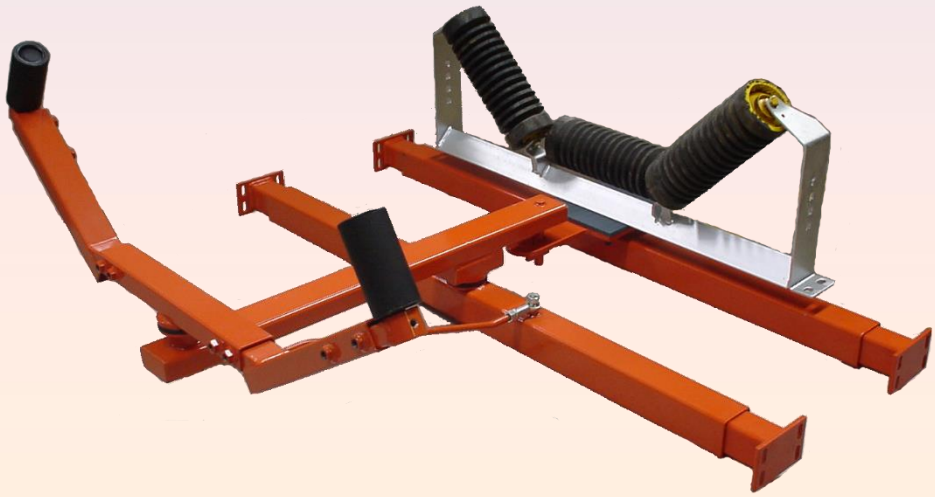
ENGINEERING SERVICES & SUPPLIES PTY LTD
Ph: 1800 074 446 www.esseng.com.au

ESS Heavy Duty Belt Tracker

Installation, Operation & Maintenance Manual



Location	Address	Phone & Email
CURRUMBIN	11 – 13 Traders Way PO Box 121 Currumbin QLD 4223	(07) 5589 2000 esscur@esseng.com.au
GLADSTONE	Shed 2, 4 Helen Street PO Box 1475 Clinton QLD 4680	(07) 4972 3759 essgla@esseng.com.au
KALGOORLIE	Unit 1 / 182 Boulder Road Kalgoorlie WA 6430 PO Box 10471 Kalgoorlie WA 6433	(08) 9021 7991 esskal@esseng.com.au
KARRATHA	26 Midas Road Malaga WA 6090	(08) 9248 4111 esskar@esseng.com.au
MACKAY	1 Progress Street Paget, QLD 4740 PO Box 5755 Mackay Mail Centre QLD 4741	(07) 4952 4600 essmac@esseng.com.au
MAITLAND	Unit 2 Barton Court 6 Johnson Street Maitland NSW 2320	(02) 4932 3544 essmai@esseng.com.au
PERTH	26 Midas Road Malaga WA 6090	(08) 9248 4111 essper@esseng.com.au
TOWNSVILLE	Unit 4/ 585 Ingham Rd Mt St John Townsville QLD 4818	(07) 5589 2032 esstow@esseng.com.au
VICTORIA	Unit 4 / 238 Governor Road Braeside VIC 3195	(03) 9587 3979 essvic@esseng.com.au
WOLLONGONG	Unit 1 / 20 Doyle Avenue PO Box 343 Unanderra NSW 2526	(02) 4272 4422 esswol@esseng.com.au
TOLL FREE 1800 074 446 FROM ANYWHERE IN AUSTRALIA		

WARRANTY

ESS WARRANTS the ESS Heavy Duty Belt 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.

CONTENTS

FIGURES

1.0 SAFETY

All equipment installed on or around a conveyor belt must comply with AS 1755 – 2000 Conveyors – Safety requirements.

Under no circumstances should any personnel attempt installation or service of this equipment whilst the conveyor belt is running.

The conveyor belt drive and any associated equipment must be shut down and locked out according to plant safety procedures before attempting work requiring access to or opening of the chute or conveyor enclosure.

Contact with a moving conveyor belt and its drive components can result in serious injury or death.

Hazards that may be present when installing this equipment:

	Hazard		Hazard
X	Moving Conveyor - ISOLATE		Other:
	Hot Work		Other:
	Working at Heights		Other:
	Heavy Lift		Other:
	Persons Working Overhead		Other:
	Persons Working Below		Other:
	Electrical & Cabling		Other:
	Pinch Points		Other:
	Trip Hazards		

Once hazards have been identified, the installer should undertake and document a comprehensive Job Hazard Analysis according to site requirements and good safe-working practice.

The installer must identify all hazards and apply appropriate controls before proceeding with the installation of this equipment.

1.1. SAFETY LABELS

Pictograph labels are used to show graphically where potential safety hazards exist around this product. These labels do not represent every possible hazard. They are not intended to be a substitute for safe work practices and good judgment. These labels and *ESS* technical manuals use specific words to identify the severity of the hazard. They are described below. Take time to read and understand the meaning of these words and symbols.

Danger labels call attention to imminently hazardous situations that will result in serious personal injury or death if not avoided. Injury from these hazards is immediate in nature and has a high probability of resulting in a serious or fatal accident if proper precautions are not followed.

Warning labels call attention to potentially hazardous situations that could result in serious personal injury or death if not avoided. Injury from these hazards is usually serious in nature, and a severe or fatal accident can occur if proper precautions are not followed.

Caution labels call attention to potentially hazardous situations that may result in minor or moderate personal injury if not avoided. Injury from these hazards is normally less serious than those from Danger or Warning hazards. However, there is still the potential for an accident resulting in serious injury if proper precautions are not followed.

2.0 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 Belt 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 Belt Tracker on high speed conveyors and where belt thickness is greater than normal.

3.0 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, Flashlight
Safety Equipment	Scaffolding as required
Grease gun	Touch up paint

4.0 INSTALLATION

4.1. INSTALLATION OF THE ESS HEAVY DUTY BELT TRACKER LOWER UNIT

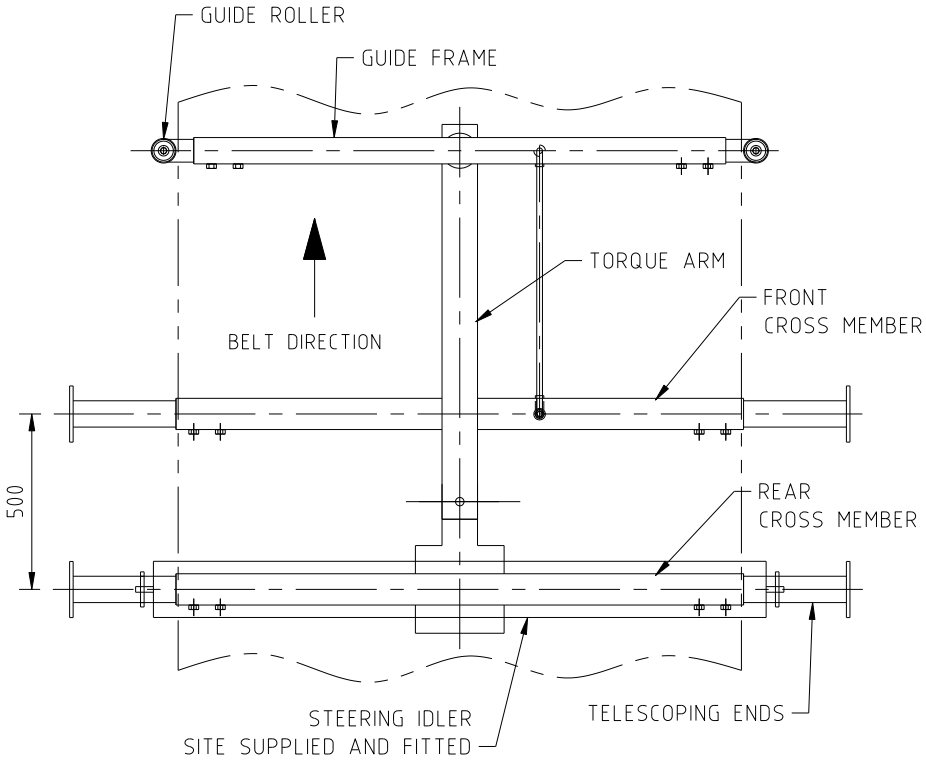


Figure 1 - Heavy Duty Belt Tracker Lower Unit

Step 1

Select the location for installation of the ESS Heavy Duty Belt 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 mis-tracking.

The Lower Belt Tracker Unit requires clearance either side of the belt to allow location of the guide rollers, especially when the belt is mis-tracked. 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.

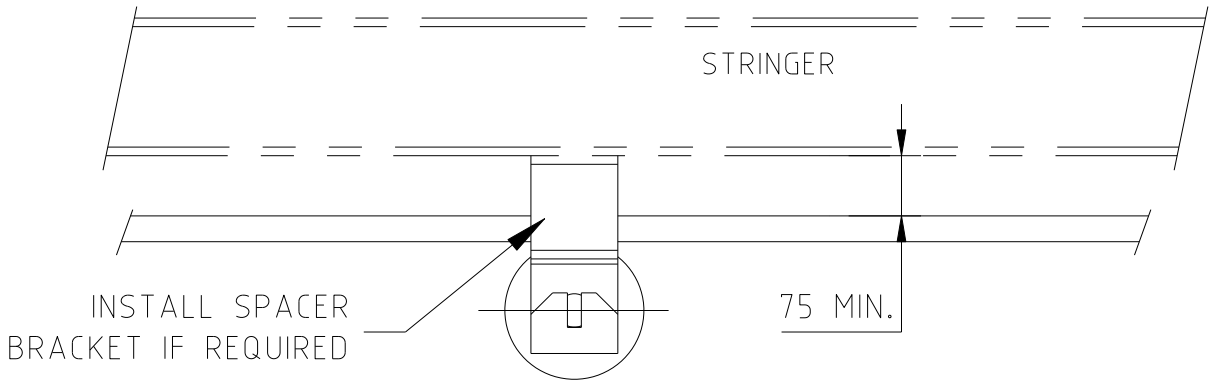


Figure 2 - Lower Belt Tracker Clearance

Step 2

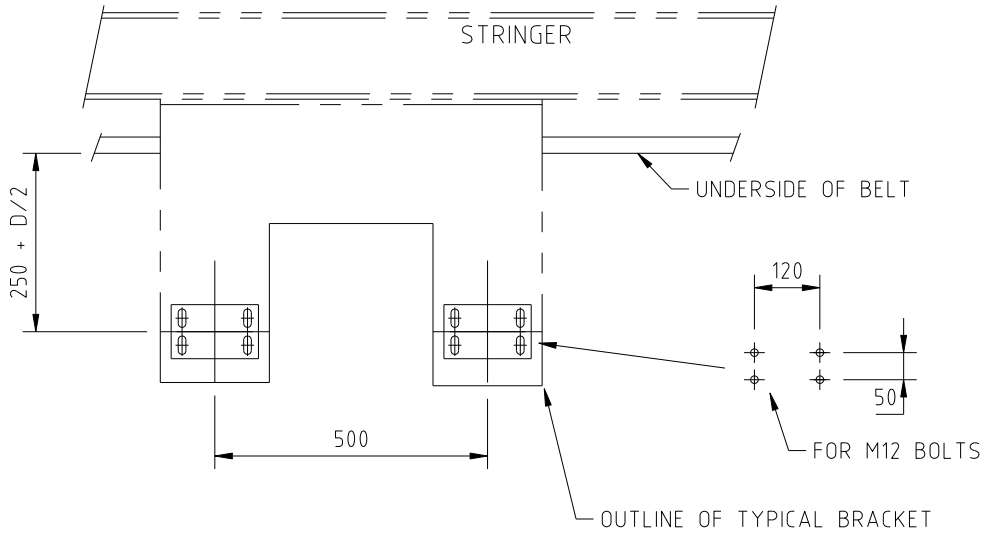
Remove the existing return idler at the installation position. Determine if the removed idler is to be used as the steering idler in the Tracker Unit. Any flat return idler in good condition can be used, but ESS recommends that a rubber lagged idler will have greater steering effect on the belt.

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.

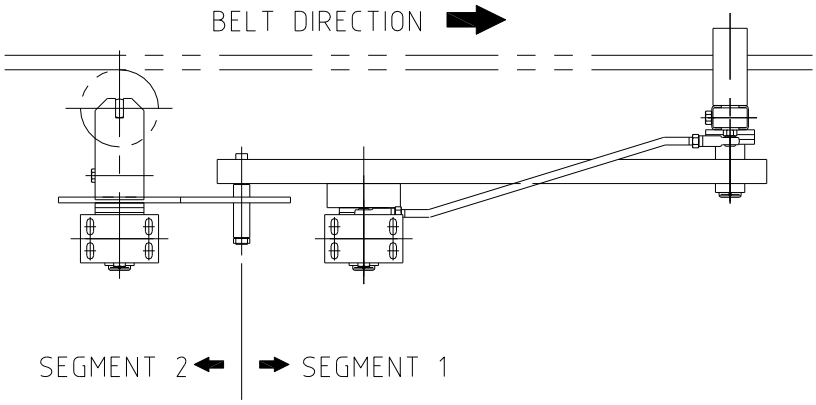


Figure 4 - Positioning the Tracker

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

4.2. INSTALLATION OF THE ESS HEAVY DUTY BELT TRACKER UPPER UNIT

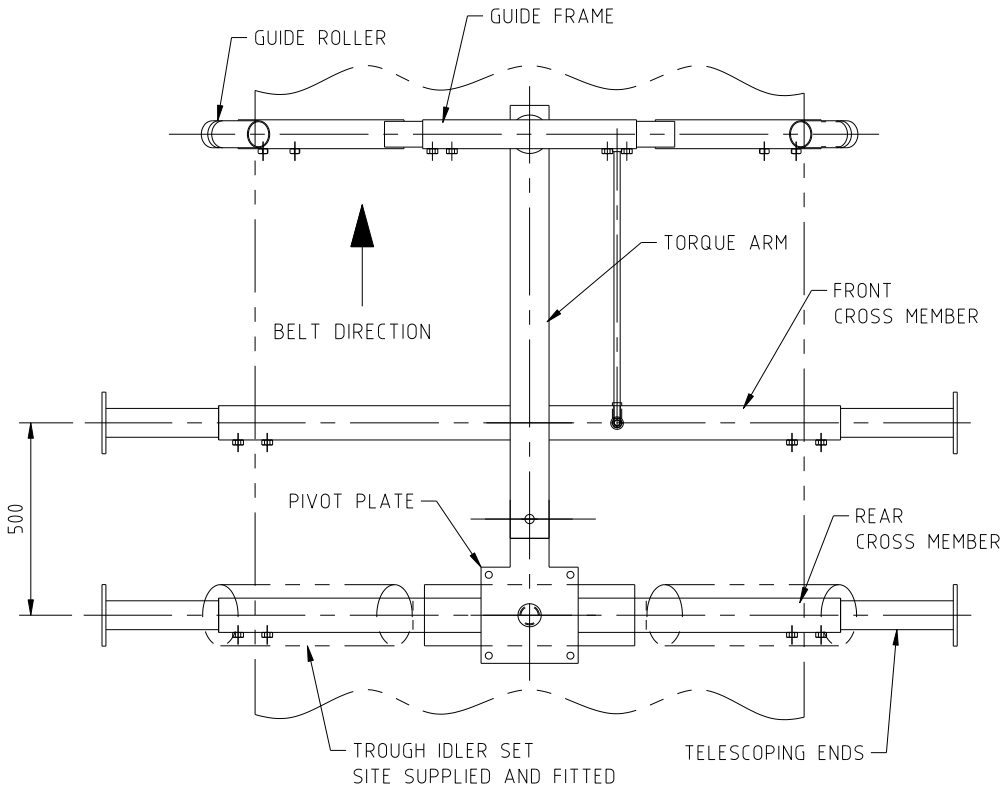


Figure 5 – Installation of Upper Unit

Step 1

Select the location for installation of the ESS Heavy Duty Belt 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 conveyor.

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

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.

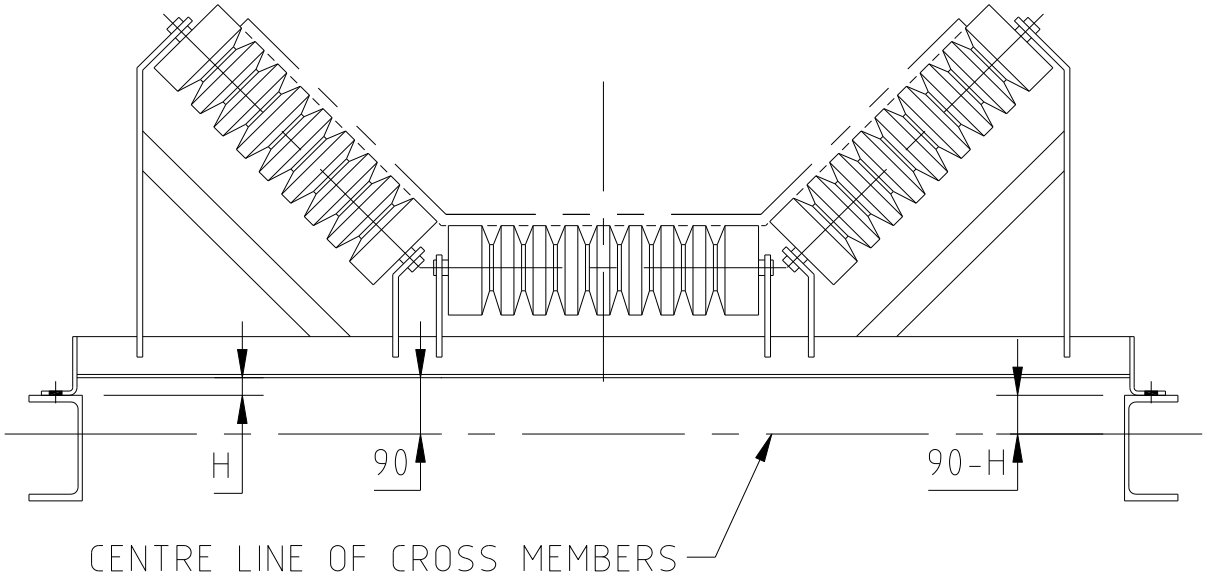


Figure 6 - HD Tracker Cross Members

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.

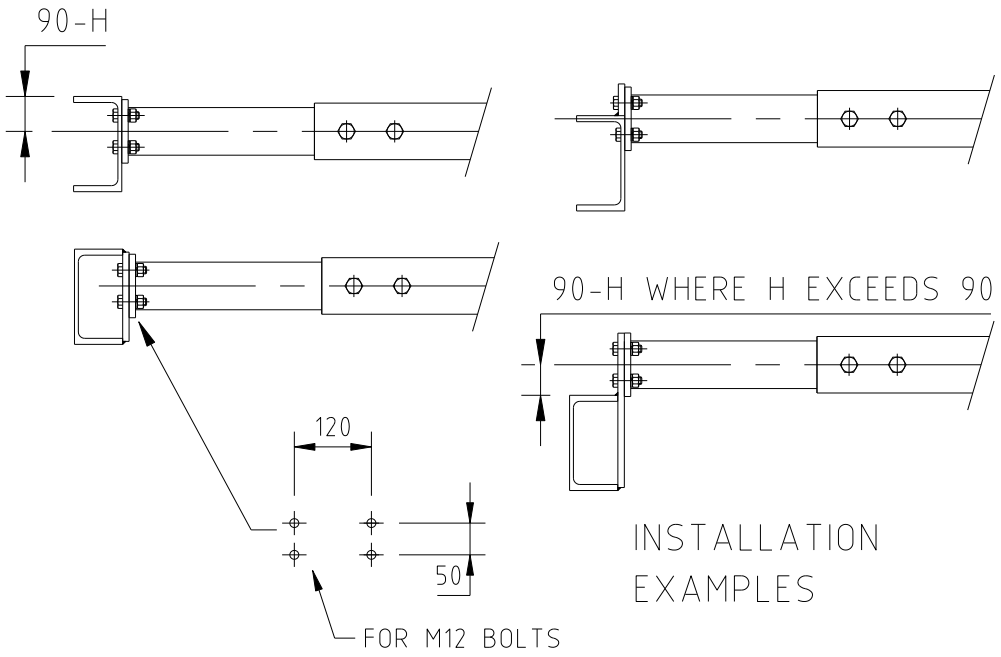


Figure 7 - Installation Examples

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.

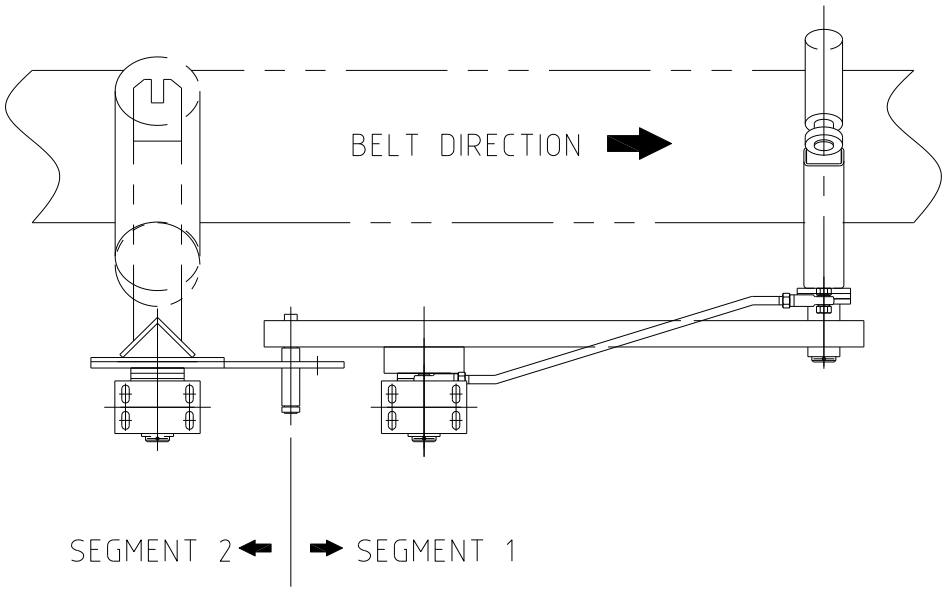


Figure 8 - Tracker Segments

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.

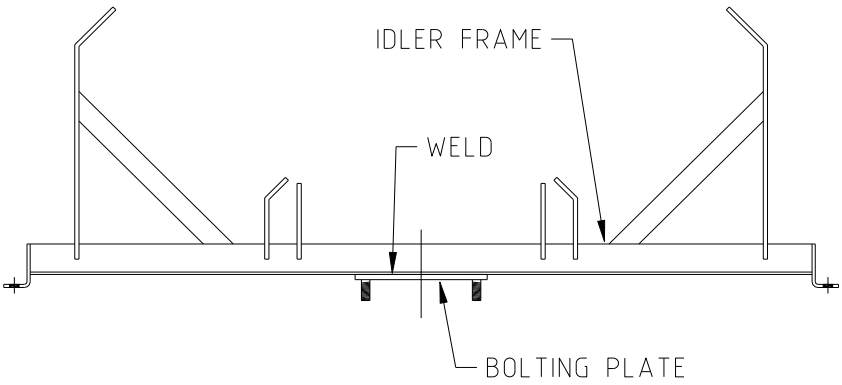


Figure 9 - Positioning the Bolting Plate

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

5.0 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 Belt Tracker

Check the Belt 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 mis-tracking, the ESS Belt Tracker should also be centred, and the steering idler(s) should be square to the belt.

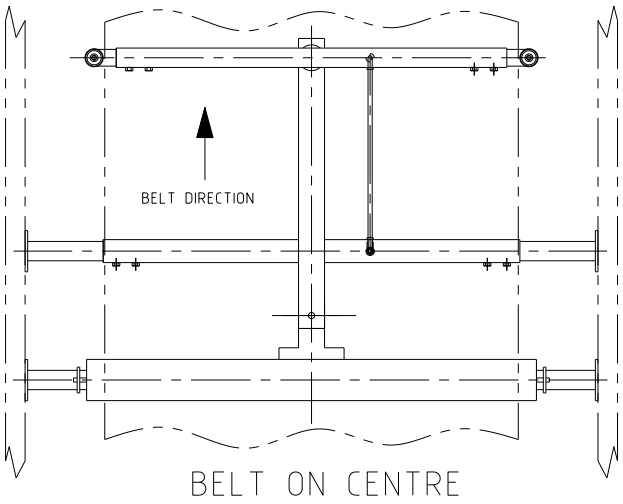


Figure 10 – Is the Belt Tracker Centred

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

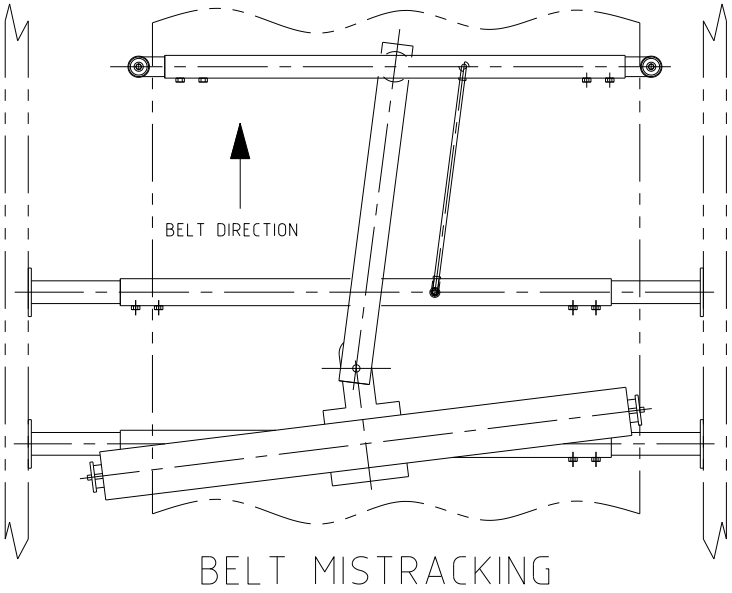


Figure 11 - Belt Mis-tracking

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.

6.0 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 Belt 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 Belt Tracker action. Clean up work area.

7.0 TROUBLESHOOTING

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 belt tracker will be mounted.

PROBLEM – Groove worn into the guide roller

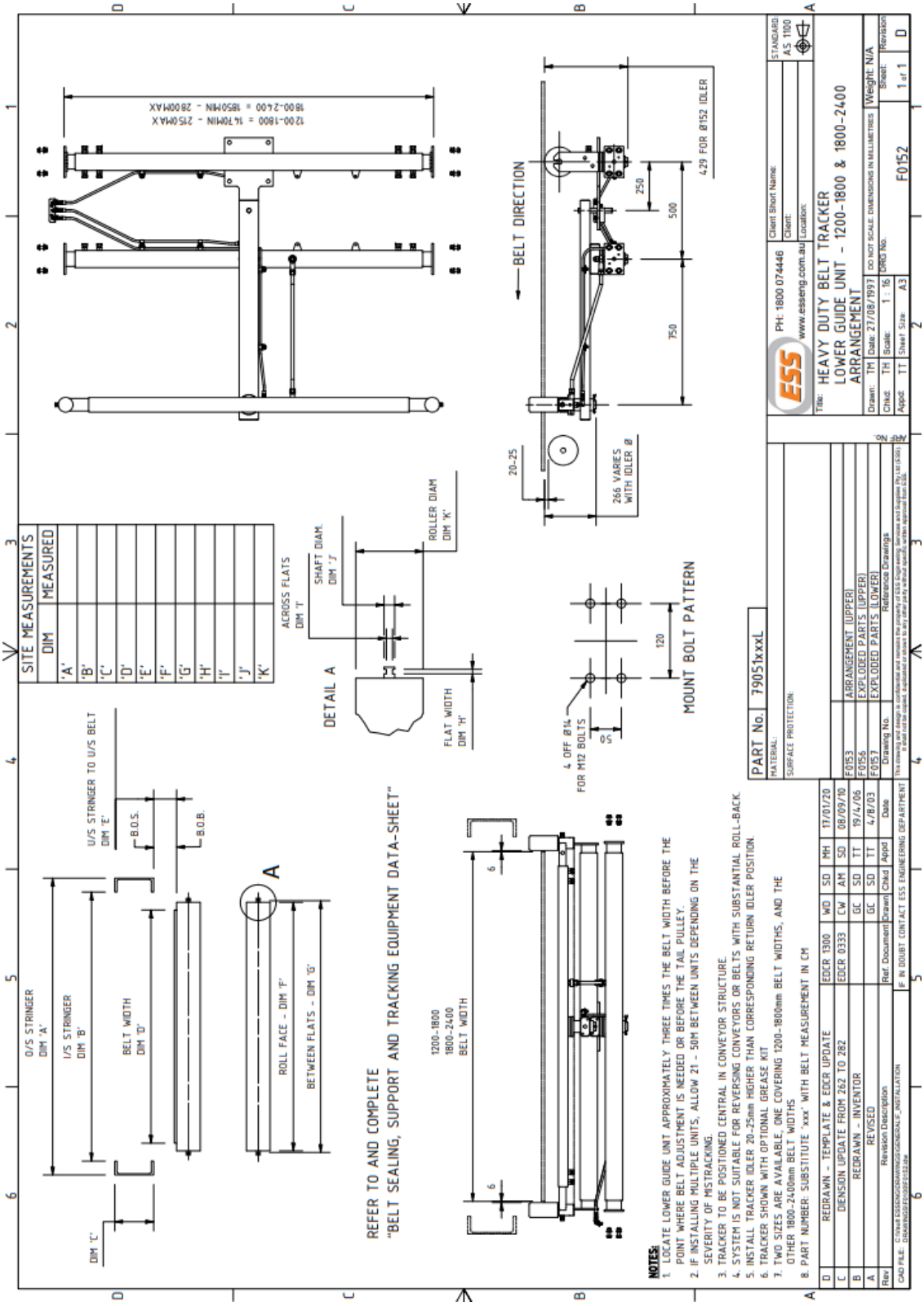
CAUSE	SOLUTION
Guide roller bearing may be seizing	Replace guide rollers.
Torque arm, Front or Rear pivot points may be seizing	Check pivot points, replace bushing and grease if required.

PROBLEM – Belt is not Tracking correctly

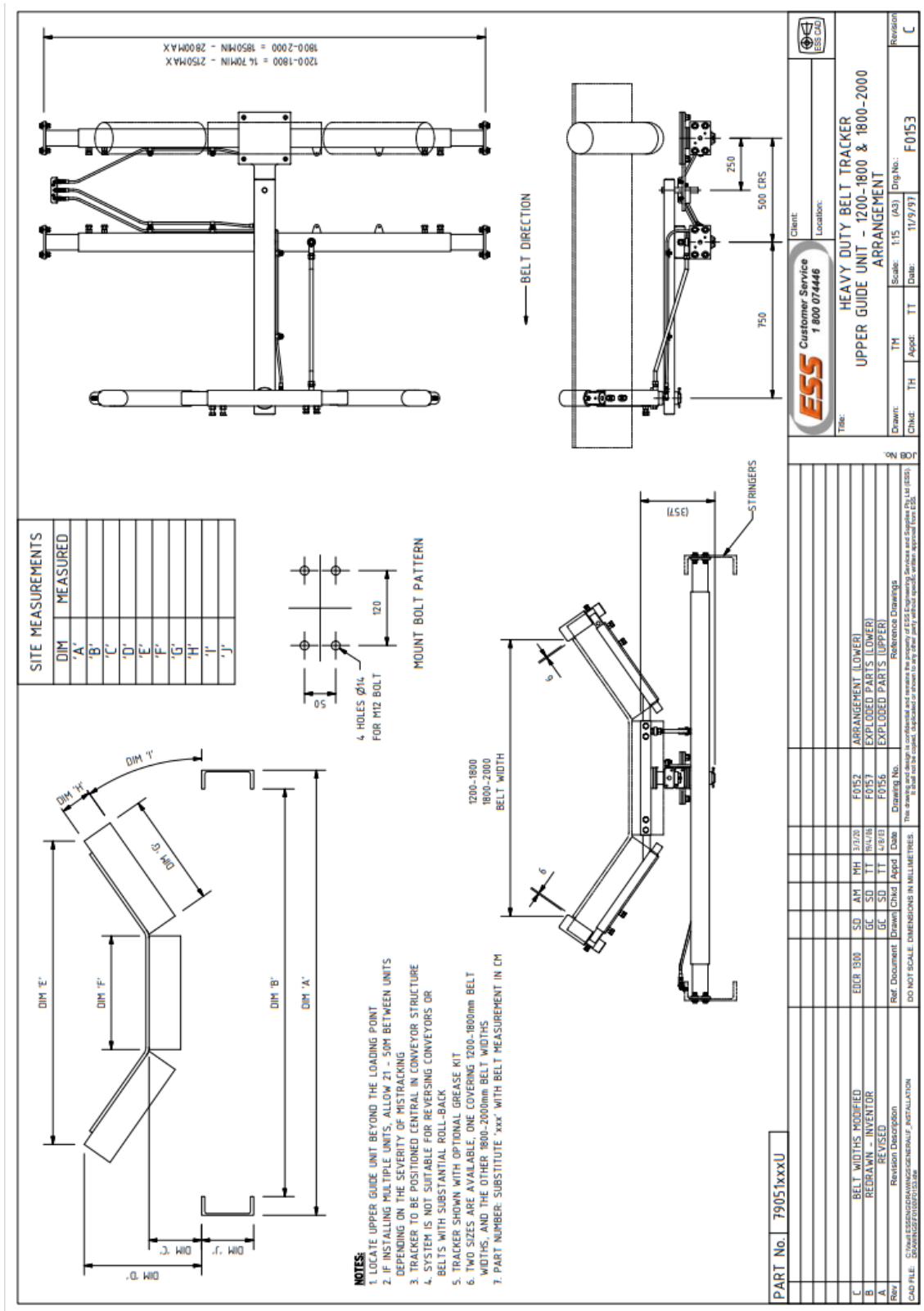
CAUSE	SOLUTION
Belt Tracker may not be adjusted correctly	Adjust Belt tracker as mentioned in Installation instruction.
There may be multiple points of misalignment in the structure	Multiple Belt Trackers may be required.

8.0 INSTALLATION ARRANGEMENT DRAWINGS

F0152 LOWER GUIDE UNITY (1200-1800 & 1800-2400)

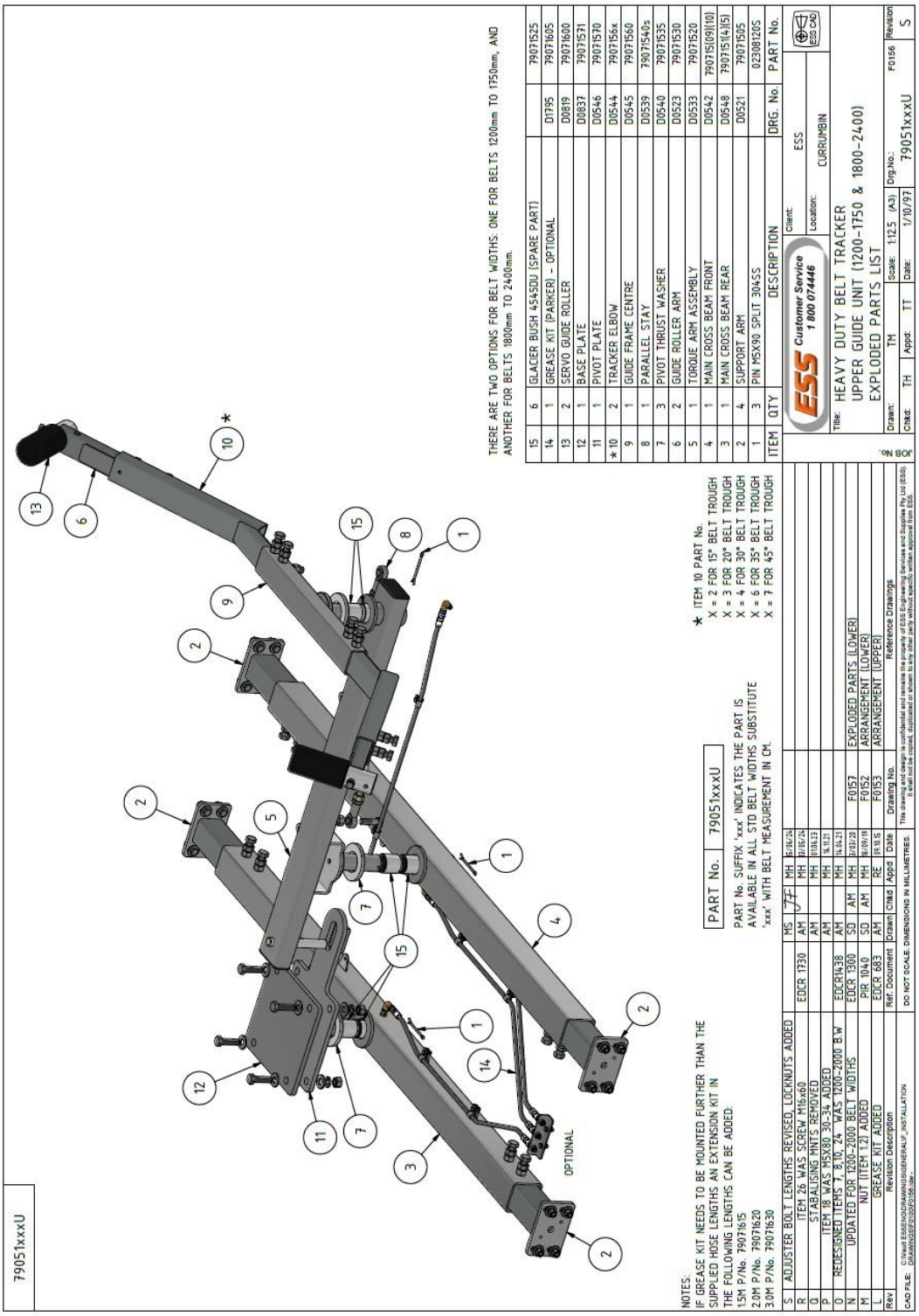


F0153 UPPER GUIDE UNIT (1200-1800 & 1800-2000)



9.0 EXPLODED PARTS DRAWINGS

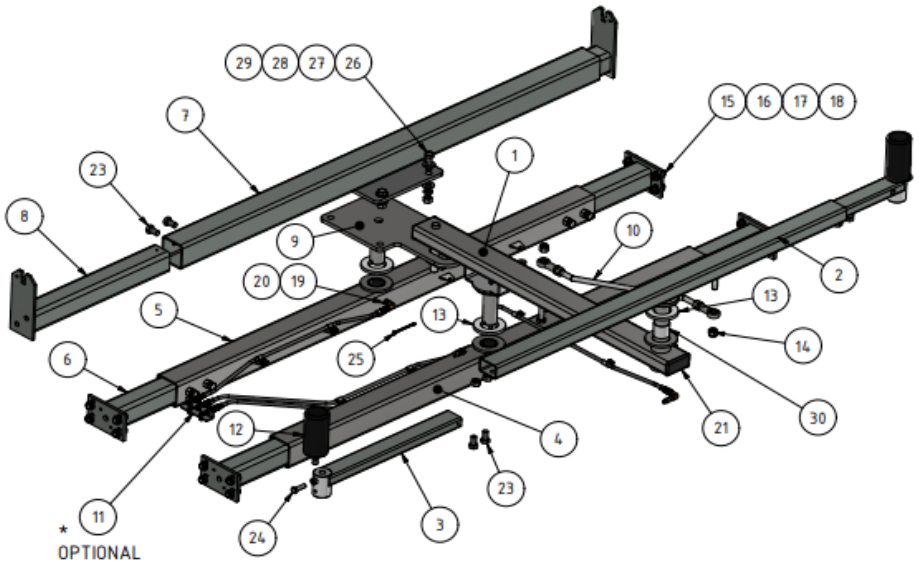
F0156 UPPER GUIDE UNIT (1200-1750 & 1800-2400)



79051xxxL

PART NUMBER FOLLOWED BY 'xxx' INDICATES THE PART IS AVAILABLE IN ALL STD BELT WIDTHS
SUBSTITUTE 'xxx' WITH BELT MEASUREMENT IN CM

THERE ARE TWO OPTIONS FOR BELT WIDTHS: ONE FOR BELTS 1200mm TO 1750mm, AND ANOTHER FOR BELTS 1800mm TO 2400mm.
THE PARTS HAVE DIFFERENT NUMBERS: (X) FOR THE SMALLER WIDTH RANGE AND (Y) FOR THE LARGER WIDTH RANGE.



*
FOR A STD. HD TRACKER SUPPLY ITEMS 19 &20
FOR OPTIONAL GREASE KIT REPLACE ITEMS 19 & 20 WITH ITEM 11
IF THE GREASE KIT NEEDS TO BE MOUNTED FURTHER THAN THE SUPPLIED HOSE LENGTH ALLOWS. AN EXTENSION KIT IN THE FOLLOWING LENGTHS CAN BE ADDED:
1.5M P/No 79071615
2.0M P/No 79071620
3.0M P/No 79071630

PART No. 79051xxxL

ITEM	QTY	DESCRIPTION	DRG. No.	PART No.
30	6	GLACIER BUSH 4545DU		79071525
29	4	NUT M16 HEX 304SS		02311616s
28	4	WASHER M16 SPRING 304SS		02319618s
27	8	WASHER 5/8" 304SS		02320458s
26	4	SCREW M16X50 HEX SET 304SS		02315640s
25	3	PIN M5X90 SPLIT 304SS		02308120S
24	2	SCREW M12X40 HEX SET 304SS		02315540s
23	16	SCREW M16X30 HEX SET 304SS		02315610s
22	2	NUT M12 HEX 304SS		02311512s
21	2	MAINFRAME PLUG SUIT 100X50X4 RHS PLASTIC		02650442P
* 20	3	ADAPTOR 1/8 F - M BRASS		02390010B
* 19	3	GREASE NIPPLE 1/8 TECALEMIT H29		02351160
18	16	NUT M12 HEX GAL		02311512g
17	16	WASHER M12 SPRING GAL		02319514g
16	32	WASHER M12 GAL		02319513g
15	16	SCREW M12X40 HEX SET GAL		02315540g
14	2	NUT M16 NYLOC 304SS		02311618s
13	3	PIVOT THRUST WASHER	D0540	79071535
12	2	SERVO GUIDE ROLLER	D0819	79071600
* 11	1	GREASE KIT (PARKER)	D1795	79071605
10	1	PARALLEL STAY	D0539	79071540s
9	1	PIVOT PLATE	D0546	79071570
8	2	H/DUTY IDLER SUPP T/SCOPIC ENDS LOWER ONLY	D0554	79071550
7	1	H/DUTY IDLER PIVOT ASSY LOWER UNIT	D0553	79071545
6	4	SUPPORT ARM	D0521	79071505
5	1	MAIN CROSS BEAM REAR	D0548	79071514(4)(5)
4	1	MAIN CROSS BEAM FRONT	D0542	79071519(10)
3	2	GUIDE ROLLER ARM	D0523	79071530
2	1	H/DUTY GUIDE FRAME LOWER	D0541	79071554(4)(5)
1	1	TORQUE ARM ASSEMBLY	D0533	79071520

Rev	Revision Description	Ref. Document	Drawn	Chkd	Appd	Date	Drawing No.	Reference Drawings
P	REDESIGNED AND UPDATED	EDCR 1438	AM		MH	07.05.21		
O	UPDATED FOR 1200-2400	EDCR 1300	WD	SD	MH	20/01/20		
N	NUT (ITEM 1.2) ADDED	PIR 1040	SD	AM	MH	18/09/19		
M	GREASE KIT ADDED	EDCR 683	AM		RE	28.07.15		
L	UPDATE AS PER REQUEST	EDCR414	RE	SD	RE	9/7/13		
							F0153	ARRANGEMENT (UPPER)
S	BOM REVISED		AM	JT	MH	01.06.23	F0152	ARRANGEMENT (LOWER)
R	ITEM 15 WAS PIN M5X80 29 WAS GAL	ECR 1479	AM		MH	18.11.21	F0156	EXPLODED PARTS (UPPER)

CAD FILE: C:\Temp\F0157.idw\DRAWINGS\GENERAL\F_INSTALLATION DRAWINGS\F0-099\F0157.idw - 7/11/2007 12:38

DO NOT SCALE. DIMENSIONS IN MILLIMETRES.

JOB No.

ESS Customer Service 1 800 074446

Client: ESS
Location: CURRUMBIN

ESS CAD

Title: HEAVY DUTY BELT TRACKER
LOWER GUIDE UNIT (1200-1750 & 1800-2400)
EXPLODED PARTS

Drawn:	TM	Scale:	NTS (A3)	Drg.No.:	F0157	Revision
Chkd:	TH	Appd:	TT	Date: 26/04/06	79051xxxL	S

10.0 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:** _____

11.0 NOTES