



ADVANCED MANUFACTURING ENGINEERING TECHNOLOGIES

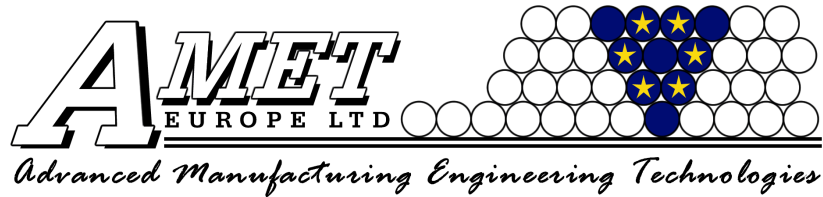
Operation Manual

Fitup Station 40 Tonne

FRS-40T

December 2011

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4 October 2011

Limited Warranty

AMET (Europe) Ltd warrants equipment as supplied to Mabey Bridge Ltd in accordance with the prevailing signed contract of Sale and Purchase, dated 8 July 2011, version 1.1. Our general warranty terms are set out below, however these are superseded by those detailed in the prevailing contract.

AMET (Europe) Ltd warrants all new equipment to be free from defects in material and workmanship for the period of one year, provided that the equipment is installed and operated in accordance with the provided operator manuals.

AMET (Europe) Ltd obligations under this warranty are expressly limited to replacing or repairing any defective part or correcting any manufacturing defect without charge during the warranty period if AMET (Europe) Ltd inspection confirms the existence of such defects.

The warranty period begins on the date of final acceptance in the purchaser's facility or three months after shipment.

AMET (Europe) Ltd will not be liable for any loss or consequential damage or expense accruing directly or indirectly from the use of equipment covered by this warranty.

5 Cambridge Westpoint., Stirling Way, Papworth Everard, CB23 3GY
Directors: D Coaster, D Schwemmer
Company Reg No: 5514053

Notice

The installation, operation and maintenance guidelines set out in this manual will enable you to maintain the equipment in peak condition and achieve maximum efficiency with your welding operation. Please read these instructions carefully.



Conforms to the following Council Directives:

Machinery Directive 89/392:

As amended by EC Directives 91/368, 93/44, 98/37, 2006/42

Low Voltage Directive: 2006/95/EC

Electro Magnetic Directive: 2004/108/EC



Caution

Only experienced personnel familiar with the operation and safe practice of welding equipment should install and/or use this equipment.

General Safety

ELECTRIC SHOCK CAN KILL

Touching live electrical parts may cause fatal shocks or severe burns. The electrode and work circuit are electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire and torch are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.



1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Use dry insulating mats or covers to insulate yourself from work and ground.
4. Disconnect input power before installing or servicing the equipment.
5. Properly install and ground any equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use.
7. Ground the work piece to a good electrical (earth) ground.
8. Do not touch electrodes while you are in contact with the work (ground) circuit.
9. Use only well maintained equipment. Repair or replace damaged parts at once.
10. Keep all panels and covers securely in place.

It is very important to read and understand all the Material Safety Data Sheets (MSDS) for all substances you work with and around. This is your responsibility!

MOVING PARTS CAN CAUSE INJURY

Moving parts, such as fans, rotors, and belts can cut fingers and hands or catch loose clothing.



1. Keep all doors, panels, covers, and guards closed and secured in place.
2. Have only qualified people remove guards or covers for necessary maintenance and troubleshooting.
3. To prevent accidental starting during servicing, shutdown the entire system, which includes turning off the power supply.
4. Keep hands, hair, loose clothing, and tools away from moving parts.
5. Reinstall panels or guards and close doors when servicing is finished and before starting equipment.

HOT PARTS CAN CAUSE SEVERE BURNS

Avoid any contact with all *HOT* materials and substances.



1. Allow a cooling period before handling, moving, or servicing.
2. Use approved techniques, tools, and safety clothing (gloves, shields, shoes, eye protection, etc.).

ELECTRICAL SHOCK CAN KILL

This identification label is used to call attention to immediate or imminent conditions, which if not avoided, will result in serious injury or death. Have only **QUALIFIED** personnel install, operate, repair, or perform any maintenance on this equipment.

**AUTOMATED AND ROBOTIC EQUIPMENT MAY MOVE UNEXPECTEDLY AND CAUSE SERIOUS INJURY OR DEATH AT ANY TIME**

Observe all perimeter boundaries for all automated equipment at all times.



1. Keep all guards, doors, covers, panels, and shields securely attached at all times.
2. Stop entire system when performing any maintenance, repair, installation, or inspections.
3. Observe all Safety Lines and Limits at all times.
4. Wear appropriate safety gear when operating any function of this equipment.
5. If a malfunction occurs:
 - A. Shut down the entire system.
 - B. Contact the system manager immediately.
6. If the standard system motion becomes obstructed, **DO NOT ATTEMPT** to clear the obstruction yourself. Follow procedures described in #5.

Failure to follow all safety guidelines can cause serious injury or death and may damage the system.

Principal Safety Standards for Welding and Automation

User should review the following references and read the documents for their intended use of the equipment

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch, Quincy, MA 02269

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1 Overall Introduction

The operating features of this Fit-Up Station can be described in two basic motion functions. Each of these functions is explained and illustrated below.

1.1 Adjust Part Centerline

Hydraulic operated Support Rolls are used to adjust part centerline vertically or horizontally. Vertical motion is accomplished by moving the rolls closer to or farther away from each other thus resulting in a change in can height (Fig 1.1). For horizontal motion, the rolls are moved as a pair to the left or right thus eliminating any vertical motion but resulting in horizontal translation. Additional motion combinations are possible but these are the basic functions resulting from motion of the Support Rolls.

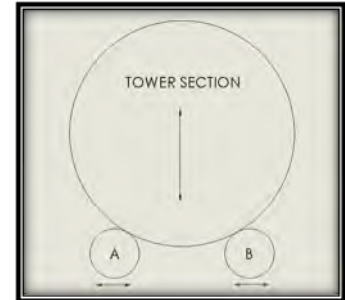


Fig 1.1 Vertical Motion

1.2 Close Part Gap

Linear guide ways allow the two halves of the fit-up station to open and close (Fig 1.2). This feature is described as the part seam open and close. By providing motion between the two halves, the two tower sections can be basically aligned. If there is a resultant gap once aligned, this feature can be used to bring the can sections together (close the gap).



Fig 1.2 Close Part Gap

2 Specifications

2.1 Physical Specs

Specification	Value
Load Capacity	44 Ton (40 Tonne)
Can Diameter Range	6.6 ft ~ 9.8 ft (2 m ~ 3 m)
Max Rotation Speed	1.2 RPM
Linear Speed	10.2 in/min (261mm/min)
Weight	6 Ton (5.4 Tonne)

2.2 Electrical Specs

Specification	Value
Input Voltage	380 - 415 VAC
Phase	3 Phase
Max Current	25 Amps
Power Rating	10,000 Watts

2.3 Pressure Specs

Specification	Value
Operating Pressure	2500 to 2750 psi (172 to 189 bar) [17.2 to 18.9 MPa]
Maximum Pressure	3000 psi (206 bar) [20 MPa]

3 Major Components

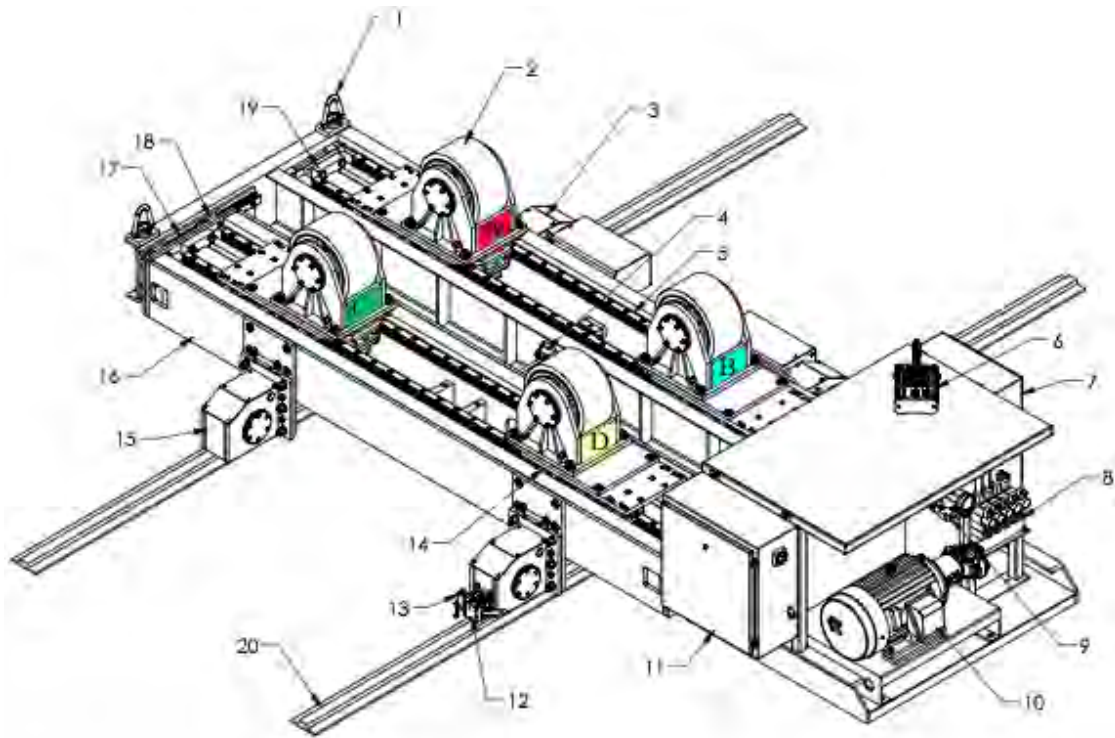


Fig 3.1 Major Components

3.1 Lifting Ring (12,000 lb)

The Lifting Rings (3.1 Item 1) are lift points for transporting the Fit-Up Station if it needs relocating. These lift rings are rated at 12,000 lb each. For instruction on how to transport the Station see section 4.1.

3.2 Support Wheels

The Support Wheels (Fig 3.1 Item 2) are located on both sides of each half of the Fit-Up Station. They support and allow rotation of the part being welded. Three materials are available for the external finish of the Support Wheels. The standard coating is Polyurethane, but rubber and bare steel are also available upon request.

3.3 Transverse Drives

The Transverse Drives (Fig 3.1 Item 3) have powered motors that propel the Fit-Up Station along the Transverse Track to accommodate various part lengths. They may also be used for transporting the weld piece closer to and farther from the weld head.

3.4 Hydraulic Cylinder (1.5")

The Hydraulic Cylinder (Fig 3.1 Item 4) moves the C and D half of the Fit-Up Station closer to or farther from the A and B half. This allows the two loaded weld cans to be butted up together.

3.5 Linear Rail

The Linear Rails (Fig 3.1 Item 5) make up the track upon which the support wheels travel. The support wheels can move either closer together, farther apart, or paired together.

3.6 Control System

The Fit-Up Pendant (Fig 3.1 Item 6) is the control center of the Fit-Up Station. All movement is managed from this pendant. Instructions for use are in Section 5.

3.7 Hydraulic Control Box

The Hydraulic Control Box (Fig 3.1 Item 7) is the point that all hydraulic logic passes. The user should not have to access this box unless catastrophic failure has occurred. At this point, entrance must be done with assistance from an AMET representative.

3.8 Hydraulic Manifold Assembly

The Hydraulic Manifold Assembly (Fig 3.1 Item 8) regulates the hydraulic pressure going through the system.

3.9 Hydraulic Solenoid Valves

The Hydraulic Solenoid Valves (Fig 3.1 Item 9) engage each piston in the hydraulic system. Every piston throughout the Fit-Up Station is controlled with one of these solenoid valves.

3.10 Hydraulic Power Unit

The Hydraulic Power Unit (Fig 3.1 Item 10) pumps the hydraulic fluid throughout the hydraulic system in the Fit-Up Station.

3.11 Power Distribution Enclosure

The Power Distribution Enclosure (Fig 3.1 Item 11) includes all the wiring for the electrical system including the fuses.

3.12 Travel Lock Brake

The Travel Lock Brake (Fig 3.1 Item 12) ensures that the Transverse Cart will remain stationary. In order to move the Cart along the Transverse track the Brake must be released.

3.13 Limit Switch

The Limit Switch (Fig 3.1 Item 13) is to prevent collision with Turning Rolls that may be on the same Transverse track. When the Limit Switch is engaged the Transverse Drives stop movement.

3.14 Linear Bearings

The Linear Bearings (Fig 3.1 Item 14) allow the Support Wheels to glide smoothly on the Linear Rails.

3.15 Transverse Wheels

The Transverse Wheels (Fig 3.1 Item 15) provide support opposite the Transverse Drives to allow the Fit-Up Station to travel along the Transverse Track.

3.16 Transverse Cart

The Transverse Cart (Fig 3.1 Item 16) refers to the entire Fit-Up Station. The Cart moves along the Transverse Track in order to accommodate various lengths of parts, and to allow transportation of weld parts while they are loaded on the Cart and another turning roll.

3.17 Linear Rail

The Linear Rail (Fig 3.1 Item 17) makes up the track that the C and D portion of the Fit-Up Station travels on.

3.18 Linear Bearings

The Linear Bearings (Fig 3.1 Item 18) are located in the Linear Rail and allow for a smooth travel for the C and D portion of the Fit-Up Station.

3.19 Hydraulic Cylinder

The Hydraulic Cylinder (Fig 3.1 Item 19) extends and retracts the Support Wheel it is attached to in order to bring the Support Wheels closer together or farther apart or move them in paired motion.

3.20 Transverse Track

The Transverse Track (Fig 3.1 Item 20) makes up the path that the Fit-Up Station can move laterally upon.

4 Setup

4.1 Relocating Fit-Up Station

The current approved method for transporting the Fit-Up Station is explained below.

4.1.1 Hooks on Lift Rings

Place the hooks of heavy-duty straps on each of the four (4) Lift Rings (Fig 3.1 Item 1). Make sure the load is balanced when lifting!

4.1.2 Lift with Crane

With the hook of a crane placed in the center of the straps lift the crane in the air until the transverse wheels of the Fit-Up Station are clear of the Transverse Track (see Fig 4.1). Carefully and slowly move the crane to the new location of the Fit-Up Station.

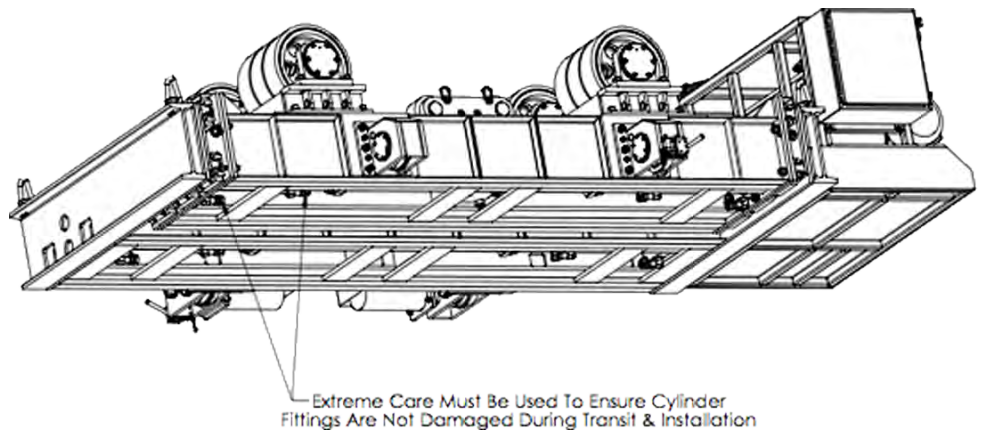


Fig 4.1 Transporting Fit-Up Station

4.1.3 Set down in New Location

Carefully lower the Fit-Up Station into its new resting place. Make sure each of the Transverse Wheels are directly above the Transverse Track before allowing the Station to come to a rest.

4.1.4 Remove the Hooks from Lift Rings

Remove the hooks from the Lift Rings prior to use.

4.2 Adjusting Support Wheel Extend and Retract Speed

The setscrews on the Hydraulic Manifold Assembly (Fig 3.1 Item 8) control the Support Wheel speed. Extend Speed is controlled from the front setscrew and Retract Speed is controlled from the setscrew on the back of the manifold assembly.

4.2.1 Loosen Nut

Loosen the nut on the setscrew (Fig 4.2 Item 1) going into the valve corresponding to the wheel to be adjusted.

4.2.2 Adjust Set Screws

Refer to Section 8.2 for the hydraulic schematic and Section 5.2 for instruction on how to control movement of the individual support wheels.

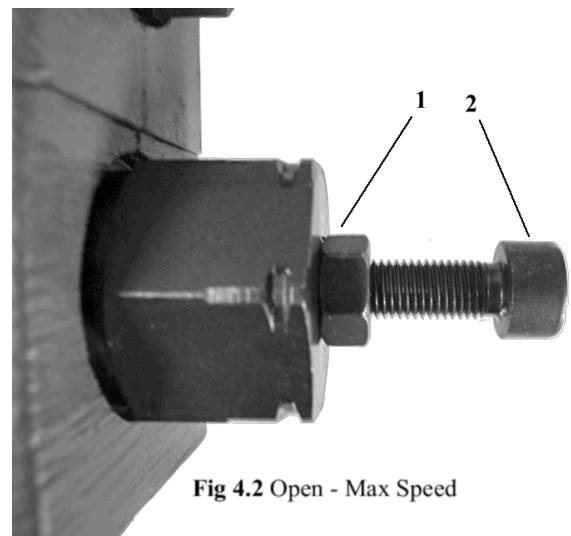


Fig 4.2 Open - Max Speed

4.2.2.1 Move one Wheel

Press one of the Independent Motion buttons on the pendant to move one of the Support Wheels.

4.2.2.2 Adjust Screw

Adjust the setscrew (Fig 4.2 Item 2) corresponding to that wheel. Screw the setscrew counterclockwise to increase speed (Fig 4.2) and clockwise to decrease speed (Fig 4.3).

4.2.2.3 Tighten Nut

Tighten the nut on the setscrew (Fig 4.2 Item 1) going into the valve corresponding to the wheel to be adjusted.

4.2.3 Repeat

Repeat steps 4.1.1 through 4.2.2 for each support wheel until the speeds are approximately equal.

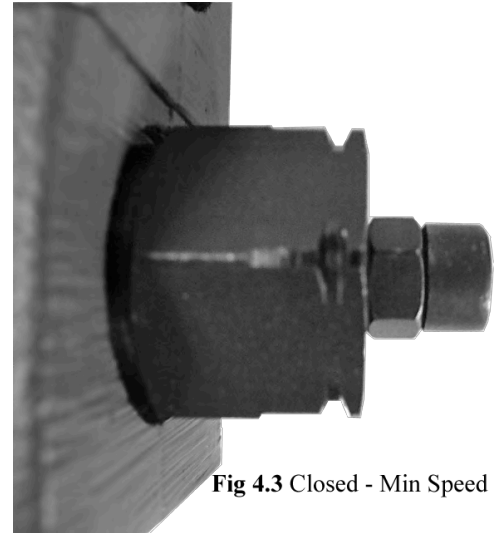
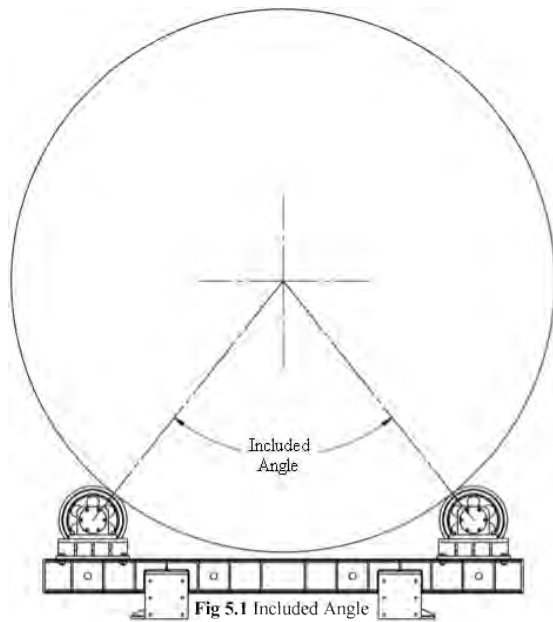


Fig 4.3 Closed - Min Speed

5 Controls



and equipment. To disable E-Stop pull the red “Emergency Stop” Button up.

5.2.2 Alignment Wheels

In order to maneuver the weld cans into the correct position for welding, the Alignment Wheels are adjusted to bring the cans flush with one another.

5.2.2.1 Independent Motion

By using the Independent Motion buttons (Fig 5.2 Items 2,3,8,9) only the Support Wheel labeled will move. For example: If button 5.2. Item 2.UP is pressed Support Wheel A (Fig 3.1 Item A) will travel toward the center of the Fit-Up Station, until the button is released, to bring the can up.

5.2.2.2 Paired Motion

Paired Motion moves both Support Wheels on each half at the same time in the designated direction. For example: If Button 5.2 Item 10.LEFT is pressed Support Wheels C and D (Fig 3.1 Items C & D) will both travel left at the same rate until the button is released.

5.1 Included Angle

The general alignment for roller placement is to have the rolls set on a common centerline and to verify the roller spacing is set for an included angle (Fig 5.1) as close to 45 degrees as possible, based on current Can diameters. The included angle must be 45 degrees or higher for the can to “nest” safely. However, an included angle of more than 60 degrees will result in poor fit-up performance and excessive torque required to rotate sections on the driven rolls.

5.2 Fit-Up Pendant (FRS-40T)

All movement on the Fit-Up Station is controlled with the Fit-Up Pendant (Fig 5.2).

5.2.1 Emergency Stop (E-Stop) Button

The E-Stop Button (Fig 5.2 Item 1) immediately cuts power to all motors to stop movement and avoid damage to persons

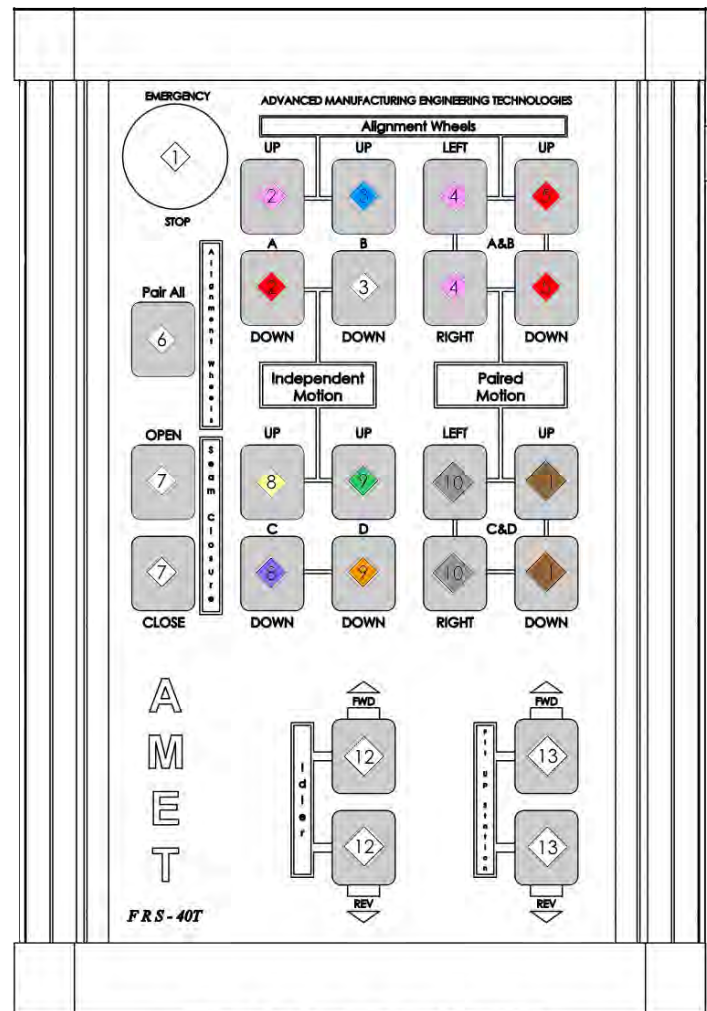


Fig 5.2 Fit-Up Pendant (FRS-40T)

5.2.2.3 Pair All

The Pair All button (Fig 5.2 Item 6) brings all four (4) Support Wheels to the approximate center of their track. This streamlines the process of changing from a large part to a small part or vice versa.

5.2.2.4 Seam Closure

The Seam Closure buttons (Fig 5.2 Item 7) bring the two halves of the Fit-Up Station closer together or farther apart. For example: If two cans are loaded and need to be brought together, the user may press the Close button (Fig 5.2 Item 7.CLOSE) to butt them against one another.

5.2.3 Transverse Drives

The Fit-Up Pendant is can control the movement of transverse drives connected to both the Fit-Up Station as well as a set of idle turning rolls. The Idler (Fig 5.2 Item 12) and Fit –Up Station buttons (Fig 5.2 Item 13) control the movement of the transverse drives indicated. Pressing the FWD button in either section drives the cart toward the manipulator, while pressing REV drives it away from the manipulator.

6 Maintenance

Figure	Item	Description	Location	Instructions	Interval
6.1	1	Gearboxes	Boom drive, turning rolls, travel cart, and fit-up station	Recommended lubricant oils Mobilgear 636(Mobil), VG680 (ISO VG) or Omala 680 (SHELL).	Check the oil every 6 months or 3000 hours. Change the oil every 10000 hours' running.
6.1	2	Fit-up Station Linear Bearings	Under idler wheel plates	Cleaning and shorter grease intervals may be needed due to harsh environment. Use Lithium Soap Grease 2 for lubrication. Inject grease into grease zerk on the bearing blocks by grease gun.	Bi-Weekly
6.2	1	Main Support Bearings	Bottom of cart	Lubricate with calcium grease. Inject grease into grease zerk on the bearing by grease gun.	Yearly
3.1	9	HYDAC filter	Hydraulic Pump	Check the filter every 3 months. Replace if necessary. RFM 165 is part number for replacement.	Quarterly
3.1	10	Hydraulic fluid sample	Hydraulic Fluid Reservoir	Take a sample of the hydraulic fluid used in the hydraulic system to determine whether there is abnormal wear within the system. Have this check performed by a laboratory. If filter is changed regularly oil should not ever need to be changed.	Semi-Annually

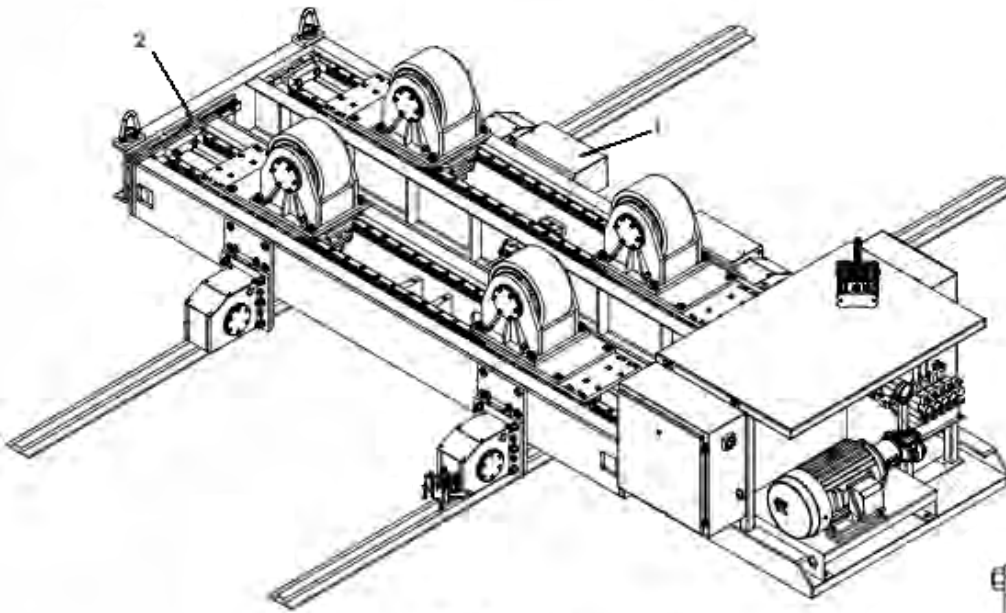


Fig 6.1 Maintenance

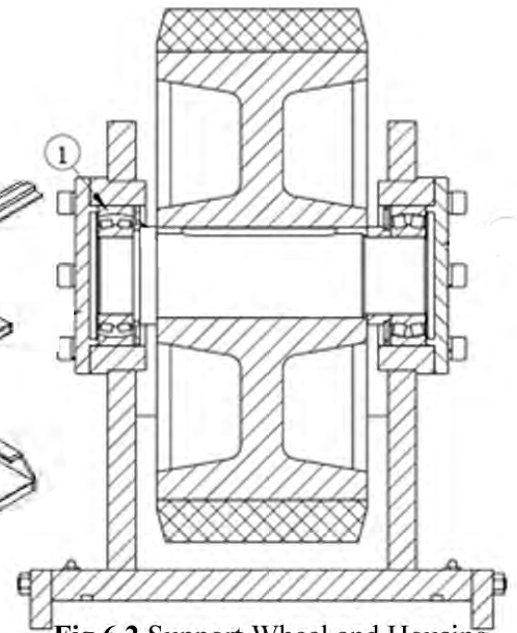


Fig 6.2 Support Wheel and Housing

7 Spare Parts List

Figure	Item	Part No.	Description
7.1	1	29505T240	Lifting Ring 12,000 lbs
7.1	2	APW-40	40 Tonne Idler Wheel Assembly
7.1	3	P10015-03-01	Transverse Drive Assembly
7.1	4	CDT4ME6/1.500/0.625/8.000 Z1X/S33HHDMWW	Hydraulic Cross Cylinder
7.1	5	R1605-404-31, 3144	Linear Rail (3144 mm)
7.1	6	---	40 Tonne Remote Pendant
7.1	7	---	Hydraulic Control Box
7.1	8	R978017756	5 x Solenoid Valves
7.1	9	3011409	Hydraulic Solenoid Valve
7.1	9	RFM165	HYDAC Low Pressure Filter
7.1	10	---	Hydraulic Power Unit 5.5 GPM @3000 psi
7.1	11	---	Power Distribution Enclosure
7.1	12	RSD20S=414	Travel Lock Brake
7.1	13	HL-5030	Limit Switch
7.1	14	R1651-414-20	24 x Linear Bearing
7.1	15	---	Transverse Wheels
7.1	16	FRS-40T	Transverse Cart
7.1	17	R1605-404 -31, 729	Linear Rail (729 mm)
7.1	18	R1651-414-20	Linear Bearing
7.1	19	CDT4ME6/5.000/2.000/17.000 Z1X/S22HHDMWW	5" Hydraulic Cylinder
7.2	1	22215C	Main Bearing 40T

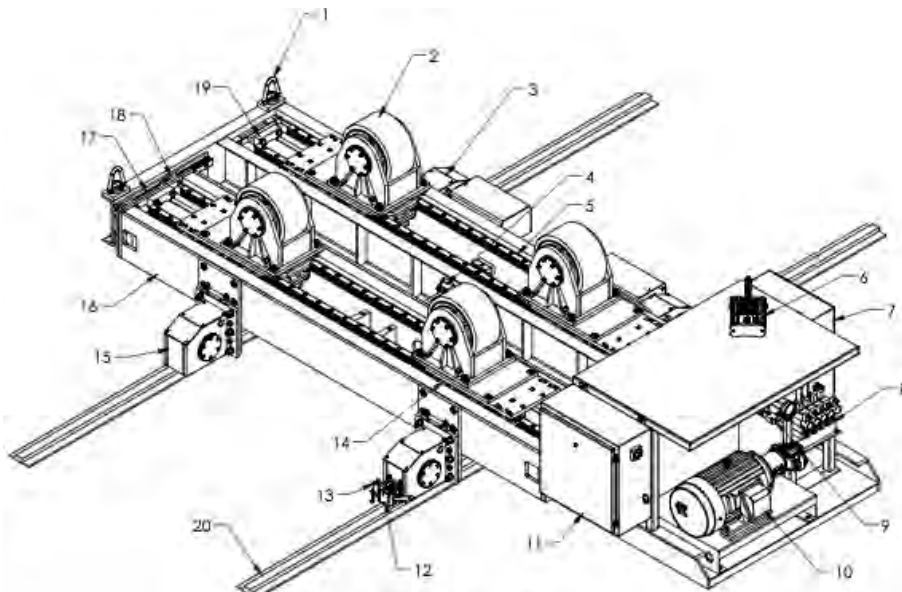


Fig 7.1 Spare Parts

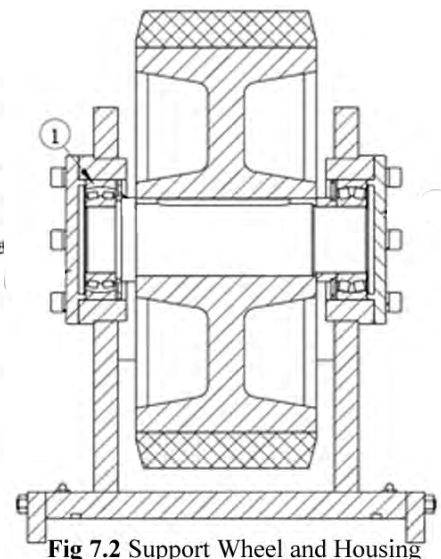
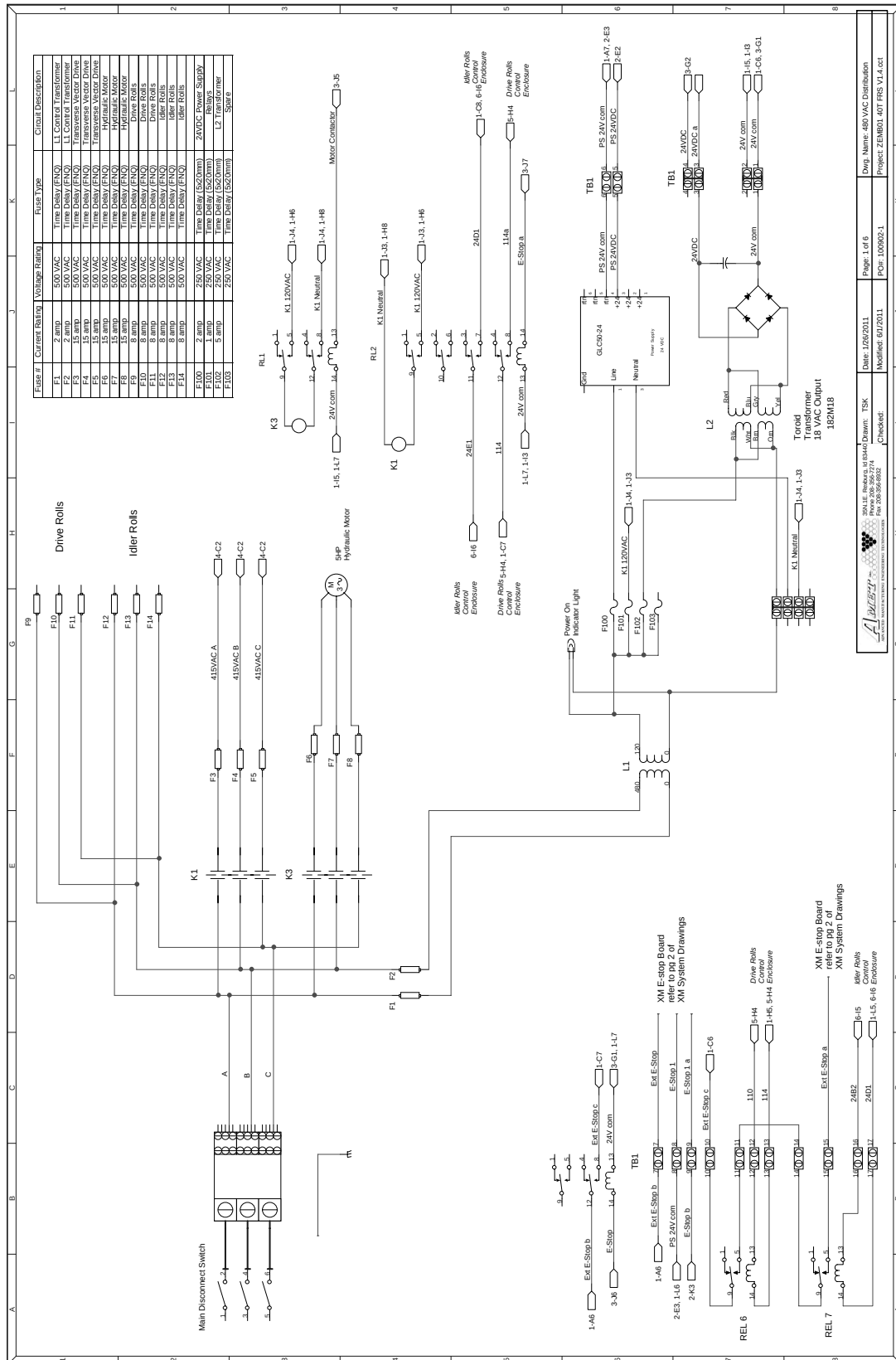


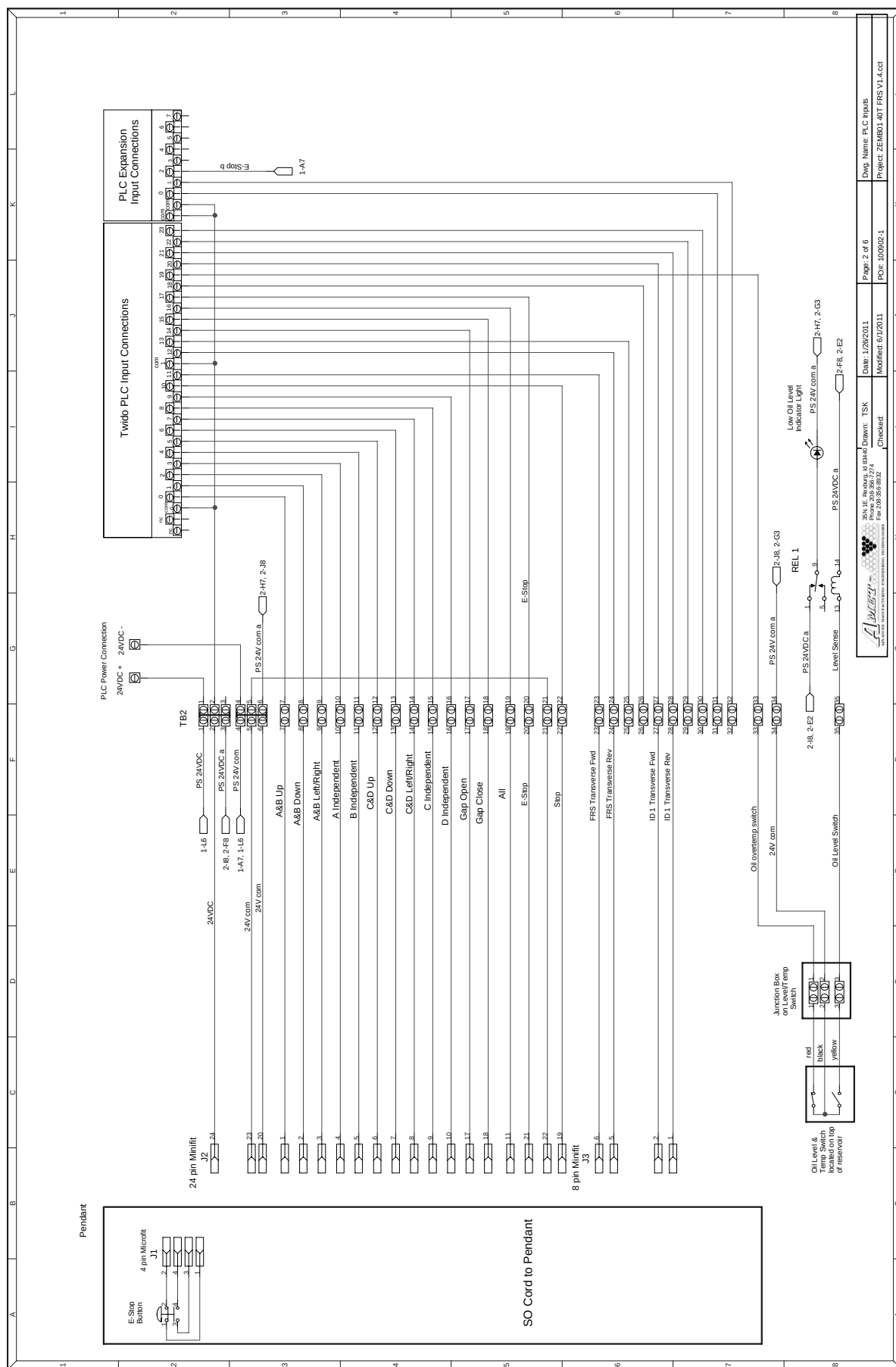
Fig 7.2 Support Wheel and Housing

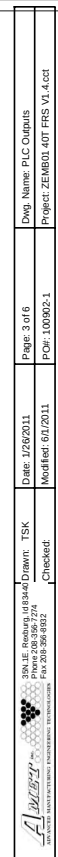
8 Appendix

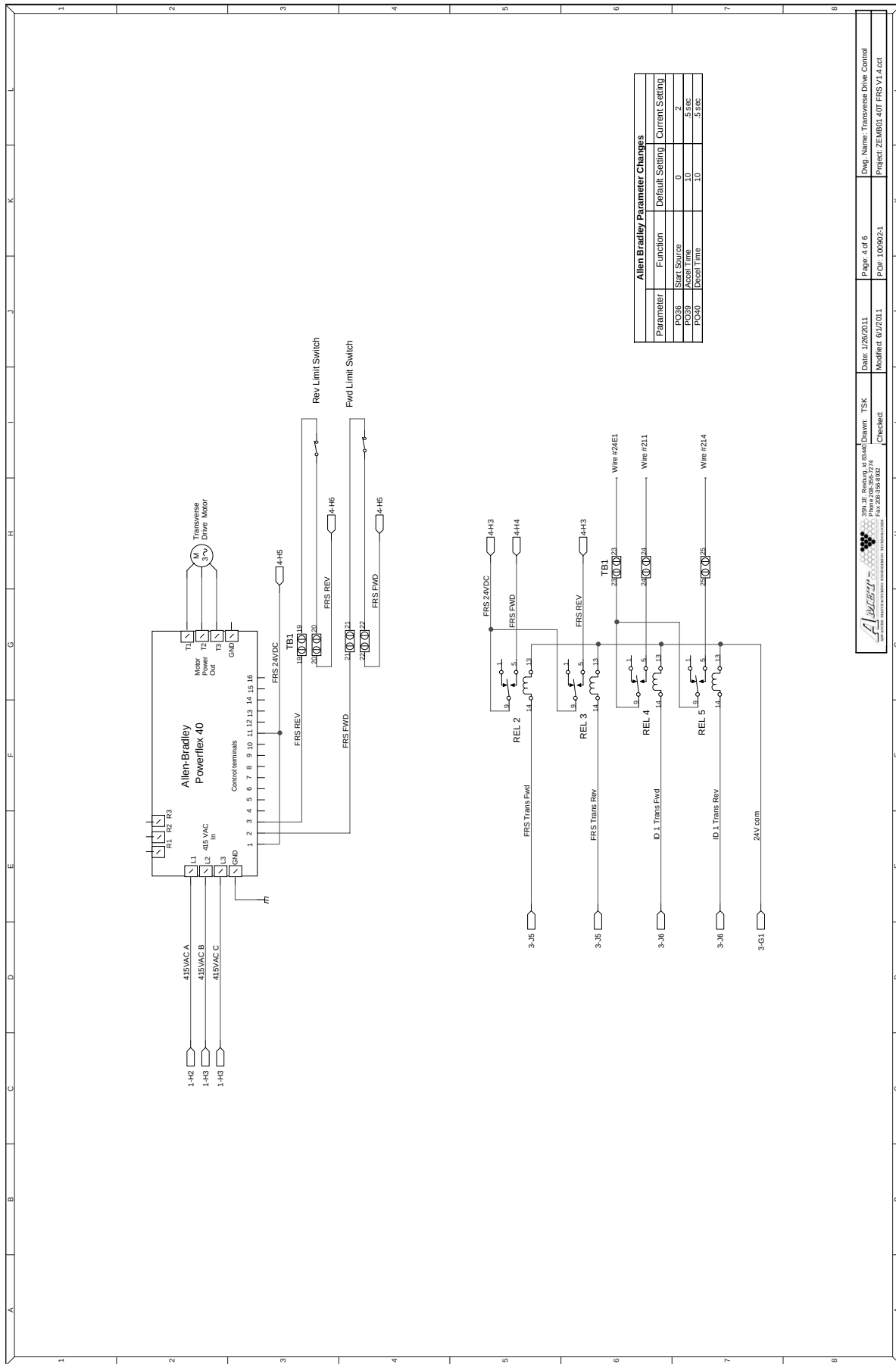
The following are hydraulic and electrical drawings related to the Fit-Up Station.

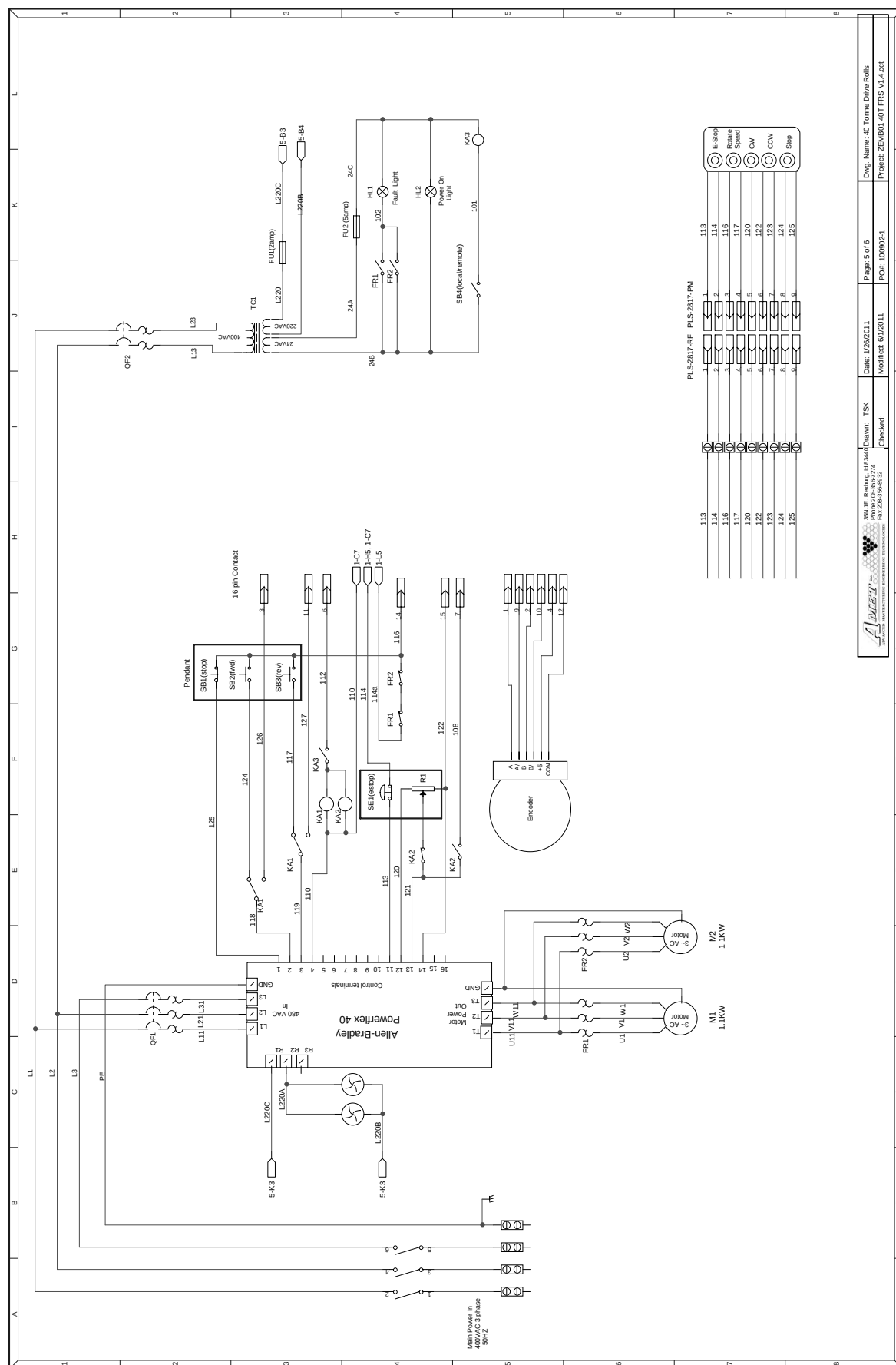
8.1 Electrical Drawings

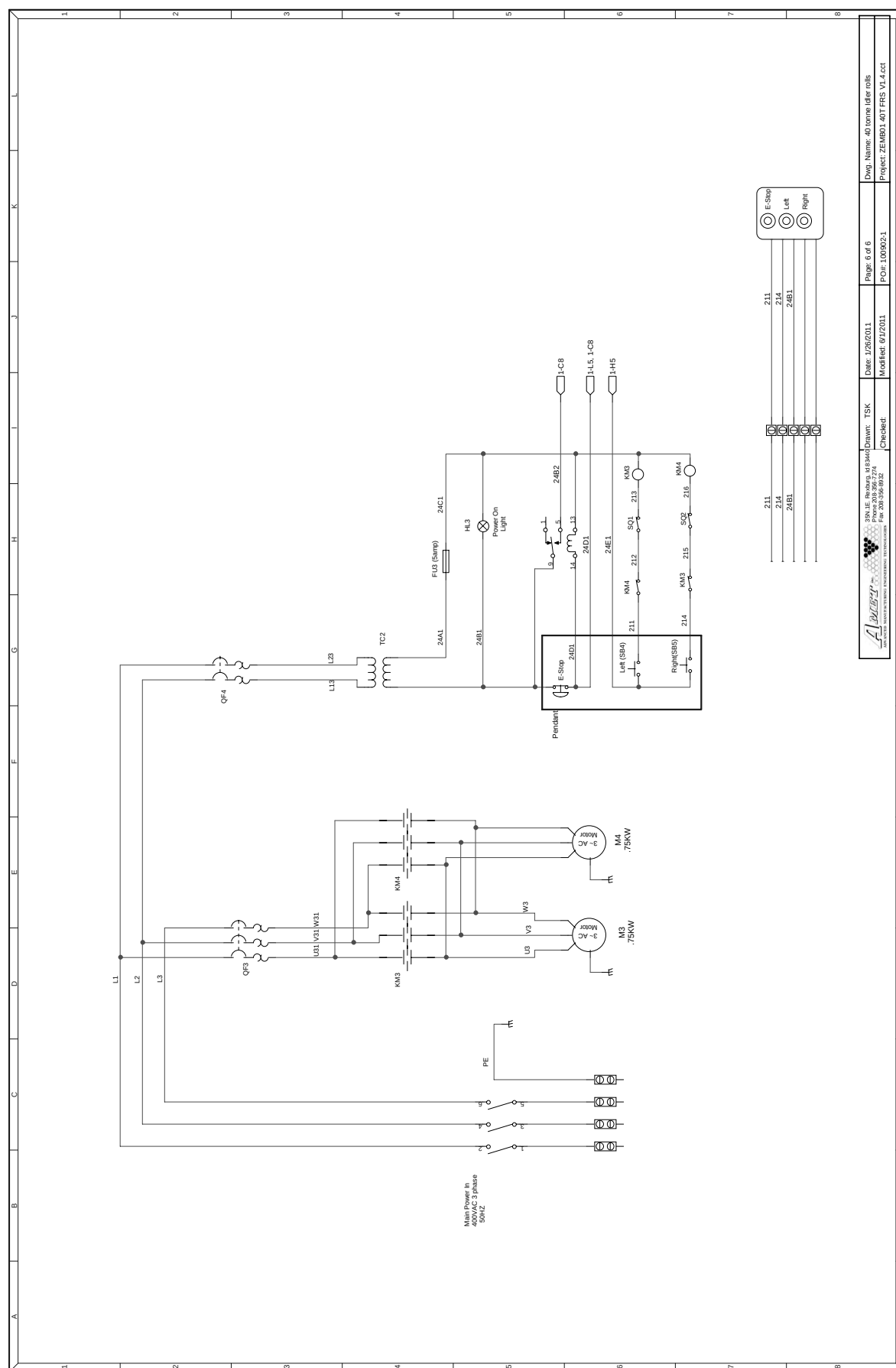












8.2 Hydraulic Drawings

