



McLAUGHLIN®

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Parts Manual
Vermeer/ McLaughlin
SKID V300HD Vacuum Machine
Part #E850608
(Serial Number Ending S3H102512259 - 041414)

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102612

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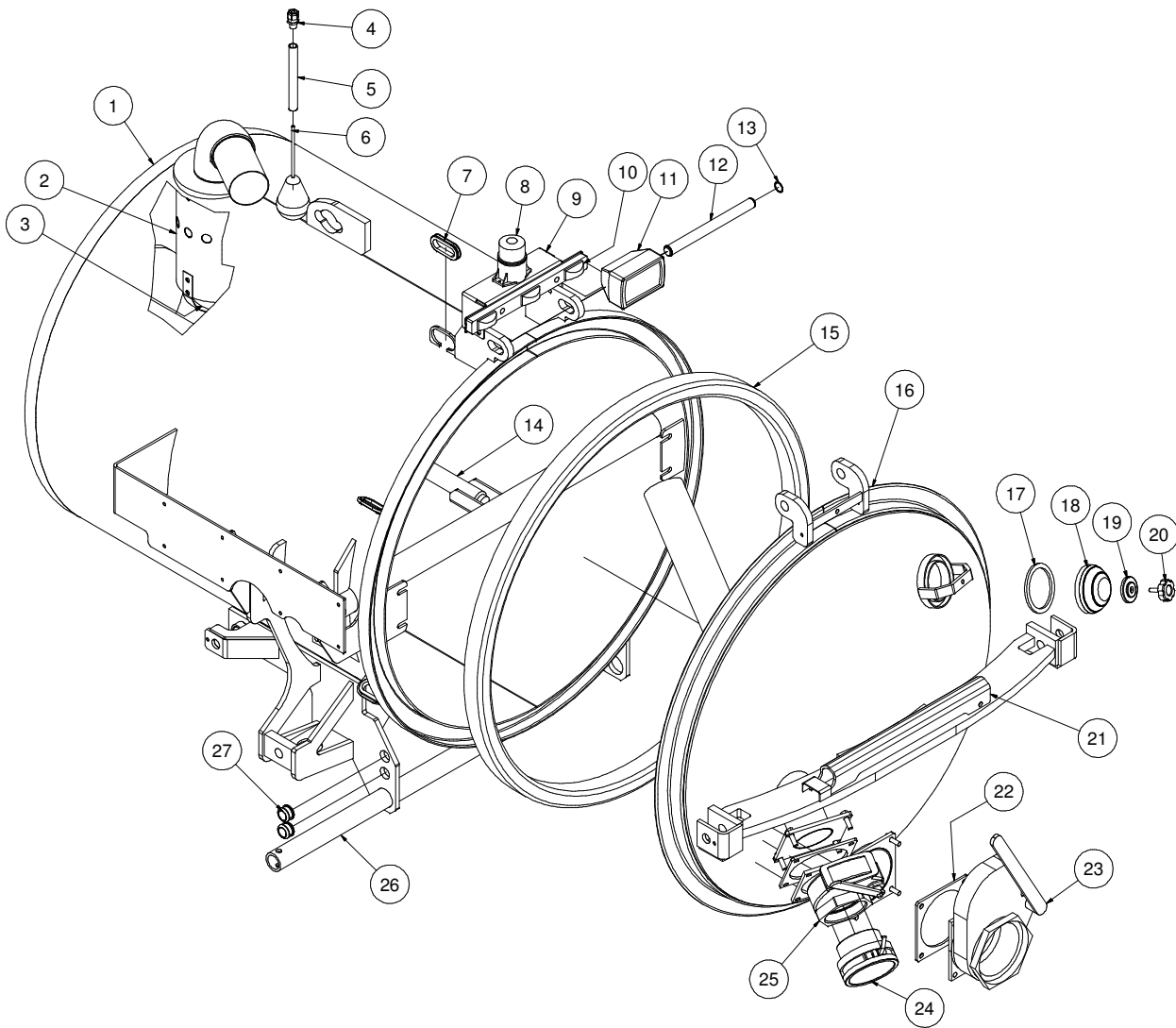
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WARRANTY

Tank and Door Assembly

V300



102212-E

VACASSY038

Tank and Door Assembly

V300

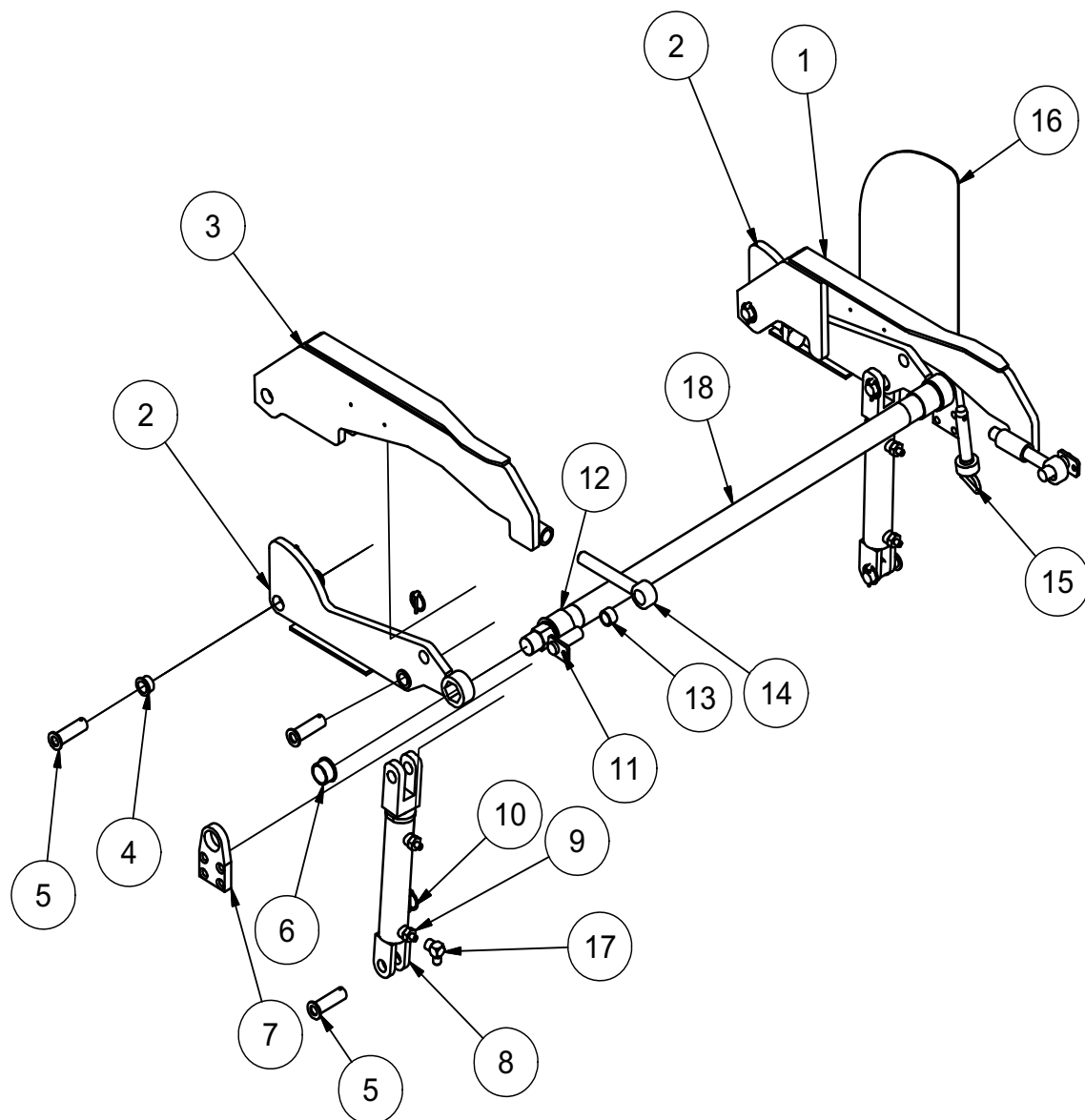
ITEM	QTY	PART NO.	DESCRIPTION
1	1	8048501	TANK WELDMENT - 300LE (42"DIA)
2	1	8043700	BALL FLOAT SHUTOFF WELDMENT
	2	U000420	SCREW, HC 3/8" - 16 X 1.00"
	2	U210060	WASHER, LOCK 3/8"
	2	U200600	WASHER, FLAT 3/8"
	1	8043571	SEAT, 4" RUBBER
	1	8043572	SEAT CLAMP 4"
3	1	8043570	BALL STRAINLESS FLOAT 6"
4	1	X000113	STRAIN RELIEF, 1/2"
5	1	8040769	HIGH LEVEL FLOAT SWITCH TUBE
	1	8041291	BUSHING, RUBBER
6	1	8030531	HIGH LEVEL FLOAT SWITCH
7	4	8042812	GROMMET 2"ID 3"OD 1/4"WOG TRAILER SLOT MODEL
8	1	8043139	STROBE LIGHT
	3	U010006	SCREW, PHILLIPS #10 - 24 X 1"
	3	U210005	WASHER, LOCK #10
	3	U100010	NUT, HEX #10 - 24
9	1	8046507	STROBE LIGHT BRACKET
	4	X000343	DT MOUNTING CLIP
	4	U000880	SCREW, HC 1/2" - 13 X 2.00"
	4	U200100	WASHER, FLAT 1/2"
	4	U210111	WASHER, LOCK 1/2"
	4	U100200	NUT, HEX 1/2" - 13
10	1	8041509	LIGHT CLEARANCE 3 BAR
11	1	8043138	WORK LIGHT
12	1	8040058	DOOR HINGE ROD
13	2	U500080	1" SNAP RING
14	1	8045446	TANK ROD 300 - WELDMENT
	3	8030369	NOZZLE, TANK CLEANOUT
	1	W200120	O-RING 1 7/8" X 2 1/8" X 1/8" (225)
15	1	8041765	DOOR SEAL (42" DIA) TANK
16	1	8047764	DOOR WELDMENT (42"DIA)
17	1	8032007	GASKET, 4" COUPLER
18	1	8031048	SIGHT GLASS
19	1	8031047	SIGHT GLASS PLATE
20	1	8031046	SIGHT GLASS HAND WHEEL
21	1	8041212	TANK SAFETY BRACE
22	3	8046191	GASKET INLET / OUTLET DOOR LE
23	1	8046214	VALVE, 6" GATE BRASS LEVER FLANGE
	1	8030849-50	HANDLE, 6" GATE VALVE (RIV MODEL)
24	1	8046445	CAMLOCK, 4" AL CAM X MNPT
25	1	8046215	VALVE, 4" GATE BRASS LEVER
26	1	8042648	TANK PIVOT TUBE V300
	2	U200180	WASHER, FLAT 2"
	2	U120120	LOCK NUT
	2	U000900	SCREW, HC 1/2"-13 X 2 1/2"LG
27	4	8041686	GROMMET 1 1/8"ID - 1 1/4"DOG - 1/4"WOG

* NOT SHOWN

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VACASSY038

Hyd. Door Cylinder Assembly



080311-E

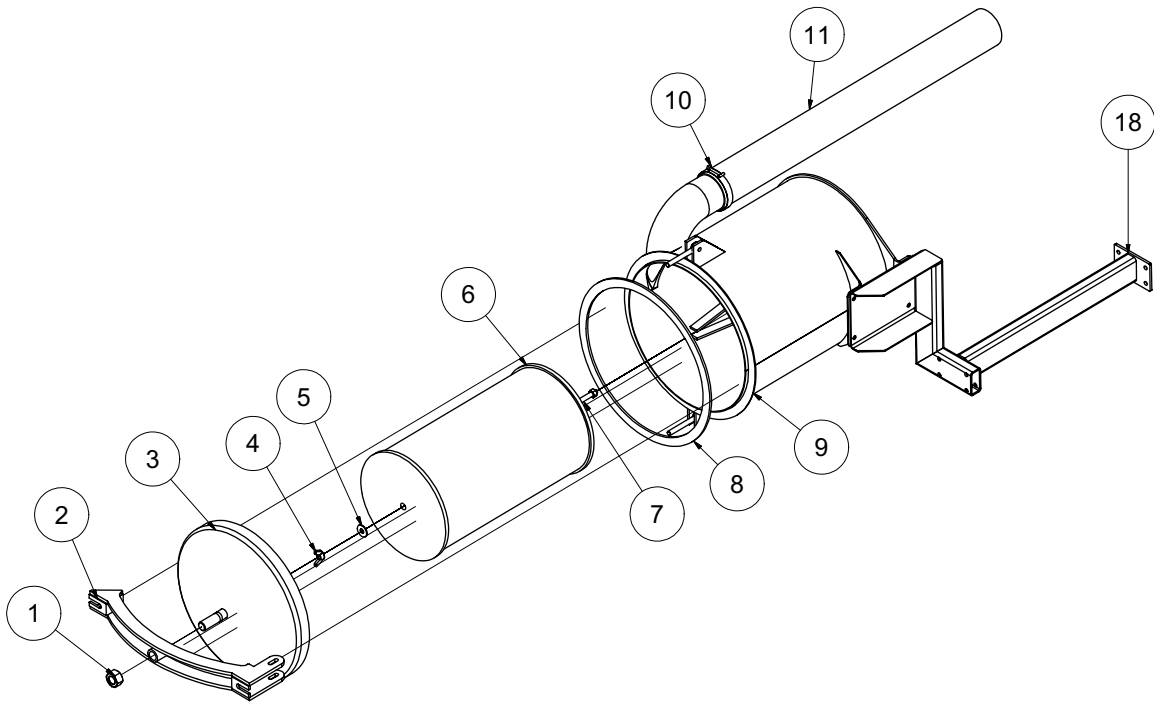
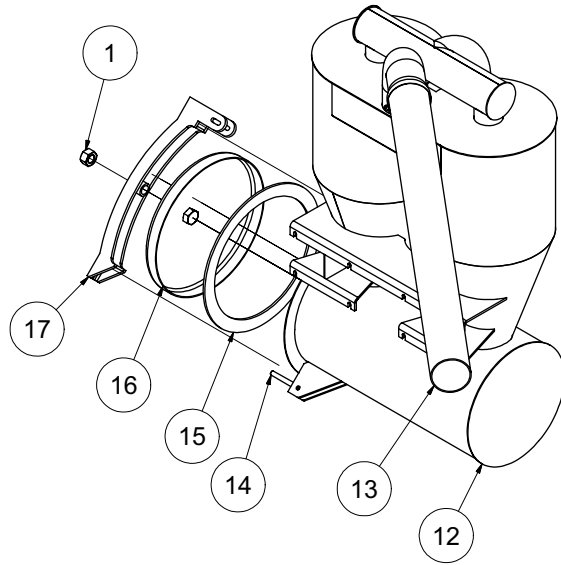
VACASSY942

Hyd. Door Cylinder Assembly

ITEM	QTY	PART NO.	DESCRIPTION
1	1	8041369	DOOR HYD LONG LINKAGE WELDMENT
2	2	8041604	SHORT LINKAGE WELDMENT
3	1	8041375	DOOR HYD LONG LINKAGE SS WELDMENT
4	6	8041883	BUSHING BRONZE FLANGED 1"
5	6	8042489	HYD DOOR - PIN WELDMENT 1"DIA X 3"
6	2	8041602	BUSHING 1 1/4" MODIFIED
7	1	8041783	OUTER BEARING PLATE
8	2	8041327	HYD CYLINDER - 8" STROKE
9	4	T400611	UNION 8MB - 4MJ
10	6	U340050	PIN LINCH 3/16 X 1 9/16
11	2	8043844	DOOR CAPTURE PIN
12	2	8041602	BUSHING BRONZE FLANGED 2"
13	2	8041524	BUSHING BRONZE 1 1/4" X 1.00 X 3/4"LG
14	2	8043131	ROD END 1" X 7 1/2"
	2	U160025	NUT, JAM 1.00"
	2	U120060	NUT, NY LOCK 1"
	4	U200170	WASHER, FLAT 1.00"
15	1	8041626	1" X 4 1/2" HITCH PIN
16	1	8041635	HYD ARM GUARD
17	1	T401225	ELBOW, 90 1/4MJ - 1/4FJ
18	1	8041607	LINKAGE CROSS TUBE V500
	1	8046186	LINKAGE CROSS TUBE V750 / V800LE
	1	8041663	LINKAGE CROSS TUBE V800 / V1200

Filtration

HD



041212-E

VACASSY347

Filtration

HD

ITEM	QTY	PART #	DESCRIPTION
1	2	U120060	NUT, LOCK NY 1" - 8
2	1	8041554	DOOR LATCH (HD AIR FILTER WELDMENT)
3	1	8041387	HD AIR FILTER DOME ASSY
4	1	U130080	NUT, WING 1/2" - 13
5	1	U200100	WASHER, FLAT 1/2"
6	1	8031293	WASHABLE AIR FILTER ELEMENT
7	1	8040302	THREADED ROD - 4"LG
8	1	8041613	SEAL 3/8" EPDM 17.
9	1	8046338	HD AIR FILTER HOUSING
*	10	U200060	WASHER, FLAT .375
*	1	U000520	SCREW, HC 3/8" - 16 X 2.25"
*	1	U000580	SCREW, HC 3/8" - 16 X 3.50"
*	4	U000420	SCREW, HC 3/8"-16 X 1.00"
*	8	U000440	WASHER, FLAT 3/8"
*	4	U120110	NYLON LOCKNUT 3/8"-16
*	2	8041594	HANDLE, WING
10	4	8042606	CLAMP T-BOLT (450)
11	1	8046804	HOSE VAC AG SUCTION 4-189" (V500)
	1	8046805	HOSE VAC AG SUCTION 4-206" (V800)
	1	8046998	HOSE VAC AG SUCTION 4-156" (VSK300)
12	1	8046458	HD SEPARATOR - HOUSING ONLY
*	10	U000440	WASHER, FLAT 3/8"
*	1	U000520	SCREW, HC 3/8" - 16 X 2.25"
*	1	U000580	SCREW, HC 3/8" - 16 X 3.50"
*	2	U120110	NYLON LOCKOUT 3/8 - 16
*	2	8041594	HANDLE, WING
*	8	U000420	SCREW, HC 3/8"-16 X 1.00"
*	16	U200060	WASHER, FLAT 3/8"
*	8	U210061	NYLON LOCKNUT 3/8"-16
13	1	8041781	HOSE VAC AG SUCTION 4-48"
14	4	8041593	BOLT, EYE 1/2" - 13 X 6"
15	1	8041612	SEAL 3/8" EPDM 14"ID, 17.25"OD
16	1	8041402	HD CYCLONE DOME DOOR ASSY
17	1	8041552	DOOR LATCH (CYCLONE) - WELDMENT
18	1	8046243	AIR FILTER BRACKET LE
*	4	U210060	WASHER, LOCK 3/8" ZP
*	4	U000441	SCREW, HC 3/8-16 X 1.25"
*	4	U000440	WASHER, FLAT 3/8"
*	4	U100060	NUT, HEX 3/8"-16

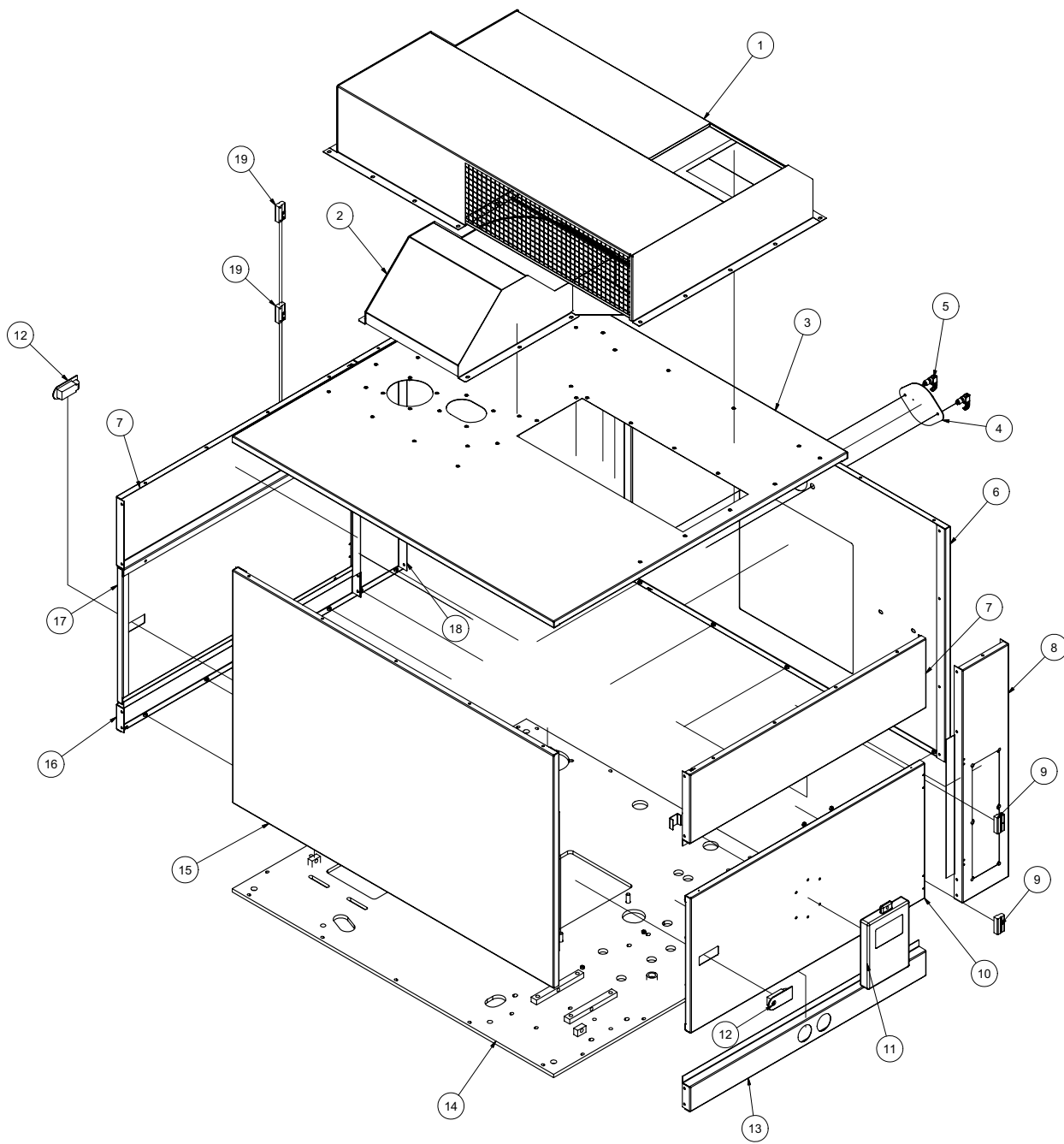
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VACASSY347

Enclosure Assembly

67 HP



042911-E

VACASSY406

Enclosure Assembly

67 HP

ITEM	QTY	PART #	DESCRIPTION
1	1	8044271	INTAKE BOX
2	1	8044283	EXHAUST SHEILD
3	1	8044250	PANEL TOP
4	1	8040592	RADIATOR ACCESS COVER
5	2	8040334	SWELL LATCH
6	1	8044248	PANEL FRONT
*	1	8044301	LS FRONT SOUND INSULATION
*	1	8044302	RS FRONT SOUND INSULATION
*	1	8044930	BELOW RADIATOR SOUND INSULATION
*	1	8044931	ABOVE RADIATOR SOUND INSULATION
7	2	8044257	PANEL SIDE UPPER
*	2	8044308	SIDE UPPER SOUND INSULATION
8	1	8043614	PANEL SIDE VERTICAL CONTROL
*	1	8044303	SIDE VERTICAL CONTOL PANEL SOUND INSULATION
9	2	8040588	OFFSET HINGE TYPE "A"
10	1	8044260	PANEL DOOR FOR MANUAL
*	1	8044310	DOOR SOUND INSULATION
11	1	E250211	BOX, PLASTIC for SAFETY MANUAL
12	2	8040586	SEALED LEVER LATCH
	1	8041816	KEY DOOR SOUTHCO LATCH
13	1	8044262	PANEL SIDE LOWER GAUGES
*	1	8044307	SIDE LOWER SOUND INSULATION
14	1	8047102	MAIN PLATE
15	1	8044252	PANEL REAR
*	1	8044306	LS REAR SOUND INSULATION
*	1	8044947	RS REAR SOUND INSULATION
16	1	8044254	PANEL SIDE LOWER
*	1	8044307	SIDE LOWER SOUND INSULATION
17	1	8044258	PANEL DOOR
*	1	8044309	DOOR SOUND INSULATION
18	1	8043922	PANEL SIDE VERTICAL
*	1	8044304	SIDE VERTICAL SOUND INSULATION
19	2	8040589	OFFSET HINGE TYPE "B"
*	20	U000060	SCREW, HC 1/4-20 X 1
*	36	U000020	SCREW, HC 1/4-20 X 1/2
*	112	U200020	WASHER, FLAT 1/4"
*	36	U120100	NUT, HEX LOCK 1/4"
*	1	8041171	HANDLE
	2	U001017	SCREW, HSH 1/4-20 X 1.25
	2	U200020	WASHER, FLAT 1/4"
	2	U120100	NUT, HEX LOCK 1/4-20
*	2	8041504	DOOR SEAL VERTICAL
*	1	8040737	EXHAUST FLANGE 5"

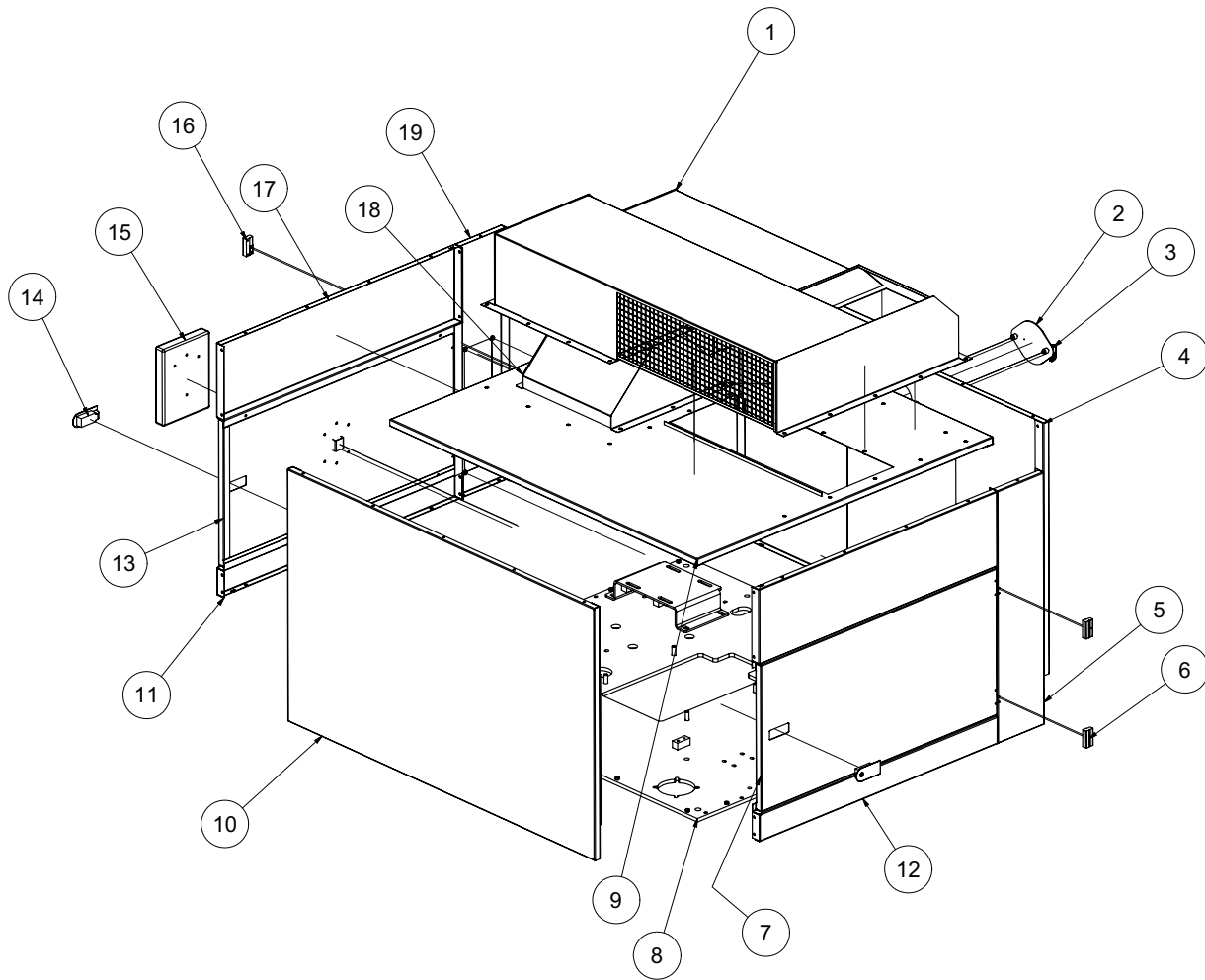
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042911-E

VACASSY406

Enclosure Assembly

67HP RC



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VACASSY415

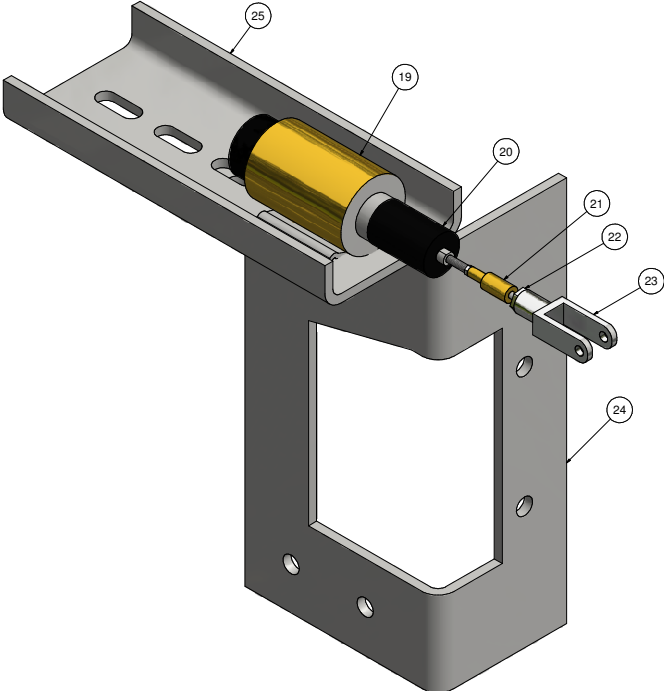
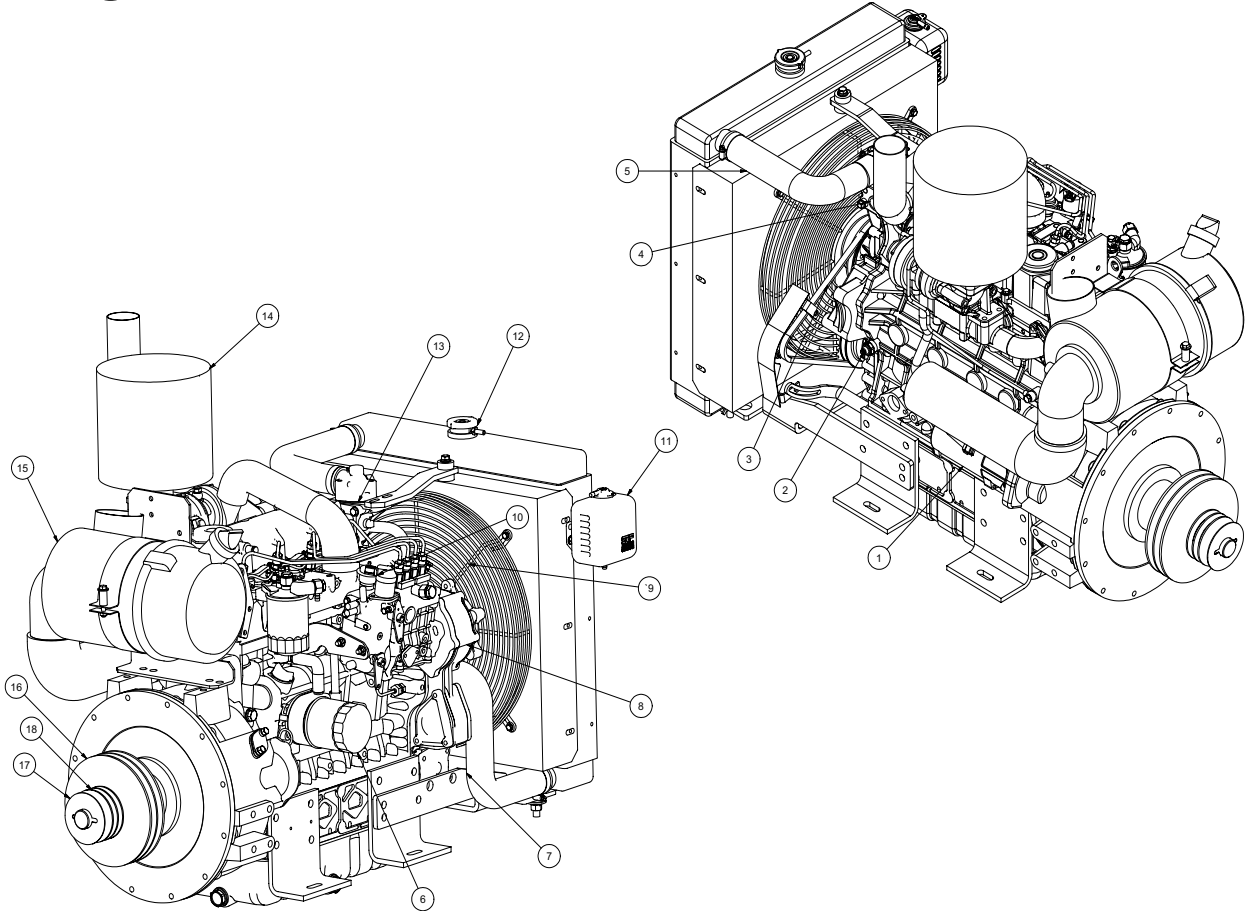
Enclosure Assembly

67HP RC

ITEM	QTY	PART NO.	DESCRIPTION
1	1	8044271	INLET OUTLET BOX
2	1	8040592	ENCLOSURE RADIATOR COVER
3	2	8040334	SWELL LATCH
4	1	8044248	PANEL FRONT
*	1	8044301	LS FRONT SOUND INSULATION
*	1	8044302	RS FRONT SOUND INSULATION
*	1	8044930	BELOW RADIATOR SOUND INSULATION
*	1	8044931	ABOVE RADIATOR SOUND INSULATION
5	1	8043924	PANEL SIDE VERTICAL
*	1	8044304	SIDE VERTICAL SOUND INSULATION
6	2	8040588	OFFSET HINGE TYPE "A"
7	1	8044258	PANEL DOOR
*	1	8044309	DOOR SOUND INSULATION
8	1	8047102	73HS MAIN PLATE WELDMENT
9	1	8044250	PANEL TOP WELDMENT
10	1	8044252	PANEL REAR
*	1	8044306	LS REAR SOUND INSULATION
*	1	8044947	RS REAR SOUND INSULATION
11	1	8044262	PANEL SIDE LOWER GAUGES
*	1	8044307	SIDE LOWER INSULATION
12	1	8044254	PANEL SIDE LOWER
*	1	8044307	SIDE LOWER INSULATION
13	1	8044260	PANEL DOOR W/TRANS. BOX 73HS
*	1	8044310	DOOR SOUND INSULATION
14	2	8040586	SEALED LEVER LATCH
	1	8041816	KEY DOOR SOUTHCO LATCH
15	1	E250210	BOX, PLASTIC FOR SAFETY MANUAL
16	2	8040589	OFFSET HINGE TYPE "B"
17	2	8044257	PANEL SIDE UPPER 73HS
*	2	8044308	SIDE UPPER SOUND INSULATION
18	1	8044283	EXHAUST SHIELD
19	1	8043917	PANEL SIDE VERTICAL CTRL 49VK
*	1	8044303	SIDE VERTICAL CONTROL PANEL SOUND INSULATION
*	1	8040737	EXHAUST FLANGE 5"

* NOT SHOWN

Engine Kubota V3600



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VACASSY852

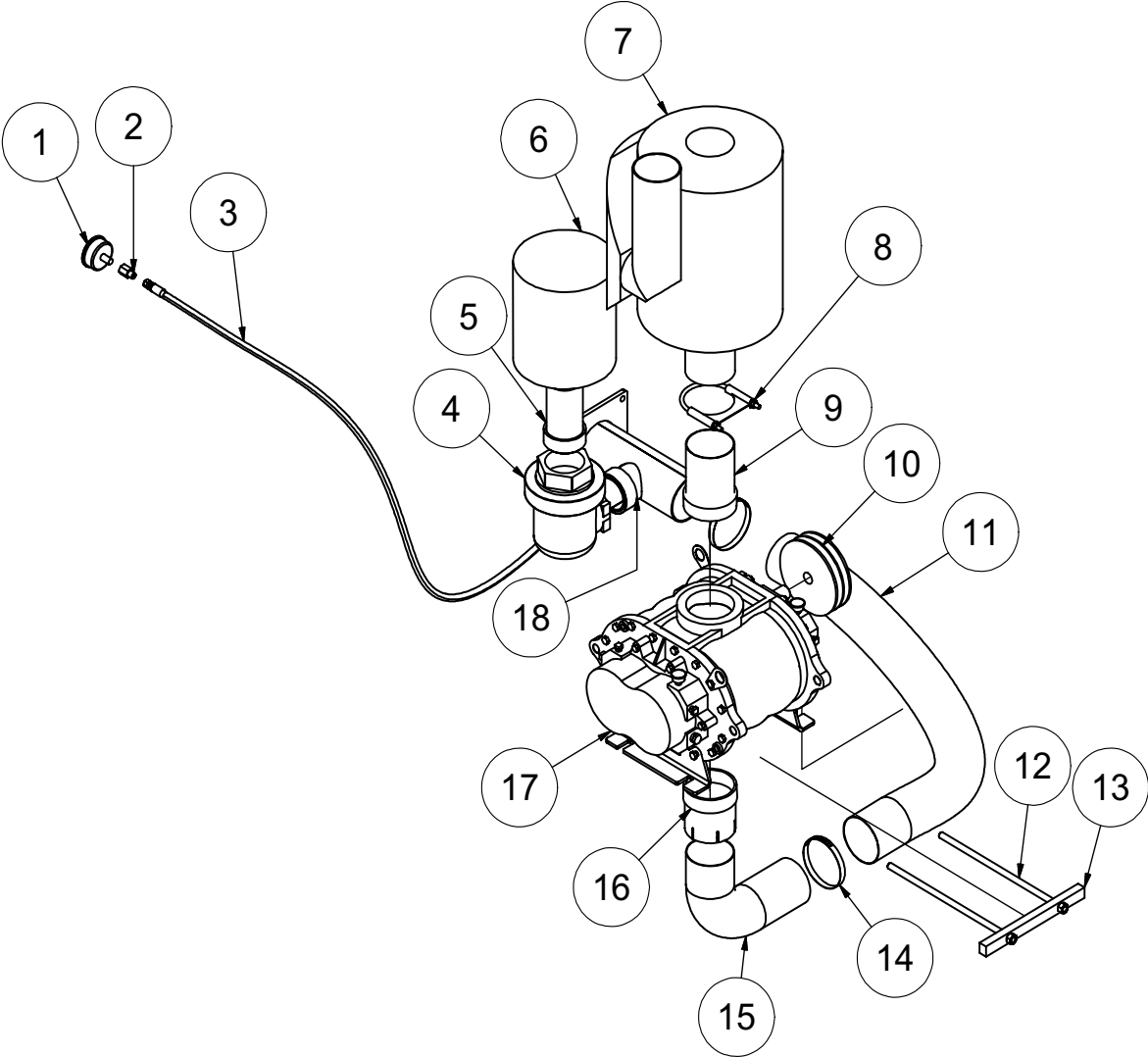
Engine Kubota V3600

ITEM	QTY	NUMBER	DESCRIPTION
	1	8047103	ENGINE
1	1	8045583	STARTER
2	1	8030960	OIL PRESSURE SWITCH
3	1	8045584	FAN BELT
4	1	8043952	WATER TEMPERTURE SWITCH
5	1	8045585	UPPER RADIATOR HOSE
6	1	8032002	OIL FILTER
7	1	8045586	LOWER RADIATOR HOSE
8	1	8045587	ALTERNATOR
9	1	8045588	FAN
10	1	8045589	FUEL SHUTOFF SOLENOID
11	1	8045590	OVERFLOW TANK
			OVERFLOW TANK CAP (Sold With Tank)
12	1	8045591	RADIATOR CAP
13	1	8045592	THERMOSTAT
14	1	8045593	MUFFLER
15	1	8045594	AIR FILTER HOUSING
*	1	8041055	AIR FILTER ELEMENT (INNER)
*	1	8041054	AIR FILTER ELEMENT (OUTER)
16	1	8044243	SHEAVE, BLOWER 8.35" OD 2517 TL
	1	8042659	BUSHING, TL2517 1 7/16"
17	1	8041799	KEYWAY RETAINER
18	1	8044244	SHEAVE, WATERPUMP 3.95" OD QT 2-GROOVE
	1	8044245	BUSHING, 1 7/16" QT
*	1	8041053	FUEL FILTER
*	1	8045595	FUEL PUMP
*	1	T400106	RADIATOR DRAIN FITTING
*	1	8047108	BRACKET, WATER SEPARATOR
*	1	8047265	OIL / WATER SEPARATOR
19	1	8030667	THROTTLE SOLENOID
20	1	8030667-1	RETURN SPRING
21	1	8046052	THROTTLE SOLENOID SPRING SWIVEL
22	2	8030667-5	JAM NUT
23	1	8030667-3	CLEVIS (INCLUDES PIN AND COTTER PIN)
24	1	8030667-11	THROTTLE SOLENOID BRACKET (VERTICAL)
25	1	8030667-10	THROTTLE SOLENOID BRACKET

* Not Shown

Blower Assembly

49HD



101712-E

VACASSY205

Blower Assembly

49HD

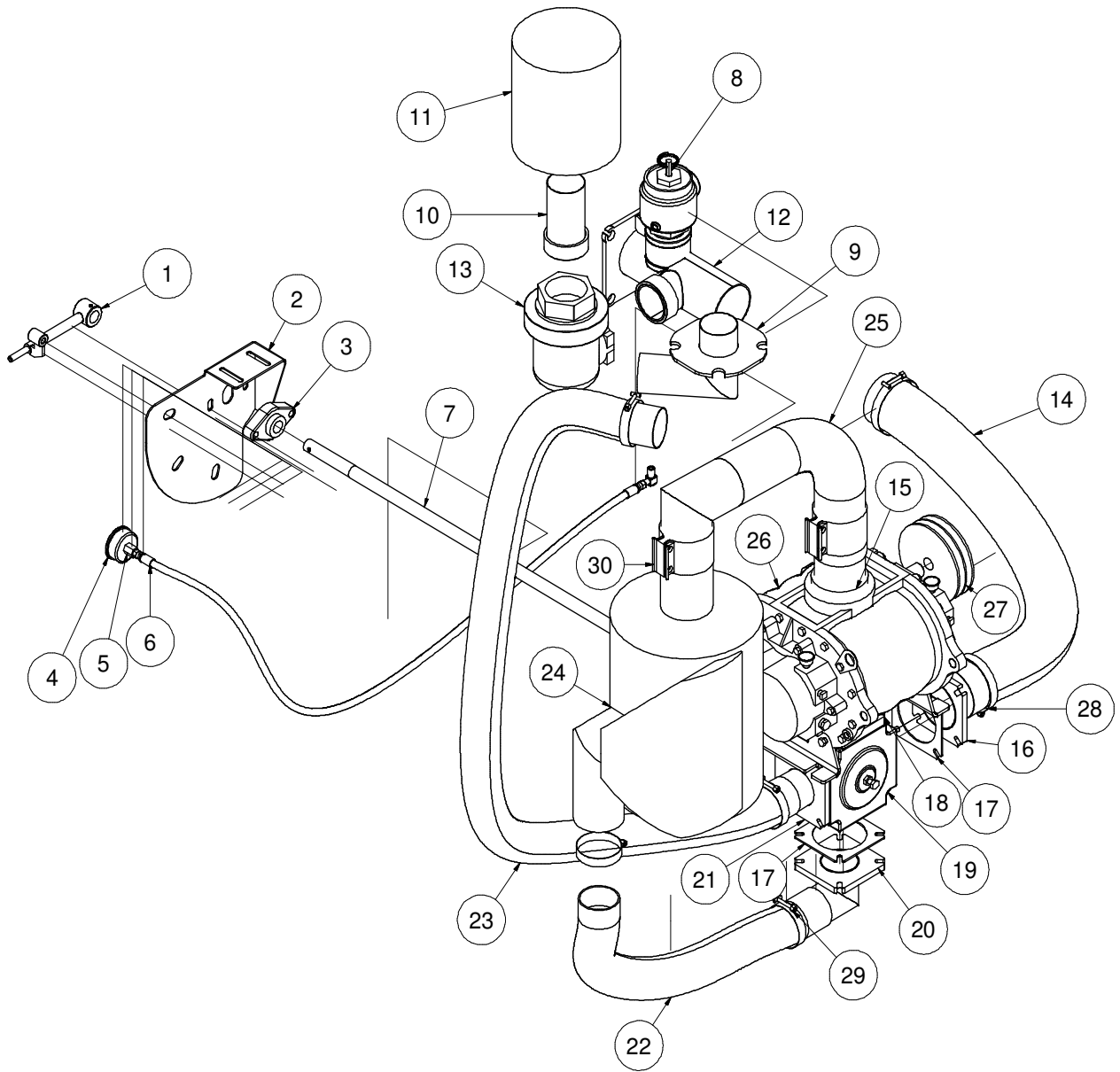
ITEM	QTY	NUMBER	DESCRIPTION
1	1	8041074	GAUGE COMPOUND PRESSURE/VACUUM
2	1	T400110	UNION, 4FP - 4MJ
3	1	8042355	HOSE ASSY VAC 4-60" ST-ST
4	1	8030866	BAYCO VALVE
5	1	8045238	UNION EXHAUST 3" OD-MNPT
6	1	8043553	AIR FILTER 3" 245CFM
7	1	8030917	SILENCER, 1025CFM, COWL
8	1	8031193	CLAMP, 4in U-BOLT EXHAUST
9	1	8045239	UNION EXHAUST 4" OD - MNPT
10	1	8040697	SHEAVE, 6.55DIA 2 - GROOVE
	1	8040485	BUSHING, 1 1/8" SDS
	1	U410090	KEY, 1/4" X 1/4" X 2 3/4"
	2	8041027	BELT, BX 54
11	1	8046575	HOSE VAC AG SUCTION 4-51"
12	2	8041507	ROD TIGHTENER WELDMENT
13	1	8040904	TENSION BLOCK 1025 CFM
14	2	8042606	CLAMP T-BOLT 4" (450)
15	1	8041814	ELBOW, 4" (4.5" RAD, OD-OD)
16	1	8046820	ADAPTER 4"MNPT - 4"ID
17	1	8040001	BLOWER (MODEL 59)
	4	U000817	SCREW, HC 1/2" - 13 X 1"
	4	U210100	WASHER, LOCK 1/2"
	4	U200100	WASHER, FLAT 1/2"
18	1	8046415	HEADER, AIR FILTER 1025
	1	8046191	GASKET, HEADER AIR FILTER

101712-E

VACASSY205

Blower Assembly

HDRF



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VACASSY232

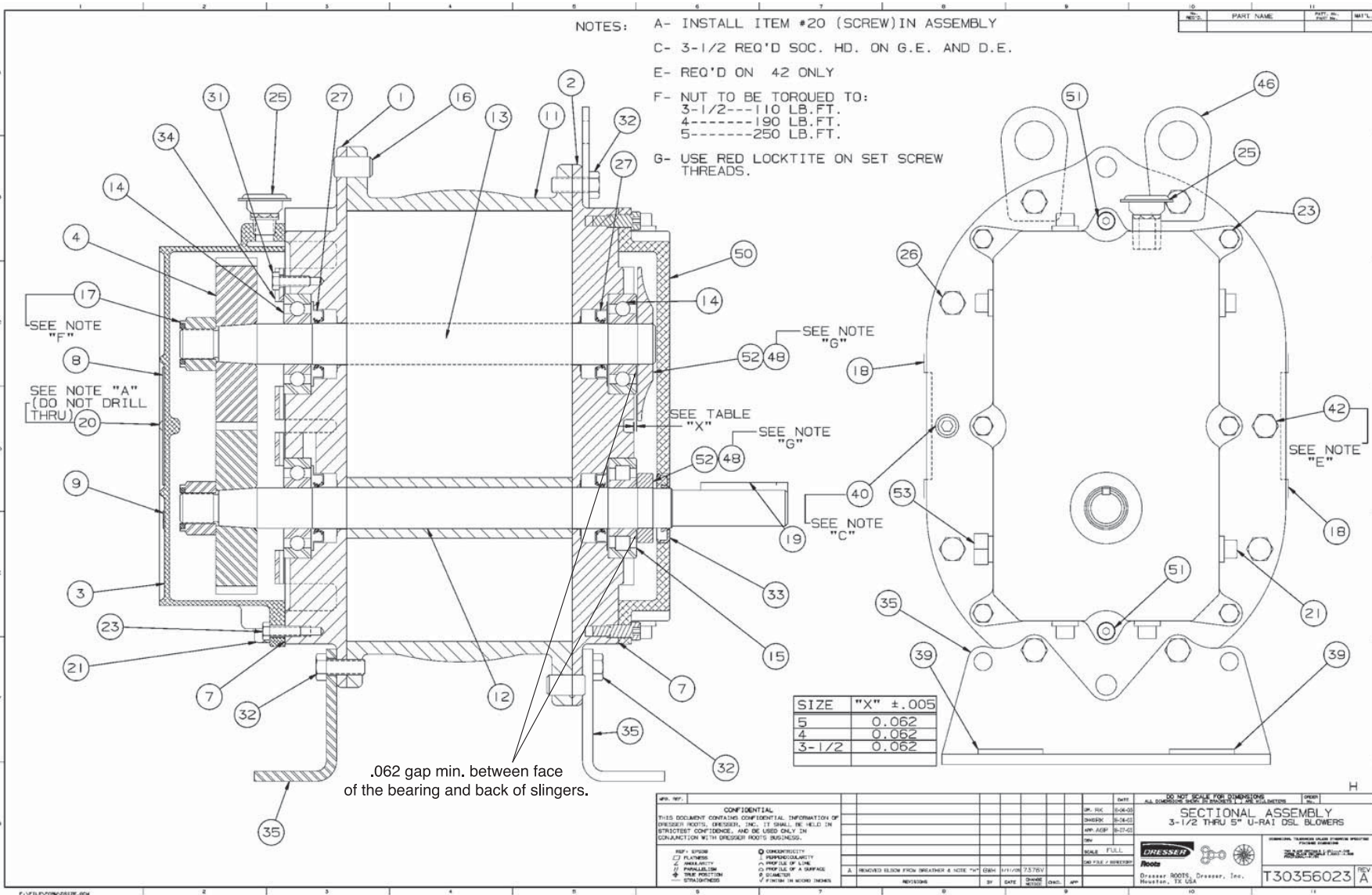
Blower Assembly

HDRF

ITEM	QTY	NUMBER	DESCRIPTION
1	1	8041617	REVERSE FLOW HANDLE, TRAILER UNIT
	1	8041177-10	HANDLE GRIP
2	1	8046202	BRACKET REV FLOW CONTROL LE
3	1	W030080	FLANGE BEARING - 2 BOLT (1" BORE)
4	1	8041074	GAUGE COMPOUND PRESSURE/VACUUM
5	1	T400110	UNION 4FP-4MJ
6	1	8045869	HOSE ASSY VAC 4-34" ST-ST
7	1	8046223	REV FLOW SHAFT 49LE
8	1	8041035	PRESSURE RELIEF 1025
9	1	8046218	EXHAUST REV FLOW PIPE WELDMENT
10	1	8045238	UNION EXHAUST 3" OD-MNPT
11	1	8043553	AIR FILTER 3" 245 CFM
12	1	8048126	HEADER AIR FILTER HDRF
	1	8046191	GASKET, HEADER
13	1	8030866	BAYCO VALVE
14	1	8046575	HOSE VAC AG SUCTION 4 - 51"
15	1	8030560	4" HOSE COUPLING WELDMENT
16	1	8046484	EXHAUST REV FLOW 4" X 4" FLANGE WELDMENT
17	4	8043554	ADAPTER VALVE FLANGE
18	1	8044330	REV FLOW 4" HEADER NIP ASSY
19	1	8041177	4" 4-WAY VALVE
20	1	8046201	ELBOW EXHAUST 3" W/ 4" FLANGE
21	1	8046222	EXHAUST REV FLOW 3" X 4" FLANGE WELDMENT
22	1	8046576	HOSE VAC AG SUCTION 3 - 29"
23	1	8046577	HOSE VAC AG SUCTION 3 - 65"
24	1	8030917	SILENCER, 1025 CFM, COWL
25	1	8046505	EXHAUST 4" ID-OD WELDMENT
26	1	8040001	BLOWER (MODEL 59)
27	1	8040697	SHEAVE 6.55" OD SDS 2-GROOVE
	1	8040485	BUSHING 1 1/8" SDS
	2	8041027	BELTS, BX 54
	1	8041798	RETAINER
28	2	8042606	CLAMP HOSE T-BOLT 450
29	4	8042605	CLAMP HOSE T-BOLT 350
30	2	8030400	4" BAND CLAMP

060812-E

VACASSY232



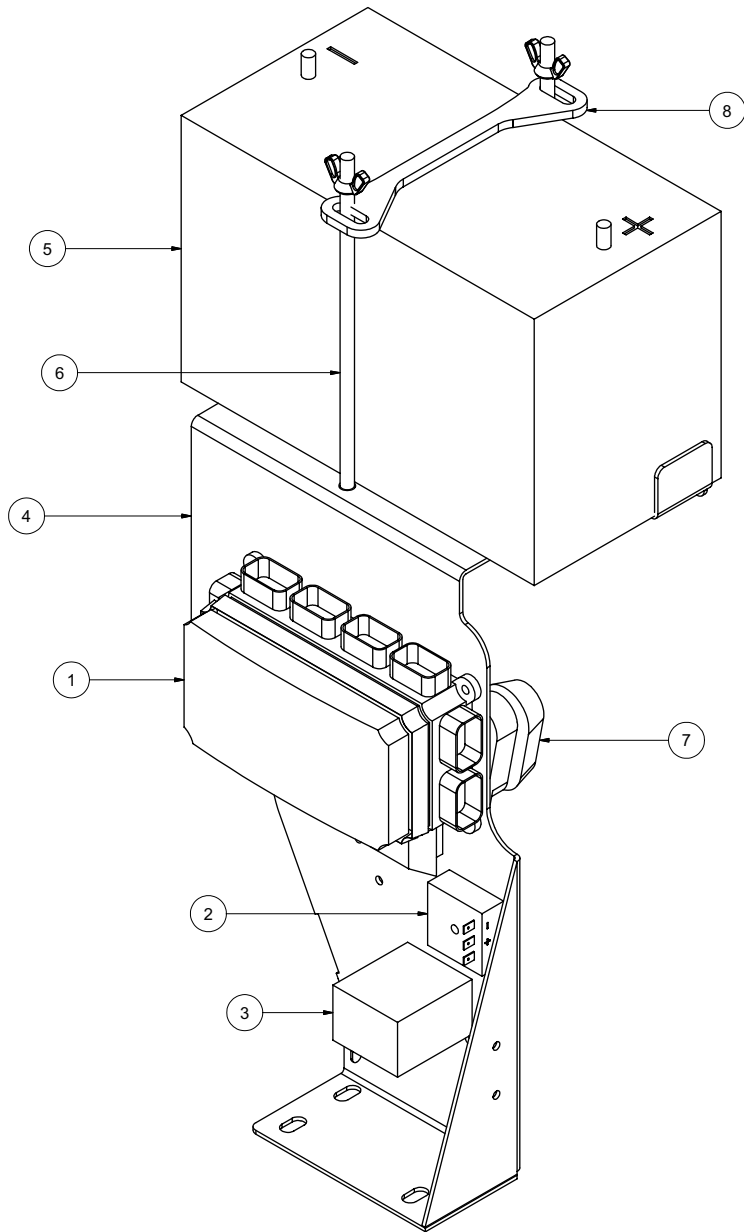
Assembly of URAI DSL Blowers with Splash Lubricated Drive End 3-5" Gear Diameter

**URAI-DSL Splash Lubricated Blowers
4" Gear Diameter**

Item #	Qty	Part #	Description
1	1	8041250-1	Headplate Gear End
2	1	8041250-2	Headplate Drive End
3	1	8041250-3	Gearbox
4	2	8041250-4	Timing Gears
7	1	8041250-7	Gasket, Gear Box, DE Cover
11	1	8041250-11	Cylinder
12	1	8041250-12	Impeller & Shaft Drive
13	1	8041250-13	Impeller & shaft Driven
14	3	8041250-14	Bearing, Ball
15	1	8041250-15	Bearing, Roller
16	4	8041250-16	Pin, Dowel
17	2	8041250-17	Gear Nut
19	1	8041250-19	Key
21	3	8041250-21	Plug, Pipe
23	6	8041250-23	Screw Hex
25	1	8041250-25	Breather (Plug Vent)
26	*	8041250-26	Screw, Hex
27	4	8041250-27	Seal, Lip Bearing
31	4	8041250-31	Screw, Hex, Nylock
32	6	8041250-32	Screw, Hex
33	1	8041250-33	Seal Lip-Drive
34	2	8041250-34	Clamp Plate
35	2	8041250-35	Foot
39	4	8041250-39	Washer Mounting
40	2	8041250-40	Screw Socket
42	2	8041250-42	Screw Hex
48	4	8041250-48	DE Oil Slinger Set Screw
50	1	8041250-50	Drive End Cover
52	2	8041250-52	Drive End Oil Slinger
53	2	8041250-53	Oil Sight Glass

*Quantities vary by blower.

Electrical Control Bracket



041112-E

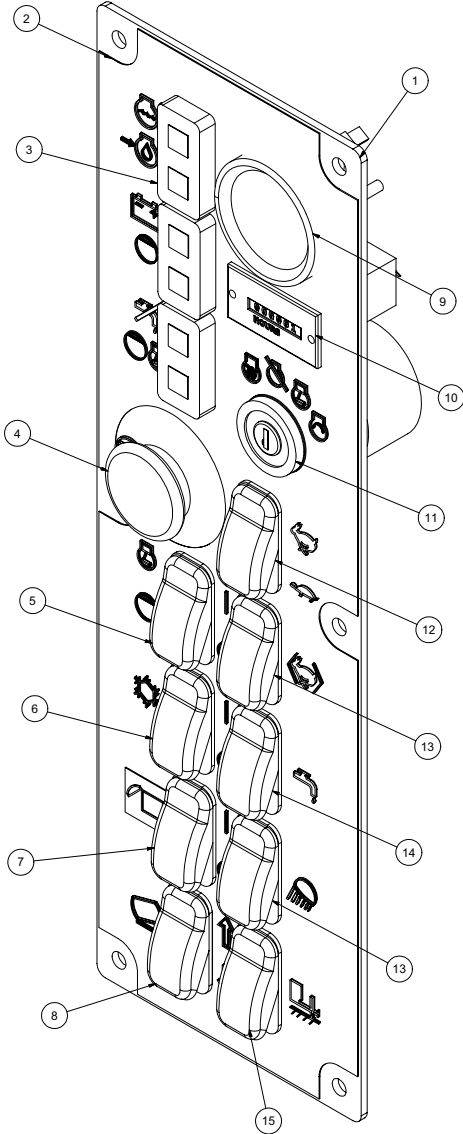
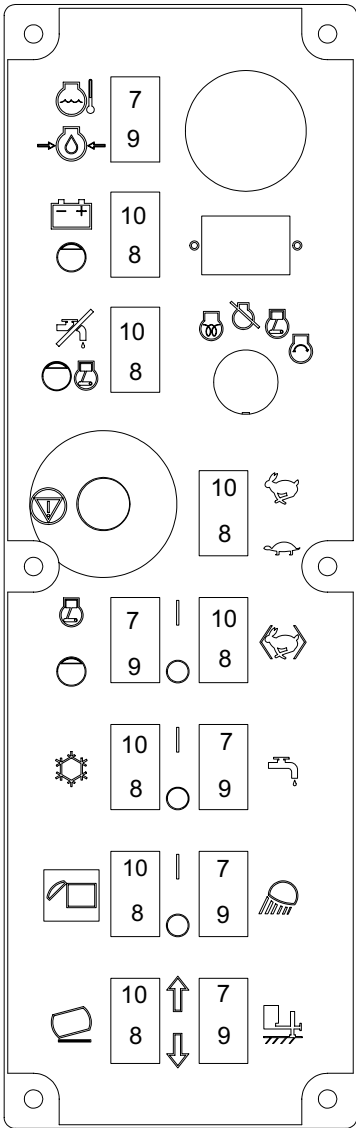
VACASSY550

Electrical Control Bracket

ITEM	QTY	PART NO.	DESCRIPTION
1	1	X000239	BUSSMAN VEC
	7	X000205	FUSE 5A
	2	X000206	FUSE 10A
	2	X000207	FUSE 20A
	3	X000237	FUSE 30A
	1	X000236	CIRCUIT BREAKER 20A
	1	X000210	CIRCUIT BREAKER 30A
	6	X000209	RELAY 35A/25A
	5	X000208	DIODE 6A
*	4	U000040	SCREW, HC 1/4" - 20 X .750
*	4	U200020	WASHER, FLAT 1/4"
*	4	U210020	WASHER, LOCK 1/4"
*	4	U100020	NUT, HEX 1/4"-20
2	1	8042282	SWITCH, DELAY RELAY
*	1	U100020	NUT, HEX 1/4"-20
	1	U200020	WASHER, FLAT 1/4"
	1	U210020	WASHER, LOCK 1/4"
	1	U000080	SCREW, HC 1/4"-20 X 1.25 ZP G5
3	1	X000241	RELAY TIMER 15 SEC SHUTDOWN
*	1	U100020	NUT, HEX 1/4"-20
	1	U200020	WASHER, FLAT 1/4"
	1	U210020	WASHER, LOCK 1/4"
	1	U000080	SCREW, HC 1/4"-20 X 1.25 ZP G5
4	1	8043127	CONTROL PANEL - HARNESS MTG PLATE
5	1	X400050	BATTERY, 31-MHD WORKAHOLIC
6	2	8043742	BATTERY HOLD DOWN ROD ASSY
7	1	8043800	FUSE HOLDERAMG
	1	8043801	FUSE 250A AMG
*	2	U000060	SCREW, HC 1/4"-20 X 1.00
*	2	U200020	WASHER, FLAT 1/4"
*	2	U210020	WASHER, LOCK 1/4"
*	2	U100020	NUT, HEX 1/4"-20
8	1	8050016	BATTERY HOLD DOWN
*	1	X200005	HARNESS VAC CONTROL
*	1	X300222	BATTERY GROUND CABLE
*	1	X300219	BATTERY HOT CABLE 18"
*	1	X300220	ENGINE TO FUSE HOT 1GA 60"
*	1	X300221	HYD PUMP TO FUSE HOT 1GA 36"
*	1	X300221	ELEC CONTROL BOX TO FUSE HOT 1GA 36"
*	1	X300222	ELEC CONTROL BOX GROUND 1GA 18"
*	1	X300224	ENGINE GROUND 1GA 21"
*	1	X300225	HYD PUMP GROUND 1GA 24"

* NOT SHOWN

Control Panel



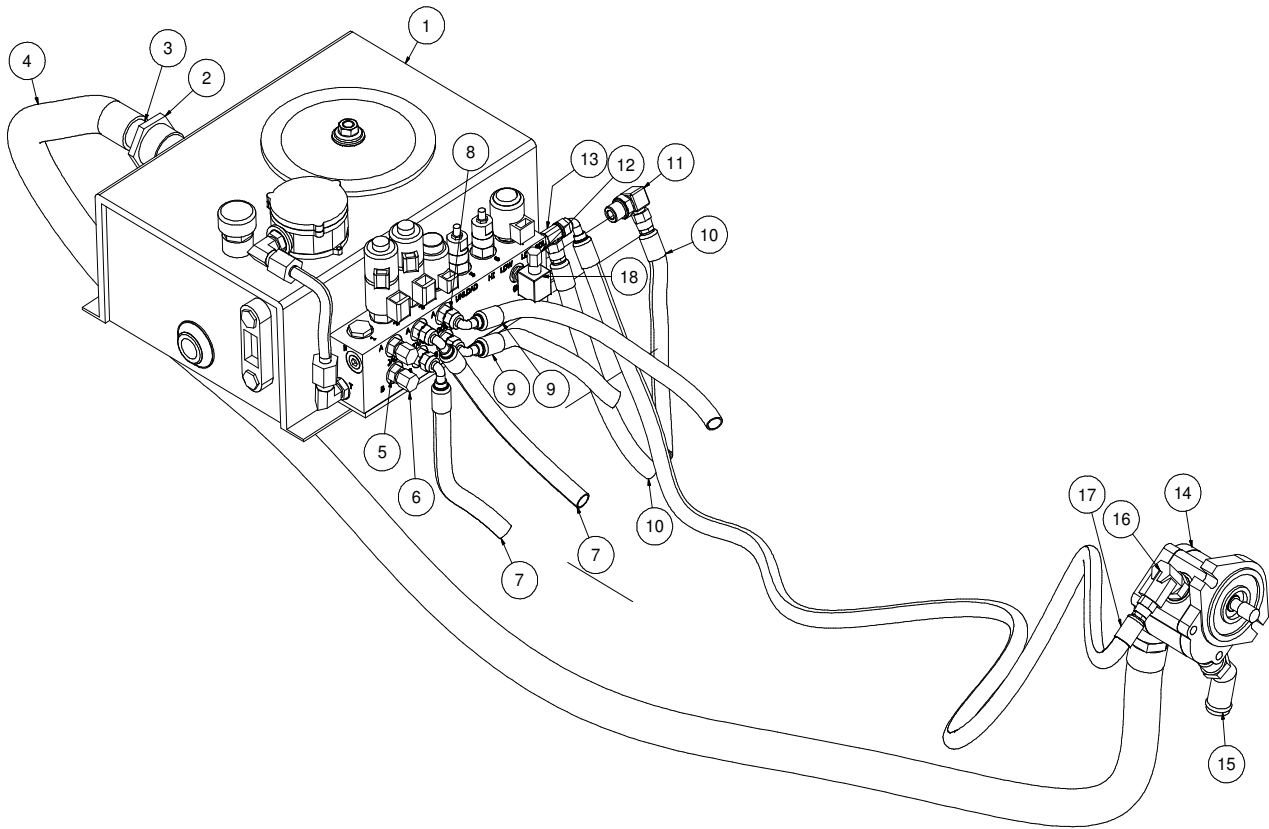
Control Panel

ITEM	QTY	PART NO.	DESCRIPTION
1	1	8043128	CONTROL PANEL - MAIN PLATE
2	1	J200031	DECAL - CONTROL PANEL
3	3	X000260	LIGHT LED DUAL PANEL
4	1	X000280	E-STOP
5	1	X000273	ROCKER SWITCH SPST (ON) NONE -OFF
6	1	X000271	ROCKER SWITCH DPST (ON) NONE -ON
7	1	X000274	ROCKER SWITCH DPST (ON) OFF (ON)
8	1	X000274	ROCKER SWITCH DPDT (ON) OFF (ON)
9	1	X100001	FUEL GAUGE
10	1	X000300	HOUR METER
11	1	8030458	IGNITION SWITCH
12	1	X000271	ROCKER SWITCH DPST ON - ON
13	2	X000270	ROCKER SWITCH SPST ON -OFF
14	1	X000270	ROCKER SWITCH SPST ON -OFF
	1	X000271	ROCKER SWITCH DPST ON -ON
15	1	X000290	ROCKER SWITCH PLUG
	1	X000274	ROCKER SWITCH DPDT (HYD. JACK OPTION)
*	1	8030829	KEY, IGNITION - KUBOTA

* NOT SHOWN

Boom Hydraulics Assembly

67HP/99HP



020612-E

VACASSY998

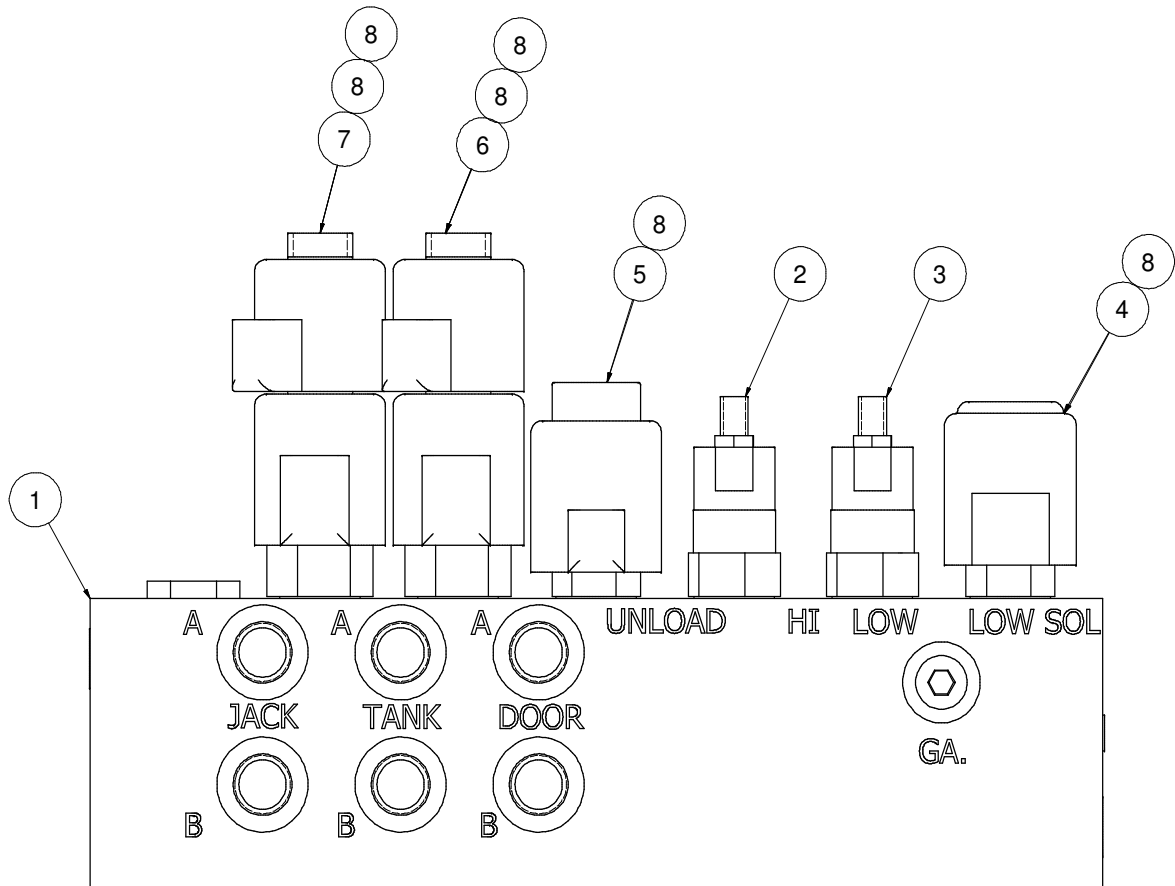
Boom Hydraulics Assembly

67HP/99HP

ITEM	QTY	PART	DESCRIPTION
1	1	8047330	KIT, HYD. BOOM BASE PACK (CROSS2)
2	1	8011058	SUCTION STRAINER 1" / 15GPM
3	1	8043963	UNION, 1"MP - 1"BARB
4	1	8047786	HOSE VAC PUSH 1" - 52"LG
5	4	T400037	UNION, 6MB - 6MJ
6	2	T405203	CAP, 3/8" FEM. JIC, HEX HEAD
7	2	8043782	HOSE ASSY VAC 6 - 77" ST-90 (99HP)
8	2	T400550	REDUCER, 3/8"MB - 1/4"MJ
9	2	8047787	HOSE ASSY VAC 4 - 133" ST-90 (99HP)
10	2	8047788	HOSE ASSY VAC 6 - 200" ST-ST (99HP)
11	1	T401250	ELBOW, 90 3/8"MB - 3/8"MJ
12	1	T405200	CAP, 1/4" FEM. JIC, HEX HEAD
13	1	T402148	TEE, 6MB - 6MJ - 6MJ
14	1	8047333	PUMP, HYD BOOM 67/99HP (CROSS2)
15	1	8043964	ELBOW, 45 16HB - 12MB
16	1	T401290	ELBOW, 90 5/8"MB - 3/8"MJ
17	1	8042924	HOSE ASSY VAC 6-60" ST-ST (99HP)
18	1	T401230	ELBOW, 90 3/8"MB - 1/4"MJ

* NOT SHOWN

Base Manifold Assembly

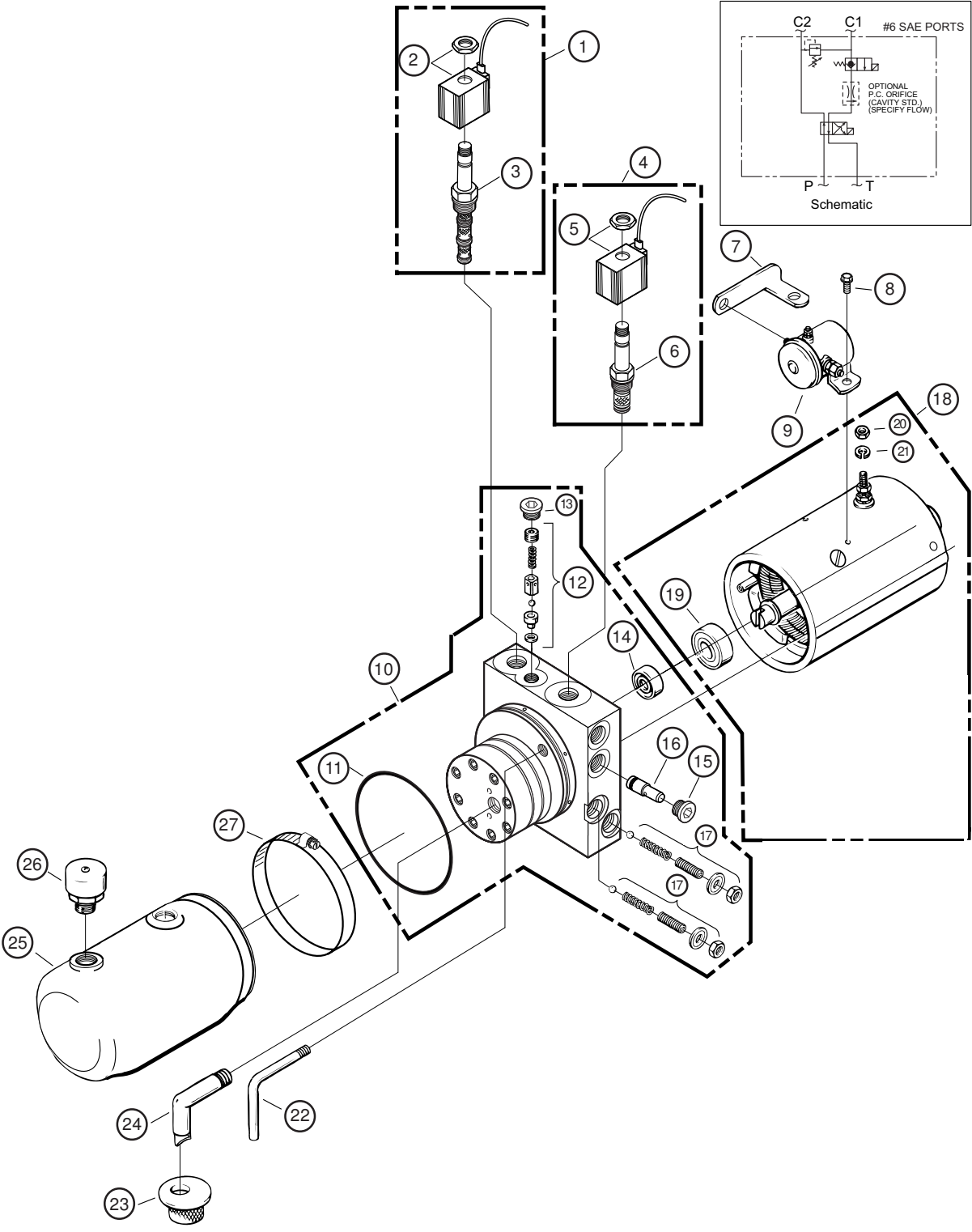


Base Manifold Assembly

ITEM	QTY	PART	DESCRIPTION
1	1	8047330-03	MANIFOLD BLOCK (ONLY)
2	1	8047330-12	HIGH PRESSURE RELIEF
3	1	8047330-13	LOW PRESSURE RELIEF
4	1	8047330-07	SOL. LOW PRESSURE
5	1	8047330-08	SOL. UNLOAD
6	1	8047330-09	SOL. DOOR
7	1	8047330-05	SOL. TANK
8	6	8047330-11	COIL

* NOT SHOWN

Hydraulic Pump w/ Bracket



033110-E

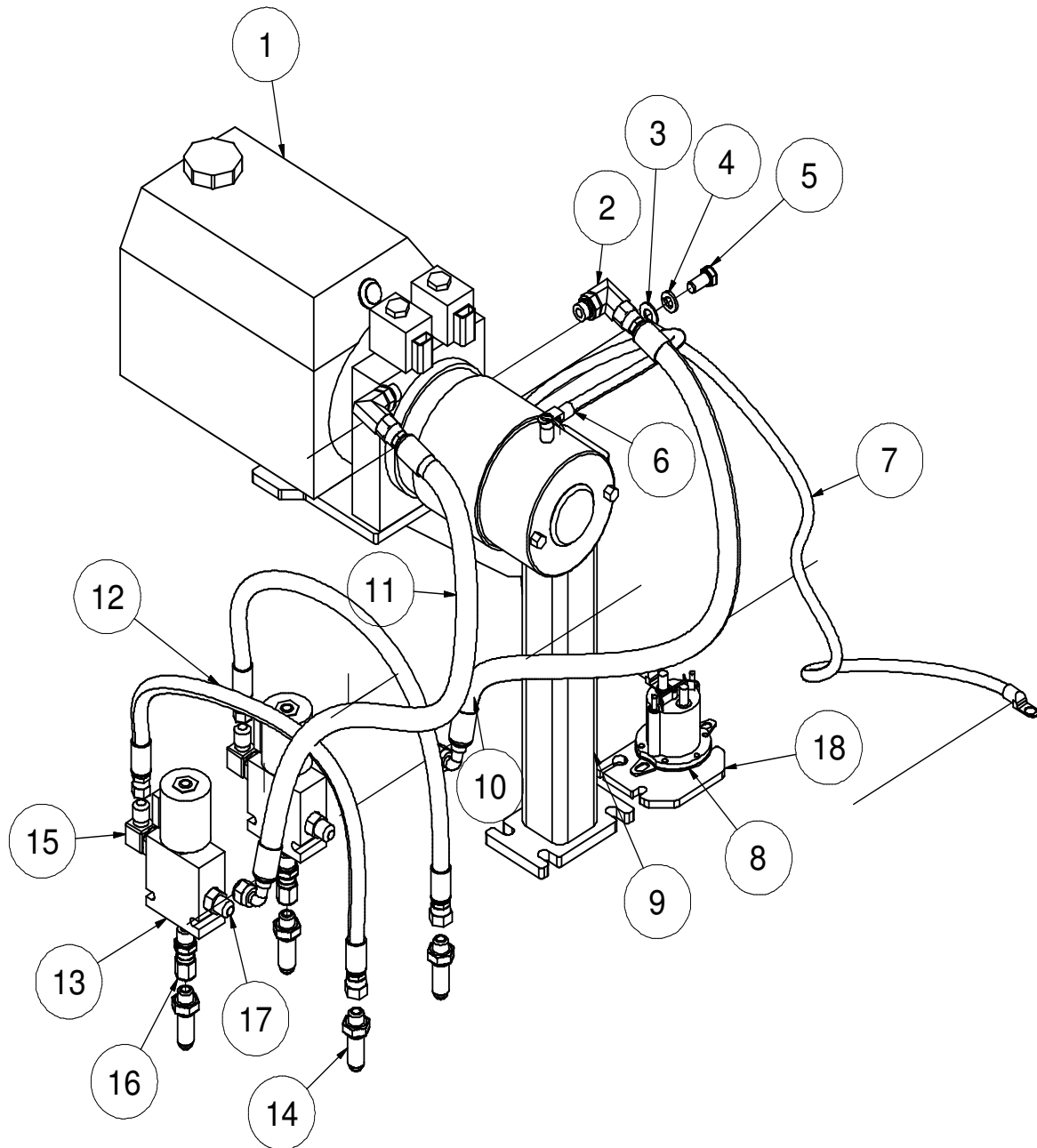
VACASSY250

Hydraulic Pump w/ Bracket

ITEM	QTY	NUMBER	DESCRIPTION
	1	8046300	PUMP, HYD 12V VAC 4.5QT
	2	U000420	SCREW, HC 3/8"-16 X 1"
	2	U210060	WASHER, LOCK 3/8"
	2	U200600	WASHER, FLAT 3/8"
	2	T400037	UNION 6MB - 6MJR
	2	8040973	HOSE ASSY VAC 6-20 ST-90
	2	T400391	BULKHEAD 6MP - 6MP
1	1	8046300-14	VALVE, 4-WAY - 2 POSITION
2	1	8046300-15	COIL, 10 VDC GROUNDED W/ DEUTSCH CONN
3	1	8046300-16	CARTRIDGE, 4-WAY 2 POSITION
4	1	8046300-17	VALVE, 2-WAY 2 POSITION (12V) GROUNDED
5	1	8046300-18	COIL, 10VDC 2-WAY 2 POS GRND W/DEUTSCH CONN
6	1	8046300-19	VALVE, 12V HYD 2-WAY 2 POSITION
7	1	8046300-23	PUMP ASSEMBLY
8	1	8046300-24	O-RING INDUST 3 5/8" X 3 7/8" X 1/8"
9	1	8046300-25	PARTS KIT - VALVE ASSY, POPPET/BALL CHECK
10	1	8046300-26	PLUG
11	1	8046300-27	SEAL
12	1	8046300-28	PLUG, #8 SAE
13	2	8046300-30	PARTS KIT, RELIEF VALVE
14	1	8046300-31	MOTOR, ELECTRIC 12VDC
15	1	8046300-32	BEARING, BASE MOTOR
16	1	8046300-33	NUT, HEX 5/16 -24
17	1	8046300-34	WASHER, LOCK 5/16"
	2	8046300-38	SCREW, HEX HEAD 1/4"-20 X 1 3/8"
	1	8046300-41	PLUG, 3/8"NPTF
18	1	8046300-42	TUBE, RETURN (1/8")
19	1	8046300-43	SCREEN, FILTER (SUCTION)
20	1	8046300-44	TUBE, FILTER SUCTION 3/8"NPT 90 DEG
21	1	8046300-45	6QT RESEVOIR POLY
	*	8040486-45	3QT RESEVOIR POLY
	*	8046300-48	4.5QT RESEVOIR POLY
22	1	8046300-46	PLUG, VENT 3/8"NPT
23	1	8046300-47	CLAMP, HOSE WORM GEAR (IN SERIES)
24	1	8046258	SWITCH HYD PUMP 12V
	1	X200002	HYDRAULIC PUMP WIRE HARNESS
*	1	8043499	HYDRAULIC PUMP MOUNT
		8044297	HYDRAULIC PUMP MOUNT (REVERSE FLOW)
		8045336	HYDRAULIC PUMP MOUNT (412 BLOWER)

* NOT SHOWN

Hydraulic Pump Assembly



101512-E

VACASSY251

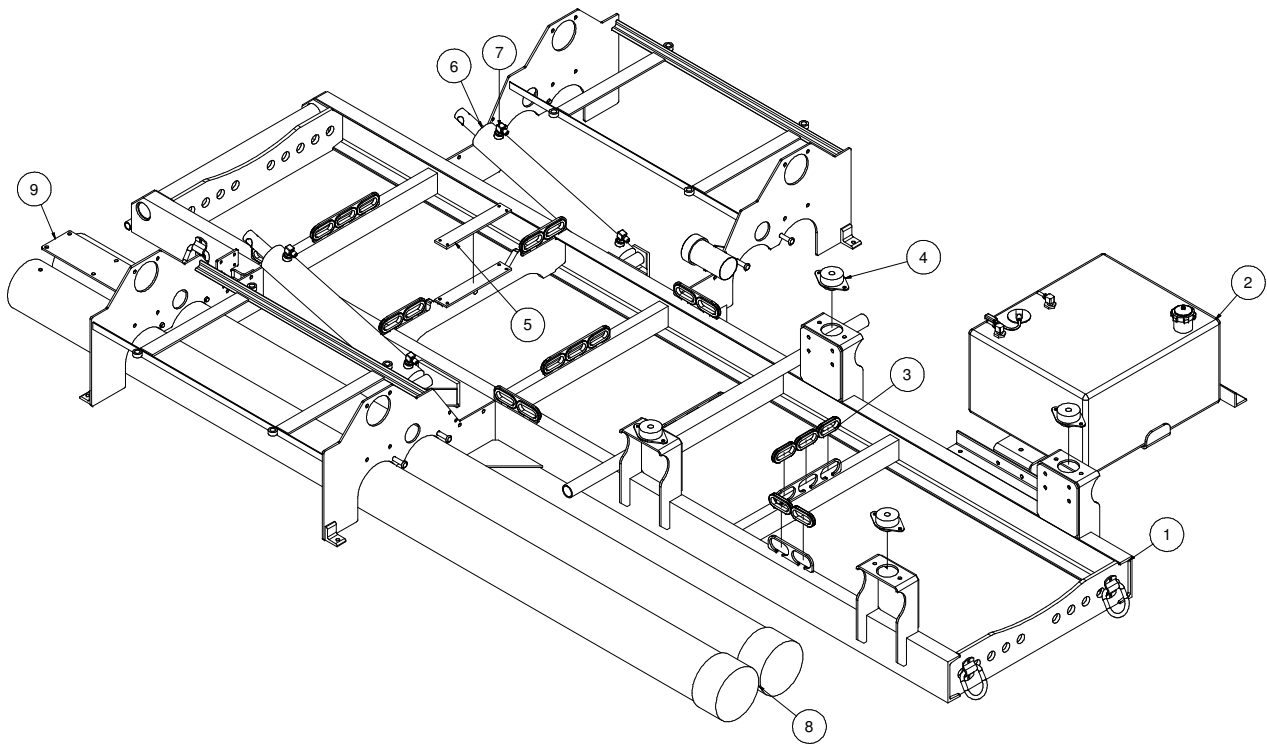
Hydraulic Pump Assembly

ITEM	QTY	PART	DESCRIPTION
1	1	8046300	PUMP, HYD 12V 4.5QT
2	2	T401250	ELBOW, 90 3/8" MB-MJ
3	1	U200600	WASHER, FLAT 3/8"
4	1	U210060	WASHER, LOCK 3/8"
5	1	U200400	SCREW, HC 3/8"-16 X .750
6	1	X300233	CABLE, BATTERY HOT 1GA 26"
	2	X300251	LUG, CABLE 1GA 3/8" HOLE
7	1	X300224	CABLE, BATTERY GROUND 1GA 21"
	2	X300251	LUG, CABLE 1GA 3/8" HOLE
8	1	8046258	SWITCH HYD PUMP 12V RELOCATE
	2	U000040	SCREW, HC 1/4"-20 X .75 ZP G5
	2	U200020	WASHER, FLAT 1/4" ZP
	2	U210020	WASHER, LOCK 1/4" ZP
	2	U100020	NUT, HEX 1/4"-20
9	1	8043499	BRACKET 36/49 12V HYD PUMP
	1	8047283	BRACKET 99AW HYD PUMP
*	2	U000460	SCREW, HC 3/8"-16 X 1.50 ZP G5
*	2	U000480	SCREW, HC 3/8"-16 X 1.75 ZP G5
*	5	U200060	WASHER, FLAT 3/8"
*	5	U210060	WASHER, LOCK 3/8"
*	4	U100060	NUT, HEX 3/8"-16
*	1	U000441	SCREW, HC 3/8"-16 X 1.25 ZP G8
10	1	8046685	HOSE ASSY VAC 6-25" ST-90 (500LE/LEHD)
	1	8046686	HOSE ASSY VAC 6-22" ST-90 (800LE/LEHD)
	1	8040973	HOSE ASSY VAC 6-20" ST-90 (73/99)
11	1	8046687	HOSE ASSY VAC 6-23" ST-90 (500LE/LEHD)
	1	8040973	HOSE ASSY VAC 6-20" ST-90 (800LE/LEHD)
	1	8040973	HOSE ASSY VAC 6-20" ST-90 (73/99)
12	2	8040971	HOSE ASSY VAC 4-19" ST-ST6FJ (LE/LEHD)
13	2	8041788	VALVE, SOLENOID 3-WAY W/ INT C4K
14	4	T400391	BULKHEAD 3/8" MJ - 3/8" MJ
15	2	T401250	ELBOW, 90 3/8" MB - 3/8" MJ
16	2	T400036	UNION, 3/8" MB - 3/8" FJ
17	2	T400037	UNION, 3/8" MB - 3/8" MJ
18	1	8046127	BRACKET PUMP SOLENOID

* NOT SHOWN

Skid Assembly

V300HD



102612-E

VACASSY9402

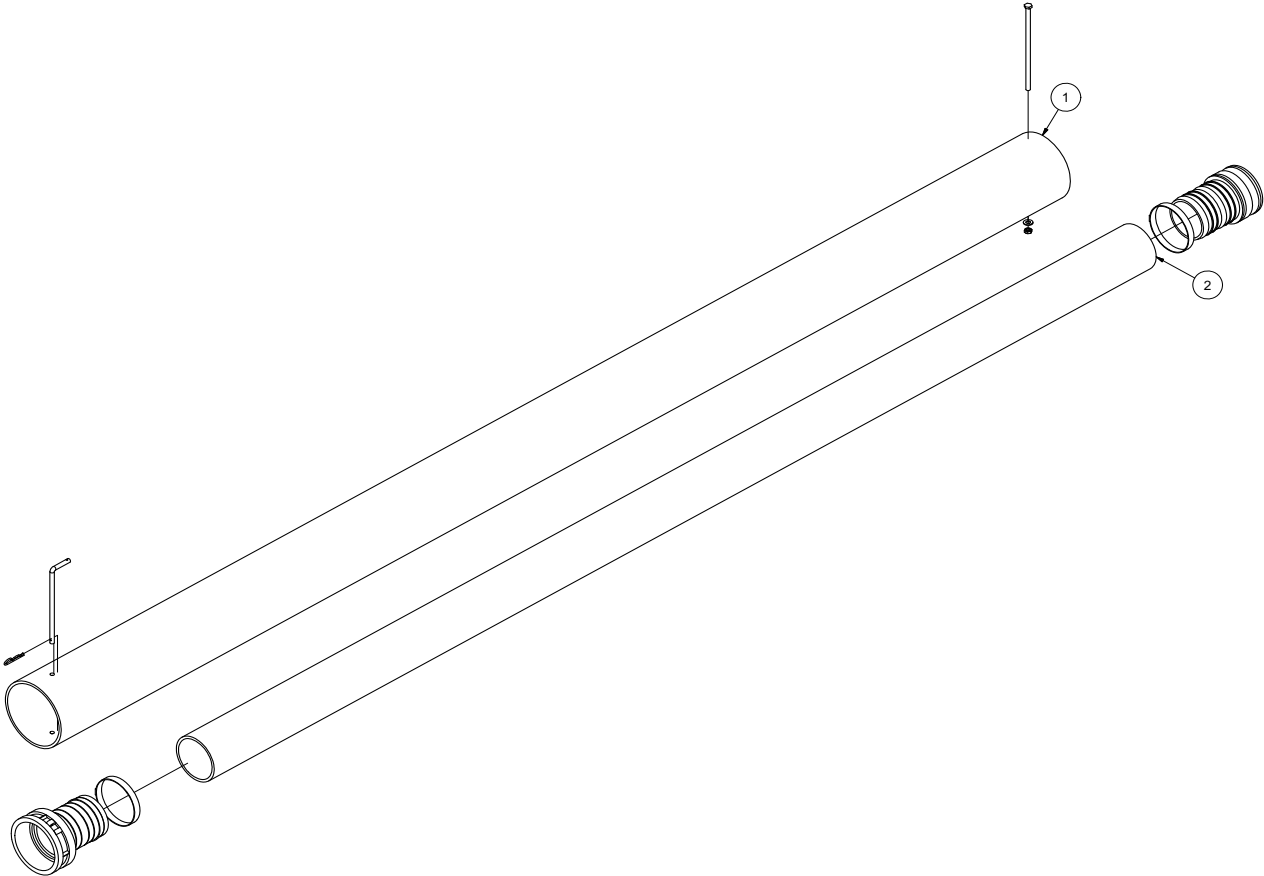
Skid Assembly

V300HD

ITEM	QTY	PART #	DESCRIPTION
1	1	8048492	SKID VSK300HD 67/99HP
2	1	8042380	FUEL TANK 22GAL
	1	8043359	STRAP W/ EYEBOLT
	1	8042380-1	FUEL TANK CAP
	1	8041725	FUEL SENDING UNIT
	1	8041725-1	SENDING UNIT GASKET
	1	8045686	FUEL LINE SUPPLY 30"
	2	8043665	FUEL TANK MTG FOOT
	1	8045507	PLATE FUEL TANK HOLDER
3	20	8042812	GROMMET 2"ID 3"OD 1/4"WOG TRAILER SLOT MODEL
4	4	8030904	ISOLATOR 840LB
	4	U000560	SCREW, HC 3/8"-16 X 3"
	4	8030851	WASHER, SNUBBLING
	4	U120110	NUT, LOCK 3/8"
	8	U000420	SCREW, HC 3/8"-16 X 1"
	24	U200060	WASHER, FLAT 3/8"-16
	8	U210060	WASHER, LOCK 3/8"
	8	U100060	NUT, HEX 3/8"-16
5	1	8045787	STRIP, PLASTIC 1/4" X 1 1/2" X 11"
6	2	8030359	CYLINDER, HYD 3" X 20"
7	4	T401270	ELBOW, 90 1/2"MB - 3/8"MJ
8	2	8041102	HOSE STORAGE 6" X 10'
	2	8041485	LANYARD CABLE
	4	8040959	HOSE STORAGE CLAMP
	8	U200060	WASHER, FLAT 3/8"
	8	U100060	NUT, HEX 3/8"
	2	8030925	END CAP 6"
9	1	8048619	WATER REEL BRACKET

HOSES

4''



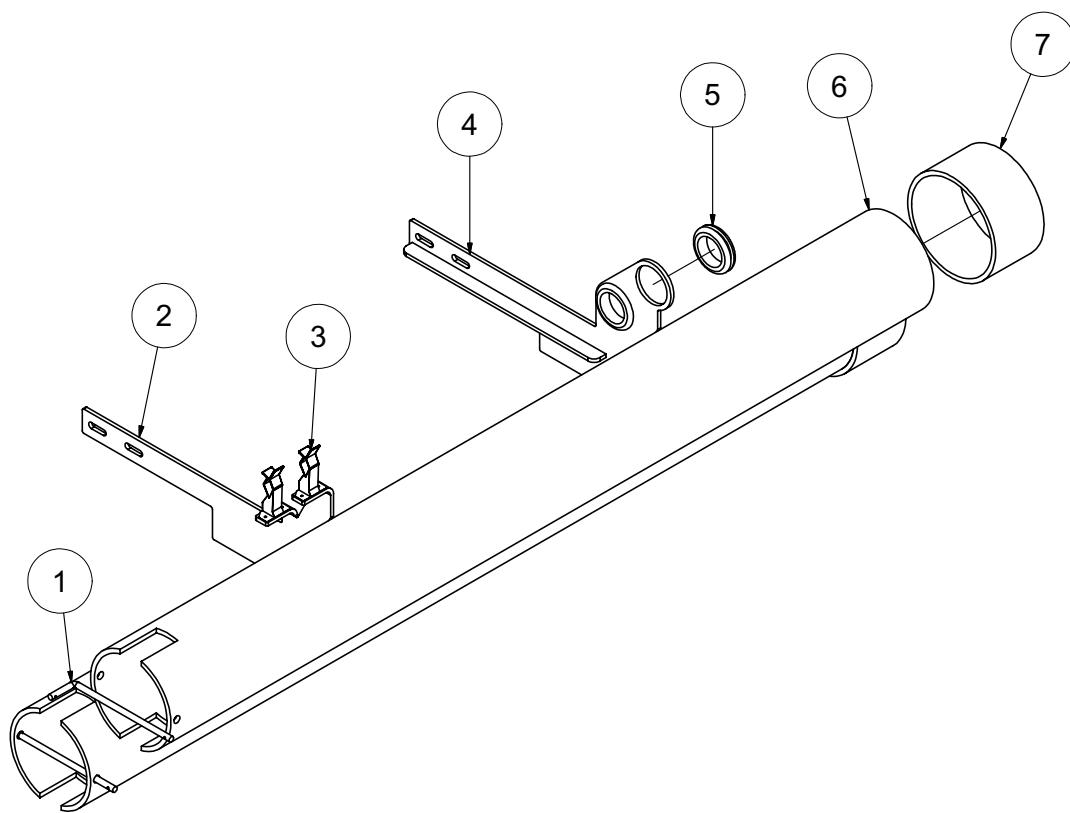
HOSES

4"

ITEM	QTY	PART NO.	DESCRIPTION	
1	1	8041102	6" PVC STORAGE TUBE 10' LG	
	1	U000626	SCREW, HC .375-16 X 7.50"	
	1	8041485	LANYARD CABLE	
	1	8040959	HOSE STORAGE CLAMP	
	2	U200060	WASHER, FLAT 3/8"	
	2	U100060	NUT, HEX 3/8"	
	1	8041101	HOSE STORAGE RETAINING ROD	
	1	R700175	R-CLIP, 1 5/8 SHANK	
	2	1	8042310	HOSE VAC KANAFLEX 4-112
		1	8046444	CAMLOCK, 4" AL FCAM X M BARB
1		8046443	CAMLOCK, 4" AL MCAM X M BARB	
2		8030912	CLAMP, 4.5" PUNCHLOK P18-S	

Tool Rack Assembly

Horizontal



082410-E

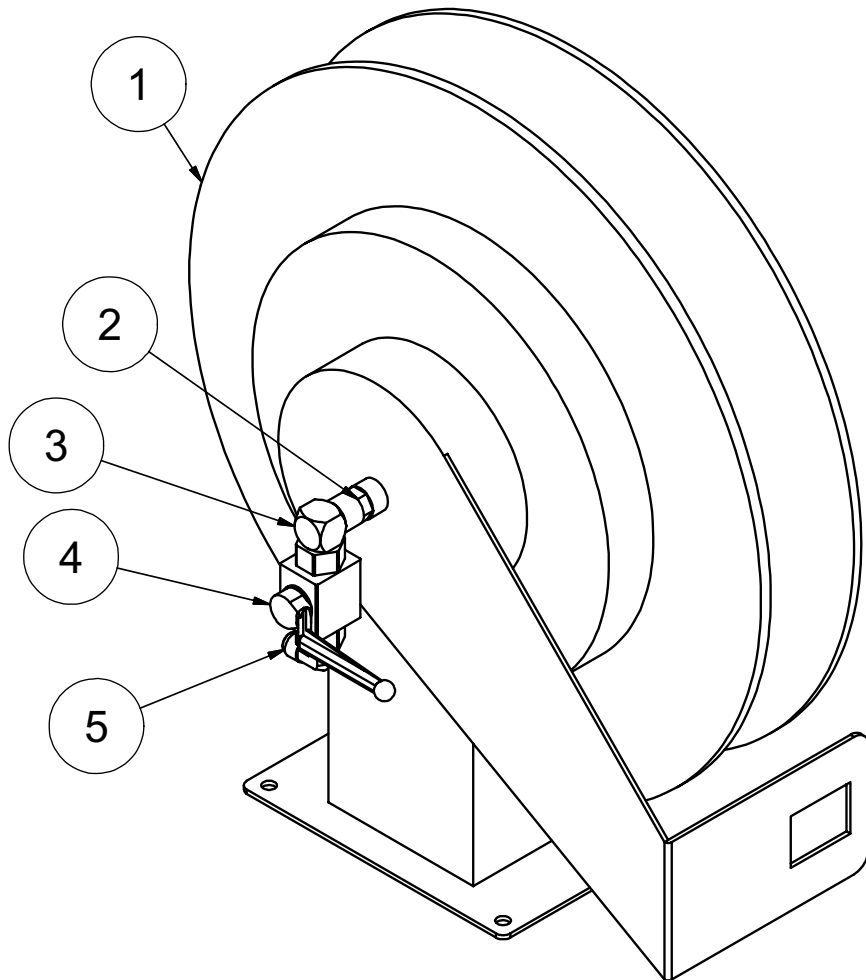
VACASSY767

Tool Rack Assembly

Horizontal

ITEM	QTY	PART NO.	DESCRIPTION
1	2	8041101	HOSE STORAGE RETAINING ROD
	2	8041485	LANYARD CABLE
	2	R700160	R-CLIP
2	1	8046722	HOSE STORAGE BRACKET
3	2	8040899	CLIP, TOOL HOLDER
4	1	8046724	HOSE STORAGE BRACKET
5	2	8042812	GROMMET 2"ID 1/4"WOG
6	2	8042222	BOOM EXT. HOSE STORAGE
7	2	8030925	END CAP 6"

Hose Reel Assembly



081010-E

VACASSY763

Hose Reel Assembly

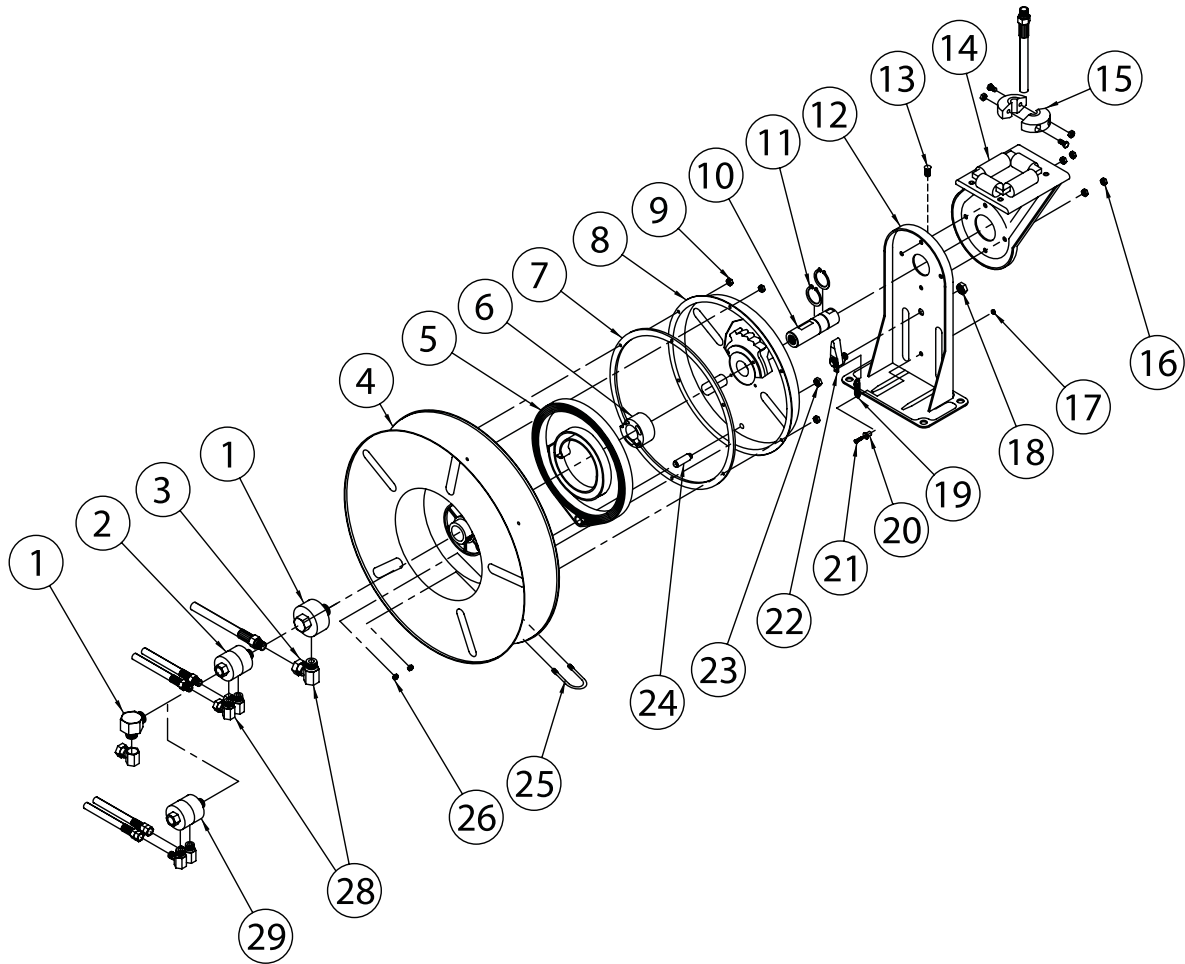
ITEM	QTY	NUMBER	DESCRIPTION
1	1	8031240	REEL with HOSE SPRINGDRIVEN 3/8" X 50'
2	1	8031269	UNION, 1/2"MP - 3/8"MP
3	1	T401065	ELBOW, 3/8"MP - 3/8"FP
4	1	8030351	STEEL BALL VALVE - 3/8"NPT
5	1	8030498	ELBOW, 3/8"MP - 3/8"MJ 90

081010-E

VACASSY763

Hose Reel

Components



081010-E

VACASSY764

Hose Reel

Components

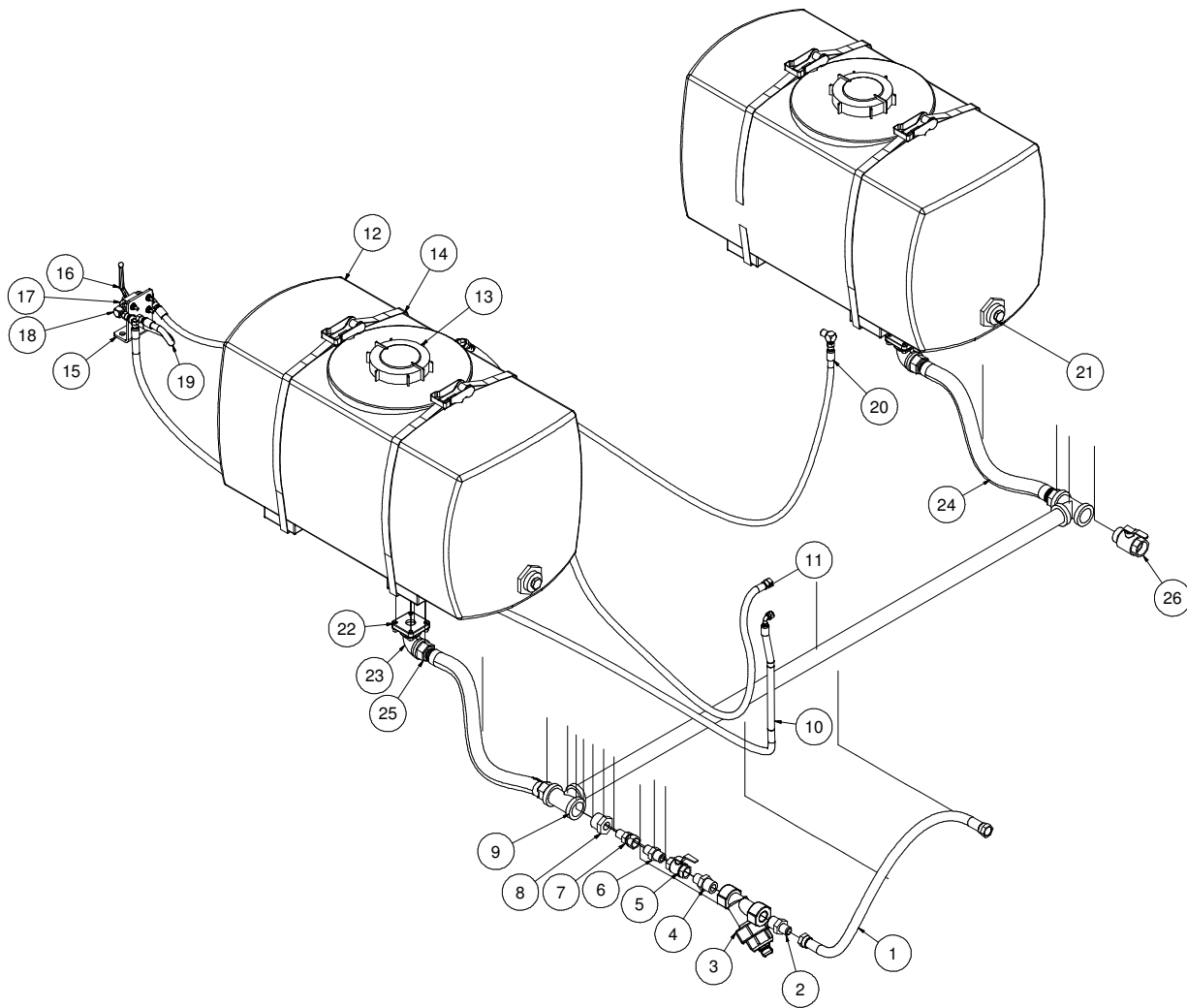
ITEM	QTY	NUMBER	DESCRIPTION
		8031240	REEL with HOSE SPRINGDRIVEN 3/8" X 50'
1	1	8031240-1	SWIVEL ASSEMBLY
2	1	8031240-2	SWIVEL & ELL ASSEMBLY
3	1	8031240-3	90 DEG ELL
4	1	8031240-4	SHEAVE ASSEMBLY
5	1	8031240-5	DRIVE SPRING ASSEMBLY
6	1	8031240-6	SPRING ARBOR ASSEMBLY
7	1	8031240-7	GASKET
8	1	8031240-8	SPRING CASE ASSEMBLY
9	6	8031240-9	10-32 HEX LOCKNUT
10	1	8031240-10	MAIN SHAFT
11	2	8031240-11	1 1/4" SNAP RING
12	1	8031240-12	BASE ASSEMBLY
13	1	8031240-13	1/2"-13 SET SCREW
14	1	8031240-14	GUIDE ARM W/ ROLLERS
15	1	8031240-15	HOSE BUMPER ASSEMBLY
16	4	8031240-16	5/16"-18 LOCKNUT
17	1	8031240-17	10-32 X 3/8" NYLOCK NUT
18	1	8031240-18	1/2"-20 X 5/8" HEX NUT
19	1	8031240-19	LATCH SPRING
20	1	8031240-20	BUSHING
21	1	8031240-21	10-32 X 7/8" SCREW
22	1	8031240-22	LATCH PAWL ASSEMBLY
23	1	8031240-23	3/8"-24 JAM NUT
24	1	8031240-24	SPRING CASE STUD
25	1	8031240-25	U-BOLT
26	4	8031240-26	1/4"-20 X 3/8" LOCKNUT
28	1	8031240-28	SWIVEL UNION

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VACASSY764

Water Tank Assembly

50Gallon Saddle SKID



102612-E

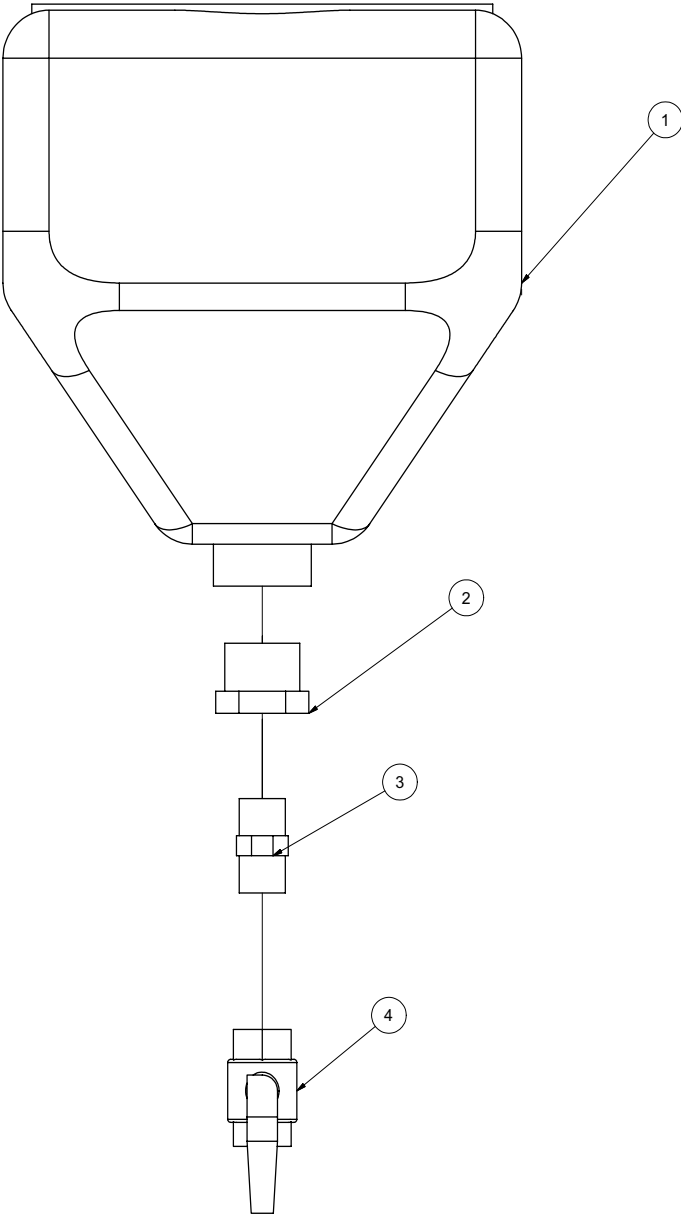
VACASSY621

Water Tank Assembly

50Gallon Saddle SKID

ITEM	QTY	PART NO.	DESCRIPTION
1	1	8043688	HOSE VAC PUSH 12-20"
	2	8030525	FITTING, HOSE #12 FJ PUSHLOCK
	1	8030518	1/2" BULKHEAD 45DEG
2	1	T400450	UNION, 12MJ - 16MP
3	1	8040186	STRAINER
	1	8040186-1	END CAP
	1	8040186-2	GASKET
	1	8040186-3	STRAINER PLUG
	1	8040186-4	FKMO
	1	8040186-5	STRAINER MESH SCREEN 80
	1	8040186-6	Y-BODY
	1	8040186-7	EPDM O-RING
4	1	T404060	UNION, 16MP-12MP
5	1	T000185	BALL VALVE, BRASS 3/4"FP
6	1	T400100	UNION, 12MJ-12MP
7	1	T400101	UNION, 12FJ-12MP
8	1	T403100	REDUCER, 20MP-12FP
9	1	8041310	TEE, 1 1/4"FP - 1 1/4"FP - 1 1/4"FP
10	1	8046897	BALL VALVE TO WATER PUMP 6-72" ST-ST
11	1	8041059	HOSE VAC PUSH 8-66"
	2	8030524	1/2" PUSHLOCK FITTING
12	2	8034151	50 GALLON WATER TANK
13	2	8034151-1	TANK LID
14	4	8043758	STRAP, EYEBOLT 1" X 55" OAL
15	1	8040670	BALL VALVE BRACKET
16	1	8030351	STEEL BALL VALVE - 3/8"NPT
17	2	U010017	1 1/2" CLAMP HOOK 1/4-20 THD
18	4	U120100	NUT, LOCK 1/4-20
	4	U200020	WASHER, FLAT 1/4"
19	1	8046898	WATER REEL TO BALL VALVE 6-27" ST-90
20	1	8046899	TANK CLEANOUT 6-143" ST-90
21	2	T405065	PLUG #12MP
22	2	8045093	BULKHEAD, 1 1/4" BOTTOM
23	2	T420120	ELBOW, 90 1 1/4" STREET
24	2	8041523	HOSE VAC CLEAR VINYL 1 1/4"-24"
25	4	8041312	FITTING, HOSEBARB 1 1/4"
26	1	8045813	VALVE, BALL 1 1/4" M X F BRASS

Antifreeze Assembly



060309

VACASSY943

Antifreeze Assembly

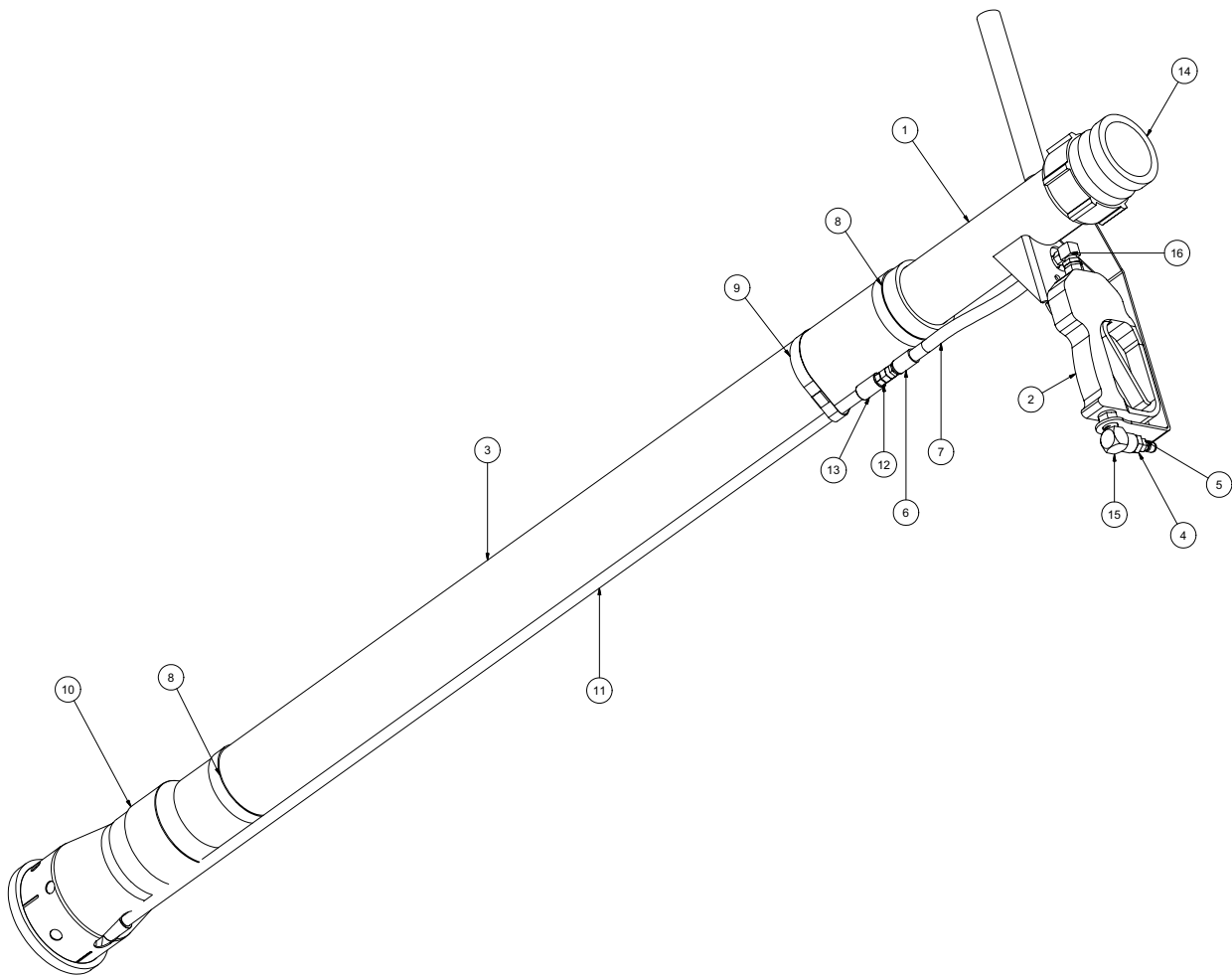
ITEM	QTY	PART NO.	DESCRIPTION
1	1	8030394	ANTI-FREEZE TANK 4 GAL.
	4	U000180	SCREW, HC .312 -18 X .750
	4	U200040	WASHER, FLAT 5/16"
	4	U210040	WASHER, LOCK 5/16"
2	1	T400585	REDUCER, 20MP-12FP
3	1	T400800	UNION, 12MP-12MP
4	1	T000185	BALL VALVE, BRASS 3/4" FP

060309

VACASSY943

Tools (Option)

HD Reduction Tool



101812-E

VACASSY707

Tools (Option)

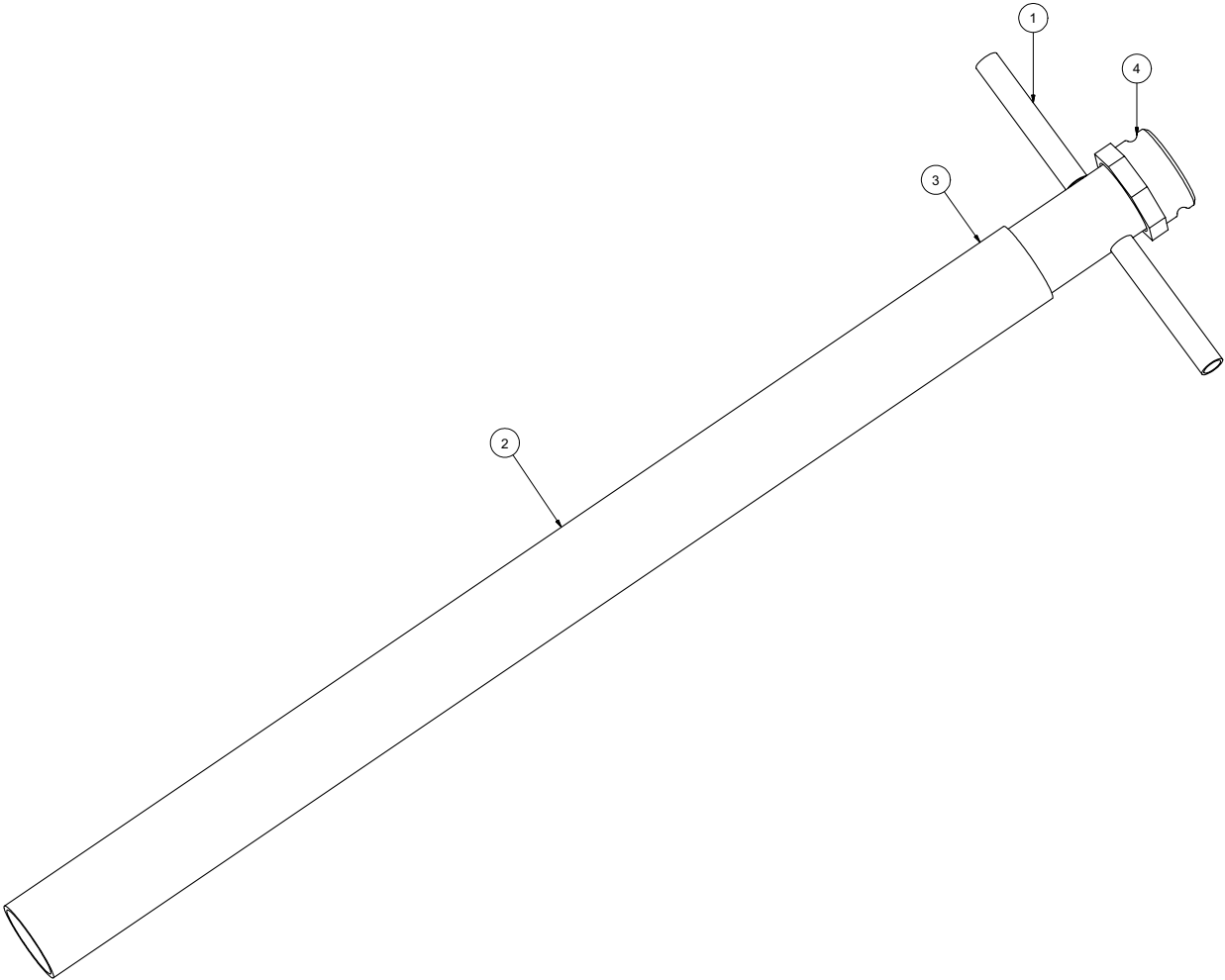
HD Reduction Tool

ITEM	QTY	PART NO.	DESCRIPTION
-	-	8043115	TOOL VAC REDUCTION HD COMPLETE
1	1	8042862	TOOL VAC HEAD ASSY 3"
2	1	8048567	STRAIGHT SPRAY GUN
3	1	8042811	TOOL VAC REDUCTION PVC 3" X 48"
4	1	T400023	UNION 6MP 4FP
5	1	8030486	WATER QD 1/4 MNPT SS
6	2	T320030	FITTING, HOSE 4HO 4FJ
7	1	8031278	HOSE ASSEMBLY REDUCTION TOOL
8	2	8030244	VAC CLAMP BAND 3 1/2" PUNCHLOCK
9	1	8030244	VAC CLAMP BAND 3 1/2" PUNCHLOCK
10	1	8041099	TOOL VAC REDUCTION HD LOWER ASSY
11	1	8030247	VAC WATER SUPPLY TUBE
12	1	T400020	UNION 1/4" MP-1/4" MJ STRAIGHT
13	2	T422010	COUPLING,PIPE 1/4"FP
14	1	8030391	BANJO 3" MALE 3" FNPT
15	1	T401065	ELBOW, 3/8 MP - 3/8 FP
16	1	T401100	ELBOW 4MP 4MJ 90
*	2	8030370	REDUCTION TOOL NOZZLE
*	2	8031268	REDUCTION TOOL NOZZLE 45 DEG

* NOT SHOWN

Tools

4" Suction Tool



072308

VACASSY710

Tools

4" Suction Tool

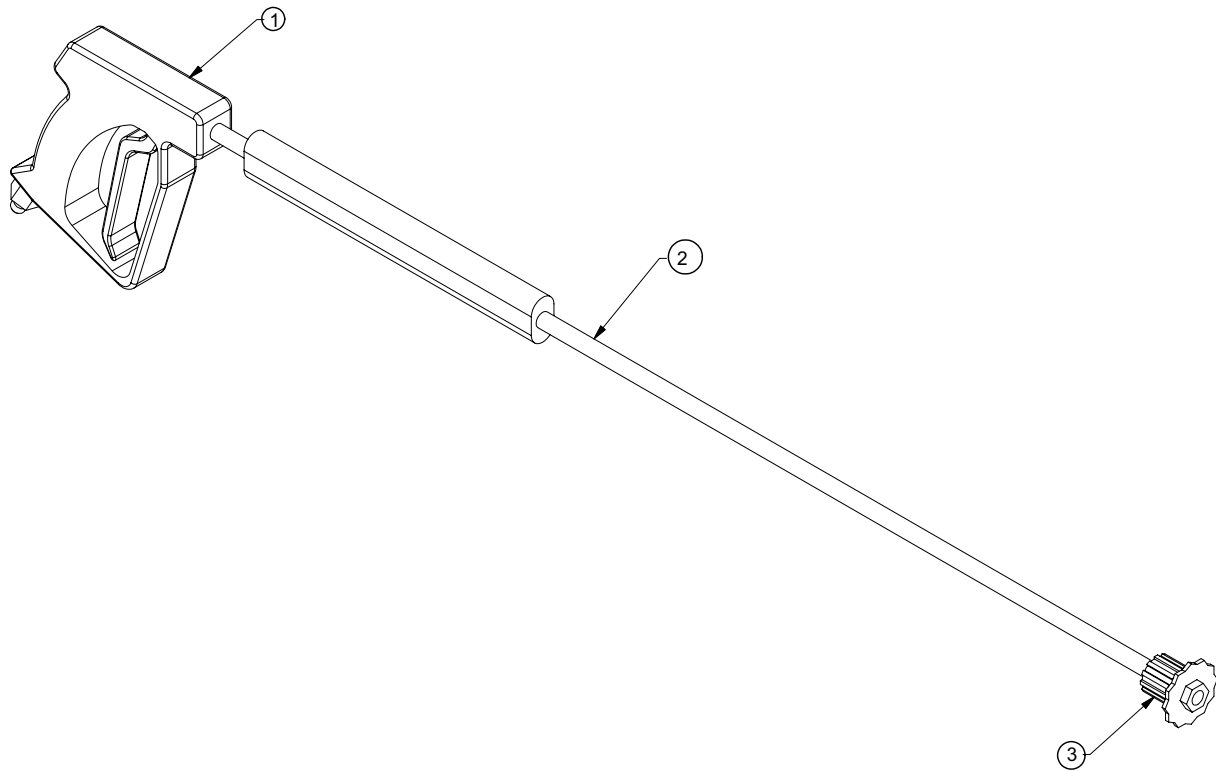
ITEM	QTY	NUMBER	DESCRIPTION
	1	8040983	TOOL VAC SUCTION 4" COMPLETE
1	1	8040981	TOOL VAC HANDLE ASSEMBLY 4"
2	1	8040982	PVC VACUUM TUBE 4"
3	1	8030912	CLAMP, 4.5" PUNCHLOK
4	1	8030844	COUPLING, 4" BANJO

072308

VACASSY710

Tools

Wash Wand



042610-E

VACASSY711

Tools

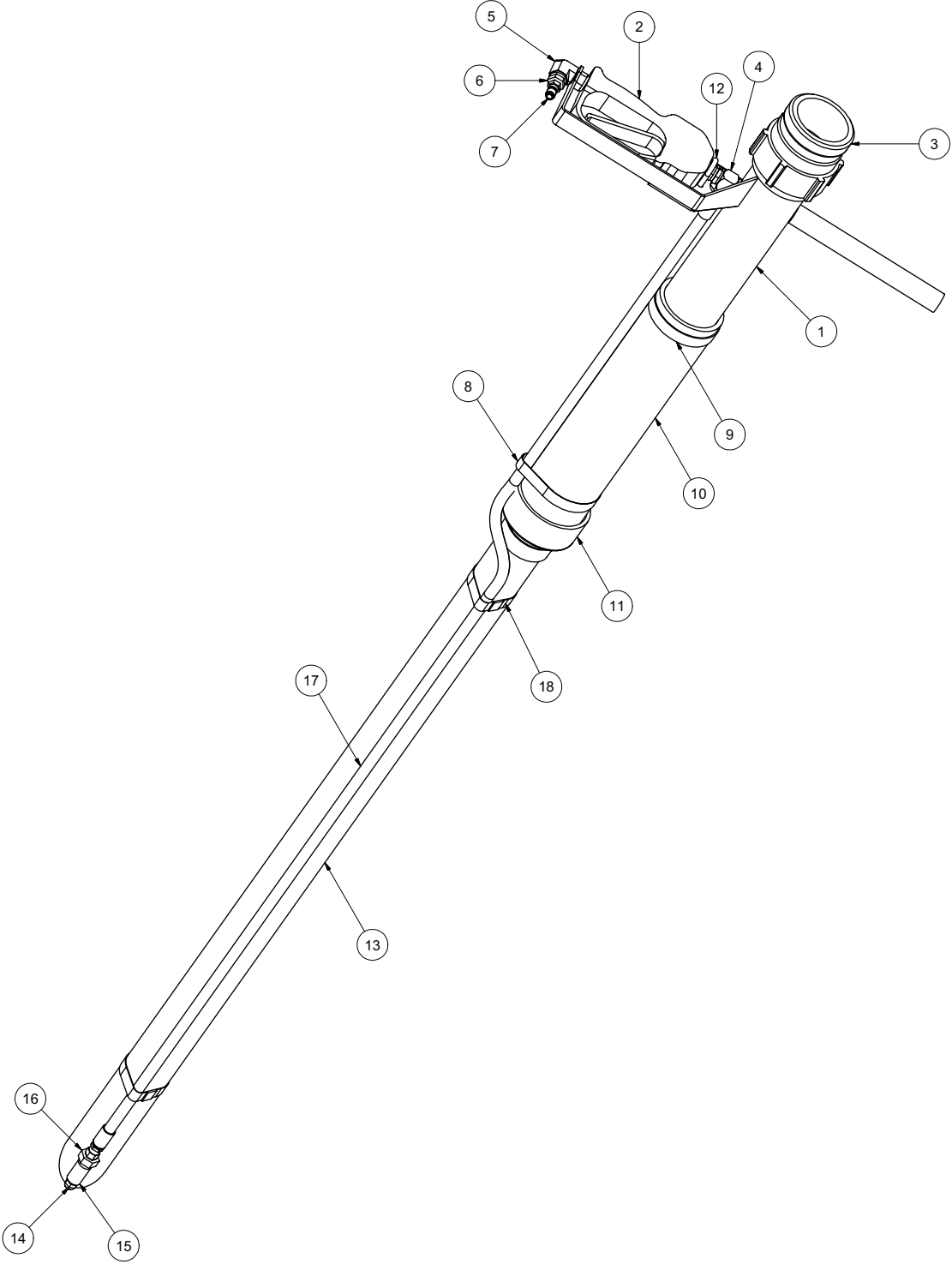
Wash Wand

Item	Qty	Number	Description
1	1	8030348	TOOL VAC SPRAY WAND COMPLETE
2	1	8030928	TRIGGERASSEMBLY
3	1	8030847	WAND
3	1	8031308	NOZZLE,#6 40 DEGREE FOR WAND

042610-E

VACASSY711

Valve Box Cleanout Tool



101812-E

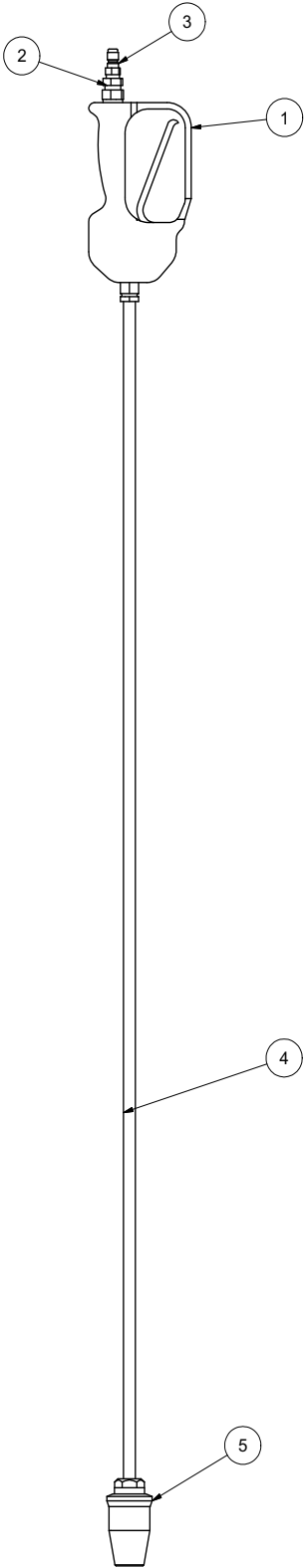
VACASSY714

Valve Box Cleanout Tool

ITEM	QTY	PART NO.	DESCRIPTION
	1	8043384	VAC TOOL VALVEBOX CLEANOUT COMPLETE
1	1	8042862	REDUCTION TOOL HEAD WELD'T
2	1	8048567	STRAIGHT SPRAY GUN
3	1	8030391	BANJO 3" MALE FNPT
4	1	T401100	ELBOW 4MP 4MJ 90
5	1	T401065	ELBOW, 3/8 MP - 3/8 FP
6	1	T400023	REDUCER 6MP 4FP
7	1	8030486	WATER QD 1/4 MNPT SS
8	1	8042855	CLAMP HOSE T-BOLT 375
9	1	8042605	CLAMP HOSE T-BOLT 350
10	1	8044096	PVC 3" DIA X 9" LONG
11	1	8030669	REDUCER PVC 3" TO 2" SLIP ON
12	1	U010019	U-BOLT 1_4-20 X 3_4 WIDE X 2 1_4 LONG
13	1	8044097	PVC 2" DIA X 42.5" LG
14	1	8031246	NOZZLE, .100 X 0 DEG
15	1	T422010	COUPLING 1/4"FP
16	1	U400020	UNION, 1/4" MP - 1/4" MJ
17	1	8044098	HOSE ASSY VALVE BOX CLEANOUT TOOL
18	2	8045316	CLAMP, HOSE T-BOLT 275

Tools

Rotary Lance



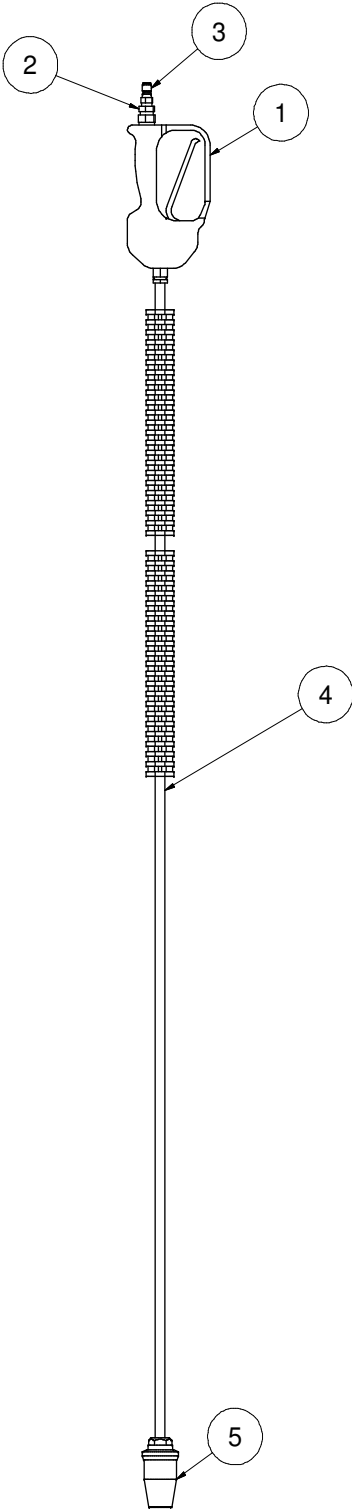
Tools

Rotary Lance

ITEM	QTY	PART NO.	DESCRIPTION
*		8042082	TOOL VAC ROTARY LANCE COMPLETE
1	1	8048567	STRAIGHT SPRAY GUN
2	1	T400023	UNION 6MP-4FP
3	1	8030486	WATER QD 1/4MNPT SS
4	1	8043765	TUBE,CHROME 1/4NPT ENDS 60"
5	1	8042691	ROTARY WOBBLE NOZZLE .085

Tools

Hot Box Rotary Lance



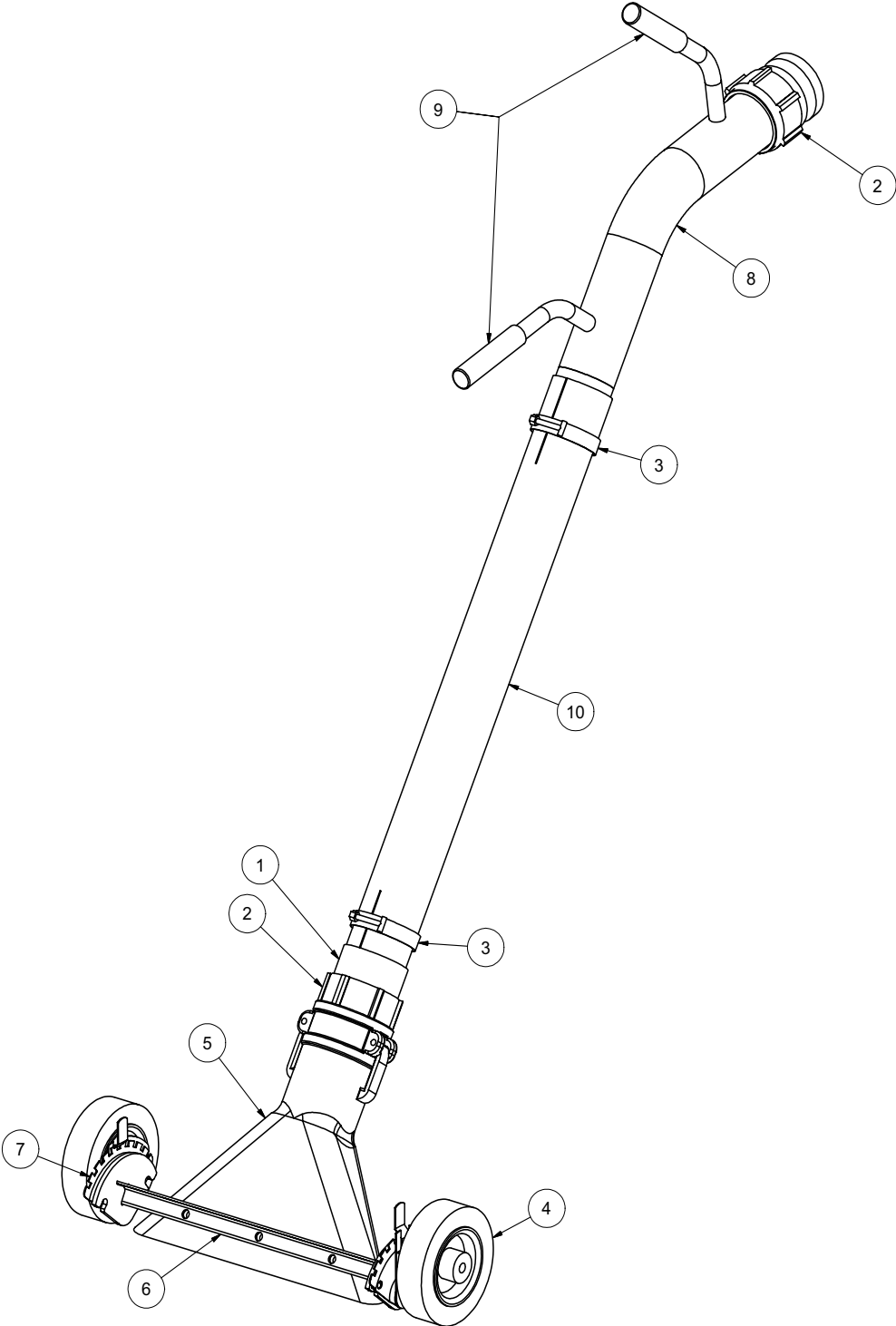
Tools

Hot Box Rotary Lance

ITEM	QTY	PART NO.	DESCRIPTION
*		8048192	TOOL VAC ROTARY LANCE for HOT BOX COMPLETE
1	1	8048567	STRAIGHT SPRAY GUN
2	1	T400023	UNION 6MP-4FP
3	1	8030486	WATER QD 1/4MNPT SS
4	1	8031394	WAND, 59" LONG
5	1	8042691	ROTARY WOBBLE NOZZLE .085

Tools

Lawn Sweeper 3''



101512-E

VACASSY713

Tools

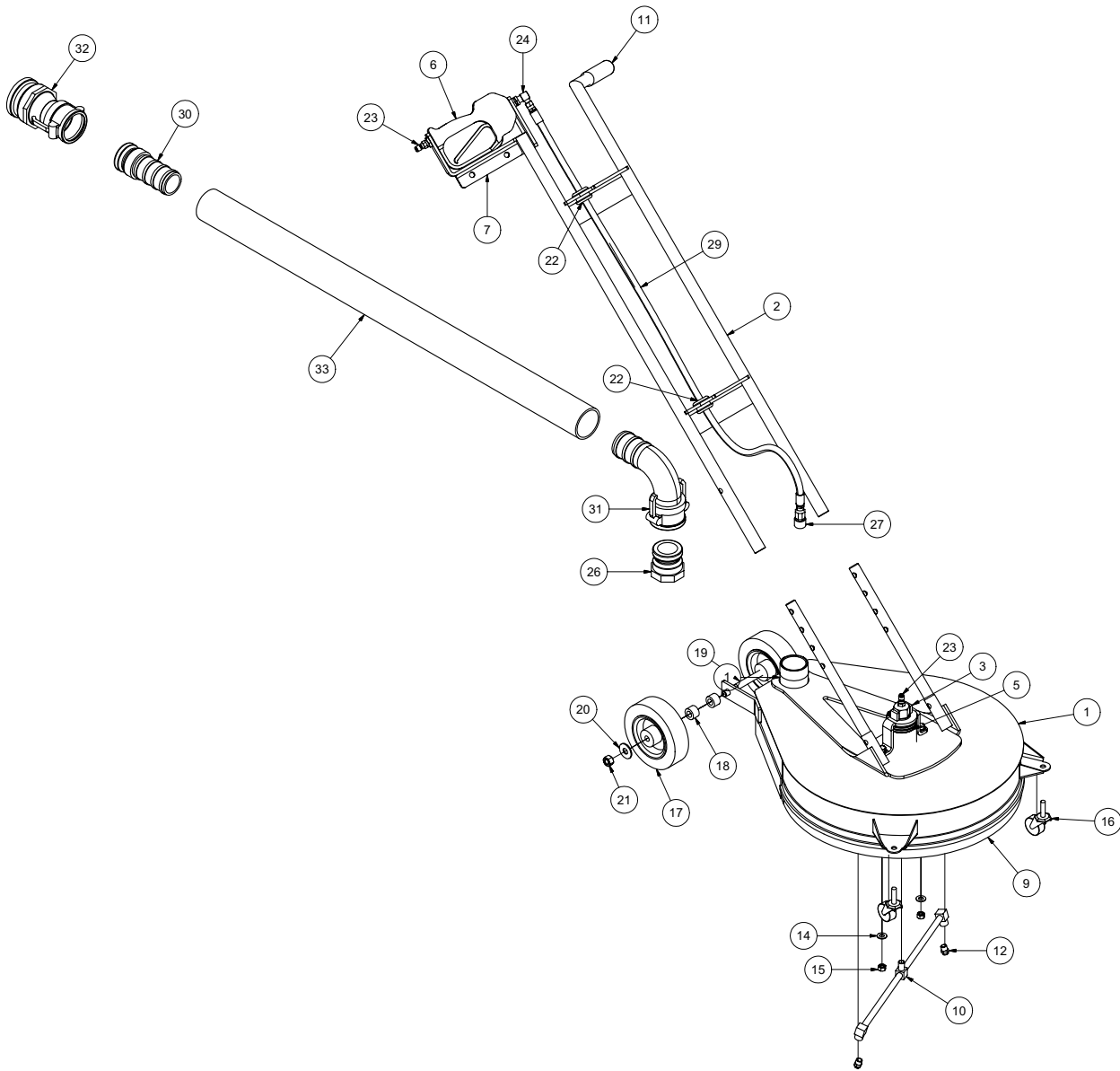
Lawn Sweeper 3''

ITEM	QTY	PART #	DESCRIPTION
	1	8043935	VAC TOOL LAWN SWEEPER COMPLETE
1	1	8030287	3" HOSE X 3" MNPT ADAPTER
2	2	8030391	BANJO 3" MALE 3" FNPT
3	2	8042605	CLAMP T-BOLT 3" (350)
4	2	8043887	WHEEL 6" PNEUMATIC
5	1	8043925	DUCKBILL 3" ALUMINUM
6	1	8043928	LS WHEEL WELDMENT
7	1	8043931	WHEEL ADJUSTERS (1 LEFT/1 RIGHT)
8	1	8043933	LS HANDLE WELDMENT
9	2	J300080	HANDLE GRIP
10	1	8043932	PVC 3" X 30"

101512-E

VACASSY713

Surface Cleaner



101812-E

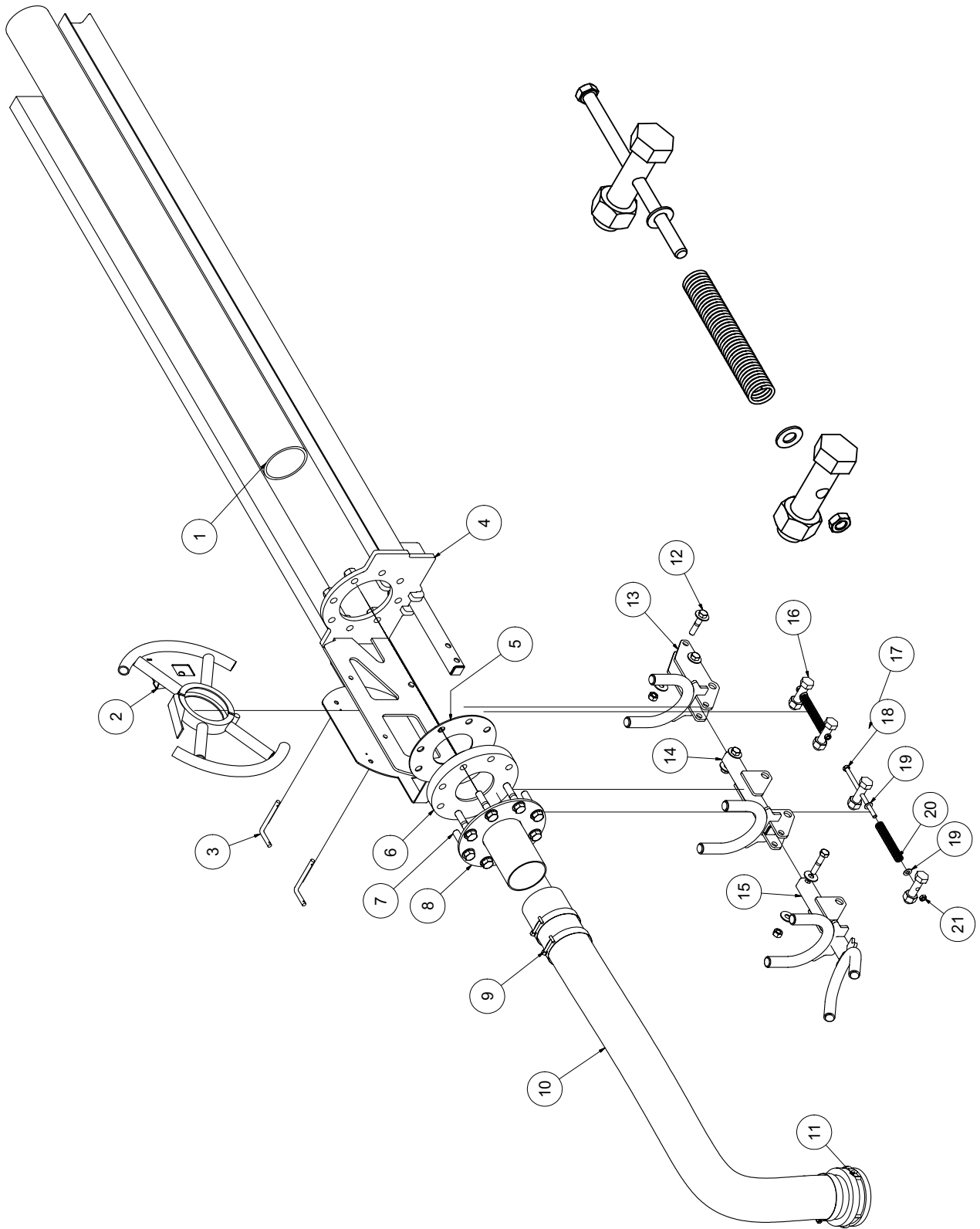
VACASSY715

Surface Cleaner

ITEM	QTY	PART NO.	DESCRIPTION
	1	8043480	VAC TOOL SURFACE CLEANER COMPLETE
1	1	8041887	SURFACE CLEANER - HEAD ASSY
2	1	8042019	HANDLE ASSY
3	1	8041890	ROTARY RETAINER
4	2	8042022	HANDLE ADJ. TUBE
5	1	8042027	ROTARY HEAD
6	1	8048567	STRAIGHT SPRAY GUN
7	1	8042020	GUN CAPTURE BRACKET
8	1	8043467	SQUEEGEE
9	1	8042030	FLEXIBLE BRUSH
10	1	8042028	ROTARY ARM
11	1	J300080	GRIPHANDLE
12	2	8031419	NOZZLE, #4.0 25 DEG
13	2	U000420	SCREW, HC 3/8-16 X 1.00
14	4	U200600	WASHER, FLAT 3/8"
15	2	U100060	NUT, HEX 3/8-16
16	2	8043387	SWIVEL CASTER 1 5/8"
17	2	8043887	WHEEL 6" PNEUMATIC
18	2	8043591	SURFACE CLEANER REAR WHEEL SPACER
19	1	U001060	SCREW, HC 1/2-13 X 6.0
20	2	U200100	WASHER, FLAT 1/2"
21	1	U120120	NUT, LOCK 1/2-13
22	2	8041686	GROMMET 1"ID- 1 1/4"DOG-1/4"WO
23	2	8030486	WATER QD 1/4 MNPT SS
24	1	T401100	ELBOW 4MP 4MJ 90
25	1	T320030	FITTING, HOSE 4HO 4FJ
26	1	8043389	ADAPTER M2" F THREAD
27	1	8030526	FITTING, QD WATER 1/4"F-1/4"FP
28	1	T320300	FITTING, HOSE 4HO 4MP
29	1	8044108	HOSE VAC SURFACE CLEANER
30	1	8043392	ADAPTER M2" F THREAD
31	1	8043391	REDUCER COUPLER 2"F 90 DEG - 3"M
32	1	8043395	REDUCER COUPLER 2" X 3" ADAPTER
33	1	8043398	HOSE VAC CLEAR 2"
*	2	8043397	CLAMP VAC CLEAR HOSE 2"
*	4	U360020	PIN, U-LOCK 3/8 X 1.5

EXTENSION ARM

BOOM



092010-E

VACASSY989

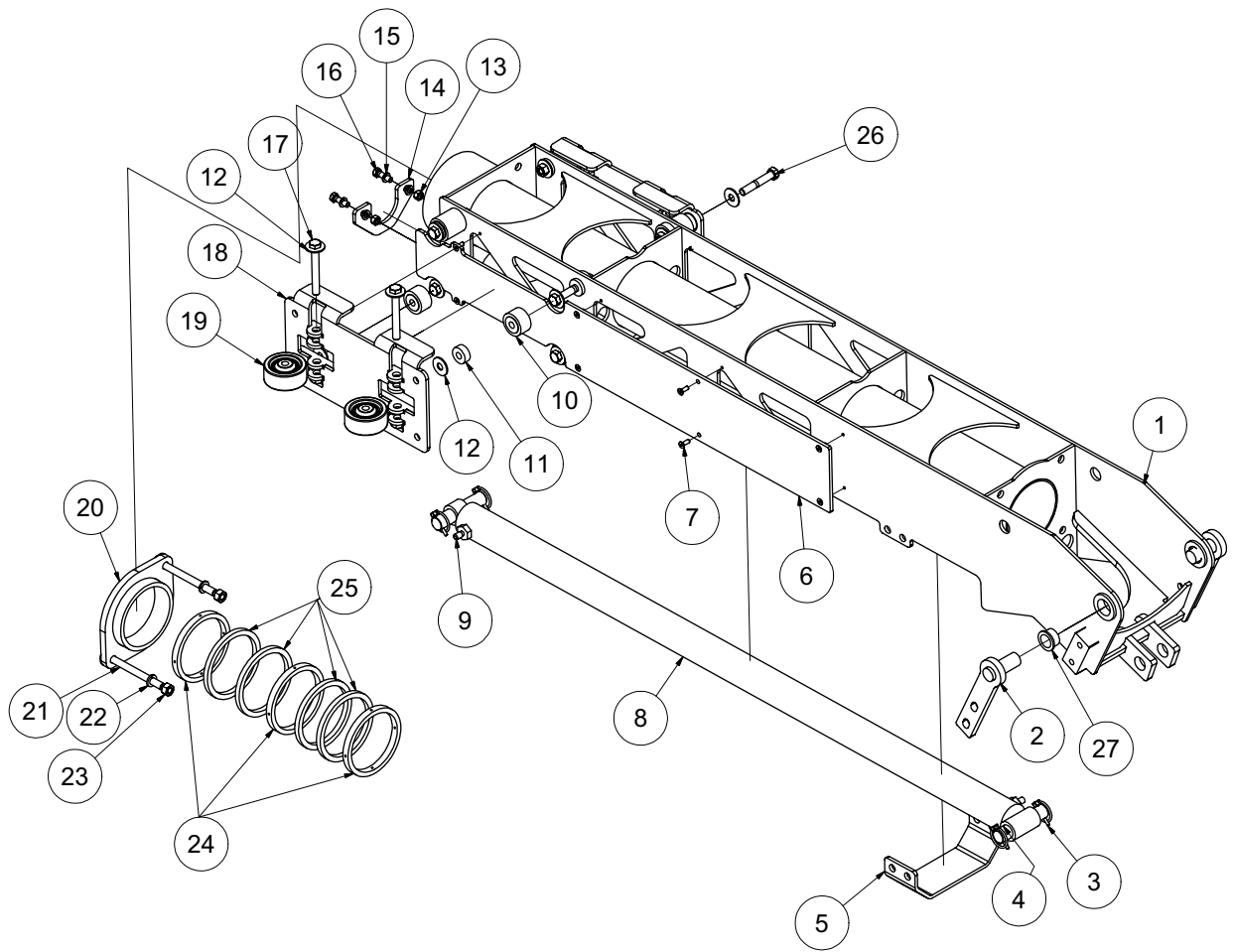
EXTENSION ARM

BOOM

ITEM	QTY	NUMBER	DESCRIPTION
1	1	8042160	BOOM - PVC TUBE 4 X 60"
2	1	8043647	BOOM HANDLE WELDMENT
	2	8042971	RUBBER STRIP
3	2	8043947	CAPTURE PIN
	2	R700160	R-CLIP
	2	8041485	LANYARD CABLE
4	1	8046591	BOOM - EXTENSION ARM WELDMENT
5	1	8041938	GASKET, FLANGE 4"
6	1	8041937	4" PVC FLANGE
7	8	U001250	SCREW, HC 5/8" - 11 X 3.00"
	16	U200140	WASHER, FLAT 5/8"
	8	U120020	NUT, NYLOCK 5/8" - 11
8	1	8046638	BOOM - HOSE MOUNT PLATE WELDMENT
9	3	8042606	CLAMP, T-BOLT 4" (450)
10	1	8046769	HOSE VAC AG SUCTION 4-42"
11	1	8046444	CAMLOCK, 4" MCAM X MBARB
12	4	U000900	SCREW, 1/2" - 13 X 2 1/2" HHCS
	8	U200100	WASHER, FLAT 1/2"
	4	U120120	NUT, LOCK 1/2" - 13
13	1	8046612	BOOM - END PIVOT WELDMENT # 3
14	1	8046603	BOOM - END PIVOT WELDMENT # 1
15	1	8046606	BOOM - END PIVOT WELDMENT # 2
16	4	8046636	BOOM - SPRING BOLT
	4	U100200	NUT, HEX 3/4" - 10
17	1	8046771	SPRING, 3/8" - 5.00", 480lb per in
18	2	U000635	SCREW, HC .375 - 16 X 6.50" ZP CR5
19	4	U200600	WASHER, FLAT 3/8"
20	1	8046770	SPRING, 3/8" X 5.00", 395 lb per in
21	2	U120110	NUT, HEX LOCK

PIVOT ARM

BOOM



081910-E

VACASSY989

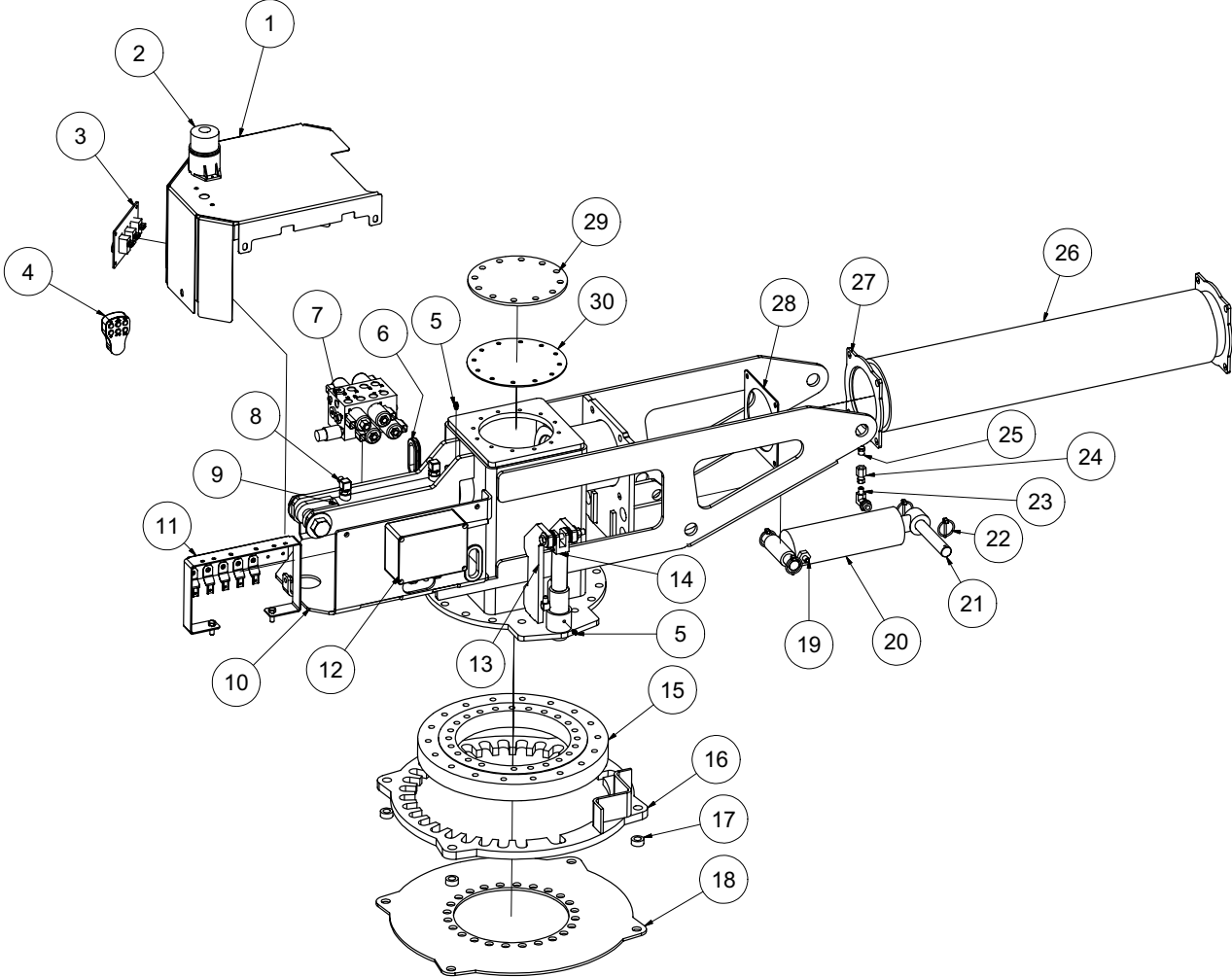
PIVOT ARM

BOOM

ITEM	QTY	NUMBER	DESCRIPTION
1	1	8046582	BOOM - PIVOT ARM WELDMENT
2	2	8046634	BOOM - PIVOT PIN WELDMENT
3	4	U340050	PIN LINCH 3/16" X 1 9/16"
4	2	8041990	BOM - PIVOT CYLINDER ROD PIN
5	1	8046635	BOOM - CRADEL FOOT PLATE
6	2	8041986	BOOM - PIVOT ARM GUIDE SHEET
7	16	U030015	SCREW, SFH 1/4-20 X .750
8	1	8041926	BOOM - CYLINDER WX
9	2	T400611	REDUCER, 1/2"MB - 1/4"MJ
10	4	W000055	CAM YOKE ROLLER 1 3/4"DIA X 1.00"
11	4	8046624	BOOM - CAM SPACER
12	14	U200100	WASHER, FLAT 1/2"
13	2	U100060	NUT, HEX 3/8"-16
14	1	8041956	BOOM - PIVOT ARM CYC RETAINER PLATE
15	4	U210060	WASHER, LOCK 3/8"
16	2	U000440	SCREW, HC 3/8"-16 X 1.25"
17	4	8046773	SCREW, BOOM EXT. CAPTURE PLATE
18	2	8046627	BOOM - EXT. CAPTURE PLATE WELDMENT
19	4	8030226	WHEEL 3.00"OD X 1.25" WIDE W / BRG
20	1	8041963	PACKING GLAND WELDMENT
21	2	U001020	SCREW, HC .50"-13 X 5.50"ZP GR5
22	2	U210111	WASHER, LOCK 1/2"
23	2	U100120	NUT, HEX 1/2-13
24	3	8041945	SLEEVE PLASTIC
25	4	8041947	PACKING RING
26	8	U000940	SCREW,HC .500-13X3.50
	16	U200110	WASHER, FLAT .500
	8	U120120	NUT, LOCK .500 - 13
27	2	8041883	BUSHING, BRONZE FLANGED 1"

TURRET

BOOM MANUAL ROTATION REV. FLOW



TURRET

BOOM MANUAL ROTATION REV. FLOW

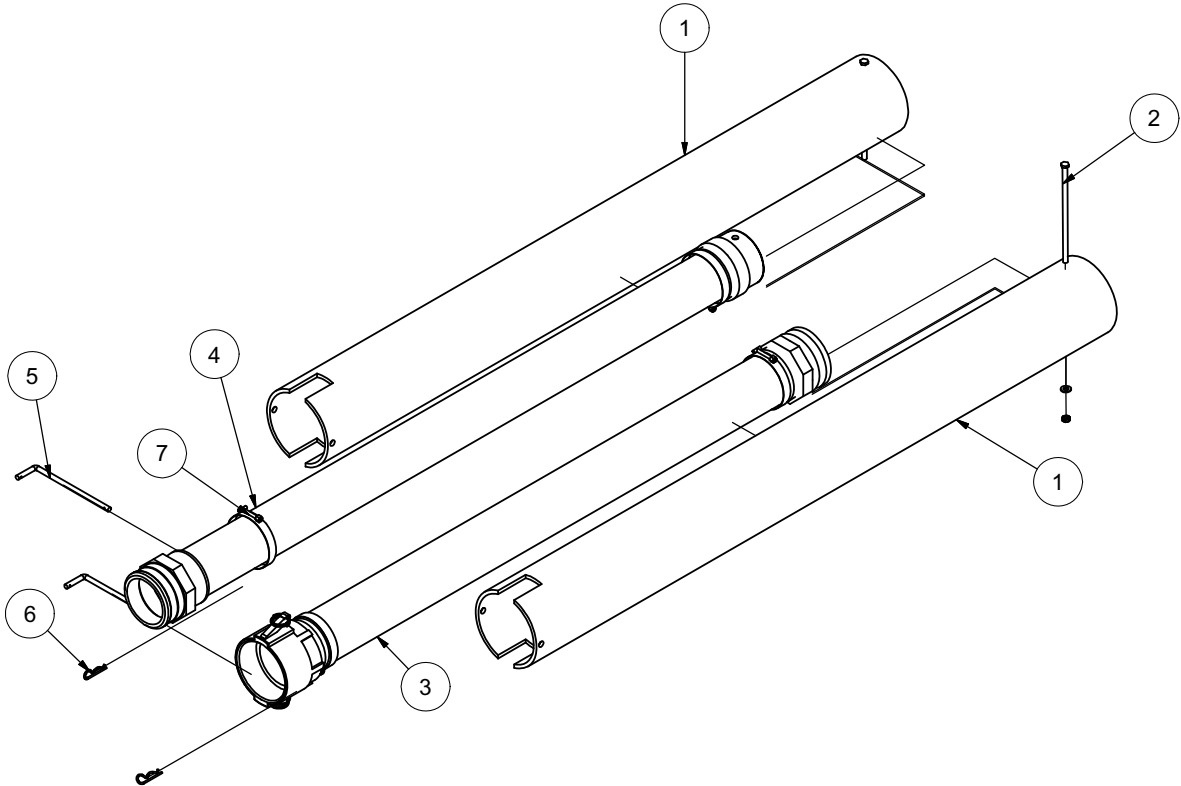
ITEM	QTY	PART #	DESCRIPTION
1	1	8046644	BOOM - COVER WELDMENT
*	5	U000400	SCREW, HC 3/8"-16 X .75
*	5	U000440	WASHER, FLAT 3/8"
2	1	8043139	LIGHT STROBE LED DEUTSCH
3	1	8046696	PANEL CONTROL BOOM OVERRIDE
	1	X000274	SWITCH, ROCKER (UP / DOWN)
	1	X000274	SWITCH, ROCKER (EXTEND / RETRACT)
	1	X000273	SWITCH, ROCKER (BRAKE)
4	1	8042426	RC TRANSMITTER (w/ GRAPHIC OVERLAYS)
*	1	8045653	BOOM REMOTE METAL CLIP
*	1	X200010	BOOM WIRING HARNESS
*	1	8041911-1	RUBBER 6-BUTTON PAD
*	1	8043075	DECAL OVERLAY
*	1	8042428	RC TRANSMITTER 8 BUTTON
5	2	T500030	GREASE FITTING 1/8"NPT STRAIGHT
6	4	8042812	GROMMET 2"ID 3"OD 1/4"WOG TRAILER SLOT MODEL
7	1	8047331	MANIFOLD ASSY BOOM (CROSS2)
8	2	T401265	ELBOW, 90 1/2"MB - 1/4"MJ
9	1	8048198	BOOM GATE VALVE CYLINDER
	2	W201020	WIPER, CYLINDER ROD, 1 1/8" ROD
	1	8044480	SEAL PLATE WELDMENT
	1	8044482	BOOM SHUTOFF SEAL
	1	8044483	BOOM SHUTOFF SEAL PLATE SHIELD
	1	U001570	SCREW, HC 1"-8 X 5.00
	1	U120060	NUT, LOCK NY 1 - 8
10	1	8046571	BOOM TURRET WELDMENT
	6	U001281	SCREW, HC .625 - 11 X 3.50"
	6	U120020	NYLON LOCK NUT .625 - 11
	12	U200140	WASHER, FLAT .625
11	1	8046764	BOOM ELECTRICAL BRACKET LP
	5	X000320	DEUTSHDIODE RECEPTACLE
	1	8040185	RELAY
	2	8044912	TIME RELAY
12	1	8041915	BOOM - RC RECEIVER 8-RELAY
	1	8044994	ANTENNA, BOOM 7" 90DEG
13	1	8045157	BOOM MANUAL BRAKE WELDMENT
14	1	8043052	BRAKE, CYLINDER
	1	T401100	ELBOW, 4MP-4MJ, 90
15	1	8042234	SWIVEL BEARING
	3	T500020	FITTING, GREASE .125 STRAIGHT (2 IN INNER RING, 1 IN OUTER RING)
	18	U001195	SCREW, HC 5/8"-11 X 1 3/4"
	23	U001210	SCREW, HC 5/8"-11 X 2 1/4"
	41	U200140	WASHER, FLAT 5/8"
	41	U210140	WASHER, LOCK 5/8"
16	1	8046688	BOOM MOUNT BRAKE RING
	4	U001900	SCREW, HC 5/8"-11 X 2 1/2"
	8	U200140	WASHER, FLAT 5/8"
	4	U120140	NUT, LOCK 5/8"-11
17	4	8030315	SKID - WATER TANK CLEVIS TUBE
18	1	8046690	BOOM - LOWER STOP RING
19	1	T400611	UNION, 8MB - 4MJ
20	1	8046597	CYLINDER, HYD BOOM 3 X 6
21	2	8041977	BOOM - PIVOT CYLINDER BASE PIN
22	4	U340050	PIN LINCH 3/16 X 1 9/16"
23	1	T401265	ELBOW, 90 1/2"MB - 1/4"MJ
24	1	T400082	UNION, 1/4"FP - 1/4"FJ
25	1	T400801	FITTING, VENTED CAP 1/4" - 18NPTF
26	1	8042103	HOSE AG SUCTION 6 - 32 1/2"
	2	8042104	CLAMP, HOSE T-BOLT 6.75
27	2	8041958	BOOM - FLEX HOSE ADAPTER WELDMENT
28	2	8041988	BOOM - FLANGE GASKET
29	1	8044471	BOOM TURRET SHUTOFF - CLEAN COVER
30	1	8044475	BOOM TURRET SHUTOFF - CLEAN COVER GASKET

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HOSE STORAGE

BOOM



060311-E

VACASSY978

HOSE STORAGE

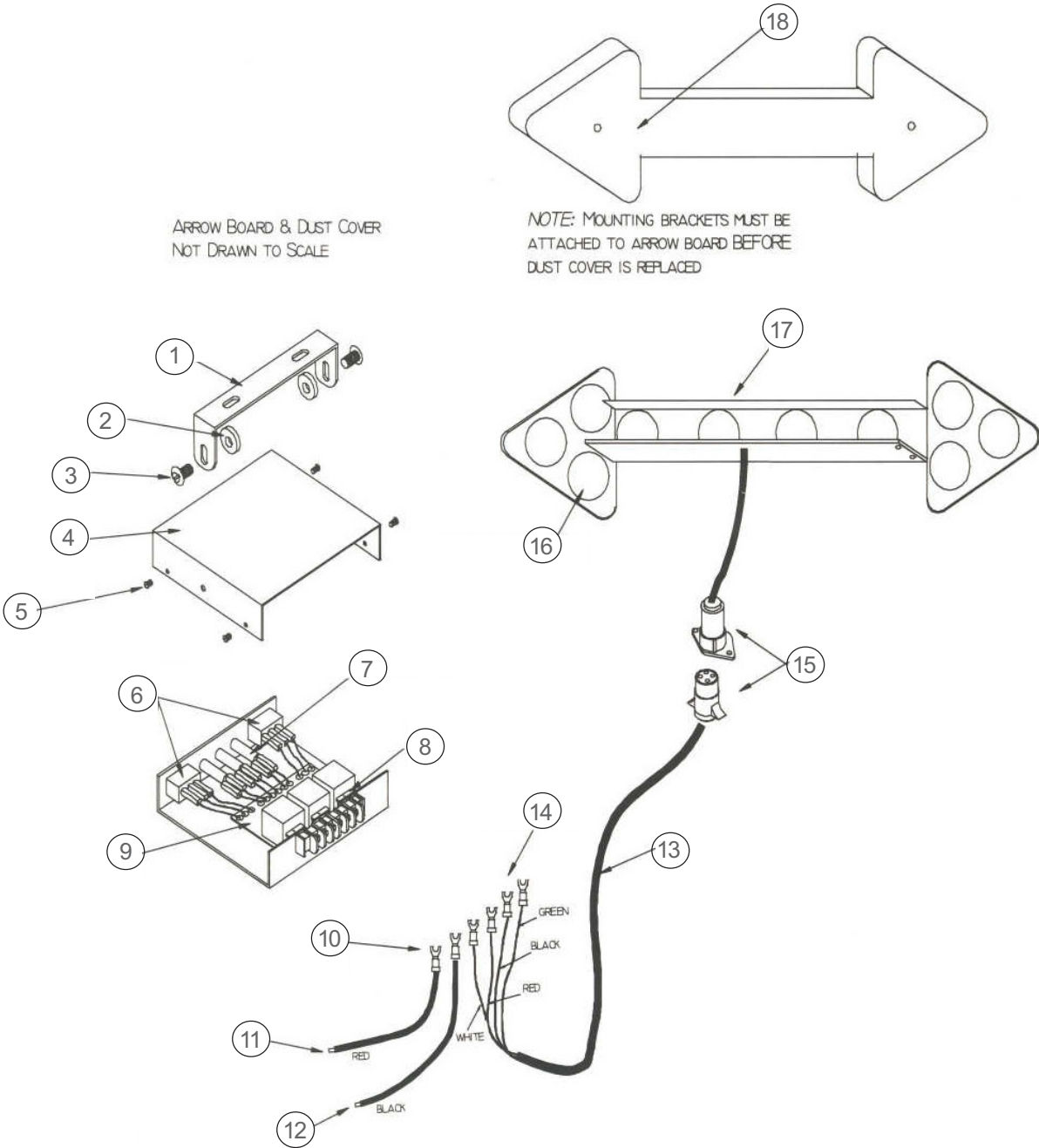
BOOM

ITEM	QTY	NUMBER	DESCRIPTION
1	2	8042222	BOOM EXTENSION HOSE STORAGE
	2	8043198	CLAMP T-BOLT 700
2	2	U000626	SCREW, HC 3/8"-16 X 7.50"
	1	U200060	WASHER, FLAT 3/8"
	1	U120110	NUT, LOCK .375-16
3	1	8042137	BOOM HOSE EXTENSION
	1	8041781	BOOM EXTENSION HOSE
	2	8045239	UNION EXHAUST 4"OD - MNPT
	1	8030846	4" FEMALE COUPLER
	1	8030844	4" MAL COUPLER
4	1	8032138	BOOM HOSE EXTENSION WITH 4" UNION PVC
	1	8045723	4" ALUMINUM TUBE 52 1/2"LG
	2	8045728	4" HALF NIPPLE
	1	8030844	COUPLING, 4" ALUM CAMLOCK MXF
	1	8045725	UNION PVC 4"FNPT 4"MSLIP w/HOLE
5	2	8041101	HOSE STORAGE RETAINING ROD
	2	8041485	LANYARD CABLE
6	2	R700160	R-CLIP
7	4	8042606	CLAMP T-BOLT 450

Arrow Board Option

ARROW BOARD & DUST COVER
NOT DRAWN TO SCALE

NOTE: MOUNTING BRACKETS MUST BE
ATTACHED TO ARROW BOARD BEFORE
DUST COVER IS REPLACED



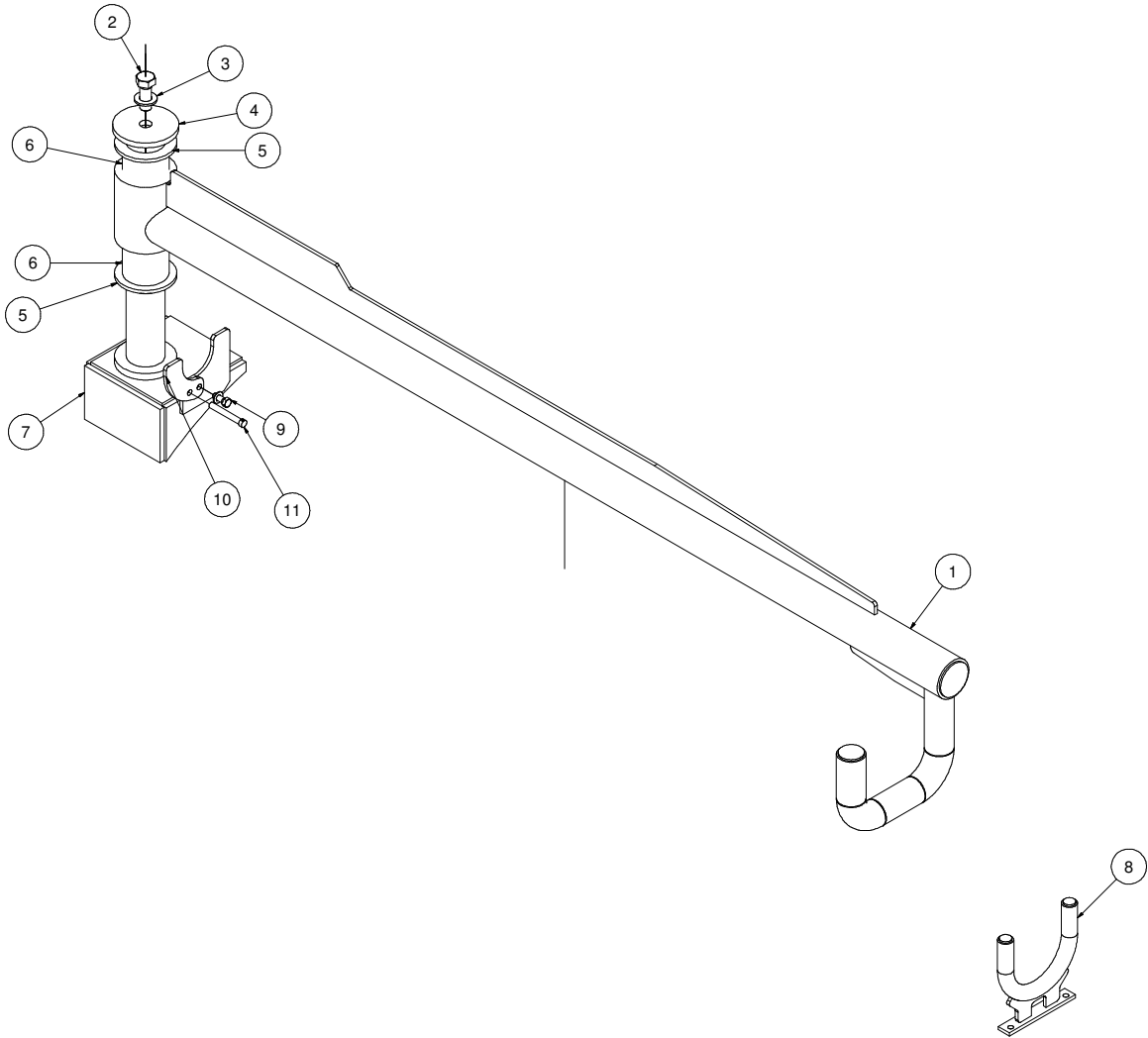
Arrow Board Option

ITEM	QTY	PART #	DESCRIPTION
1	1	8042197-1	MOUNTING BAIL
2	2	8042197-2	WASHER
3	2	8042197-3	BOLT
4	1	8042197-4	COVER
5	4	8042197-5	MACHINE SCREW
6	2	8042197-6	SPDT SWITCH
7	3	8042197-7	RED PILOT LAMP
8	1	8042197-8	15 AMP FUSE
9	1	8042197-9	CIRCUIT BOARD ASSY
10	2	8042197-10	#6 BLUE SPADE CONNECTOR
11	4'	8042197-11	RED
12	4'	8042197-12	BLACK
13	20'	8042197-13	CABLE HARNESS
14	4	8042197-14	#6 BLUE SPADE CONNECTOR
15	1	8042197-15	4-WAY CONNECTOR
16	1	8042197-16	STANDARD LAMP ASSY
17	1	8042197-17	ARROWBOARD FRAME
18	1	8042197-18	DUST COVER
*	1	8045830	ARROWBOARD BRACKET
*	1	8046526	ARROWBOARD MOUNT PLATE

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STRONGARM



121911-E

VACASSY990

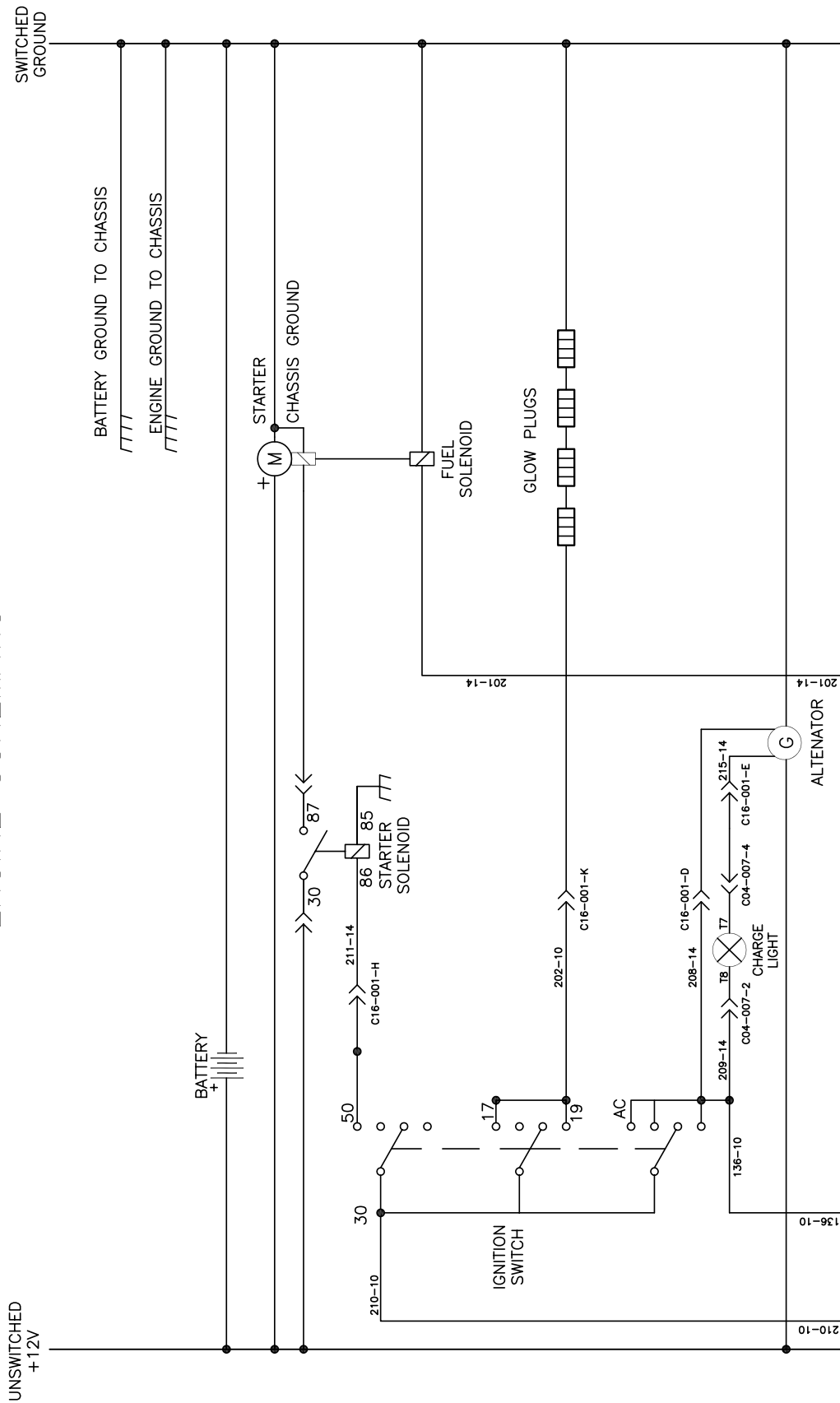
STRONGARM

ITEM	QTY	NUMBER	DESCRIPTION
1	1	8047181	STRONG ARM
2	1	U001355	SCREW, HC .750 10 X 1.25
	1	U210160	WASHER, LOCK .750
3	1	U200160	WASHER, FLAT 3/4"
4	1	8047085	END CAP, SA
5	2	8047077	WEAR FLANGE, UHMW
6	2	8047076	BEARING, NYLON
7	1	8047098	STRONG ARM BASE (500)
	1	8047258	STRONG ARM BASE (800)
8	1	8047194	STRONGARM HOLDER WELDMENT
9	1	U000445	SCREW, HC 3/8"-16 X 1.25
	1	U210061	NUT, LOCK, NY, .375
	1	U200060	WASHER, FLAT 3/8"
10	1	8047089	RETAINER, FRONT PLATE
11	1	8041213	SAFETY SNAP PIN
*	1	J200114	DECAL, I.D. STRONGARM

* NOT SHOWN

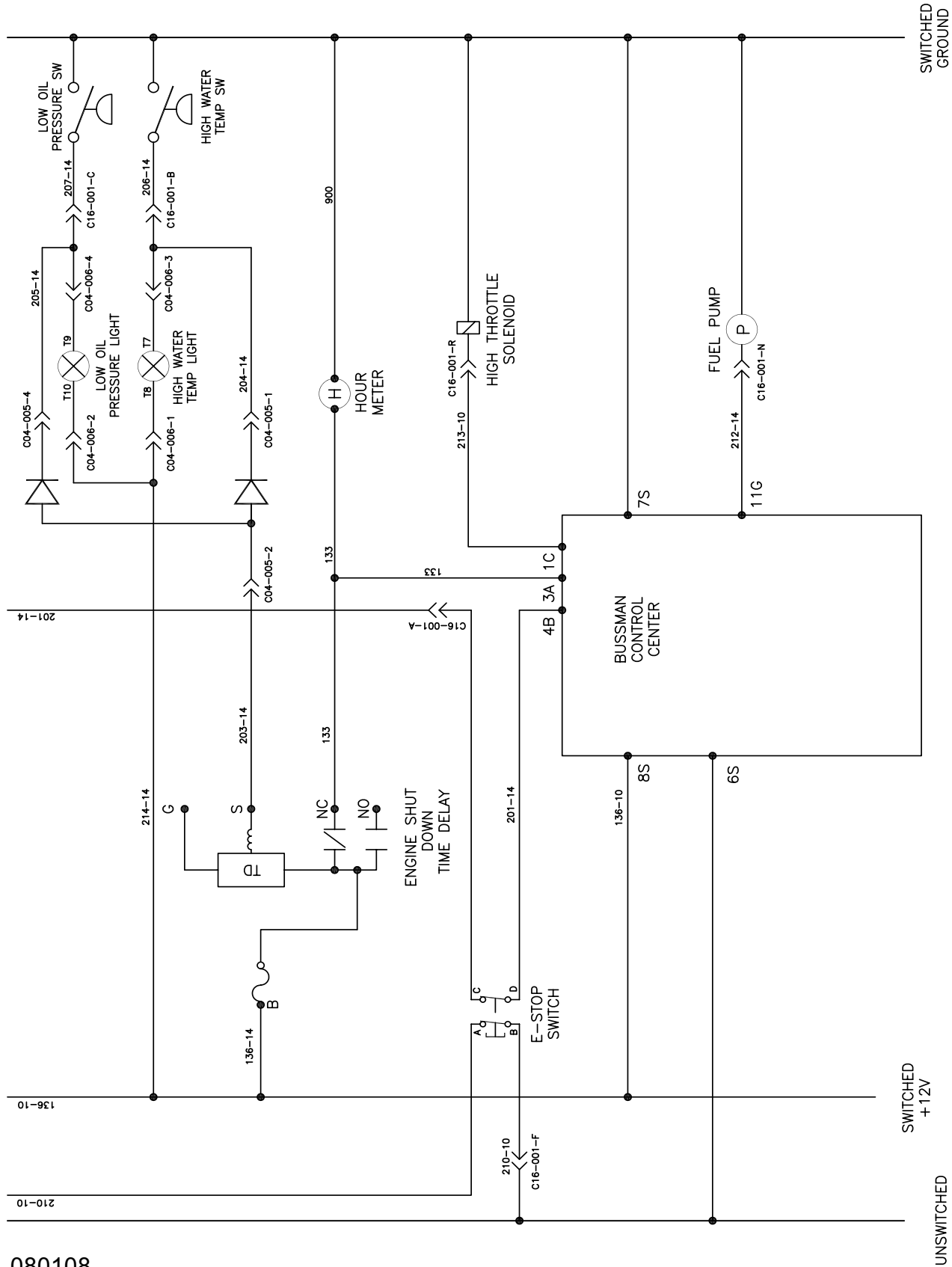
Vacuum Diesel Engine Schematic

VACUUM DIESEL ENGINE SCHEMATIC



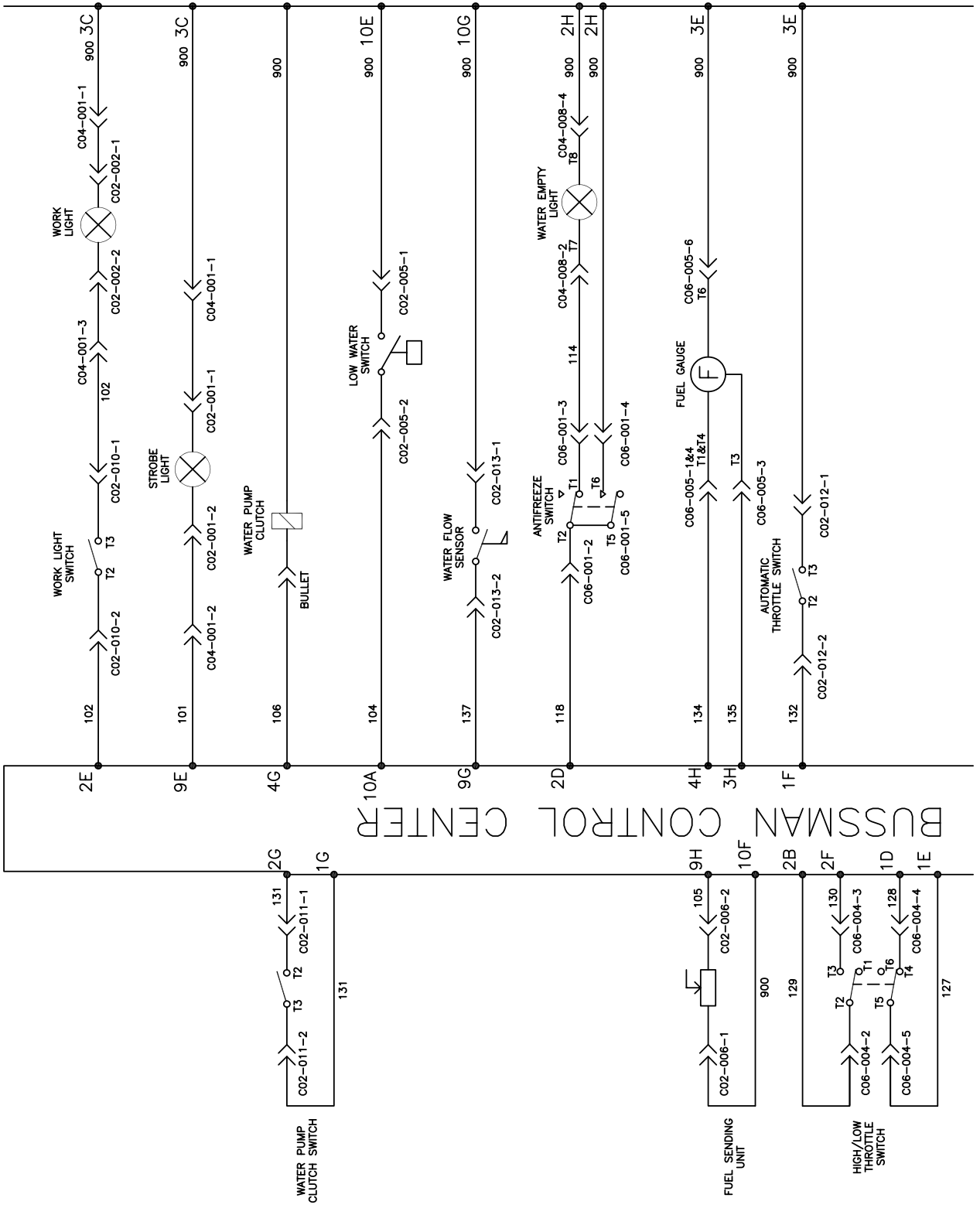
080108

Vacuum Diesel Engine Schematic



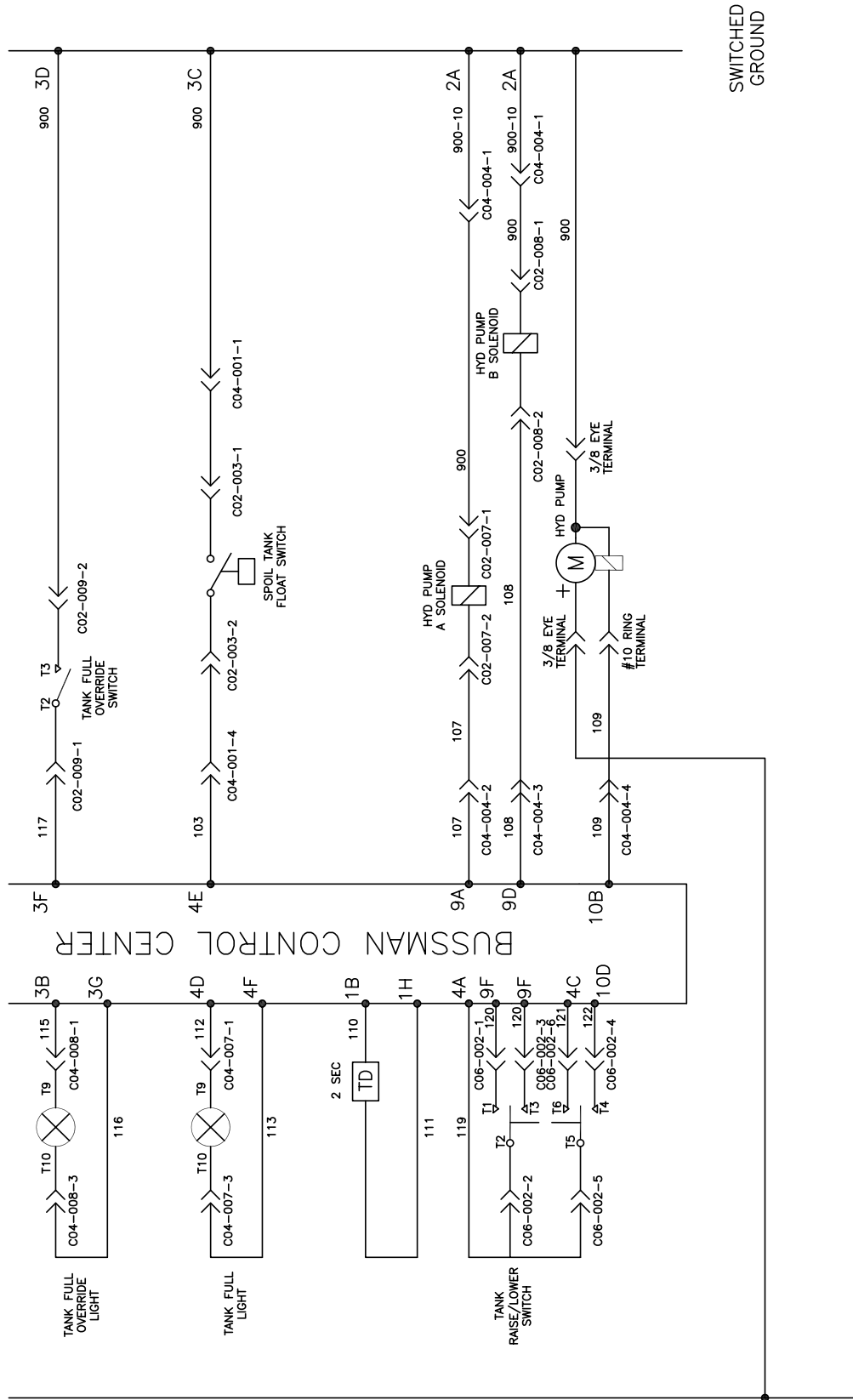
080108

Vacuum Diesel Engine Schematic



080108

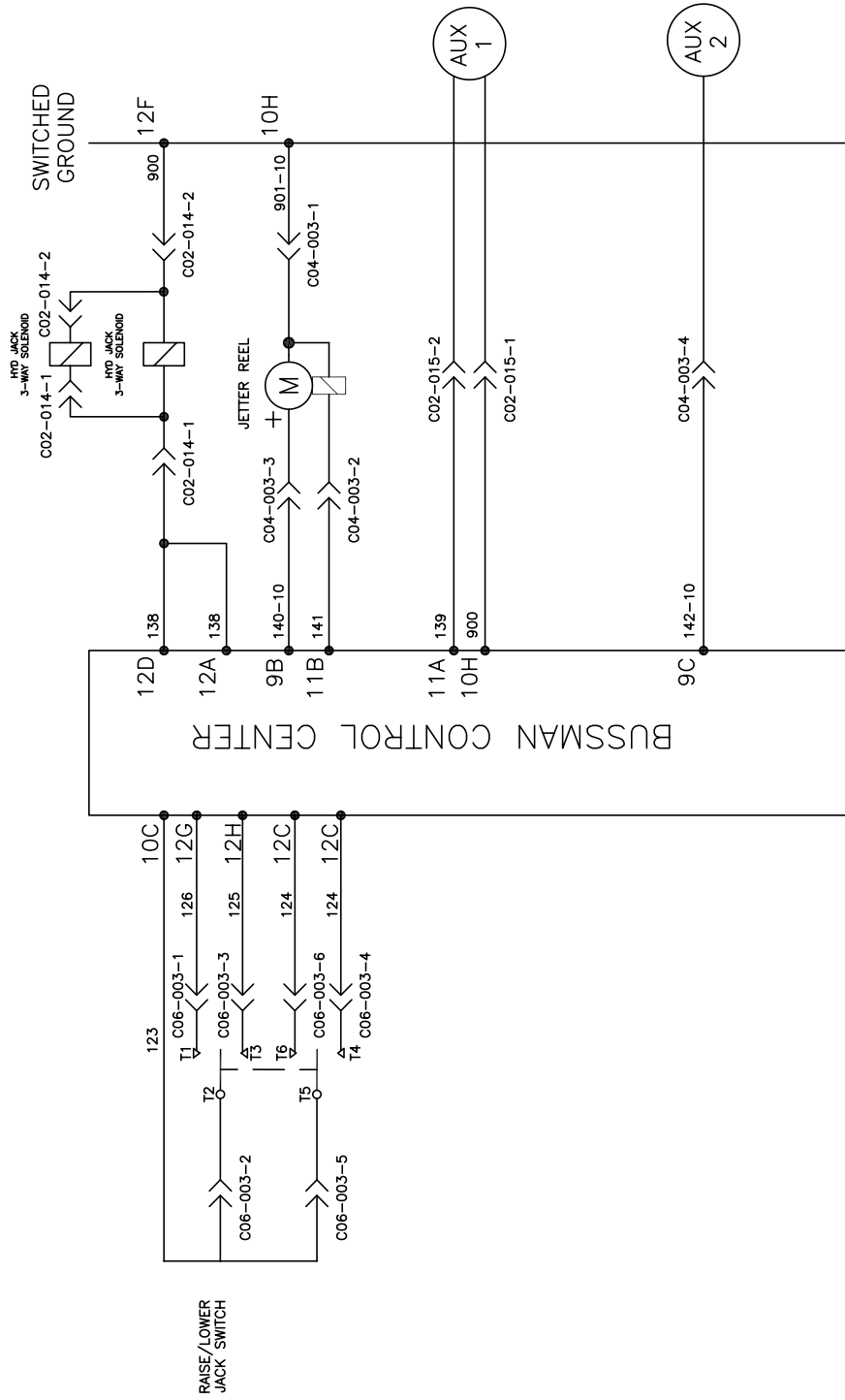
Vacuum Diesel Engine Schematic



080108

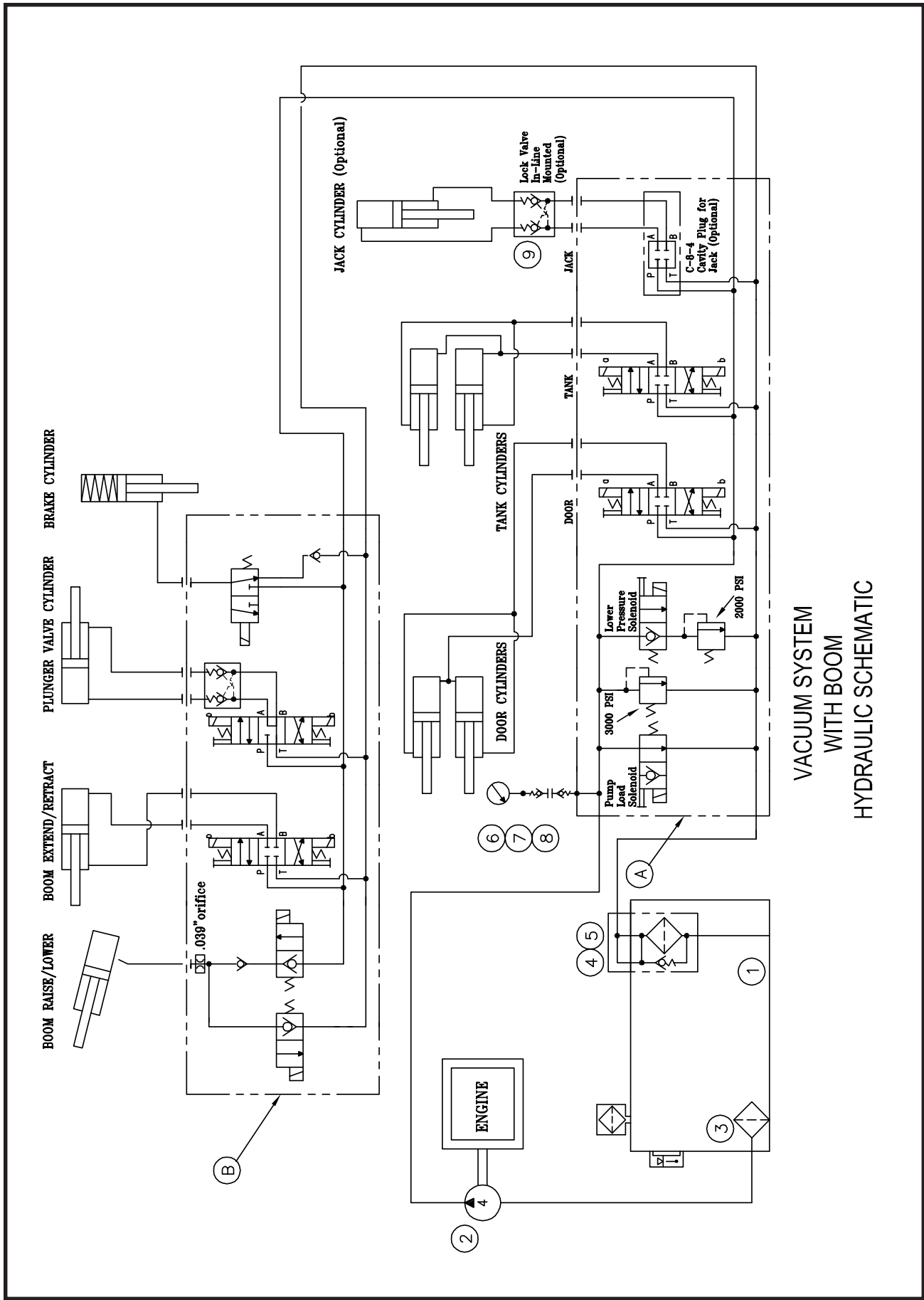
Vacuum Diesel Engine Schematic

BUSSMAN CONTROL CENTER OPTIONS

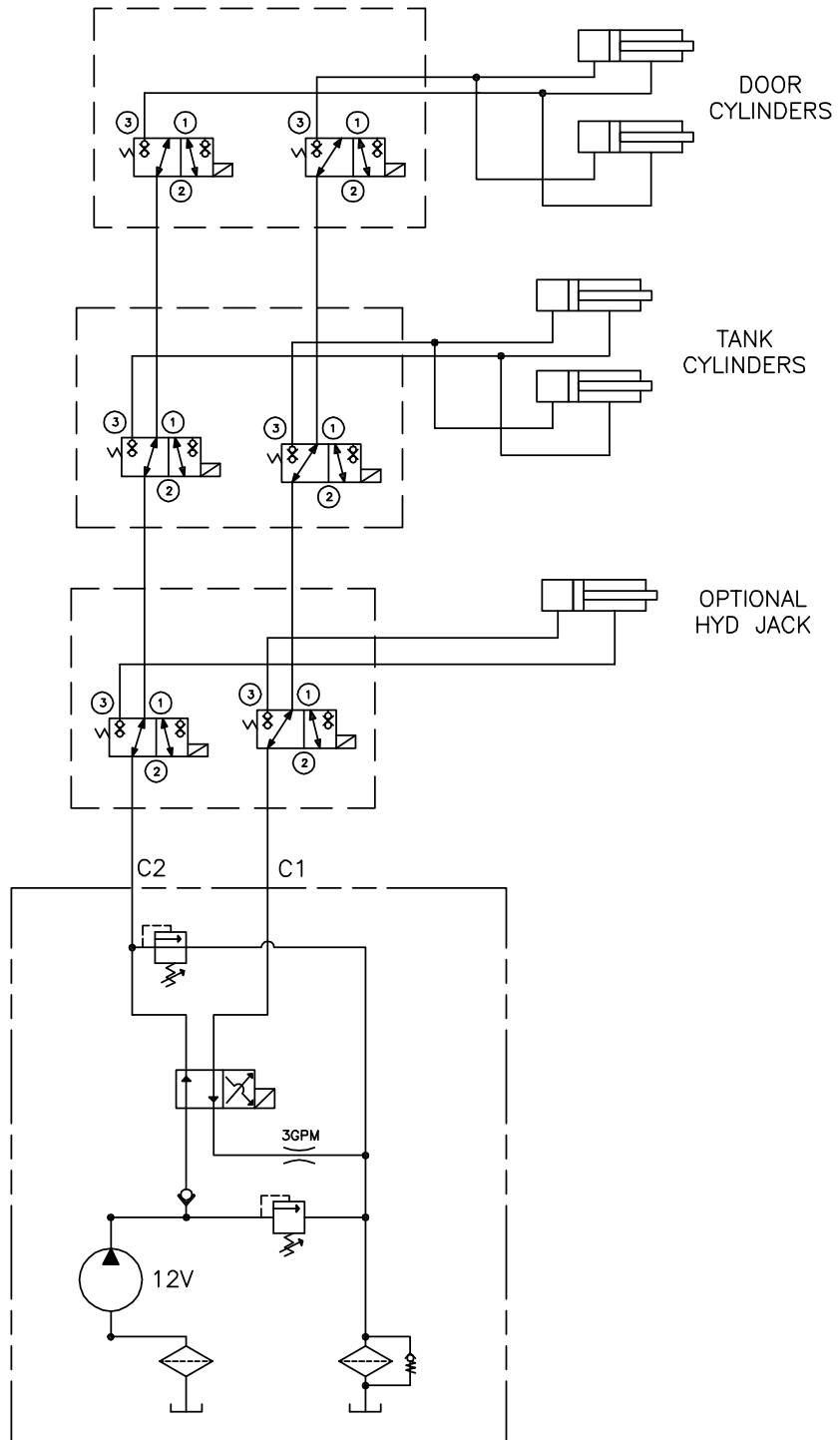


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VACUUM SYSTEM WITH BOOM HYDRAULIC SCHEMATIC

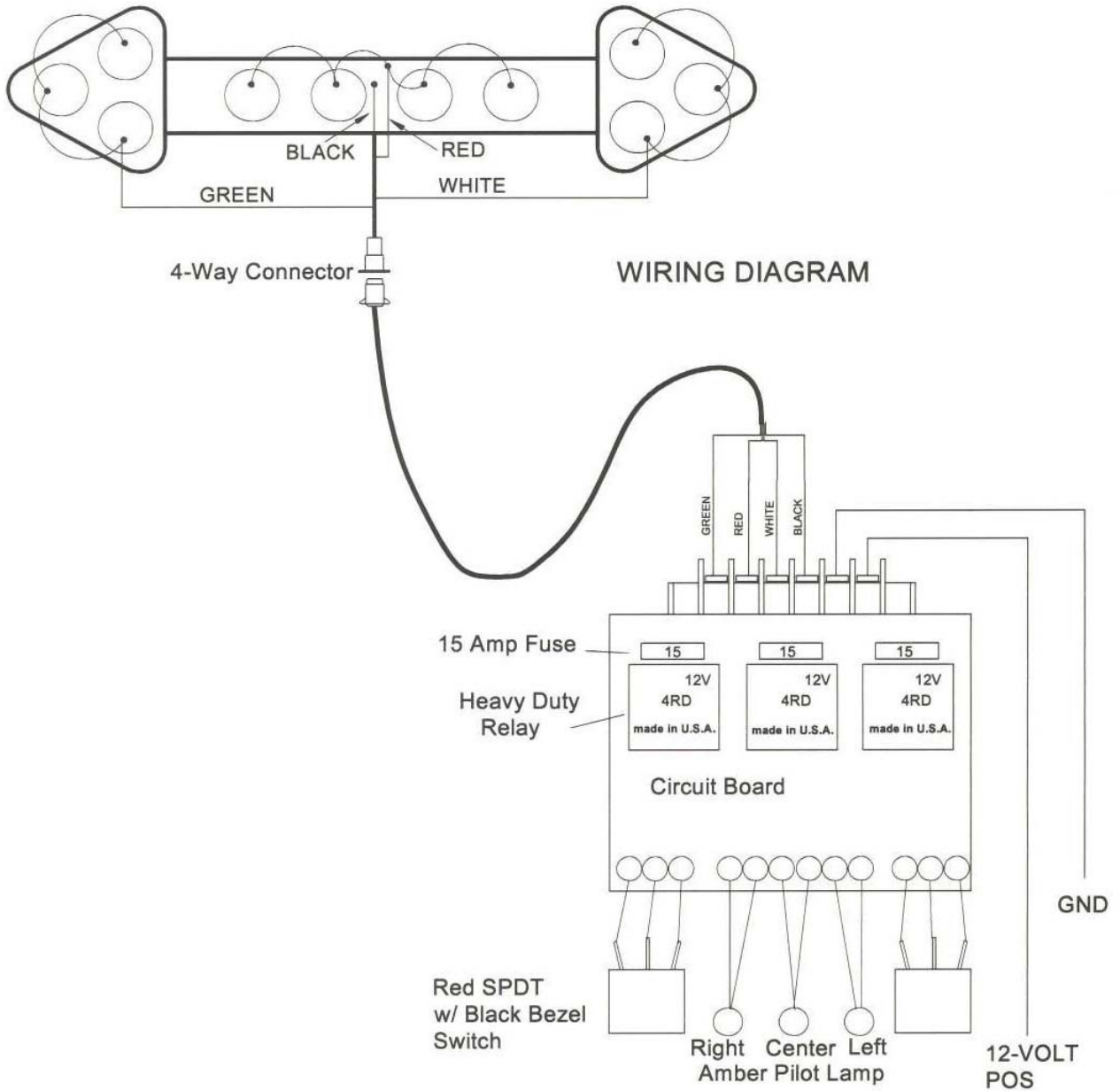


BASE HYDRAULIC MANIFOLD

VACUUM SYSTEM
 W/O BOOM
 12V HYDRAULIC SCHEMATIC

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Arrow Board Option

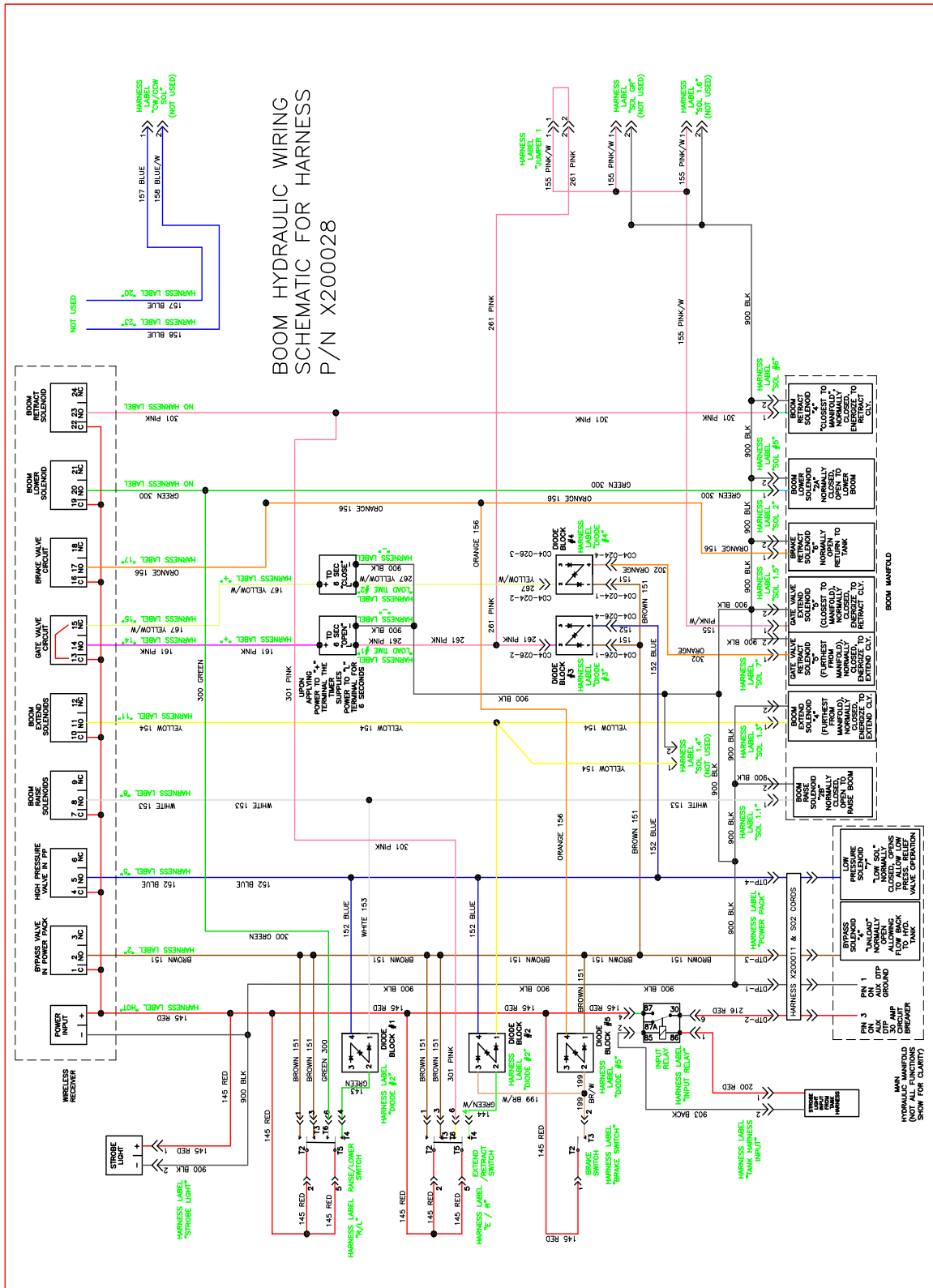


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VACASSY947

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BOOM HYDRAULIC WIRING SCHEMATIC FOR HARNESS P/N X200028



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ROOTS

Blowers Compressors Exhausters

Universal URAI-DSL

Contents

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Lubrication
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Parts List

Do These Things To Get The Most From Your ROOTS™ blower

- **Make sure both driving and driven equipment is correctly lubricated before start-up. See LUBRICATION.**
- In event of trouble during installation or operation, do not attempt repairs of ROOTS furnished equipment. Notify ROOTS, giving all nameplate information plus an outline of operating conditions and a description of the trouble. Unauthorized attempts at equipment repair may void ROOTS warranty.
- Units out of warranty may be repaired or adjusted by the owner. Good inspection and maintenance practices should reduce the needs for repairs.

NOTE: Information in this manual is correct as of the date of publication. ROOTS reserves the right to make design or material changes without notice, and without obligation to make similar changes without notice, and without obligation to make similar changes on equipment of prior manufacture.

Safety Precautions

It is important that all personnel observe safety precautions to minimize the chances of injury. Among many considerations, the following should be particularly noted:

- Blower casing and associated piping or accessories may become hot enough to cause major skin burns on contact.
- Internal and external rotating parts of the blower and driving equipment can produce serious physical injuries. Do not reach into any opening in the blower while it is operating, or while subject to accidental starting. Protect external moving parts with adequate guards.
- Disconnect power before doing any work, and avoid bypassing or rendering inoperative any safety or protective devices.
- If blower is operated with piping disconnected, place a strong coarse screen over the inlet and avoid standing in the discharge air stream. **CAUTION: Never cover the blower inlet with your hand or other part of body.**
- Stay clear of the blast from pressure relief valves and the suction area of vacuum relief valves.
- Use proper care and good procedures in handling, lifting, installing, operating and maintaining the equipment.
- Casing pressure must not exceed 25 PSI (1725 mbar) gauge. Do not pressurize vented cavities from an external source, nor restrict the vents without first consulting Roots.
- Do not use air blowers on explosive or hazardous gases.
- Other potential hazards to safety may also be associated with operation of this equipment. All personnel working in or passing through the area should be trained to exercise adequate general safety precautions.

Operating Limitations

A ROOTS blower or exhauster must be operated within certain approved limiting conditions to enable continued satisfactory performance. Warranty is contingent on such operation.

Maximum limits for pressure, temperature and speed are specified in TABLE 1 for various models & sizes of blowers & exhausters. These limits apply to all units of normal construction, when operated under standard atmospheric conditions. Be sure to arrange connections or taps for instruments, thermometers and pressure or vacuum gauges at or near the inlet and discharge connections of the unit. These, along with a tachometer, will enable periodic checks of operating conditions.

PRESSURE – The pressure rise, between inlet and discharge, must not exceed the figure listed for the specific unit frame size concerned. Also, in any system where the unit inlet is at a positive pressure above atmosphere a maximum case rating of 25 PSI gauge (1725 mbar) should not be exceeded without first consulting Roots. Never should the maximum allowable differential pressure be exceeded.

On vacuum service, with the discharge to atmospheric pressure, the inlet suction or vacuum must not be greater than values listed for the specific frame size.

TEMPERATURE – Blower & exhauster frame sizes are approved only for installations where the following temperature limitations can be maintained in service:

- Measured temperature rise must not exceed listed values when the inlet is at ambient temperature. Ambient is considered as the general temperature of the space around the unit. This is not outdoor temperature unless the unit is installed outdoors.
- If inlet temperature is higher than ambient, the listed allowable temperature rise values must be reduced by 2/3 of the difference between the actual measured inlet temperature and the ambient temperature.
- The average of the inlet and discharge temperature must not exceed 250°F. (121°C).
- The ambient temperature of the space the blower/motor is installed in should not be higher than 120°F (48.8°C).

SPEED – These blowers & exhausters may be operated at speeds up to the maximum listed for the various frame sizes. They may be direct coupled to suitable constant speed drivers if pressure/temperature conditions are also within limits. At low speeds, excessive temperature rise may be a limiting factor.

Special Note: The listed maximum allowable temperature rise for any particular blower & exhauster may occur well before its maximum pressure or vacuum rating is reached. This may occur at high altitude, low vacuum or at very low speed. The units' operating limit is always determined by the maximum rating reached first. It can be any one of the three: Pressure, Temperature or Speed.

Lubrication

For Units with Splash Lubrication on Both Ends

Bearings and oil seals are lubricated by the action of the timing gears or oil slingers which dip into the main oil sumps

causing oil to splash directly on gears and into bearings and seals. A drain port is provided below each bearing to prevent an excessive amount of oil in the bearings. Seals located inboard of the bearings in each headplate effectively retain oil within the sumps. Any small leakage that may occur should the seals wear passes into a cavity in each vented headplate and is drained downward.

Oil sumps on each end of the blower are filled by removing top vent plugs, Item (25), and filling until oil reaches the middle of the oil level sight gauge when the unit is not operating, Item (45 or 53), DO NOT FILL PAST THE MIDDLE OF THE SIGHT GLASS.

Initial filling of the sumps should be accomplished with the blower not operating, in order to obtain the correct oil level. Approximate oil quantities required for blowers of the various models and configurations are listed in Table 3. Use a good grade of industrial type non-detergent, rust inhibiting, anti-foaming oil and of correct viscosity per Table 2. ***ROOTS synthetic oil (Roots P/N 813-106-) is specified and recommended.** Roots does not recommend automotive type lubricants, as they are not formulated with the properties mentioned above.

The oil level may rise or fall on the gauge during operation, to an extent depending somewhat on oil temperature and blower speed.

Proper lubrication is usually the most important single consideration in obtaining maximum service life and satisfactory operation from the unit. Unless operating conditions are quite severe, a weekly check of oil level and necessary addition of lubricant should be sufficient. During the first week of operation, check the oil levels in the oil sumps about once a day, and watch for leaks. Replenish as necessary. Thereafter, an occasional check should be sufficient. It is recommended that the oil be changed after initial 100 hours of operation. Frequent oil changing is not necessary unless the blower is operated in a very dusty location.

Normal life expectancy of petroleum based oils is about 2000 hours with an oil temperature of about 180°F (82°C). As the oil temperature increases by increments of 15-18°F (8°C - 10°C), the life is reduced by half. Example: Oil temperatures of 210-216°F (99°C - 102°C) will produce life expectancy of 1/4 or 500 hours. Therefore, it is considered normal to have oil change periods of 500 hours with petroleum based oils.

Normal life expectancy of ROOTS™ Synthetic Oil is about 4000 to 8000 hours with an oil temperature of about 180°F (82°C). As the oil temperature increases by increments of 15-18°F (8°C - 10°C), the life is reduced by half. Example: Oil temperatures of 210-216°F (99°C - 102°C) will produce life expectancy of 1/4 or 1000 to 2000 hours.

NOTE: To estimate oil temperature, multiply the discharge temperature of the blower by 0.80. Example: if the discharge air temperature of the blower is 200° F, it is estimated that the oil temperature is 160° F.

*ROOTS™ Synthetic Oil & Grease is superior in performance to petroleum based products. It has high oxidation stability, excellent corrosion protection, extremely high film strength and low coefficient of friction. Typical oil change intervals are increased 2-3 times over petroleum based lubricants. Also, ROOTS™ Synthetic Oil is 100% compatible with petroleum based oils. Simply drain the oil in the blower and refill the reservoirs with ROOTS™ Synthetic Oil to maintain optimum performance of your ROOTS™ blower.

Operation

Before operating a blower under power for the first time, recheck the unit and the installation thoroughly to reduce the likelihood of avoidable troubles. Use the following procedure check list as a guide, but consider any other special conditions in the installation.

- Be certain that no bolts, tools, rags, or debris have been left in the blower air chamber or piping.
- If an outdoor intake without filter is used, be sure the opening is located so it cannot pick up dirt and is protected by a strong screen or grille. Use of the temporary protective screen as described under INSTALLATION is strongly recommended.
- Recheck blower leveling, drive alignment and tightness of all mounting bolts if installation is not recent. If belt drive is used, adjust belt tension correctly.
- Turn drive shaft by hand to make sure impellers still rotate without bumping or rubbing at any point.
- Ensure oil levels in the main oil sumps are correct.
- Check lubrication of driver. If it is an electric motor, be sure that power is available and that electrical overload devices are installed and workable.
- Open the manual unloading valve in the discharge air line. If a valve is in the inlet piping, be sure it is open.
- Bump blower a few revolutions with driver to check that direction of rotation agrees with arrow near blower shaft, and that both coast freely to a stop.

After the preceding points are cleared, blower is ready for trial operation under "no-load" conditions. The following procedure is suggested to cover this initial operation test period.

- a. Start blower, let it accelerate to full speed, then shut off. Listen for knocking sounds, both with power on and as speed slows down.
- b. After blower comes to a complete stop, repeat above, but let blower run 2 or 3 minutes. Check for noises, such as knocking sounds.
- c. After blower comes to a complete stop, operate blower for about 10 minutes unloaded. Check oil levels. Observe cylinder and headplate surfaces for development of hot spots such as burned paint, indicating impeller rubs. Be aware of any noticeable increase in vibration.

Assuming that all trials have been satisfactory, or that necessary corrections have been made, the blower should now have a final check run of at least one hour under normal operating conditions. After blower is restarted, gradually

close the discharge unloading valve to apply working pressure. At this point it is recommended that a pressure gauge or manometer be connected into the discharge line if not already provided, and that thermometers be in both inlet and discharge lines. Readings from these instruments will show whether pressure or temperature ratings of the blower are being exceeded.

During the final run, check operating conditions frequently and observe the oil levels at reasonable intervals. If excessive noise or local heating develops, shut down immediately and determine the cause. If either pressure rise or temperature rise across the blower exceeds the limit specified in this manual, shut down and investigate conditions in the piping system. Refer to the TROUBLESHOOTING CHECKLIST for suggestions on various problems that may appear.

The blower should now be ready for continuous duty operation at full load. During the first few days make periodic checks to determine whether all conditions remain steady, or at least acceptable. This may be particularly important if the blower is supplying air to a process system where conditions can vary. At the first opportunity, stop the blower and clean the temporary inlet protective screen. If no appreciable amount of debris has collected, the screen may be removed. See comments under INSTALLATION. At this same time, verify leveling, coupling alignment or belt tension, and mounting bolt tightness.

Should operating experience prove that blower capacity is a little too high for the actual air requirements, a small excess may be blown off continuously through the manual unloading or vent valve. Never rely on the pressure relief valve as an automatic vent. Such use may cause the discharge pressure to become excessive, and can also result in failure of the valve itself. If blower capacity appears to be too low, refer to the TROUBLESHOOTING CHECKLIST.

Vibration Assessment Criteria

With measurements taken at the bearing locations on the housings, see chart below for an appropriate assessment guide for rotary lobe blowers rigidly mounted on stiff foundations.

In general, blower vibration levels should be monitored on a regular basis and the vibration trend observed for progressive or sudden change in level. If such a change occurs, the cause should be determined through spectral analysis.

As shown on the chart below, the level of all pass vibration will determine the need to measure discrete frequency vibration levels and the action required.

All Pass Vibration (in/sec)	Discrete Frequency Vibration (in/sec)	Action
0.45 or less	N/R	Acceptable
Greater than 0.45 but 1.0 or less	0.45 or less @ any frequency	Acceptable
	Greater than 0.45 @ any frequency	Investigate
Greater than 1.0	Less than 1.0	Investigate
	Greater than 1.0	Investigate

Troubleshooting Checklist

Trouble	Item	Possible Cause	Remedy
No flow	1	Speed too low	Check by tachometer and compare with published performance
	2	Wrong rotation	Compare actual rotation with Figure 1 Change driver if wrong
	3	Obstruction in piping	Check piping, valves, silencer to assure open flow path
Low capacity	4	Speed too low	See item 1, If belt drive, check for slippage and readjust tension
	5	Excessive pressure rise	Check inlet vacuum and discharge pressure and compare with Published performance
	6	Obstruction in piping	See item 3
	7	Excessive slip	Check inside of casing for worn or eroded surfaces causing excessive clearances
Excessive power	8	Speed too high	Check speed and compare with published performance
	9	Excessive pressure rise	See Item 5
	10	Impeller rubbing	Inspect outside of cylinder for high temperature areas, then check for impeller contact at these points. Correct blower mounting, drive alignment
	11	Scale, sludge, rust or product build up	Clean blower appropriately
Damage to bearings or gears	12	Inadequate lubrication	Check oil sump levels in gear and drive end headplates
	13	Excessive lubrication	Check oil levels. If correct, drain and refill with clean oil of recommended grade
	14	Excessive pressure rise	See Item 5
	15	Coupling misalignment	Check carefully. Realign if questionable
	16	Excessive belt tension	Readjust for correct tension
Vibration	17	Misalignment	See Item 15
	18	Impellers rubbing	See Item 10
	19	Worn bearings/gears	Check gear backlash and condition of bearings, and replace as indicated
	20	Unbalanced or rubbing impeller	Scale or process material may build up on casing and impellers, or inside impellers. Remove build-up to restore original clearances and impeller balance
	21	Driver or blower loose	Tighten mounting bolts securely
	22	Piping resonances	Determine whether standing wave pressure pulsations are present in the piping
	23	Scale/sludge build-ups	Clean out interior of impeller lobes to restore dynamic balance
Driver stops, or will not start	24	Casing strain	Re-work piping alignment to remove excess strain
	25	Impeller stuck	Check for excessive hot spot on headplate or cylinder. See item 10. Look for defective shaft bearing and/or gear teeth
	26	Scale, sludge, rust or product build-up	Clean blower appropriately
Excessive breather	27	Broken seal	Replace seals
Blow-by or excessive oil leakage to vent area	28	Defective O-ring	Replace seals and O-ring
Excessive oil leakage in vent area	29	Defective/plugged breather	Replace breather and monitor oil leakage
	30	Oil level too high	Check sump levels in gear and drive headplates.
	31	Oil type or viscosity incorrect	Check oil to insure it meets recommendations. Drain then fill with clean oil of recommended grade.
	32	Blower running hot	Check blower operating conditions to ensure they are within the operating limitations defined in this manual.

Inspection & Maintenance: Universal RAI® series blowers

A good program of consistent inspection and maintenance is the most reliable method of minimizing repairs to a blower. A simple record of services and dates will help keep this work on a regular schedule. Basic service needs are:

- Lubrication
- Checking for hot spots
- Checking for increases or changes in vibration and noise
- Recording of operating pressures and temperatures

Above all, a blower must be operated within its specified rating limits, to obtain satisfactory service life.

A newly installed blower should be checked often during the first month of full-time operation. Attention there after may be less frequent assuming satisfactory performance. Lubrication is normally the most important consideration and weekly checks of lubricant levels in the gearbox and bearing reservoirs should be customary. Complete oil change schedules are discussed under **LUBRICATION**.

Driver lubrication practices should be in accordance with the manufacturer's instructions. If direct connected to the blower through a lubricated type coupling, the coupling should be checked and greased each time blower oil is changed. This will help reduce wear and prevent unnecessary vibration. In a belted drive system, check belt tension periodically and inspect for frayed or cracked belts.

In a new, and properly installed, unit there is no contact between the two impellers, or between the impellers and cylinder or headplates. Wear is confined to the bearings (which support and locate the shafts) the oil seals, and the timing gears. All are lubricated and wear should be minimal if clean oil of the correct grade is always used. Seals are subject to deterioration as well as wear, and may require replacement at varying periods.

Shaft bearings are designed for optimum life under average conditions with proper lubrication and are critical to the service life of the blower. Gradual bearing wear may allow a shaft position to change slightly, until rubbing develops between impeller and casing. This will cause spot heating, which can be detected by observing these surfaces. Sudden bearing failure is usually more serious. Since the shaft and impeller are no longer supported and properly located, extensive general damage to the blower casing and gears is likely to occur.

Oil seals should be considered expendable items, to be replaced whenever drainage from the headplate vent cavity becomes excessive or when the blower is disassembled for

any reason. Some oil seal leakage may occur since an oil film under the lip is required for proper operation. Periodically leaked oil should be wiped off from surfaces. Minor seal leakage should not be considered as indicating seal replacement.

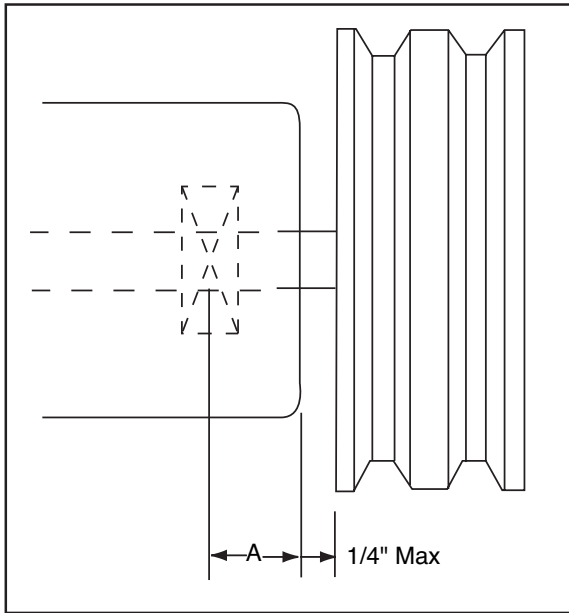
Timing gear wear, when correct lubrication is maintained, should be negligible. Gear teeth are cut to provide the correct amount of backlash, and gears correctly mounted on the shafts will accommodate a normal amount of tooth wear without permitting contact between lobes of the two impellers. However, too high an oil level will cause churning and excessive heating. This is indicated by unusually high temperature at the bottom of the gear housing. Consequent heating of the gears will result in loss of tooth-clearance, backlash and rapid wear of the gear teeth usually will develop. Continuation of this tooth wear will eventually produce impeller contacts (knocking), and from this point serious damage will be unavoidable if blower operation is continued. A similar situation can be produced suddenly by gear tooth fracture, which is usually brought on by sustained overload or momentary shock loads.

Problems may also develop from causes other than internal parts failure. Operating clearances within a blower are only a few thousandths of an inch. This makes it possible for impeller interference or casing rubs to result from shifts in the blower mounting, or from changes in piping support. If this type of trouble is experienced, and the blower is found to be clean, try removing mounting strains. Loosen blower mounting bolts and reset the leveling and drive alignment. Then tighten mounting again, and make sure that all piping meets blower connections accurately and squarely. Foreign materials in the blower will also cause trouble, which can only be cured by disconnecting the piping and thoroughly cleaning the blower interior.

A wide range of causes & solutions for operating troubles are covered in the **TROUBLE SHOOTING CHECKLIST**. The remedies suggested should be performed by qualified mechanics with a good background. Major repairs generally are to be considered beyond the scope of maintenance, and should be referred to an authorized Roots distributor.

Warranty failures should not be repaired at all, unless specific approval has been obtained through Roots before starting work. Unauthorized disassembly within the warranty period may void the warranty.

Figure 2 - Allowable Overhung Loads for V-Belt Drives Universal RAI®/URAI®-DSL Units



$$\text{Belt Pull lbs} = \frac{252100 \cdot \text{Motor HP}}{\text{Blower RPM} \cdot \text{Sheave Diameter}}$$

$$\text{Shaft Load (lb.in)} = \text{Belt Pull} \cdot \left(A + \frac{1}{4} + \frac{\text{Sheave Width}}{2} \right)$$

Frame Size	Dimension "A"	Max Allowable Shaft Load (lb-in)	Min Sheave Diameter
59	1.13	1,325	6.00

NOTE:

Arc of sheave belt contact on the smaller sheave not to be less than 170°
 Driver to be installed on the inlet side for vertical units, and on the drive shaft side for horizontal units.
 Roots recommends the use of two or more 3V, 5V or 8V matched set or banded belts and sheaves.

Specified Lubricants

ROOTS Synthetic Oil: ISO-VG-320 Grade

	Part Number
Quart	13106004
Gallon	13106005
Case (12 qts)	13106007

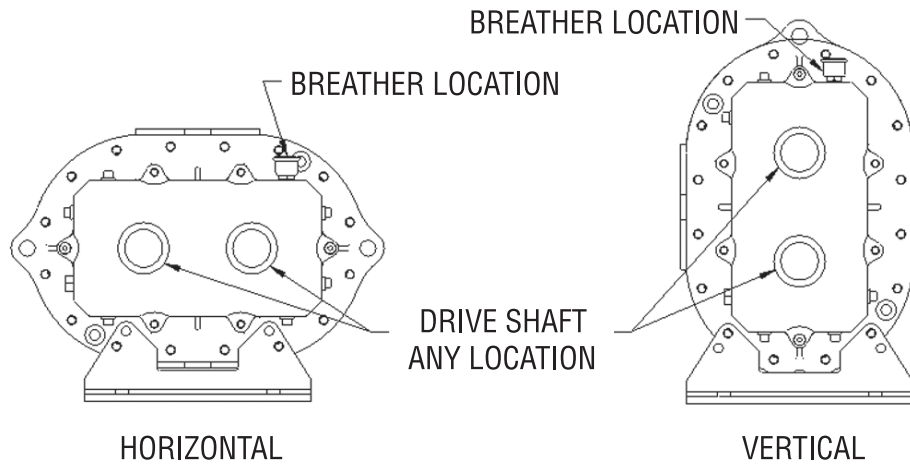
ROOTS Synthetic Oil: ISO-VG-220 Grade

	Part Number
Quart	13106001
Gallon	13106002
Case (12 qts)	13106008

ROOTS Synthetic Oil: ISO-VG-150 Grade

	Part Number
Quart	13106020
Gallon	13106021
Case (12 qts)	13106023
5 Gallon Pail	13106022
55 Gallon Drum	13106025

Drive End Breather Orientation for URA-DSL blowers with Oil Lube



URAI DSL BREATHER ORIENTATION

**Table 1 - URAI, URAI-DSL Blowers,
Maximum Allowable Operating Conditions**

Frame Size	Gear Diameter (Inch)	Speed RPM	Temp. Rise Deg F (Deg C)	Delta Pressure PSI (mbar)	Inlet Vacuum INHG (mbar)
59	5	2,850	225 (125)	7 (483)	15 (500)

Table 2 - Recommended Oil Grades

Ambient Temperature °F (°C)	ISO Viscosity No.
Above 90° (32°)	320
32° to 90° (0° to 32°)	220
0° to 32° (-18° to 0°)	150
Below 0° (-18°)	100

Ambient temperature is defined as the temperature of the space in which the blower and drive are located.

Table 3 - Approximate Oil Sump Capacities

These capacities are provided to assist in stocking the correct amount of oil. Exact sump capacities may differ slightly. See "Lubrication" section for proper filling instructions.

URAI-DSL Splash Lubricated Blowers

Frame Size	Gear End Capacity Fl. Oz (Liters)	Drive End Capacity Fl. Oz. (Liters)
59	27.6 (.82)	14.8 (.44)

Basic Connection & Drive Shaft Information

URAI DSL AIR BLOWERS (with Dual Splash Lubrication DSL)

BOM#	FRAME SIZE	INLET/DISCHARGE CONN.	SHAFT DIAMETER	BARE WEIGHT
T30361020	59	4" NPT	1.125	209

Universal RAI air blowers include detachable mounting feet which permit vertical or horizontal installation. The units are center timed for rotation in either direction. The bearings on the URAI are grease lubricated on the drive end and splash lubricated on the gear end. The URAI-DSL is splash lubricated on BOTH ends.

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