ENGINEERING SERVICES & SUPPLIES PTY LTD
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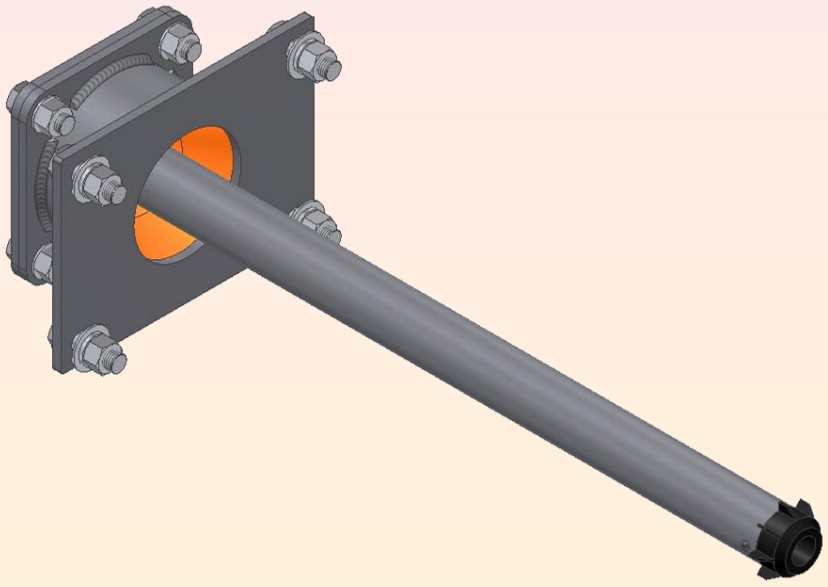
XHD Mandrel

Installation, Operation & Maintenance Manual



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WARRANTY

ESS warrants the **XHD Mandrel Belt Cleaner Service Accessory** 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 is also 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:

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

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.

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FIGURES

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1.0 SAFETY

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

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

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.**

The ESS XHD Mandrel will allow substantially easier removal of the XHD Cleaner mainframe and blade assembly without the need to enter the chute, but still carries some hazards:

- Material flow or moving conveyor contact with the mainframe or blades during withdrawal could cause severe injury to personnel holding the assembly. The conveyor MUST be shut down and locked out before attempting withdrawal of the mainframe.
- The XHD mainframe and blade assembly can be heavy (30 to 130 kg, depending on belt width) and even though the Mandrel acts to steady and guide the load, personnel should be aware that the mainframe can twist, and will eventually clear the Mandrel. Sufficient personnel must be present to ensure a safe lifting load for removal of the unit, or lifting aids should be used.
- Under some conditions, the Mandrel inner pipe may be subject to vibration, and possible eventual failure. The unit has been redesigned to allow inspection of the Mandrel pipe before use, and a vibration dampener has been added to the Mandrel pipe end. These features should be utilised to ensure that the Mandrel is in good condition before withdrawing the cleaner mainframe.
- The XHD Cleaner may be inspected or the tension adjusted with the belt running as long as suitable visual access is available (refer XHD Primary Cleaner manual), but the service person should never reach into or enter the conveyor enclosure. No other service work is able to be carried out with the conveyor running. Shut down and lock out the conveyor for any work requiring any part of the body to enter the conveyor enclosure, or be exposed to moving components.

The following are some of the hazards that may be present when installing this equipment:

Table 1 - Hazard Checklist

	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		Other:

Once hazards have been identified, the installer should undertake and document a comprehensive Job Hazard Analysis (JHA) according to site requirements and good safe-working practice. The installer must identify all hazards and apply appropriate controls before proceeding with the installation or servicing 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

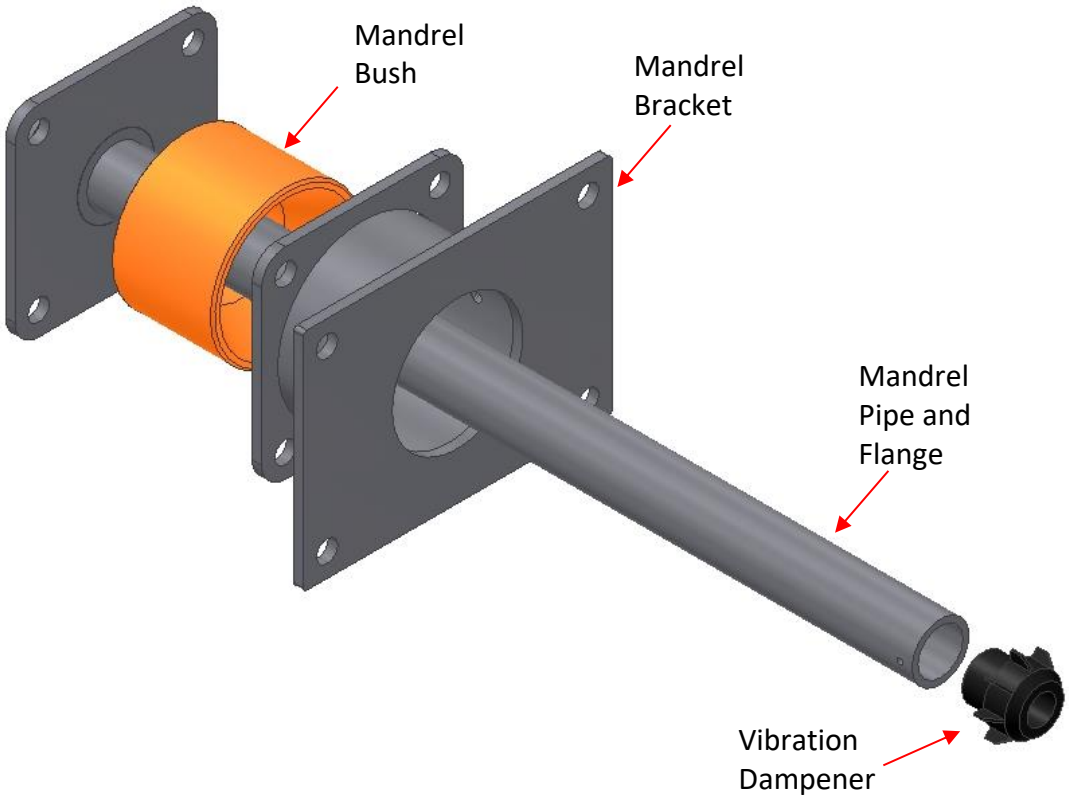
The XHD Mandrel is an add-on piece of equipment which, when used in conjunction with an XHD Primary Belt Cleaner, will allow withdrawal of the cleaner mainframe and blade assembly without the need to enter the conveyor chute.

This can be of great assistance to service personnel, saving time on maintenance procedures, and eliminating the hazards of confined space entry.

The XHD Mandrel is comprised of a bracket that either replaces the far side mount for a single tensioner cleaner, or piggybacks the far side mount / tensioner for a dual tensioner cleaner.

Fitted to this bracket is a flanged pipe that passes into the inside of the XHD Cleaner mainframe pipe. The Mandrel pipe extends almost to the other end of the XHD Cleaner, and will provide support when withdrawing the cleaner mainframe from the chute.

Inside the Mandrel Bracket is a urethane or Polyethylene bush that supports the XHD Cleaner in its operating position. Fitted to the end of the Mandrel Pipe is a urethane Vibration Dampener.



3.0 INSTALLATION

CONVEYORS MUST BE SHUT DOWN AND LOCKED OUT BEFORE ANY INSTALLATION OR SERVICE WORK IS PERFORMED.

IF INSTALLATION IS TO BE DONE IN AN ENCLOSED AREA, TEST ATMOSPHERE FOR GAS LEVEL OR DUST CONTENT. FOLLOW ALL WELDING AND SAFETY GUIDELINES.

This installation instruction must be read in conjunction with the Installation Manual for the XHD Cleaner. Ensure that the XHD Cleaner and all of its components are present.

3.1 PREPARATION FOR INSTALLATION

If not already done, carry out the installation procedures for XHD Primary cleaner according to the instructions in the Installation manual, up to the point where the cleaner mainframe is ready to be installed.

If the cleaner is already installed, remove the blades, mounts and mainframe from the chute in preparation for the installation of the Mandrel.

The installer must decide which side of the chute will be the access side for servicing and withdrawing of the cleaner mainframe. This side will be referred to as the Operator Side, whilst the other side will be referred to as the Far Side. For cleaners with a single tensioner (less than 1500 mm belt width) the Operator Side will normally be the side where the tensioner is located.

3.2 MANDREL INSTALLATION

⚠ CAUTION

THE XHD MANDREL ASSEMBLY COMPRISES A LONG PIPE SECTION WHICH IS ATTACHED BY A BRACKET TO THE CHUTE WALL. THIS ASSEMBLY EXTENDS OUT INTO THE CHUTE ENCLOSURE, AND IS ATTACHED AT THE FAR SIDE CHUTE WALL ONLY. DURING INSTALLATION THE PIPE EXTENSION WILL NEED TO BE SUPPORTED. LIFTING EQUIPMENT OR INTERNAL CHUTE ACCESS AND SCAFFOLDING MAY BE REQUIRED. AN ALTERNATIVE IS TO REMOVE THE VIBRATION DAMPER FROM THE MANDREL PIPE, AND USE A SMALLER PIPE PASSED FROM THE OTHER SIDE OF THE CHUTE AND INSERTED INTO THE MANDREL PIPE AS A SUPPORT DURING INSTALLATION.

The XHD Mandrel itself is installed in place of the far side mount of an XHD Primary Cleaner.

For single tensioner cleaners (belts less than 1500mm wide), remove the far side mount, and bolt the Mandrel assembly in its place, using the same fasteners and bolt holes. As noted above, the Mandrel pipe will need to be supported during installation until the mounting bolts can be secured. Ensure that the fasteners securing the Mandrel bracket to the chute wall are tight, and the fasteners securing the Mandrel pipe to the Mandrel bracket flange are also tight.

For dual tensioner cleaners, (1500 belt width and wider, plus some special applications) the far side mount and tensioner must remain. The Mandrel is fitted to an ESS XHD Stand-off bracket to straddle the far side mount. It is essential to pre-determine that the XHD cleaner mainframe is long enough to extend through the far side mount and into the Mandrel bracket.

Using the drawings in the XHD Primary Cleaner manual, mark out and drill / cut bolts holes to secure the XHD stand-off bracket to the chute wall. Fit the stand-off bracket and bolt in place, ensuring the bolts are correctly tightened.
Fit the XHD Mandrel to the stand-off bracket, passing the pipe through the existing far side tensioner and mount assembly. As noted above, support the Mandrel pipe by available means until the Mandrel bracket can be secured to the stand-off bracket.

If the vibration Damper has been removed to assist in fitting of the Mandrel, refit the Damper to the end of the Mandrel pipe and secure with the screw provided.

Once the XHD Mandrel has been installed, the tensioner or operator side needs to be set up to allow the use of the Mandrel.

3.3 OPERATOR SIDE SET-UP

The operator side (also the tensioner side for belts less than 1500 wide) is the side of the conveyor from which the cleaner will be serviced during operation. This side must be set-up to allow easy and safe withdrawal of the cleaner mainframe with blades.

To enable this, the tensioner will need to be easily removed, and the mainframe and blades withdrawn without colliding on structure or brackets. Further to this, the access opening needs to have minimal clearance from the underside of the mainframe so that the mainframe can be supported or rested on the structure during withdrawal. The Mandrel pipe is intended to guide and partially support the mainframe – it is not intended to take the full load of the mainframe.

Where an ESS XHD Stand-off bracket is used, the bracket should be cut away as shown in the following figure.

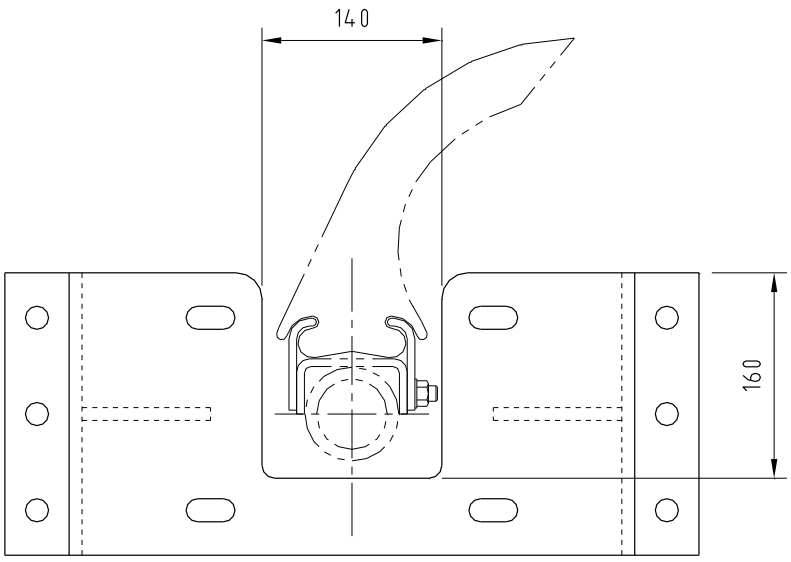


Figure 1 - Stand-off Bracket Cutaway

Where a stand-off bracket is not used, the mount and tensioner assembly should be attached in a manner that will allow easy removal. Bolting through the chute wall makes this difficult, since the bolt heads inside the chute are inaccessible. Brackets cut from steel angle or bent plate and welded to the chute are ideal to provide access to the bolts, and to leave an opening for withdrawal of the cleaner.

Where a larger or irregular chute opening is provided for access, a support bar should be welded to the inside of the chute to take the weight of the mainframe after removal of the mount and during withdrawal.

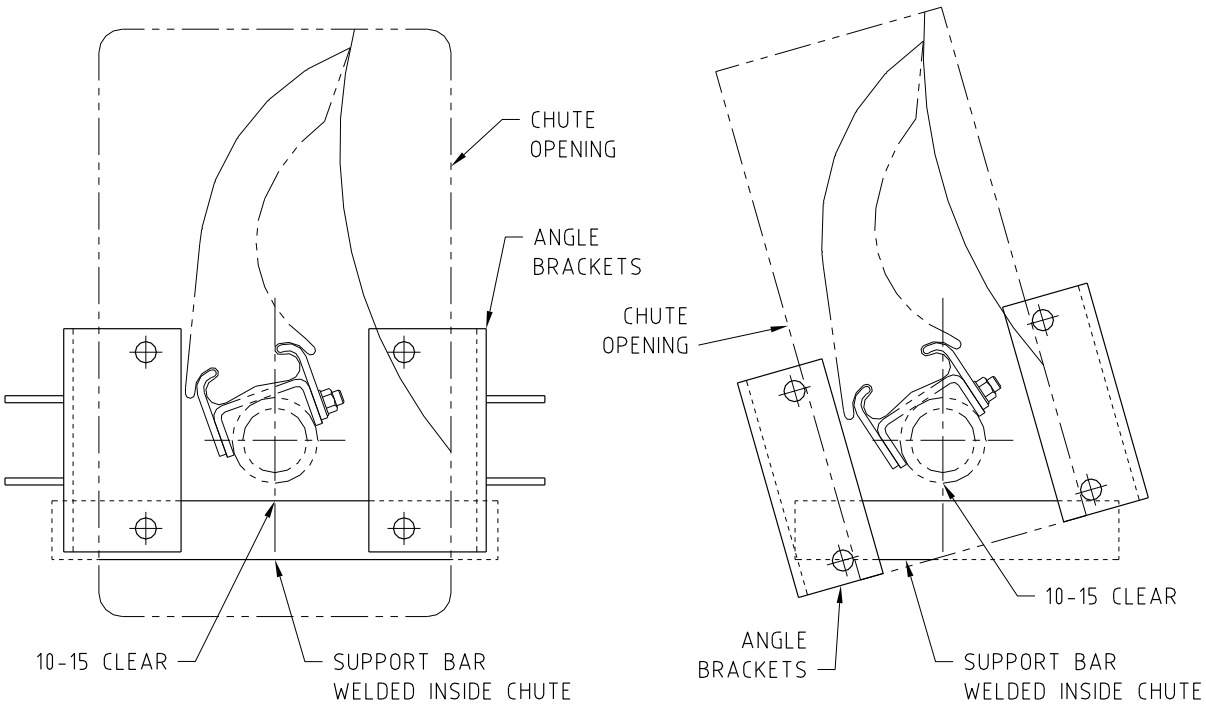


Figure 2 – Support Bar Arrangement

⚠ CAUTION

IN ALL CASES, ENSURE THAT COVERS ARE FITTED OVER ALL ACCESS OPENINGS TO COMPLY WITH AS1755-2000 CONVEYORS – SAFETY REQUIREMENTS. COVERS SHOULD ONLY BE REMOVED AFTER THE CONVEYOR HAS BEEN SHUT DOWN AND LOCKED OUT, AND MUST BE REFITTED AND SECURED BEFORE LOCKS ARE REMOVED AND THE CONVEYOR RETURNED TO SERVICE.

ESS strongly recommends that safe visual access be provided to enable inspection of belt cleaners in operation. This may be in the form of an opening with a fixed safety mesh barrier, and must comply with AS1755-2000. An ESS CYA door with Safety Mesh Insert is ideal.

As an alternative, ESS can offer an integrated access opening, mount plate and tensioner assembly. See ESS drawing F0299 at the back of this manual for details.

This arrangement has a cover plate that includes the cleaner mount / tensioner, a CYA Pokehole inspection door, and provision to padlock the assembly in place onto a weld-on base frame. The cover is secured by 6 screws, requiring spanner access. The cleaner, however, can be inspected and the tension adjusted with the cover in place and the conveyor running.

3.4 CLEANER INSTALLATION

Once the XHD Mandrel has been installed, and the operator side set up appropriately, the cleaner can be (re)installed in the chute. The cleaner mainframe will probably need to be cut to length on the Far Side to fit into the Mandrel mount bracket.

Measure the distance from the centre of the head pulley to the far side chute wall, and the centre of the pulley to the operator side chute wall. Add the chute wall thickness to determine the X and Y dimensions shown in the following figure. In most cases, these will be equal.

The mainframe will probably need to be cut at the Far Side end to fit into the Mandrel mount. For a single tensioner cleaner, add 85 to the X dimension, and for a dual tensioner cleaner add 245 to the X dimension. Using the centre of the mainframe blade track as the start point, measure the above (X + 85 or 245) and mark the mainframe pipe at this distance. This will be the cut point for the Far Side of the mainframe.

Before cutting, check the length of the other end. Add 300 to the Y dimension to get the cut point for the Operator End of the mainframe. Ensure that the mainframe is long enough before cutting the Far End. If not, try moving the centre line of the track toward the Far End, and repeat the marking procedure.

Remember, the blades and blade locks need to fit in the track, and need to be centred at the selected centre line of the track, so that the blades will be centred on the conveyor belt in service. If the mainframe is not long enough, contact ESS for a replacement.

Note

The 300 dimension above is based on an ESS XHD Stand-off bracket being used, plus the tensioner depth and a small projection of 30-40 mm of the mainframe. If other brackets are used, determine the alternate value for this dimension by measurement.

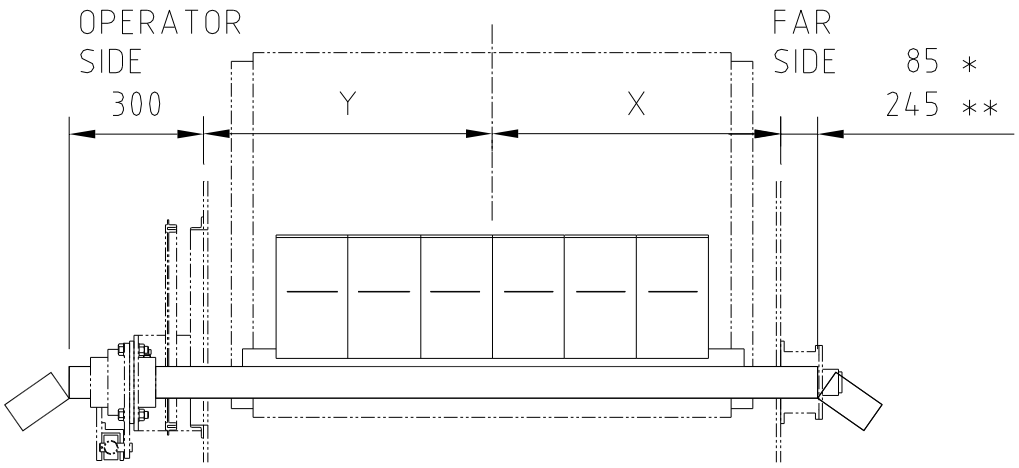


Figure 3 - Mainframe Cut Points

*- 85 for Single Tensioner Cleaners

** - 245 for Dual Tensioner Cleaners
After cutting the Far End of the mainframe, grind a chamfer on the outside of the end of the pipe. A 3 to 4 mm chamfer will assist in locating the end of the pipe in the Mandrel bush during installation.

Once the mainframe has been cut to length, fit the Far Side blade lock to the mainframe track. Using the centre line of the track (as determined above), measure the width of half the number of blades toward the Far End, and make a mark at this point. For example, the standard XHD blade is 165 mm wide. If 7 blades are to be fitted to the cleaner, the mark should be 3.5 x 165 = 577.5 mm from the centre.

Be careful that standard width blades are being used – check measure a couple of blades.

At the marked point, align the inside edge (edge closest to the centre line) of the blade lock, then tighten the lock screw of the blade lock.

⚠ CAUTION

THE NEXT STEP IS TO LIFT THE MAINFRAME INTO PLACE. DEPENDING ON THE BELT WIDTH, THIS MAY REPRESENT A SUBSTANTIAL LIFT – SEE WEIGHTS TABLE FOLLOWING. ENSURE THAT SUFFICIENT PERSONNEL ARE AVAILABLE TO PERMIT A SAFE LIFT, OR USE LIFTING EQUIPMENT.

The table below shows the approximate weight of an XHD mainframe with and without blades.

Table 2 - Approx. XHD Mainframe Weights

Belt Width	Mainframe Weight - kg	Standard Blade Weight - kg	Total Weight with Std Blades - kg
900	28	16	44
1050	31	19	50
1200	35	19	54
1350	38	22	60
1500	52*	25	77
1600	56	28	84
1800	61	31	92
2000	74**	34	108
2200	81	37	118
2400	88	40	128

* - Mainframe stiffener added at 1500 Belt Width.
** - Pipe wall thickness increases at 2000 Belt Width.

Lift the bare mainframe and insert the Far End into the chute opening, aligning the end of the mainframe with the tip of the Mandrel. The mainframe will be a close fit over the Vibration Dampener on the end of the Mandrel, and may need a slight effort to push on.

Once located, feed the mainframe over the Mandrel, and slide it fully into the chute. As the end of the mainframe enters the Far Side (Mandrel) mount, further effort will be required to push the end of the mainframe into the Mandrel bush.

For dual tensioner cleaners, an assistant will need to help locate the mainframe through the tensioner operating arm on the Far Side of the chute.
TIP: By removing attachment screws or adjusting rod, the tensioner operating arm can be moved away from the mount and the mount bush can be removed from the mount, but will still be captive on the Mandrel. Insert the cleaner mainframe until it just clears the mount, then refit the bush and operating arm, before sliding the mainframe fully into the mandrel mount.

Check that the length of the mainframe and the position of the blade track to the belt are correct.

Withdraw the mainframe to approx half of its length, and then rest it on the structure, support bar or similar. The Mandrel pipe will support the end of the mainframe.

⚠ CAUTION

THE NEXT STEP IS TO PLACE THE BLADES IN THE MAINFRAME. THE OFFSET WEIGHT OF THE BLADES WILL CAUSE THE MAINFRAME TO ROTATE. THIS MAY PRESENT A TWISTING HAZARD TO PERSONNEL HOLDING THE MAINFRAME. USE APPROPRIATE TOOLS TO SECURE THE MAINFRAME AND PREVENT ROTATION.

Using a pipe wrench or similar tool, hold the end of the mainframe so that the track is in an accessible position.

Slide a blade into the track, ensuring that it is in the correct direction. Push the blade as far into the track practical then repeat with another blade. Use subsequent blades to continue pushing the blades into the track, until the first blade is in contact with the Far Side blade lock.

When all blades have been fitted to the track, check that they are in even contact with each other, and then fit the Operator End blade lock and secure in position.

Whilst still holding the mainframe to prevent twisting, slide the mainframe into the chute until the Far End locates in the Mandrel bush. Again, for dual tensioner cleaners, an assistant will need to locate the mainframe through the far side mount and tensioner assembly. Once the mainframe is located, very carefully allow the mainframe to rotate with the blade weight until the blades rest in the downward position.

Release the tool from the end of the mainframe. For single tensioner cleaners, fit a lock collar over the operator end of the mainframe, lift the mainframe and position the collar just on the inside of the stand-off or mounting bracket. This is not required for dual tensioner cleaners.

Fit the Operator side mount and tensioner assembly on to the end of the mainframe, and bolt in place on the stand-off or mounting bracket. The mainframe will need to be lifted slightly for this. Again, ensure that adequate measures are available for a safe lift to take place.

For single tensioner cleaners, position the lock collar about 2 mm clear of the inside of the mount bracket, and secure to the mainframe. The function of the collar is to prevent lateral movement of the mainframe by contacting against the mount or mounting bracket. As such, it must be free to rotate with the mainframe, whilst preventing the lateral movement. Check that the collar screws do not catch on the bracket or structure when the cleaner rotates. Modify the brackets if required to ensure clearance, or remove one of the collar screws. The collar has three screws, but can be used with two.

Using a pipe wrench or the tool previously mentioned, grab the protruding end of the mainframe and rotate the cleaner until the blade tips come into light contact with the belt. Tighten the locking screws in the operating arm of the tensioner. For the Spring Tensioner,

ensure that the adjusting nut is positioned so that the spring is just held in place. For the Air Tensioner, ensure that the air bag is in the fully collapsed position. Refer to the XHD Primary Cleaner manual for set up and operation of tensioners.

The cleaner should not rotate now, so the pipe wrench or tool can be removed. For dual tensioner cleaners, go to the Far Side and lock the tensioner operating arm to the mainframe as described above.

The XHD Primary Cleaner with Mandrel is now installed. Refer to the XHD Installation and Operation manual for cleaner tensioning procedures.

4.0 USING THE XHD MANDREL

Refer to the XHD Primary Cleaner manual for details of maintenance requirements and procedures for this cleaner. Tensioning and in service inspections of the cleaner are unchanged by the use of the Mandrel.

As previously stated, the XHD Mandrel allows the cleaner mainframe to be withdrawn from the chute. This is specifically intended to facilitate change out of worn blades without the need for confined space entry and the associated hazards.

⚠ WARNING

DO NOT ATTEMPT TO WITHDRAW THE XHD PRIMARY CLEANER WITH THE CONVEYOR RUNNING. THE CONVEYOR MUST BE SHUTDOWN AND LOCKED OUT BEFORE ATTEMPTING ANY MAINTENANCE THAT INVOLVES REMOVAL OF ACCESS COVERS, OR ENTERING THE CONVEYOR ENCLOSURE WITH ANY PART OF THE BODY. REFER TO AS1755 – 2000 CONVEYORS – SAFETY REQUIREMENTS.

DO NOT RELEASE THE LOCK SCREWS ON THE TENSIONER OPERATING ARM WHILST THE CONVEYOR IS RUNNING. MATERIAL CONTACT WITH THE BLADES MAY RESULT IN RAPID ROTATION OF THE CLEANER MAINFRAME, AND PRESENT A HAZARD TO THE SERVICE TECHNICIAN.

SHUTDOWN AND LOCK OUT THE CONVEYOR BEFORE COMMENCING ANY MAINTENANCE WORK ON THE XHD PRIMARY CLEANER.

4.1 CLEANER WITHDRAWAL

Withdrawal of the cleaner is the reverse of the installation procedure.

⚠ CAUTION

THE XHD CLEANER AND BLADES ARE HEAVY. ENSURE ADEQUATE PERSONNEL, OR LIFT AIDS ARE AVAILABLE TO FACILITATE SAFE HANDLING. THE CLEANER AND BLADES WILL ROTATE WHEN THE TENSIONERS ARE RELEASED, AND COULD CAUSE INJURY TO ARMS OR HANDS IN CONTACT WITH THE MAINFRAME. ENSURE PERSONNEL ARE AWARE AND CLEAR WHEN THIS OCCURS.

Once the conveyor is shut down and locked out, open the access doors or covers to visually inspect the cleaner and blades. If allowable, hose down the cleaner and blades to remove material build-up and enable blade inspection. If the blades need replacing, proceed.

At the far side of the chute, and with the XHD Cleaner in position, remove the 4 bolts securing the Mandrel pipe to the Mandrel bracket. Grasp the pipe protrusion of the Mandrel and withdraw the Mandrel pipe from the bracket for at least 500 mm.

⚠ CAUTION

DO NOT ATTEMPT TO REMOVE THE MANDREL PIPE WITHOUT THE XHD CLEANER IN POSITION. THE MANDREL PIPE MUST BE SUPPORTED BY THE XHD MAINFRAME. A SEVERE PINCH POINT HAZARD COULD OCCUR IF THE MANDREL PIPE IS REMOVED WITHOUT SUPPORT.

Inspect the Mandrel pipe, ensuring that it is in good condition with no cracks or points of failure. Rotate the Mandrel pipe 90° and re-insert, bolting firmly back in place on the Mandrel bracket. For dual tensioned cleaners, release the lock screws on the Far Side tensioner operating arm.

⚠ CAUTION

THE NEXT STEP WILL CAUSE THE CLEANER MAINFRAME AND BLADES TO ROTATE RAPIDLY. ENSURE PERSONNEL ARE AWARE AND CLEAR WHEN THIS OCCURS. SEVERE PINCH POINT AND TWIST HAZARDS COULD RESULT IN INJURY TO PERSONNEL.

Returning to the Operator Side, release the lock screws on the Operator side tensioner operating arm. The weight of the blades will usually cause the mainframe to rotate as the blades fall to the downward position. If this does not occur (possibly due to material build-

up or blade position) the potential of the mainframe to rotate may present a hazard to personnel. It is best to cause the mainframe to rotate safely, and eliminate the hazard.

⚠ CAUTION

DO NOT PLACE A PIPE WRENCH OR OTHER TOOL ON THE MAINFRAME TO CAUSE THE ROTATION. RAPID ROTATION OF THE MAINFRAME WITH THE BLADE WEIGHT COULD CAUSE INJURY TO PERSONNEL HOLDING THE WRENCH, OR STANDING ADJACENT TO THE MAINFRAME.

To dislodge material build-up and encourage the mainframe to rotate try striking the end of the mainframe with a hammer.

If the mainframe still does not rotate, carefully insert a bar between the blades and the conveyor belt, and lever the blades out until the mainframe rotates. Ensure that all personnel are clear of the mainframe and blades.

Once the mainframe and blades are in the relaxed position, remove the Operator Side tensioner and mount assembly. The mainframe may need to be lifted slightly to make removal of the mount bolts easier. Refer to mainframe weights in previous sections.

With the mainframe resting on the bracket or support, attach a pipe wrench or other tool to the end of the mainframe, and rotate to a position where the mainframe and blades can be withdrawn through the chute opening.

The end of the mainframe will need to be lifted again, so that the lock collar can clear the stand-off bracket, and on larger cleaners the mainframe stiffener can clear the chute opening or support bar. Once these items have cleared the obstructions, the mainframe can be rested on the brackets or bars, and withdrawn over them.

Keep the pipe wrench or tool on the mainframe and held by an assistant so that the mainframe and blades cannot suddenly rotate. Withdraw the mainframe until the blades can be accessed, and the mainframe can be rested on brackets, structure and the Mandrel.

⚠ CAUTION

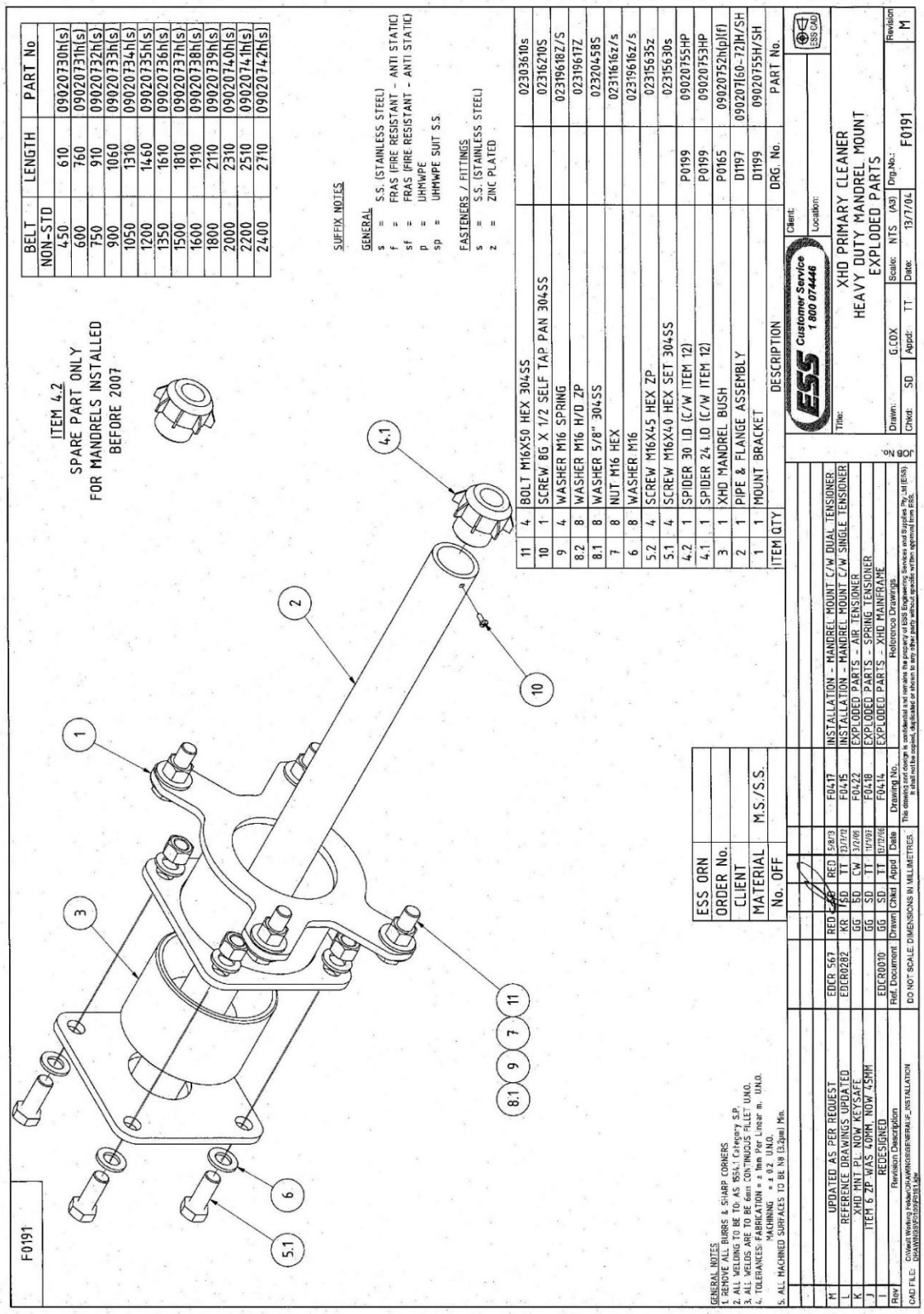
TAKE PRECAUTIONS TO PREVENT THE MAINFRAME ROTATING WHILST AT REST. THIS MAY INCLUDE CLAMPING, LOCATING IN THE BRACKET CUT-OUT, TYING OFF OR THE LIKE.

Remove and replace the blades as described in the XHD manual, and in the installation section of this manual. Reverse the above procedure to re-install the mainframe, referencing the installation section of this manual. Adjust the cleaner tension as per the XHD manual.

Replace all covers and guards, remove locks and return the conveyors to service.

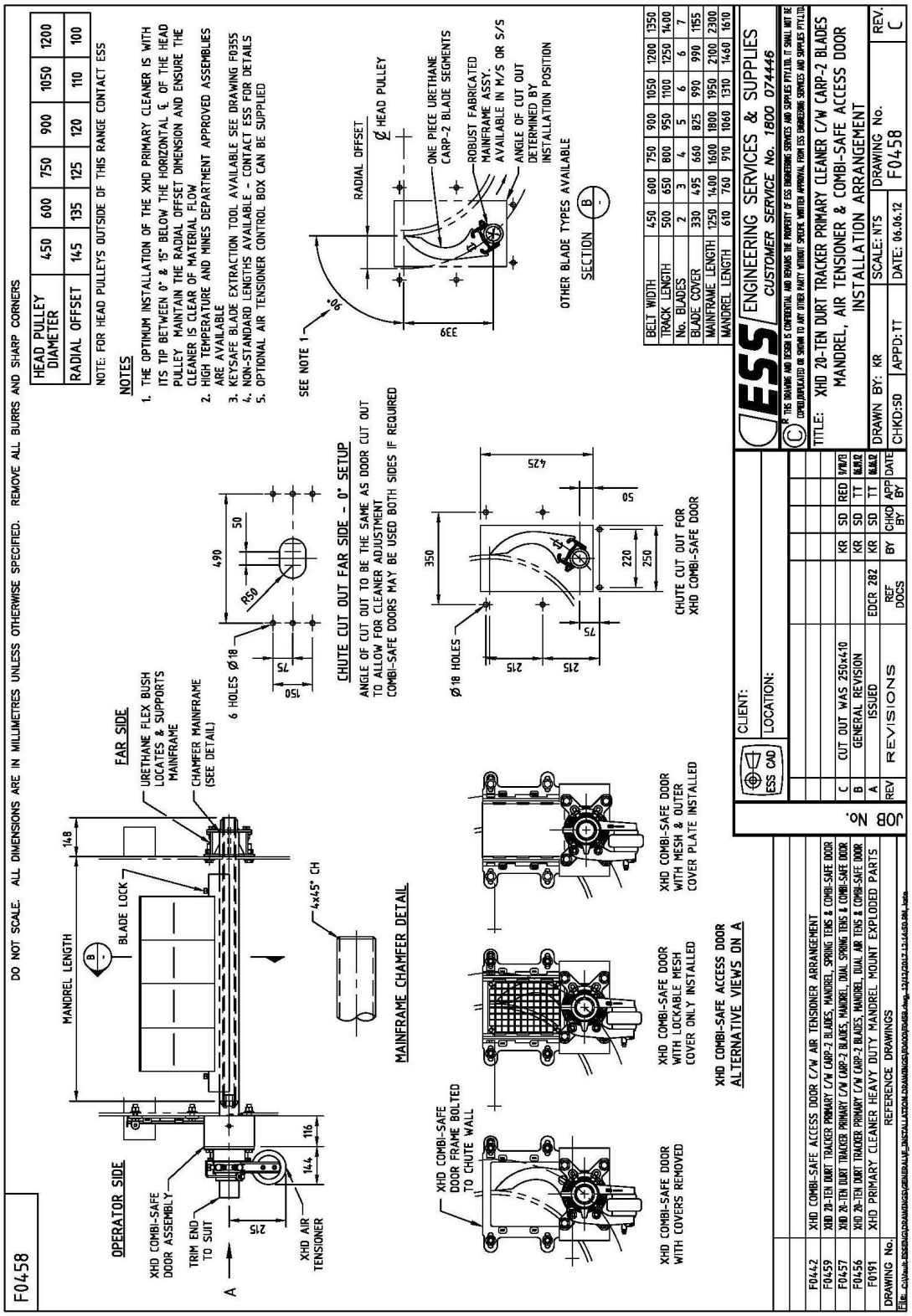
5.0 PARTS

F0191 HEAVY DUTY MANDREL MOUNT

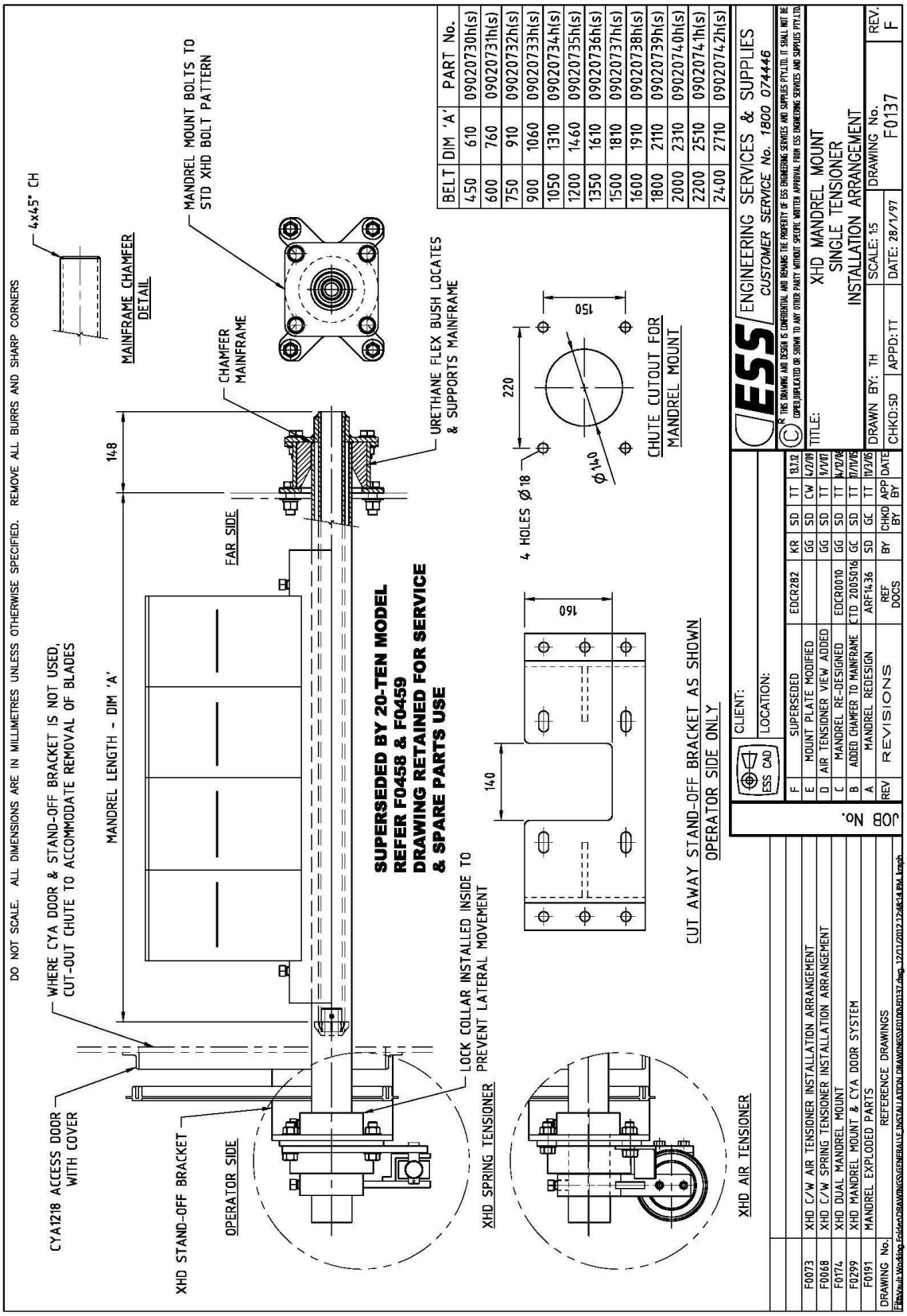


6.0 INSTALLATION DRAWINGS

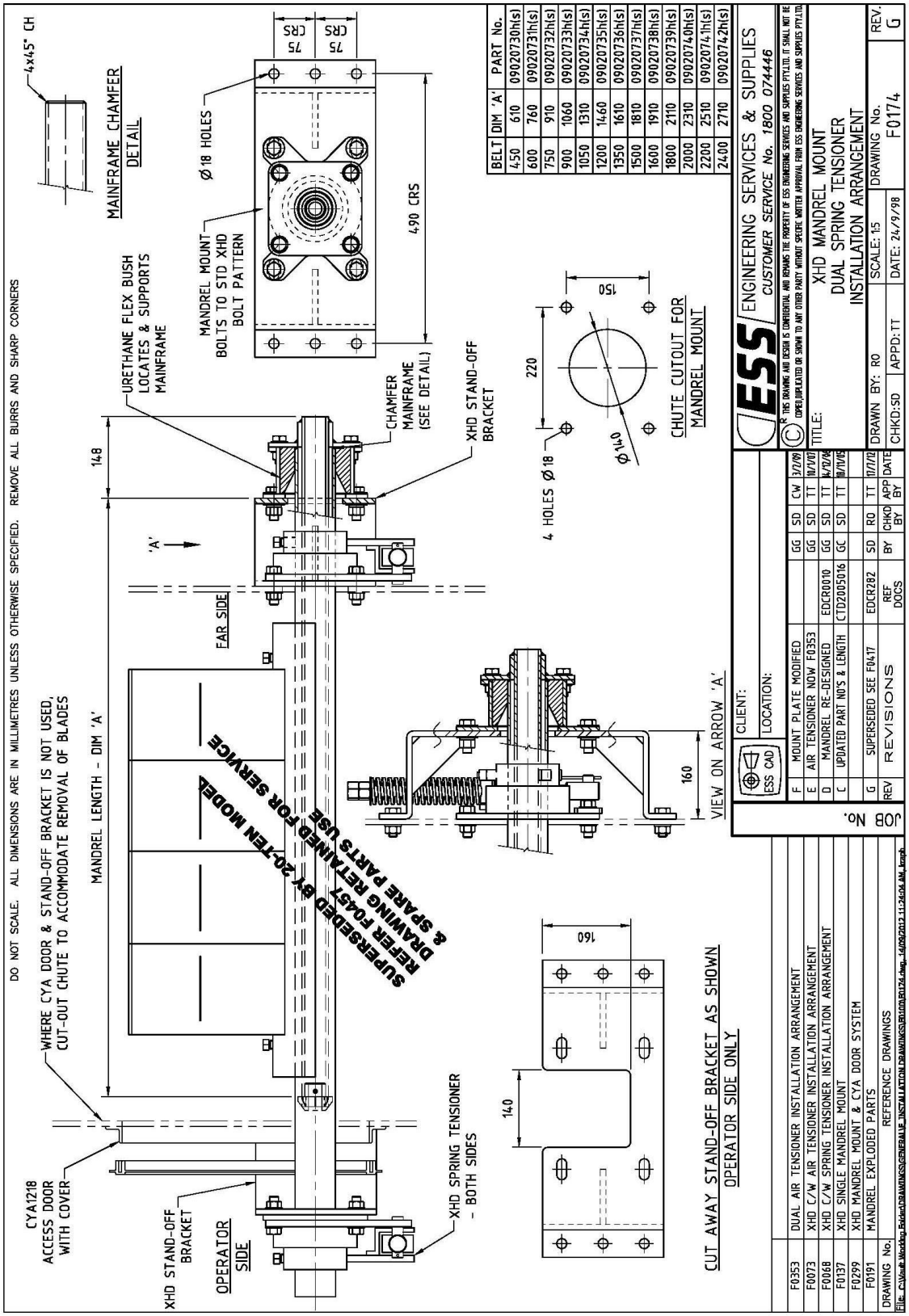
F0458 MANDREL, AIR TENSIONER & COMBI-SAFE ACCESS DOOR



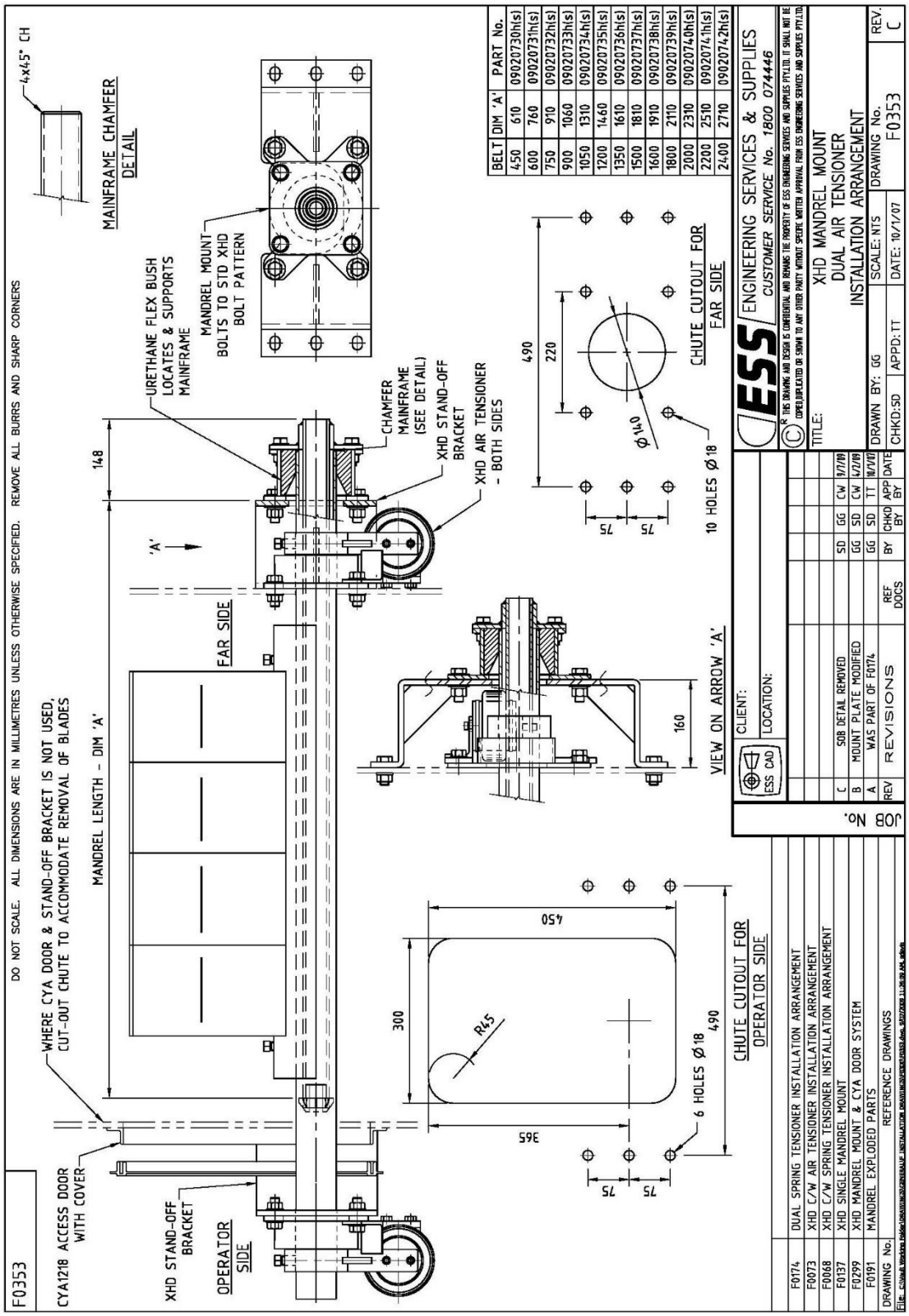
F0137 SINGLE TENSIONER



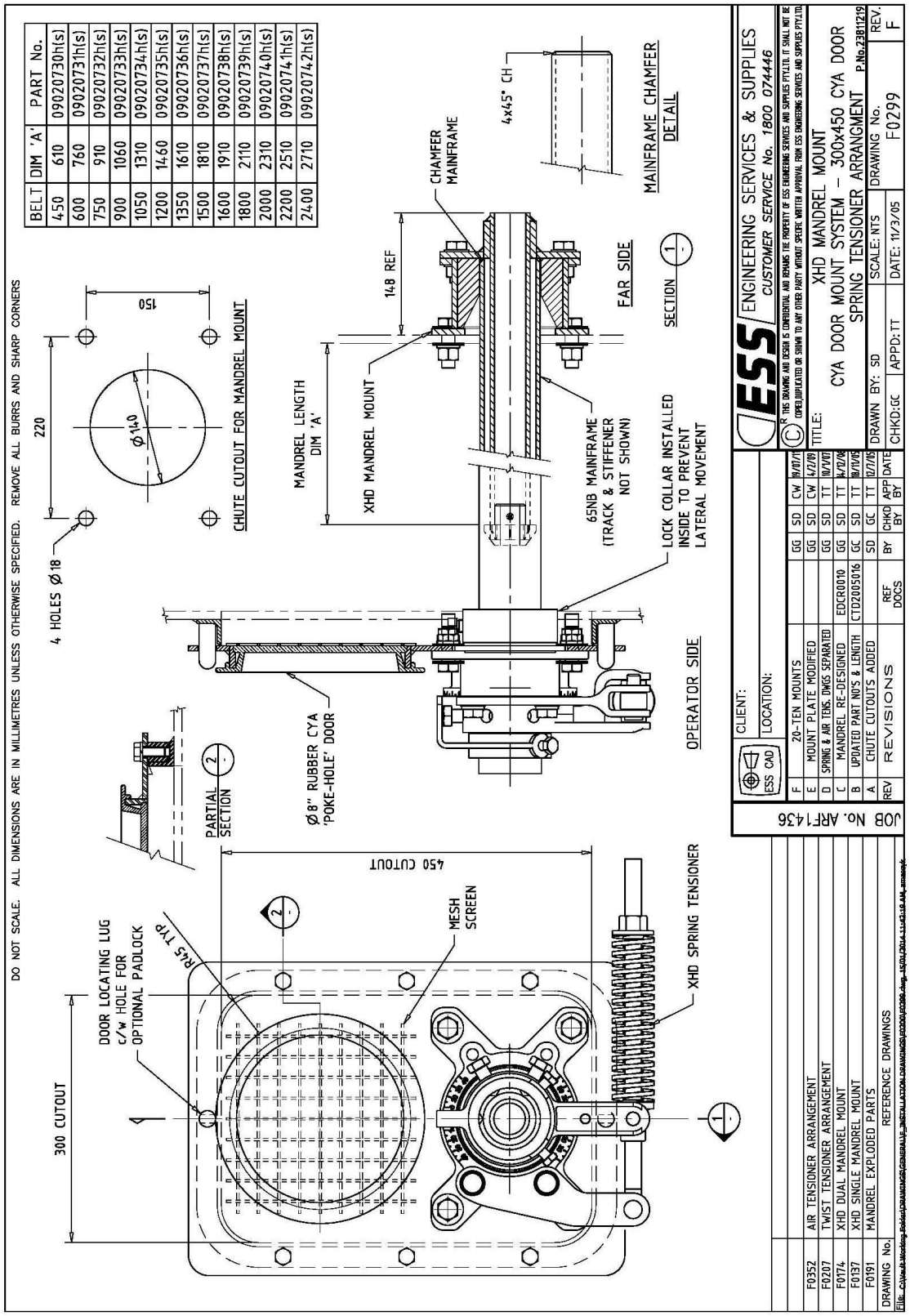
F0174 DUAL SPRING TENSIONER



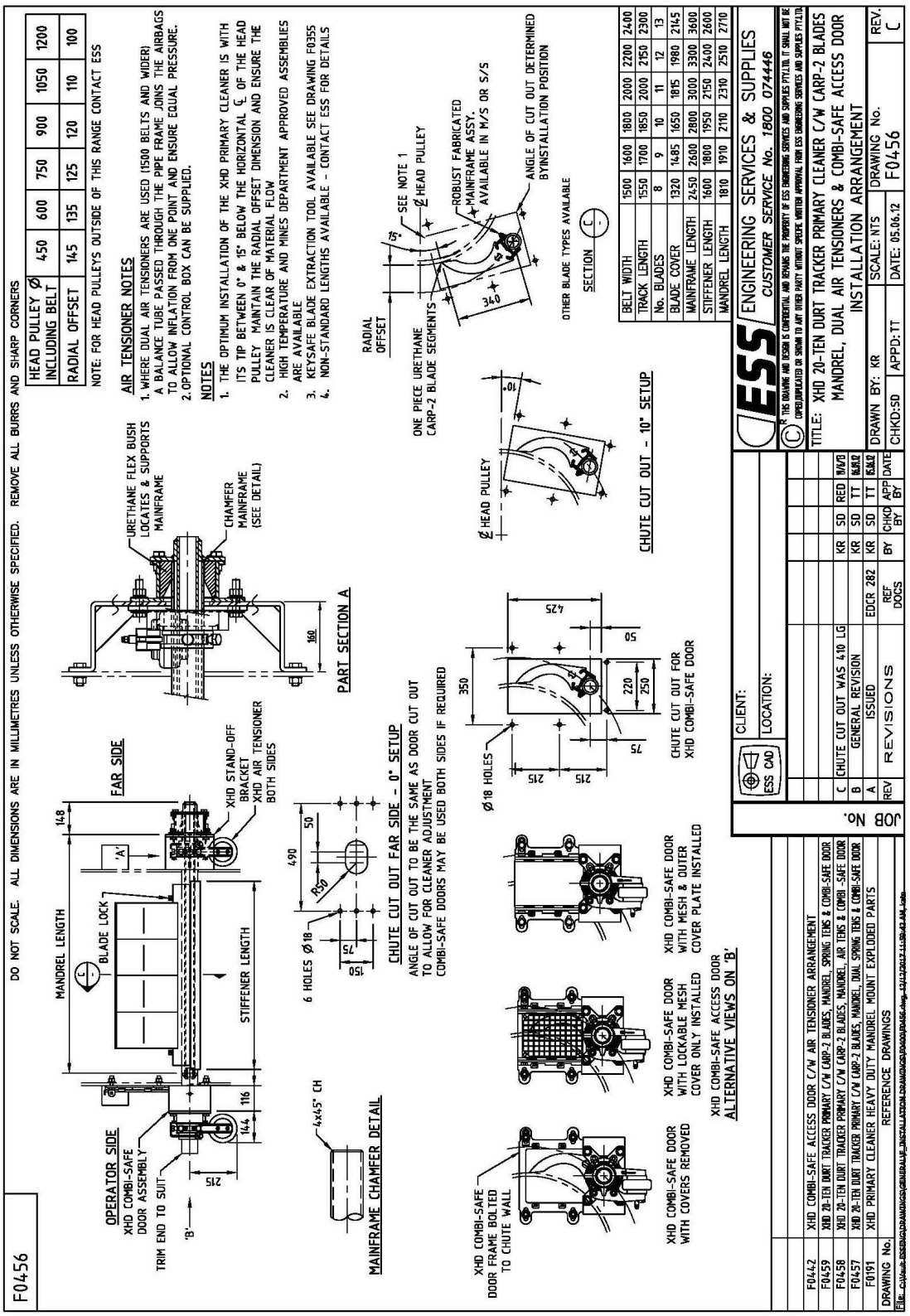
F0353 DUAL AIR TENSIONER



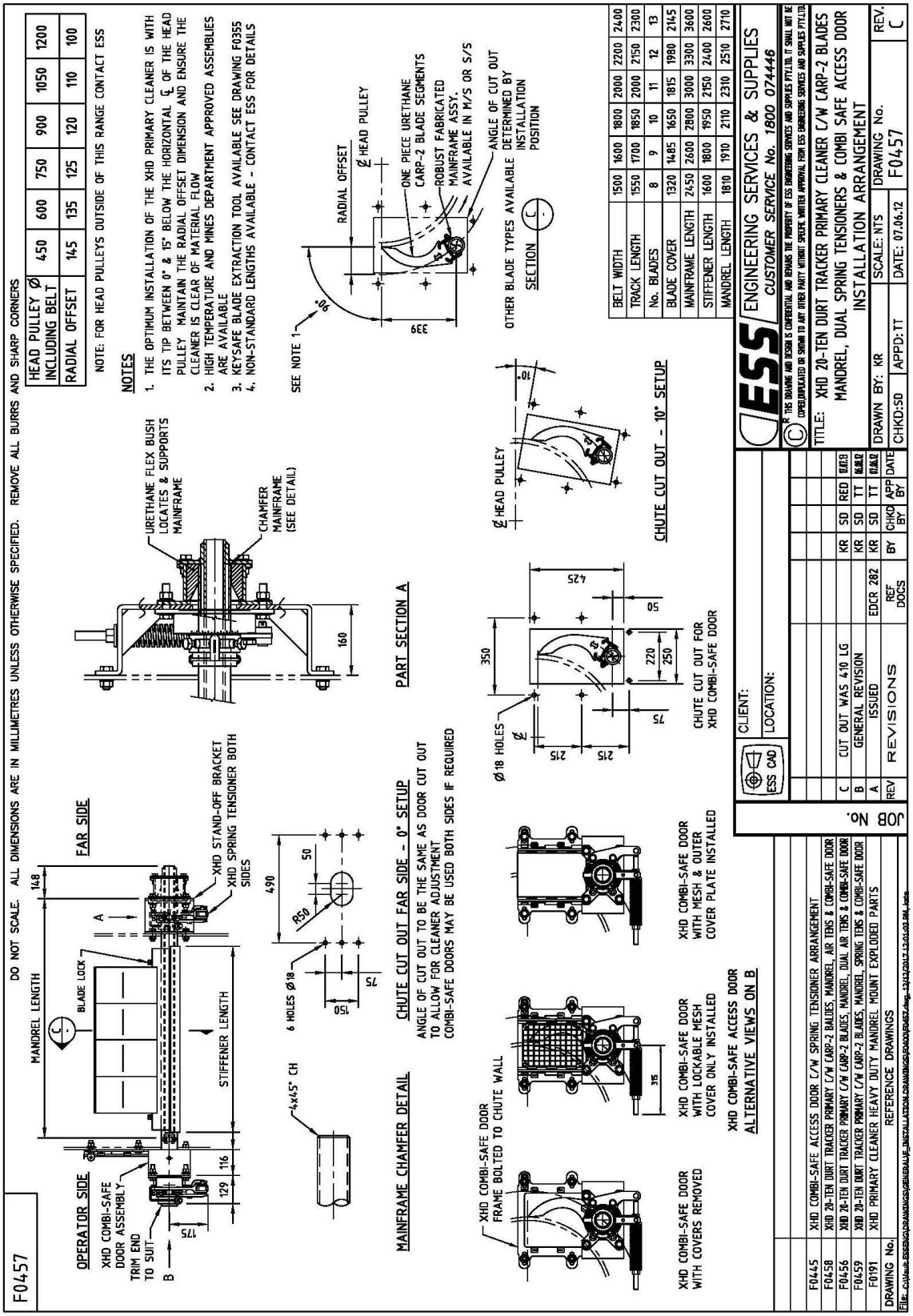
F0299 CYA DOOR MOUNT SYSTEM – 300X450 CYA DOOR



F0456 MANDREL, DUAL AIR TENSIONERS & COMBI-SAFE ACCESS DOOR



F0457 MANDREL, DUAL SPRING TENSIONERS & COMBI SAFE ACCESS DOOR



7.0 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: _____**

8.0 NOTES