

# DIVERSIFIED METAL FABRICATORS, INC.



## Operation and Maintenance Manual **REMOTE DRIVE**



April 2015

SERIAL NUMBER \_\_\_\_\_

### NOTE:

Please refer to the serial numbers when ordering parts or  
inquiring about warranty items.

**Message from DMF**

Thank you for choosing DMF. We make every effort to provide quality, safe and rugged products for the railroad. We hope you'll find our equipment to be satisfactory in every way. We take product support very seriously, so if you have any questions, please contact us.

Manuals, service bulletins and general information are available on our website listed below.

**Contact:**

Diversified Metal Fabricators  
665 Pylant St. NE  
Atlanta, GA 30306  
(404) 875-1512  
(404) 875-4835 Fax  
(404) 607-1684 Parts  
<http://www.dmfatlanta.com>  
[info@dmfatlanta.com](mailto:info@dmfatlanta.com)

**Ship to:**

668 Drewry St. NE  
Atlanta, GA 30306

# 1.0 GENERAL INFORMATION

## 1.0 General Information

- 1.1 General Description
- 1.2 Terms Used In This Manual

### 1.1 General Description

DMF remote drive allows control over the forward and reverse movement of the vehicle from outside of the cab. It does not offer any control for the vehicle steering system and may only be used while the vehicle is on rail. The remote drive system uses electrical and pneumatic components to control the throttle, transmission, brakes, and some other vehicle functions.

DMF offers a tethered remote drive system and one that is wireless. In addition, remote drive systems are available for vehicles with an automatic or manual transmission. In each configuration, the controls and labels are slightly different.

### 1.2 Terms Used In This Manual

- **Tethered Remote:** A type of remote drive system with a console box mounted in a fixed location that communicates with the controls in the cab via wires.
- **Wireless Remote:** A type of remote drive system with a console box that communicates wirelessly with the controls in the cab. The console box can be moved to different locations while maintaining communication.
- **Enable Switch:** Switch in the cab that is used to enable and disable the remote drive system. It is not an emergency stop button. For the tethered remote drive systems, turning off this switch will not initiate a shutdown sequence. This means that the vehicle may remain in gear even if the switch is turned off (button in the down position).
- **Shutdown Sequence:** This sequence allows some functions of the remote drive system to remain active long enough to ensure the vehicle comes out of gear and comes to a complete stop.
- **Fully Reversing Transmission:** A type of transmission that allows all of the same gears in forward and reverse.

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# 2.0 OPERATIONS

## 2.0 OPERATIONS

- 2.1 Warnings
- 2.2 Startup & Shutdown Procedures
  - 2.2.1 Preparing the Vehicle for Remote Driving
  - 2.2.2 Returning the Vehicle to In-cab Driving
- 2.3 Tethered Console Box with Manual Transmission
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  - 2.3.3 Driving Instructions
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- 2.6 Wireless Console Box with Manual Transmission
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- 2.7 Wireless Console Box with Automatic Transmission
  - 2.7.1 Driving Instructions

## 2.1 Warnings

The remote drive system should only be used while the vehicle is on rail.

Never allow personnel or equipment in the working area of the vehicle (in front or behind) while the remote drive system is enabled.

Keep body parts and equipment out of the path of travel of the clutch and shifter assemblies while the remote drive system is enabled.

Revving the engine while a PTO is engaged may result in PTO or pump damage.

Never operate the remote drive system when there is less than 80 psi in the vehicle's air tank.

In rare instances, loss of wireless communication can occur as a result of interference from other wireless equipment, such as cell phone towers, wireless locomotive controls, handheld radios, etc.

In the event of remote drive system communication loss, the vehicle will come to an abrupt stop, PTO's will disengage, and all other remote system functions will turn off.

## 2.2 Startup & Shutdown Procedures

### 2.2.1 Preparing the Vehicle for Remote Driving

1. See vehicle's railgear operation manual for instructions for getting the vehicle on rail. Once the vehicle is on rail, proceed to step 2.
2. Ensure the Emergency Stop / Machine Stop button on the console box is in the down (remote turned off) position.
3. Apply the parking brake in the cab.
4. Ensure the engine is running and at idle.
5. Place the transmission in neutral.
6. Ensure that the clutch pedal is not pressed (*manual transmission only*).
7. Set the transmission range selector to Low (*manual transmission only*).
8. Set the Forward / Reverse selector to "Forward" (*fully reversing transmission only*).
9. Ensure that all PTO's are disengaged.
10. Ensure that the air system for the vehicle has at least 80 PSI.
11. Ensure that there are no obstructions in front of or behind the vehicle.
12. Attach the shift cylinder assembly to the shift lever with the clevis pin (*manual transmission only*).
13. Use the spring under the driver's seat to hold the shift lever in the left-most gate (*manual transmission only*).
14. Attach the clutch cylinder to the clutch pedal (*some manual transmission vehicles only*).
15. Pull the Enable Switch for the remote drive system. When the red light illuminates, the system is ready for the console box to be activated.

### 2.2.2 Returning the Vehicle to In-cab Driving

1. Ensure that the vehicle is stationary and that the parking brake is applied.
2. Ensure that all PTO's are disengaged.
3. Ensure the secondary shift pad is set to neutral. This step must be performed with the emergency stop in the up (remote turned on) position (*tethered remote with automatic transmission only*).
4. Put the Emergency Stop / Machine Stop button on the console box in the down (remote turned off) position.
5. Keep body parts and equipment out of the path of travel of the clutch and shifter assemblies for another 10 seconds while the shutdown sequence finishes taking place (*manual transmission only*).
6. Ensure that the vehicle remains stationary after the shutdown sequence is finished.
7. Push the Enable Switch in the cab to disable the remote drive system.
8. Remove the spring from the shift lever (*manual transmission only*).
9. Remove the shift cylinder from the shift lever (*manual transmission only*).
10. Remove the clutch cylinder from the clutch pedal (*some manual transmission vehicles only*).

## 2.3 Tethered Console Box with Manual Transmission

### 2.3.1 Typical Layout

See section 2.2 for safe startup and shutdown procedures. See Figure 2.3.1.A for a view of a typical console box and each button function. Below that is a description of each button function.

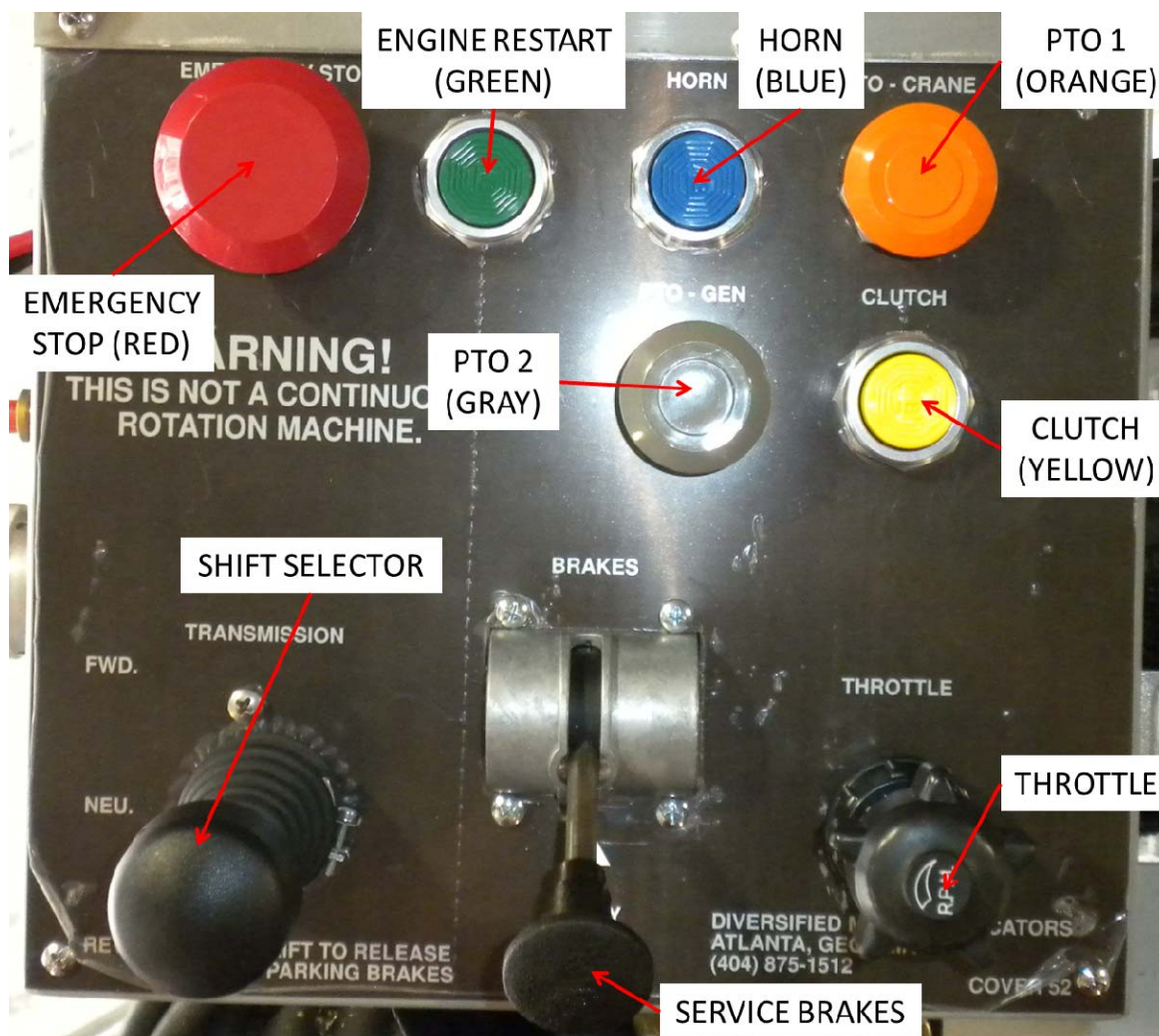


Figure 2.3.1.A

- **Emergency Stop:** The large red mushroom button. It must be in the up position in order for the remote drive functions to work. If it is pressed while the vehicle is in gear and the remote drive system is enabled, a shutdown sequence will initiate that presses in the clutch and returns the transmission to neutral. The engine will return to idle and all other remote drive functions will stop immediately.
- **Clutch:** A yellow momentary button. When pressed, it applies the clutch mechanism to release the engine from the input shaft of the transmission. It must be pressed before restarting the engine, engaging a PTO, or moving the shift selector.
- **Engine Restart:** A green, momentary push button. Make sure the vehicle is stationary with the transmission in neutral, parking brake applied, throttle at idle, and clutch pressed before starting the engine.



- **PTO 1:** A latched, orange, mushroom button. Set the throttle to idle and press the clutch before engaging the PTO. Pull the button to engage the PTO and push the button to disengage it. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **PTO 2:** A latched, gray, mushroom button. Set the throttle to idle and press the clutch before engaging the PTO. Pull the button to engage the PTO and push the button to disengage it. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **Horn:** A blue momentary push button that turns on an air horn.
- **Throttle:** A black knob that controls the engine speed. Turning the knob counterclockwise increases engine speed and turning it clockwise decreases engine speed. Pressing the top of the knob will return the engine to idle.
- **Service Brakes:** A black lever that applies the vehicle's air brakes. The brakes will apply more firmly as the lever is pressed further up. The fully down position has no braking effort applied.
- **Shift Selector:** A single axis joystick that controls the shift lever in the cab. It moves the shifter forward and rearward between neutral and the two gears available in the left-most section of the shift pattern (typically reverse and the lowest forward gear). The joystick will not move from the center position (neutral) unless the parking brake is released. The joystick is spring loaded and will return to center when it is not being pressed forward or rearward.
- **Parking Brake Release:** This switch releases the parking brakes for the vehicle and allows it to roll freely. It is activated by pulling up on the Shift Selector knob (see Figure 2.3.1.B). The parking brake will re-apply when the knob is released.

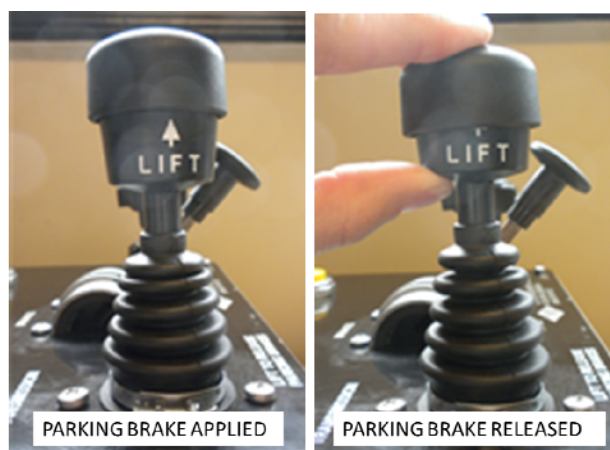


Figure 2.3.1.B

### 2.3.2 Fully Reversing Manual Transmission

Using a tethered remote on a vehicle with a fully reversing, manual transmission is the same as mentioned above except for the operation of the shift selector and forward / reverse switch. See Figure 2.3.2.A for a typical layout of the console box.



Figure 2.3.2.A

- **Shift Selector:** A single axis joystick that controls the shift lever in the cab. It moves the shifter forward and rearward between neutral and the two lowest gears in the transmission. The joystick will not move from the center position (neutral) unless the parking brake is released. The joystick is spring loaded and will return to center when it is not being pressed forward or rearward.
- **Forward / Reverse Switch:** Two-position latched switch on the console box. It will choose the direction of travel for the vehicle, either forward or reverse.

### 2.3.3 Driving Instructions

#### Starting:

1. Disengage PTO's.
2. Set throttle to idle.
3. Set the forward / reverse switch for the desired direction of travel (***fully reversing transmission only***).
4. Release parking brake.
5. Apply service brakes if required to prevent vehicle from rolling.
6. Press the clutch.
7. Move the shift selector to the desired position (forward or rearward) and hold it in that position.
8. Release the clutch.
9. Release the service brakes.
10. Vary the throttle to reach desired speed.

#### Stopping:

1. Set throttle to idle.
2. Press the clutch.
3. Move the shift selector to the middle position (neutral) while continuing to keep the parking brake released.
4. Release the clutch.
5. Apply service brakes to stop the vehicle.
6. Apply the parking brake.
7. Release the service brakes.

## 2.4 Tethered Console Box with Automatic Transmission

See section 2.2 for safe startup and shutdown procedures. See Figure 2.4.A for a view of a typical console box and each button function. Below that is a description of each button function.



Figure 2.4.A

- **Emergency Stop:** The large red mushroom button. It must be in the up position in order for the remote drive functions to work. If it is pressed while the vehicle is in gear and the remote system is enabled, the transmission will shift to neutral but the shift pad inside the cab will not work until the shift pad on the console box is set to neutral while the emergency stop button is up. When the emergency stop button is pressed, the engine will return to idle and all other remote drive functions will stop immediately.
- **Parking Brake Release:** A yellow, momentary button. It releases the vehicle's parking brake when the button is pressed. It must be pressed in order for the vehicle to move. If the vehicle is in forward or reverse gear when this button is released, the transmission will automatically shift to neutral.

- **Engine Restart:** A green, momentary push button. Make sure the vehicle is stationary with the transmission in neutral, parking brake applied, and throttle at idle before starting the engine.
- **PTO 1:** A latched, orange, mushroom button. Set the throttle to idle before engaging the PTO. Pull the button to engage the PTO and push the button to disengage it. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **PTO 2:** A latched, gray, mushroom button. Set the throttle to idle before engaging the PTO. Pull the button to engage the PTO and push the button to disengage it. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **Horn:** A blue momentary push button that turns on an air horn.
- **Throttle:** A black knob that controls the engine speed. Turning the knob counterclockwise increases engine speed and turning it clockwise decreases engine speed. Pressing the top of the knob will return the engine to idle.
- **Service Brakes:** A black lever that applies the vehicle's air brakes. The brakes will apply more firmly as the lever is pressed further up. The fully down position has no braking effort applied.
- **Shift Pad:** A shift pad mounted on the console box that is identical to the one used inside the cab of the truck. The one on the console box is programmed to only allow the transmission to shift between low gear, neutral, and reverse gear. This shift pad must return the transmission to neutral before returning to in-cab driving.

#### 2.4.1 Driving Instructions

##### Starting:

1. Disengage PTO's.
2. Set throttle to idle.
3. Press and hold the parking brake button to release the parking brake.
4. Apply service brakes if required to prevent vehicle from rolling.
5. Select Drive or Reverse on the shift pad.
6. Release the service brakes.
7. Vary the throttle to reach desired speed.

##### Stopping:

1. Set throttle to idle.
2. Select neutral on the shift pad.
3. Apply service brakes to stop the vehicle.
4. Release the parking brake button to apply the parking brake.
5. Release the service brakes.



## 2.5 Wireless Console Box – General Info

Figure 2.5.A shows a typical view of the left-hand and right-hand side of the wireless console box. Below that is a description of each switch function.

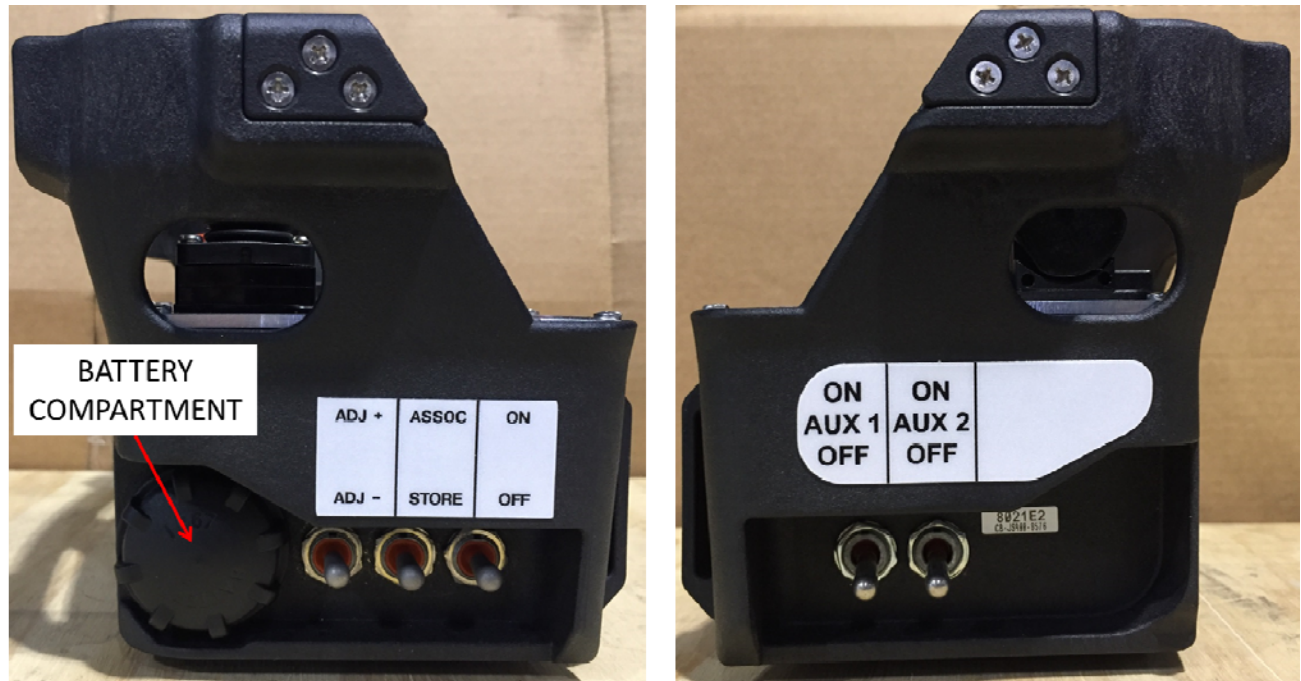


Figure 2.5.A

- **Adj +/-:** Only used during association procedure with base unit. See Cervis manual supplement in section 5.0 for more information.
- **Assoc / Store:** Only used during association procedure with base unit. See Cervis manual supplement in section 5.0 for more information.
- **On / Off:** A momentary switch used to turn the console box on and off. The console box will not turn on if the Machine Stop button is down. Turning the console box off will initiate a shutdown sequence. If the Enable Switch in the cab is pressed down (off) while the console box is on and the remote drive system is active, remote drive functions will not return until after the Enable Switch is pulled back up (on) again and the On / Off switch for the console box is pressed up again.
- **Aux 1:** A two-position latched switch that can be configured to control a 12V output.
- **Aux 2:** A two-position latched switch that can be configured to control a 12V output.
- **Battery Compartment:** It holds two alkaline C batteries. See Cervis manual supplement in section 5.0 for more information.

## 2.6 Wireless Console Box with Manual Transmission

See section 2.2 for safe startup and shutdown procedures. See Figure 2.6.A for a view of a typical console box and each button function. Below that is a description of each button function.



Figure 2.6.A

- **M-Stop:** A red mushroom button. It must be in the up position in order for the console box to turn on. If it is pressed while the console box is on and communicating with the base unit, a shutdown sequence will initiate that presses in the clutch and returns the transmission to neutral. The engine will return to idle and all other remote drive functions will stop immediately.
- **Clutch:** When pressed, it applies the clutch mechanism to release the engine from the input shaft of the transmission. It is a momentary switch.
- **Engine Restart:** A momentary switch. Make sure the vehicle is stationary with the transmission in neutral, parking brake applied, and throttle at idle before starting the engine. There is a several second delay after hitting the switch before the engine turns over. This gives the clutch time to apply before the engine turns over.
- **PTO 1:** A latched switch. Set the throttle to idle before engaging the PTO. Revving the engine while a PTO is engaged may result in PTO or pump damage. There is a several second delay after hitting the switch before the PTO turns on. This gives the clutch time to apply before engaging the PTO.
- **PTO 2:** A latched switch. Set the throttle to idle before engaging the PTO. Revving the engine while a PTO is engaged may result in PTO or pump damage. There is a several second delay after hitting the switch before the PTO turns on. This gives the clutch time to apply before engaging the PTO.
- **Horn:** A blue momentary push-button that turns on an air horn.
- **Throttle:** The black lever on the right that controls the engine speed. Pushing the lever up increases engine speed and pushing it down decreases engine speed. The fully down position is idle.

- **Service Brakes:** The black lever on the left that applies the vehicle's air brakes. The brakes will apply more firmly as the lever is pressed further up. The fully down position has no braking effort applied.
- **Shift Selector:** A single axis joystick that controls the shift lever in the cab. It moves the shifter forward and rearward between neutral and the two gears available in the left-most section of the shift pattern (typically reverse and the lowest forward gear). The joystick is spring loaded and will return to center when it is not being pressed forward or rearward. There is a several second delay after hitting the joystick before the transmission goes into gear. This gives the clutch time to apply and the parking brakes time to release before moving the shift lever in the cab.
- **Easy Shift Enable:** A latched switch that allows the use of a button on the crane controls joystick (if equipped) to start and stop vehicle forward movement instead of using the shift selector on the console box.
- **LED Lights (TX, RX, ERR, etc.):** See Cervis manual supplement in section 5.0 for information regarding each light function.

### 2.6.1 Driving Instructions

Starting:

1. Disengage PTO's.
2. Set throttle to idle.
3. Apply service brakes if required to prevent vehicle from rolling.
4. Move the shift selector to the desired position (forward or rearward) and hold it in that position.
5. Release the service brakes.
6. Vary the throttle to reach desired speed.

Stopping:

1. Set throttle to idle.
2. Move the shift selector to the middle position (neutral).
3. Apply service brakes to stop the vehicle (if required) and then release the service brakes.



## 2.7 Wireless Console Box with Automatic Transmission

See section 2.2 for safe startup and shutdown procedures. See Figure 2.7.A for a view of a typical console box and each button function. Below that is a description of each button function.



Figure 2.7.A

- **M-Stop:** A red mushroom button. It must be in the up position in order for the console box to turn on. If it is pressed while the console box is on and communicating with the base unit, a shutdown sequence will initiate that returns the transmission to neutral. The engine will return to idle and all other remote drive functions will stop immediately.
- **Parking Brake:** When pressed, it releases the truck's parking brake. It is a momentary switch.
- **Engine Restart:** A momentary switch. Make sure the vehicle is stationary with the transmission in neutral, parking brake applied, and throttle at idle before starting the engine. There is a minor delay after hitting the switch before the engine turns over. This gives the transmission time to ensure it's in neutral before the engine turns over.
- **PTO 1:** A latched switch. Set the throttle to idle before engaging the PTO. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **PTO 2:** A latched switch. Set the throttle to idle before engaging the PTO. Revving the engine while a PTO is engaged may result in PTO or pump damage.
- **Horn:** A blue momentary push-button that turns on an air horn.
- **Throttle:** The black lever on the right that controls the engine speed. Pushing the lever up increases engine speed and pushing it down decreases engine speed. The fully down position is idle.
- **Service Brakes:** The black lever on the left that applies the vehicle's air brakes. The brakes will apply more firmly as the lever is pressed further up. The fully down position has no braking effort applied.
- **Shift Selector:** A single axis joystick that controls the shift pad in the cab. Press forward for first gear. Press rearward for reverse gear. Let go of the joystick to allow it to return to center and neutral will be selected on the shift pad. The parking brake will also automatically apply and release based on joystick position.

- **Easy Shift Enable:** A latched switch that allows the use of a button on the crane controls joystick (if equipped) to start and stop vehicle forward movement instead of using the shift selector on the console box.
- **LED Lights (TX, RX, ERR, etc.):** See Cervis manual supplement in section 5.0 for information regarding each light function.

### 2.7.1 Driving Instructions

#### Starting:

1. Disengage PTO's.
2. Set throttle to idle.
3. Apply service brakes if required to prevent vehicle from rolling.
4. Move the shift selector to the desired position (forward or rearward) and hold it in that position.
5. Release the service brakes.
6. Vary the throttle to reach desired speed.

#### Stopping:

1. Set throttle to idle.
2. Apply service brakes to stop the vehicle.
3. Move the shift selector to the middle position (neutral).
4. Release the service brakes.

## **3.0 MAINTENANCE & INSPECTION**

### **3.0 Maintenance & Inspection**

- 3.1 Recommended Maintenance & Inspection Frequency
  - 3.1.1 Daily Maintenance
  - 3.1.2 Weekly Maintenance
  - 3.1.3 Monthly Maintenance or as required
  - 3.1.4 Annual Maintenance
- 3.2 Troubleshooting

### 3.1 Recommended Maintenance & Inspection Frequency

Never perform maintenance on the vehicle or the remote drive system while the remote drive system is enabled.

Disconnect the Cervis base units by unplugging them before welding on the vehicle (*wireless remote only*).

#### 3.1.1 Daily Maintenance

- Use a damp cloth to clean the console box.

#### 3.1.2 Weekly Maintenance

In addition to the items listed in 3.1.1 Daily Maintenance, perform the following:

- Inspect the electrical system and cables for damage or wear.
- Inspect the shifter and clutch mechanism for wear and component binding.

#### 3.1.3 Monthly Maintenance or as required

In addition to the items listed in 3.1.1 Daily Maintenance and 3.1.2 Weekly Maintenance, perform the following:

- Inspect the entire vehicle for air leaks.
- Replace the console box batteries per instructions in the Cervis manual supplement in section 5.0 (*wireless remote only*).

#### 3.1.4 Annual Maintenance

In addition to the items listed in 3.1.1 Daily Maintenance, 3.1.2 Weekly Maintenance, and 3.1.3 Monthly Maintenance, perform the following:

- Inspect air filters for remote drive system. Drain moisture and replace filter if necessary.
- Test the shutdown sequence (to be performed with an individual seated in the driver's seat inside the cab of the vehicle):
  1. Follow the instructions in section 2 of the manual to get the vehicle moving. While the vehicle is moving and still in gear, press the Emergency Stop / Machine Stop.
  2. Ensure that the vehicle comes to a complete stop.
  3. Ensure that the transmission returns to neutral.
  4. Ensure that all remote drive functions stop working.

### 3.2 Troubleshooting

See Table 3.2.A for troubleshooting assistance on remote drive systems.

Symptom	Possible Cause	Diagnostic Step	Corrective Action
No remote drive functions work	Communication loss	Trace wires / see Cervis manual supplement in section 5.0	Repair communication loss
	Blown fuse	Inspect fuse	Replace fuse
	Vehicle ignition turned off	Check ignition key position	Turn on vehicle ignition
	Enable switch in cab pressed down	Check enable switch position	Pull enable switch up
	E-stop / Machine Stop on console box pressed down	Check E-stop / Machine Stop button position	Pull E-stop / Machine Stop button up
	Console box turned off / low batteries (wireless remote)	Check console box LED's & batteries	Turn on console box / replace batteries
Transmission hangs in gear or will not come out of gear	Communication loss	Trace wires / test other outputs	Repair communication loss
	Low air pressure	Check air pressure	Increase air pressure
	Shift cylinders need adjustment	Inspect stroke & location of shift cylinders	Adjust shift cylinders
	Cab air suspension not fully deflating	Inspect air bags for cab suspension	Repair faulty cab air override system
	Clutch Sequencer / Shutdown Sequence not working properly	Monitor electronic signals with volt meter	Repair wiring
Parking brake always released when remote turned on	Parking brake knob not fully tightened	Disassemble and inspect shift selector	Tighten parking brake knob
Remote throttle will not work	Communication loss	Trace wires / test other outputs	Repair communication loss
	High idle engaged	Check high idle switch	Turn off high idle
	PTO engaged	Check PTO's	Turn off PTO
	Throttle control not handed off to remote	Check to see if in-cab throttle works	Repair wiring / replace Williams Control Module
	Faulty remote throttle	Test with a new throttle	Replace throttle

Table 3.2.A

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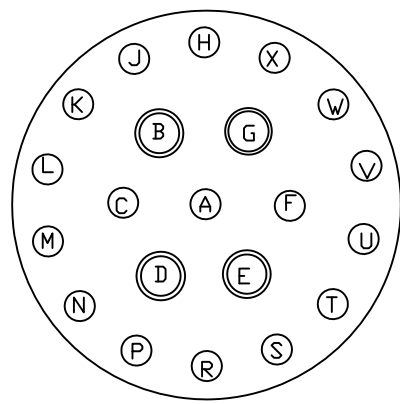
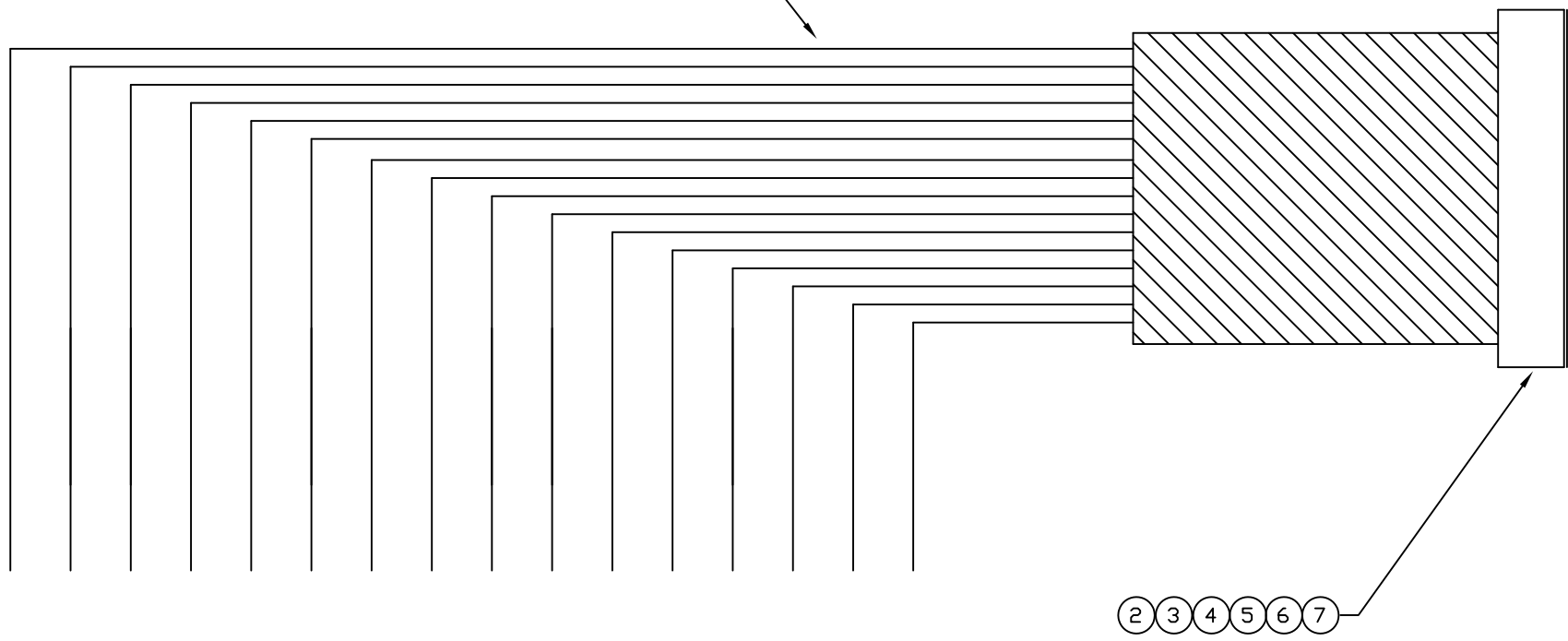
## 4.0 TECHNICAL DETAILS

### 4.1 Technical Drawings

4.1.1	402130	40' Cable Along Chassis
4.1.2	402120	15" Cable Thru Crane Mast
4.1.3	404020I	Clutch Sequencer Installation
4.1.4	Varies	System Drawing

ITEM	PART NO.	QTY	DESCRIPTION
1	ITEM #	40'	CABLE, 16 STRAND (WIRE16AWG-16SD)
2	ITEM #	1	CONNECTOR, DEUTSCH HD34-24-21, SN-L006
3	ITEM #	1	PANEL NUT, DEUTSCH 112263-90/24
4	ITEM #	1	LOCK WASHER, DEUTSCH #24
5	ITEM #	1	CABLE CLAMP, DEUTSCH L006
6	402124	16	SOCKET, DEUTSCH 0462-201-16141
7	ITEM #	1	CAP, DEUTSCH HDC36-24

(DO NOT STRIP UNTIL INSTALLATION) 1



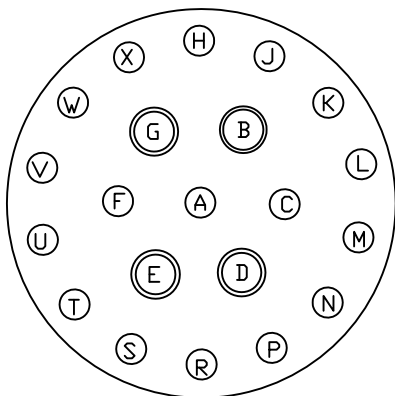
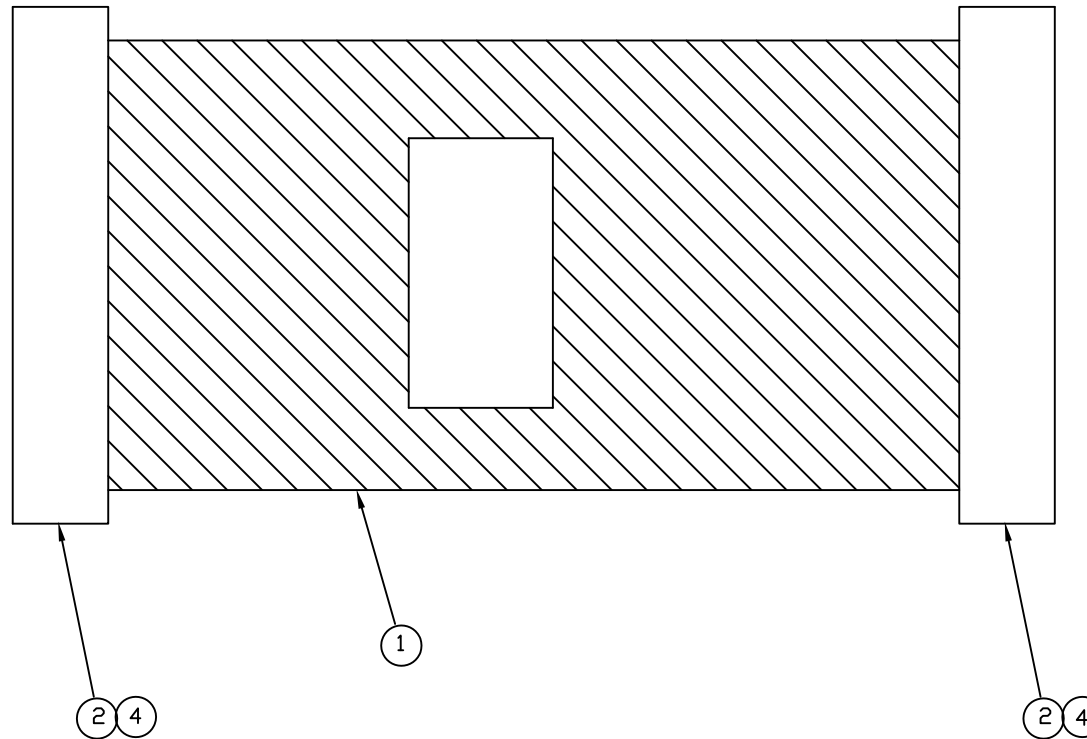
DEUTSCH PIN-OUT

PIN	COLOR
A	B
C	BL
F	D
H	G
J	R
K	W
L	B/R
M	D/B
N	G/B
P	R/B
R	W/B
S	BL/B
T	B/W
U	G/W
V	R/W
W	BL/W




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REV		DATE		DESCRIPTION				BY	APP
TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS				TITLE: REMOTE CONTROL CABLE ASSY 40' ALONG THE CHASSIS DIVERSIFIED METAL FABRICATORS, INC.(404)875-1512					
FRAC. MACH. ± 1/32" FRAC. OTHER ± 1/16" X ± .063 XX ± .030 XXX OR .XXXX ± .005 DRILL SIZES: ± .015 ANGULAR ± 1° SURF. FINISH: .025 THREADS: RA AND 2B <small>BREAK SHARP CORNERS (R. 0.000 X 40° MAX.)</small>									
DRAWN BY:		APPD BY:		DATE:		<div><div><div></div></div></div>		DRAWING NUMBER:	REV:
WET				4-16-99				402130	A








	ITEM	PART NO.	QTY	DESCRIPTION
⚠	1		15'	CABLE, LUTZE A1381618, 16AWG, 18 CONDUCTOR
⚠	2		2	CONNECTOR, DEUTSCH HD36-24-21-PN-L006
	3			
⚠	4	402123	32	PIN, DEUTSCH 0460-202-16141



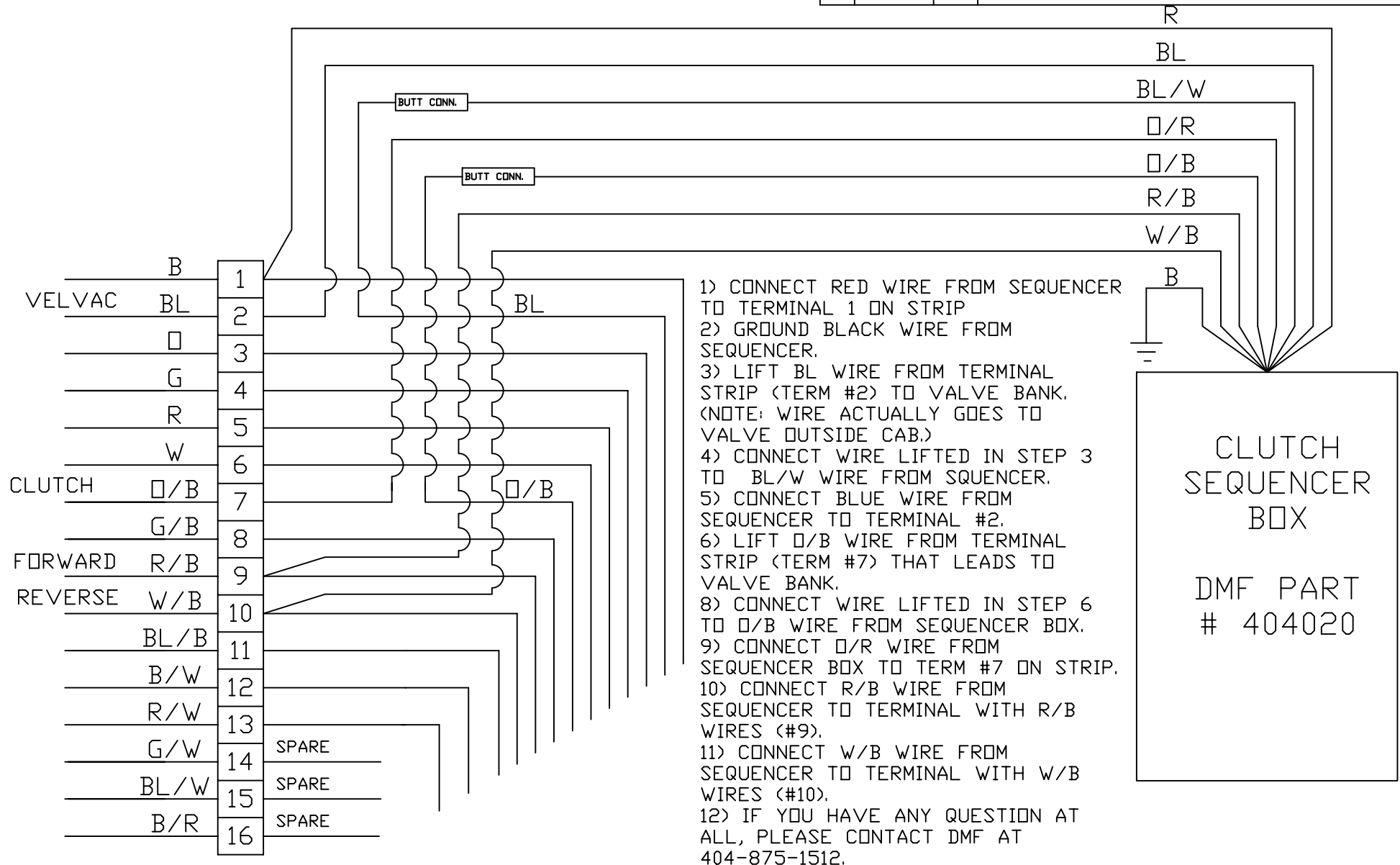
DEUTSCH PIN-OUT

PIN	WIRE #
A	1
 C	2
F	3
H	4
J	5
K	6
L	7
M	8
N	9
P	10
R	11
S	12
T	13
U	14
V	15
W	16
  X	17

NOTE: G/Y WIRE IS A SPARE

	2/23/15	402123 WAS 402124		BJF
	2/15/10	C - 2 WAS C - 18; ADDED X - 17; LUTZE A1381618 WAS BELDEN INFINITY C-TC7028A		BJF
	1/6/10	C - 18 WAS C - 2		BJF
	5/4/00	IT #3, L006 INCLUDED AS PART OF IT #2		WT
REV	DATE	DESCRIPTION		BY
TOLERANCES:		TITLE:		
(UNLESS SPECIFIED)		REMOTE CONTROL CABLE ASSY		
COMMON SENSE PREVAILS		15' THROUGH THE PEDESTAL		
FRAC. MACH. B 1/32		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		
FRAC. OTHER: 1/16"		DRAWN BY:		
X .063		APPD BY:		
XX .030		DATE:		
XXX OR .XXXXX .005		DRAWING NUMBER:		
DRILL SIZES: .015		REV:		
ANGULAR SURF FINISH: .05 MICRO				
THREADS: RA AND .20				
BASIC DRAP CODE: (0.000 X .40" MAX.)		WET 4-16-99 402120 D		


ITEM	PART NO.	QTY	DESCRIPTION
1	404020	1	REMOTE CONTROL CLUTCH SEQUENCER



TO CONTROL  
BOX VIA 16  
CONDUCTOR  
CABLE

TERMINAL  
STRIP

TO VALVE  
BANK IN CAB

REV	DATE	DESCRIPTION	BY	APP
<div> <div> <b>TOLERANCES</b>            (UNLESS SPECIFIED)            COMMON SENSE PREVAILS            FRAC. INCH ± 1/32"            DEC. INCH ± .003            .XX ± .003            .XXX OR .XXXX ± .005            DRILL SIZES ± .015            ANGULAR ± 1°            SURF. FINISH .125 MICRO            THREADS .25 AND .375         </div> <div>           REMOTE DRIVE            DRAWN BY: SEW            APPD BY:         </div> <div>           TITLE: REMOTE DRIVE SHUTDOWN SEQUENCER            HOOKUP WIRING FOR 402600            DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512            DATE: 12/13/04              DRAWING NUMBER: 404020I            REV: #         </div> </div>				

# DMF LIMITED WARRANTY POLICY

**Diversified Metal Fabricators (DMF)** products are designed to provide the utmost service and reliability. Competent workmen, guided by stringent quality standards, manufacture the products from high-grade material. **DMF** warrants products of its manufacture to be free of defects in material and workmanship, under normal use and service, for a period of **ONE CALENDAR YEAR**. **DMF's** obligation under this warranty is limited to repairing or replacing at its factory, or other location designated by us, any part or parts there-of which shall, within 30 DAYS of the date of failure or notice of defect, be returned, and which upon examination shall appear to **DMF's** satisfaction to have been defective. Such repair or replacement does not include the cost of installing the new part or any other expenses incident thereto; however, the outbound direct ground freight on the part will be prepaid to locations within the continental United States and Canada. **DMF** shall not be liable for other loss, damage, or expense directly or indirectly arising from the use of its products.

Ordinary wear and tear, abuse, misuse, neglect, or alteration is not covered by this warranty. **DMF** assumes no liability for expenses or repairs made outside its factory except by written consent. Warranty is null and void if instructions and operating procedures specifically referring to warranty coverage are not followed.

Equipment or parts not manufactured by this company, but which are furnished in connection with **DMF** products are covered directly and solely by the warranty of the manufacturer supplying them.

This warranty is in lieu of other warranties, expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose and any liability for special or consequential damages.

All warranty claims must reference a serial number. Returns must reference a RA number.



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