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TECHNICAL MANUAL FOR THE STAND ALONE BELT DRIVE ENCODER SYSTEM

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WE RESERVE THE RIGHT TO ALTER WITHOUT GIVING PRIOR NOTICE TECHNICAL
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1 Introduction

The ILE belt drive encoder system is designed to be installed on the lift car to provide the ILE shaft encoder system with pulse data for floor positioning when an alternative means is not available or desirable (no motor or governor encoder present). It has advantages over the aforementioned means of feedback as it is driven via a toothed belt so it is impervious to slip so the shaft encoder system has fewer corrections to perform.

The belt drive encoder system is also designed to be used with Sykcom+ systems where positioning is carried out via an absolute encoder (available 2010)

The belt drive encoder system is designed to use the same footprint as a conventional tape head so can be fitted any where a tape head was previously installed.

An illustration of a fully fitted assembly is shown below fitted to the guide rail (not included)



The belt drive encoder system comprises of three main assemblies all of which are divided into various components, all of which are available separately as spares (see component lists)

2 Belt drive car top fixture

The belt drive car top fixture is fitted as a conventional tape head system would be.

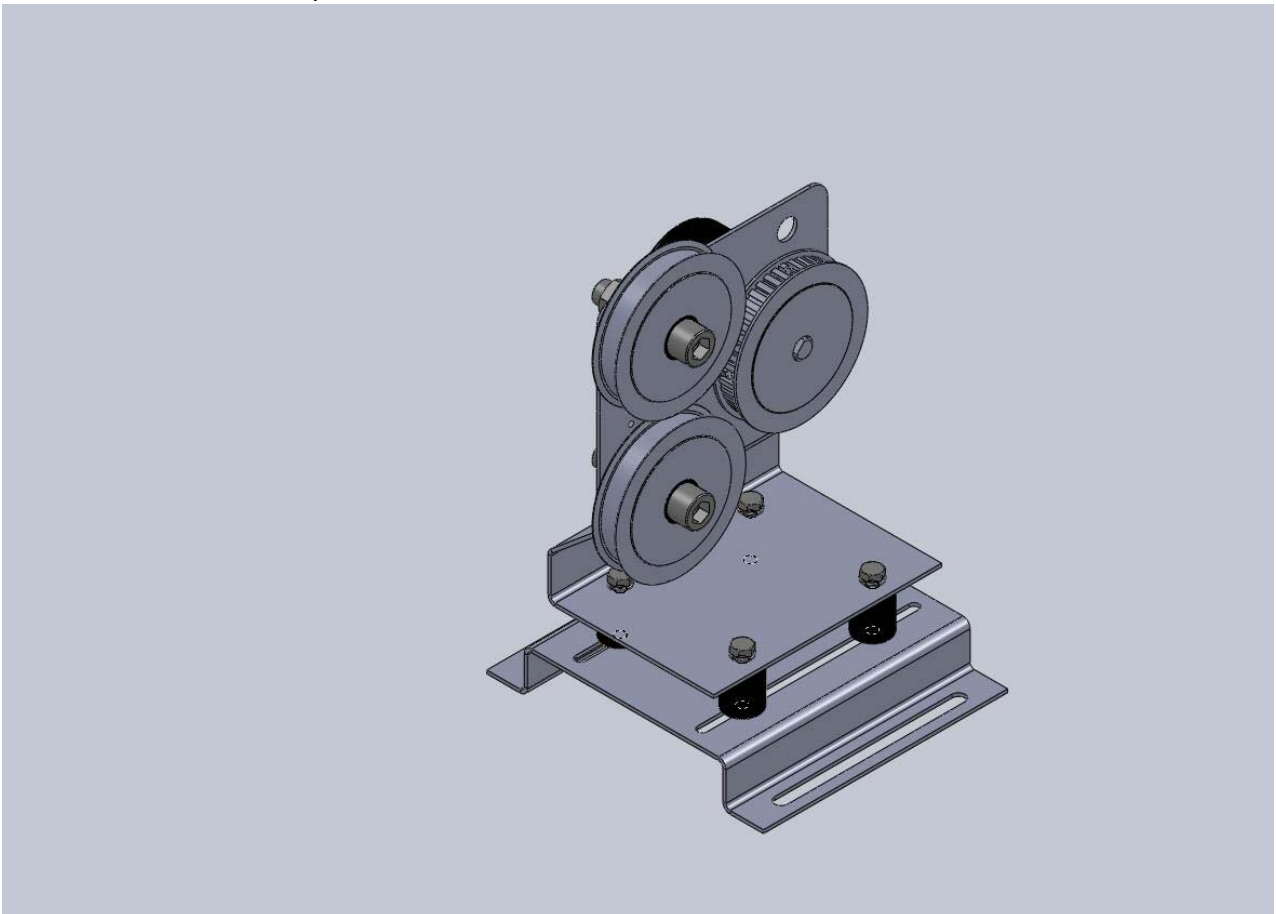
The system comprises of a mount bracket, an encoder mount, four rubber mounts, two idler pulleys, a drive pulley and an encoder.

The unit needs to be securely fitted to the car top using fixings which are capable of maintaining the mechanical integrity of the system.

Two 6mm slots are provided each side of the mounting bracket to allow full a range of movement for final adjustment after being installed. Further adjustment is provided where the rubber mounts secure to the mount bracket.

ILE recommend securing to the lift car with four M6 bolts with flat and spring washers.

The full belt drive car top fixture is shown below



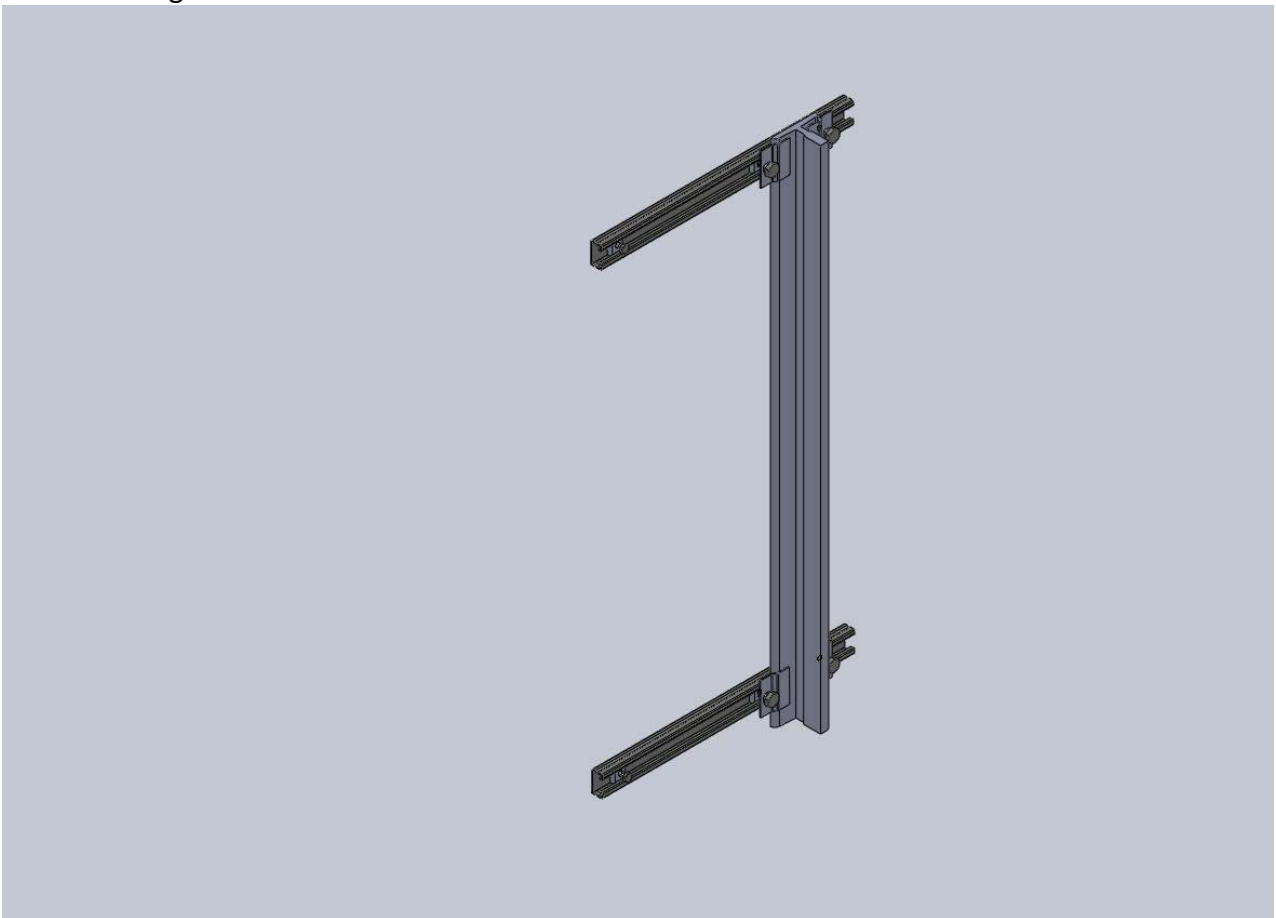
3 Top and bottom brackets

The top and bottom belt brackets comprise of two 600mm long unistruts© which are fitted to the guide using pressed steel guide clips fixed via M12 unistrut© inserts.

These should be positioned at the top and bottom of the lift shaft and care should be taken to ensure that they do not come into contact with any other parts of the lift installation especially when the lift over travels the top and bottom floors.

Once the final position is decided upon ILE recommend that these brackets are pinned to the guide to stop any unwanted movement of the brackets thus causing the belt to lose tension and the lift to get out of position.

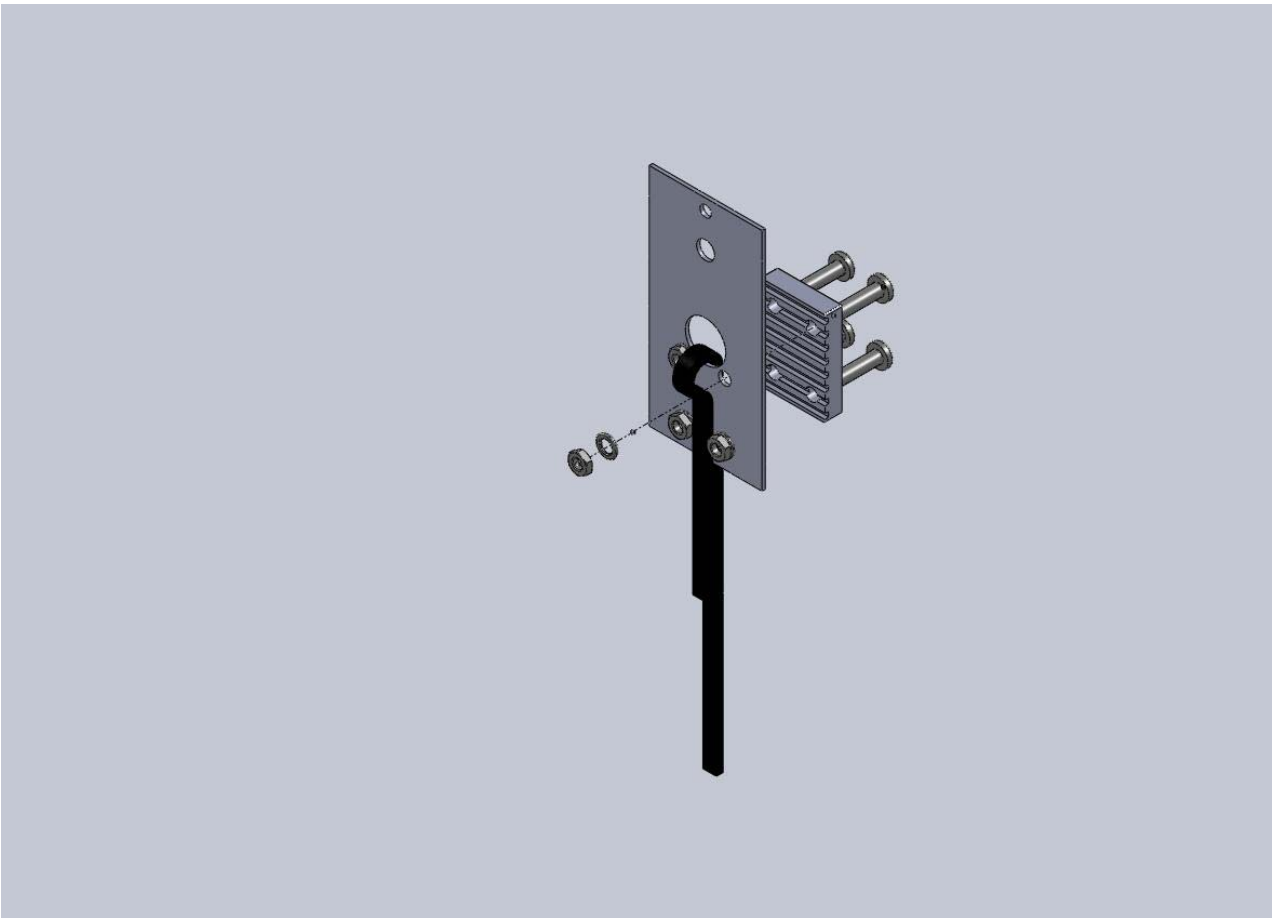
The mounting of the brackets is shown below.



4 Belt installation.

Care must be taken when installing the belt. It is important for belt integrity and longevity that it is handled correctly and not knotted up or twisted too much during installation.

The belt is secured at the top and bottom of the shaft using the belt clap and bracket as shown below



As can be seen from the above diagram the belt clamp is toothed to match up and mesh with the teeth in the belt. The belt should be fed up behind the clamp plate threaded through the large hole in the plate, then secured with the clamp against the toothed side of the belt. The four M5 screws should then be tightened to secure the belt and the dead end of the belt secured with cable ties or tape (not provided).

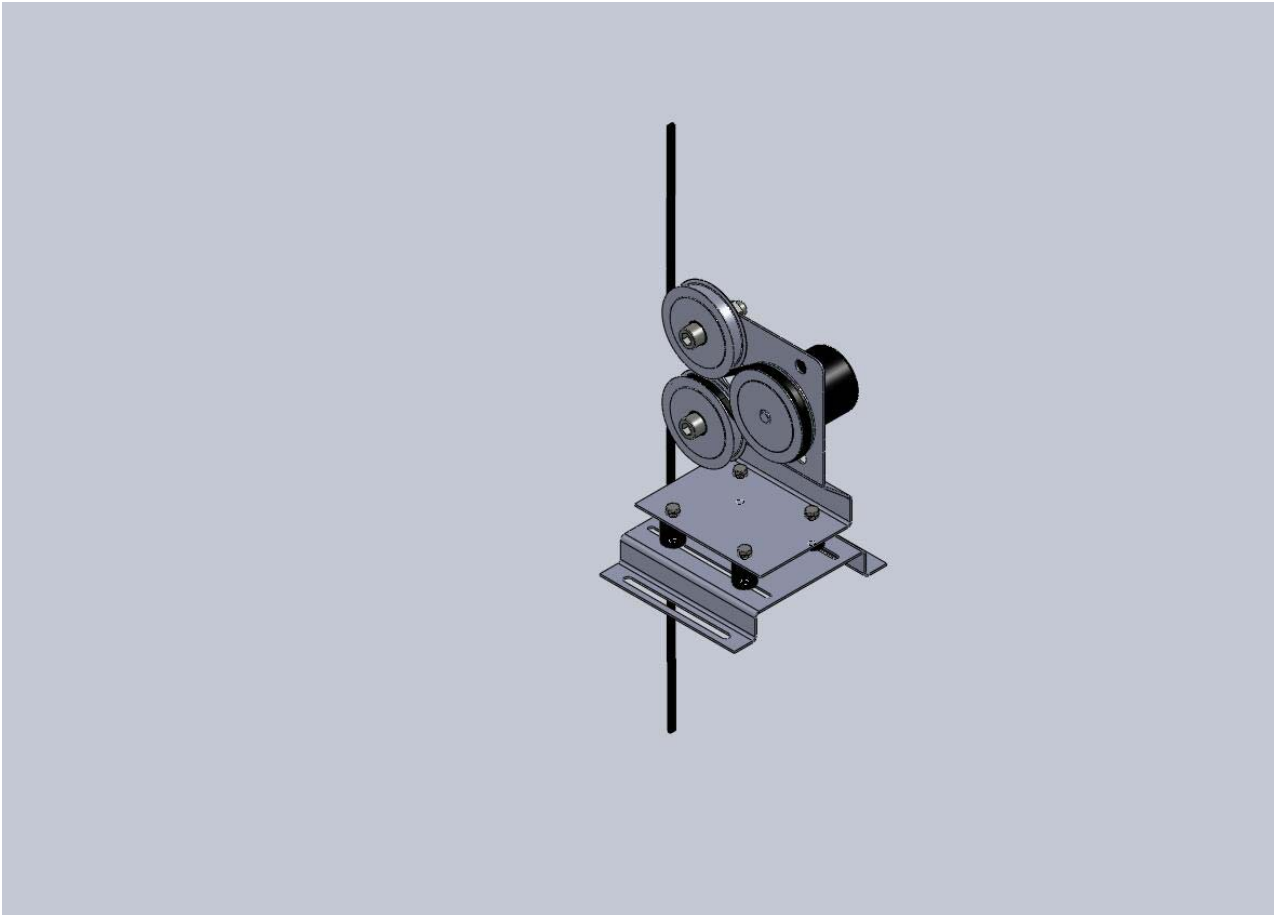
The belt clamp assembly is then secured to the top unistrut® via the M8 bolt and unistrut® insert supplied. It is best to leave the clamp plate only loosely fixed to the unistrut® until the installation is complete.

The belt now needs to be run down the length of the shaft best done on inspection with one person driving and one person feeding of the belt. Once the belt has been run the full length of the shaft the remaining belt should be fed down the side of the car and left loose in the pit.

The belt needs now to be fed around the idler and drive pulleys on the belt drive encoder system.

Care needs to be taken at this point as not to have any twists in the belt as it wraps around the pulleys, this can cause undue wear and noise when in operation.

The diagram below shows the correct method of feeding the belt.



The belt now needs to be secured at the bottom of the shaft using the same method as at the top of the shaft.

The belt now requires tensioning. To tension the belt loosen the bottom unistrut® via the guide fixing and apply a downward force of no more than 15kg. The tension should be tight enough as not to put undue strain on the encoder bearing.

5 Belt alignment and final checks.

The belt should be aligned referenced from the guide. Take a measurement from the centre of the drive pulley to the blade of the guide and set the centre of the belt to the guide blade the same distance, this should ensure correct running and tracking as the lift travels up and down the shaft. Run the lift on inspection and check that the belt runs true and centre to the drive pulley and no excess noise is generated by the belt.

Check all fixings are tight and carry out final pinning as described in section three.

6 Electrical connections.

The belt drive encoder system comes complete with an encoder used to generate the necessary pulses to be read by the ILE shaft encoder board. The encoder is manufactured by Tekel and has a 10mm shaft to mount to the drive pulley it produces 2048 pulses per revolution. The encoder has A, B and Z channels including complimentary channels but we require only require the A and B channels.

Care must be taken when connecting the encoder so that all unused channels are isolated from each other and are unable to touch earth, failure to do so will cause damage to the encoder.

The encoder is fed from the power supply of the shaft encoder board.

The encoder needs to be connected to the controller via a screened cable and segregated from all high voltage cables.

The connections are as follows

| | | |
|--------|------|---------------------------------------|
| Red | TV+ | (positive connection from controller) |
| Black | T0v | (negative connection from controller) |
| Green | TA+ | (A+ channel to the controller) |
| Yellow | TB+ | (B+ channel to the controller) |
| Screen | TSCN | (screen back to the controller) |

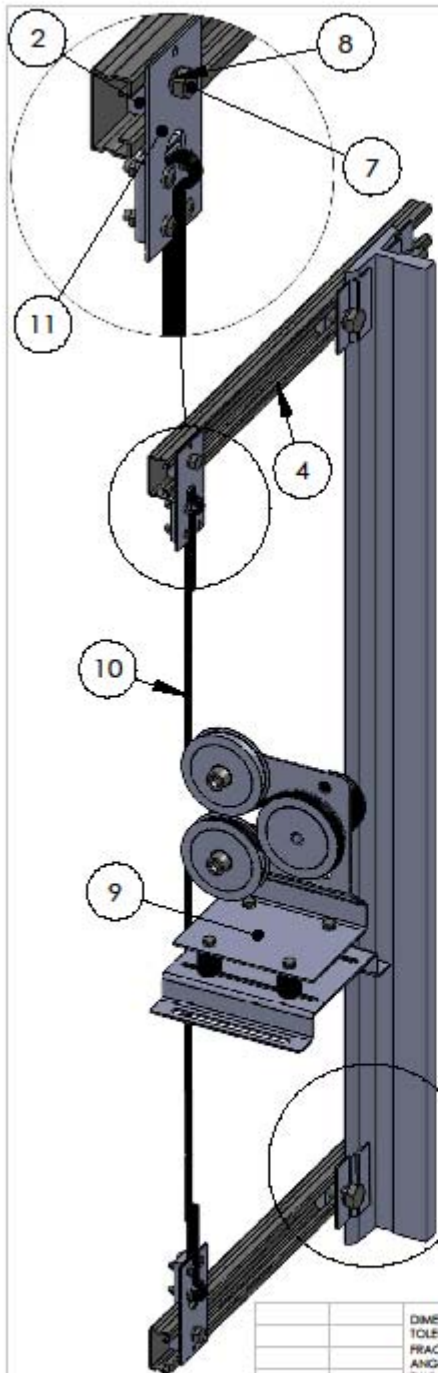
The shaft encoder pulses per millimetre value in the Skycom processor should be set to 8.544ppm.

7 Parts lists and component views.

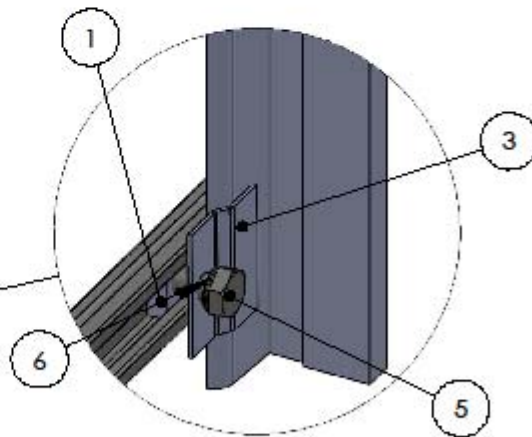
The following three pages show a breakdown of the components that make up the ILE belt drive encoder system.

It lists all the individual parts required to make up the complete assembly.

It also shows exploded views of the sub assemblies to aid with the installation of the components.



| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|---------------------------------------------------------|-----------------------------|------|
| 1 | m12 unistrut nut | | 4 |
| 2 | m8 unistrut nut | | 2 |
| 3 | guide clip | 2mm pressed galv steel clip | 4 |
| 4 | P4000x19.5 | 500mm long unistrut | 2 |
| 5 | B18.2.3.3M - Heavy hex screw, M12 x 1.75 x 25 - 25N | | 4 |
| 6 | Rectangular section spring washer BS 4464 - 12 (Type B) | | 4 |
| 7 | ISO 4018 - M8 x 20-WN | | 2 |
| 8 | Square section spring washer BS 4464 - 8 (Type A) | | 2 |
| 9 | ful mount 1 | | 1 |
| 10 | belt | belt length to suit site | 1 |
| 11 | clamp plate assy | clamp plate assy | 1 |

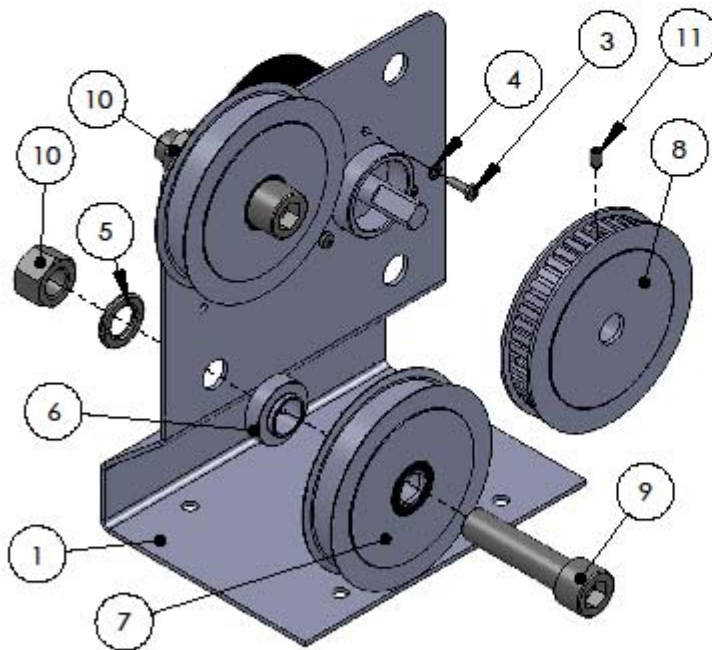


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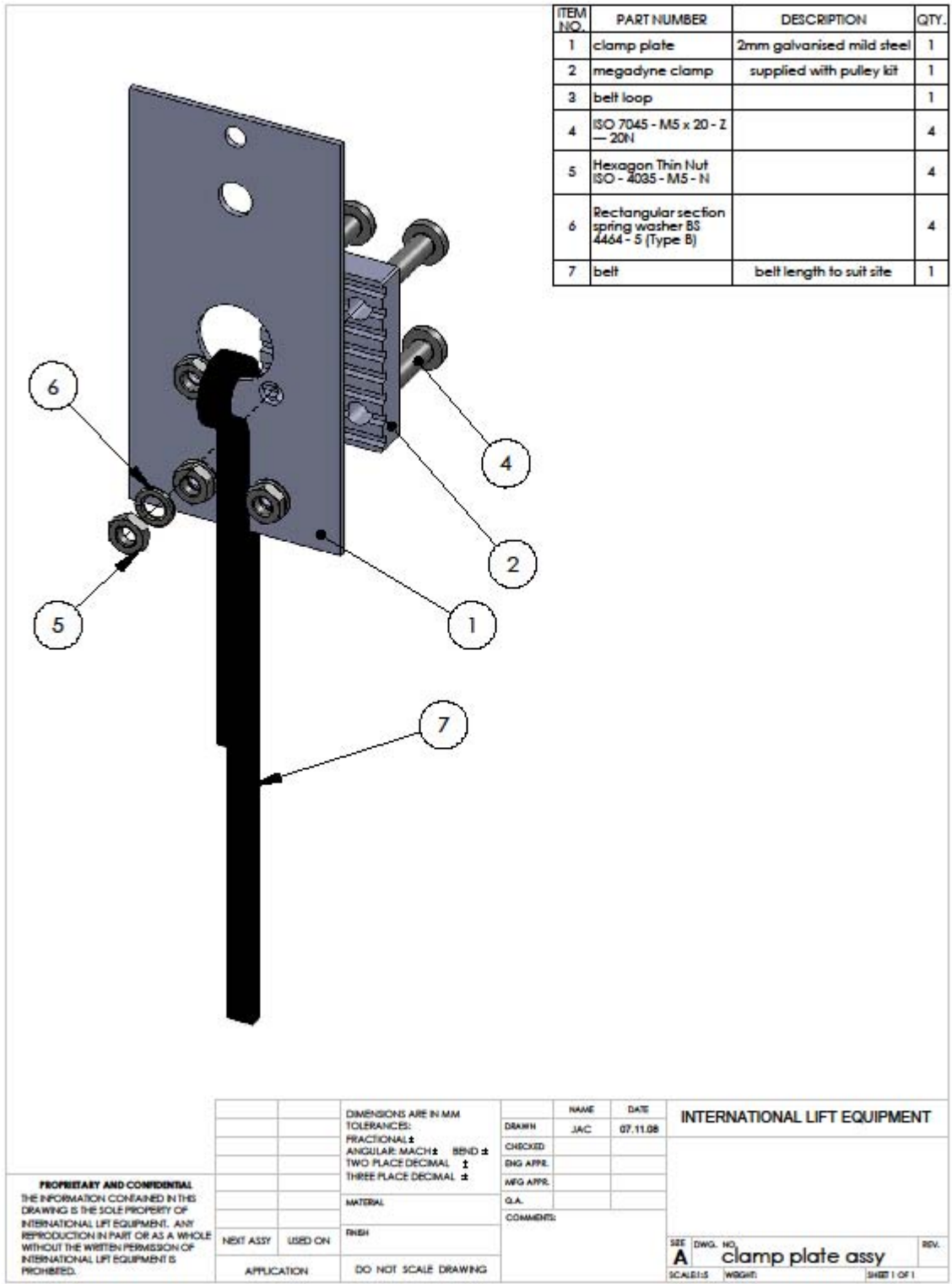
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| | | DIMENSIONS ARE IN MM | | NAME | DATE |
| | | TOLERANCES: | | JAC | 05.11.08 |
| | | FRACTIONAL ± | | | |
| | | ANGULAR: MACH ± | | | |
| | | TWO PLACE DECIMAL ± | | | |
| | | THREE PLACE DECIMAL ± | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | COMMENTS: | | | |
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| INTERNATIONAL LIFT EQUIPMENT | | |
| SEE DWG. NO. | full assy | REV. |
| A | | |
| SCALE: 1:30 | WRIGHT | SHEET 1 OF 1 |

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|---------------------------------------------------------|-----------------------------|------|
| 1 | encoder mount | 2mm galvenised mild steel | 1 |
| 2 | tekel encoder | 2048 pulse 10mm shaft | 1 |
| 3 | ISO 7045 - M3 x 10 - 7 — 10N | | 3 |
| 4 | Rectangular section spring washer BS 4464 - 3 (Type B) | | 3 |
| 5 | Rectangular section spring washer BS 4464 - 12 (Type B) | | 2 |
| 6 | back idler boss | machined boss | 2 |
| 7 | idler pulley | megadyne flanged back idler | 2 |
| 8 | drive pulley | megadyne 48 teeth T5 | 1 |
| 9 | ISO 4762 M12 x 50 — 50N | | 2 |
| 10 | Hexagon Nut ISO - 4034 - M12 - N | | 2 |
| 11 | BT8.3.6M - M4 x 0.7 x 8 Hex Socket Cone Pt. SS -N | | 1 |



| | | | | | | |
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| | | | MATERIAL | CHECKED ENG APPR. MFG APPR. Q.A. COMMENTS: | | |
| | NEXT ASSY | USED ON | FINISH | | | |
| | APPLICATION | | DO NOT SCALE DRAWING | | | |
| | | | | SEE DWG. NO. A | DWG. NO. mount assembly | REV. A |
| | | | | SCALE: 1:5 | WEIGHT | SHEET 1 OF 1 |



| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|--------------------------------------------------------|---------------------------|------|
| 1 | clamp plate | 2mm galvanized mild steel | 1 |
| 2 | megadyne clamp | supplied with pulley kit | 1 |
| 3 | belt loop | | 1 |
| 4 | ISO 7045 - M5 x 20 - Z - 20H | | 4 |
| 5 | Hexagon Thin Nut ISO - 4035 - M5 - N | | 4 |
| 6 | Rectangular section spring washer BS 4464 - 5 (Type B) | | 4 |
| 7 | belt | belt length to suit site | 1 |

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| | | DIMENSIONS ARE IN MM | | NAME | DATE | INTERNATIONAL LIFT EQUIPMENT |
| | | TOLERANCES: | | JAC | 07.11.08 | |
| | | FRACTIONAL ± | | CHECKED | | |
| | | ANGULAR: MACH ± | | ENG APPR. | | |
| | | TWO PLACE DECIMAL ± | | MFG APPR. | | |
| | | THREE PLACE DECIMAL ± | | Q.A. | | |
| | | MATERIAL | | COMMENTS: | | |
| NEXT ASSY | USED ON | FINISH | | | | SEE DWG. NO. |
| APPLICATION | | DO NOT SCALE DRAWING | | | | A clamp plate assy |
| | | | | | | SCALE: 1:1 |
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