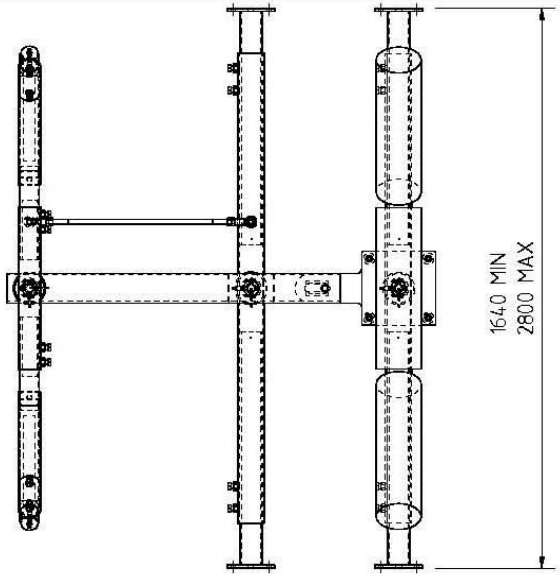
CAUSE	SOLUTION
Tracker may not be adjusted correctly	Adjust tracker as mentioned in Installation instruction.
There may be multiple points of misalignment in the structure	Multiple Trackers may be required.

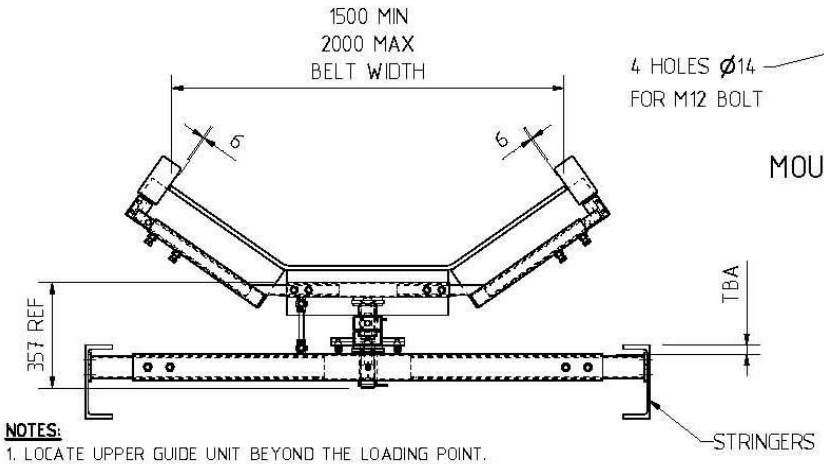
SECTION 9 – INSTALLATION ARRANGEMENT DRAWINGS

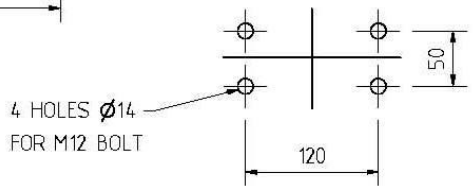




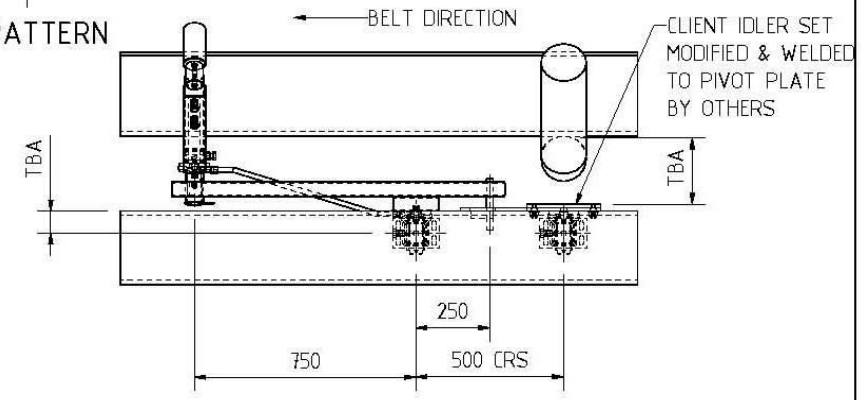
SITE MEASUREMENTS	
DIM	MEASURED
'A'	
'B'	
'C'	
'D'	
'E'	
'F'	
'G'	
'H'	
'I'	
'J'	







MOUNT BOLT PATTERN



NOTES:

1. LOCATE UPPER GUIDE UNIT BEYOND THE LOADING POINT.
2. IF INSTALLING MULTIPLE UNITS, ALLOW 21 - 50M BETWEEN UNITS DEPENDING ON THE SEVERITY OF MISTRACKING.
3. TRACKER TO BE POSITIONED CENTRAL IN CONVEYOR STRUCTURE.
4. SYSTEM IS NOT SUITABLE FOR REVERSING CONVEYORS OR BELTS WITH SUBSTANTIAL ROLL-BACK.

Rev	Revision Description	Ref. Document	Drawn	Chkd	Appd	Date	Drawing No.	Reference Drawings
							F0152	ARRANGEMENT (LOWER)
B	REDRAWN - INVENTOR		GC	SD	TT	19/4/06	F0157	EXPLODED PARTS (LOWER)
A	REVISED		GC	SD	TT	4/8/03	F0156	EXPLODED PARTS (UPPER)

CAD FILE: E:\Drawings\Installation Drawings\F0153.idw

DO NOT SCALE. DIMENSIONS IN MILLIMETRES.

JOB No.

ESS Customer Service 1 800 074446

Client:

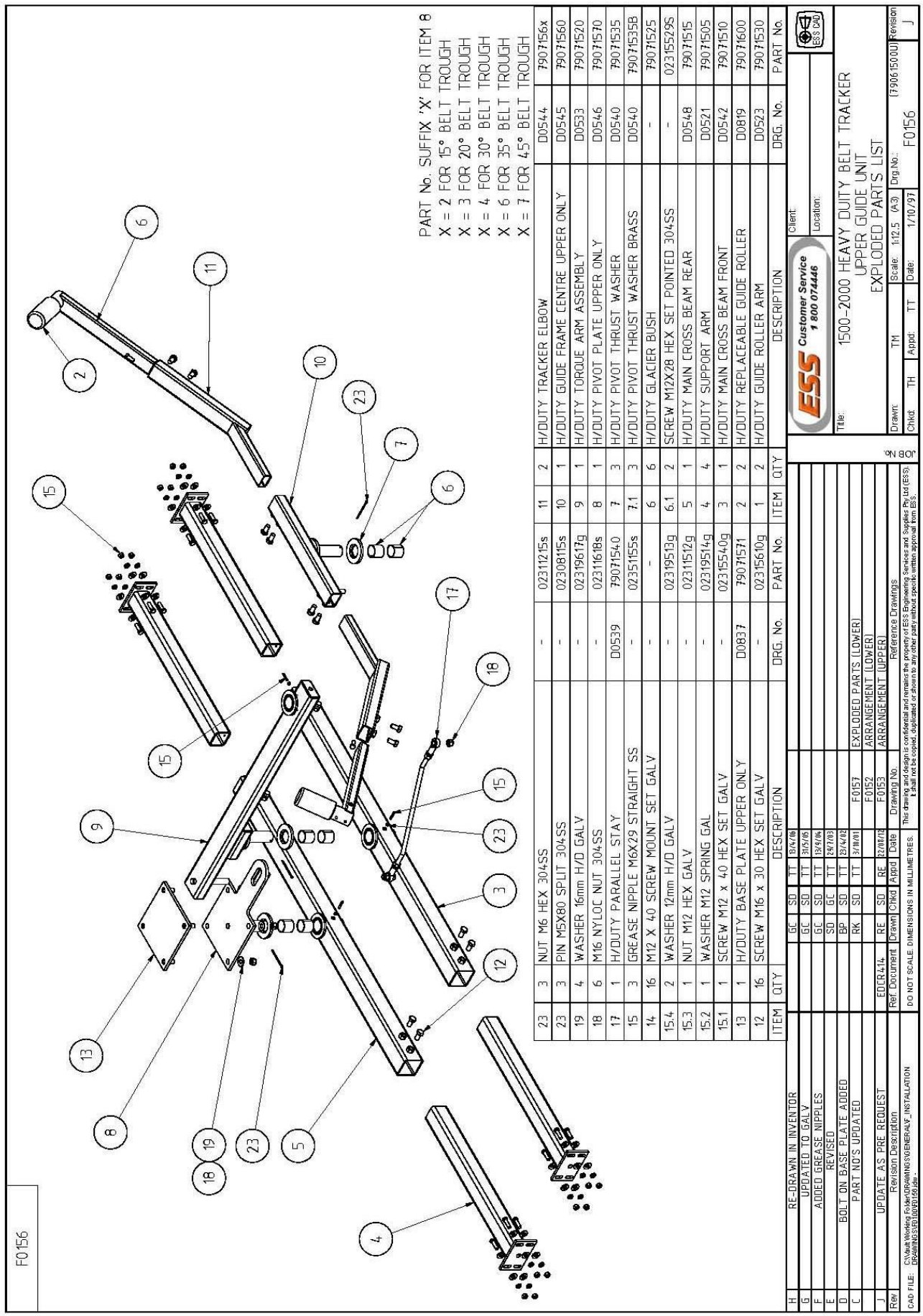
Location:

ESS CAD

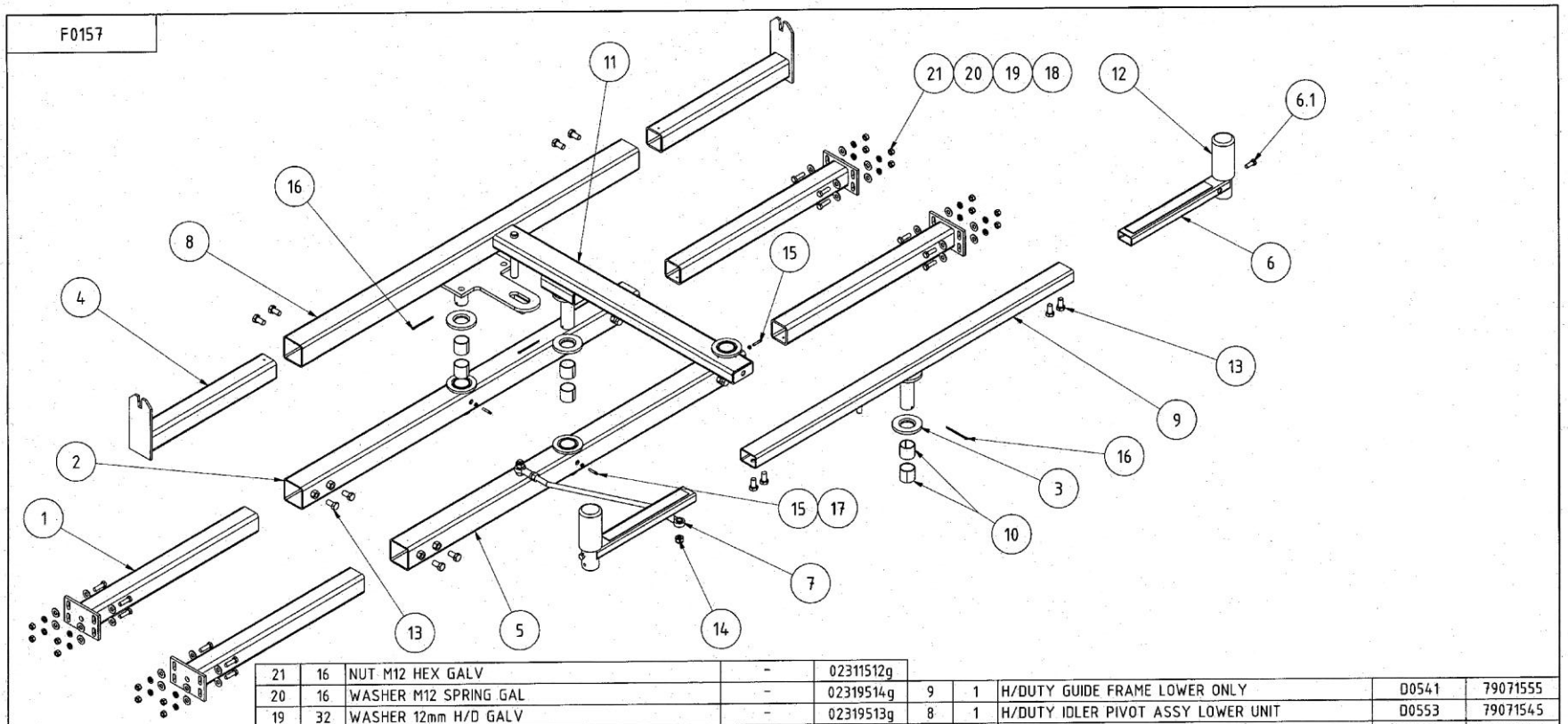
Title: HEAVY DUTY BELT TRACKER 1500-2000
UPPER GUIDE UNIT
ARRANGEMENT

Drawn:	TM	Scale: 1:15 (A3)	Drg.No.:	Revision
Chkd: TH	Appd: TT	Date: 11/9/97	F0153	B

SECTION 10– EXPLODED PARTS DRAWINGS



F0157



ITEM	QTY	DESCRIPTION	DRG. No.	PART No.	ITEM	QTY	DESCRIPTION	DRG. No.	PART No.
21	16	NUT M12 HEX GALV	-	02311512g					
20	16	WASHER M12 SPRING GAL	-	02319514g	9	1	H/DUTY GUIDE FRAME LOWER ONLY	D0541	79071555
19	32	WASHER 12mm H/D GALV	-	02319513g	8	1	H/DUTY IDLER PIVOT ASSY LOWER UNIT	D0553	79071545
18	16	SCREW M12 x 40 HEX SET GALV	-	02315540g	7	1	H/DUTY PARALLEL STAY	D0539	79071540
17	3	NUT M6 HEX 304SS	-	02311215s	6.1	2	SCREW M12X28 HEX SET POINTED 304SS	-	02315529S
16	3	PIN M5X80 SPLIT 304SS	-	02308115s	6	2	H/DUTY GUIDE ROLLER ARM	D0523	79071530
15	3	GREASE NIPPLE M6X29 STRAIGHT SS	-	02351155s	5	1	H/DUTY MAIN CROSS BEAM FRONT	D0542	79071510
14	2	M16 NYLOC NUT 304SS	-	02311618s	4	2	H/DUTY IDLER SUPP T/SCOPIC ENDS LOWER ONLY	D0554	79071550
13	16	SCREW M16 x 30 HEX SET GALV	-	02315610g	3.1	3	H/DUTY PIVOT THRUST WASHER BRASS	D0540	79071535B
12	2	H/DUTY REPLACEABLE GUIDE ROLLER	D0819	79071600	3	3	H/DUTY PIVOT THRUST WASHER	D0540	79071535
11	1	H/DUTY TORQUE ARM ASSEMBLY	D0533	79071520	2	1	H/DUTY MAIN CROSS BEAM REAR	D0548	79071515
10	6	H/DUTY GLACIER BUSH	-	79071525	1	4	H/DUTY SUPPORT ARM	D0521	79071505

Rev	Revision Description	Ref. Document	Drawn	Chkd	Appd	Date
H	REDRAWN - INVENTOR	2006017	GC	SD	TT	26/4/06
G	UPDATED TO GALV		GC	SD	TT	31/5/05
F	UPDATED QTY'S		GC	SD	TT	24/5/05
L	UPDATE AS PER REQUEST	EDCR414	RE	SD	RE	9/7/13
K	ITEM 6.1 WAS GRUB SCREW M12x16		RED	SD	RED	11/7/07
J	CORRECTED ITEM 9 WAS D0545 ITEM 8 WAS D0546		GG	SD	TT	11/7/07
I	ITEM 14 WAS Z.P	ECR 170506	GG	SD	GG	24/5/06

Drawing No.	Reference Drawings
F0153	ARRANGEMENT (UPPER)
F0152	ARRANGEMENT (LOWER)
F0156	EXPLODED PARTS (UPPER)

CAD FILE: C:\Vault Working Folder\DRAWINGS\GENERAL\F_INSTALLATION DRAWINGS\F0100\F0157.idw - 11/07/2007 12:08

DO NOT SCALE. DIMENSIONS IN MILLIMETRES.

JOB No.

ESS Customer Service 1 800 074446

Client:

Location:

ESS CAD

Title: 1500-2000 HEAVY DUITY BELT TRACKER
LOWER GUIDE UNIT
EXPLODED PARTS

Drawn:	TM	Scale:	NTS (A3)	Drg.No.:	Revision
Chkd:	TH	Appd:	TT	Date: 26/04/06	F0157	L

SECTION 11

FINAL CHECKLIST

Site:_____ Number: _____ Date:_____

Site Equipment No./Location: _____ Site Contact: _____

Completed By: _____ **(Circle Yes or No Below)**

1. **Was equipment to ESS Specification?** _____ **Yes/No**

   Drawing No. Ref:_____**Attached? Yes/No**

   If No, WHY _____

   _____

   Will this affect performance? Yes/No

   If Yes, WHY _____

   _____

2. **Was this a standard ☐ service ☐ inspection ☐ installation? Yes/No**

   If No, WHY _____

   _____

3. **Was work carried out as per procedure and JSA? Yes/No**

   If No, WHY _____

   _____

4. **Is equipment fit for commissioning? Yes/No**

   If No, WHY _____

   _____

5. **Was a final inspection carried out while plant was running? Yes/No**

   If No, WHY _____

   _____

6. **Has anything changed from previous service / inspection / installation? Yes/No**

   If Yes, WHAT _____

   _____

7. **Is equipment performance to Client expectations? Yes/No**

   If No, WHY _____

   _____

ESS Signature: _____ **Client Signature:** _____