HENRY & WRIGHT CORPORATION

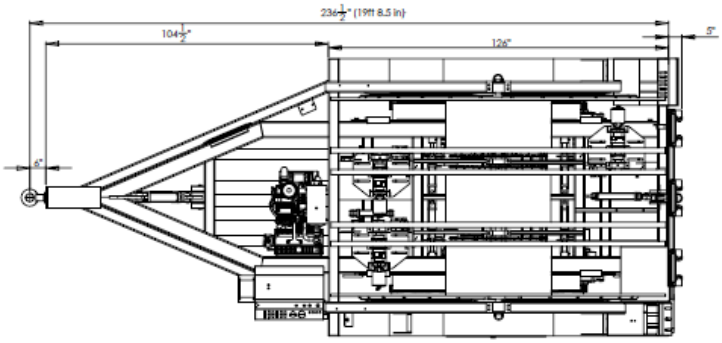
Leading Manufacturer of Utility Trailers and Related Capital Equipment.

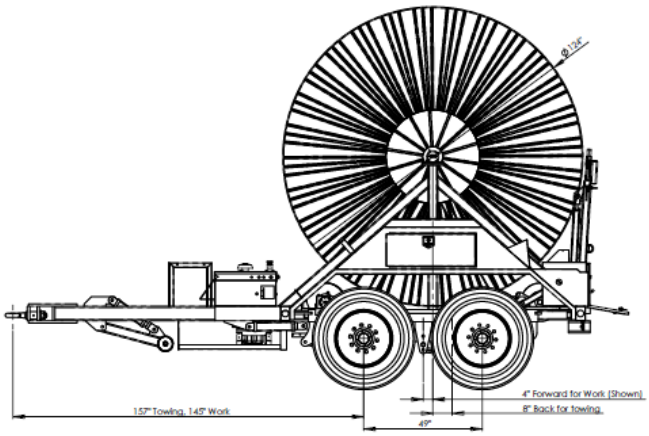
739 East 140th Street • Cleveland, Ohio 44110
Phone 216-851-3750 • Fax 216-851-3970 • utilitytrailers@henrywright.com

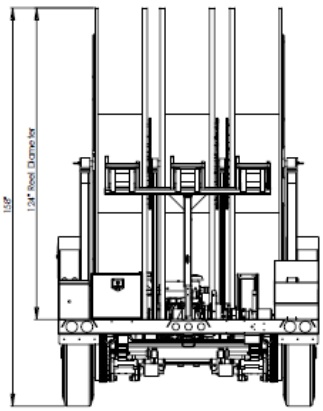
3-in-1 Dolly "Ferris Wheel" Trailer

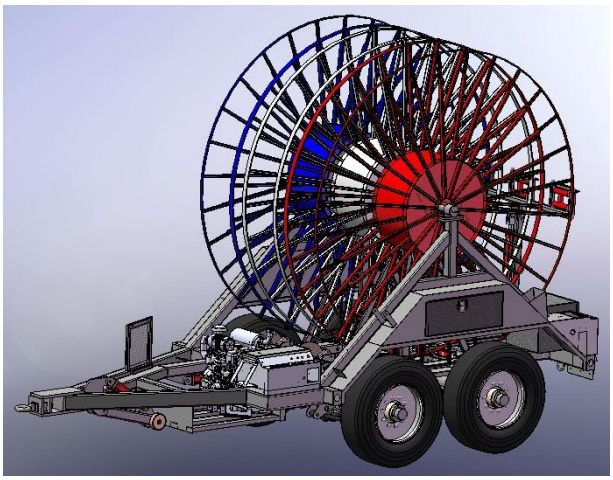
3-Reel Self-Crawling for Underground Cable

Operating & Maintenance Manual









Contents:

Introduction

For over a quarter of a century, Allegheny Trailers has been the world leader in the design and manufacture of trailers and related capital equipment for the utility industry. With our sole focus on serving the utility industry, Henry & Wright Corporation has quickly gained a reputation for manufacturing excellence and unsurpassed product quality while continuing the Allegheny Trailer Product line. From our expanded manufacturing facility in Cleveland — nearly 40,000 square feet of space in the heart of a manufacturing center — we have enhanced our ability to satisfy your requirements. Henry & Wright offers expert engineering services and can customize any product to meet your precise requirements. Henry & Wright offers a standard product line, remanufacturing of units already in service and immediate delivery on spare parts.

Overall Description

The Henry & Wright Ferris-Wheel type trailer is designed for under-ground cable installation.

The trailer contains 3 side-by-side independently self-driven reels designed for winding and unwinding. The reels are non-removable (except for maintenance). Each reel is chain-driven and includes a hydraulic tensioning brake. The reel drive design incorporates clutch-type hydraulic motors which allow the reels to be used for payout (free-wheeling) when needed. The reel tensioning brakes can be used to control over-spin. The reel drive levers are located at the curb-side rear corner of the trailer. The reel tensioning brake levers are located at the street-side rear corner.

The trailer can be self-driven for short distances using the drive levers at the street-side front corner of the trailer. Each wheel is gear-driven with independent levers for street-side and curb-side to control steering. The drive engagement lever engages/disengages all four wheels. The air-brakes can be released from this same location for self-driving.

The unique self-driving design enables the trailer to get into tighter areas where the tow vehicle can't fit or maneuver into.

The wheel carriage slides 4-inches forward of center for driving (which balances the load) or 8-inches rear of center for towing (to provide tongue weight). The carriage is adjustable using a lever at the street-side front corner. The carriage is locked in place with four 1½" lock pins at the forward (Work) or back (Tow) positions using a lever at the street-side front corner.

The Fairlead at the rear of the trailer is used to guide the cable. The Fairlead can be tilted 90-degrees and/or extended 24-inches.

The size of each of the three reels measures 124-inches OD with a 39-inch diameter hub. Reel width is 17.5-inches inside, 21.5-inches outside. Total trailer height measures 13ft-1in and width is 102-inches. The total length is just less than 20ft (not including the Fairlead) with a 110-inch tongue (to center of the swivel eye).

A 36HP Diesel engine in the tongue provides the hydraulic pressure necessary to operate the Reel Turning (3), Drive Wheels (4), Drive Wheel Engagement, Wheel Carriage Slide, Carriage Lock Pins, Front Jack, Fairlead (extend and tilt), rear capstan, and auxiliary Tool Circuit connection. Fluid tanks in the tongue hold up to 10 gallons of diesel fuel, and 30 gallons of hydraulic oil. The Reel Tensioning Brakes (3) are powered separately using brake fluid in reservoirs attached to the Braking Levers at the street-side rear corner.

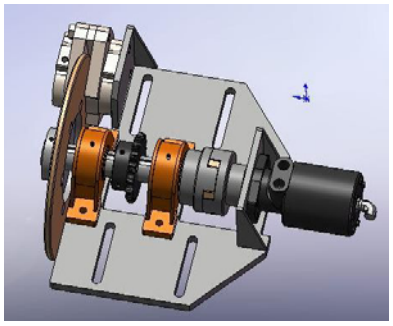
Two air tanks are included to provide enough air for at least two brake releases (when disconnected from the truck) for self-driving.

This trailer's information for Operation, Maintenance, and Parts details is contained in FIVE (5) Documents:

1. **THIS MANUAL COVERS THE TRAILER OPERATION & MAINTENANCE**, including Control Panel Functions, Running Gear (Axles, Brakes), Hardware, Electrical, and Mechanical.
2. **2nd MANUAL COVERS THE TRAILER'S HYDRAULIC SYSTEM** in detail;
3. **3rd MANUAL COVERS THE TRAILER'S YANMAR DIESEL ENGINE** in detail.
4. **4th MANUAL COVERS THE TRAILER'S DP WINCH CAPSTAN** parts & operation in detail.
5. **5th MANUAL COVERS THE TRAILER'S DEXTER 22.5K AXLE** parts & operation in detail.

Reel Drive Units

Description & Operation



Each of the three reel drive units contains a tensioning brake with 16-inch bronze disk, 17-tooth chain drive sprocket (#80), two 2-inch pillow block bearings, flex coupler, and a clutch-actuated hydraulic motor. The entire unit can be removed for servicing, or disassembled on the trailer.

The unit allows for 5-inches of travel positioning for chain tensioning. Its design signifies that when the chain requires more travel for correct tension than the unit will provide, the chain should be replaced (the chain has stretched beyond its specification). The chain should be purchased as #80, self-lubricating, 215-links (215-inches) each (x3).

The hydraulic motor has a clutch-actuated feature that enables the motor to free-spin when disengaged. This allows the reel to free-spin for payout, and provides smooth gradual starts and stops. The internal friction of the motor, drive-chain, and brake linkage prevents the reel from continually spinning out of control. The hydraulic tensioning brake can be used to control or stop any free-spin during payout. If pulling from the free-spinning reel becomes too much tension, the reel can be hydraulically driven forward to aid in payout.

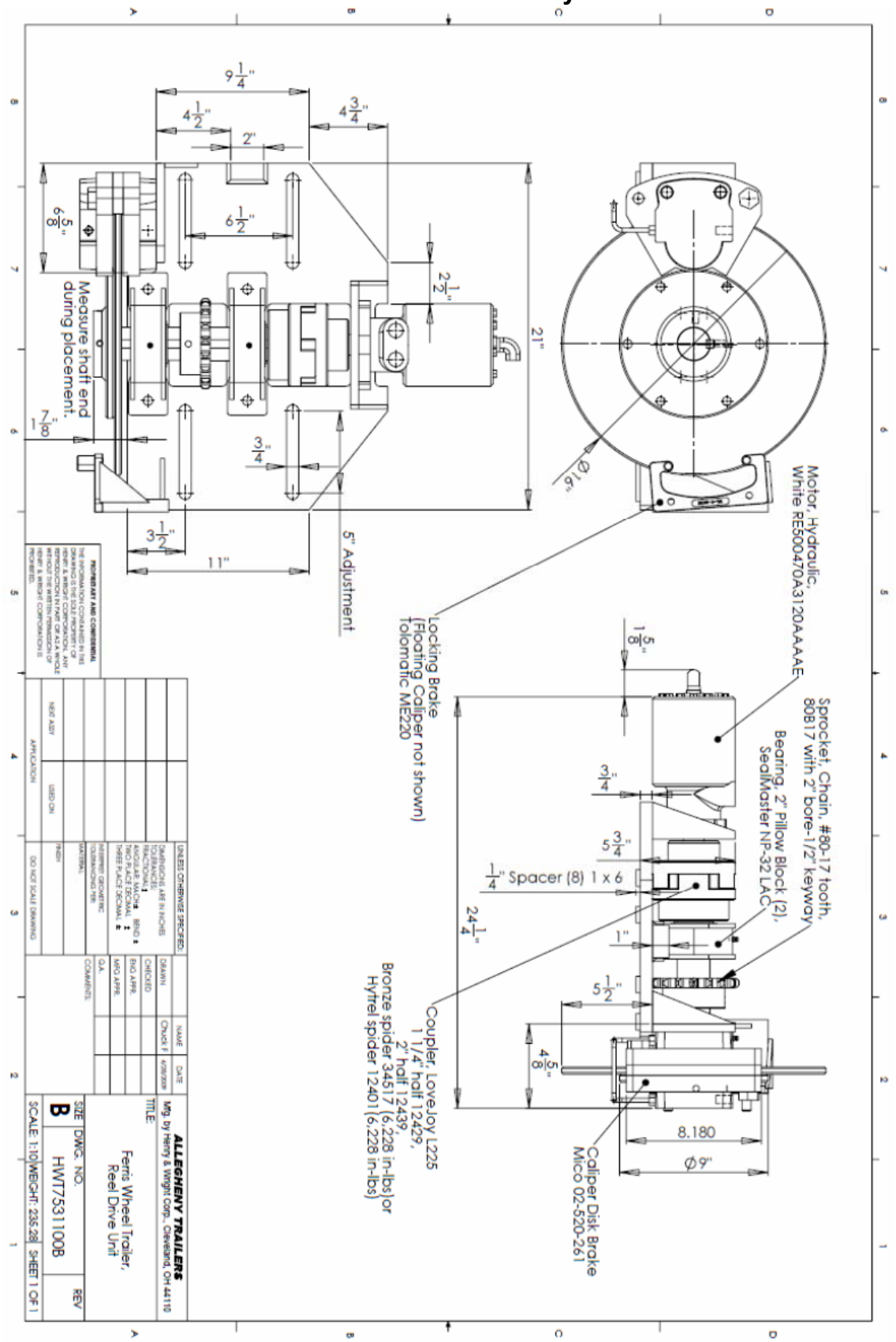
The tensioning brake feature is operated independently from a separate lever (1 of 3) located at the street-side rear corner of the trailer. Each tensioning brake lever contains a master cylinder with brake fluid, which enables braking operation independent of the Diesel Engine and hydraulic pump (the engine can be on or off). Reel braking is simply done by pulling on the lever.

Chain adjustment is done by ***loosening*** the four 3/4"' bolts in the slots and adjusting the adjustment screw at the rear of the unit. When the chain has the correct tension, re-tighten the four ¾" mounting bolts, and tighten the locking nut on the adjusting screw. DO NOT COMPLETELY REMOVE THE FOUR 3/4" MOUNTING BOLTS WHEN MAKING ADJUSTMENTS. The bolts also serve to guide the Reel Drive Unit. The bolts should only be loosened enough to allow sliding movement.

Reel Drive Unit Specifications …

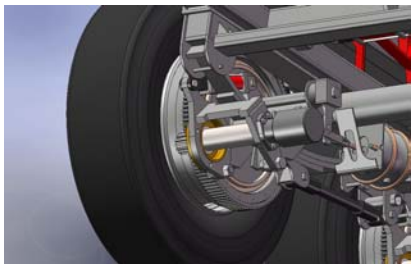
REEL DRIVE UNIT (each) – Replaceable PARTS LIST		
QTY	PART #	DESCRIPTION
1	RDM-AAAAE	Motor, Hydraulic, with Clutch-on-the-fly
1	C17x80	Chain Sprocket, #80, 17-teeth, 2" bore
1	C112x80	Chain Sprocket, #80, 112-teeth, blank (on reel)
2	PBBRG2000	Pillow block bearing, 2"
2	PFBRG2250x5000	Flange bearing, 2¼" bore, 5" hub (on reel)
1	Cplr1250x0500	Coupler (½), spider,1¼" bore
1	Cplr2000x0500	Coupler (½), spider, 2" bore
1	Spdr6228	Spider, 6,228 in-lbs
215" ea	RS80DX	Chain, #80, Self-lubricating, 215 links.
1	02-520-261	Caliper disk brake, brake fluid, 2000 psi
1	HWT5531100A	Brake Disk, 16" dia., ½" wide, bronze, H&W
1	HWT6531101A	Brake Disk Hub, 2" bore, H&W
1	HWT5531102A	Shaft, 2" , Reel Drive Unit, H&W

Reel Drive Unit Assembly



Wheel Drive System

Description & Operation



Each wheel is equipped with a gear drive system for self-driving the trailer. The four drive motors are engaged hydraulically with a cylinder on each wheel. A single lever at the street-side front corner of the trailer controls the engagement and disengagement of the drive system. Two additional levers at the street-side front corner operate either the street-side wheels and/or the curb-side wheels independently. The drive gears are released (moved away from the ring gears) for towing the trailer.

Self-Drive Safety Interlock

An interlock is incorporated into the wheel drive system when the gears are engaged and/or in "Work" position. Four indicator lights on the street-side front console can be lit while the diesel engine is running. Two lights indicate when all four gears are engaged (during self-driving) or disengaged (for tow). Two other lights indicate when the carriage assembly is in the forward (Work) position or back (Tow) position. The lights will go out if the engine is turned off (to save battery life), though the safety interlock is still active.

If the trailer is plugged into the tow vehicle while the drive gears are not disengaged and/or not in the "Tow" position, the trailer will dump the air pressure from the air brake tanks. This will lock the trailer brakes on to signal that the wheel drive system is still engaged and/or in the "Work" position.

Make sure the wheels are fully back in the "Tow" position and the drive gears are fully disengaged before plugging into the tow vehicle. Both "Green" lights should be illuminated on the front console.

Wheel Drive System Specifications …

QTY	PART #	DESCRIPTION
4	RDMX-AAAAA	Motor, Hydraulic
4	HWT5533601A	Gear, Pinion, 5-7 Pitch, 1¼" bore, 13-tooth, H&W
4	HWT5533602A	Gear, Ring, 5-7 Pitch, 117-tooth, 23.4 PD, H&W
4	HWT6533603A	Hub, Ring Gear, hub piloted, 10 on 11¼ ", H&W
4	C2000x4000	Cylinder, hydraulic, 2" bore, 4" stroke
4	HWT5530010A	Motor plate mount, inside
4	HWT5530009A	Motor plate mount, outside

LUBRICATION

Use the chart below for lubricating the ***21*** grease fittings total on each 3-in-1 Dolly Trailer…

H&W CORP - "ALLEGHENY TRAILERS"

GREASE LUBRICATION POINTS

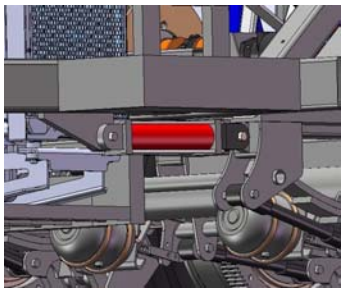
3-IN-1 DOLLY "FERRIS WHEEL" TRAILER

Suggested Lubrication Grease: EP BEARING NLGI GRADE 2

	Location	Item	Lube Point	# Assemblies	# Items Ea	Total Points	Frequency
1	Reel, LH & RH Side	Flange Bearing	Grease Fitting	3	2	6	Check Once per Quarter
2	Reel Drive Unit Shaft Support	Pillow Block	Grease Fitting	3	2	6	Once per Quarter
3	Lock Pin - Undercarriage	Pin & Tube	Grease Fitting	4	1	4	Once per Quarter
4	Wheel Drive Swing Bracket	Flange Bearing	Grease Fitting	4	1	4	Check Once per Month
5	Swivel Pintle Eye	Pin & Tube	Grease Fitting	1	1	1	Once per Quarter

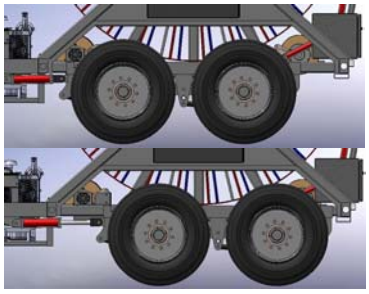
Wheel Base Positioning

Description & Operation



Work position

Tow position



The wheel carriage assembly is adjustable by 12 inches with two lock positions; all the way forward for work (self-driving) and all the way back for towing.

The ***tow*** position (8in back) creates a 2,000 lb tongue weight bringing the trailers total weight capacity when fully loaded (35,600 lbs) down to 33,600 lbs which satisfies the Bridge Law requirements.

The ***work*** position (4in forward) lowers the tongue weight for self-driving. There is still a small amount of tongue weight in the Work position (approx 500 lbs) to help keep the trailer stabilized during self-driving. The front jack does not need to be down when self-driving since the tongue weight is low enough to remain off the ground without assistance.

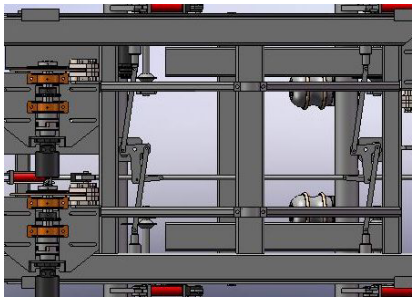
Two hydraulic cylinders are used to slide the wheel carriage forward and back. The cylinders are operated by a single lever at the front street-side console.

Wheel Carriage Lock Pins

MAKE SURE THE CARRIAGE **LOCK PINS** ARE RELEASED BEFORE SLIDING THE CARRIAGE ASSEMBLY!

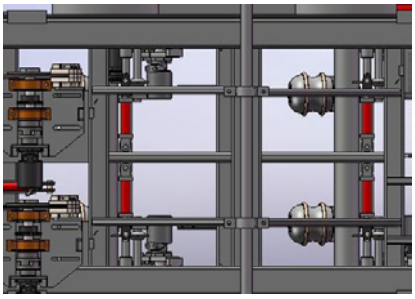
MAKE SURE THE WHEEL CARRIAGE IS IN THE FORWARD (*WORK*) POSITION BEFORE SELF-DRIVING THE TRAILER!

Original linkage



Four carriage Lock Pins are used to lock the carriage into position. These pins keep the carriage firmly attached to the frame for work or tow. The lock must be released before changing the wheel carriage position. The lock pins are operated hydraulically by a single lever at the street-side front console.

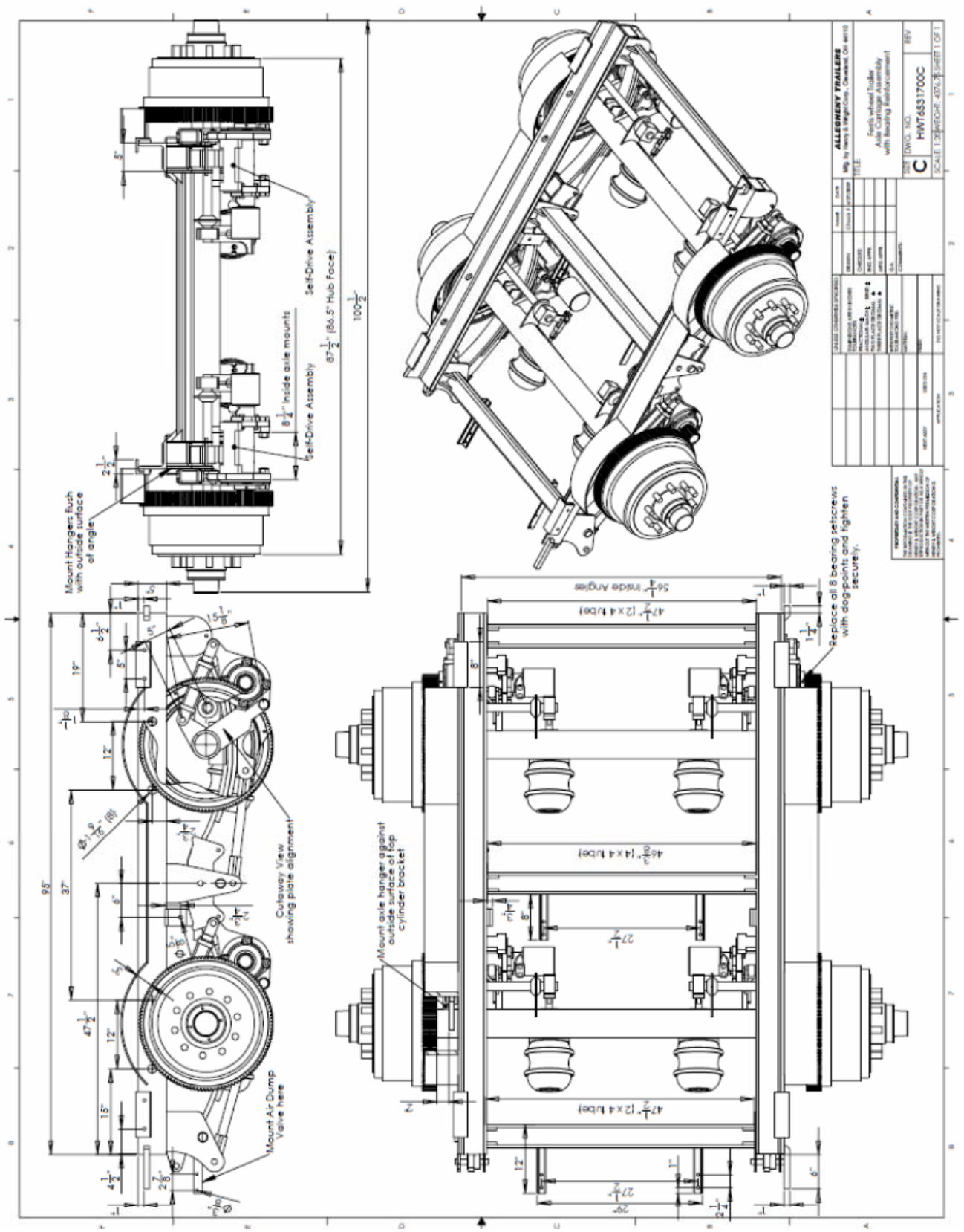
Revised 4-cylinder design



The lock pin linkage was revised using 4 independent cylinders for more stability and strength to prevent linkage bending if the positions are not completely in line when attempting to engage the pins. A pressure reducing manifold was also added in the front console to prevent the revised system from bending the frame or carriage if not aligned properly.

MAKE SURE THE CARRIAGE **LOCK PINS** ARE LOCKED IN PLACE BEFORE SELF-DRIVING THE TRAILER, TOWING THE TRAILER, OR PERFORMING ANY OPERATIONS!

Wheel Carriage Sliding Assembly



Trailer Specifications

Axles:	DEXTER, 22.5K, Tandem. underslung
Wheels:	9 x 22.5, 10 on 11¼ , hub piloted
Tires:	315/80R22.5 Load Range L
Trailer Brake Actuation:	Air with ABS on front axle
Gross Vehicle Weight Rating (G.V.W.R.)	36,360 lbs
Gross Axle Weight Rating (G.A.W.R.)	45,000 lbs
Overall Length:	20ft, 10in (with fairlead up)
Overall Width:	102 inches
Overall Height (approximate):	13ft-1in
Empty Vehicle Weight:	15,000 lbs
Reel Carrying Weight (total):	20,600 lbs
Reel Size (each):	124” dia, 17.5” inside width, 39” dia hub
Reel wire capacity (each):	6,866 lbs / 3,000ft (x3)
Rear Fairlead:	Vertical to horizontal tilt, 24” extension
Tongue Jack:	Hydraulic with swivel solid caster
Towing:	Swivel eye, Holland 2 3/8”
Lighting:	12 Volt, LED
Engine (hydraulics):	Yanmar 36HP Diesel
Hydraulic Pump:	Oilgear 18 gpm

ELECTRICAL

Replacement Lighting:

DESCRIPTION:	H&W P/N	VENDOR P/N	
Stop/Turn/Tail Light – LED		44302R	
2½“ Round Marker Light Red – LED		10250R	
2½“ Round Marker Light Yellow – LED		10250Y	
License Plate/Console Light Assembly – LED		15040	
Work Flood Light White – LED		81360	
Tool Box Light White – LED		4060C	

Replacement Plugs:

DESCRIPTION:	H&W P/N	VENDOR P/N	
7-Way Plug – Metal (Tow Vehicle Connection)		670-71SG	

Miscellaneous accessories:

DESCRIPTION:	H&W P/N	VENDOR P/N	
Solar Panel Keeps battery charged when unplugged		BSP-512	

7-WAY PLUG WIRING - SCE		
#	WIRE COLOR	DESCRIPTION
1	White	Ground
2	Black	Tail & Clearance
3	Yellow	Left Turn
4	Red	Stop
5	Green	Right Turn
6	Brown	Hot Lead +12Vdc
7	Blue	Auxiliary or Electric Brakes

Electrical notes:

All wire colors are each placed on their appropriate wire color terminals for easy identification in the front junction box at the rear of the tongue.

Use a 3/8” nut driver for removing or checking any wire connections inside the junction box.

The junction box cover is hand-tightened only. Do not use any tools or wrenches to tighten the box cover, or damage may occur to the box and cover.

All electrical wiring is run through the frame whenever possible. All cables are terminated at the lights with preformed and sealed harnesses. Connections are made in the rear bumper behind the right brake light and inside the junction box at the rear of the tongue. Cables entering and exiting from the frame are protected with rubber grommets.

The electrical wiring is divided into two drawing numbers; the Main Trailer Lighting **#HWT8533201A** and Auxiliary Wiring **#HWT853202D**. The Auxiliary Wiring includes tool box lights, engine control, and drive gear interlocks.

Tool Box Lights:

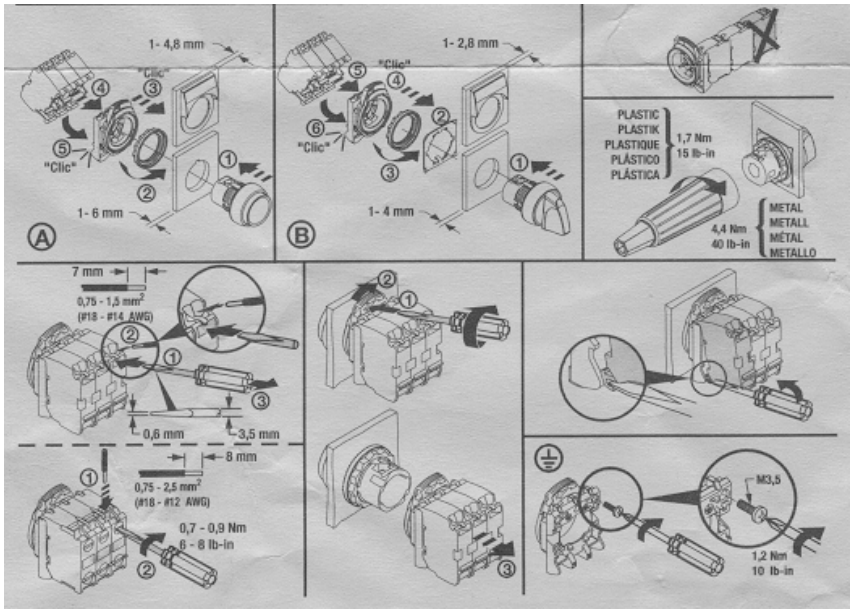
Each of the three tool boxes contains an LED light for illumination. The light must be turned on manually after the lid is opened, by pulling out the switch in the upper left corner of the lid opening. The light can be turned off by pushing the switch in or simply closing the lid.

Console Lights/Work Lights:

There are three WORK lights on the trailer; one at the front street-side console, and one at each corner of the rear of the trailer. The front WORK light is operated by a selector switch on the front street-side console. The two WORK lights at the rear are operated by selector switches on the rear curb-side console.

The front street-side console and rear curb-side console also contain console lights operated by selector switches on their console.

All selector switches on the front and rear control consoles are Sprecher & Schuh D7M. Switch removal and contact replacement are done using the diagram below …



ABS Wiring:

The ABS wiring connections are made behind the *rear passenger-side brake light* to a 7-conductor cable running to the front junction box and trailer plug. An ABS indicator/warning light is located on the street side of the trailer on the side of the brake console.

The new style ABS kit contains a “white with yellow tracer” wire for an optional remote indicator light in the tow vehicle cab. This wire is capped behind the passenger-side brake light with a blue connector. If desired, you can connect this wire to the auxiliary “Blue” wire in the 7-way cable which is also capped behind the passenger-side brake light. The blue wire runs through the front junction box to the trailer plug “Auxiliary” terminal. You can use this blue terminal to install a remote indicator light in the tow vehicle cab.

Operating the Engine:

The Yanmar 36HP diesel engine drives an Oilgear pump at 18 gpm which supplies the entire hydraulic system. The engine is self-contained with a special Lofa EP250 G1 control panel with remote start. The control panel contains an hour meter, engine tachometer, on/off switch, and indicator lights for the following …

1) Battery charge
2) Low Oil Pressure
3) High Temperature
4) Over-speed Condition

First check the diesel fuel level, engine oil level, and coolant before attempting to start the engine.

To start the engine from the front control console, simply turn the engine start switch (on the front of the front control console EP250 panel) to the "Start" position until the engine starts, then let go to the "Run" position.

The indicator lights on the EP250 panel should light when switched to the "Run" position. If the engine is not started within 15 seconds, the lights will reset (go out) and the switch must be turned off then back on again to start. The hydraulic Dump switches are wired to this ignition circuit and will only operate and light while the engine is running and during this 15 second interval.

To start and stop the engine from the rear control panel, the start switch on the *front* control panel must be in the **"*Auto Start*"** position. Use the rear engine start switch the same as the front. Note that although the same switch is used in both places, the "Auto Start" position is not used on the rear switch. The *rear* engine start switch has no effect when the *front* start switch is not in "Auto Start". Be sure to turn the *front* engine start switch to the "Off" position when the engine is not running to prolong battery life.

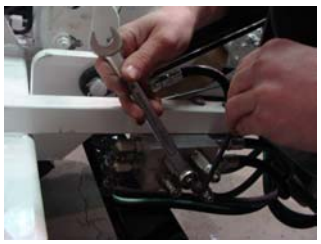
Hydraulic Adjustments / Calibrations:

These adjustments have been adjusted before shipment, but are covered here for replacement or maintenance purposes …

Main Hydraulic High Limit: The maximum hydraulic pressure is adjusted at 2,000 psi. This pressure is adjusted under maximum load. The easiest way to keep the system under maximum load is to start the engine, energize the dump valve, and set the "Drive Gear" lever to the *Engage* or *Disengage* position (since it is a maintained lever). The hydraulic gage on the front console should read 2,000 psi.

The pressure is adjusted on the main pump from the curb side of the tongue. You will need a 9/16' open-end wrench and a 5/16" allen wrench. The 9/16" locking nut must be cracked loose while holding the allen screw from turning. Turn the allen screw *slowly* until 2,000 psi is shown on the pressure gage. Lock the screw in place with the nut. Do not go over 2,000 psi.

If replacing or servicing the entire pump, be sure to **PRIME** the pump **before startup** to keep the pump lubricated. To prime the pump, remove the hose fitting on top of the pump and fill the pump completely with hydraulic fluid.

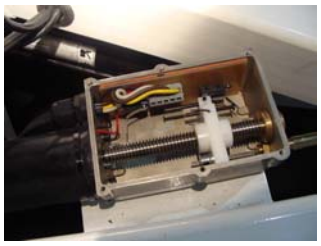


Fairlead counterbalance adjustment: The fairlead counterbalance is adjusted to keep the fairlead from "jumping" while tilting or extending the fairlead.

The counterbalance units are located under and behind the tool hose reel. You will need a 9/16" open-end wrench and a 5/32" allen wrench. This is a trial and error setting but is around 3-4 turns in from the point that the adjusting screw feels tension.

The 9/16" locking nut must be cracked loose while holding the allen screw from turning. Turn the allen screw to adjust the counterbalance. Lock the screw in place with the locking nut.

The counterbalance units on top of the manifold inside the front console are all preset using the same manor at 3-turns in from the point that the adjusting screw feels tension. These should not have to be modified.



Engine Throttle Adjustment: The engine throttle is adjusted from idle speed to 3,000 engine rpm maximum. The adjustment is done in the remote speed adjust unit at the curb side of the tongue. The rpm can be read from the gage on the engine panel on the front side of the front console.

Loosen the 6 Philips head screws in the cover and remove the cover. Use the included allen wrench (located in the extra hole in the nylon bushing) to adjust the black push-levers for minimum and maximum settings. The *left* limit switch lever may need to be bent slightly outward to accommodate the extra distance.

Operating the Hydraulics:

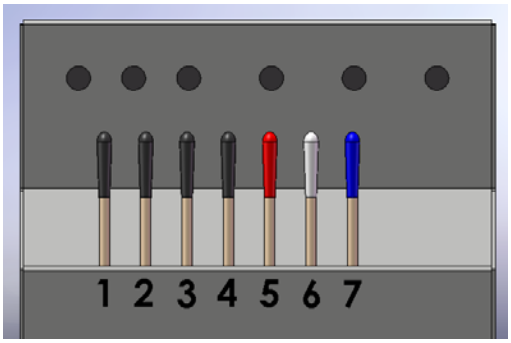
Dump Switches

Before any hydraulic operation can be performed on the trailer, the engine must be started and all 3 DUMP switches must be in the *out* position (all 3 DUMP lights turned on) to keep the hydraulic DUMP valve energized. The connection plug at the hydraulic dump valve (on top of the oil reservoir) contains a light which can be used to check voltage at the dump valve. The light should be on to energize the dump valve.

The DUMP valve must remain energized to keep hydraulic pressure built up in the system. If any DUMP switch is pushed in, the DUMP valve shuts off (opens) and allows the oil to flow directly to the tank with no pressure buildup. The DUMP switches act as emergency stop buttons for the hydraulics.

Hydraulic Lever Description Detail …

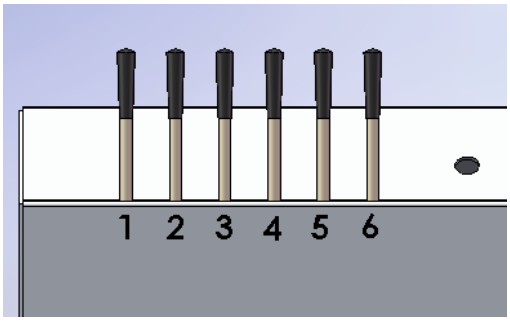
Lever location – Rear curb-side panel …



The rear curb-side panel is used for operating the Fairlead, capstan, auxiliary tool circuit, and reels. Description of each lever is as follows …

(1) **Capstan** – Pushing this lever forward rotates the capstan at the rear of the trailer in the forward direction for pulling. Pulling the lever towards you rotates the capstan in the reverse direction for pay out. This lever can be maintained at any position for unattended operation.
(2) **Tool Circuit** – Pushing this lever forward completely activates the auxiliary tool circuit hoses at the rear of the trailer with 5 gallons of oil per minute. Pulling the lever towards you completely activates the auxiliary tool circuit hoses with 10 gallons of oil per minute. The maintained lever can be set at any position for less flow. The 25ft hoses can unwound to any required length.
(3) **Fairlead Tilt** - Pushing this lever forward tilts the rear Fairlead to the upright position. Pulling the lever towards you tilts the Fairlead down to 90 degrees. The momentary spring-return lever permits locating the Fairlead at any angle in between.
(4) **Fairlead Extend** - Pushing this lever forward retracts the Fairlead to 54in minimum (to the center of the rollers). Pulling the lever towards you extends the Fairlead 24 inches (78in total). The momentary spring-return lever permits stopping the Fairlead at any distance in between.
(5) **Red Reel** - Pushing this lever forward rotates the red reel for pay in. Pulling the lever towards you rotates the red reel for pay out. The speed of the reel can be set at any required speed using the maintained lever. The maximum speed of the reel depends on the speed the engine is running at.
(6) **White Reel** - Pushing this lever forward rotates the white reel for pay in. Pulling the lever towards you rotates the white reel for pay out. The speed of the reel can be set at any required speed using the maintained lever. The maximum speed of the reel depends on the speed the engine is running at.
(7) **Blue Reel** - Pushing this lever forward rotates the blue reel for pay in. Pulling the lever towards you rotates the blue reel for pay out. The speed of the reel can be set at any required speed using the maintained lever. The maximum speed of the reel depends on the speed the engine is running at.

Lever location – Front street-side panel …



The front street-side panel is used for operating the landing gear (front jack), wheel positioning and locking, and self-driving the trailer. Description of each lever is as follows …

(1) **Landing Gear** – Pushing this lever forward raises the landing gear (lowers the trailer front). Pulling the lever towards you lowers the landing gear (raises the trailer front).

(2) **Curb Drive** - Pushing this lever forward drives the curb-side of the trailer in reverse. Pulling the lever towards you drives the curb-side of the trailer forward. This momentary spring-return lever gradually increases the speed as the lever is moved; up to a maximum walking speed determined by how fast the engine is running.

(3) **Street Drive** - Pushing this lever forward drives the street-side of the trailer in reverse. Pulling the lever towards you drives the street-side of the trailer forward. This momentary spring-return lever gradually increases the speed as the lever is moved; up to a maximum walking speed determined by how fast the engine is running.

Moving both levers (2) and (3) together drives the trailer straight. By moving the levers in opposite directions the trailer can be turned gradually or on a dime.

(4) **Drive Gear** - Pushing this lever forward engages the four drive gears. Pulling the lever back disengages the four drive gears.

Lights on the front console indicate whether the drive gear is completely engaged or disengaged. The drive gear must be engaged before levers (2) and (3) will operate.

Ideally, when engaging the drive gear, *slowly* rotate the drive motors using levers (2) and (3) while pushing lever (4) forward. This can help mesh the drive gears as they engage and prevent the gears from "snapping" into place when starting to self-drive the trailer.

This lever is maintained and preferably left in the engaged position when driving the trailer to keep the gears firmly engaged together.

The drive gear must be completely disengaged (green light on) before attempting to tow the trailer. Otherwise, when the trailer plug is plugged into the tow vehicle, the air tanks will dump the air pressure to the brakes locking them on. The trailer wheels will not free-wheel while the drive gear is engaged.

(5) **Wheel Position** - Pushing this lever forward moves the wheel carriage 12 inches back to the "Tow" position. Pulling the lever towards you moves the wheel carriage 12 inches forward to the "Work" position to self-drive the trailer.

Make sure to disengage lever (6) before attempting to move the wheel position.

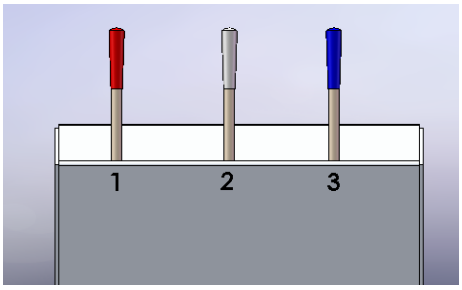
Lights on the front console indicate whether the wheel carriage is in the "Tow" or "Work" positions. The wheel carriage must be in the "Tow" position (green light on) before attempting to tow the trailer. Otherwise, when the trailer plug is plugged into the tow vehicle, the air tanks will dump the air pressure to the brakes locking them on.

The wheel carriage should be in the "Work" position when self-driving the trailer to keep the trailer load balanced. Although, self-driving the trailer straight can be done in the "Tow" position while using the landing gear (lever (1)) to keep the tongue raised. Do not try to *turn* the trailer while supported by the landing gear when fully loaded.

(6) **Wheel Lock** - Pushing this lever forward engages the four lock pins locking the carriage to the trailer frame. Pulling the lever towards you releases the four lock pins.

The lock pins must be released to move the carriage (lever (5)) to the "Tow" or "Work" position. The lock pins must be engaged before using or towing the trailer! Verify that the pins are fully engaged by checking that the four pins are through the carriage holes at each end of the carriage frame.

Lever location – Rear street-side panel (reel tensioning brakes)



The rear street-side panel is used for braking the reels. These reel tensioning brakes will operate at any time, even with engine power off. Description of each lever is as follows …

1) **Red Reel Brake** – Pulling this lever stops the red reel. The harder you pull the more braking tension you apply.
2) **White Reel Brake** – Pulling this lever stops the white reel. The harder you pull the more braking tension you apply.
3) **Blue Reel Brake** – Pulling this lever stops the blue reel. The harder you pull the more braking tension you apply.

These are momentary levers. Releasing the tensioning brake lever releases the brake.

The tensioning brakes contain reservoirs with brake fluid behind each lever inside the panel. Access to the reservoirs is done by removing the access panel on top of the console.

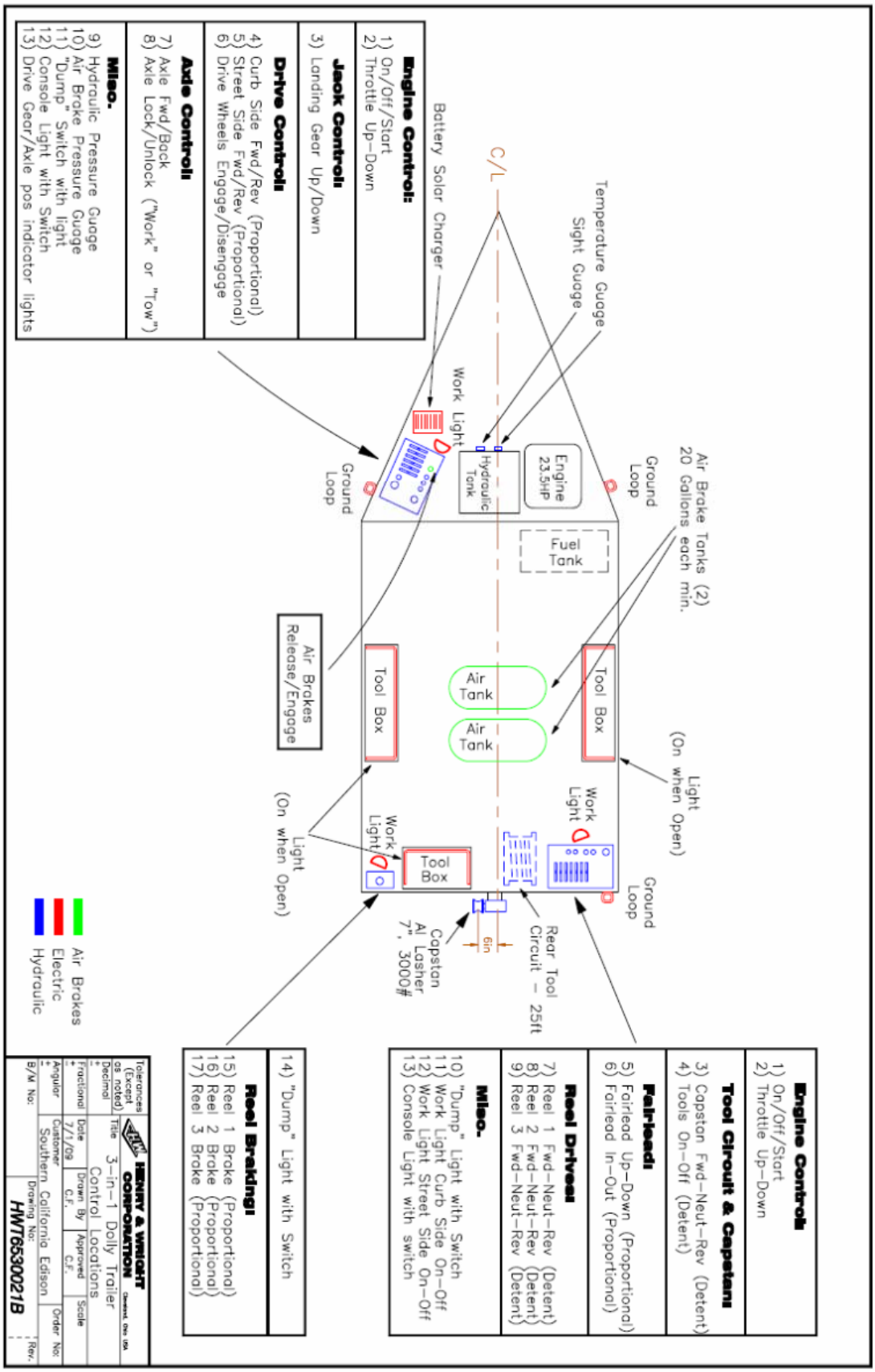
Earlier versions may require removing the console. To remove the console, you must first unplug the feed wire going into the rear tool box along the left side of the tool box. The Dump switch contacts must be released from the switch by sliding the *black lever* on top of the switch contacts all the way to the street side. The ABS light and Work light inline connectors must also be unplugged.

The reservoirs must be kept full and bled of all air to operate properly. Bleeding the tensioning brakes requires two people. One person must loosen the fluid relief fitting on top of a tensioning brake while the other is pulling on the braking handle. The fitting must be re-tightened before the handle is released. This is repeated until all air has escaped and only fluid is coming out of the relief fitting. Make sure to periodically check the fluid level during this procedure. If the fluid runs out you must start this procedure over.

Operating the Reel Locking Brakes:

Some trailers may include reel locking brakes on the rear of the trailer to lock each reel from turning during transport or when idle. These brakes are operated by pulling down on the handle 90-degrees until the handle locks in place. The brake tension is adjusted by turning the handle of the lever before locking the lever down. When adjusted properly, the reel will not rotate when locked down. Be sure to release these levers before attempting to rotate the reels.

Controls Layout



Rear Curbside Console …

Operating the Capstan:

The Capstan is operated by **lever #1** on the control panel at the rear curb side corner. This lever is detented to stay in the position selected. The center position is off. Moving the lever forward or back will rotate the capstan in the direction required. The farther from center the lever is moved, the faster the capstan will spin proportionally.

Operating the Tool Circuit:

The Tool Circuit is operated by **lever #2** on the control panel at the rear curb side corner. This lever is detented to stay in the position selected. The center position is off. Moving the lever back will provide 5 gpm to the tool circuit. Moving the lever forward will provide 10 gpm to the tool circuit.

The tool circuit hoses are self-retracting and can extend to 25ft. The hoses are located at the rear center just above the bumper.

Operating the Fairlead:

The Fairlead is operated by **levers #3 and #4** on the control panel at the rear curb side corner. These levers are spring-return to center.

Lever #3 tilts the Fairlead from 0 (upright) -90 degrees (horizontal). The Fairlead will remain at the current (desired) angle when the lever is released. This lever is proportional in that the farther you move the lever, the faster the tilt.

Lever #4 extends and retracts the Fairlead from 0-24 inches. The Fairlead will remain at the current (desired) distance when the lever is released. This lever is proportional in that the farther you move the lever, the faster the Fairlead will extend/retract.

Rotating the Reels:

The Reels are rotated by **levers #5, #6, and #7** on the control panel at the rear curb side corner. These levers are detented to stay in the position required. The center position is off. Moving the lever forward or back will rotate the reel in the direction required. The farther from center the lever is moved, the faster the reel will spin proportionally from 0-16 rpm (under load).

The RED lever (**#5**) rotates the RED reel.

The WHITE lever (**#6**) rotates the WHITE reel.

The BLUE lever (**#7**) rotates the BLUE reel.

Front Street-side Console …

Operating the Landing Gear (Front Jack):

The Landing Gear is operated by **lever #1** on the control panel at the front street side corner. This lever is spring-return to center. Push the lever back to raise the landing gear. Pull the lever forward to lower the landing gear.

Stops are internally set in this lever to limit the speed of the landing gear so as to not “bounce” (jerk) the trailer when adjusting the landing gear.

Self-Driving the Trailer …

Steps must be followed in a certain order prior to self driving the trailer. For this reason, the following levers will be described out of sequence…

Wheel Carriage Lock Pins:

The wheel carriage lock pins are operated by **lever #6** on the control panel at the front street side corner. This lever is spring return to center. The lock pins must be disengaged before sliding the wheel carriage to the front (WORK) position to self drive the trailer.

Push Lever #6 back to disengage the lock pins. The Lock Pins can be inserted only at the full front (WORK) position or at the full rear (TOW) position. *Attempting to engage the Lock Pins at any other position will bend or damage the frame or carriage.*

MAKE SURE THE CARRIAGE **LOCK PINS** ARE RELEASED BEFORE SLIDING THE CARRIAGE ASSEMBLY!

WORK & TOW Positioning:

The wheel carriage is moved to the WORK or TOW position by **lever #5** on the control panel at the front street side corner. This lever is spring return to center.

Push Lever #5 back to slide the wheel carriage forward to the WORK position (amber light lit). The movement will stop whenever the lever is released. The lever must be held back until the full travel is reached. The WORK (forward) position is 4-inches forward of reel center.

Pull Lever #5 forward to slide the wheel carriage back to the TOW position (green light lit). The movement will stop whenever the lever is released. The lever must be held back until the full travel is reached. The TOW (rear) position is 8-inches behind reel center.

MAKE SURE THE CARRIAGE **LOCK PINS** ARE LOCKED IN PLACE BEFORE SELF-DRIVING THE TRAILER OR TOWING THE TRAILER!

MAKE SURE THE WHEEL CARRIAGE IS IN THE FORWARD (*WORK*) POSITION BEFORE SELF-DRIVING THE TRAILER!

Engaging/Disengaging the Drive Gears:

The Drive Gears are engaged and disengaged by **lever #4** on the control panel at the front street side corner. This lever is detented to stay in the position required. The center position is off. This lever can be left in the fully detented position after engagement or disengagement, or returned to the center position. The system has a built-in check valve to hold current hydraulic pressure which will keep the drive gears in the position selected, regardless of lever position.

Pushing the lever backward will engage the drive gears to the ring gears on all 4 wheels (amber light lit). The farther from center the lever is moved, the faster the gears will engage proportionally.

The drive gears should be engaged *while* slowly rotating the pinion gears at the same time using Levers #2 and #3. This will aid in meshing the gear teeth during engagement. The direction of gear rotation does not matter while engaging; therefore, all 3 levers can be pushed backward together while engaging. Be careful, as when the gears become engaged, Levers #2 and #3 will drive the trailer backwards while held in. See the next section “Operating the Drive Wheels”.

If the gear teeth do not align properly on any of the wheels, you will hear a “snap” as the gears pop together when starting to self-drive the trailer.

Pulling the lever forward will disengage the drive gears from the ring gears on all 4 wheels (green light lit). The farther from center the lever is moved, the faster the gears will disengage proportionally. ***Be sure to completely disengage the drive gears the full travel (green light is on) before attempting to tow the trailer.***

Operating the Drive Wheels:

The drive wheels are operated by **levers #2 and #3** on the control panel at the front street side corner. These levers are spring-return to center.

Lever #2 operates the drive wheels on the CURB side.

Lever #3 operates the drive wheels on the STREET side.

Pushing the levers back drives the trailer backwards. Pulling the levers toward you drives the trailer forward. Turning the trailer is accomplished by moving only one of the levers. Tighter turns can be accomplished by pushing one lever and pulling the other to drive one side forward and the other side in reverse.

The maximum self-drive speed of the trailer can be increased by increasing the engine speed. The trailer maximum speed range can be between 60 and 100 feet per minute.

To self-drive the trailer:

Start by working the levers from right to left … Lever (6) first.

1) Release the wheel lock pins using lever (6).
2) Move the wheel carriage to the “Work” position using lever (5) (amber light lit).
3) Re-engage the wheel lock pins using lever (6).
4) Raise the landing gear (front jack) using lever (1).
5) Use lever (4) to engage the drive gear (amber light lit). Slightly move levers (2) and (3) while moving lever (4) to aid in meshing the drive gears.
6) Both amber lights should be lit.
7) Release the brakes by pushing the yellow Air Brake switch on the console. The air tank supply should hold enough air for at least two air brake releases when disconnected from the tow vehicle.
8) Use levers (2) and (3) to self-drive the trailer.

To tow the trailer:

1) Use lever (4) to disengage the drive gear (green light lit).
2) Lower the landing gear (front jack) using lever (1).
3) Release the wheel lock pins using lever (6).
4) Move the wheel carriage to the “Tow” position using lever (5) (green light lit).
5) Re-engage the wheel lock pins using lever (6).
6) Both green lights should be lit.

Suspension:

The carriage assembly was specifically designed for minimum height trailer clearance using standard axle and spring components. The entire suspension assembly is mounted on an independent frame that slides along the main trailer frame and locked together with four locking pins at either the forward (Work) or back (Tow) positions (see page 7).

Wheel Carriage Removal:

The entire carriage assembly can be removed from the trailer for servicing by performing the following steps in this order …

1) Empty the three reels.
2) Release the four wheel lock pins. Move the carriage assembly somewhere in the middle of the stroke (to protect the Tow and Work limit switches). Then turn off the engine.
3) Unscrew the four safety clamp angles on top of the carriage hugging the trailer frame rails.
4) Unscrew the rear end of the two 3/8in air lines at the air tank and air brake manifold.
5) Unbolt the drive Engage and Disengage limit switches at the *front driver side* drive assembly. Note that the heavier 4-conductor cable is on the lower (Disengage) switch.
6) Unscrew the cover of the air dump valve and remove the electric cable from the solenoid.
7) Remove the pins from the rear (rod-end) of the two cylinders that move the carriage located at the rear of the tongue.
8) Unfasten the 8 hydraulic lines to the four drive motors. Mark the lines so they don’t get mixed up.
9) Unfasten the 8 hydraulic lines to the four drive engage cylinders. Mark the lines so they don’t get mixed up.
10) Suspend and lift the rear of the trailer approximately 2ft to clear the tires.
11) Roll the carriage assembly out from the rear.

ABS Braking System:

See Drawing **HWT8533205A** for air brake connections and ABS system. Note the ABS is on the front axle only. An air pressure gauge is located on the front control console to monitor air brake pressure.

When disconnected from the tow vehicle, the air tank supply should hold enough air for at least two brake releases for self-driving the trailer.

The ABS wiring connections are made behind the rear passenger-side brake light to a 7-conductor cable running to the front junction box and trailer plug.

Axles:

The 22.5K axles, springs, hangers, and ABS system are standard Dexter Axle components. See the Dexter Axle portion of this manual for reference, maintenance, or repair.

CALIFORNIA

PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.