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This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

The words DANGER, WARNING, CAUTION, and NOTICE are used throughout this manual to highlight important information.

⚠ DANGER

Indicates a hazardous situation that, if not avoided, *will* result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, *could* result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, *could* result in minor or moderate injury.

NOTICE

Indicates a situation that can cause damage to the engine, personal property, and/or the environment, or cause the equipment to operate improperly.

NOTE: *Indicates a procedure, practice, or condition that should be followed in order for the pump to function in the manner intended.*

Power Take-Off (PTO) Safety Information

These instructions are for your safety and the safety of the end user. Read them carefully until you understand them.

Important: Safety Information and Owner's Manual

Chelsea Power Take-Offs are packaged with safety information, decals, instructions, and owner's manual. These items are located in the envelope with the PTO mounting gaskets. Also, safety information and installation instructions are packaged with some individual parts and kits. **Be sure to read the owner's manual before installing or operating the PTO.** Always install the safety information decals according to the instructions provided. Place the owner's manual in the vehicle glove compartment.

⚠ WARNING



Verify that the PTO is properly selected to operate while the vehicle is in motion. If in doubt about the PTO specifications and capabilities, avoid operating the PTO when the vehicle is in motion. Improper applications and/or operation can cause serious personal injury and premature failure of the vehicle, the driven equipment, and/or the PTO.

Always remember to disengage the PTO when the driven equipment is not in operation.

GENERAL SAFETY INFORMATION

To prevent injury to yourself and/or damage to the equipment:

- Read carefully all owner's manuals, service manuals, and/or other instructions.
- Always follow proper procedures, and use proper tools and safety equipment.
- Be sure to receive proper training.
- Never work alone while under a vehicle or while repairing or maintaining equipment.
- Always use proper components in the applications in which they are approved.
- Be sure to assemble components properly.
- Never use worn-out or damaged components.
- Always block any raised or moving device that may injure a person working on or under a vehicle.
- Never operate the controls of the Power Take-Off or other driven equipment from any position that could result in getting caught in the moving machinery.

PROPER MATCHING OF PTO

WARNING



Equipment Hazard: Always match the Power Take-Off to the vehicle transmission and the auxiliary equipment being powered. An improperly matched Power Take-Off could cause severe damage to the vehicle transmission, the auxiliary driveshaft, and/or to the auxiliary equipment being powered. Damaged components or equipment could malfunction, causing serious personal injury to the vehicle operator or to others nearby.

- Always refer to Chelsea catalogs, literature, and owner's manuals. Follow Chelsea recommendations when selecting, installing, repairing, or operating a Power Take-Off.
- Never attempt to use a Power Take-Off not specifically recommended by Chelsea for the vehicle transmission.
- Always match the Power Take-Off's specified output capabilities to the requirements of the equipment to be powered.
- Never use a Power Take-Off whose range of speed could exceed the maximum.

COLD WEATHER OPERATION OF POWERSHIFT PTO

 **WARNING**

Sudden Movement Hazard: Always allow the vehicle to warm up before operating driven equipment. During extreme cold weather operation [32°F, (0°C) and lower] a disengaged Powershift Power Take-Off can momentarily transmit high torque that will cause unexpected output shaft rotation. This is caused by the high viscosity of the transmission oil when it is extremely cold. As slippage occurs between the Power Take-Off clutch plates, the oil will rapidly heat up and the viscous drag will quickly decrease.

The Power Take-Off output shaft rotation could cause unexpected movement of the driven equipment, resulting in serious personal injury, death, or equipment damage.

- Driven equipment must have separate controls.
- The driven equipment must be left in the disengaged position when not in operation.
- Do not operate the driven equipment until the vehicle is allowed to warm up.

ROTATING AUXILIARY DRIVESHAFTS

 **WARNING**

Entanglement Hazard: Use extreme caution when near rotating parts. Rotating parts can entangle hands, feet, hair, clothing, and/or accessories.

- Keep hands and feet away from rotating parts.
- Tie up long hair and remove jewelry.
- Operate equipment with guards in place.
- NEVER wear loose-fitting clothing, dangling drawstrings, or items that could become caught.
- Always turn the engine OFF and chock the wheels before working on the Power Take-Off or driven equipment.
- NEVER go under the vehicle when the engine is running.

GUARDING AUXILIARY DRIVESHAFTS

WARNING



Entanglement Hazard: Never operate an auxiliary driveshaft without a guard installed. The manufacturer strongly recommends that a Power Take-Off (PTO) and a directly mounted pump be used to eliminate the auxiliary driveshaft whenever possible. If an auxiliary driveshaft is used and remains exposed after installation, it is the responsibility of the vehicle designer and PTO installer to install a guard.

Auxiliary driveshafts may be installed with either recessed or protruding set screws. If you choose a square head set screw, you should be aware that it will protrude above the hub of the yoke and there may be a point where clothes, skin, hair, hands, etc. could be snagged. A socket head screw, which may not protrude above the hub of the yoke, does not permit the same amount of torquing as does a square head set screw. Also, a square head set screw, if used with a lock wire, will prevent loosening of the screw caused by vibration. Regardless of the choice made with respect to a set screw, an exposed rotating auxiliary driveshaft must be guarded.

USING SET SCREWS

WARNING



Snag Hazard: Always use caution when working around an auxiliary driveshaft that square head set screws are installed to avoid snagging of your skin, hair and clothes.

Remove the driveshafts, driveshaft hanger bearing, bracket, and brake assembly from the chassis.

In some applications, it is necessary to move the truck frame cross-member forward or back to provide clearance for the pump. Cross-members are usually riveted to the truck frame. The rivets can be cut with a cold chisel and sledge. The cross-member may be re-fastened by drilling new holes and bolting them into position.

Universal joints must always be installed in pairs to transmit uniform rotary motion. The operating angles of each universal joint in the pair should be as close to equal as possible. The input and output shafts of each universal joint pair may be either parallel, or so located that the centerline of each shaft intersects the midpoint of the shaft connecting each universal joint (intersecting angles). This arrangement may be required if the coupling shaft between the pump and transmission is relatively short, or if the engine is mounted with its driveshaft horizontal. Refer to detail drawing DGM1301 for examples of parallel shaft and intersecting angle installations.

Measure the angle between the truck transmission shaft centerline and chassis frame (often 4 degrees).

Suspend the pump so that the pump driveshaft centerline is as close as possible to being inline and parallel to the truck transmission shaft centerline. Example: If the truck transmission is at 4 degrees with horizontal, the pump driveshaft should also be set at 4 degrees with horizontal. This will ensure that even if the transmission or pump are offset from each other, the universal joint operating angles will be equal.

The input shaft of the truck differential must be at the same angle with horizontal as the pump driveshaft. This is especially important since the operating angles of this universal joint pair constantly change under load and road conditions, and very often the differential input shaft is offset from the truck centerline. The differential shaft angle can be changed by shimming under the leaf springs.

Before proceeding further, align the suction arms so they are perpendicular to the frame rails. By measuring from the frame flange to the centerline of the pump shaft at both front and rear, check to confirm the pump shaft is parallel to the transmission shaft.

Place mounting brackets into position as shown on detail drawing DGM1300 and securely clamp against the side of the frames. Use a transfer punch to mark hole centers for the extension arm lug cap screws. Remove the brackets, center punch the marks, and drill 5/8 in. diameter holes as required.

Attach brackets to the suction extensions with 5/8 in. NC x 2-3/4 in. cap screws (provided). Torque to 112 ft-lb.

Drill holes through the side frames and attach the mounting brackets.

NOTICE

One mounting bracket is designed to permit truck frame flex without imposing stress on the pump extensions. The bracket must be free to pivot as seen in drawing DGM1300.

The pump input and output shafts are supplied with lock-on type end yokes sized to match existing driveline components. A slip-type coupling shaft must be supplied in the front and rear of the pump. See drawing DNM0000 for component numbers or contact your local driveline supplier for assistance.

Keep the following points in mind when positioning the pump and constructing the driveline.

1. Do not exceed recommended universal joint operating angles. Complimentary shaft angles should be equal and as low as possible.
2. Do not exceed universal joint torque limitations.

[INSTALLATION]

3. Do not exceed driveshaft speed/length limitations.
4. Yokes on each coupling shaft must be in phase. When in phase, the slip yoke lugs (ears) and tube yoke lugs (ears) are in line.

Torque the bearing cap retaining bolts to the following specifications:

Full Round End Yoke			
Series	Thread Size		Cap Screw Torque (lb-ft)
1610	(5/16)	.312-24	26-35
1710	(3/8)	.375-24	38-48
1760	(3/8)	.375-24	38-48
1810	(3/8)	.375-24	38-48
1880	(7/16)	.438-20	60-70

Quick Disconnect Half Round End Yoke			
Series	Thread Size		Cap Screw Torque (lb-ft)
1590	(3/8)	.375-24	45-60
1610	(3/8)	.375-24	45-60
1710	(1/2)	.500-20	115-135
1760	(1/2)	.500-20	115-135
1810	(1/2)	.500-20	115-135

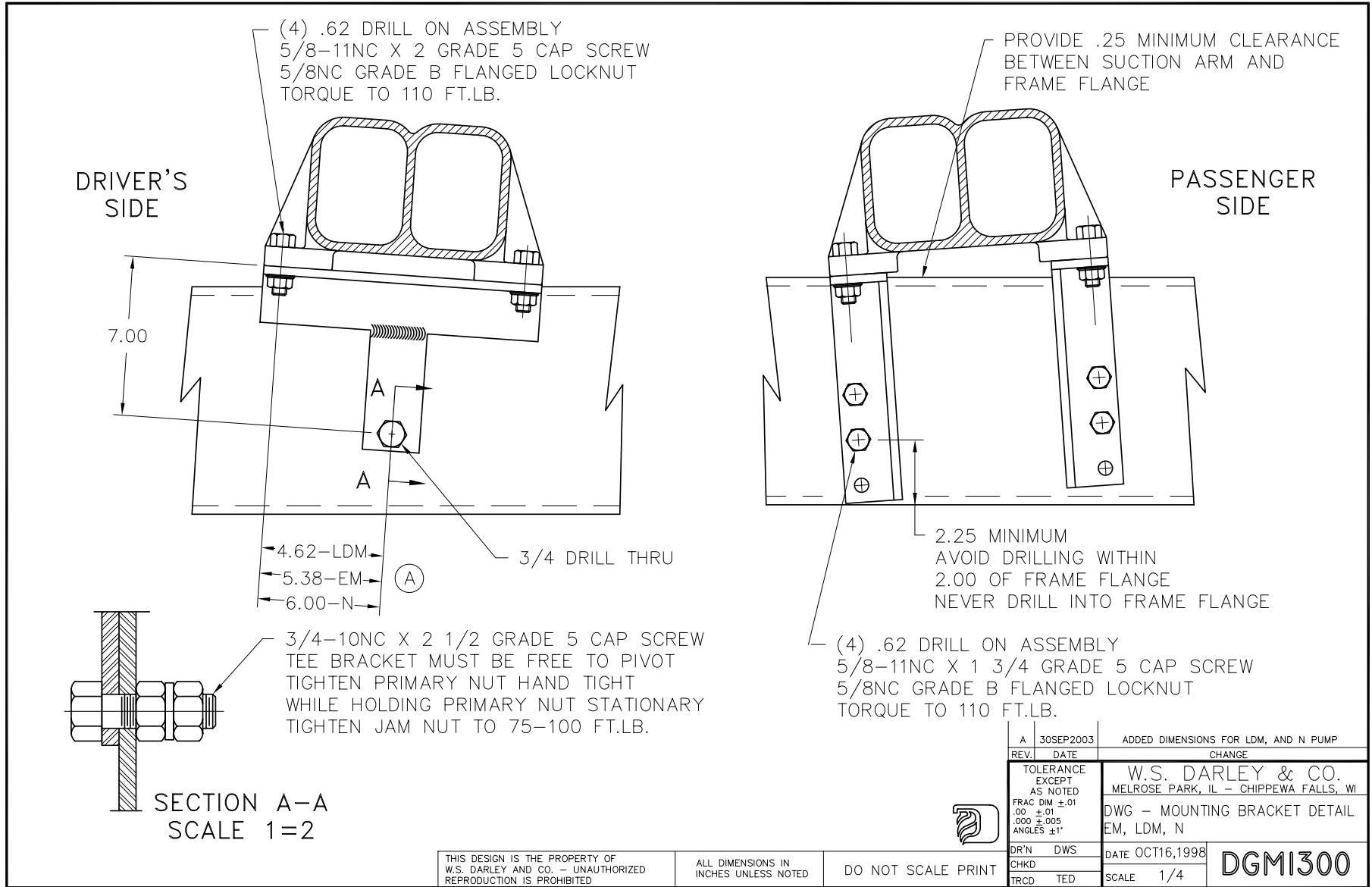
Lubricate universal joint cross using National Lubricating Grease Institute Extreme Pressure (NLGI EP) Grade 2 lubricating grease.

PRIMER CONNECTION: For 12 volt electric priming pump installation, see drawing DVCO108. See drawing DVCO109 for oilless primer.

HEATER CONNECTION: Two tapped openings in the pump casing head are provided for circulating engine coolant through the heater jacket to prevent freezing in cold weather. Use no smaller than a 1/2 in. line for this connection.

PUMP SHIFT INSTALLATION: For power shift installation, refer to drawing DGS1200 for automatic transmission wiring details.

ENGINE COOLING: Bypass radiator cooling water through the heat exchange (pump heater jacket) and fittings. See drawing DGS0400.



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ALL DIMENSIONS IN
INCHES UNLESS NOTED

DO NOT SCALE PRINT

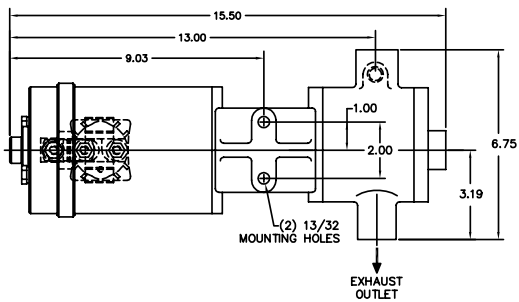
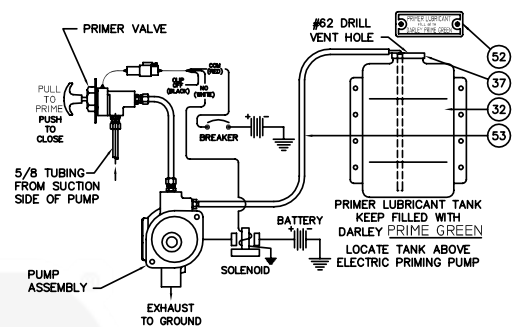
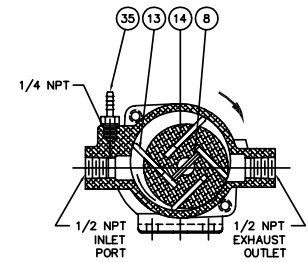
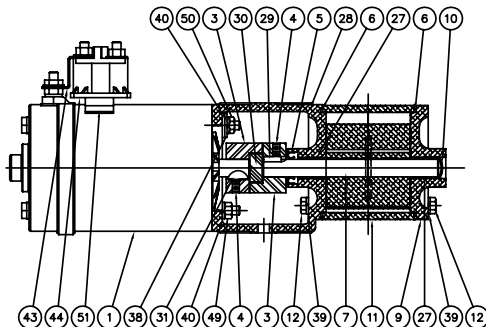
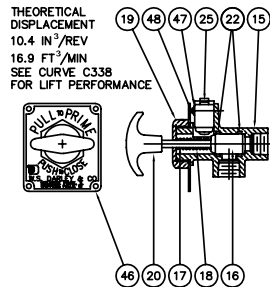


A	30SEP2003	ADDED DIMENSIONS FOR LDM, AND N PUMP
REV.	DATE	CHANGE
TOLERANCE EXCEPT AS NOTED		W.S. DARLEY & CO. MELROSE PARK, IL - CHIPPEWA FALLS, WI
FRAC DIM ±.01 .00 ±.01 .000 ±.005 ANGLES ±1°		DWG - MOUNTING BRACKET DETAIL EM, LDM, N
DR'N	DWS	DATE OCT16,1998
CHKD		SCALE 1/4
TRCD	TED	DGMI300

DETAIL DRAWINGS

REVISIONS			
LR#	DESCRIPTION	DATE	CHK. NO. / APP'D
A	REARRANGED AND MIRRORED VIEWS	08/11/04	2004-194 / DAB
B	ADDED AMPERAGE INFORMATION	28MAY09	5495 / MJB

REP. NO.	DESCRIPTION	QTY.
1	DC MOTOR	1
3	FLEXIBLE COUPLING	1
4	SET SCREW	1
5	OIL SEAL	1
6	O-RING	2
7	ROTOR SHAFT	1
8	DRIVE LOCK PIN	1
9	END CAP	1
10	FREEZE PLUG	1
11	CYLINDER	1
12	HHCS - 5/16-18 NC	4
13	ROTOR VANES	4
14	ROTOR - 4 VANE	1
15	VALVE BODY	1
16	VALVE PLUG	1
17	STEM	1
18	SPRING	1
19	PANEL VALVE NUT	1
20	PLASTIC KNOB - T HANDLE	1
22	O-RING	2
25	MICROSWITCH	1
27	BUSHING	2
28	CYLINDER HEAD	1
29	ROTOR SHAFT KEY	1
30	FLEXIBLE COUPLING	1
31	MOTOR SHAFT KEY	1
32	PRIMER TANK	1
35	BARB FITTING	1
37	CAP - PRIMER TANK	1
38	FLAT WASHER	2
39	LOCK WASHER	4
40	LOCK WASHER	2
43	CONDUCTOR	1
44	SOLENOID	1
46	PRIMER DECAL	1
47	LOCK WASHER	2
48	RD HD MACH SCREW	1
49	HEX NUT, 5/16-18 NC	2
50	HEX JAM NUT, 5/16-18 NC	1
51	TRUSS HD SCREW	2
52	LUBRICANT PLATE	1
53	TUBING	1
54	GROUND STRAP	1



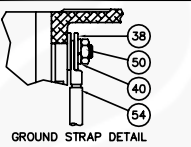
NOTE:
MOUNT WITH EXHAUST OUTLET DOWN.

CONNECT #54 4 GA. COPPER GROUND STRAP TO CLEAN, PAINT FREE GROUNDING SURFACE
IF SUPPLIED GROUND STRAP #54 IS REMOVED FROM ASSEMBLY, RETIGHTEN CYLINDER HEAD ADAPTER RETAINING NUTS #49 & #50 EQUALLY TO 90 IN.LB.

POSITIVE LEAD WIRE SIZE FOR 12V PRIMERS:
UP TO 5'.....#6 COPPER
5' TO 8'.....#4
8' TO 12'.....#2
12' TO 16'.....#1
16' TO 20'.....#0
20' TO 25'.....#00 DOUBLE RUN LENGTH

WEIGHT = 27 LB [12.1 KG]

② 12V-240AMPS
24V-140AMPS



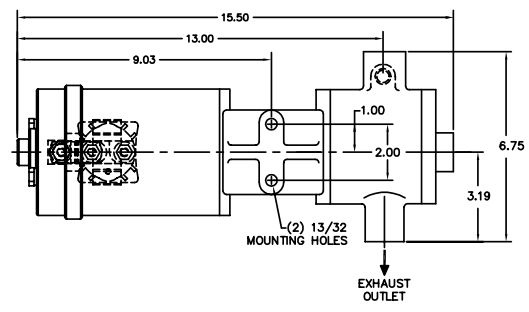
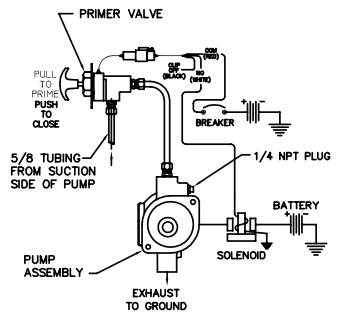
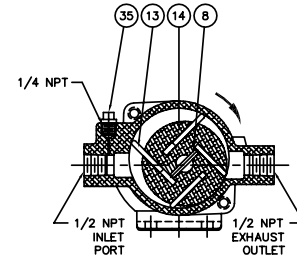
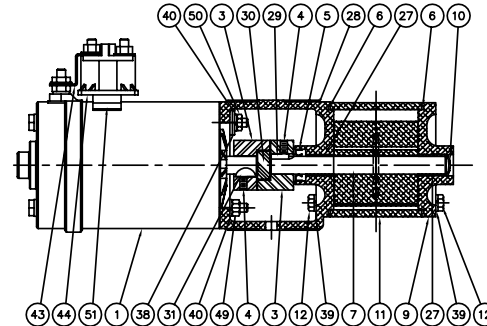
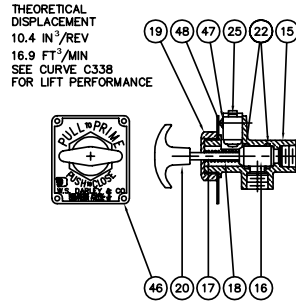
REMOVE SHARP EDGES

MATERIAL DESCRIPTION		MATERIAL NO.		PATTERN NO.		TOLERANCE		W. S. DARLEY & CO. MILWAUKEE PARK - CHIPPewa FALLS, WI	
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. - UNAUTHORIZED REPRODUCTION IS PROHIBITED		ALL DIMENSIONS IN UNLESS OTHERWISE NOTED		DO NOT SCALE PRINT		DATE JUN17/03		DVC0108	

DETAIL DRAWINGS

REVISIONS				
LT#	DESCRIPTION	DATE	CHG. NO.	APP'D
A	REARRANGED AND MIRRORED VIEWS	08JLD4 2004-194		DAB
B	ADDED AMPERAGE INFORMATION	28MAY09	5495	MJW

REP. NO.	DESCRIPTION	QTY.
1	DC MOTOR	1
3	FLEXIBLE COUPLING	1
4	SET SCREW	1
5	OIL SEAL	1
6	O-RING	2
7	ROTOR SHAFT	1
8	DRIVE LOCK PIN	1
9	END CAP	1
10	FREEZE PLUG	1
11	CYLINDER	1
12	HHCS - 5/16-18 NC	4
13	ROTOR VANES	4
14	ROTOR - 4 VANE	1
15	VALVE BODY	1
16	VALVE PLUG	1
17	STEM	1
18	SPRING	1
19	PANEL VALVE NUT	1
20	PLASTIC KNOB - T HANDLE	1
22	Q-RING	2
25	MICROSWITCH	1
27	BUSHING	2
28	CYLINDER HEAD	1
29	ROTOR SHAFT KEY	1
30	FLEXIBLE COUPLING	1
31	MOTOR SHAFT KEY	1
35	1/4 NPT PLUG	1
38	FLAT WASHER	2
39	LOCK WASHER	4
40	LOCK WASHER	2
43	CONDUCTOR	1
44	SOLENOID	1
46	PRIMER DECAL	1
47	LOCK WASHER	2
48	RD HD MACH SCREW	1
49	HEX NUT, 5/16-18 NC	2
50	HEX JAM NUT, 5/16-18 NC	1
51	TRUSS HD SCREW	2
54	GROUND STRAP	1

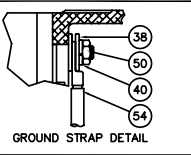


NOTE:
MOUNT WITH EXHAUST OUTLET DOWN.
CONNECT #54 4 GA. COPPER GROUND STRAP TO CLEAN, PAINT FREE GROUNDING SURFACE
IF SUPPLIED GROUND STRAP #54 IS REMOVED FROM ASSEMBLY, RETIGHTEN CYLINDER HEAD ADAPTER RETAINING NUTS #48 & #50 EQUALLY TO 90 IN.LB.
LUBRICATE INTERNAL COMPONENTS WITH DOW CORNING COMPOUND #111 SILICONE

⊙ 12V-240AMPS
⊙ 24V-140AMPS

POSITIVE LEAD WIRE SIZE FOR 12V PRIMERS:
UP TO 5'.....#6 COPPER
5' TO 8'.....#4
8' TO 12'.....#2
12' TO 16'.....#1
16' TO 20'.....#0
20' TO 25'.....#00 DOUBLE RUN LENGTH

WEIGHT = 27 LB [12.1 KG]



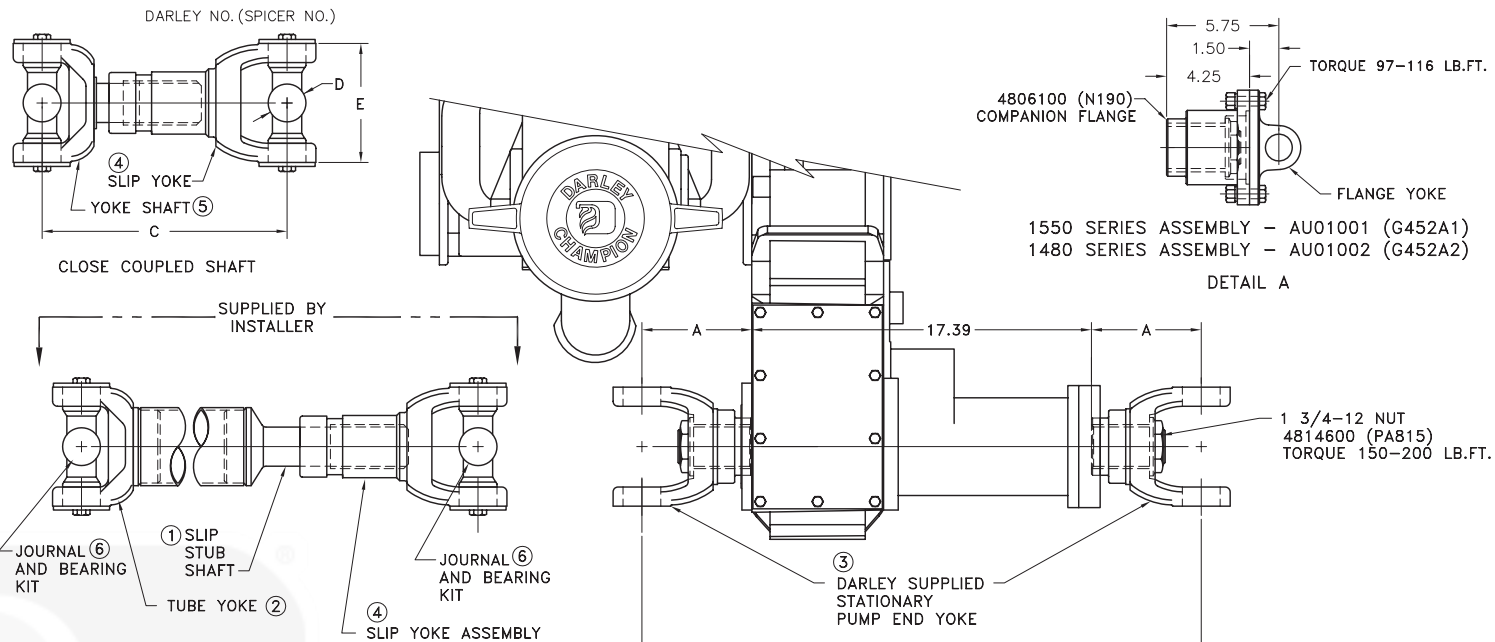
REMOVE SHARP EDGES

MATERIAL DESCRIPTION	MATERIAL NO.	PATTERN NO.	QTY.	UNIT	DATE	SCALE
DO NOT SCALE PRINT					JUN17.03	1/2

W.S. DARLEY & CO.
ELEC PRIMR 4VANE NO TANK
DVC0109

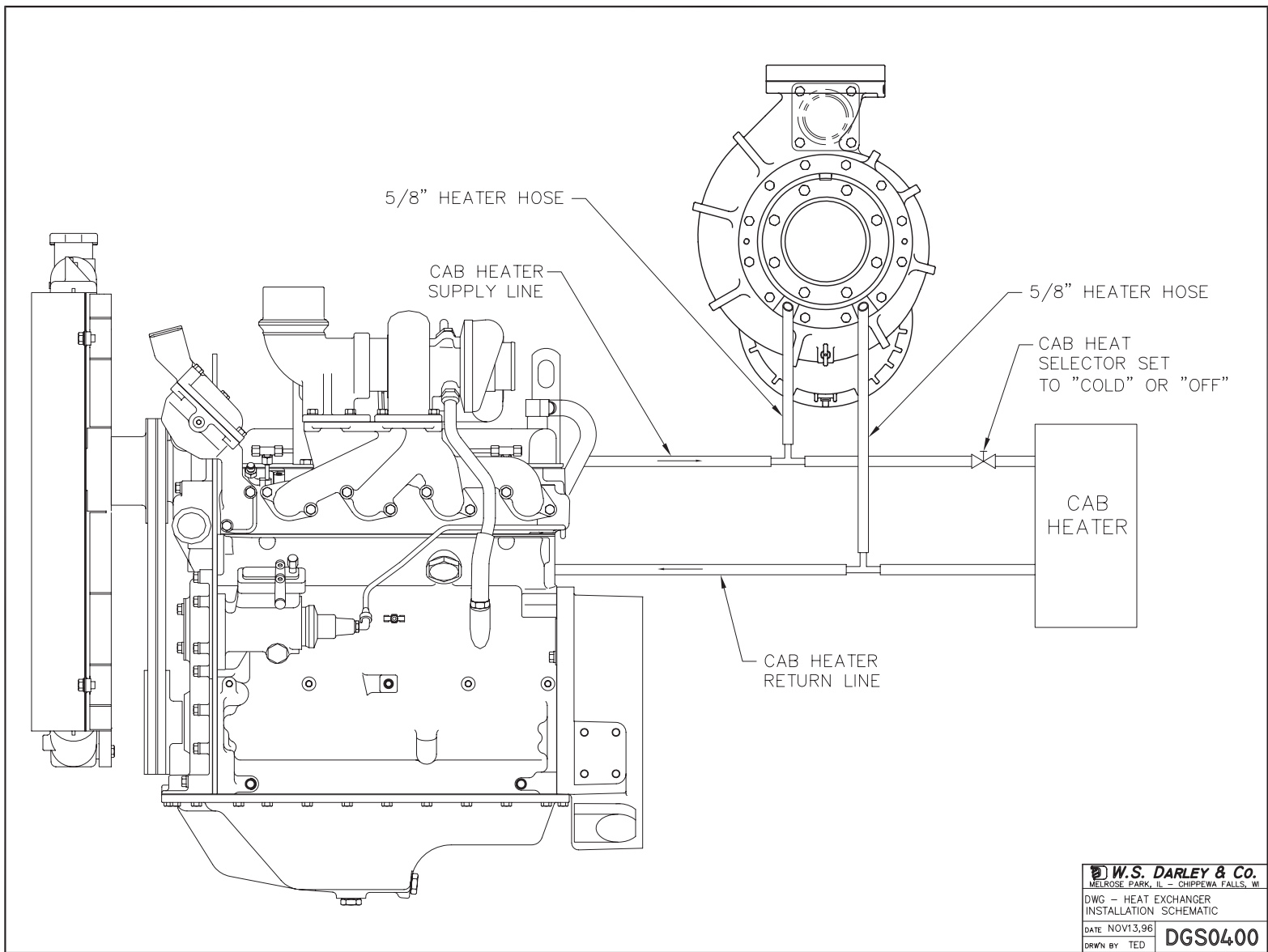
DETAIL DRAWINGS

YOKE SERIES	TUBE SIZE	SLIP STUB SHAFT ①	TUBE YOKE ②	PUMP YOKE ③	SLIP YOKE ④	YOKE SHAFT (FOR CLOSE COUPLE) ⑤	BEARING KIT ⑥	A	B	C CLOSE COUPLED	D	E
1550	3.00x.095W	PA671 (4-40-821)	PA678 (4-28-377X)	ASSEMBLY: AU01001 [G452A1] (REF. DETAIL A)	PA690 (4-3-1241KX)	PA695 (4-82-371)	PA620 (5-155X)	5.75	28.90	10.31	1.38	4.97
1550	3.50x.095W	PA672 (4-40-761)	PA679 (4-28-307)		PA690 (4-3-1241KX)	PA695 (4-82-371)	PA620 (5-155X)	5.75	28.90	10.31	1.38	4.97
1610	3.50x.095W	PA673 (5-40-451)	4816900(5-28-167)	4813300 (5-4-4971)	4814201 (5-3-108KX)	PA696 (5-82-871)	4809900 (5-279X)	6.12	29.64	11.25	1.88	5.31
1610	3.50x.134W	4814401 (5-40-1151)	4810800(5-28-627)					4813300 (5-4-4971)	4814201 (5-3-108KX)	PA696 (5-82-871)	4809900 (5-279X)	6.12
1710	4.00x.134W	PA675 (6-40-711)	4811700 (6-28-347)	4813400 (6-4-6611)	4813700 (6-3-2741KX)	4813800 (6-82-1251)	4810300 (5-280X)	5.63	28.66	11.42	1.94	6.09
1710	4.50x.134W	PA676 (6-40-631)	PA682 (6-28-407)					4813400 (6-4-6611)	4813700 (6-3-2741KX)	4813800 (6-82-1251)	4810300 (5-280X)	5.63
1760	4.00x.134W	PA675 (6-40-711)	PA683 (6.3-28-17)	4813500 (6.3-4-651)	PA693 (6.3-3-41KX)	PA698 (6.3-82-21-13)	4810600 (5-407X)	6.00	29.40	13.66	1.94	7.00
1760	4.50x.134W	PA676 (6-40-631)	PA683 (6.3-28-17)					4813500 (6.3-4-651)	PA693 (6.3-3-41KX)	PA698 (6.3-82-21-13)	4810600 (5-407X)	6.00
1810	4.50x.134W	PA677 (6.5-40-201)	PA684 (6.5-28-117)	4813600(6.5-4-3451)	PA694 (6.5-3-1431KX)	PA699 (6.5-82-451-8)	PA633 (5-281X)	5.88	29.16	13.46	1.94	7.55



- NOTES:
- REFERENCE DIMENSION 'B' IS FOR ALL CHAMPION PUMPS WHICH USE THE 'N' STYLE GEAR BOX [EM-LDM-N-PSM]
 - 1810 SERIES JOINTS WILL NOT SWING UNDER CASING OF 'N' PUMP FORWARD OF GEAR CASE
 - 1760 SERIES JOINTS REQUIRE SPECIAL YOKE KIT KA00051 TO SWING UNDER CASING OF 'N' PUMP FORWARD OF GEAR CASE (H)

TOLERANCE EXCEPT AS NOTED FRAC DIM ±.01 DEC DIM ±.005 ANGLES ±1°		W.S. DARLEY & CO. MELROSE PARK, IL - CHIPPEWA FALLS, WI	
PART NO. N188		DRIVELINE DETAIL SPICER LOCKON YOKE	
DATE FEB22,91		SCALE 1/4	
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DO NOT SCALE PRINT		DNMM0000	



10-Bolt Powershift P.T.O.s*

SAFETY INFORMATION

These instructions are for your safety and the safety of the end user. Read them carefully until you understand them.

GENERAL SAFETY INFORMATION

To prevent injury to yourself and/or damage to the equipment:

- Read carefully all owner's manuals, service manuals, and/or other instructions.
- Always follow proper procedures, and use proper tools and safety equipment.
- Be sure to receive proper training.
- Never work alone while under a vehicle or while repairing or maintaining equipment.
- Always use proper components in applications for which they are approved.
- Be sure to assemble components properly.
- Never use wornout or damaged components.
- Always block any raised or moving device that may injure a person working on or under a vehicle.
- Never operate the controls of the Power Take-Off or other driven equipment from any position that could result in getting caught in the moving machinery.

PROPER MATCHING OF P.T.O.

WARNING

A Power Take-Off must be properly matched to the vehicle transmission and to the auxiliary equipment being powered. An improperly matched Power Take-Off could cause severe damage to the vehicle transmission, the auxiliary driveshaft, and/or to the auxiliary equipment being powered. **Damaged components or equipment could malfunction, causing serious personal injury to the vehicle operator or to others nearby.**

To avoid personal injury and/or equipment damage:

- Always refer to Chelsea catalogs, literature, and owner's manuals. Follow Chelsea recommendations when selecting, installing, repairing, or operating a Power Take-Off.
- Never attempt to use a Power Take-Off not specifically recommended by Chelsea for the vehicle transmission.
- Always match the Power Take-Off's specified output capabilities to the requirements of the equipment to be powered.
- Never use a Power Take-Off whose range of speed could exceed the maximum.

COLD WEATHER OPERATION OF POWERSHIFT P.T.O.

WARNING

During extreme cold weather operation [32°F (0°C) and lower], a disengaged Powershift Power Take-Off can momentarily transmit high torque that will cause unexpected output shaft rotation. This is caused by the high viscosity of the transmission oil when it is extremely cold. As slippage occurs between the Power Take-Off clutch plates, the oil will rapidly heat up and the viscous drag will quickly decrease.

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VENDOR INFORMATION

The Power Take-Off output shaft rotation could cause unexpected movement of the driven equipment, resulting in serious personal injury, death, or equipment damage.

To avoid personal injury or equipment damage:

- Driven equipment must have separate controls.
- The driven equipment must be left in the disengaged position when not in operation.
- Do not operate the driven equipment until the vehicle is allowed to warm up.

ROTATING AUXILIARY DRIVESHAFTS

WARNING



- Rotating auxiliary driveshafts are dangerous. You can snag clothes, skin, hair, hands, etc. This can cause serious injury or death.
- Do not go under the vehicle when the engine is running.
- Do not work on or near an exposed shaft when the engine is running.
- Shut off the engine before working on the Power Take-Off or driven equipment.
- Exposed rotating driveshafts must be guarded.

GUARDING AUXILIARY DRIVESHAFTS

WARNING

We strongly recommend that a Power Take-Off and a directly mounted pump be used to eliminate the auxiliary driveshaft whenever possible. If an auxiliary driveshaft is used and remains exposed after installation, it is the responsibility of the vehicle designer and P.T.O. installer to install a guard.

USING SET SCREWS

WARNING

Auxiliary driveshafts may be installed with either recessed or protruding set screws. If you choose a square head set screw, you should be aware that it will protrude above the hub of the yoke and may be a point where clothes, skin, hair, hands, etc. could be snagged. A socket head set screw, which may not protrude above the hub of the yoke, does not permit the same amount of torquing as does a square head set screw. Also, a square head set screw, if used with a lock wire, will prevent loosening of the screw caused by vibration. Regardless of the choice made with respect to a set screw, an exposed rotating auxiliary driveshaft must be guarded.

Important: Safety Information and Owner's Manual
Chelsea Power Take-Offs are packaged with safety information decals, instructions and an owner's manual. These items are located in the envelope with the P.T.O. mounting gaskets. Also, safety information and installation instructions are packaged with some individual parts and kits. **Be sure to read the owner's manual before installing or operating the P.T.O.** Always install the safety information decals according to the instructions provided. Place the owner's manual in the vehicle glove compartment.

 **WARNING****Operating the P.T.O. with the Vehicle in Motion**

Some Power Take-Offs may be operated when the vehicle is in motion. To do so, the P.T.O. must have been properly selected to operate at highway speeds and correctly matched to the vehicle transmission and the requirements of the driven equipment.

If in doubt about the P.T.O. specifications and capabilities, avoid operating the P.T.O. when the vehicle is in motion. Improper application and/or operation can cause serious personal injury or premature failure of the vehicle, the driven equipment, and/or the P.T.O.

Always remember to disengage the P.T.O. when the driven equipment is not in operation.

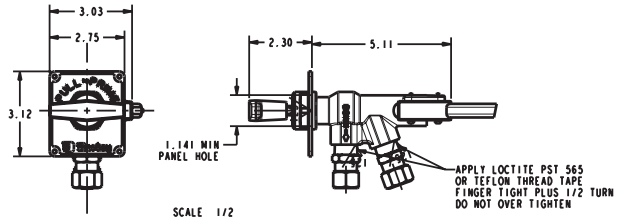
PUMP INSTALLATION PRECAUTIONS

Use a bracket to support the pump to the transmission if:

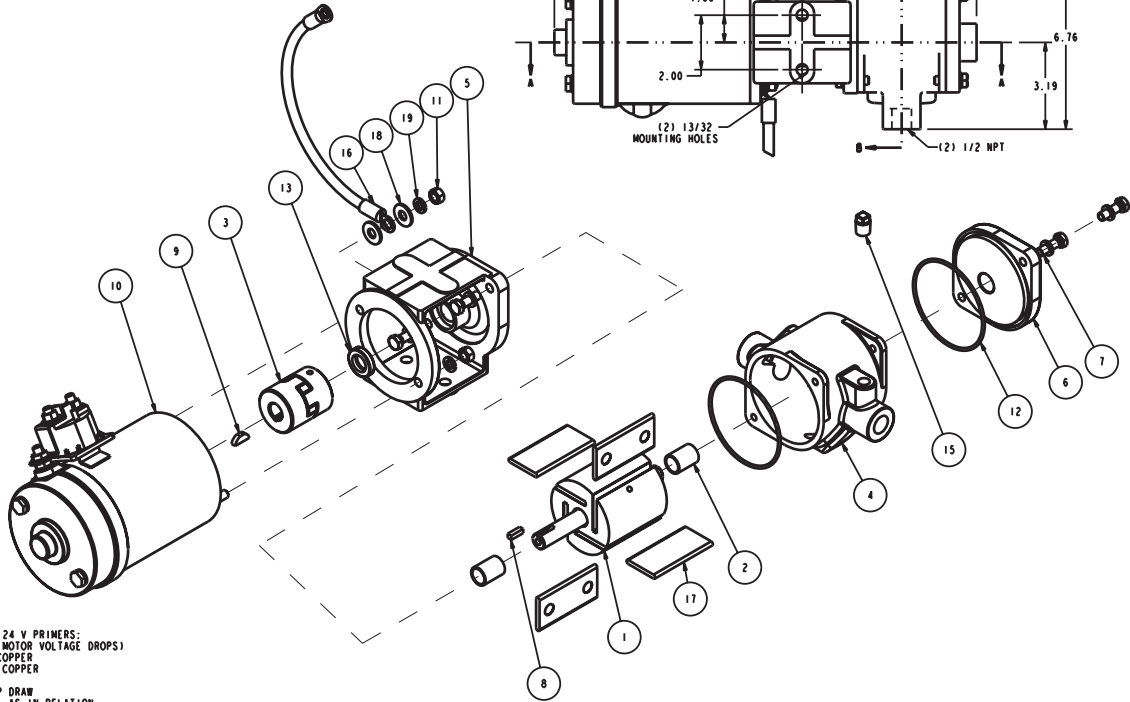
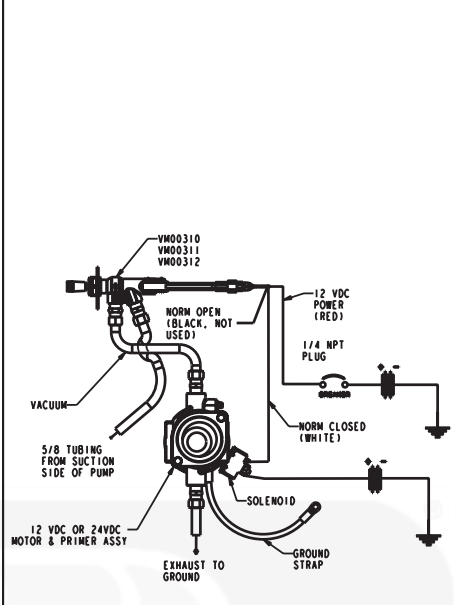
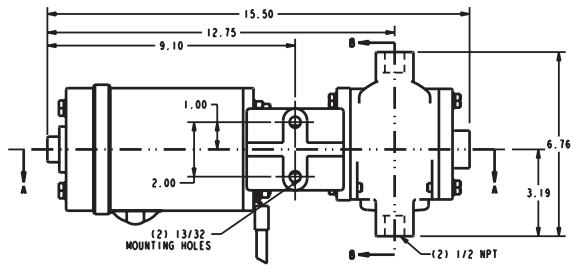
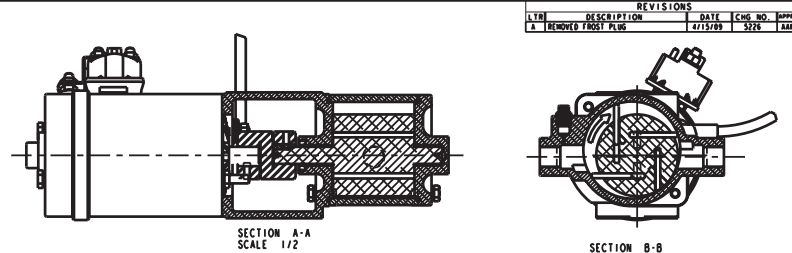
- The pump weighs **40 pounds (18.4 kg)** or more.
- The combined length of the P.T.O. and pump is **18 inches (45.72 cm)** or more from the P.T.O. centerline to the end of the pump.

[SCHEMATICS]

NO.	DESCRIPTION	PART NO.	QTY.
1	ASSEMBLY - PRIMER, ROTOR	4420105	1
2	BEARING - OILITE, 0.626 ID	1760023	2
3	COUPLING - #44093	2404500	1
4	CYLINDER - VACUUM PUMP	1020800	1
5	HEAD - CYLINDER INBOARD	2808904	1
6	HEAD - CYLINDER, OUTBOARD	2808800	1
7	NHCS - .313-18 x 1.00, SST	5400610	4
8	KEY - SO., 0.19 x 0.62 GR2	3602425	1
9	KEY - WOODRUFF, 606	3602200	1
10	MOTOR - PRIMER, 12V	4223400	1
11	NUT - HER., .313-15, SST	5403024	2
12	O-RING - 3.50 x 3.69 x 0.09	3601101	2
13	OIL SEAL - 0.625 ID x 1.128 OD	3600505	1
15	PLUG - PIPE, 0.250, BR SO HD	1080504	1
16	STRAP - GROUND, 12V PRIMER	2600516	1
17	WASHER - ROTOR, ELEC PRIMER	4407601	4
18	WASHER - FLAT, 5/16, STEEL	3603802	2
19	WASHER - LOCK, 0.313 ID	3603502	6



NOTE:
 - FOR CROSS SECTION AND EXPLODED VIEW DRAWING SEE DVC0203, DVC0204 & DVC0205
 - ALSO: WHEN REPLACING THE OLD VERSION OF THIS VALVE WITH THIS NEW VERSION: BUSHING 1762500 CAN BE USED TO RETROFIT IT TO THE EXISTING PANEL.



NOTE:
 MOUNT WITH EXHAUST OUTLET DOWN
 CONNECT 4 GA COPPER GROUND STRAP TO CLEAN, PAINT FREE GROUNDING SURFACE
 IF SUPPLIED GROUND STRAP IS REMOVED FROM ASSEMBLY, RETIGHTEN CYLINDER HEAD ADAPTER RETAINING NUTS EQUALLY TO 90 IN. LB.

POSITIVE LEAD WIRE SIZES FOR 12 V & 24 V PRIMERS:
 PER SAE STANDARD 541J (MAX STARTING MOTOR VOLTAGE DROPS)
 0' TO 20' #0 (12V), #3 (24V) COPPER
 0' TO 25' #00 (12V), #2 (24V) COPPER

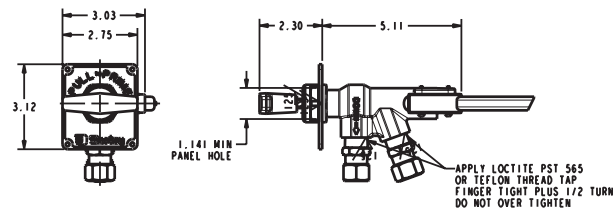
THESE GAGE WIRES CORRESPOND WITH AMP DRAW REQUIREMENTS FOR EACH MOTOR, AS WELL AS IN RELATION TO RESISTANCE OVER GIVEN LENGTH.
 12 V = 240 AMP
 24 V = 140 AMP

WEIGHT = 27 LB (12.1 KG)

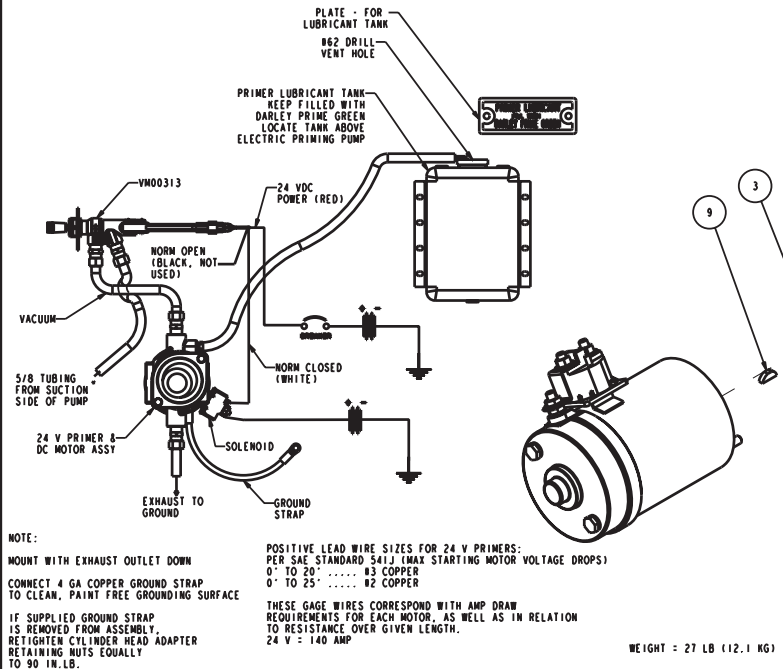
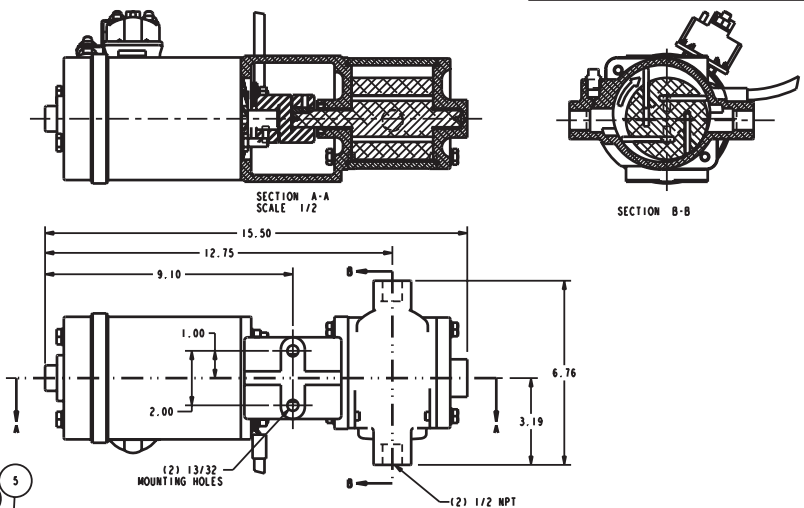
REMOVE SHARP EDGES	INCH (MILLIMETER)	OLD PART NO.	TOLERANCE	DATE 18-Apr-09	DVC0207
MATERIAL DESCRIPTION:		PATTERN NO.	AS SHOWN		
THIS DRAWING IS THE PROPERTY OF W. S. DARLEY AND COMPANY. IT IS TO BE KEPT IN CONFIDENCE AND NOT REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.		ALL DIMENSIONS IN INCHES UNLESS NOTED		DO NOT SCALE PRINT	

NO.	DESCRIPTION	PART NO.	QTY.
1	ASSEMBLY - PRIMER, ROTOR	4420105	1
2	BEARING - OILITE, 0.626 ID	1760023	2
3	COUPLING - 844093	2404500	1
4	CYLINDER - VACUUM PUMP	1020800	1
5	HEAD - CYLINDER INBOARD	2080904	1
6	HEAD - CYLINDER, OUTBOARD	2080800	1
7	HHCS - .313-18 x 1.00, SST	5400610	4
8	KEY - SO., 0.19 x 0.62 GR2	3602425	1
9	KEY - WOODRUFF, 606	3602200	1
10	MOTOR - PRIMER, 24V	4223500	1
11	NUT - HEX., .313-15, SST	5403024	2
12	O-RING - 3.50 x 3.69 x 0.09	3601101	2
13	OIL SEAL - 0.625 ID x 1.128 OD	3600505	1
15	TUBE FITTING - STR., .25 x .19	3500021	1
16	STRAP - GROUND, 12V PRIMER	2600516	1
17	VANE - ROTOR, ELEC PRIMER	4407601	4
18	WASHER - FLAT, 5/16, STEEL	3603802	2
19	WASHER - LOCK, 0.313 ID	3603502	6

REVISIONS				
LTB	DESCRIPTION	DATE	CHG NO.	APP'D
0	REMOVED FIRST PAGE	4/13/09	5/16	AM



NOTE:
 - FOR CROSS SECTION AND EXPLODED VIEW DRAWING SEE DRAWING DVC0203
 - ALSO, WHEN REPLACING THE OLD VERSION OF THIS VALVE WITH THIS NEW VERSION, BUSHING 1762500 CAN BE USED TO RETROFIT IT TO THE EXISTING PANEL.



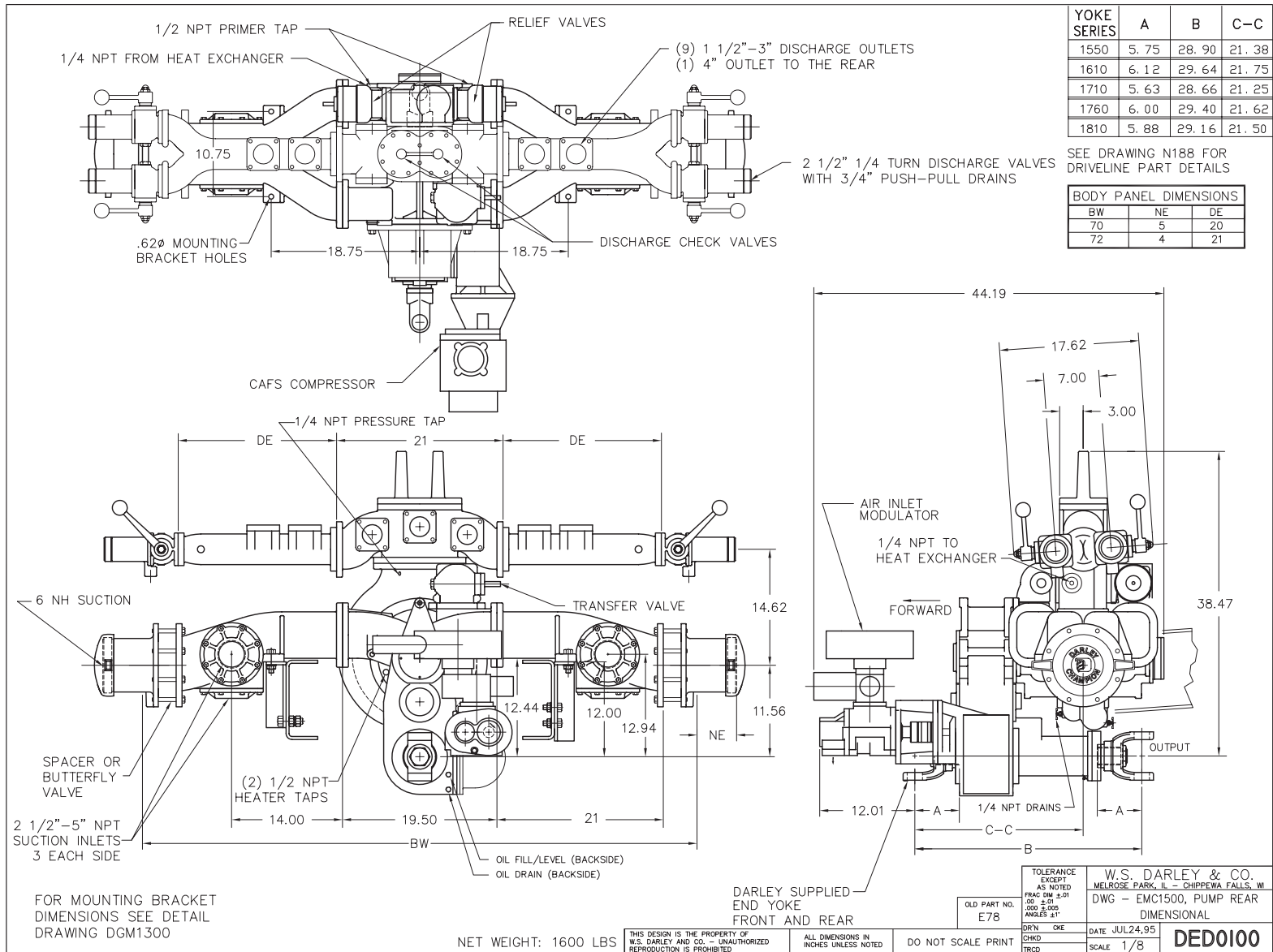
NOTE:
 MOUNT WITH EXHAUST OUTLET DOWN
 CONNECT 4 GA COPPER GROUND STRAP TO CLEAN, PAINT FREE GROUNDING SURFACE
 IF SUPPLIED GROUND STRAP IS REMOVED FROM ASSEMBLY, RETIGHTEN CYLINDER HEAD ADAPTER RETAINING NUTS EQUALLY TO 90 IN. LB.

POSITIVE LEAD WIRE SIZES FOR 24 V PRIMERS:
 PER SAE STANDARD S411 (MAX STARTING MOTOR VOLTAGE DROPS)
 0' TO 20' #3 COPPER
 0' TO 25' #2 COPPER

THESE GAGE WIRES CORRESPOND WITH AMP DRAW REQUIREMENTS FOR EACH MOTOR, AS WELL AS IN RELATION TO RESISTANCE OVER GIVEN LENGTH.
 24 V = 140 AMP

WEIGHT = 27 LB (12.1 KG)

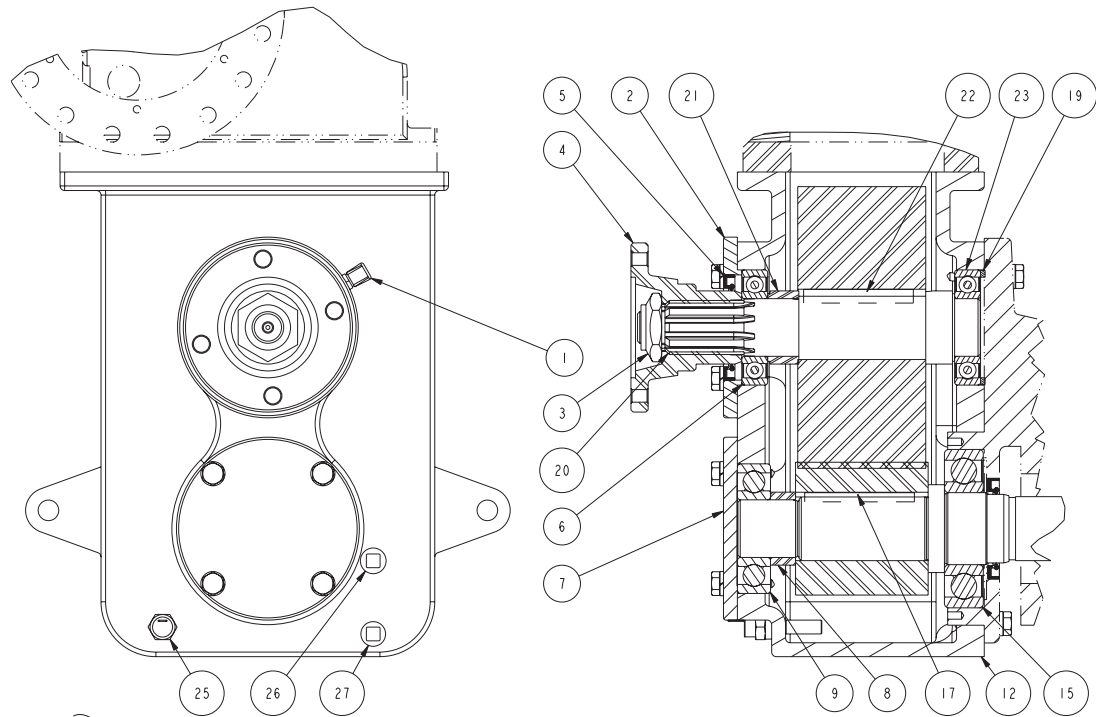
REMOVE SHARP EDGES	1 INCH (25.4 MILLIMETER)	OUR PART NO.	TOLERANCE	DATE
MATERIAL DESCRIPTION:	MATERIAL NO.	PATTERN NO.	SCALE	DATE 18-Apr-08
THIS DESIGN IS THE PROPERTY OF W. S. DARLEY & COMPANY	ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT	DVC0209	



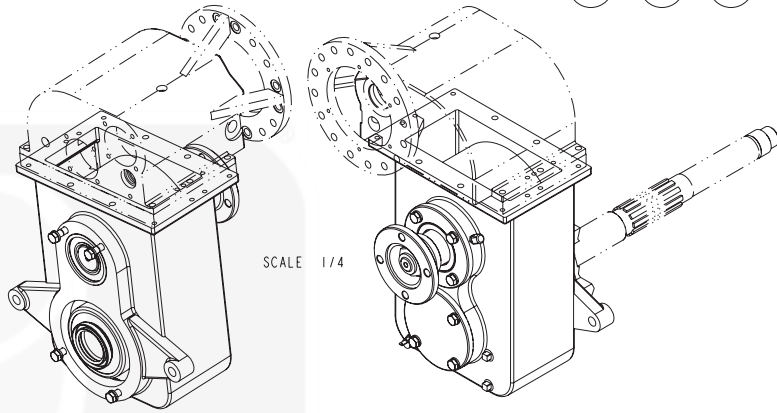
[SCHEMATICS]

NO.	DESCRIPTION	PART NO.	QTY.
1	VENT	-	1
2	CAP - BEARING, LDM PTO	-	1
3	NUT - FLANGE, 7/8-14	-	1
4	COMP FLANGE - 1410	-	1
5	OIL SEAL - 2.000 ID X 2.879 OD	-	1
6	BEARING-BALL, 208SF	-	1
7	CAP - BEARING, LDM PTO	-	1
8	SPACER - 1.57 X 2.00 X 0.69	-	1
9	BEARING-BALL	-	1
12	GEARCASE - LDM, PTO DRIVE	-	1
15	BEARING-BALL, 310SF	-	1
17	KEY - SQ., 0.25 X 3.00 GR2	-	1
19	SPACER	-	1
20	SHAFT - TRANSMISSION, LDM PTO	-	1
21	SPACER	-	1
22	KEY - SQ., 0.38 X 3.00	-	1
23	BEARING-BALL, 208S	-	1
25	SENSOR - TEMP., 150C	-	1
26	PLUG - PIPE, 0.375, BLK SQ HD	-	1
27	PLUG - PIPE, 0.375, MAG SQ HD	-	1

REVISIONS			
LTR	DESCRIPTION	DATE	CHG NO. APPR'D



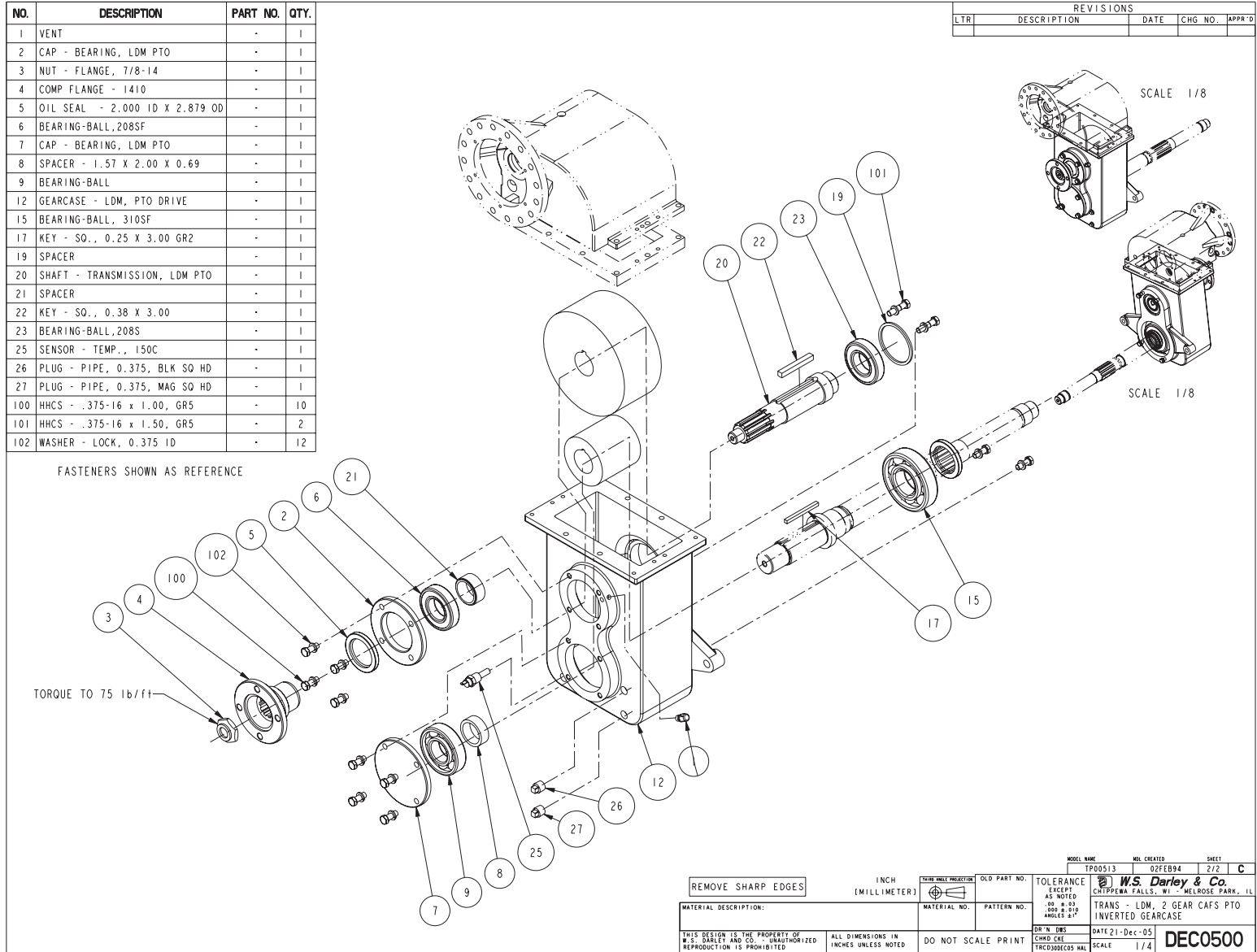
SECTION A-A



REMOVE SHARP EDGES		INCH (MILLIMETER)	FORM/SHARPENED	OLD PART NO.	TP00513	MOI CREATED	02FEB94	SHEET	1/2	C
MATERIAL DESCRIPTION:		TOLERANCE EXCEPT AS NOTED .0008 & .010 ANGLES 45°		MATERIAL NO.	PATTERN NO.	W.S. Darley & Co. CITRIFER FALLS, WY - MELROSE PARK, IL		TRANS - LDM, 2 GEAR CAFS PTO INVERTED GEARCASE		DATE 12-Dec-05
THIS DESIGN IS THE PROPERTY OF W. S. DARLEY AND CO. UNAUTHORIZED REPRODUCTION IS PROHIBITED		ALL DIMENSIONS IN INCHES UNLESS NOTED		DO NOT SCALE PRINT		DR'N DWS	CHKD CRE	SCALE 1/2		DEC0500

NO.	DESCRIPTION	PART NO.	QTY.
1	VENT	-	1
2	CAP - BEARING, LDM PTO	-	1
3	NUT - FLANGE, 7/8-14	-	1
4	COMP FLANGE - 1410	-	1
5	OIL SEAL - 2.000 ID X 2.879 OD	-	1
6	BEARING-BALL, 208SF	-	1
7	CAP - BEARING, LDM PTO	-	1
8	SPACER - 1.57 X 2.00 X 0.69	-	1
9	BEARING-BALL	-	1
12	GEARCASE - LDM, PTO DRIVE	-	1
15	BEARING-BALL, 310SF	-	1
17	KEY - SQ., 0.25 X 3.00 GR2	-	1
19	SPACER	-	1
20	SHAFT - TRANSMISSION, LDM PTO	-	1
21	SPACER	-	1
22	KEY - SQ., 0.38 X 3.00	-	1
23	BEARING-BALL, 208S	-	1
25	SENSOR - TEMP., 150C	-	1
26	PLUG - PIPE, 0.375, BLK SQ HD	-	1
27	PLUG - PIPE, 0.375, MAG SQ HD	-	1
100	HHCS - .375-16 x 1.00, GR5	-	10
101	HHCS - .375-16 x 1.50, GR5	-	2
102	WASHER - LOCK, 0.375 ID	-	12

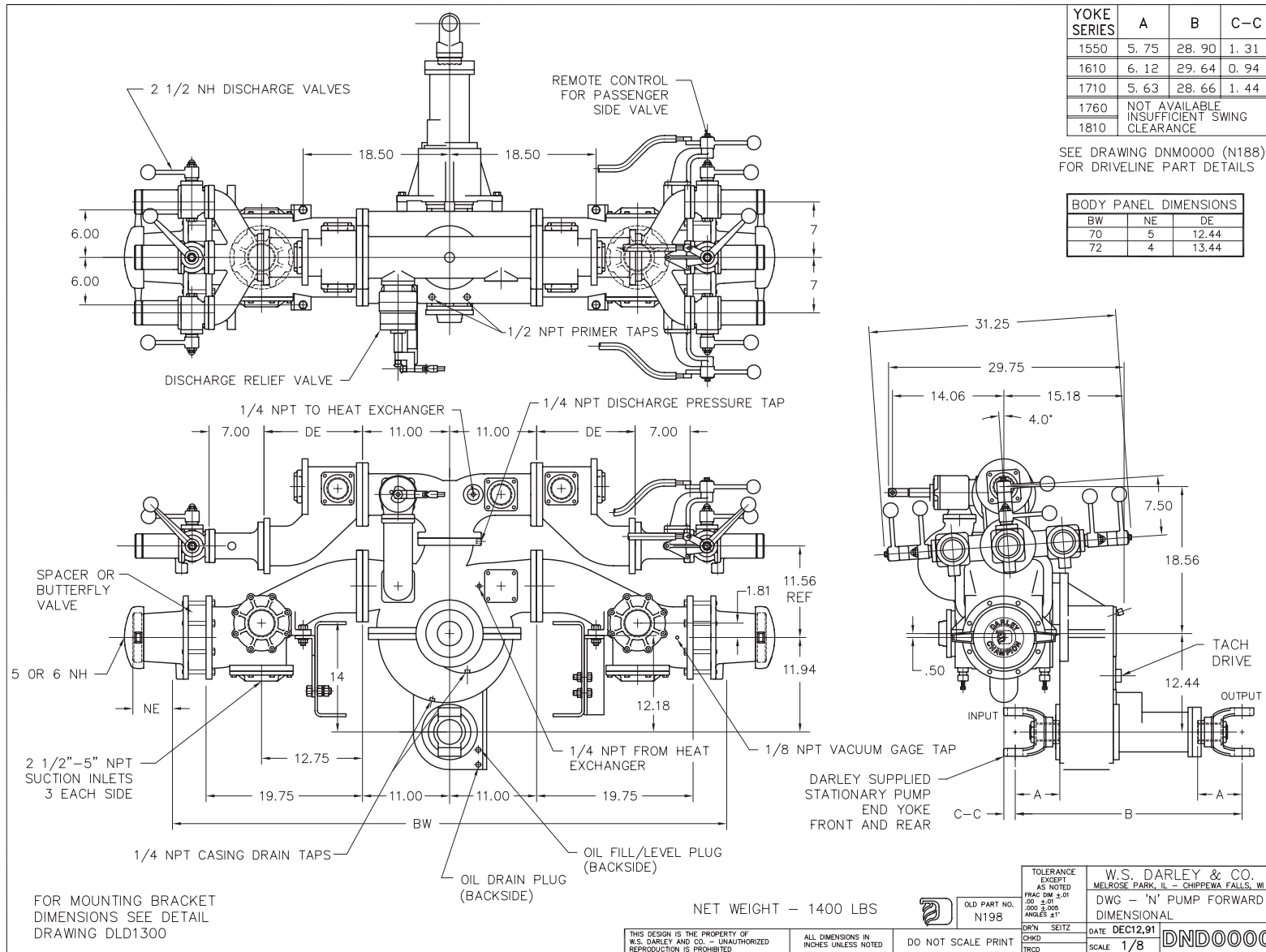
REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D



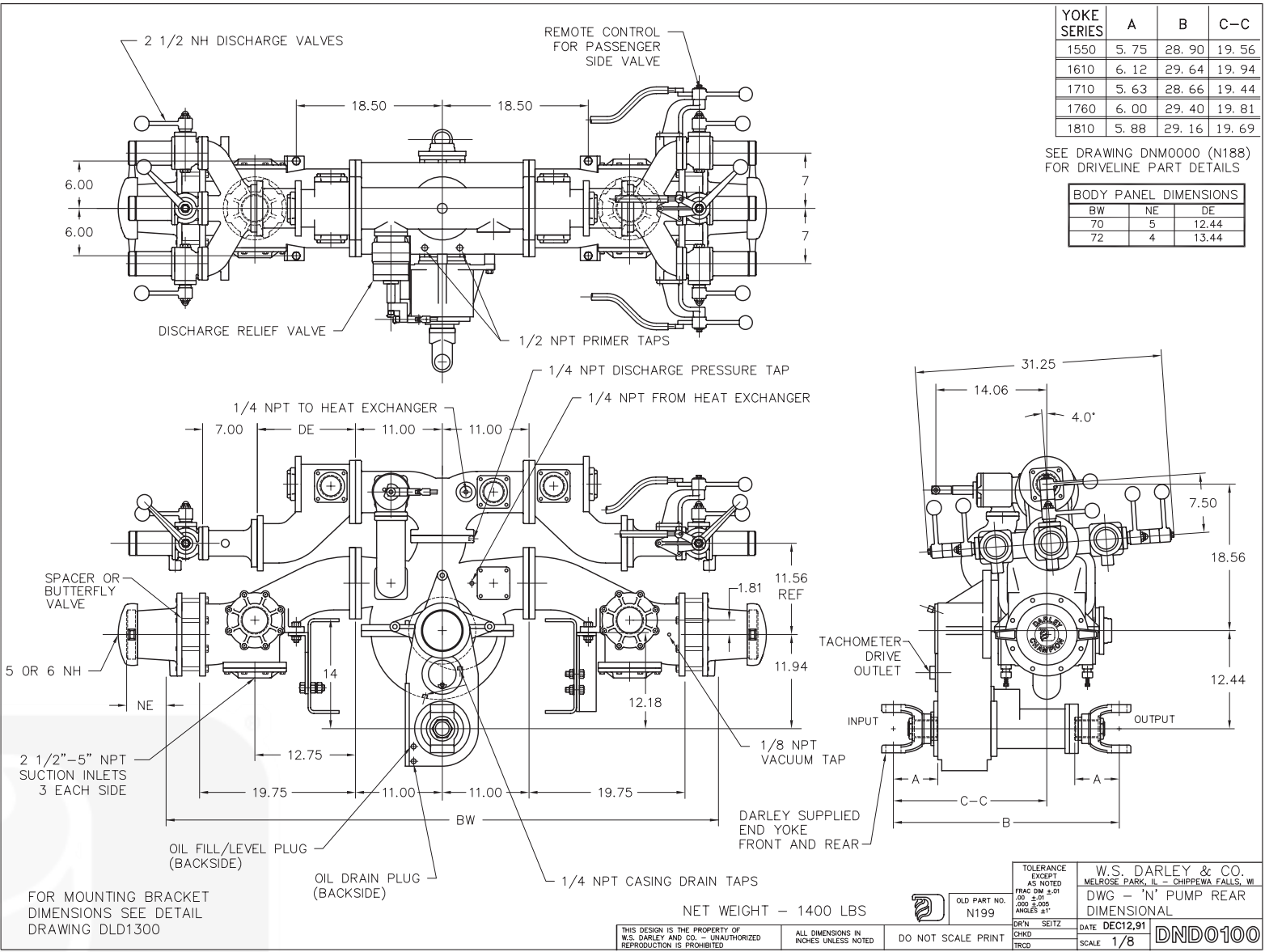
FASTENERS SHOWN AS REFERENCE

TORQUE TO 75 lb/ft

REMOVE SHARP EDGES		INCH (MILLIMETER)	FORM AND PRECISION	OLD PART NO.	TOLERANCE EXCEPT AS NOTED ±.000 ±.010 ANGLES 45°	MODEL NAME TP00513	MODEL CREATED 02FEB94	SHEET 2/2	C
MATERIAL DESCRIPTION:		MATERIAL NO.	PATTERN NO.	TRANS - LDM, 2 GEAR CAFS PTO INVERTED GEARCASE		W.S. Darley & Co. CHIPPEWA FALLS, WI - MELROSE PARK, IL		DATE 21-Dec-05	
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. UNAUTHORIZED REPRODUCTION IS PROHIBITED		ALL DIMENSIONS IN INCHES UNLESS NOTED		DO NOT SCALE PRINT		DR'N DMS CHKD CKE TRCD30EC05 MAL		SCALE 1/4 DEC0500	



[SCHEMATICS]



YOKE SERIES	A	B	C-C
1550	5.75	28.90	19.56
1610	6.12	29.64	19.94
1710	5.63	28.66	19.44
1760	6.00	29.40	19.81
1810	5.88	29.16	19.69

SEE DRAWING DNM000 (N188) FOR DRIVELINE PART DETAILS

BODY PANEL DIMENSIONS		
BW	NE	DE
70	5	12.44
72	4	13.44

FOR MOUNTING BRACKET DIMENSIONS SEE DETAIL DRAWING DLD1300

NET WEIGHT - 1400 LBS

TOLERANCE EXCEPT AS NOTED FRAC DIM ±.01 DEC DIM ±.005 ANGLES ±1°		W.S. DARLEY & CO. MELROSE PARK, IL - CHIPPEWA FALLS, WI	
OLD PART NO. N199		DWG - 'N' PUMP REAR DIMENSIONAL	
DRYN SEITZ	DATE DEC12,91	DND0100	
CHKD	SCALE 1/8		
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. - UNAUTHORIZED REPRODUCTION IS PROHIBITED		ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT