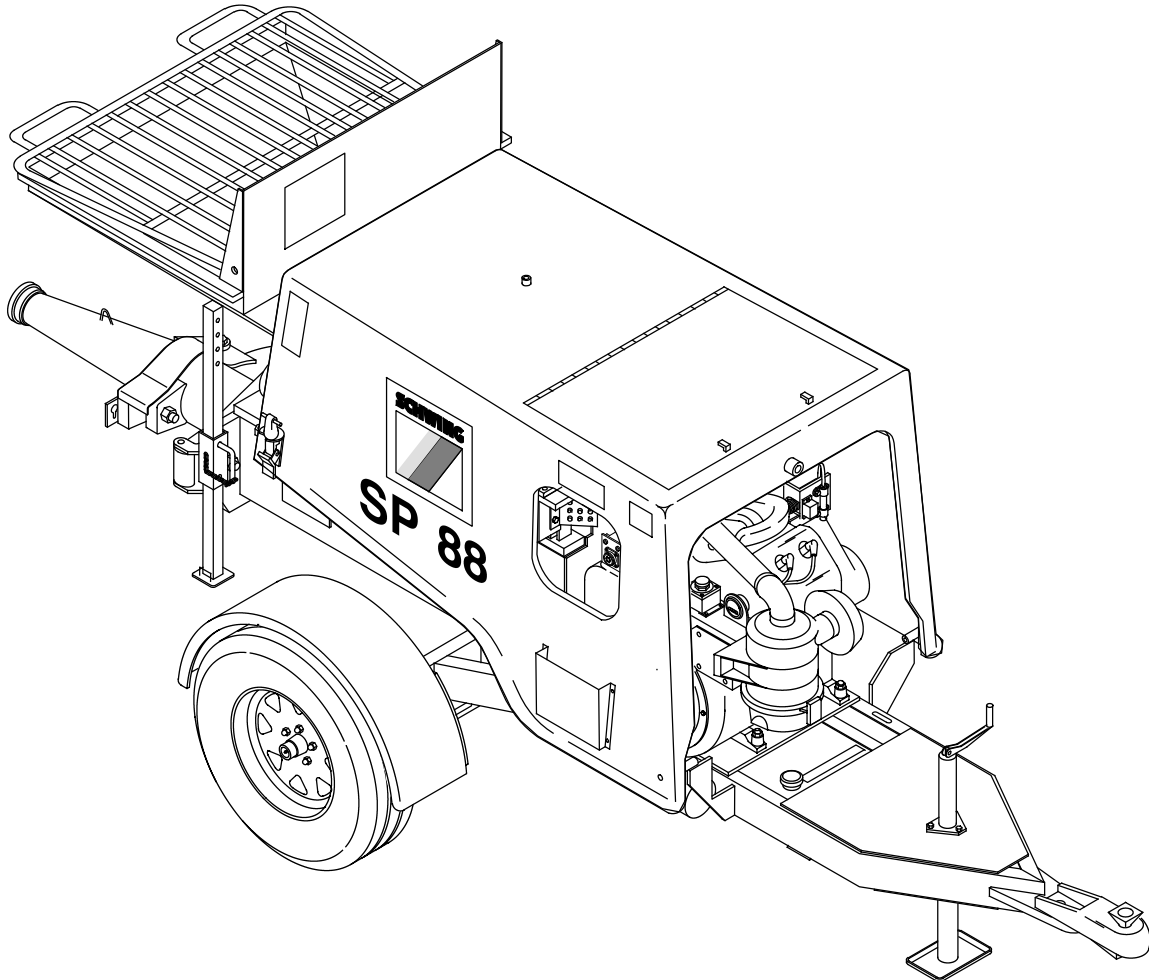


SCHWING

**SP 88, SP 88D,
SP 88SV, SP 125SV**

Serial#: _____



PARTS LIST & OPERATION MANUAL

When ordering parts please specify:

1. Model and Serial Number.
2. Quantity.
3. Description and Order number.
or
Description and Item number.
or
Order number and Item Number.



SCHWING

5900 CENTERVILLE ROAD
WHITE BEAR, MINNESOTA 55127
(651) 429-0999
Factory-GA 1-800-237-8960

Manual Part #: 30372907

Serial #:

February 2009

In the event of failures, possible queries and for ordering spare parts, please contact:



STATIONARY PUMPS

1300 Gresham Road

Marietta, GA 30062-4072 USA

Phone: (678) 560-9801

Toll Free: (800) 237-8960

Parts Fax: (678) 560-1574

Office/Sales Fax: (678) 560-1269

Subsidiary of: Friedrich Wilh. Schwing GmbH.

or the authorized representative for your area, quoting always the machine model, the serial number and the information on the model plates.

Carry out operation and maintenance of the chassis and the engine installed according to the maker's instructions.

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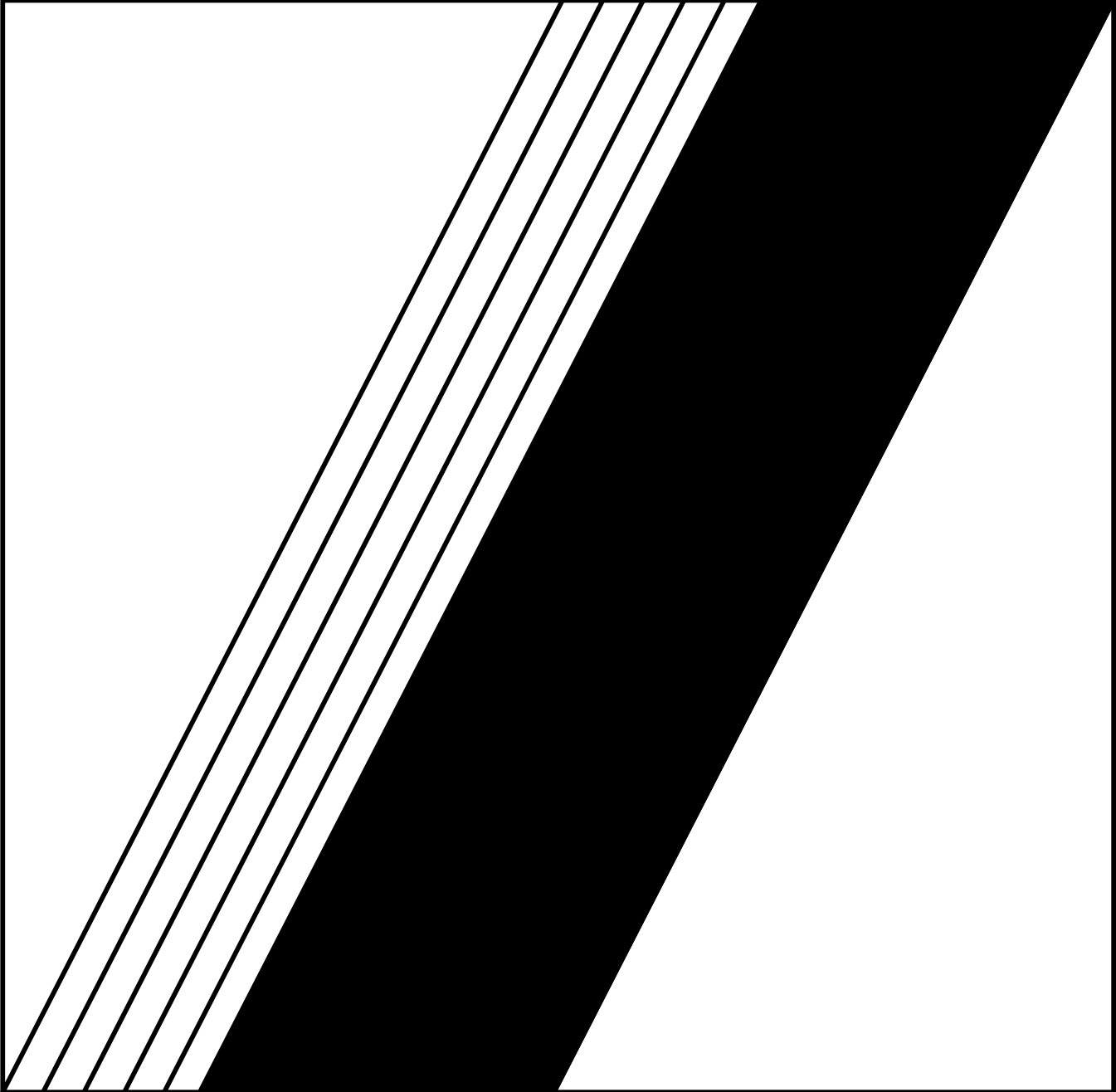
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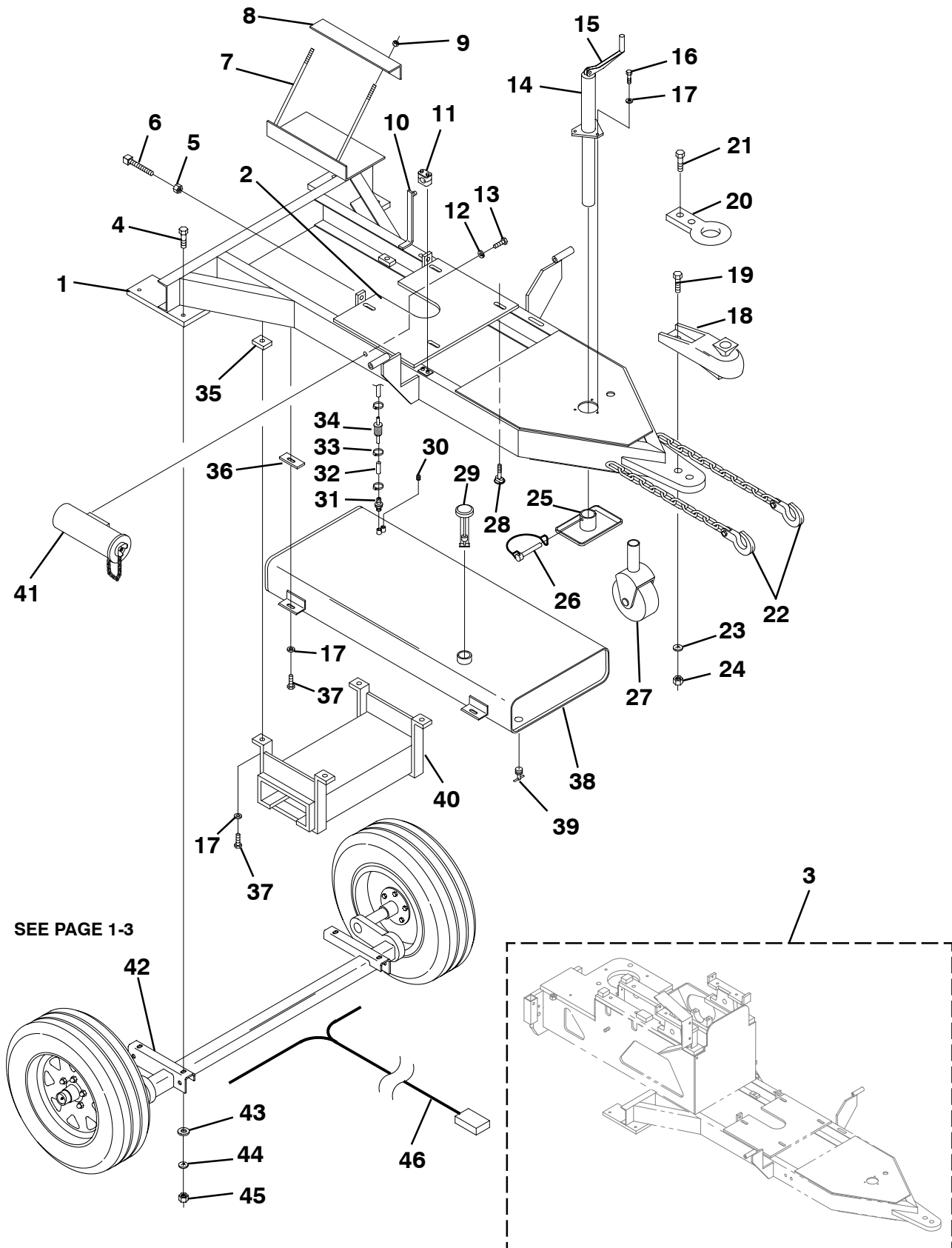
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SECTION 1



STRUCTURE

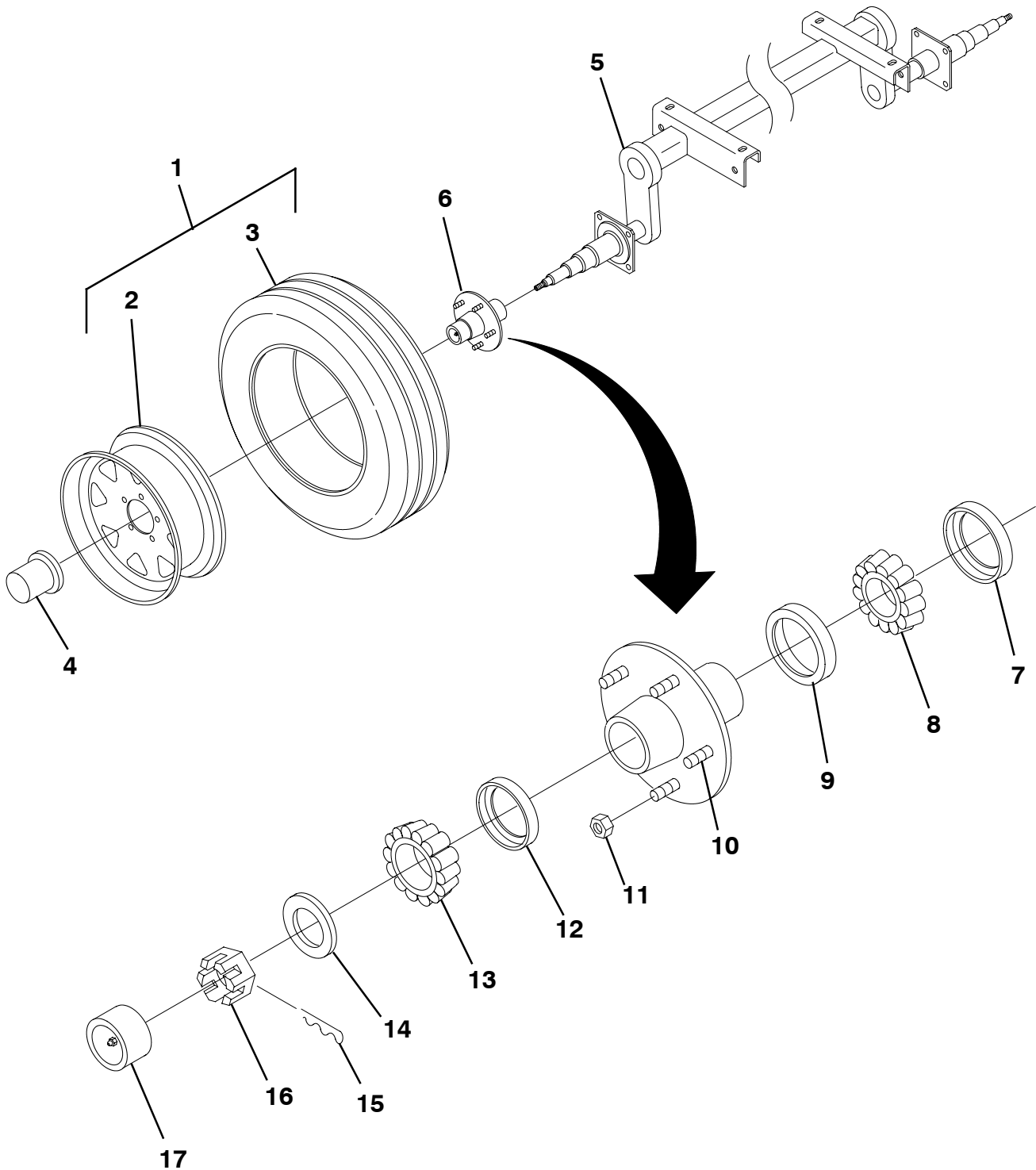


**SCHWING****FRAME AND ATTACHMENTS**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	CHASSIS WELDMENT, NO ENGINE MOUNTING PLATE (PM1133)	30329700
	1	FRAME ONLY	30373426
2	1	ENGINE MOUNTING PLATE ONLY	30392621
3	1	FRAME, ENGINE MOUNTING PLATE AND WATER BOX WELDMENT	30391188
4	4	BOLT, 1/2-13 X 2"	30337904
5	2	NUT, ADJUSTING (PM9029)	30373846
6	2	BOLT, SQUARE HEAD 1/2" X 3" (PM9049B)	30373866
7	2	STUD, BATTERY HOLD DOWN (PM1158)	30373482
8	1	BRACKET, BATTERY HOLD DOWN (PM1157)	30373481
9	2	NUT, NYLOCK, 3/8"	30389195
		ITEMS 7, 8 & 9 NOT REQUIRED WHEN 30396492 BATTERY BOX USED	
10	1	BRACKET	30392385
11	1	CLAMP ASSEMBLY 5/8"	10002502
12	2	WASHER, LOCK, 1/4" (PM9035)	30373852
13	2	BOLT, 1/4-20 X 3/4"	30373841
14	1	JACK, SUPPORT (PM1155)	30373474
15	1	HANDLE, JACK	30390836
16	3	BOLT, 3/8" X 1"	30391549
17	11	WASHER, FLAT, 3/8" (PM9076)	30396619
18	1	BALL COUPLER, 2" (PM9087)	30373898
19	2	BOLT, 1"-14 X 2-1/2" GR8	30373191
		REPAIR KIT	30391015
20	1	TOW RING - OPTIONAL, BOLT-ON	30392981
21	2	BOLT, 1"-14 X 3" GR8	30394890
	1	TOW RING - OPTIONAL, WELD-ON (PM9098)	30391102
22	2	SAFETY CHAIN (PM1156)	30373480
23	2	WASHER, FLAT, 1" SAE	30394650
24	2	NUT, NYLOCK, 1"	30373908
25	1	JACK FOOT (PM1155-1A) INCLUDES JACK PIN WITH CLIP	30373476
26	1	JACK PIN WITH CLIP	30394730
	1	JACK PIN WITH CLIP - REPLACED 11/01	30373478
27	1	JACK, CASTER - OPTIONAL	30373477
28	4	BOLT, T-SLOT (PM9152)	30373940
29	1	FUEL CAP WITH GAUGE (PM1162-1P)	30373488
30	1	PIPE PLUG	30373941
31	1	FITTING, BARBED, 1/4" (PM1163-2P)	30373495
32	A/R	FUEL LINE (PM1175)	30373513
33	2	HOSE CLAMP	30373514
34	1	FUEL FILTER, IN-LINE	30373515
35	4	NUT, WELDMENT	30329715
36	4	PAD, FUEL TANK (PM1163PAD)	30373496
37	8	BOLT, 3/8-16 X 1-3/4" (PM9168)	30373946
38	1	FUEL TANK (PM116348)	30373497
39	1	PETCOCK (PM1162-3P)	30373491
40	1	LIFTING BRACKET	30391196
41	1	MANUAL TUBE ASSEMBLY	30327997
	1	EXPANSION PLUG, WITH WING NUT	30391552
	1	WING NUT, 3/8-16	30392768
42	1	AXLE, ASSEMBLY (PM1099)	30373339
43	4	WASHER, FLAT, 1/2" SAE	30391335
44	4	WASHER, WILLIAMS, 1/2" (PM9026-W)	30373844
45	4	NUT, NYLOCK 1/2-13	30391247
46	1	TAIL LIGHT WIRING HARNESS (W/STD 4-PRONG TRAILER PLUG)	30393421





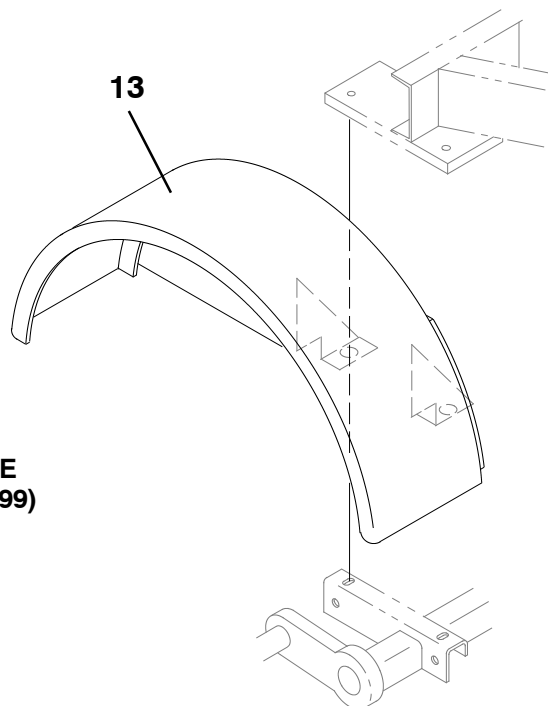
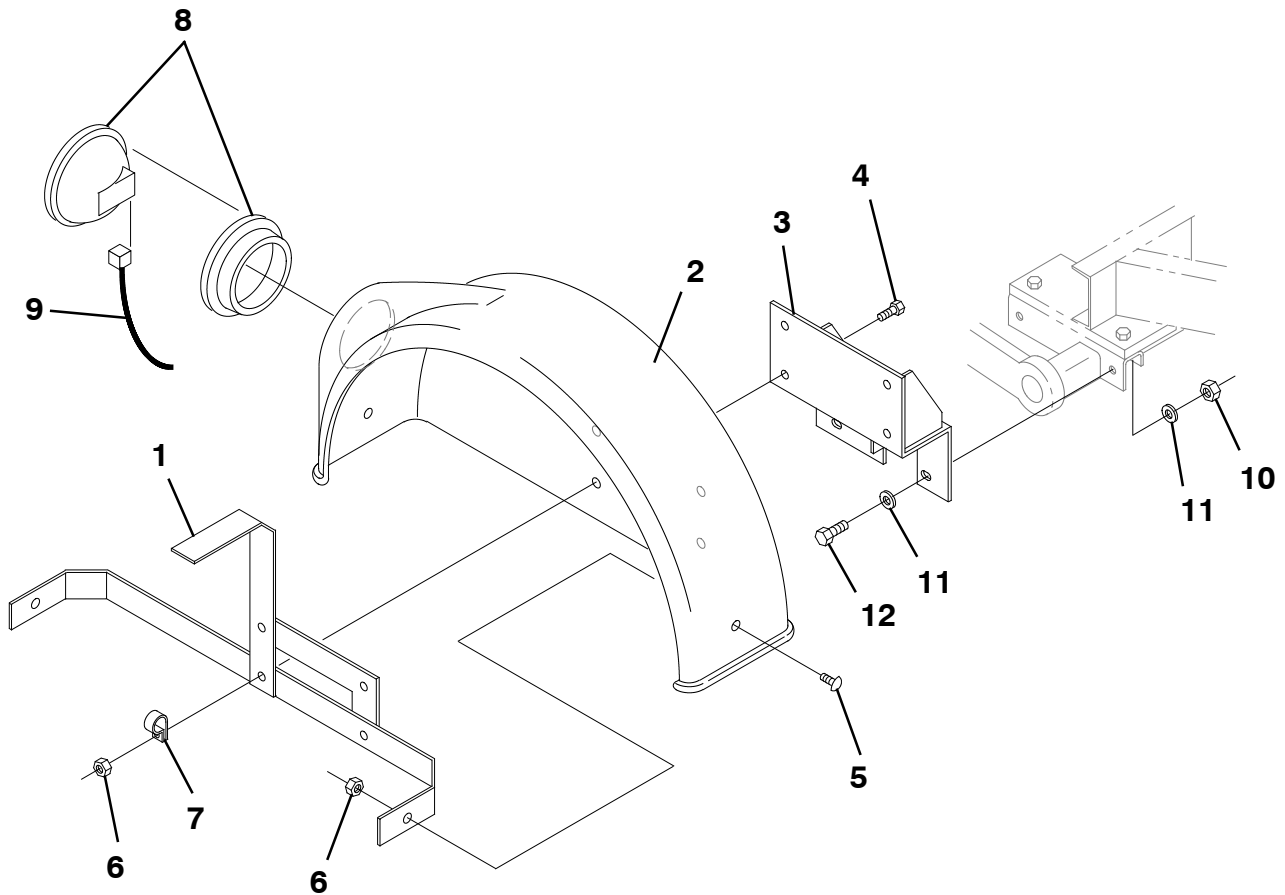
AXLE ASSEMBLY

SECTION

1

30373339 PM1099

Pos.	Qty.	Description	Part No.
1	2	STEEL WHEEL WITH TIRE COMPLETE	30373465
	2	ALUMINIUM WHEEL WITH TIRE COMPLETE - OPTIONAL	30396302
2	2	STEEL WHEEL (PM1149)	30373463
3	2	TIRE, 205/75 D14, LOAD RANGE C (PM1150)	30373464
4	2	HUB, CHROME - OPTIONAL	98323966
5	1	AXLE HUB ASSEMBLY, INCLUDES ITEM 6 (PM1099)	30373339
	1	AXLE, 3500LB P88 ELECTRIC - OPTIONAL	30391006
	1	BRAKE HARNESS	30391315
6	2	HUB ASSEMBLY WITH BEARINGS (PM1179)	30373520
7	1	SEAL, GREASE (SL-173)	30373521
8	1	INNER BEARING CONE (L68149)	30373522
9	1	INNER BEARING CUP (PM1179-C)	30373523
10	5	STUD (PM1179-G)	30373527
11	5	LUG NUT, 1/2"-20 (STN-506)	30373530
	5	CHROME LUG NUT, 1/2"-20 - OPTIONAL	30396337
12	1	OUTER BEARING CUP (PM144610)	30373525
13	1	OUTER BEARING CONE (L44649)	30373524
14	1	WASHER, SPINDLE (DW-813)	30391817
15	1	PIN, COTTER, 1-1/2" X 5/32", ZINC PLATED (SCP-103)	30373342
16	1	NUT, SPINDLE, 13/16"-20 (SN-813)	30391797
	1	LOCK SHIELD, SPINDLE NUT (LS813)	30373340
17	1	GREASE CAP, SURE LUBE (GC-1980-01)	30373526
18	1	BEARING & SEAL KIT, INCLUDES ITEMS 7 THRU 14 (PM1179KIT)	30373529



**METAL STYLE
(REPLACED 6/99)**

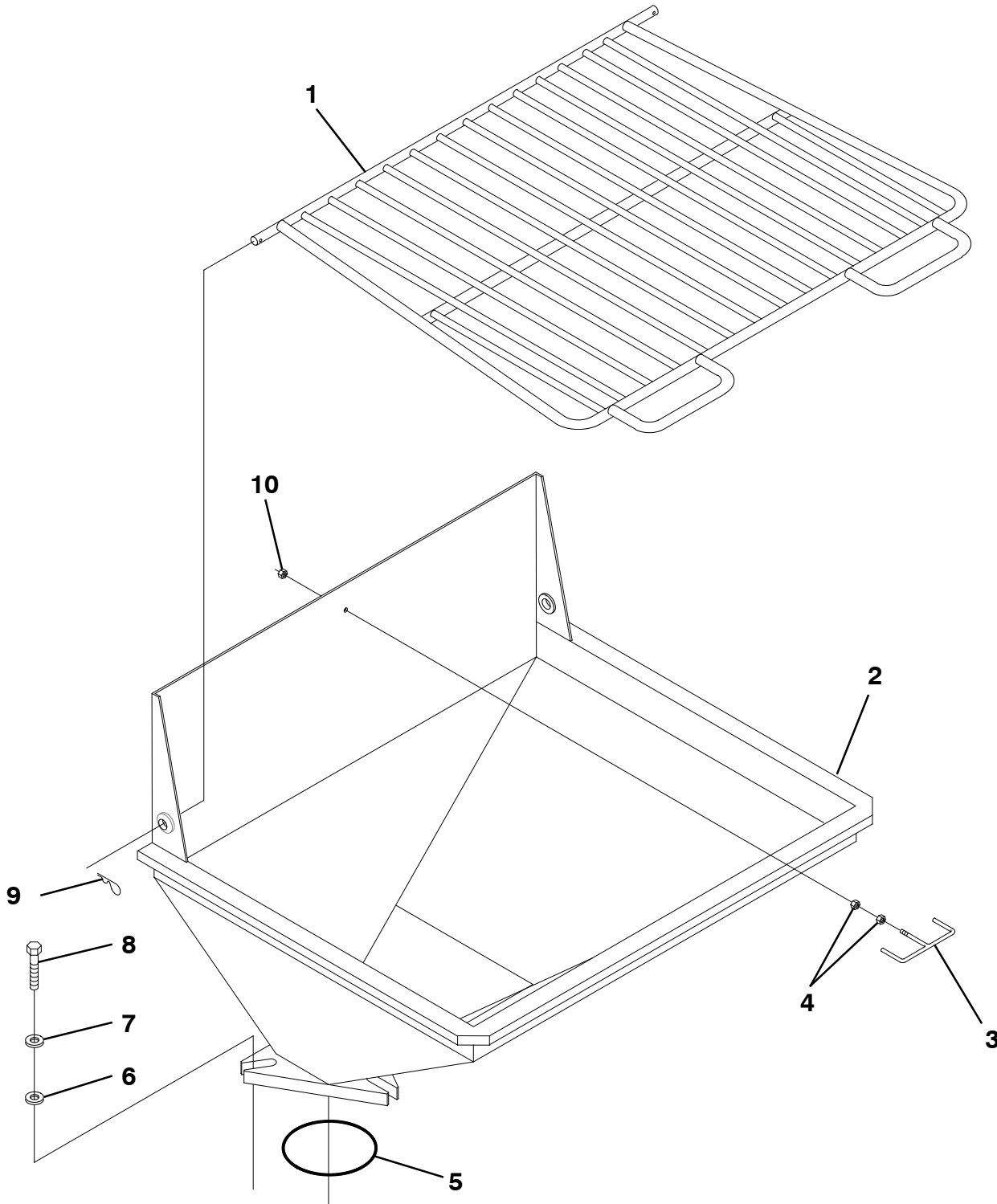


FENDER ASSEMBLY

SECTION

1

Pos.	Qty.	Description	Part No.
	SET	PLASTIC FENDER ASSEMBLIES, CAM AND CRANK SIDES, GREEN	30367911
1	1	FENDER SUPPORT BRACKET, CAM SIDE	30395602
	1	FENDER SUPPORT BRACKET, CRANK SIDE	30395495
2	1	PLASTIC FENDER ONLY, CAM SIDE	30392959
	1	PLASTIC FENDER ONLY, CRANK SIDE	30392934
3	1	WELDMENT, SUPPORT BRACKET, CAM SIDE	30395605
	1	WELDMENT, SUPPORT BRACKET, CRANK SIDE	30395606
4	8	BOLT, 1/4-20 X 1"	30391417
5	4	BOLT, STEP, 1/4-20 X 1"	30393771
6	12	NUT, NYLOCK, 1/4"	30391374
7	2	CLAMP	30390855
8	2	TAIL LIGHT ASSEMBLY (INCLUDES LENS, BULB, FIXTURE AND SEAL) ..	30393472
9	1	TAIL LIGHT WIRING HARNESS	30393421
10	4	NUT, NYLOCK, 3/8-16	30389195
11	8	WASHER, FLAT, 3/8-16	30373894
12	4	BOLT, 3/8-16 X 1"	30391549
13	SET	METAL FENDERS WITH BRACKETS, CAM AND CRANK SIDES, GREEN ..	30391105
	1	METAL FENDER ONLY, CAM SIDE	30391154
	1	METAL FENDER ONLY, CRANK SIDE	30374538

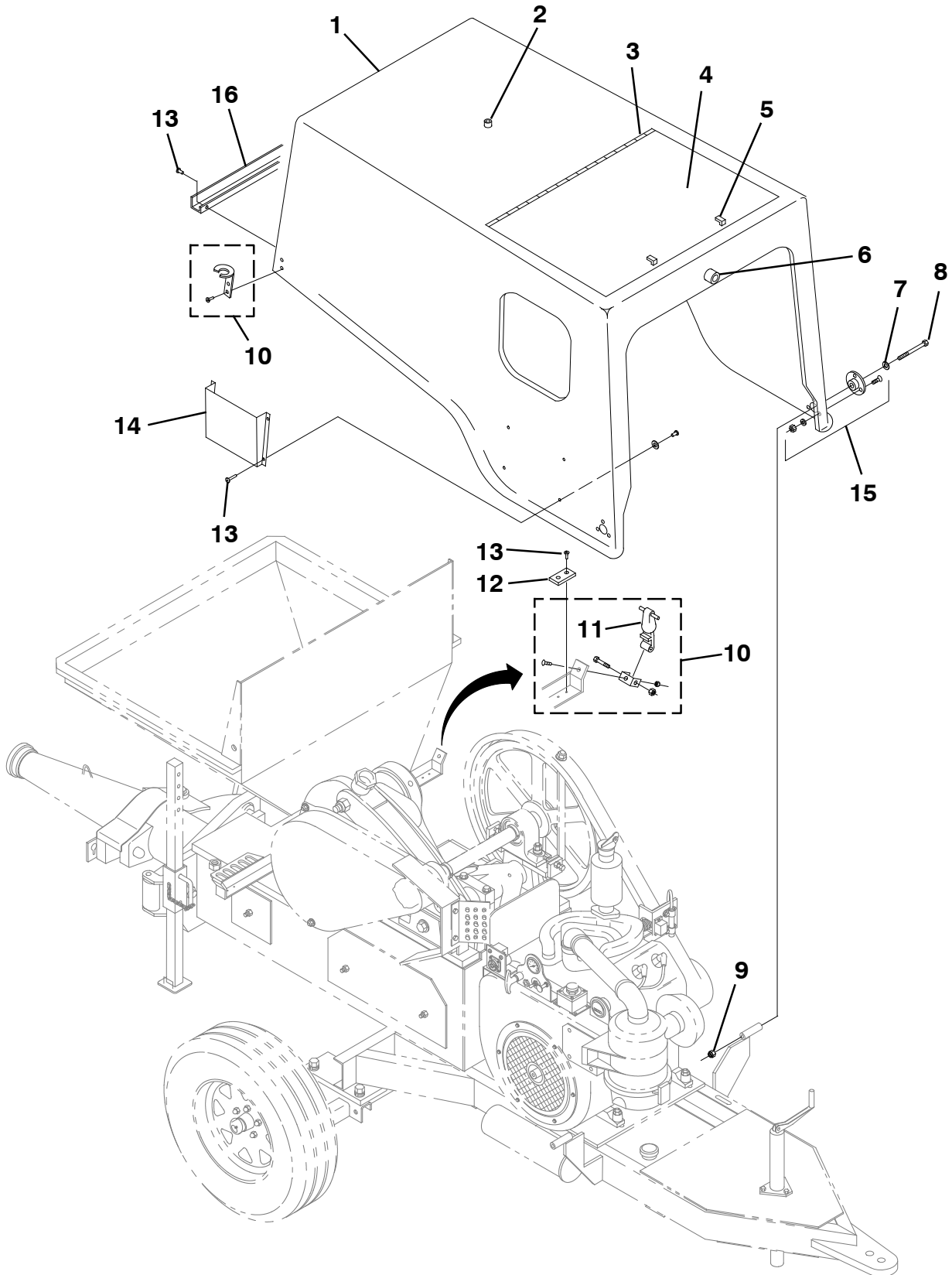


**SCHWING****HOPPER ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	GRATE, 1-1/4" (PM1061S) GREEN	30373223
	1	GRATE, 1", CREAM - OPTIONAL	30373222
2	1	HOPPER (PM1063)	30373228
	1	SV HOPPER (PM1063125)	30373236
	1	FLANGE	30373229
3	1	HANDLE (PM9061)	30373882
4	2	NUT, 3/8-16	30373893
5	1	O-RING (PM1074)	30373303
	1	O-RING - USED ON P125SV (PM0014)	30373140
6	3	WASHER, FLAT, 5/8" (PM1148)	30373462
7	3	WASHER, WILLIAMS, 5/8" (PM9022)	30373839
8	3	BOLT, 5/8" X 2-1/4" NC, GR8 (PM9190)	30373954
9	2	HITCH PIN, #8	30393671
10	1	NUT, NYLOCK, 3/8-16	30389195

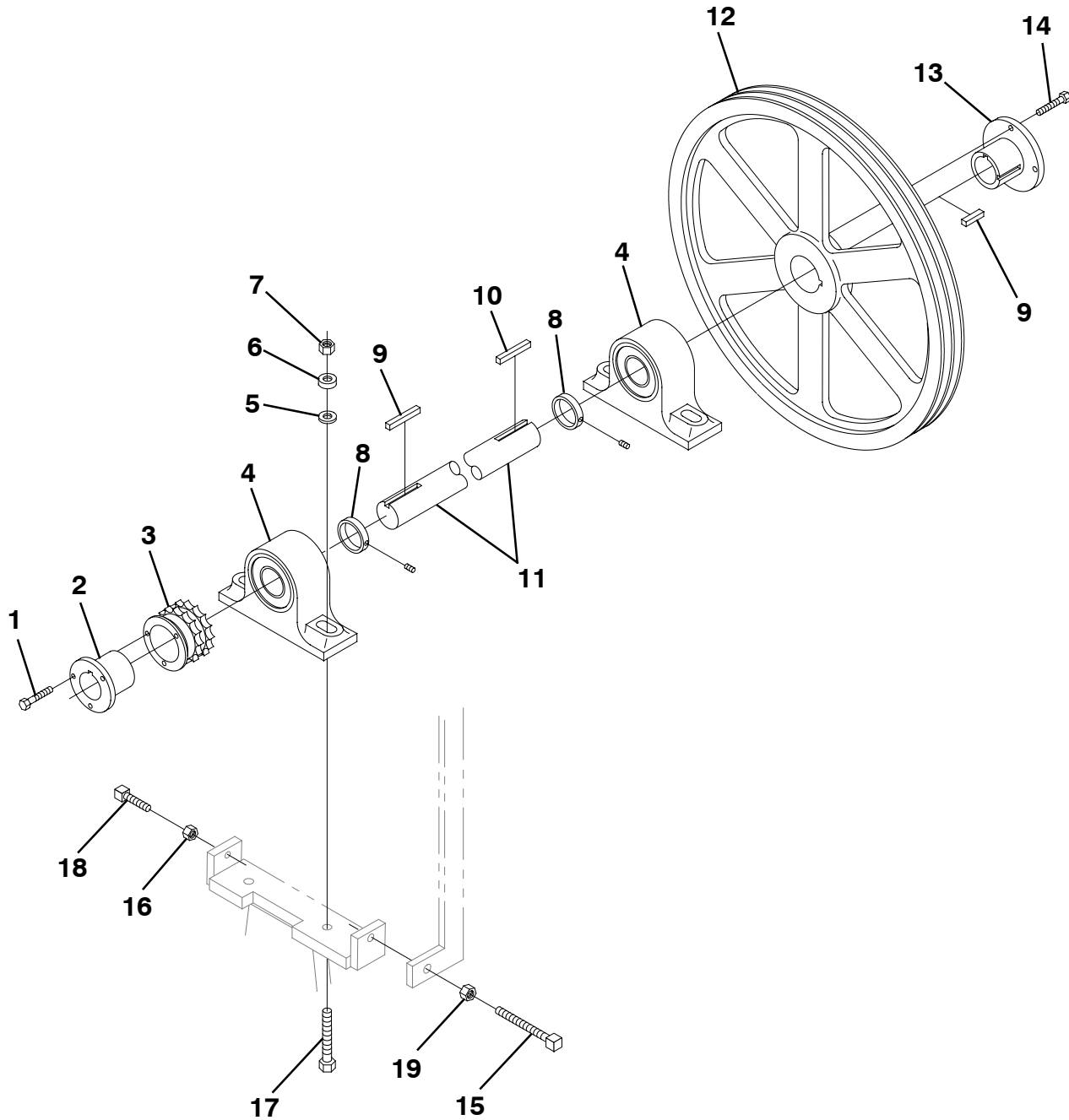


**SCHWING****HOOD ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	HOOD (PM1062-125) W/LARGE ACCESS DOOR	30373225
2	1	BUMPER, DOOR REST (PM1133P2)	30373487
3	2	HINGE, LARGE ACCESS DOOR	30394193
	2	HINGE (PM1159-3) SMALL ACCESS DOOR	30373483
4	1	DOOR, LARGE ACCESS	30394192
	1	DOOR (PM1161-5) SMALL ACCESS	30373485
5	2	LATCH/KNOB (PM1160-41)	30373484
	1	LARGE ACCESS DOOR ASSEMBLY W/LATCHES & HINGE	30395687
	1	DOOR KIT, RETROFIT - LARGE ACCESS DOOR	30394075
6	1	BUMPER PAD (PM1161B)	30373433
7	2	WASHER, FLAT 1/2" (PM9026)	30373843
8	2	BOLT, 1/2-13 X 4-1/2" NC (PM9047)	30373862
9	2	NUT, NYLOCK, 1/2-13 (PM9030)	30373847
10	2	HOOD LATCH ARM ASSEMBLY, INCLUDES ITEM 11 (PM1063-2P)	30373231
11	2	HOOD HOOK, RUBBER (PM1063R)	30373235
12	2	PAD, HOOD REST	30373434
13	10	RIVET, POP, 3/16" (PM1063-2PR)	30373232
14	1	POCKET, MANUAL HOLDER	30327999
15	2	PIVOT BUSHING KIT	30392668
16	1	HOODREST STRIP, UHMW	30392669
17	2	HANDLE, RUBBER INSERT (USED ON OLDER HOODS)	30390894
	1	HOOD ASSEMBLED COMPLETE, WITH DECALS, READY TO INSTALL - SPECIFY WHEN ORDERING - (INCLUDES SERVICE CHARGE FOR LABOR)	SEE MFG

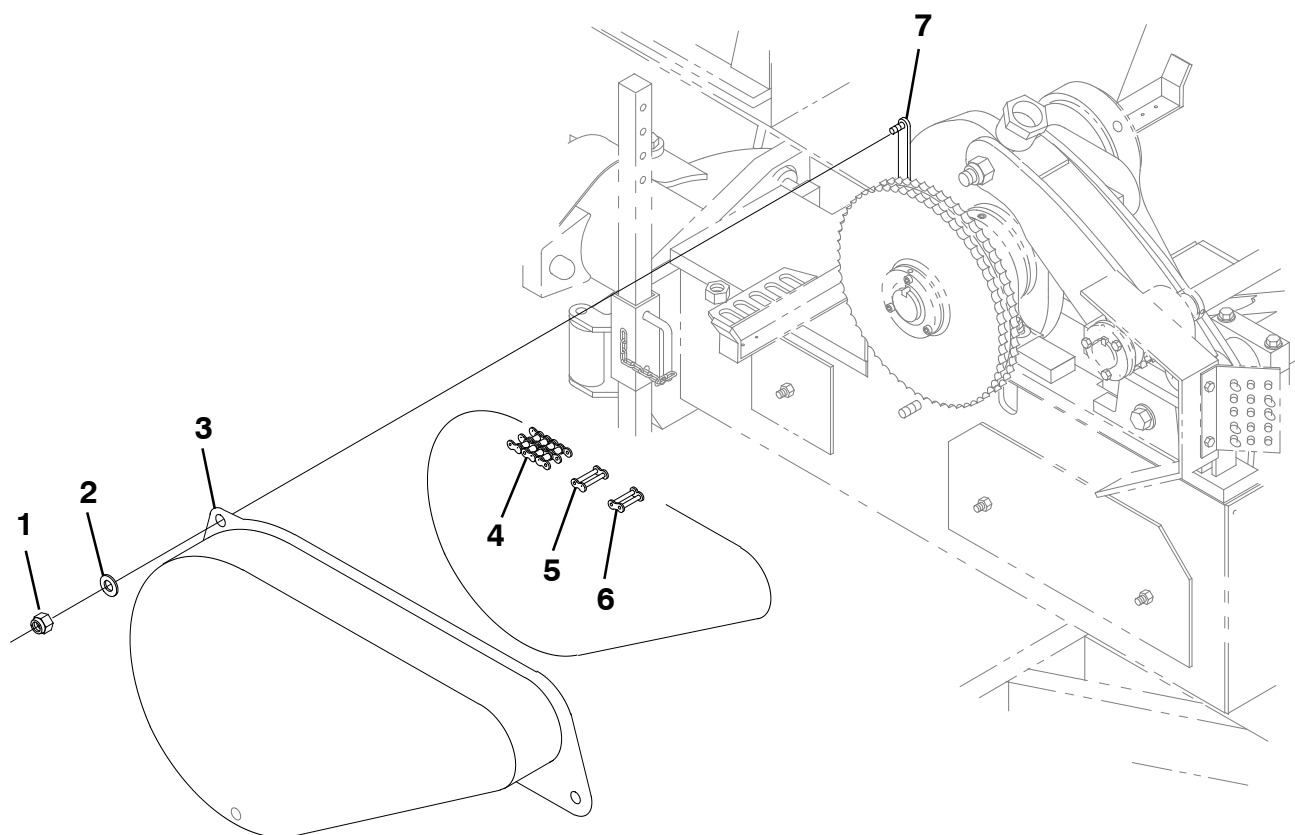


**SCHWING****COUNTERSHAFT ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
	1	COUNTERSHAFT ASSEMBLY	30391131
1	3	BOLT, 5/16" X 1" (PM9092)	30373903
2	1	BUSHING (PM1052)	30373209
3	1	SPROCKET, SMALL, 13T (PM1121)	30373393
4	2	BEARING (PM1045) BROWNING/DODGE	30373196
5	4	WASHER, FLAT, 1/2"	30391335
6	4	WASHER, WILLIAMS, 1/2" (PM9026-W)	30373844
7	4	NUT, NYLOCK, 1/2-13, GR8	30391247
8	2	SET COLLARS, INCLUDES SET SCREW (PM1045B) BROWNING	30373197
	2	SET COLLARS, INCLUDES SET SCREW (PM1045B) DODGE	30393812
9	2	KEY (PM1056)	30373215
10	1	KEY (PM1055)	30373214
11	1	COUNTERSHAFT (PM1044)	30373194
	1	COUNTERSHAFT, LONG - P88 DIESEL ONLY	30373195
12	1	PULLEY, 20" (PM1046)	30373198
13	1	BUSHING (PM1047)	30373199
14	3	BOLT, 3/8" X 1-3/4" NC (PM9038)	30373855
15	1	BOLT, SQUARE HEAD, 3/8" X 3" (PM9097A)	30373910
16	1	NUT, 3/8" (PM9075)	30373893
17	4	BOLT, 1/2-13 X 3"	30391246
18	2	BOLT, SQUARE HEAD, 3/8" X 1-3/4" NC (PM9097)	30373909
19	1	NUT, JAM, 3/8"	30391328





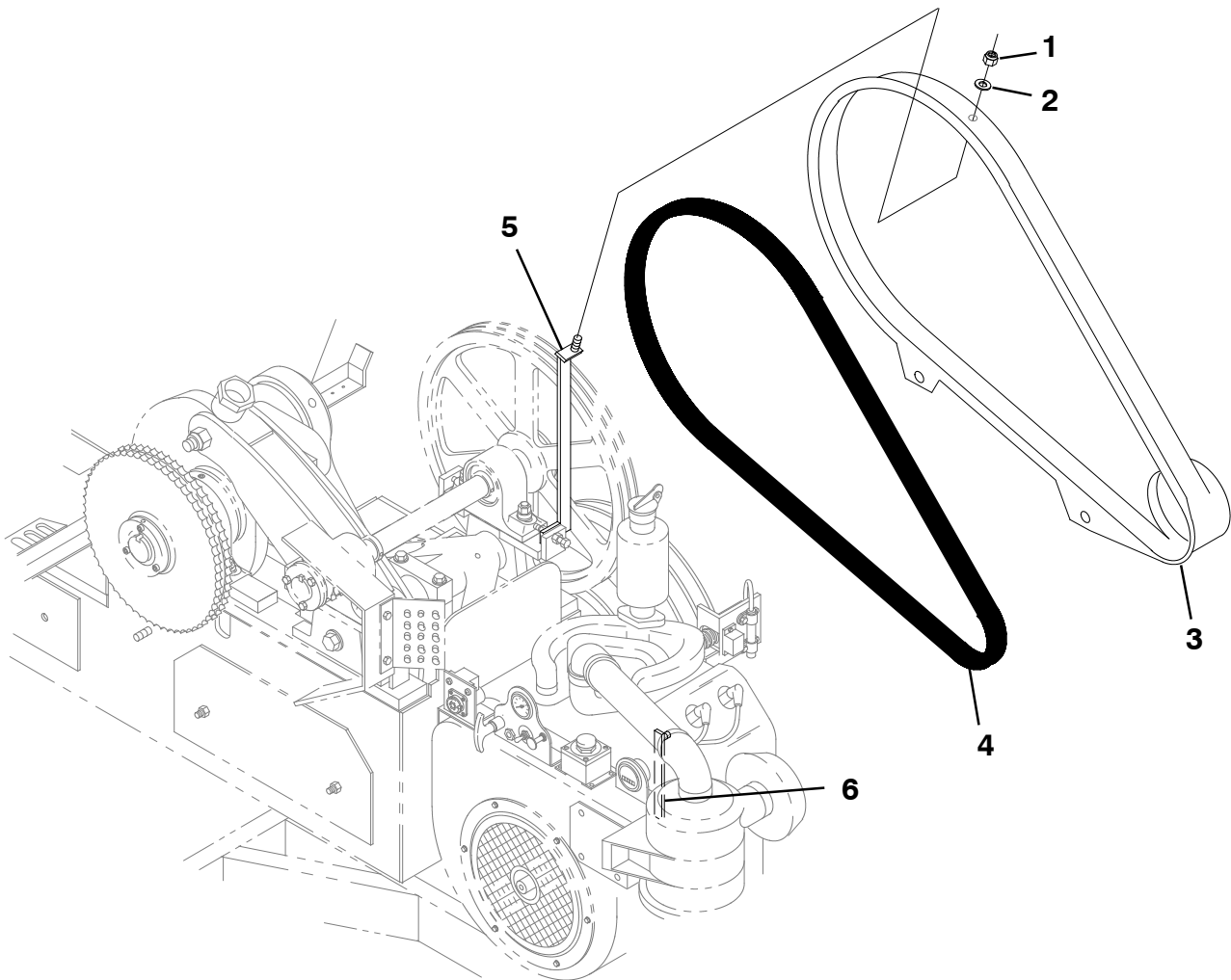
SCHWING

DRIVE CHAIN - GUARD

SECTION

1

Pos.	Qty.	Description	Part No.
1	3	NUT, NYLOCK, 3/8-16	30389195
2	3	WASHER, FLAT, 3/8" (PM9076)	30373894
3	1	GUARD, CHAIN (PM088170)	30391422
4	1	CHAIN, INCLUDES ITEMS 5 & 6 (PM1122D)	30373397
5	1	MASTER LINK (PM1053D)	30373211
6	1	OFFSET LINK (PM1054D)	30373213
7	1	BRACKET, CHAIN GUARD (SEE CRANKSHAFT ASSEMBLY)	30391457
8	1	BRACKET, CHAIN GUARD, WATERBOX (NOT SHOWN)	30329736





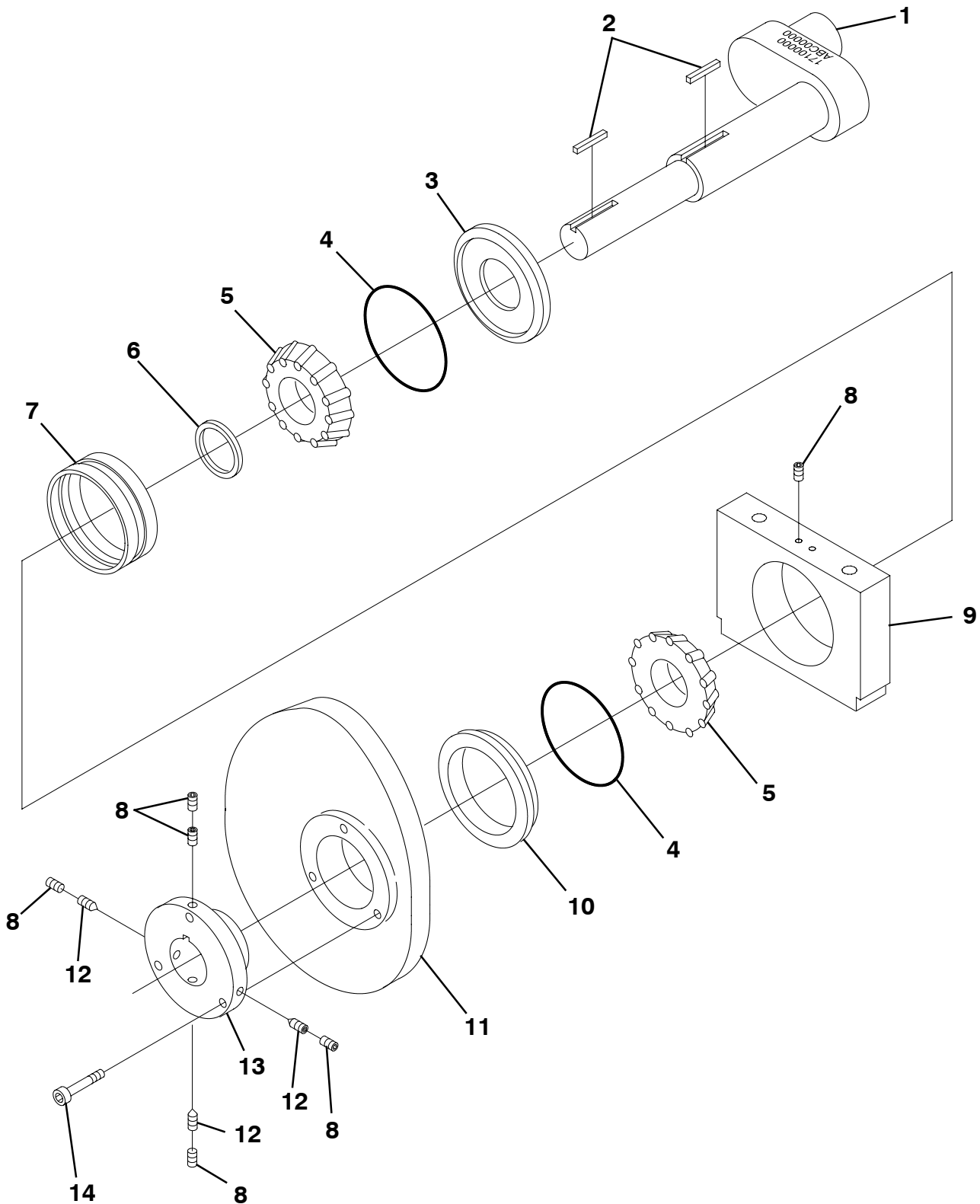
SCHWING

DRIVE BELT - GUARD

SECTION

1

Pos.	Qty.	Description	Part No.
1	3	NUT, NYLOCK, 3/8-16	30389195
2	3	WASHER, FLAT, 3/8" (PM9076)	30373894
3	1	GUARD, BELT (PM088177)	30391423
4	1	BELT, DOUBLE V (PM1049D)	30373203
5	1	BRACKET, BELT GUARD (SEE WATERBOX ASSEMBLY)	30391440
6	1	BRACKET, BELT GUARD (SEE FRAME & ATTACHMENTS)	30392385



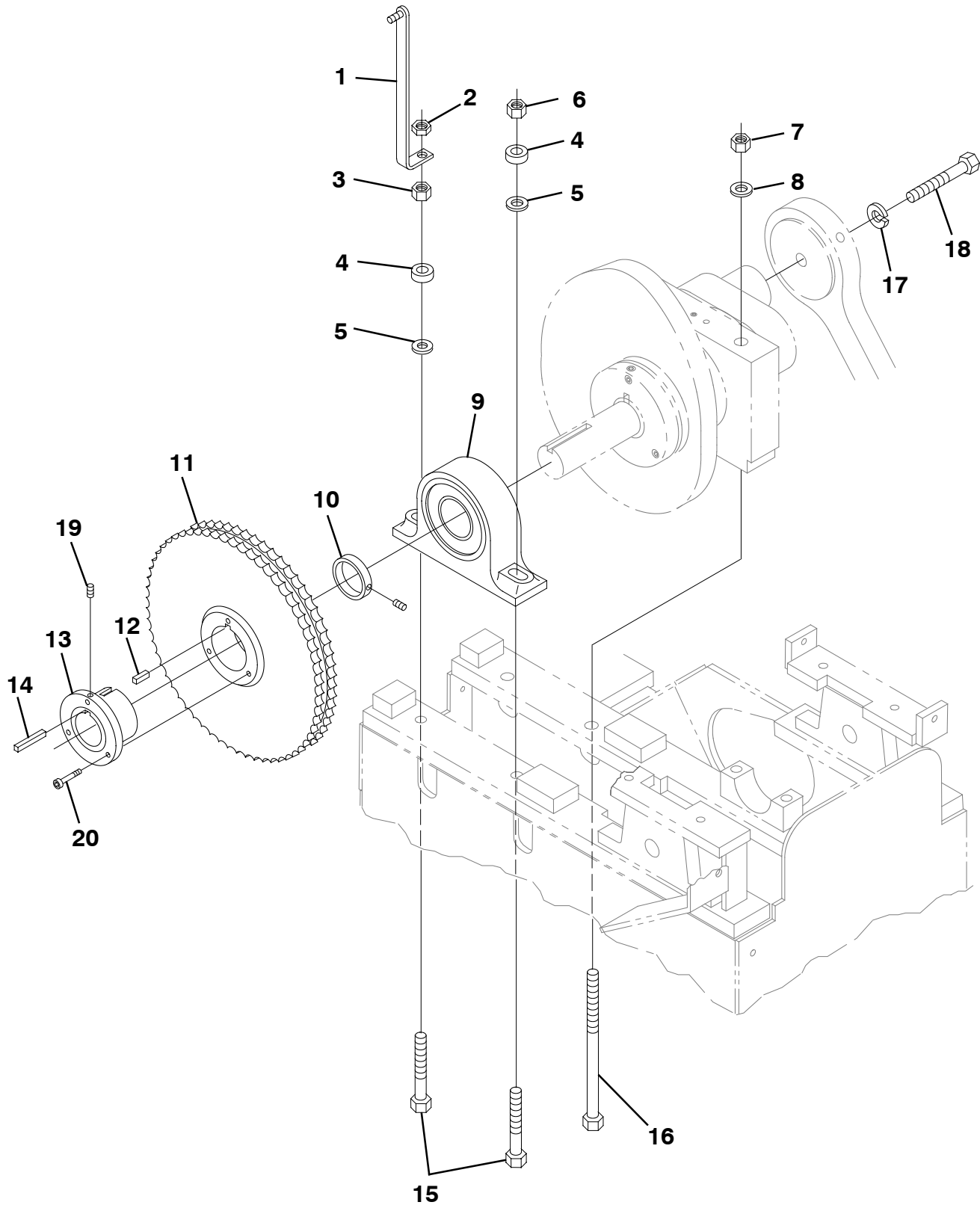


CRANKSHAFT ASSEMBLY (1 OF 2)

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	CRANKSHAFT (PM11183)	30373376
2	2	KEY, HARDENED, 5/8" RECTANGULAR (PM1035H)	30373183
3	1	SPACER (PM1125-4)	30373406
4	2	O-RING (PM1125-7)	30373409
5	2	CONE (PM1125-3)	30373405
6	1	SPACER (PM1125-6)	30373408
7	1	CUP (PM1125-2)	30373404
8	6	SET SCREW, 3/8-16 X 3/8" (PM9048)	30373863
9	1	BLOCK (PM1125-1)	30373403
10	1	SPACER (PM1125-5)	30373407
11	1	CAM WELDMENT (PM1037C)	30373186
12	3	SET SCREW, DOG POINT, 3/8-16 X 1/2" (PM1206A)	30373563
13	1	CAM BUSHING KIT, INCLUDES ITEMS 8, 12 & 14 (PM1124)	30373400
	1	KIT, WITHOUT CAM BUSHING	30396101
14	3	SCREW, SOCKET HEAD CAP, 3/8-16 X 1-1/4" (PM9031)	30373848
15	1	CRANKSHAFT ASSEMBLY COMPLETE (PM11183CH)	30373377
		INCLUDES ITEMS 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13 (ALSO ITEM 9 ON LIST 2 OF 2)	
16	1	BLOCK ASSEMBLY COMPLETE (PM1125)	30373402
		INCLUDES ITEMS 5, 6, 7, 8, 9, 10, 15	



**SCHWING****CRANKSHAFT ASSEMBLY (2 OF 2)**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	BRACKET, CHAIN GUARD	30391457
2	1	NUT, JAM, 5/8-11	30391664
3	1	NUT, 5/8-11, GR8	30391494
4	2	WASHER, WILLIAMS, 5/8" (PM9022)	30373839
5	2	WASHER, FLAT, SAE, 5/8"	30391038
6	1	NUT, NYLOCK, 5/8-11	30391368
7	2	NUT, LOCK, 3/4-10	30308525
8	2	WASHER, FLAT, SAE, 3/4"	30391360
9	1	BEARING, INCLUDES ITEM 10 (PM1089) BROWNING/DODGE, 2-7/16" ...	30373325
10	1	SET COLLAR (PM1089B) BROWNING, 2-7/16"	30373326
	1	SET COLLAR 040054 DODGE, 2-7/16"	30396632
11	1	SPROCKET (PM1050)	30373205
12	1	KEY (PM1051K)	30373208
13	1	BUSHING (PM1051)	30373207
14	1	KEY (PM1035)	30373183
15	2	BOLT, 5/8-11 X 4"	30391346
16	2	BOLT, 3/4-10 X 8-1/2", GR8 (PM1125-88)	30373410
17	1	WASHER, LOCK, 5/8" (PM9021)	30373838
18	1	BOLT, 5/8" X 1-1/2"	30391327
19	1	SET SCREW, 3/8-16 X 3/8" (PM9048)	30373863
20	3	SCREW, SOCKET HEAD CAP, 3/8-16 X 1-1/4" (PM9031)	30373848



Emerson Power Transmission
909 N. Lafayette Street
VALPARAISO, IN 46383
Phone: 219-465-2211
www.emerson-ept.com

FORM
PN 786515
PS-740-0001
Rev 0
February, 2004

BALL AND ROLLER BEARINGS INSTALLATION INSTRUCTIONS

	<p>⚠ WARNING</p> <p>High voltage and rotating parts may cause serious or fatal injury.</p> <p>Turn off power to install or service.</p> <p>Operate with guards in place.</p> <p>Read and follow all instructions.</p>	
-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

These instructions cover setscrew and eccentric locking ball and roller bearings. It is important that they be read in their entirety before attempting installation or removal. The procedures indicated should be carefully followed. Failure to do so can result in mis-installation, which could cause bearing performance problems as well as serious personal injury.

BALL BEARING INSERT INSTALLATION

SPHERICAL OD INSERTS - Place into housing load slot, positioning the anti-rotation rivet in the load slot. Using a bar slipped into the insert bore, swing insert into place within the housing. A snug fit should result. If insert can swivel by hand, the housing fit is too loose, replace entire unit. If heavy force is required, fit is too tight (**Do not hammer**) - replace entire unit. Insure alignment of the lube hole in outer race and the grease groove in housing bore.

CYLINDRICAL OD INSERTS - Be sure housing bore is clean and free of debris. Press the bearing into the housing by applying force to the face of the outer ring. **Do not hammer on any component of the bearing or apply force to inner ring.** For recommended housing bore tolerance, consult BROWNING/EPT Bearing Application Engineering.

BEARING INSTALLATION

- CHECK AREA** - Clean and organize bearing installation area, and keep well lit. Be sure mounting surfaces are clean and flat.
- CHECK SHAFT** - Shaft should be within tolerance range shown in Table 1, clean, and free of nicks and burrs. Mount bearing on unused section of shafting or repair/replace shafting as required.
- INSTALL UNIT** - Slide the bearing unit and/or locking collar on shaft. (If the projecting side of the bearing is to be mounted toward the machine, put the locking collar on first.) If it is difficult to mount the bearing on shaft, use a piece of emery cloth to reduce any high spots on shaft. **Do not hammer on any component of the bearing**
- CENTER INSERT** - The expansion unit must be centered in the housing to allow axial shaft expansion. Move the bearing as far as it will go in both directions in the housing and determine the centered position. It may be necessary to unload the bearing while moving the assembly.

- FASTEN UNIT IN PLACE** - Install housing attachment bolts, check and align bearing and tighten attachment bolts. Rotate shaft slowly to center bearing.
 - SET SCREW INSERTS**
 - Setscrews in a multiple bearing setup should be aligned.
 - Torque first set screw to one half recommended torque. Torque second set screw to full torque. Torque first set screw to full torque. Review Table 2 for Ball Bearings and Tables 3 and 4 for Roller Bearings set screw torque.
 - Check shaft again for freedom of rotation.
 - ECCENTRIC LOCK INSERTS**
 - Rotate locking collar in the direction of shaft rotation until hand tight. Lock tightly with a drift pin and hammer or spanner wrench and hammer. Tighten setscrews to torque specified in Table 5.
 - Check shaft again for freedom of rotation.
 - BOA CONCENTRIC INSERTS**
 - Be sure that BOA concentric collar is fitted square and snug against the shoulder on the inner ring.
 - Torque BOA concentric collar cap screw to torque recommended in Table 6.
- CHECK HOUSING ALIGNMENT** - The maximum permissible static misalignment of the shaft is 2° for ball bearings, 1.5° for roller bearings, except for 900 and 920 series tapered roller bearings. The 900 and 920 series have no misalignment capabilities.
- INSTALL 2nd UNIT** - Repeat Steps 4 through 6 for each additional bearing used on the shaft



RELUBRICATION INSTRUCTIONS

BROWNING® Brand Bearing Units are factory lubricated with high quality lithium soap grease with an EP additive. The bearing is ready for use with no initial lubrication required. However, for slow speed applications less than 100 RPM, operating in dirty or wet environment, sufficient additional grease should be applied at start-up to completely fill the void in the bearing. Lubrication intervals depend upon the type of application, speed and other external conditions. For general use, suggested intervals are shown in Table 6 for roller bearings and Table 9 for ball bearings. Grease charge amounts are shown in Table 7 for roller bearings and Table 8 for ball bearings. Experience will determine the best interval for each specific application. For safety, stop rotating equipment. Add one half the recommended amount shown in Table 7 or 8. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. Lubricate with lithium soap grease with EP additive, which conforms to NLGI 2 consistency and is suitable for an operating range of -20°F to +250°F.

Compatibility of grease is critical, therefore consult with BROWNING/EPT Engineering Department and your grease supplier for current grease specifications to ensure any greases used are compatible. For applications operating below -20°F, above 250°F, and all other applications, contact BROWNING/EPT Engineering Department at 219-465-2211*.

Table 1

RECOMMENDED SHAFT TOLERANCES	
Nominal Shaft Size (inches)	Shaft Tolerance (inches)
1 1/8 to 1 15/16	+0.0000/-0.0005
2 to 3 15/16	+0.0000/-0.0010
4 to 4 15/16	+0.0000/-0.0015

Table 2

SET SCREW TIGHTENING (BALL BEARINGS)					
Set Screw Locking		Eccentric Lock			
Bore Size (in) 100 & 200	Bore Size (in) 300	Bore Size (in)	Screw Size	Hex Size	Torque (in-lbs.)
1 1/2 - 5/8	-	-	10-32	3/32	28 - 36
3/4 - 1 1/4R	15/16 - 1	1/2 - 1	1/4-28	1/8	66 - 85
1 1/4 - 1 3/4	1 3/16 - 1	1 1/8 - 1 1/4R	5/16-24	5/32	126 - 164
1 15/16 - 2	1/2	1 1/4 - 1 15/16	3/8-24	3/16	228 - 296
2 1/2 - 3	1 11/16 - 2	2 - 2 7/16	7/16-20	7/32	348 - 452
15/16	3/16	2 11/16 - 2	1/2-20	1/4	504 - 655
-	2 7/16 - 3	15/16	-	-	-
-	15/16	-	-	-	-

Table 3

SET SCREW LOCK (TAPERED ROLLER)				
BORE SIZE	SCREW SIZE	RECOMMENDED TORQUE		
		(in-lbs.)	(ft-lbs.)	(N-m)
1 3/16 to 1 11/16	15/16 - 24	108-144	9 - 12	12 - 16
1 3/4 to 2 1/2	3/8 - 24	180-228	15 - 19	20 - 26
2 11/16 to 3 1/2	1/2 - 20	408-540	34 - 45	46 - 61
3 15/16 to 4	5/8 - 18	876-1140	73 - 95	99 - 129
4 7/16 to 5	3/4 - 16	1440-1800	120 - 150	163 - 203

Table 4

SETScrew LOCK (SPHERICAL ROLLER)				
Bore Size	Screw Size	Torque		
		(in-lbs.)	(ft-lbs.)	(N-m)
1 1/8 to 2 3/16	3/8	250	20	290
2 7/16 to 3 1/2	1/2	535	45	655
3 7/16 to 4 15/16	5/8	1060	90	1310



WARNING Disconnect all power before adjusting units

Table 5

ECCENTRIC LOCK				
Bore Size	Screw Size	Torque		
		(in-lbs.)	(ft-lbs.)	(N-m)
1 1/8 to 2 3/16	3/16	250	20	290
2 7/16 to 3 1/2	7/32	360	30	435
3 7/16 to 4 15/16	1/4	535	45	655

Table 6

BOA CONCENTRIC TIGHTENING			
English Screw Size	Hex Size	Torque	
		(in-lbs.)	(N-m)
#8-32	T-25	65 - 70	7 - 8
#10-24	T-27	80 - 90	9 - 10
1/4-20	T-30	160 - 180	18 - 20
5/16-18	T-45	360 - 400	40 - 45

Table 7

RELUBRICATION INTERVALS FOR BROWNING® BRAND ROLLER BEARINGS			
A QUALITY LITHIUM SOAP GREASE WITH AN EP ADDITIVE SHOULD BE USED			
Speed RPM	Temperature	Cleanliness	Greasing Interval
100	-20° F to 125° F	Clean	1-4 Months
500	-20° F to 150° F	Clean	1 Week to 1 Month
1000	-20° F to 210° F	Clean	1-2 Weeks
1500 to Maximum Catalog Rating	Up to 150° F	Dirty	Daily to 1 week
	Over 150° F	Dirty	Daily to 1 week
	Up to 250° F	Very Dirty*	Daily to 1 week
	Up to 250° F	Extreme Conditions*	Daily to 1 week

Table 8

GREASE CHARGE FOR ROLLER BEARING RELUBRICATION	
SHAFT SIZE (inches)	GREASE CHARGE (ounces)
1 1/8 to 1 1/4	0.10
1 3/8 to 1 7/16	0.22
1 1/2 to 1 11/16	0.32
1 3/4 to 2	0.50
2 to 2 3/16	0.55
2 1/4 to 2 1/2	0.65
2 11/16 to 3	0.85
3 3/16 to 3 1/2	1.25
3 15/16 to 4	2.50
4 7/16 to 4 1/2	3.10
4 15/16 to 5	4.75

Table 9

GREASE CHARGE FOR BALL BEARING RELUBRICATION	
SHAFT SIZE (inches)	GREASE CHARGE (ounces)
1/2 to 3/4	0.03
7/8 to 1 3/16	0.10
1 1/4 to 1 1/2	0.15
1 11/16 to 1 15/16	0.30
2 to 2 15/16	0.50
34 to 3 7/16	0.85
3 1/2 to 4	1.50

Table 10

RELUBRICATION INTERVALS FOR BROWNING® BRAND BALL BEARINGS			
Speed RPM	Temperature	Cleanliness	Relub. Intervals
100	-20° F to 125° F	Clean	4-10 Months
500	-20° F to 150° F	Clean	1 to 4 Months
1000	-20° F to 200° F	Clean	1 Week to 1 Month
1500	-20° F to 200° F	Clean	Biweekly
1500 to Maximum Catalog Rating	Up to 150° F	Dirty	Daily to 1 week
	150° F to 200° F	Dirty	Daily to 1 week
	-20° F to 200° F	Very Dirty*	Daily to 1 week
	-20° F to 200° F	Extreme Conditions*	Daily to 1 week

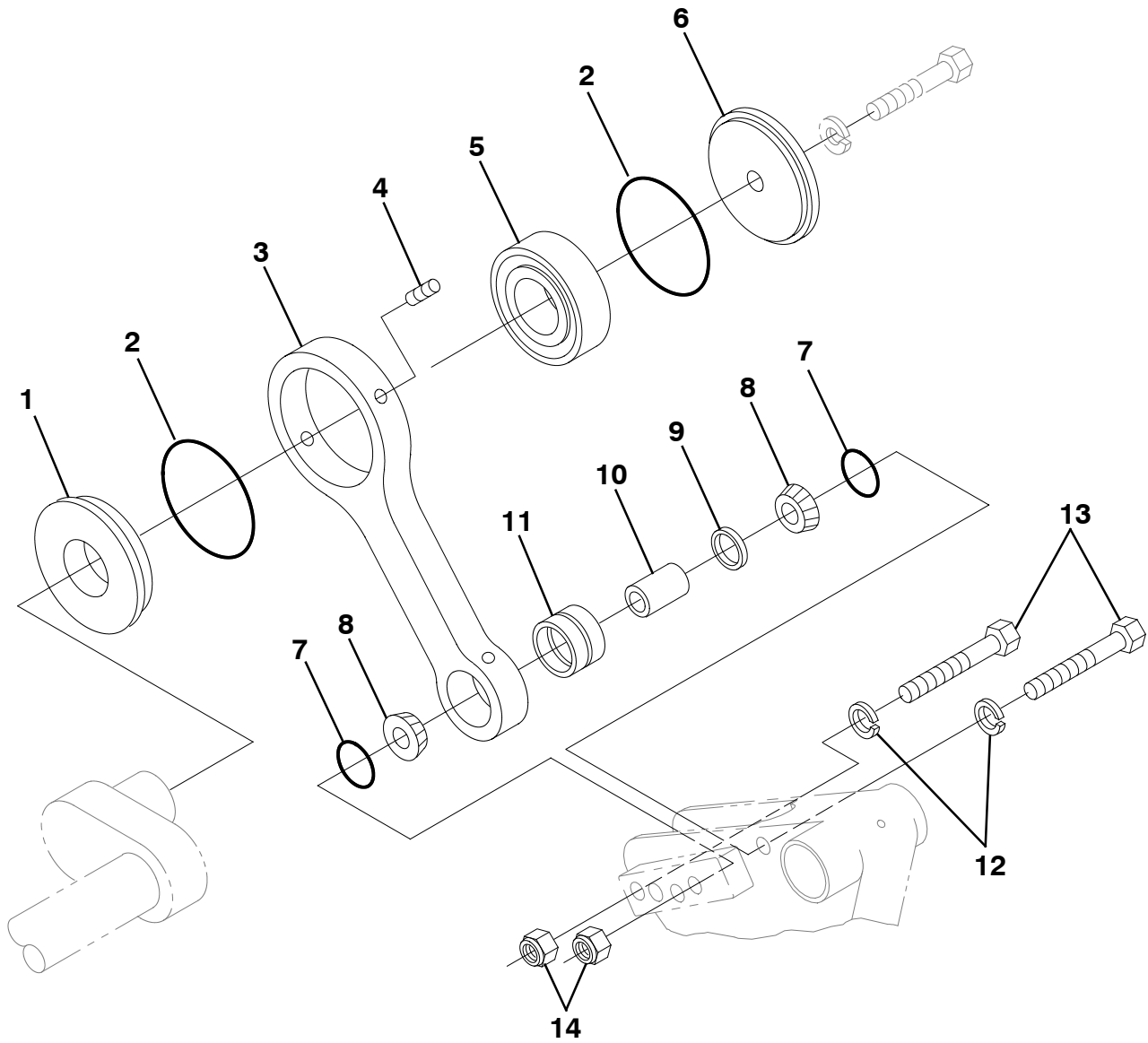
APPLICATION ASSISTANCE:

Please contact Application Engineering at:

Phone: (219) 465-2211

Fax: (219) 465-2263

Email: brownningbearing.eng@emerson-ept.com





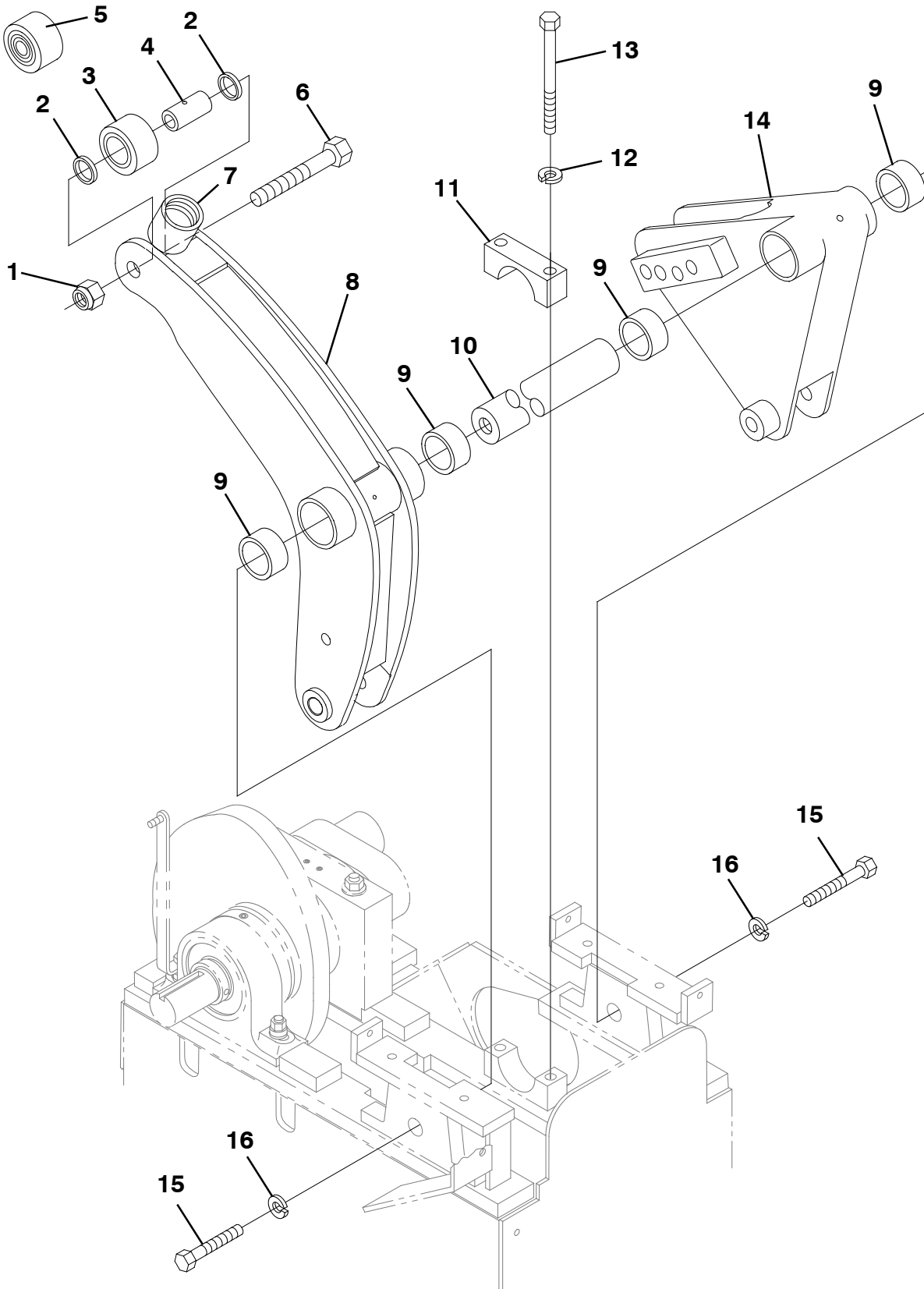
SCHWING

CONNECTING ROD ASSEMBLY

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	SPACER, INBOARD (PM1120-7)	30373390
2	2	O-RING (PM1120-9)	30373392
3	1	CONNECTING ROD (1120-1A)	30373383
4	1	SET SCREW, 3/8-16 X 1/2" (PM9048-A)	30373864
5	1	BEARING (PM1120-6)	30373389
6	1	SPACER, OUTBOARD (PM1120-8)	30373391
7	2	O-RING (PM1093)	30373330
8	2	BEARING CONE (PM1080)	30373314
9	1	SPACER (PM1027)	30373168
10	1	BUSHING (PM1026)	30373166
11	1	BEARING CUP (PM1079)	30373313
12	2	WASHER, LOCK, 1" (PM1043)	30373193
13	2	BOLT, 1" X 6" GR8 (PM11178)	30373374
14	2	NUT, JAM, THIN, 1", NC	30373467
15	1	CONNECTING ROD ASSEMBLY (PM1119D)	30373380
		INCLUDES ITEMS 3, 5, 7, 8, 9, 10 & 11	
16	1	BEARING KIT	30373571
		INCLUDES ITEMS 7, 8, 9, 10 & 11	

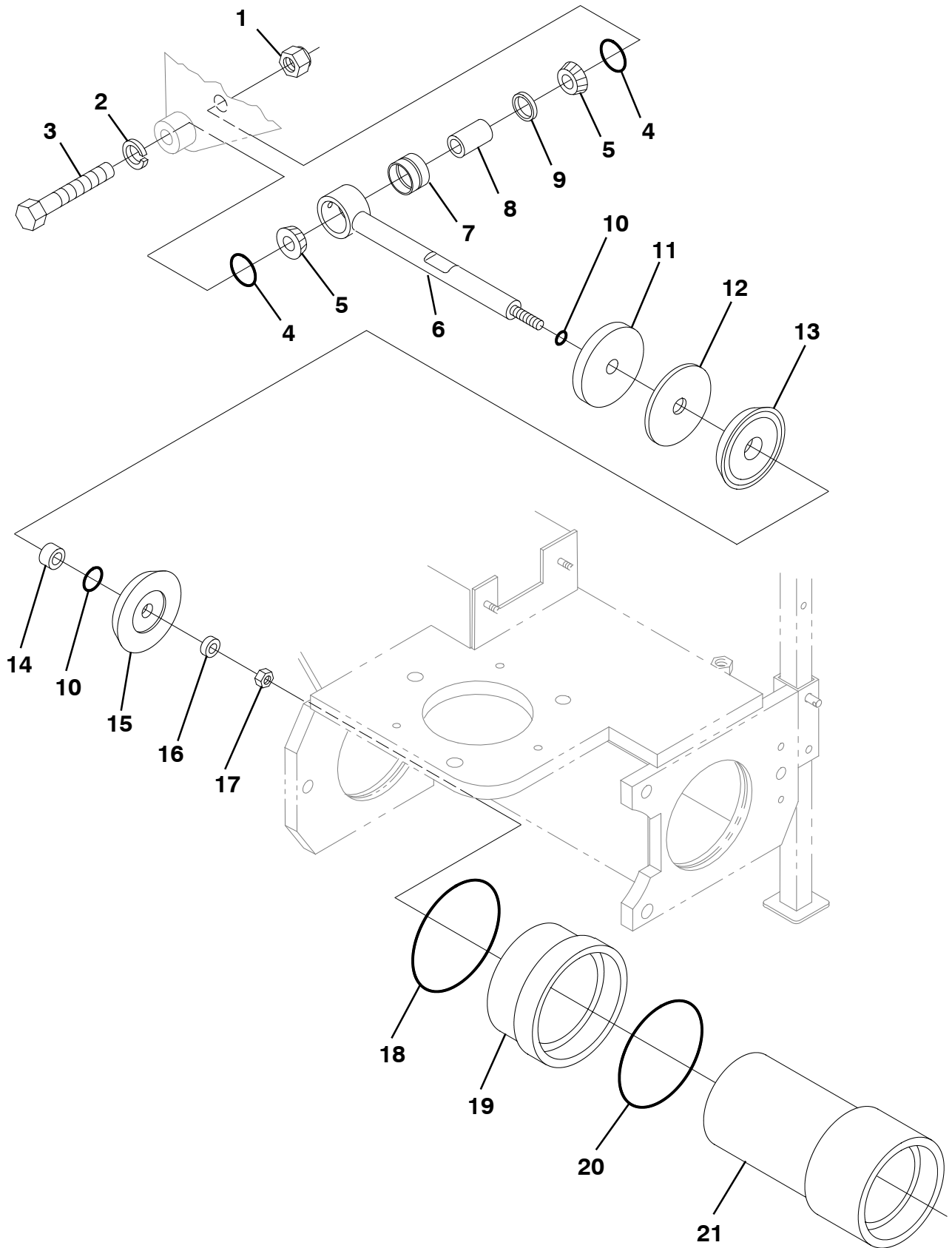


**SCHWING****ROCKER ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	NUT, NYLOCK, 1" (PM9096)	30373908
2	2	SPACER (PM1040)	30373189
3	1	CAM ROLLER BEARING WITH SEALS (PM10862)	30373321
4	1	BUSHING (PM1041)	30373190
5	1	BEARING CAM ROLLER - SPECIAL ASSEMBLY REPLACES ITEMS 2,3,4 .	30395378
6	1	BOLT, CAM, INCLUDES ITEMS 1 & 7 (PM1087)	30373322
7	1	CAM OILER BRACKET	30373181
8	1	CAM ROCKER ARM, INCLUDES ITEM 9, QTY. 2	30373180
9	4	BUSHING (PM1085)	30373319
10	1	ROCKER ARM SHAFT (PM1039)	30373188
11	1	BLOCK, MATCHED SET (PM1038)	30373187
12	2	WASHER, LOCK, 3/4", GR8 (PM90178)	30373854
13	2	BOLT, 3/4" X 5" GR8 (PM90178)	30391391
14	1	CONNECTING ROD ROCKER ARM	30373347
		INCLUDES ITEM 9, QTY 2 (PM11045)	
15	2	BOLT, 1-14 X 2-1/2" GR8 (PM1042)	30373191
16	2	WASHER, LOCK, 1" (PM1043)	30373193
		CAM ROLLER ASSEMBLY PACK - WITHOUT SEALS (PM1211)	30373569
		INCLUDES ITEMS 1, 2, 3, 4, 6, 7	
		CAM ROLLER ASSEMBLY PACK - WITH SEALS (PM12112)	30373570
		INCLUDES ITEMS 1, 2, 3, 4, 6, 7	
		SEE SECTION 3 FOR LUBRICATION FITTINGS	



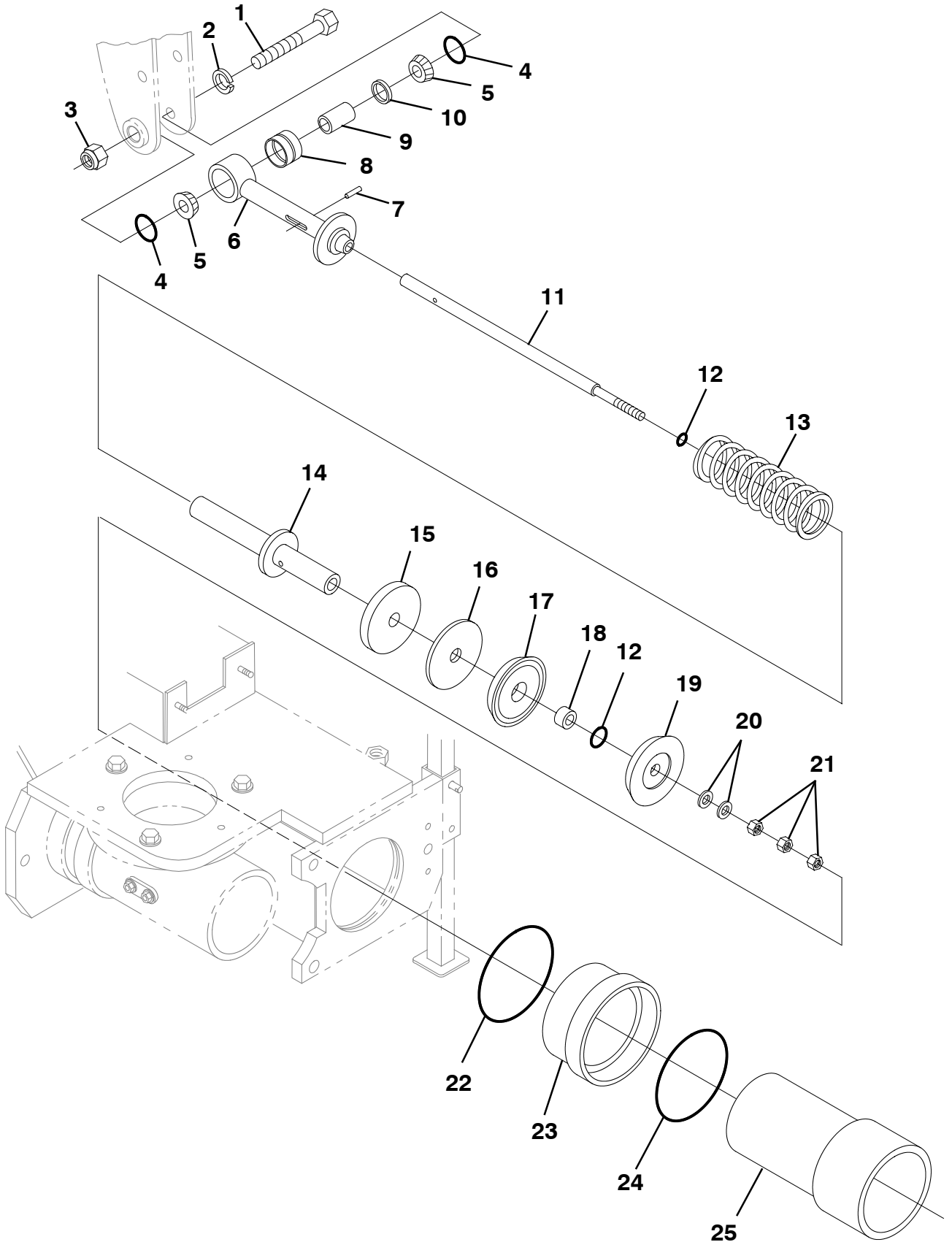


**CONNECTING ROD SIDE
PISTON ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	NUT, NYLOCK, 1"	30391407
2	1	WASHER, LOCK, 1"	30373193
3	1	BOLT, PISTON ROD, 1" X 8", GR8 (PM11178)	30373374
4	2	O-RING (PM1093)	30373330
5	2	BEARING CONE (PM1080)	30373314
6	1	PISTON ROD (PM10332)	30373179
7	1	BEARING CUP (PM1079)	30373313
8	1	BUSHING (PM1026)	30373166
9	1	SPACER (PM1027)	30373168
10	2	O-RING (PM1088)	30373323
11	1	SPACER, 6" (PM10183)	30373152
	1	SPACER, 7" - USED ON P125SV (PM10182)	30373153
12	1	BACKING PLATE, 6" (PM1019)	30373154
	1	BACKING PLATE, 7" - USED ON P125SV (PM10192)	30373155
13	1	PISTON CUP, GREEN, NEO, 6"	30392560
	1	PISTON CUP, BLACK, BUNA, 6" (PM1031)	30373172
	1	PISTON CUP, RUST, NEO, 6"	30373126
	1	PISTON CUP, GREEN, NEO, 7" - USED ON P125SV	30393593
	1	PISTON CUP, BLACK, BUNA, 7" - USED ON P125SV (PM10317)	30373174
	1	PISTON CUP, RUST, NEO, 7" - USED ON P125SV	30373175
14	1	BUSHING (PM1020)	30373156
15	1	FACE PLATE, 6" (PM1032)	30373177
	1	FACE PLATE, 7" - USED ON P125SV (PM10327)	30373178
16	1	WASHER, WILLIAMS, 3/4" (PM9013)	30373827
17	1	NUT, NYLOCK, 3/4", GR8	30373829
18	1	O-RING (PM1023-14)	30373161
19	1	CYLINDER ADAPTER - NOT USED ON P125SV (PM9107)	30373912
20	1	O-RING - NOT USED ON P125SV (PM1023-13)	30373160
21	1	PUMPING CYLINDER, 6" (PM 1025)	30373164
	1	PUMPING CYLINDER, 7" - USED ON P125SV (PM10257)	30373165
22	1	CRANK SHAFT PISTON ASSEMBLY	30391312
		INCLUDES ITEMS 4, 5, 6, 7, 8 & 9	
23	1	BEARING KIT	30373571
		INCLUDES ITEMS 4, 5, 7, 8 & 9	



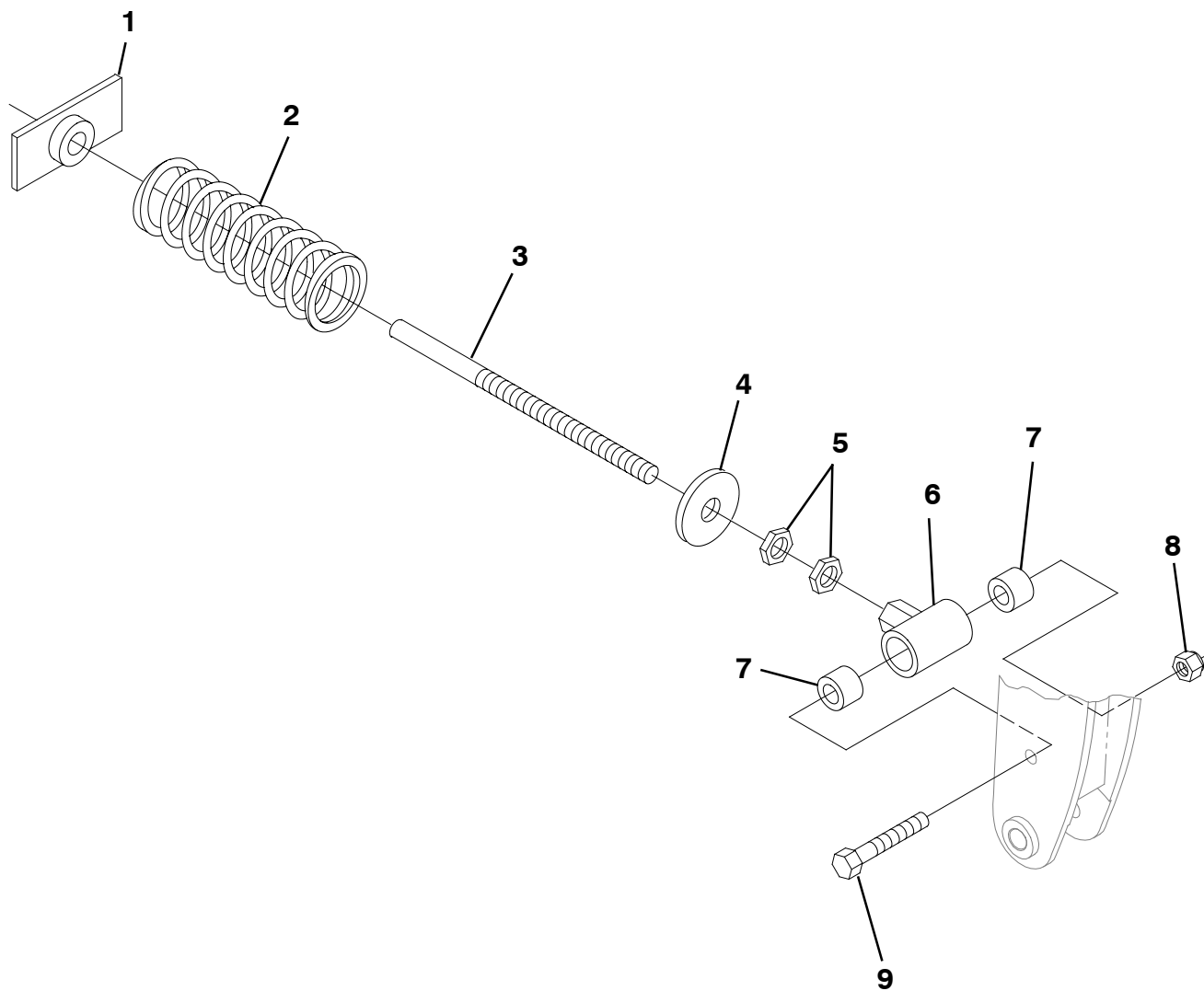


CAM SIDE PISTON ASSEMBLY

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	BOLT, 1" X 6", GR8 (PM11178)	30373374
2	1	WASHER, LOCK, 1"	30373193
3	1	NUT, NYLOCK, 1"	30391407
4	2	O-RING (PM1093)	30373330
5	2	BEARING CONE (PM1080)	30373314
6	1	PISTON GUIDE WELDMENT - AFT	30373343
7	1	PIN, ROLL (PM1097)	30373336
8	1	BEARING CUP (PM1079)	30373313
9	1	BUSHING (PM1026)	30373166
10	1	SPACER (PM1027)	30373168
11	1	PISTON ROD (PM1103-1)	30373345
12	2	O-RING (PM1088)	30373323
13	1	SPRING, COMPENSATOR (PM1096)	30373335
	1	SPRING, COMPENSATOR - USED ON P125SV	30330518
14	1	PISTON GUIDE WELDMENT - FORWARD (PM1102)	30373344
15	1	SPACER, 6" (PM10183)	30373152
	1	SPACER, 7" - USED ON P125SV (PM10192)	30373153
16	1	BACKING PLATE, 6" (PM1019)	30373154
	1	BACKING PLATE, 7" - USED ON P125SV (PM10182)	30373155
17	1	PISTON CUP, GREEN, NEO, 6"	30392560
	1	PISTON CUP, BLACK, BUNA, 6" (PM1031)	30373172
	1	PISTON CUP, RUST, NEO, 6"	30373126
	1	PISTON CUP, GREEN, NEO, 7" - USED ON P125SV	30393593
	1	PISTON CUP, BLACK, BUNA, 7" - USED ON P125SV (PM10317)	30373174
	1	PISTON CUP, RUST, NEO, 7" - USED ON P125SV	30373175
18	1	BUSHING (PM1020)	30373156
19	1	FACE PLATE, 6" (PM1032)	30373177
	1	FACE PLATE, 7" - USED ON P125SV (PM10327)	30373178
20	2	WASHER, WILLIAMS, 3/4" (PM9013)	30373827
21	3	NUT, 3/4" NC (PM9014)	30373828
22	1	O-RING - NOT USED ON P125SV (PM1023-14)	30373161
23	1	CYLINDER ADAPTER - P88, NOT USED ON P125SV (PM9107)	30373912
	1	CYLINDER ADAPTER - P88SV, NOT USED ON P125SV	30373913
24	1	O-RING - P88 (PM1023-13)	30373160
	1	O-RING - P88SV	30373136
25	1	PUMPING CYLINDER, 6" (PM1024)	30373162
	1	PUMPING CYLINDER, 7" - USED ON P125SV (PM10247)	30373163
26	1	PISTON GUIDE ASSEMBLY	30391313
		INCLUDES ITEMS 4, 5, 6, 7, 8, 9, 10 & 11	
27	1	BEARING KIT	30373571
		INCLUDES ITEMS 4, 5, 8, 9 & 10	





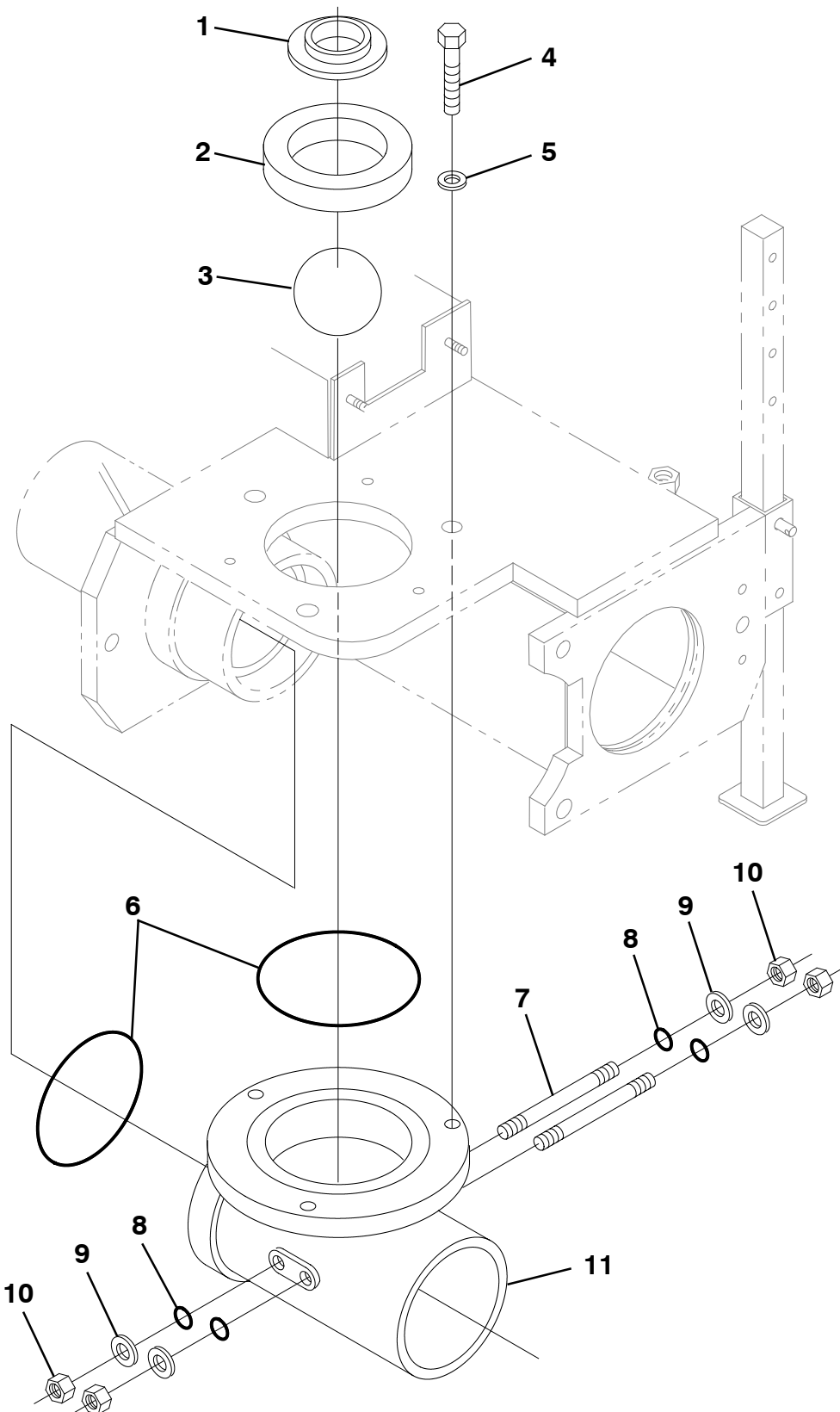
SCHWING

RETURN SPRING ASSEMBLY

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	PLATE, COMPRESSION SPRING	30329731
2	1	RETURN SPRING (PM1126-3)	30373414
3	1	GUIDE ROD (PM1126-2)	30373413
4	1	BACKING PLATE (PM1126-1)	30373412
5	2	NUT, THIN JAM, 3/4" (PM9043)	30373860
6	1	ROD END, INCLUDES ITEM 7 (PM1126-4)	30373415
7	2	BUSHING (PM1126-6)	30373417
8	1	NUT, NYLOCK, 3/4", GR8 (PM9014-NL)	30373829
9	1	BOLT, 3/4" X 5"	30391391





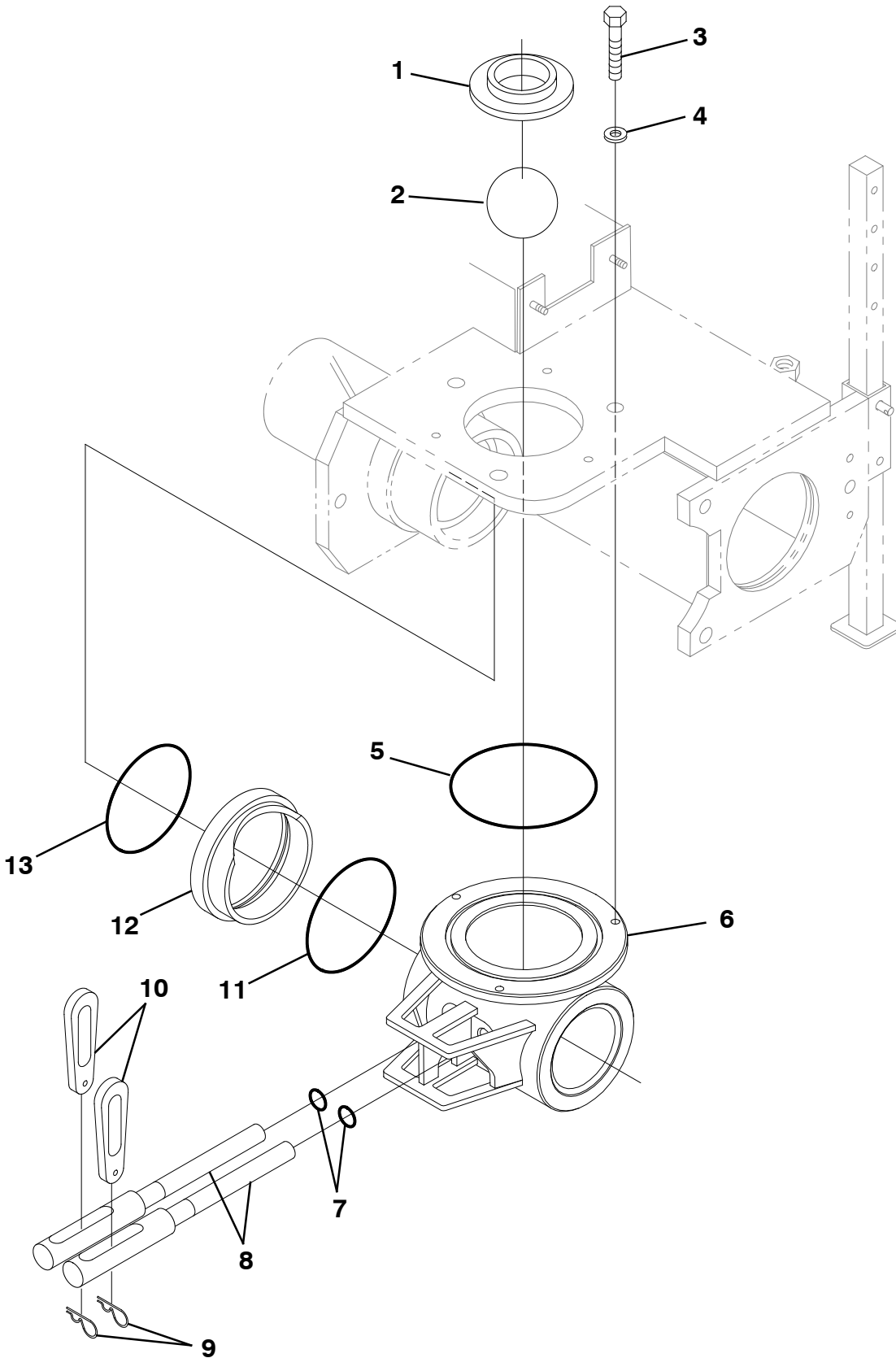
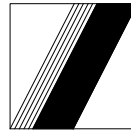
SCHWING

"T" MANIFOLD ASSEMBLY - SP 88

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	DUAL SEAT (PM9814)	30373960
2	1	ADAPTER RING (PM9106)	30373911
3	1	STEEL BALL, 4-1/2" DIA. (PM1107)	30373350
4	3	BOLT, 5/8" X 2-1/4" NC GR8 (PM9190)	30373954
5	3	WASHER, WILLIAMS, 5/8"	30373839
6	2	O-RING (PM1074)	30373303
7	2	STUD (PM1059A)	30373219
8	4	O-RING (PM1088)	30373323
9	4	WASHER, FLAT, 3/4" (PM9039)	30373856
10	4	NUT, JAM, 3/4" (PM9016)	30373831
11	1	"T" MANIFOLD (PM1123)	30373399
12	1	BALL STOP ASSEMBLY, INCLUDES ITEMS 7, 8, 9 & 10 (PM1123)	30373218

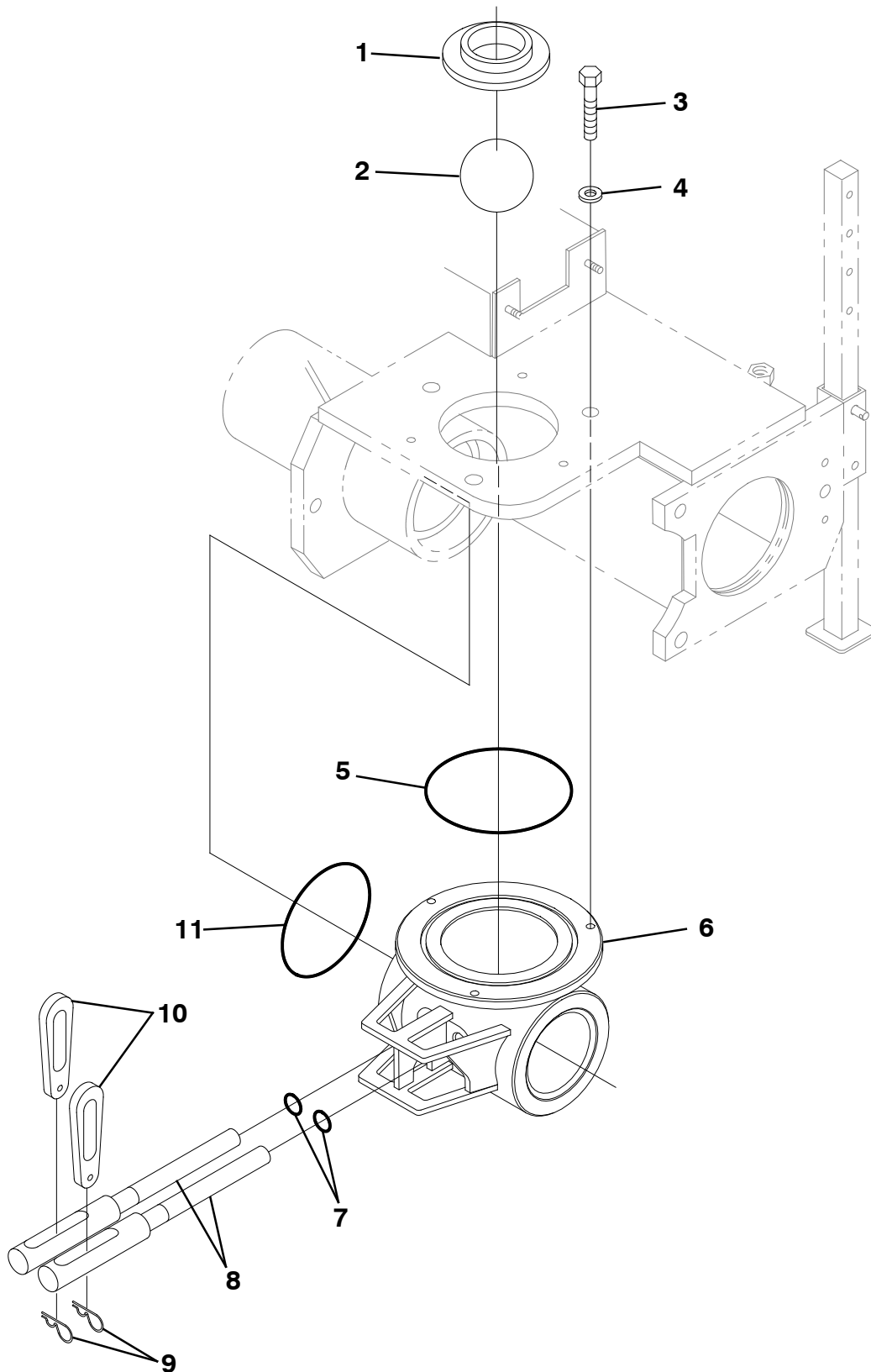


**SCHWING****"T" MANIFOLD ASSEMBLY - SP 88SV**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	DUAL SEAT FOR 4-1/2" BALL (PM0004)	30373132
	1	DUAL SEAT FOR 5" BALL (PM0003)	30373131
2	1	STEEL BALL, 4-1/2" DIA. (PM1107)	30373350
	1	STEEL BALL, 5" DIA. (PM0005)	30373133
3	3	BOLT, 5/8" X 2-1/4" NC GR8 (PM9190)	30373954
4	3	WASHER, WILLIAMS, 5/8" (PM9022)	30373839
5	1	VACUUM SEAL (PM0015VS)	30373142
6	1	"T" MANIFOLD (PM0006)	30373134
7	2	O-RING (PM0013)	30373139
8	2	PIN, STRAIGHT (PM844)	30373820
	2	PIN, CURVED, SV HP (PM896)	30373822
9	2	PIN, COTTER (PM1129SP)	30373422
10	2	WEDGE (PM1129)	10006368
11	1	O-RING (PM0014)	30373140
12	1	ADAPTER, "T" MANIFOLD (PM0018)	30373146
13	1	O-RING (PM0009)	30373136

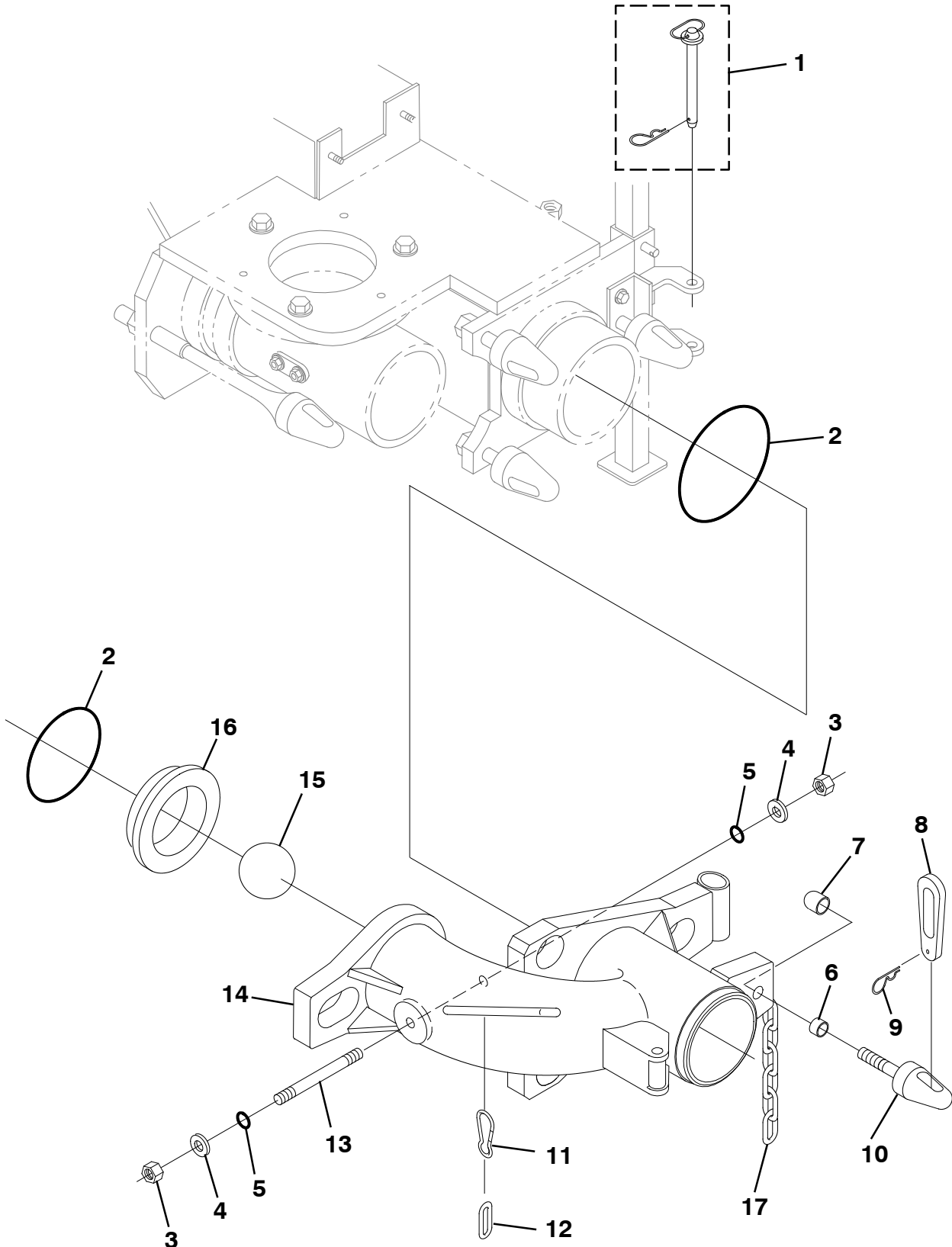


**SCHWING****"T" MANIFOLD ASSEMBLY - SP 125SV**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	DUAL SEAT FOR 5" BALL (PM0003)	30373131
2	1	STEEL BALL, 5" DIA. (PM0005)	30373133
3	3	BOLT, 5/8" X 2-1/4" NC GR8 (PM9190)	30373954
4	3	WASHER, WILLIAMS, 5/8" (PM9022)	30373839
5	1	VACUUM SEAL (PM0015VS)	30373142
6	1	"T" MANIFOLD (PM0006)	30373134
7	2	O-RING (PM0013)	30373139
8	2	PIN, STRAIGHT (PM844)	30373820
	2	PIN, CURVED, SV HP (PM896)	30373822
9	2	PIN, COTTER (PM1129SP)	30373422
10	2	WEDGE (PM1129)	10006368
11	1	O-RING (PM0014)	30373140

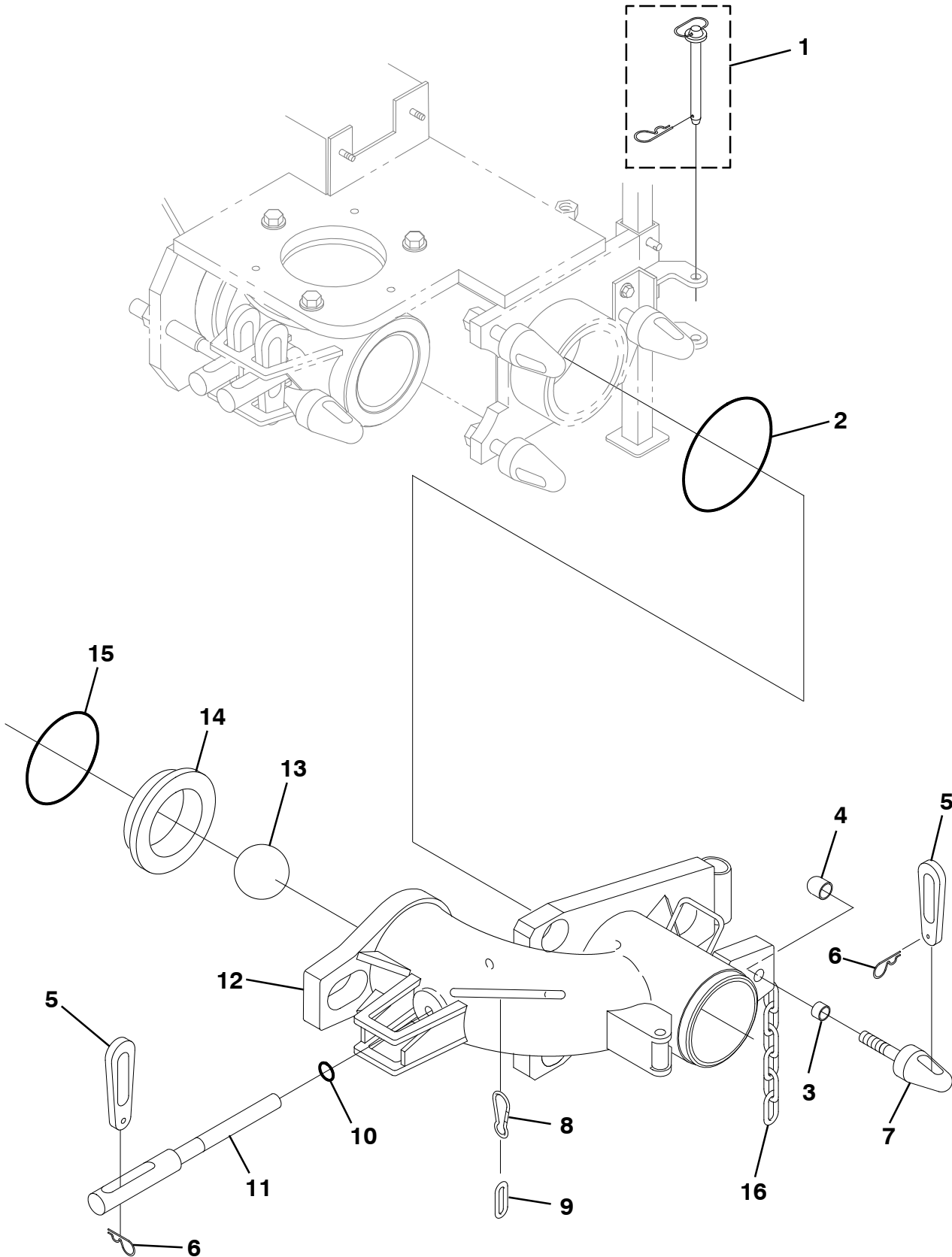


**SCHWING****"Y" MANIFOLD ASSEMBLY - SP 88**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	PIN, HITCH, 7/8" X 6" (PA78PIN)	30372990
2	2	O-RING (PM1074)	30373303
3	2	NUT, JAM 3/4-16 (PM9016)	30373831
4	2	WASHER (PM9039)	30373856
5	2	O-RING (PM1088)	30373323
6	AR	THREAD GUARD	30373419
7	1	CAP END	30397409
8	1	WEDGE (PM1129)	10006368
9	1	PIN, COTTER (PM1129SP)	30373422
10	1	BOLT, RETAINING, 6" (PM1130-6)	30373423
11	1	EYE SNAP	30373889
12	1	CHAIN CONNECTOR, 5/16" X 2"	30373890
13	1	STUD (PM1059A)	30373219
14	1	"Y" MANIFOLD (PM088518D)	30391473
15	1	BALL, 4" DIA. (PM1058)	30373217
16	1	DUAL SEAT (PM9815)	30373961
17	1	SAFETY CHAIN	30391319
18	1	BALL STOP ASSEMBLY, INCLUDES ITEMS 3, 4, 5 & 13 (PM1059)	30373218

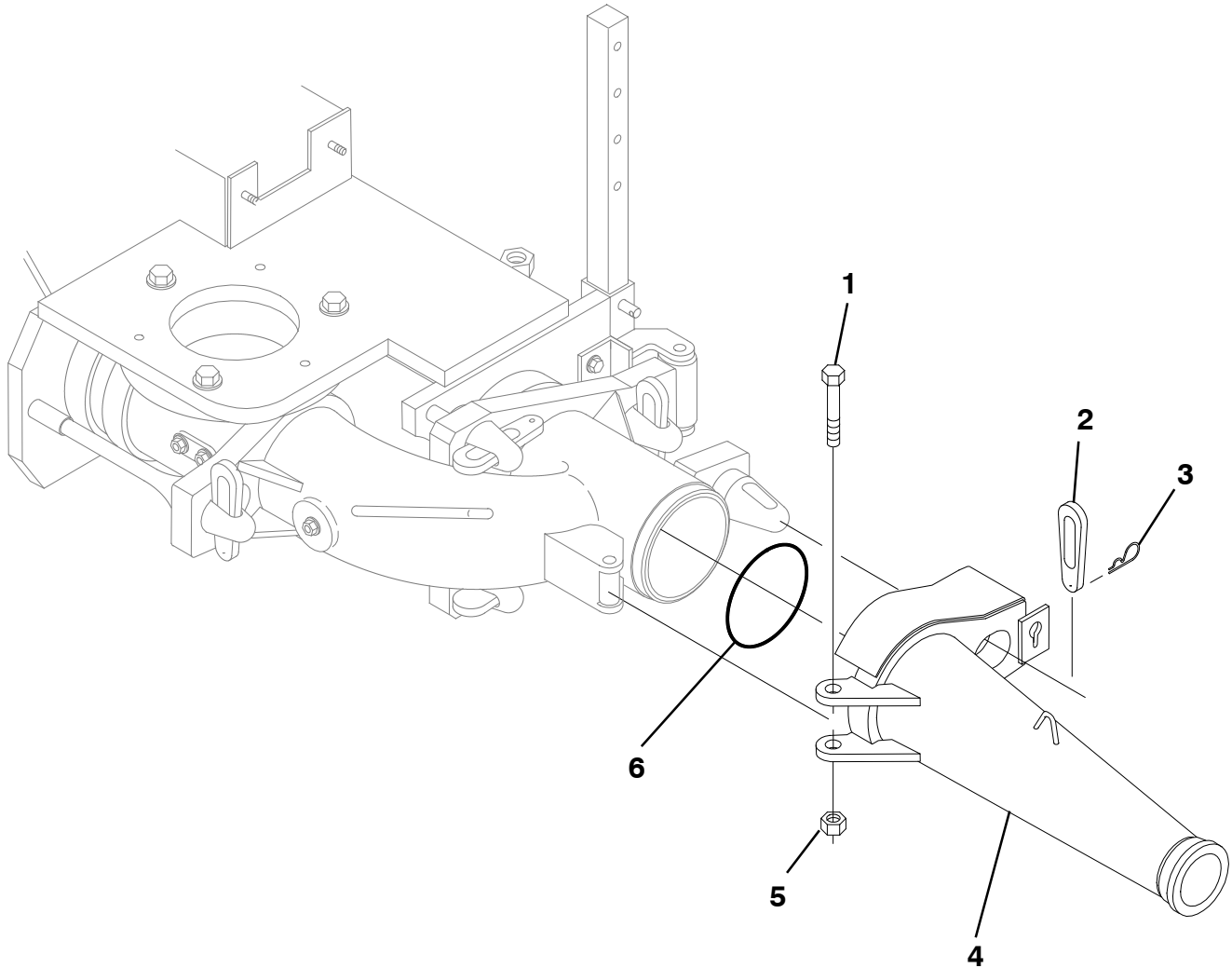


**SCHWING****"Y" MANIFOLD ASSEMBLY
SP 88SV / SP 125SV**

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	PIN, HITCH, 7/8" X 6" (PA78PIN)	30372990
2	1	VACUUM SEAL (PM0014VS)	30373141
3	AR	THREAD GUARD	30373419
4	1	CAP END	30397409
5	2	WEDGE (PM1129)	10006368
6	2	PIN, COTTER (PM1129SP)	30373422
7	1	BOLT, RETAINING, 6" (PM1130-6)	30373423
8	1	EYE SNAP	30373889
9	1	CHAIN CONNECTOR, 5/16" X 2"	30373890
10	1	O-RING (PM0013)	30373139
11	1	PIN, STRAIGHT (PM844)	30373820
12	1	"Y" MANIFOLD (PM0007)	30373135
13	1	STEEL BALL, 4-1/2" DIA. (PM1107)	30373350
14	1	DUAL SEAT (PM0004)	30373132
15	1	VACUUM SEAL (PM0017VS)	30373142
16	1	SAFETY CHAIN	30391319





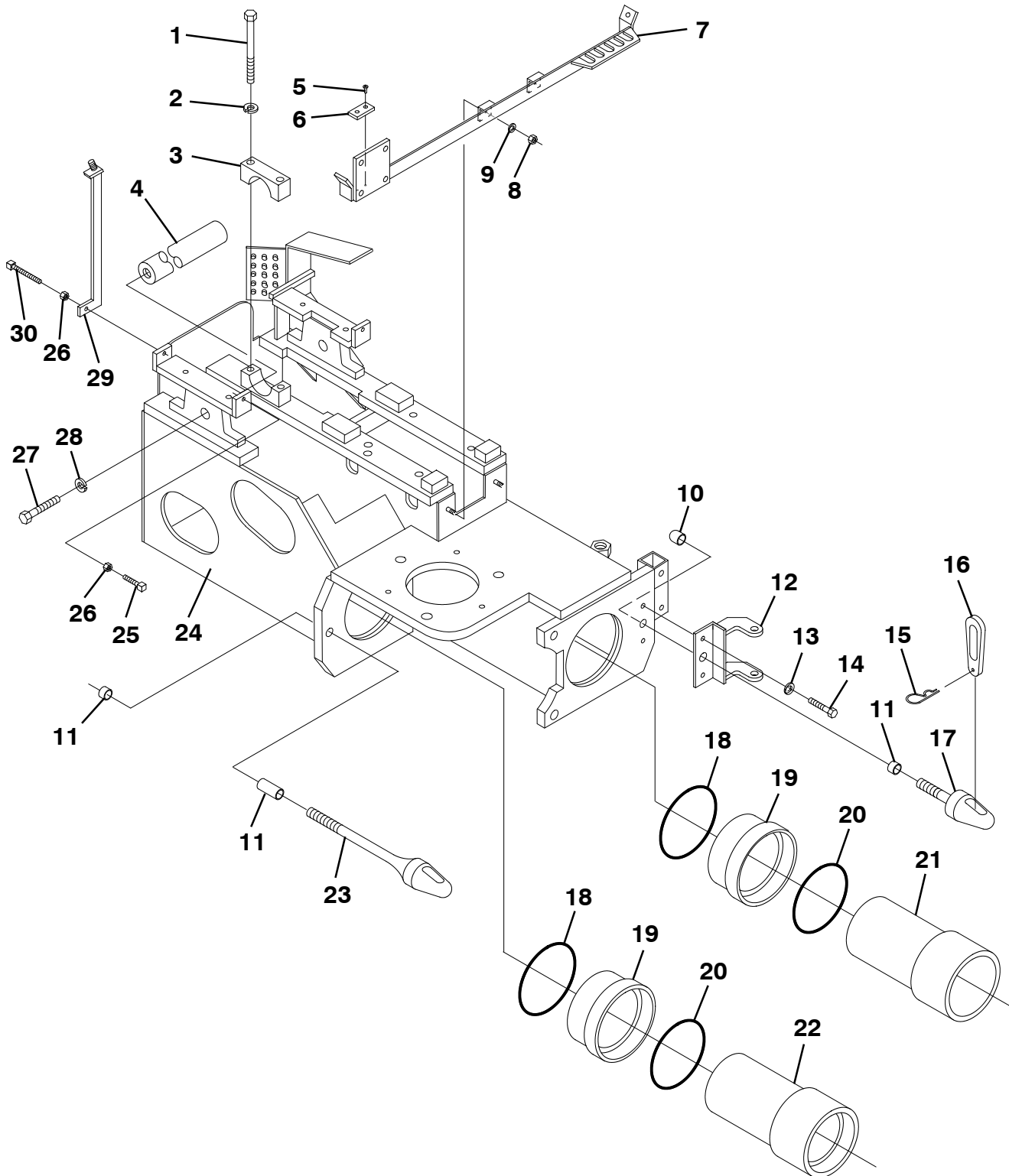
SCHWING

REDUCER CONE ASSEMBLY

SECTION

1

Pos.	Qty.	Description	Part No.
1	1	BOLT, 3/4" X 5-1/2" GR9	30391359
2	1	WEDGE (PM1129)	10006368
3	1	PIN, COTTER (PM1129SP)	30373422
4	1	REDUCER CONE, 6" - 3" HD (PM1111-WT)	30373358
5	1	NUT, NYLOCK, 3/4", GR8 (PM9014-NL)	30373829
6	1	O-RING (PM1074)	30373303
	1	O-RING, 12-PAK	30373304

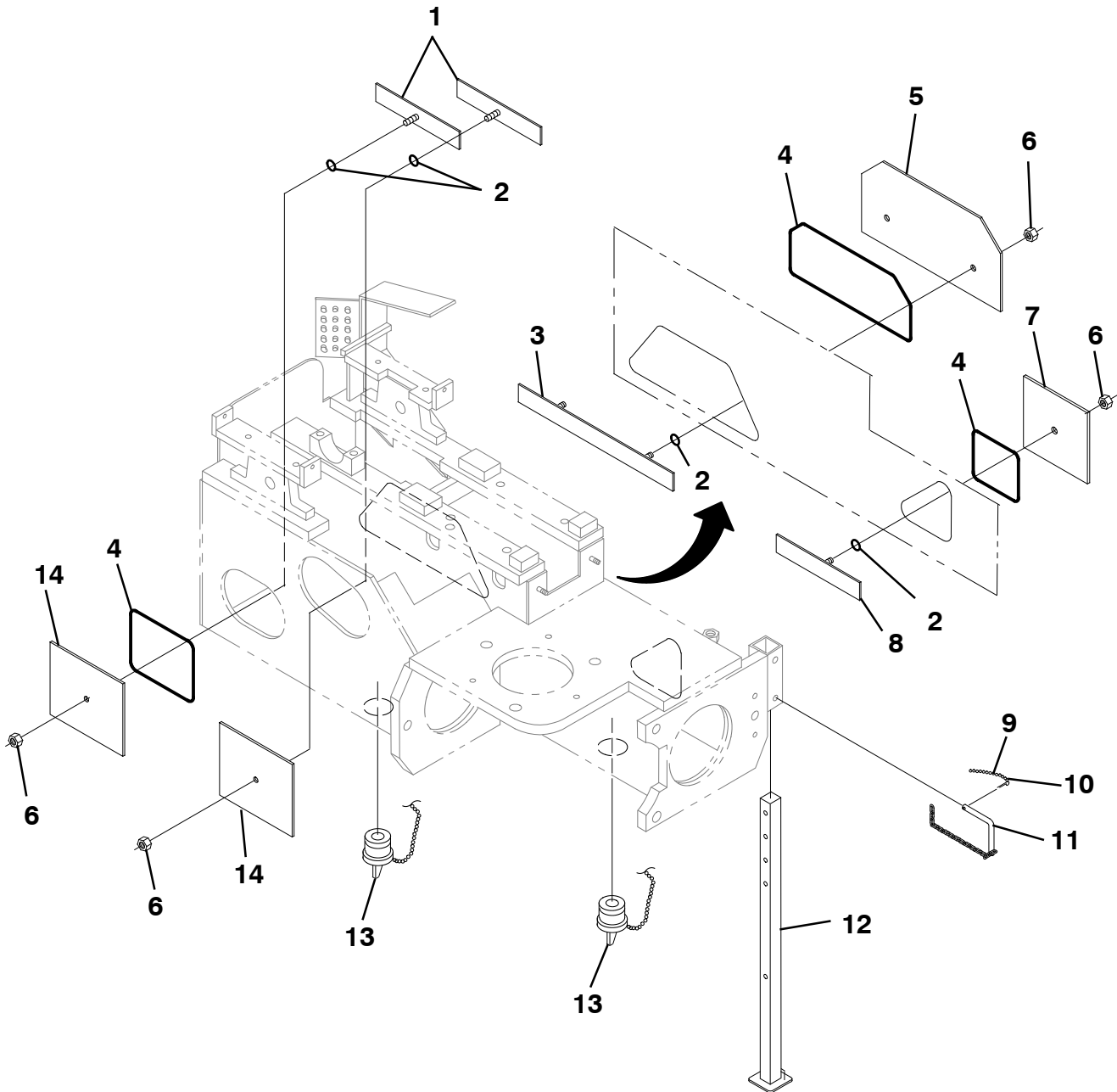


**SCHWING****WATER BOX ASSEMBLY**

SECTION

1

Pos.	Qty.	Description	Part No.
1	2	BOLT, 3/4" X 5" GR8 (PM90178)	30391391
2	2	WASHER, LOCK, 3/4", GR8 (PM9037)	30373854
3	1	BLOCK, MATCHED SET (PM1038)	30373187
4	1	SHAFT, ROCKER ARM (PM1039)	30373188
5	4	RIVET, POP, 3/16" (PM1063-2PR)	30373232
6	2	BUMPER	30390227
7	1	HOOD BRACKET ASSEMBLY, INCLUDES ITEMS 5 & 6 (PM1062HB)	30373226
8	2	NUT, NYLOCK, 3/8-16	30389195
9	2	WASHER, FLAT, 3/8"	30373894
10	3	CAP END	30397409
11	AR	THREAD GUARD	30373419
12	1	BRACKET, HINGE (PM9110A)	30373916
13	2	WASHER, FLAT, 5/8" (PM1148)	30373462
14	2	BOLT, 5/8" X 1-1/2" (PM9142)	30391327
15	4	PIN, COTTER (PM1129SP)	30373422
16	4	WEDGE (PM1129)	10006368
17	3	BOLT, RETAINING, 6" (PM1130-6)	30373423
18	2	O-RING - NOT USED ON SP 125SV (PM1023-14)	30373161
19	2	CYLINDER ADAPTER - SP 88, NOT USED ON SP 125SV (PM9107)	30373912
	1	CYLINDER ADAPTER - SP 88SV, NOT USED ON SP 125SV	30373913
20	2	O-RING - SP 88 (PM1023-13)	30373160
	1	O-RING - SP 88SV	30373136
21	1	PUMPING CYLINDER, 6" (PM1024)	30373162
	1	PUMPING CYLINDER, 7" - USED ON SP 125SV (PM10247)	30373163
22	1	PUMPING CYLINDER, 6" (PM1025)	30373164
	1	PUMPING CYLINDER, 7" - USED ON SP 125SV (PM10257)	30373165
23	1	BOLT, RETAINING, 16" (PM1131-16)	30373424
24	1	WATER BOX WELDMENT (PM1133A)	30391178
	1	SV WATER BOX WELDMENT	30391210
25	2	BOLT, SQUARE HEAD, 3/8" X 1-3/4" NC (PM9097)	30373909
26	3	NUT, 3/8" (PM9075)	30373893
27	2	BOLT, 1-14 X 2-1/2" GR8 (PM1042)	30373191
28	2	WASHER, LOCK, 1" (PM1043)	30373193
29	1	BRACKET, BELT GUARD	30391440
	1	BRACKET, BELT GUARD, DUETZ F2L1011 ONLY	30394714
30	1	BOLT, SQUARE HEAD, 3/8" X 3" (PM9097A)	30373910



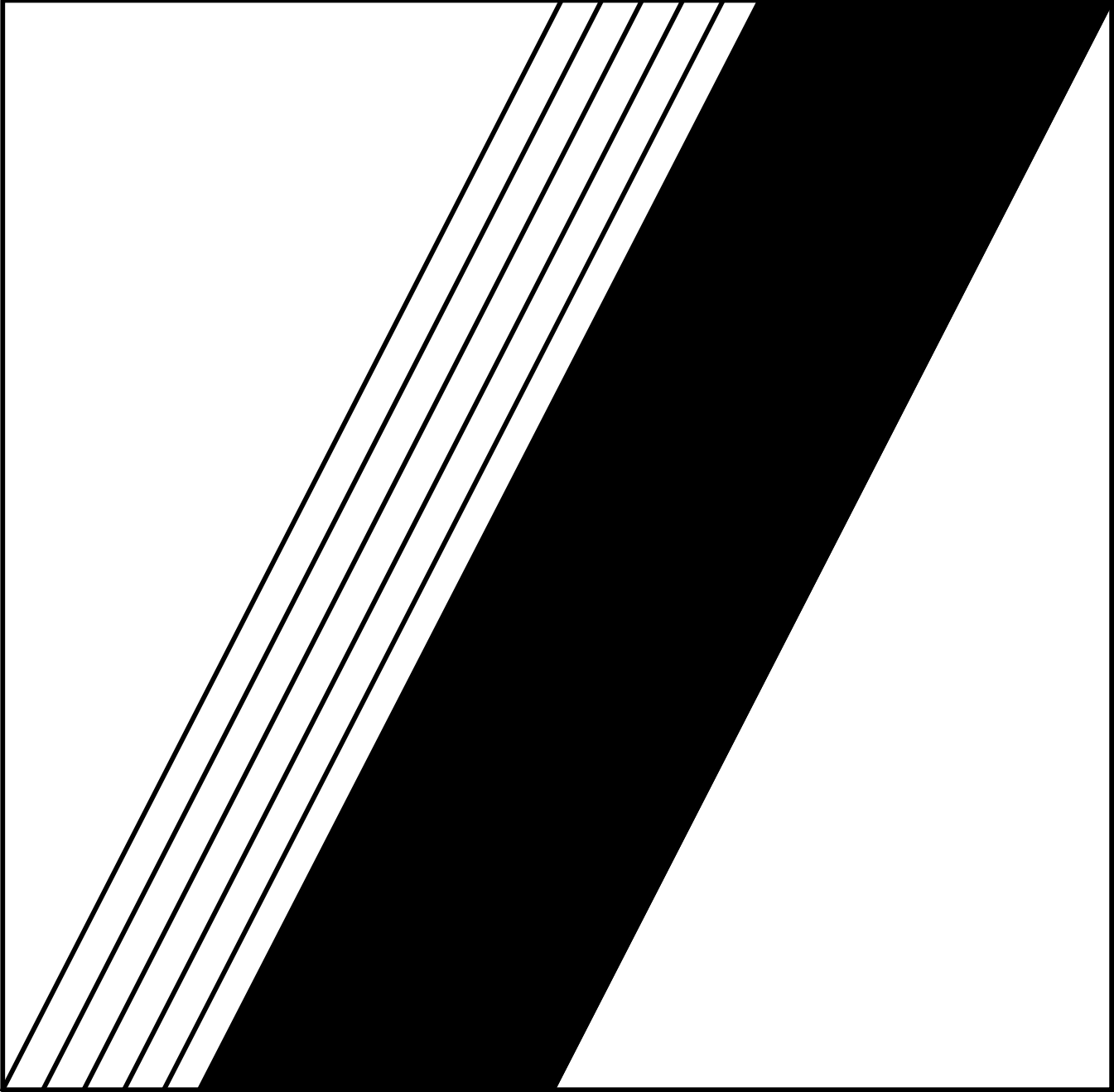
**SCHWING****WATER BOX ACCESSORIES**

SECTION

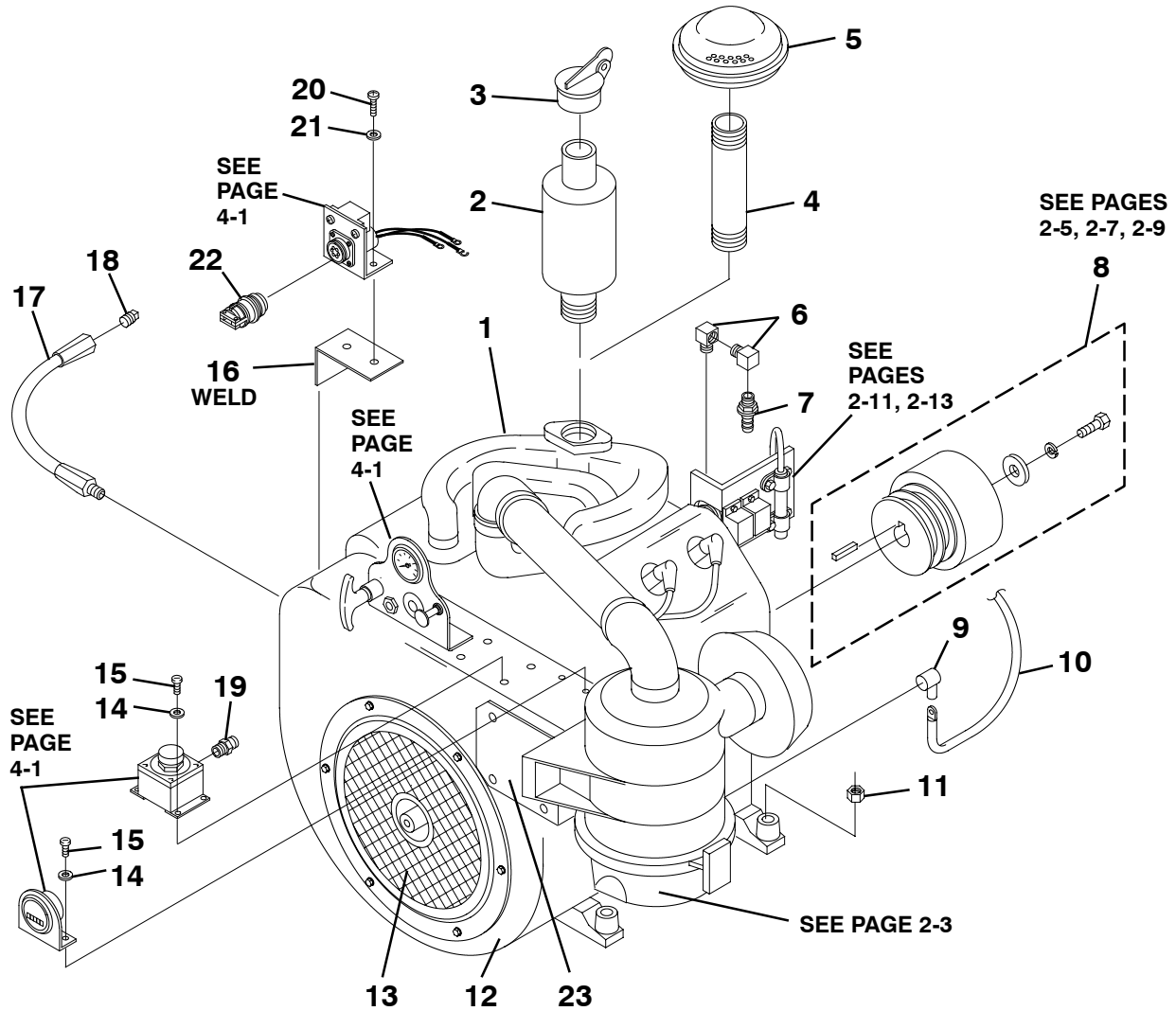
1

Pos.	Qty.	Description	Part No.
1	2	SIDE COVER BRACKET, MEDIUM (PM1133G)	30373432
2	5	O-RING (PM1133H)	30391054
3	1	SIDE COVER BRACKET, LARGE (PM1133C)	30373428
4	A/R	GASKET, FOAM, 1/4" X 1/2"	30394125
5	1	SIDE COVER PLATE, LARGE (PM133B)	30373427
6	5	NUT, 3/8"	30373893
7	1	SIDE COVER PLATE, SMALL (PM133D)	30373429
8	1	SIDE COVER BRACKET, SMALL (PM133E)	30373430
9	1	CHAIN	SEE MFG
10	1	PIN	30373952
11	1	PIN, SUPPORT STAND (PM1153)	30373471
12	1	SUPPORT STAND (PM1154)	30373472
13	2	EXPANSION PLUG (PM1132)	30373425
14	2	SIDE COVER PLATE, MEDIUM (PM133F)	30373431

SECTION 2



POWER

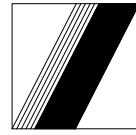


**SCHWING****ENGINE ASSEMBLY - 30 AND 35 HP**

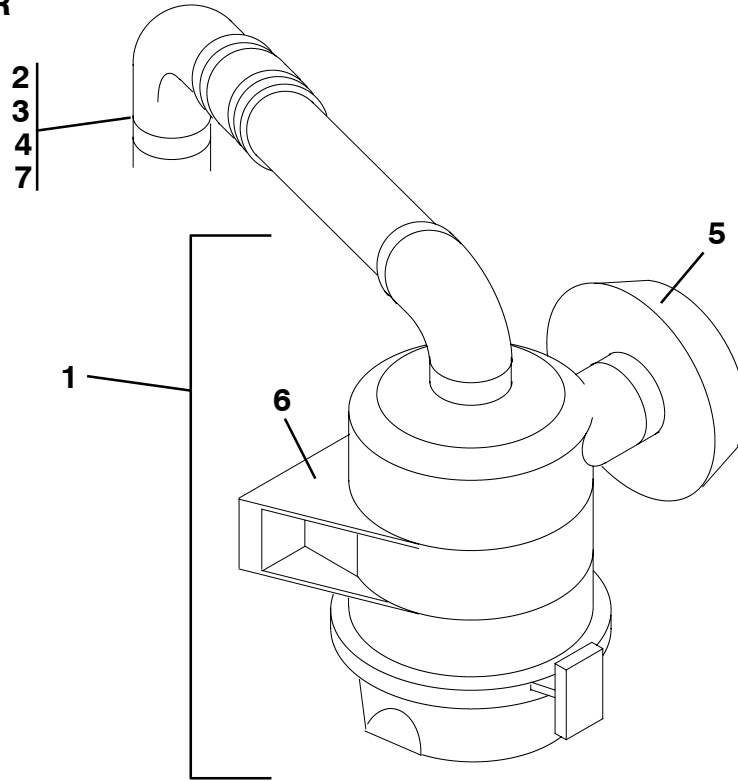
SECTION

2

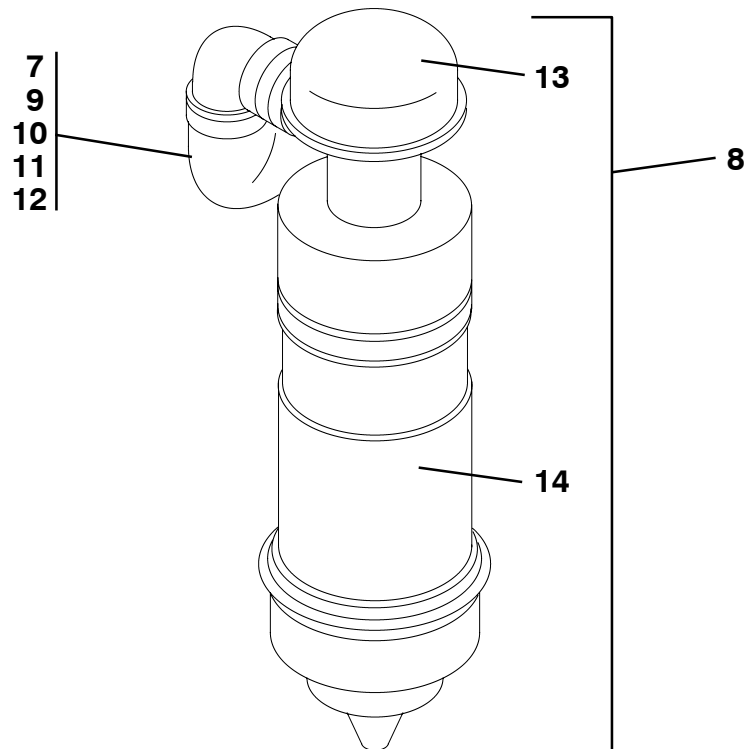
Pos.	Qty.	Description	Part No.
1	1	VH4D ENGINE, 30 HP, COMPLETE (BARE ENGINE 30373250)	30373251
	1	VH4D ENGINE, 35 HP, COMPLETE (BARE ENGINE 30391256)	30391253
2	1	MUFFLER (WD86)	30394093
3	1	RAIN CAP	30396222
4	1	PIPE NIPPLE, 1-1/4" X 9" (PM9118)	30373922
5	1	MUFFLER, PANCAKE (PM1199)	30373556
6	2	FITTING, ELBOW	30373871
7	1	FITTING, BARBED (PM1163-2P)	30373495
8	1	CLUTCH ASSEMBLY, NORAM, SEE PAGE 2-5 (PM10692)	30373272
	1	CLUTCH ASSEMBLY, NORAM TRI-LOBE, SEE PAGE 2-7	30395262
	1	CLUTCH ASSEMBLY, SALSBURY, SEE PAGE 2-9 (PM1069)	30373260
	1	CLUTCH ASSEMBLY, CENTRI-MATIC, SEE PAGE 2-11 (PM1069C)	30373261
9	1	BOOT, INSULATED	30390474
10	1	BATTERY CABLE, POSITIVE	30373511
11	4	NUT, NYLOCK, 1/2", GR8	30391247
12	1	SHROUD, ENGINE (PMW103)	30373130
13	1	SCREEN, ENGINE (PM9066)	30373885
14	6	WASHER, LOCK, EXTERNAL TOOTH, #10	30391639
15	6	SCREW, 10-32 X 3/4"	30391389
16	1	BRACKET, E-STOP	30393529
17	1	HOSE, OIL DRAIN	30393546
18	1	FITTING, PLUG (PM1172-D)	30373508
19	1	CONNECTOR	30391594
20	2	SCREW, 8-32 X 1/2	30391399
21	2	WASHER, LOCK, EXTERNAL TOOTH, #8	30391398
22	1	DUMMY PLUG, 6-PIN	30391669
	1	DUMMY PLUG, 4-PIN	SEE MFG
23		ENGINE BRACKET, AIR CLEANER MOUNTING, PG1356	SEE MFG
Additional spare parts			
	1	CARBURETOR, 30 HP (PM1192)	30373547
	1	CARBURETOR, 35 HP (PM9135)	30391829
	1	CARBURETOR REBUILD KIT, 30 HP (PM1193)	30373548
	1	CARBURETOR REBUILD KIT, 35 HP	30391146
	1	FUEL PUMP (PM1195)	30373550
	1	FUEL PUMP KIT (PM1195KIT)	30373551
	1	FUEL LINE (PM1175)	30373513
	1	FUEL FILTER, IN-LINE (PM1175FF)	30373515
	1	GASKET, INTAKE/EXHAUST (QB75)	30373536
	1	HAND CRANK (PM1026-1)	30373167
	1	OIL CAP (PM1200-1)	30373557
	1	OIL BREATHER TUBE (PM1200-2)	30373558
	1	OIL DIPSTICK (PM1204)	30373561
	1	OIL FILTER (PM1197)	30373554
	1	IGNITION COIL (PM9139)	30373933
	1	DISTRIBUTOR CAP (PM9068A)	30373887
	1	ROTOR (PM9810)	30373959
	1	STARTER, WISC YA60	30396546
	1	STARTER SOLENOID, WISC YA53B	SEE MFG
	4	SPARK PLUG (PM9069)	30373888
	1	WIRE SET, SPARK PLUG (PM1187F)	30373539
	1	ENGINE WIRING HARNESS - 4 POLE	30391534
	1	ENGINE WIRING HARNESS - 6 POLE MILITARY STYLE	30395854
	1	ENGINE GASKET SET (Q12R)	SEE MFG



MANN AIR CLEANER



WET/DRY SYSTEM
AIR CLEANER



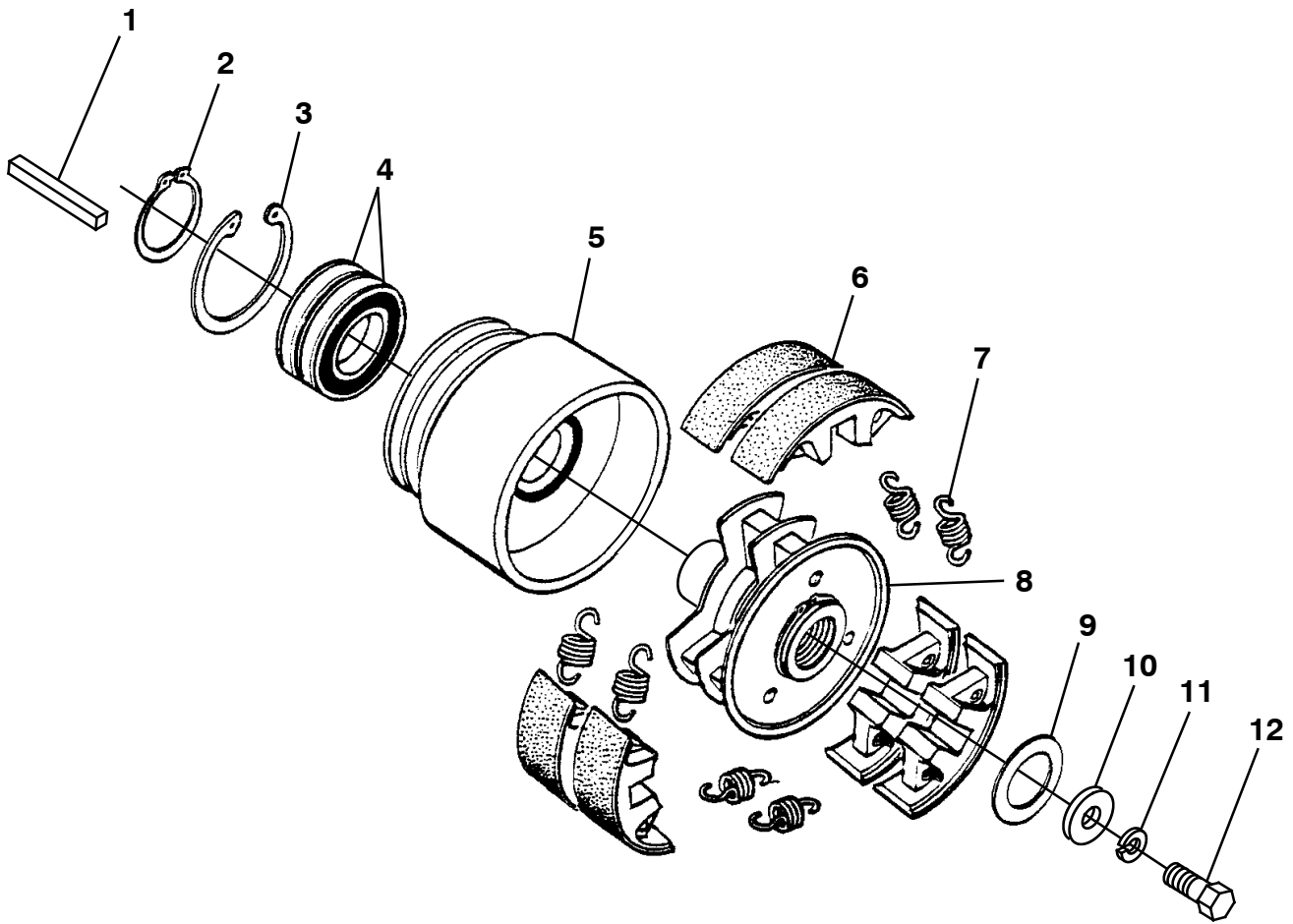


AIR CLEANER ASSEMBLY

SECTION

2

Pos.	Qty.	Description	Part No.
1	1	AIR FILTER ASSEMBLY, MANN (USED AFTER 6/01)	30394767
	1	PRIMARY ELEMENT, AIR FILTER, L0226	30394605
	1	SECONDARY ELEMENT, AIR FILTER, L0227	30394766
2		ELBOW, 3910025999	SEE MFG
3		TUBE, LJ472-1	SEE MFG
4		REDUCER, LL215	SEE MFG
5		CAP, 3902067910	30395926
6		MOUNTING BRACKET, PG1306	30394884
7	A/R	CLAMP (PM1183)	30373535
	1	KIT, ALL PARTS FROM ELBOW-AIR CLEANER TO CARBURATOR	30395027
		Mann retrofit	
		ELBOW, LL87	SEE MFG
		PIPE, LJ120	SEE MFG
		HOSE CONNECTOR, LL27	SEE MFG
		CAP, 3902067910	SEE MFG
		MOUNTING BRACKET, 3910040999	SEE MFG
		Donaldson	
8	1	AIR FILTER ASSEMBLY, WET SYSTEM (PM9056)	30373876
	1	AIR FILTER ASSEMBLY, DRY SYSTEM	30390780
	1	ELEMENT, AIR FILTER	30390501
	1	ELEMENT, AIR FILTER (USED AFTER 5/01)	30394605
9	1	ELBOW, HOSE - NOT USED ON 35 HP	30391309
10	1	ELBOW, HOSE (PM1181)	30373533
11	1	TUBE, HOSE (PM1182)	30373534
12	1	TUBE, AIR CLEANER (PM1185) MAJ120, MA26771	30373537
13	1	CAP, AIR CLEANER, WET SYSTEM (PM9055)	30373874
	1	CAP, AIR CLEANER, DRY SYSTEM	30390781
14	1	STRAP, AIR CLEANER (PM9054)	30373873
	1	STRAP, AIR CLEANER - NEW	30390824



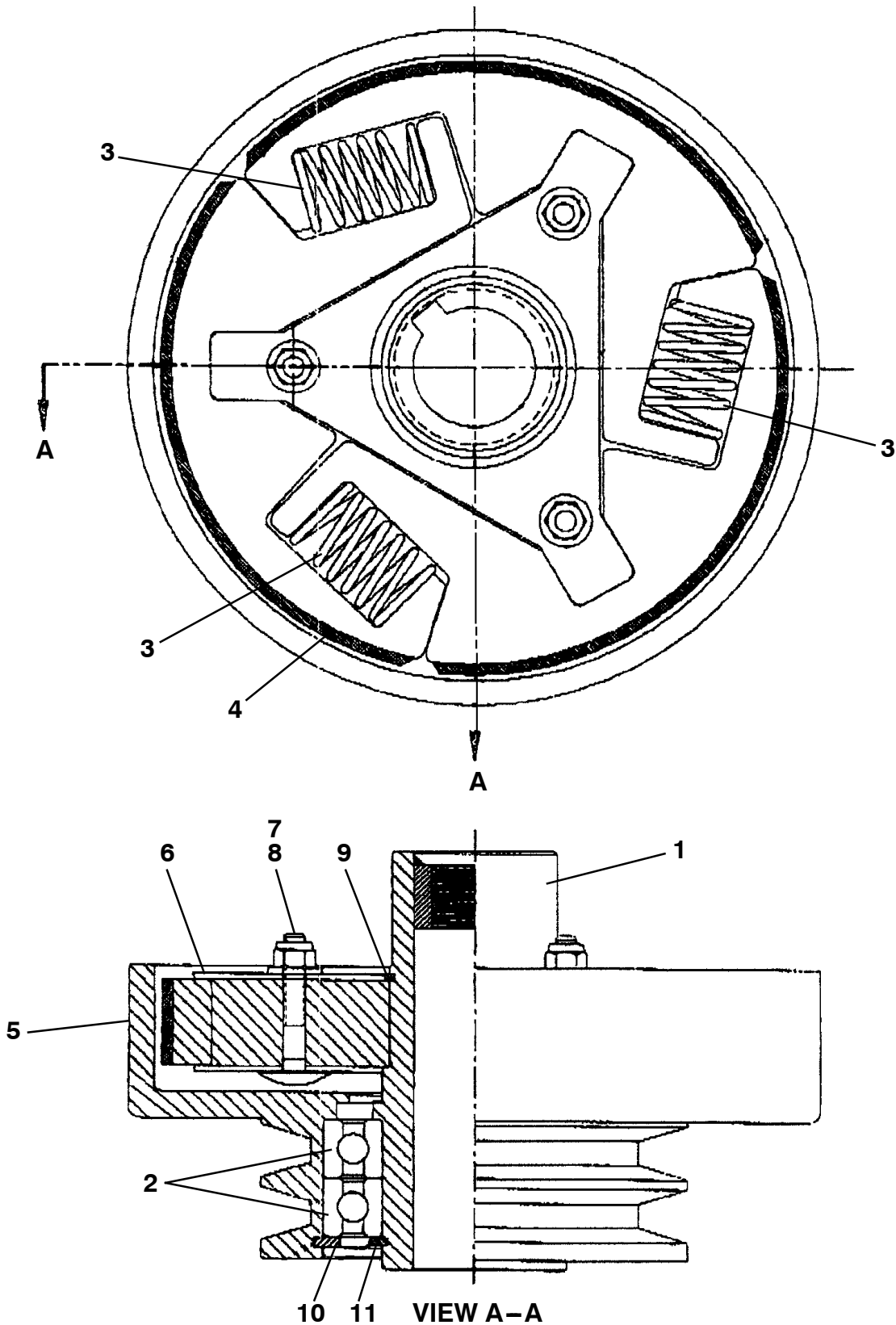
**SCHWING****CLUTCH ASSEMBLY - NORAM**

SECTION

2

30373272

Pos.	Qty.	Description	Part No.
1	1	KEY, 3/8" X 4" 02500036	30390531
2	1	SNAP RING 01900311	30391796
3	1	SNAP RING 01900312 (PM1070-9)	30373280
4	2	BALL BEARING 03000055 6011ZR	30394815
5	1	DRUM 01660010	SEE MFG
6	6	SHOE 11200200	30391317
7	6	SPRING 01030108	30391318
8	1	HUB ASSEMBLY 11300928	SEE MFG
9	1	WASHER, SPECIAL 02400134	30390532
10	1	WASHER, FLAT, 1/2" (PM9026)	30373843
11	1	WASHER, LOCK, 1/2" (PM9028)	30373845
12	1	BOLT, 1/2" X 2" GR8 (PM9079)	30337904
		USE 1" UNF BOLT FOR CLUTCH REMOVAL (7/8" UNF BEFORE 4/02)	





SCHWING

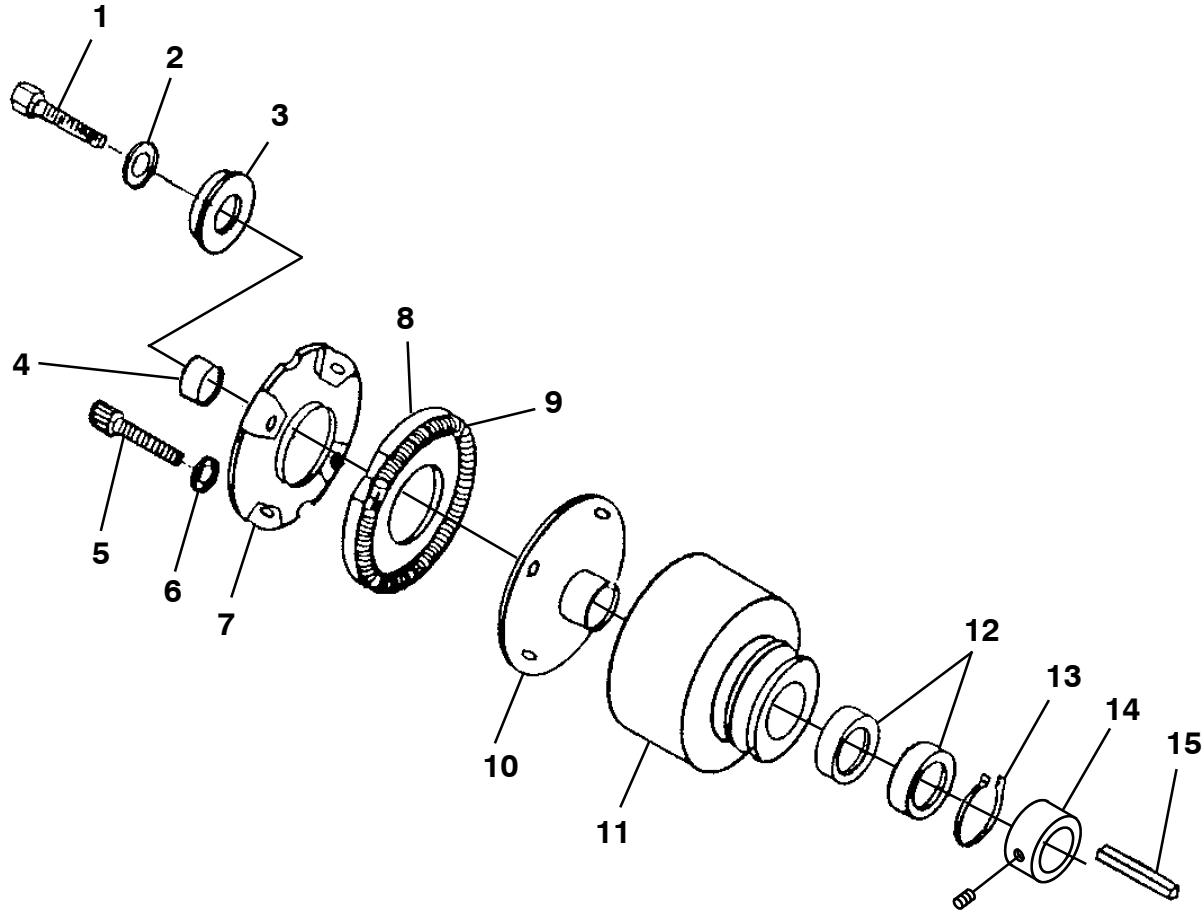
**CLUTCH ASSEMBLY - NORAM
TRI-LOBE SERIES 3700**

30395262

SECTION

2

Pos.	Qty.	Description	Part No.
	1	TRI-LOBE SERIES 3700 CLUTCH ASSEMBLY	30395262
1	1	HUB ASSEMBLY 11301058	SEE MFG
2	2	BEARING 03000055	SEE MFG
3	3	SPRING 01000234	SEE MFG
4	3	SHOE WITH LINING 11200233	SEE MFG
5	1	DRUM 01600686	SEE MFG
6	2	PLATE 02800236	SEE MFG
7	3	BOLT 04000044	SEE MFG
8	3	NUT 02300022	SEE MFG
9	1	SNAP RING 01900310	SEE MFG
10	1	SNAP RING 01900312	SEE MFG
11	1	SNAP RING 01900311	SEE MFG



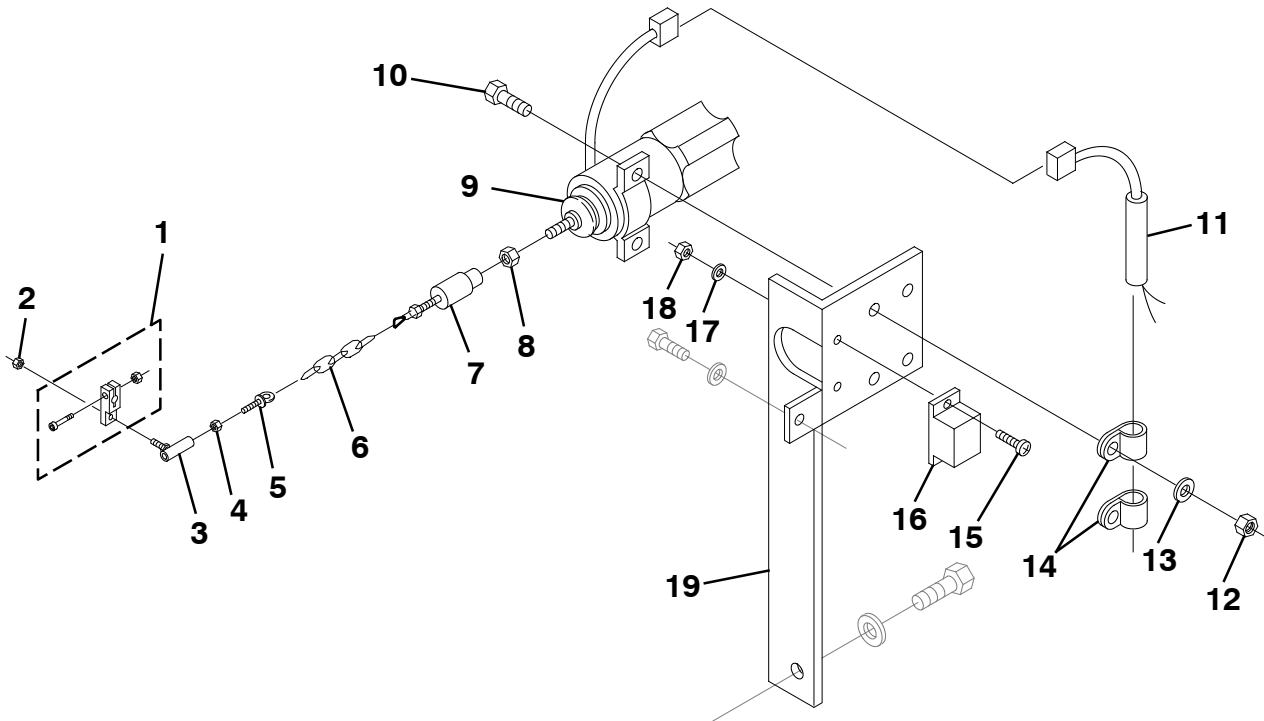
**SCHWING****CLUTCH ASSEMBLY - CENTRI-MATIC**

SECTION

2

30373261 (PM1069C)

Pos.	Qty.	Description	Part No.
1	1	BOLT, 1/2" X 1-1/2" NC (PM9011)	30373824
2	1	WASHER, LOCK, 1/2" (PM9028)	30373845
3	1	WASHER, SPECIAL (PM9032)	30373849
4	1	SPACER (PM1069C-C)	30373264
5	4	BOLT, 5/16-18 X 1-1/4" (PM1069C-G)	30373268
6	4	WASHER, LOCK, 5/16" HIGH COLLAR (PM1069C-1)	30373270
7	1	MODULE PLATE (PM1069C-P)	30373271
8	1	ROTOR CARTRIDGE (PM1069C-A) INCLUDES ITEM 9	30373262
9	1	CLUTCH SPRING	30373266
10	1	ROTOR BACK FLANGE (PM1069C-B)	30373263
11	1	CLUTCH HOUSING AND SHEAVE (PM1069C-D)	30373265
12	2	BALL BEARING 6011ZR	30394815
13	1	SNAP RING (PM1070-9)	30373280
14	1	SET COLLAR WITH SET SCREW (PM1068)	30373259
15	1	KEY (PM1070)	30373273



**SCHWING****THROTTLE ACTUATOR ASSEMBLY**

SECTION

2

30394428

Pos.	Qty.	Description	Part No.
1	1	CONTROL LEVER ASSEMBLY	30391343
2	1	NUT, NYLOCK, 10-32	30309882
3	1	BALL JOINT	30390636
4	1	NUT, 10-32	30392237
5	1	THUMB SCREW, 10-32 X 1/2"	30395540
6	A/R	SAFETY LINK CHAIN, 5 LINKS, REVERSE END LINKS	30373300
7	1	ENGINE THROTTLE SPRING SWIVEL	30396382
8	1	NUT, 1/4-28	30392236
9	1	SOLENOID ASSEMBLY	30394284
10	2	BOLT, 1/4" X 3/4" NC (PM9024)	30373841
11	1	COIL/TIMER MODULE	30394285
12	2	NUT, 1/4-20 (PM9040)	30373857
13	2	WASHER, LOCK, 1/4" (PM9035)	30373852
14	2	CLAMP	30390855
15	2	SCREW, PAN HEAD, 8-32 X 1/2"	30391399
16	1	RELAY, 30 AMP	30392547
17	2	WASHER, LOCK, EXTERNAL TOOTH, #8	30391398
18	2	NUT, 8-32	30391397
19	1	REMOTE BRACKET (PM1147-3)	30373461



**SOLENOID BRACKET KIT
BEFORE 1/1/01**

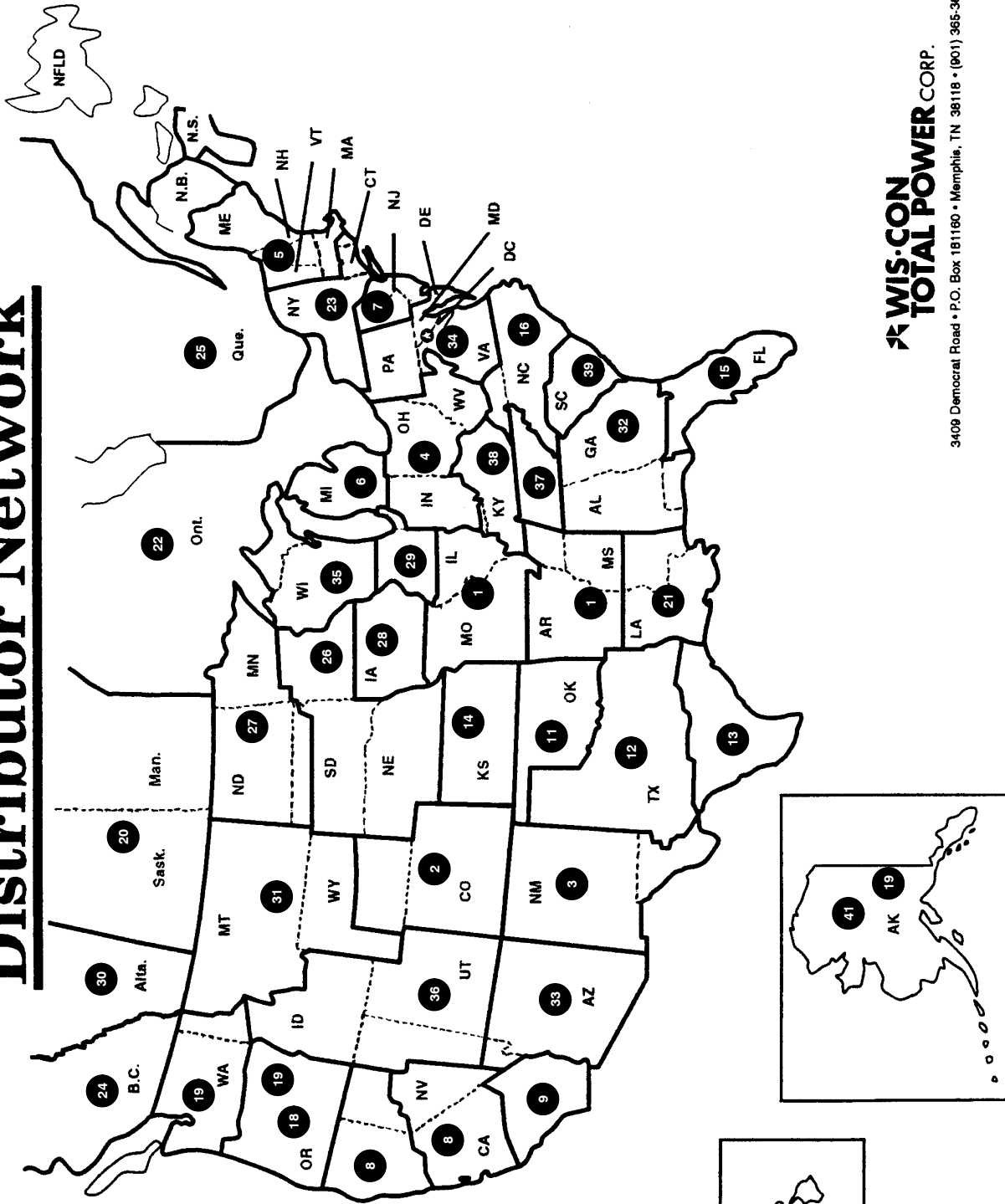
30373290

SECTION

2

Pos.	Qty.	Description	Part No.
1	1	CONTROL LEVER ASSEMBLY	30391343
2	1	BALL JOINT	30390636
3	1	NUT, 10-24	SEE MFG
4	1	EYE BOLT	30390690
5	1	SAFETY LINKAGE ASSEMBLY (PM1073-4)	30373297
6	1	NUT, 1/4" (PM9040)	30373857
7	1	SOLENOID ASSEMBLY	30390867
8	4	BOLT, 1/4" X 3/4" NC (PM9024)	30373841
9	4	WASHER, LOCK, 1/4" (PM9035)	30373852
10	6	NUT, 1/4-20 (PM9040)	30373857
11	4	NUT, 8-32	30391397
12	4	WASHER, LOCK, EXTERNAL TOOTH, #8	30391398
13	1	RELAY, 30 AMP	30392547
14	1	RELAY, 10/20 AMP	30373295
15	2	SCREW, PAN HEAD, 8-32 X 1/2"	30391399
16	2	CLAMP	30390855
17	1	REMOTE BRACKET - 30 HP ENGINE (PM1147-3)	30373461
	1	REMOTE BRACKET - 35 HP ENGINE (PM1147-2)	30373460

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- 23 **JOSEPH L. PINTO, INC.**
719 EAST BALTIMORE PIKE
EAST LANSDOWNE, PA 19080
(610) 623-3667
- 24 **HANCO INDUSTRIAL ENGINES (*)**
2760 E. CHEROKEE
STOCKTON, CA 95205
(209) 462-8695
- 25 **HANCO INDUSTRIAL ENGINES (*)**
2760 JUNIPER
LONG BEACH, CA 90806
(562) 424-0913
- 26 **HARLEY POWER SYSTEMS (*)**
5408 SOUTH 103 EAST AVE
TULSA, OK 74107
(918) 447-1008
- 27 **OK POWER**
400 N. ANN ARBOR
OKLAHOMA CITY, OK 73127
(405) 945-7525 (800) 654-3673
- 28 **ALBERT ELECTRIC LTD.**
814 4TH STREET EAST
SASKATOON, SASKATCHEWAN
CANADA, S7K 0X4
(306) 242-0370
- 29 **M & L INDUSTRIES**
1212 ST. CHARLES STREET
HOUMA, LA 70360
(504) 857-8000 (800) 960-0068
- 30 **MARINDUSTRIAL-ONTARIO (*)**
4120 RIDGEWAY DRIVE # 33
MISSISSAUGA, ONTARIO
(905) 820-4001 (FAX 905-820-9709)
- 31 **JOHN REINER & COMPANY, INC.**
601 COMMERCIAL AVE.
CARLSTADT, NJ 07072
(201) 460-9444
- 32 **JOHN REINER & COMPANY (*)**
2001 LEMOYNE AVENUE
SYRACUSE, NY 13208
(315) 454-4323
- 33 **INDUSTRIAL ENGINES LTD. (*)**
8975 OAK STREET
VANCOUVER, BRITISH COLUMBIA
CANADA V6P 4B6
(604) 266-4126
- 34 **MARINDUSTRIEL (*)**
8550 DELMEADE
MONTREAL, QUEBEC
CANADA H4T 1L7
(514) 342-2746
- 35 **MARINDUSTRIAL, INC. (*)**
75 URQUHART AVE
MONCTON, NB, CANADA E1H 2R4
(506) 852-3332
- 36 **MINNESOTA POWER CTR (*)**
3779 N. LEXINGTON
ARDEN HILLS, MN 55126
(612) 486-7499 (800) 328-0916
- 37 **NORTHERN ENGINE & SUPPLY CO.**
2929 WEST SUPERIOR STREET
DULUTH, MN 55806
(218) 624-1443
- 38 **HARLEY POWER SYSTEMS (*)**
5408 SOUTH 103 EAST AVE
TULSA, OK 74107
(918) 447-1008
- 39 **OK POWER**
400 N. ANN ARBOR
OKLAHOMA CITY, OK 73127
(405) 945-7525 (800) 654-3673
- 40 **NORTHERN ENGINE & SUPPLY CO.**
2710 THIRD AVE NORTH
FARGO, ND 58102
(701) 232-3284
- 41 **TRI STATE ENGINE SERVICE**
6125 VALLEY DRIVE
BETTENDORE, IA 52722
(319) 232-6684
- 42 **CARLSON MACHINE**
417 FLOYD BLVD.
SILOUX CITY, IA 51101
(712) 255-1676
- 43 **POWER GREAT LAKES**
655 WHEAT LN.
WOODDALE, IL 60191
(800) 350-9400 (800) 551-2938
- 44 **CONTINENTAL ENGINES LTD.**
5511 - 82ND AVENUE
EDMONTON, ALBERTA
CANADA T6B 2J6
(403) 426-3690
- 45 **RENOVIN INDUSTRIES LTD.**
5608-94A STREET
EDMONTON, ALBERTA
CANADA T6E 3E4
(403) 435-3447
- 46 **SCHMALZ, INC.**
1639 LOCKWOOD ROAD
BILLINGS, MONTANA 59101
(406) 246-6621
- 47 **SOUTHEAST SERVICE & SUPPLY (*)**
1721 E. OAKBROOK DRIVE, NW
NORCROSS, GA 30093
(770) 448-4251
- 48 **SOUTHWEST PROD. CORP. (*)**
5143 W. ROOSEVELT
PHOENIX, AZ 85043
(602) 269-3581
- 49 **EXTO, INC.**
4200 CHAMBER HILL ROAD
HARRISBURG, PA 17111
(717) 564-1193
- 50 **POWER CENTER (*)**
1127 INTERNATIONAL PARKWAY
FREDERICKSBURG, VA 22406
(540) 752-9395 (800) 447-9400
- 51 **POWER CENTER (*)**
2244 WEST BLUEMOUND ROAD
WAUKESHA, WI 53188
(414) 786-1600 (800) 837-6937
- 52 **SAW ENGINES & POWER**
3305 NORTH 124TH STREET
BROOKFIELD, WI 53005
(414) 781-8344 (800) 236-1625
- 53 **POWER CENTER (*)**
2712 SOUTH 3600 WEST
BUILDING B, SUITES G.H. & I
WEST VALLEY CITY, UT 84119
(801) 964-1278 (800) 999-7610
- 54 **WILDER MOTOR & EQUIPMENT CO., INC.**
301-16TH AVENUE NORTH
NASHVILLE, TN 37203
(615) 329-2365
- 55 **WILDER MOTOR & EQUIPMENT CO., INC.**
4022 PRODUCE ROAD
LOUISVILLE, KY 40218
(602) 966-5141
- 56 **CONTINENTAL ENGINES, INC.**
1201 POINSETT HWY.
GREENVILLE, SC 29608
(864) 242-5657 (800) 922-5632
- 57 **WILDER MOTOR & EQUIPMENT CO., INC.**
1219 ROSEWOOD DRIVE
COLUMBIA, SC 29201
(803) 799-1220 (800) 922-9564
- 58 **WEST AUTO**
1131 N.W. EVERETT
PORTLAND, OR 97209
(503) 227-6577
- 59 **LUCKY DISTRIBUTING**
8111 N.E. COLUMBIA BLVD.
PORTLAND, OR 97218
(503) 252-1249

 = CONTINENTAL
 = WISCONSIN
 = CONTINENTAL & WISCONSIN

MAY 1998
LIT00286

(*) = MASTER DISTRIBUTOR

LIMITED ENGINE WARRANTY

WISCONSIN MOTORS, LLC (herein "Wisconsin"), warrants to the original retail purchaser (herein "Purchaser"), that each new Wisconsin engine or service engine assembly (herein "engine(s)") will be free from defects in material and workmanship for a period one (1) year after delivery, or for up to 2,000 hours of operation by the Purchaser, whichever occurs first. Wisconsin's obligation under this Limited Warranty shall be limited, at Wisconsin's option, to repairing or replacing the engine, which upon examination is found to be defective in material or workmanship. The repair or replacement of any engine under this Limited Warranty shall not extend the term of the engine warranty beyond the original term as set forth above.

All repairs qualifying under this Limited Warranty must be performed by Wisconsin or one of its authorized Distributors or Warranty Stations. In the event that any engine is found to be defective during the warranty period, the Purchaser shall notify Wisconsin, or one of its authorized Distributors or Warranty Stations of any claimed defect within thirty (30) days after such defect is discovered. The engine claimed to be defective must then be promptly delivered to an authorized Distributor or Warranty Station for inspection, repair or replacement. The Purchaser is responsible for all transportation charges in connection with any covered warranty work. In connection with a covered warranty repair or replacement, Wisconsin may, in its sole discretion assume responsibility for a portion of the labor necessary for removal and reinstallation of an engine. However, the Purchaser shall be responsible for other labor charges not assumed by Wisconsin and for all labor charges and travel expenses incurred in connection with travel to and from Purchaser's location.

This Limited Warranty shall not apply to:

A. Defective conditions caused, in whole or in part, by an engine which has, in Wisconsin's opinion been subjected to negligence in use, misuse, abuse, improper installation or application, improper maintenance or repair, alteration, repair or alteration by an unauthorized repair facility, over-speeding, casualty or improper storage, transportation, or handling; and

B. Engine tune-ups and normal maintenance service as specified in the Operator's Manual, including, but not limited to, valve adjustment, normal replacement of service items, fuel and lubricating oils, fan belts, anti-freeze, etc.

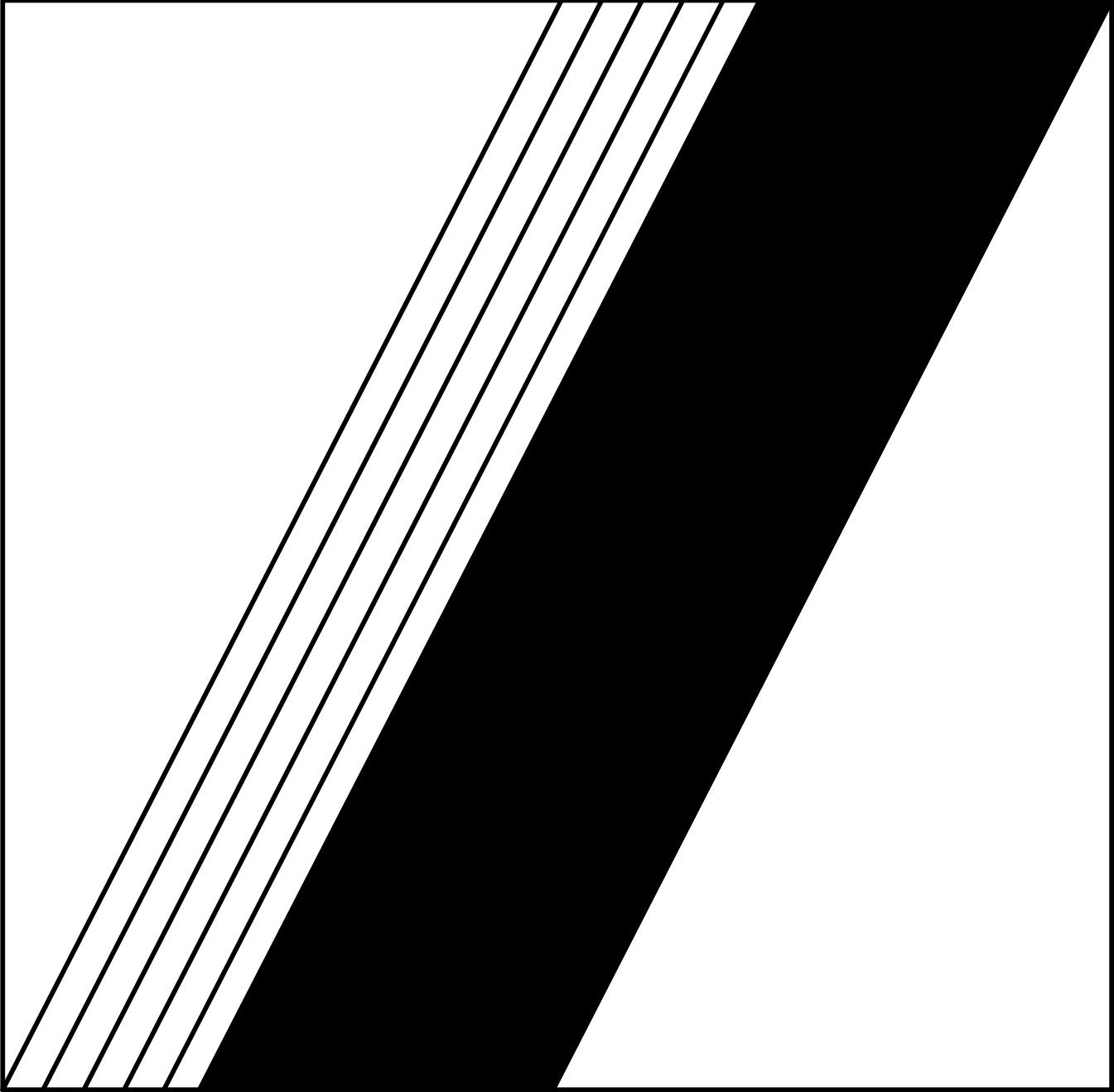
Wisconsin reserves the right to modify, alter or improve any engines without incurring any obligation to modify or replace any engines previously sold without such modification, alteration or improvement.

Written and oral representations made by Wisconsin's employees or agents, before or after sale of the engine, are not to be considered warranties or additional obligations unless they are in writing and signed by an officer or authorized employee of Wisconsin.

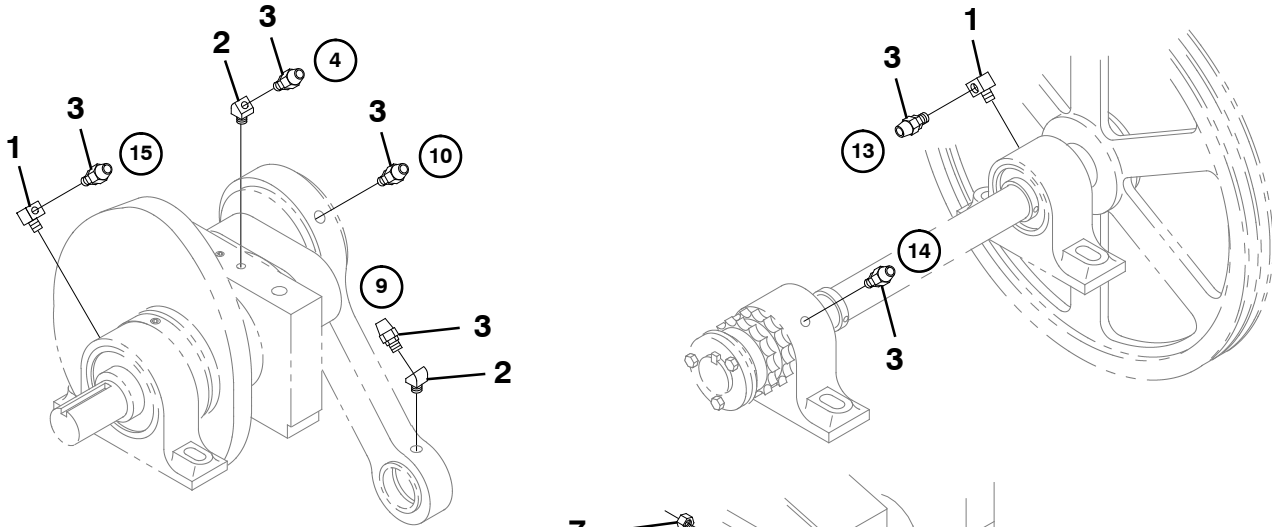
THIS LIMITED WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO WISCONSIN'S ENGINES AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF ANY NATURE WHATSOEVER, WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW, TRADE, USAGE OR COURSE OF DEALING, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY, WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTIES RELATING TO MATERIALS OR COMPONENTS MANUFACTURED BY ANY PARTY OTHER THAN WISCONSIN, PURCHASER REPRESENTS THAT IT ALONE HAS DETERMINED THAT THE ENGINES PURCHASED ARE SUITABLE FOR AND WILL MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Limitation of Liability and Remedy. In no event, whether arising out of breach of contract, warranty or tort (including negligence, failure to warn or strict liability) or otherwise, shall Wisconsin be liable to Purchaser, or to Purchaser's officers, employees, or representatives, or to any third part, for any special, indirect, consequential or incidental damages, including, but not limited to loss of profit or revenues, loss of use of equipment or services furnished by Wisconsin, damage to associated equipment, cost of capital, cost of substitute products, facilities, service or replacement power or down-time costs. In no event shall Wisconsin's liability for any claim for any engine exceed Wisconsin's price for the engine or engine component part that gives rise to the claim. Purchaser assumes all other risks and liabilities for any loss, damage, or injury to persons, property, or the environment arising out of, connected with or resulting from the use or subsequent sale of the engines, either alone or in combination with other products. Purchaser expressly agrees that the remedies granted to it hereunder are Purchaser's sole and exclusive remedies with respect to any claim of Purchaser arising under this Limited Warranty.

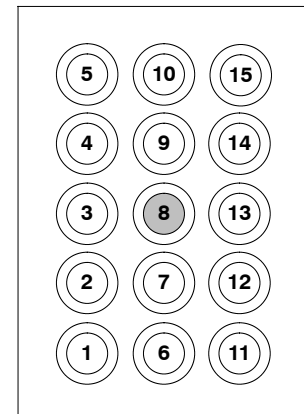
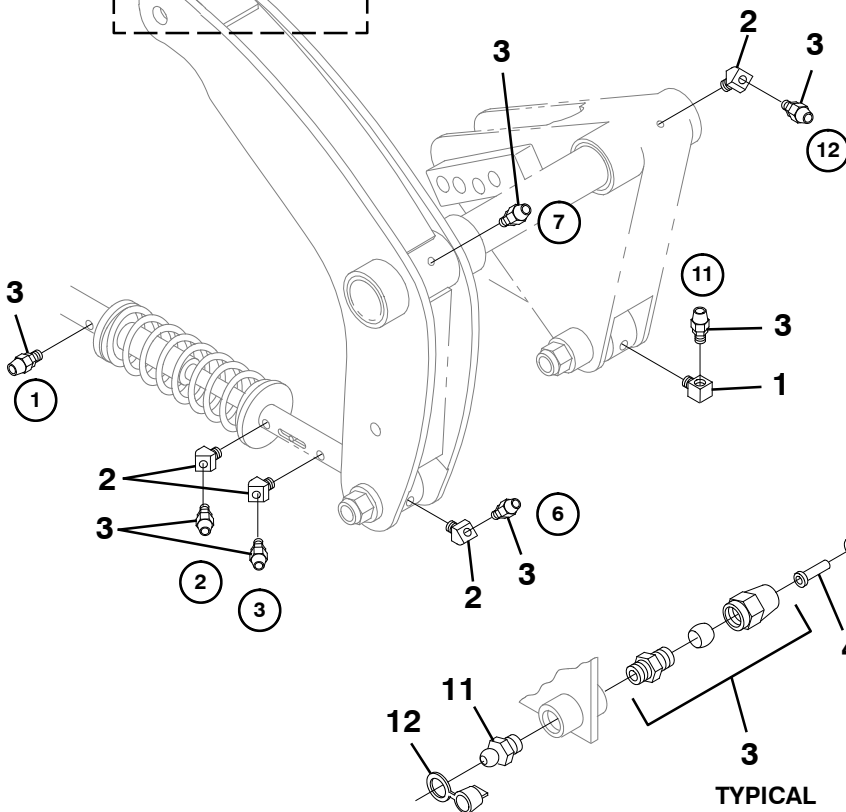
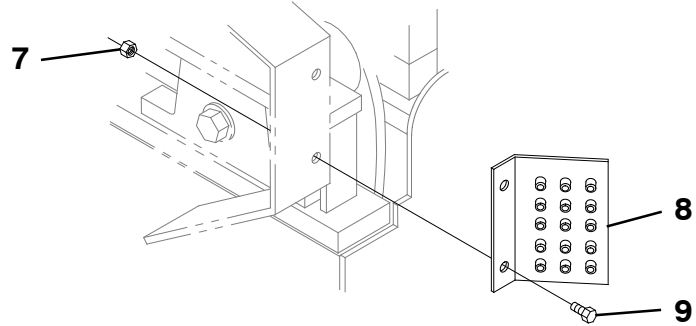
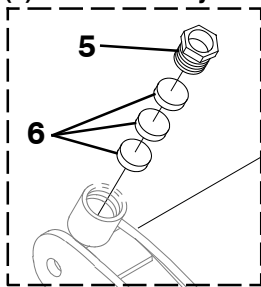
SECTION 3



LUBRICATION



Remove plug (5) and apply oil to felts (6) DAILY with any SAE oil



Lubrication Bracket with Line Assignments (position 8 not used)

Lubrication lines 1, 11, and 15 require protective tubing.

TYPICAL

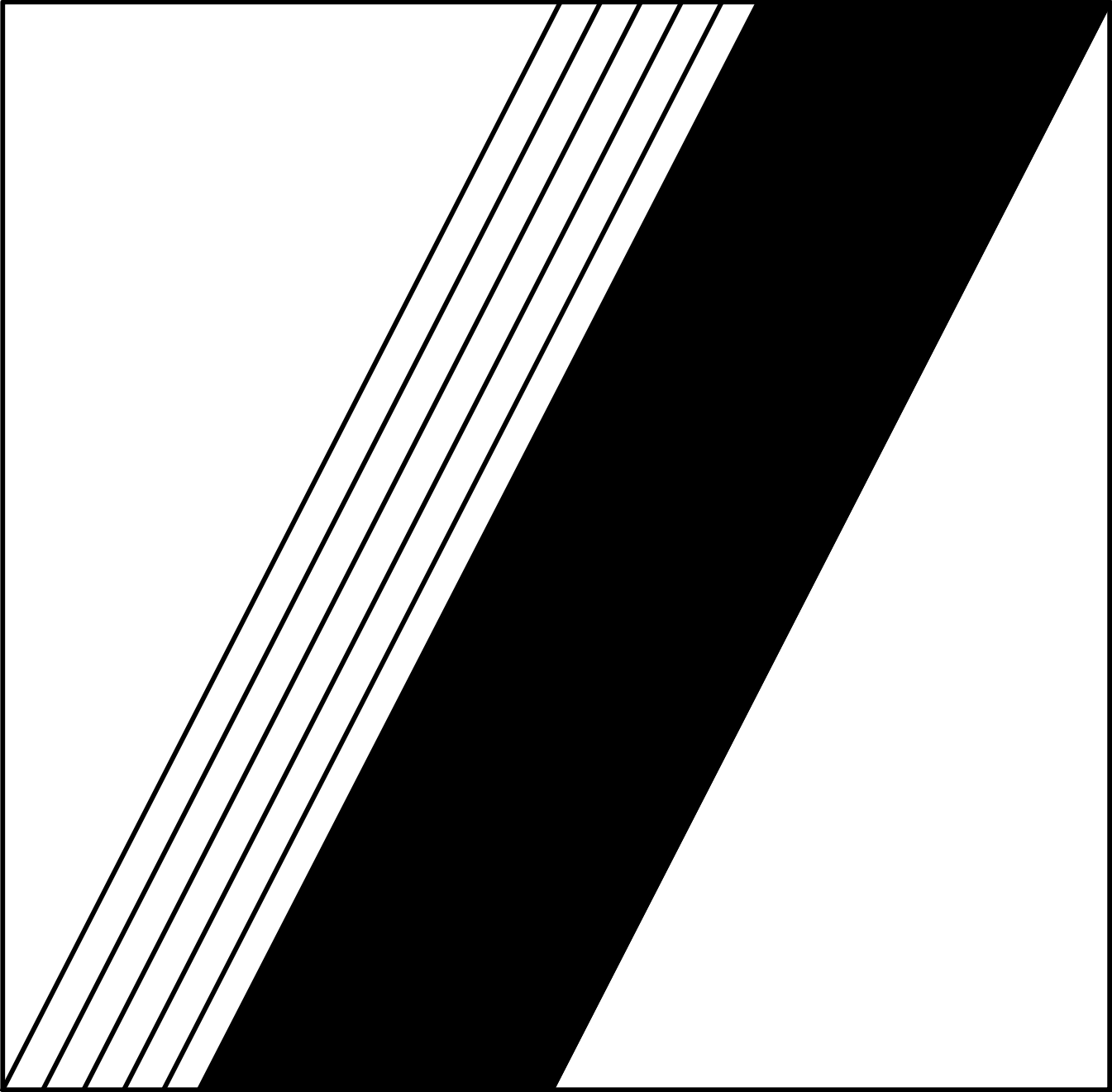
**SCHWING****LUBRICATION SYSTEM**

SECTION

3

Pos.	Qty.	Description	Part No.
1	4	ELBOW, BRASS, 1/8", 90° (PM9052A)	30373871
2	6	ELBOW, BRASS, 45° (PM9052)	30373870
3	28	TUBING CONNECTOR, STRAIGHT	30394827
4	28	INSERT, TUBE, 1/4"	30394828
5	1	PLUG, OILER (PM1082)	30373316
6	3	FELT, OILER (PM1081A)	30373315
7	2	NUT, NYLOCK, 5/16-18	30390383
8	1	BRACKET, REMOTE GREASE (PM116515)	30373503
9	2	BOLT, 5/16-18 X 3/4"	30307683
10	A/R	GREASE LINE, 1/4" (PM1165RAW)	30373501
11	14	LUBE FITTING (PM1116-NPT)	30373371
12	14	COVER, GREASE FITTING	30305039
13	1	LUBRICATION KIT, LINES ONLY	30391311
	A/R	PROTECTIVE TUBING, 5/16" I.D. X 7/16" O.D., CLEAR	30373498
		FASTENAL 10335-01437	

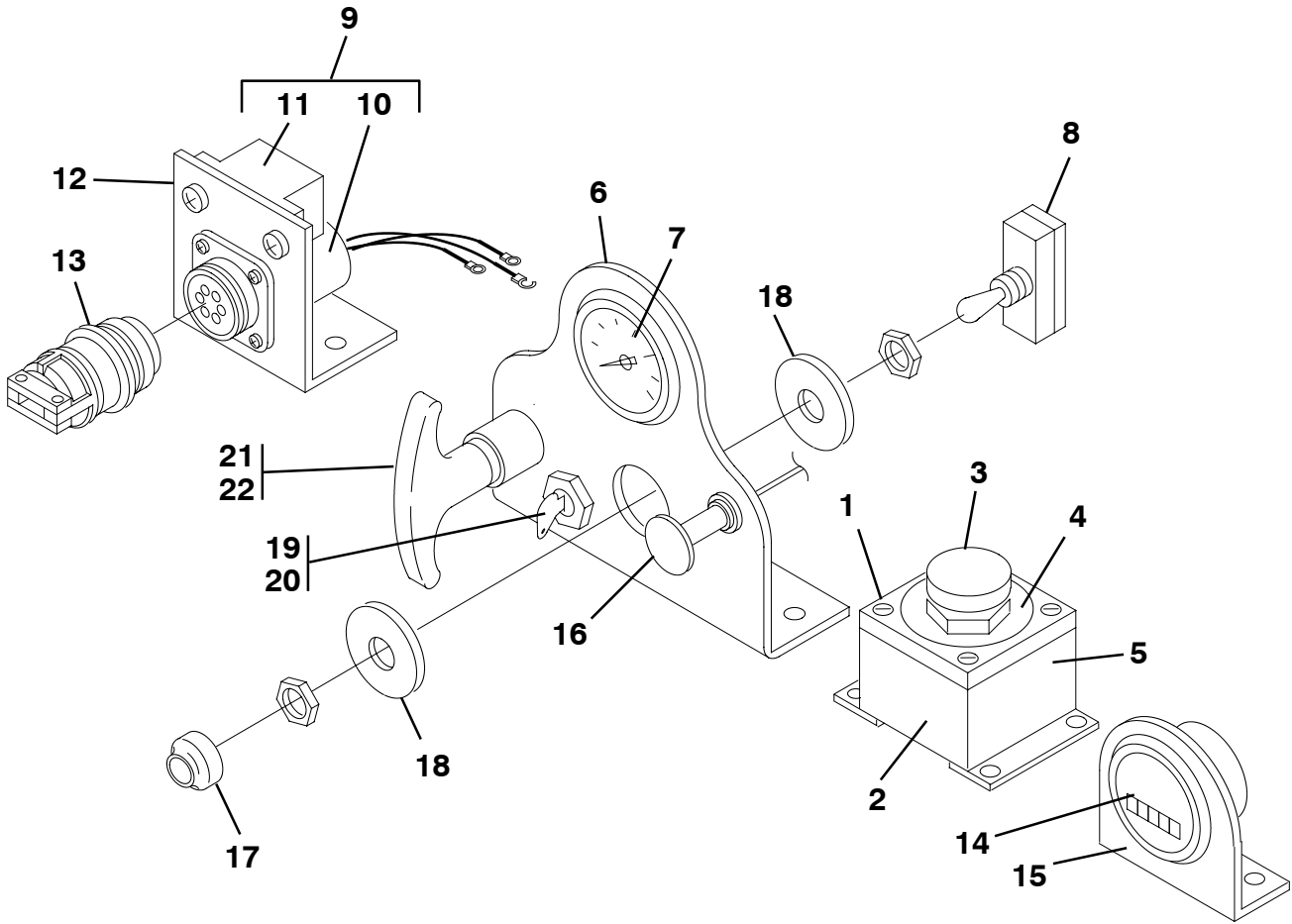
SECTION 4



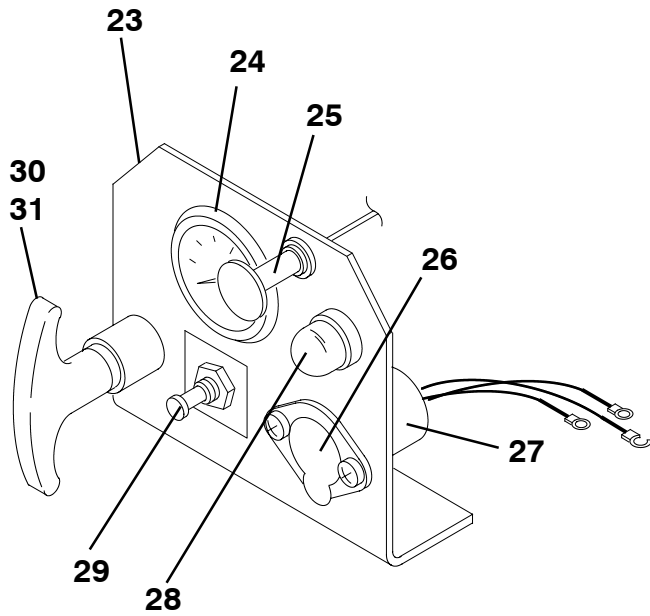
ELECTRICAL



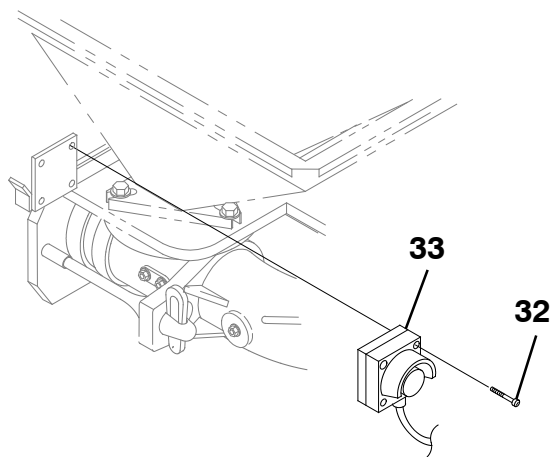
30 HP



35 HP



30 & 35 HP



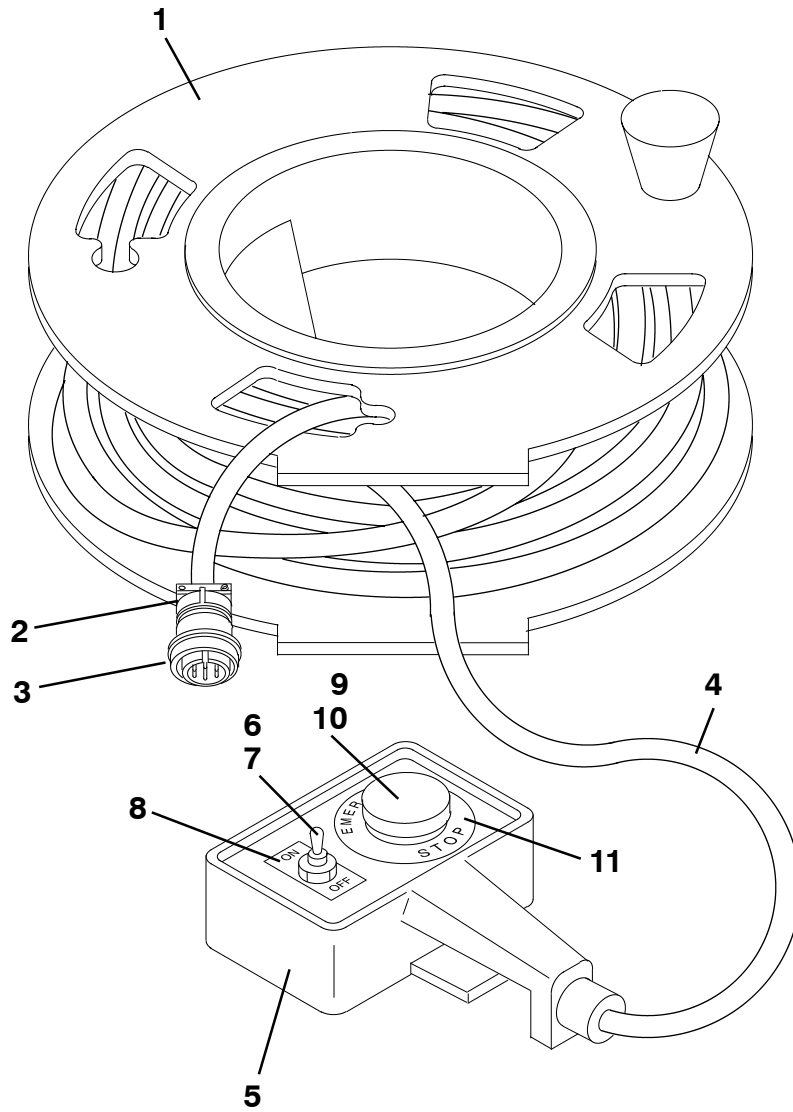


ENGINE CONTROLS - 30 & 35 HP

SECTION

4

Pos.	Qty.	Description	Part No.
30 HP ENGINE CONTROLS			
1	1	EMERGENCY STOP SWITCH ASSEMBLY	30393885
	1	EMERGENCY STOP SWITCH ASSEMBLY (OLD STYLE)	30391557
2	1	SWITCH BOX	SEE MFG
3	1	KNOB	30393952
	1	KNOB (OLD STYLE)	SEE MFG
4	1	SAFETY LABEL	30333578
5	1	CONTACT BLOCK	30393953
	1	CONTACT BLOCK (OLD STYLE)	30330019
6	1	PANEL WITH FASTENERS (PM9073)	30373891
7	1	AMMETER GAUGE (PM1190)	30373541
8	1	TOGGLE SWITCH, 2-WAY (PM1146)	30373456
9	1	REMOTE SWITCH ASSEMBLY, INCLUDES ITEMS 10, 11 & 12	SEE MFG
10	1	RECEPTACLE, 4-PIN	30330545
	1	RECEPTACLE, 6-PIN	30391586
11	1	RELAY, 10/20 AMP (4-PIN REMOTE)	30373295
	1	RELAY, 30 AMP (6-PIN REMOTE)	30392547
12	1	BRACKET, 4-PIN	30391523
	1	BRACKET, 6-PIN	30394160
13	1	DUMMY PLUG, 6-PIN	30391669
	1	DUMMY PLUG, 4-PIN	SEE MFG
14	1	HOUR METER	30302179
15	1	BRACKET, HOUR METER	30396063
	1	BRACKET, HOUR METER (USED BEFORE 8/04)	30393528
16	1	CHOKE CABLE (PMVE693)	30373127
17	2	RUBBER BOOT (PM11463)	30373458
18	2	WASHER, FLAT, 1/2" (PM9026)	30373843
19	1	IGNITION SWITCH WITH KEY (PM1191)	30373543
20	1	KEY (PM1191K)	30391444
21	1	THROTTLE HANDLE (PM1196W)	30373552
22	1	BUSHING, THROTTLE HANDLE - IF REQUIRED (PM1196W-A)	30373553
35 HP ENGINE CONTROLS			
23	1	PANEL WITH FASTENERS (PM9073)	30373891
24	1	AMMETER GAUGE (PM1190)	30373541
25	1	CHOKE CABLE (PMVE693)	30373127
26	1	REMOTE SWITCH ASSEMBLY, INCLUDES ITEM 27	30391534
	1	DUMMY PLUG, 4-PIN	SEE MFG
27	1	RECEPTACLE, 4-PIN	30330545
28	1	STARTER BUTTON SWITCH (PM1191B)	30373545
29	1	IGNITION SWITCH (PM9064)	30373884
30	1	THROTTLE HANDLE (PM1196W)	30373552
31	1	BUSHING, THROTTLE HANDLE - IF REQUIRED (PM1196W-A)	30373553
30 & 35 HP ENGINE CONTROLS			
32	4	SCREW, SOCKET HEAD CAP, M4 X 30, 12.9	10087381
33	3	EMERGENCY STOP STATION, SIEMENS 3SB1831-8AQZ	10205385
	1	EMERGENCY STOP SWITCH ASSEMBLY, SIEMENS 3SB3603-1HA20	SEE MFG
	1	PUSH BUTTON, SIEMENS 3SB3500-1HA20	30396339
	1	CONTACT BLOCK (2005) SIEMENS 3SB3423-OC	10209386





SCHWING

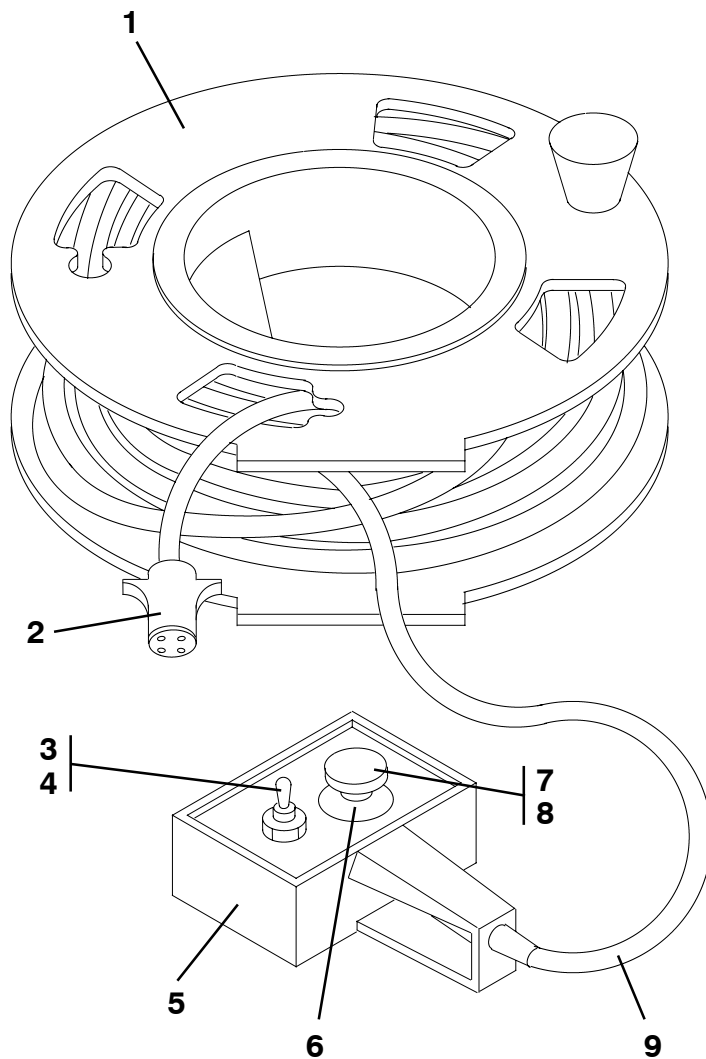
**REMOTE CABLE ASSEMBLY
(AFTER 2/28/00)**

30391589

SECTION

4

Pos.	Qty.	Description	Part No.
	1	REMOTE CABLE ASSEMBLY, COMPLETE	30391589
1	1	SPOOL	30391554
2	1	STRAIN RELIEF (MS 3057-6A)	30391587
3	1	PLUG, MALE, 6 POLE (75-68664-6P)	30391588
4	1	CORD, 50 FT, 4-WIRE	30391553
5	1	REMOTE CONTROL BOX	30356355
6	1	RUBBER BOOT	30373458
7	1	SWITCH, TOGGLE, ON/OFF	30373456
8	1	LABEL, ON/OFF	SEE MFG
9	1	PUSH BUTTON, EMERGENCY STOP	30391615
10	1	SWITCH, EMERGENCY STOP	30330019
11	1	LABEL, EMERGENCY STOP	30319872



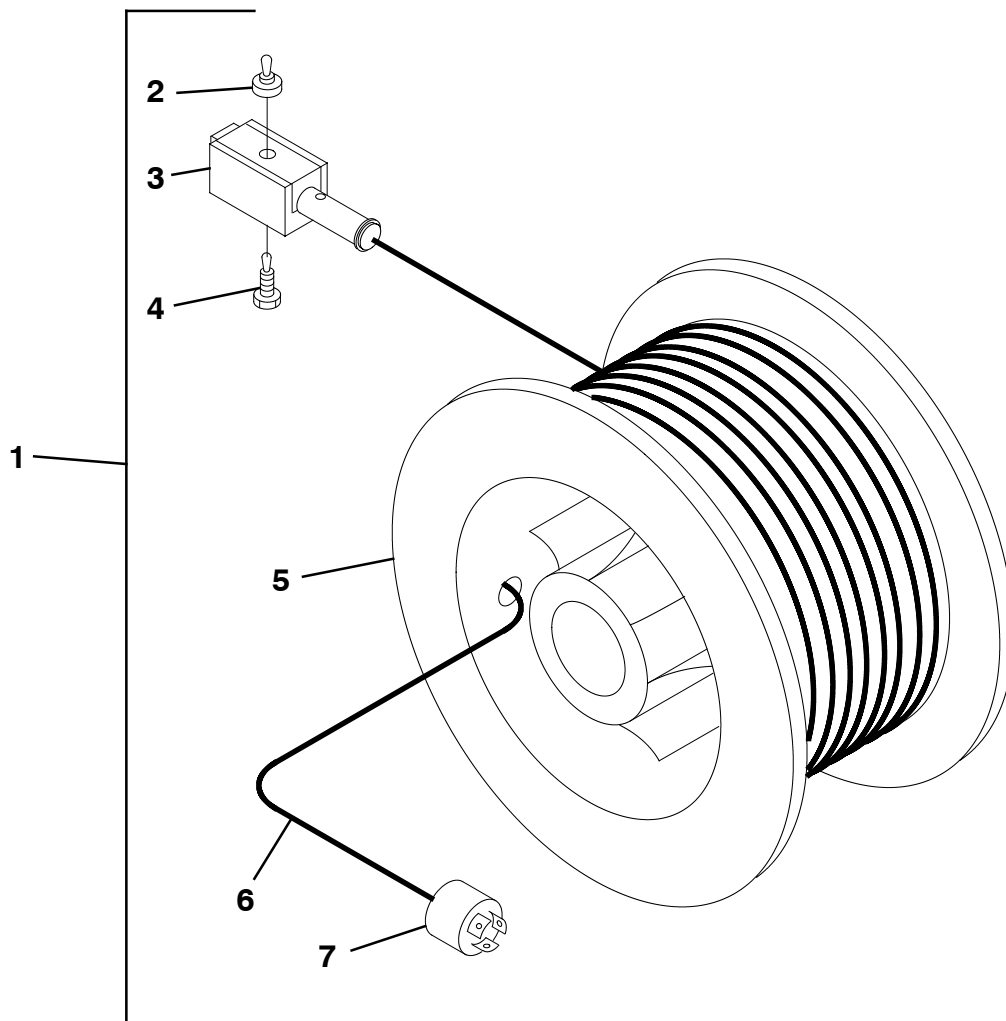
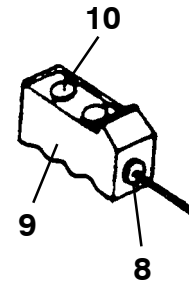


**REMOTE CABLE ASSEMBLY
(AFTER 1/1/97)**

SECTION

4

Pos.	Qty.	Description	Part No.
	1	REMOTE CABLE ASSEMBLY, COMPLETE	30391511
	1	REMOTE CABLE ASSEMBLY (DIESEL) 4-WIRE, COMPLETE	30391629
	1	REMOTE CABLE ASSEMBLY (DIESEL) 6-WIRE, COMPLETE	30391031
1	1	SPOOL	30391554
2	1	PLUG, 4-POLE	30390462
	1	REMOTE PLUG ASSEMBLY (DIESEL)	
	1	WIRE HOLDER	30391587
	1	PLUG, 6-POLE	30391588
3	1	RUBBER BOOT (PM11463)	30373458
4	1	SWITCH, 2-WAY	30373456
	1	SWITCH, 3-WAY PARALLEL (DIESEL)	30373457
5	1	E-STOP ENCLOSURE	30390169
6	1	SAFETY LABEL	30319872
7	1	E-STOP SWITCH	30391615
8	1	CONTACT BLOCK	30330019
9	1	CORD, 50 FT, 4-WIRE	30391553
	1	CORD, 50 FT, 6-WIRE (DIESEL)	30391628
	FT	CORD, 6-WIRE (DIESEL)	30396100





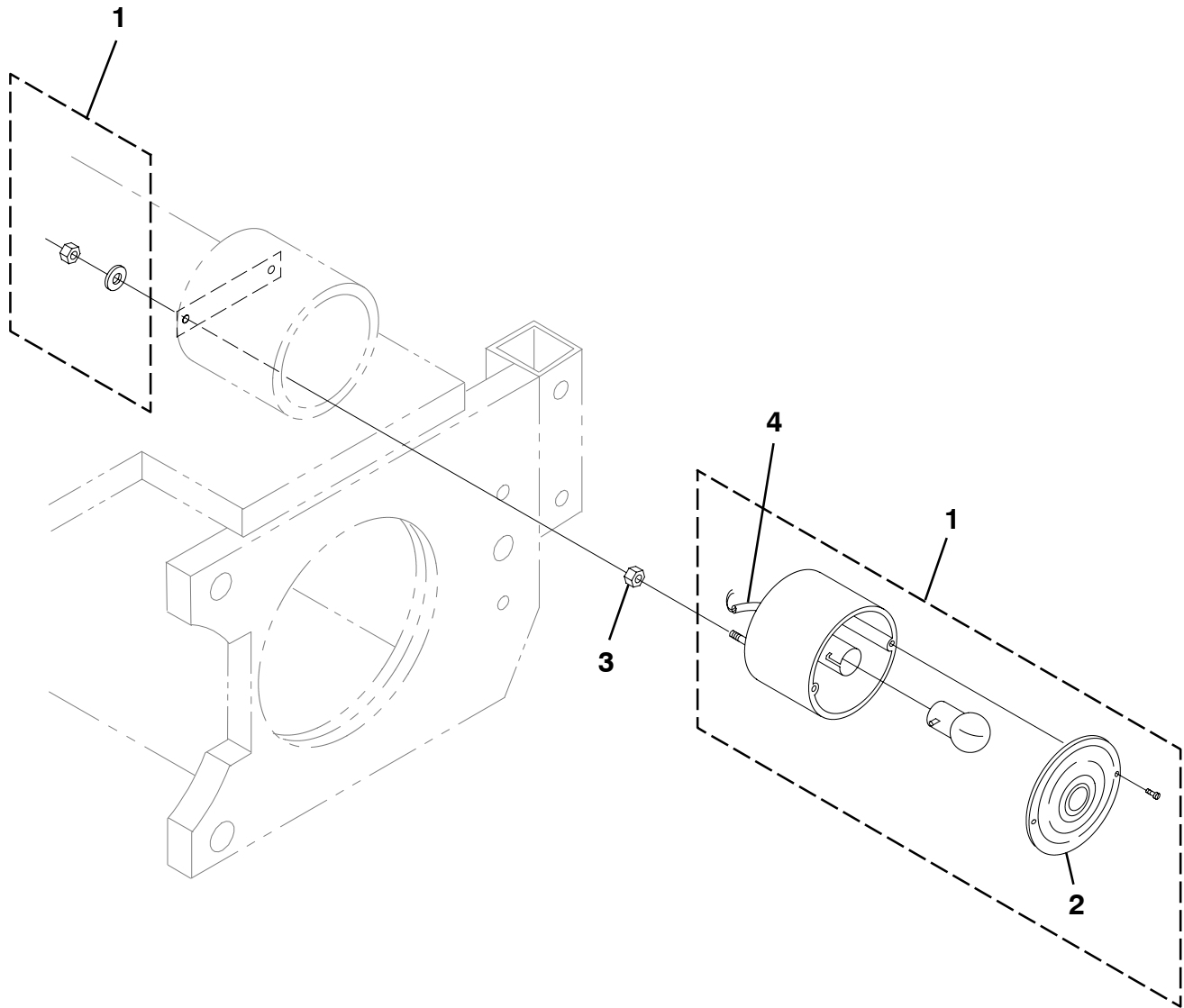
SCHWING

**REMOTE CABLE ASSEMBLY
(BEFORE 1/1/97)**

SECTION

4

Pos.	Qty.	Description	Part No.
1	1	REMOTE CABLE ASSEMBLY (PM11522)	30373470
	1	REMOTE CABLE ASSEMBLY - DIESEL	30391031
2	1	RUBBER BOOT (PM11463)	30373458
3	1	SWITCH BOX (PM314981)	30314981
4	1	SWITCH, 2-WAY (PM1146)	30373456
5	1	SPOOL (PM1065-5R)	30391554
6	1	CORD (PM1065-1)	30373239
7	1	PLUG, MALE (PM1065-2)	30373240
8	1	CORD GRIP - REPLACED 5/1/93 (PM1065-4P)	30373243
9	1	BOX WITH SWITCH - REPLACED 5/1/93 (PM1065-3P)	30373241
10	1	SWITCH - REPLACED 5/1/93 (PM1065-3S)	30373242





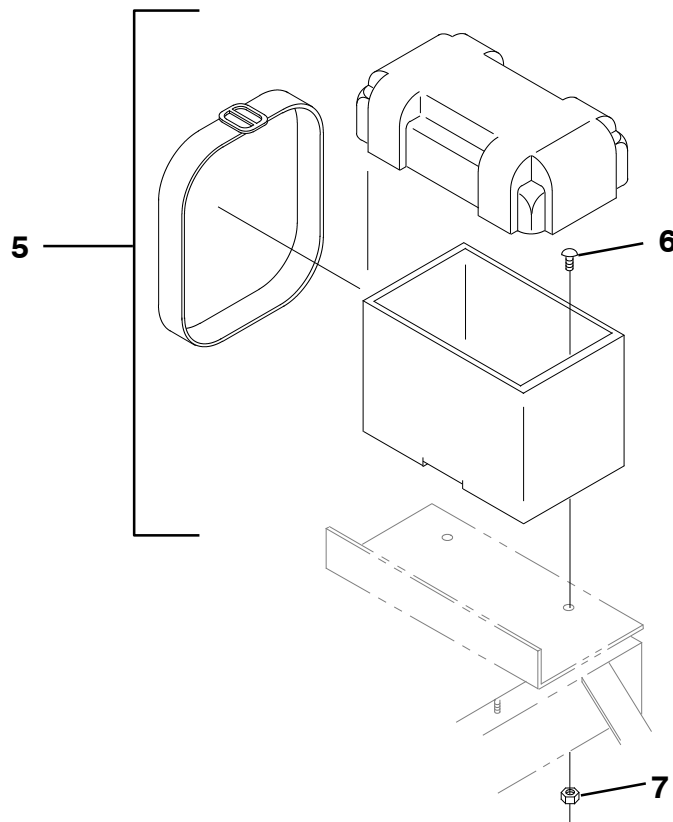
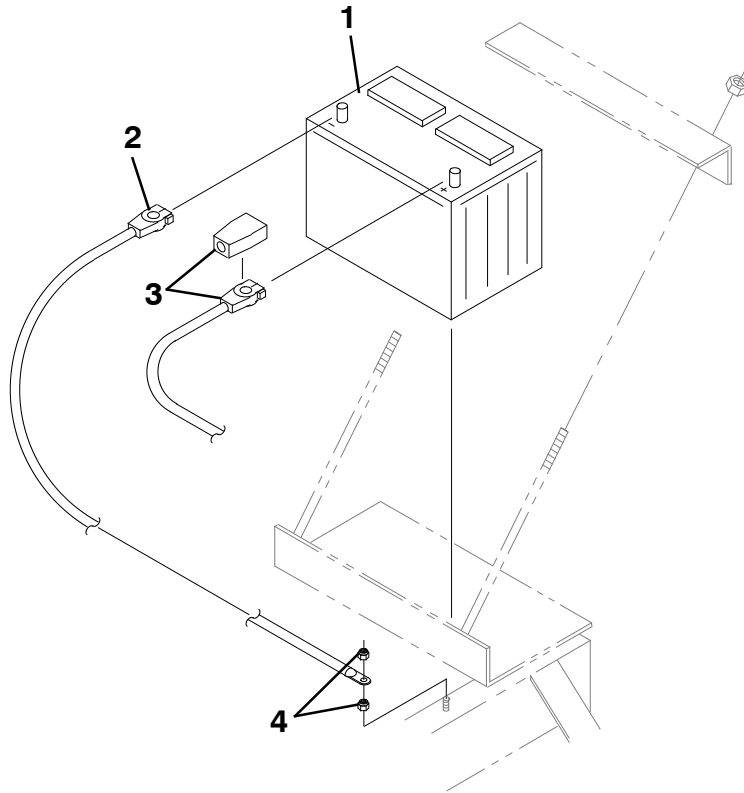
SCHWING

**TAIL LIGHT ASSEMBLY
(BEFORE 6/1/99)**

SECTION

4

Pos.	Qty.	Description	Part No.
1	1	TAIL LIGHT ASSEMBLY (PM1176)	30373517
	2	TAIL LIGHT ASSEMBLY FOR PLASTIC FENDERS (NOT SHOWN)	30393472
2	1	LENS	30391097
3	2	NUT	30373857
4	AR	WIRE	30373437





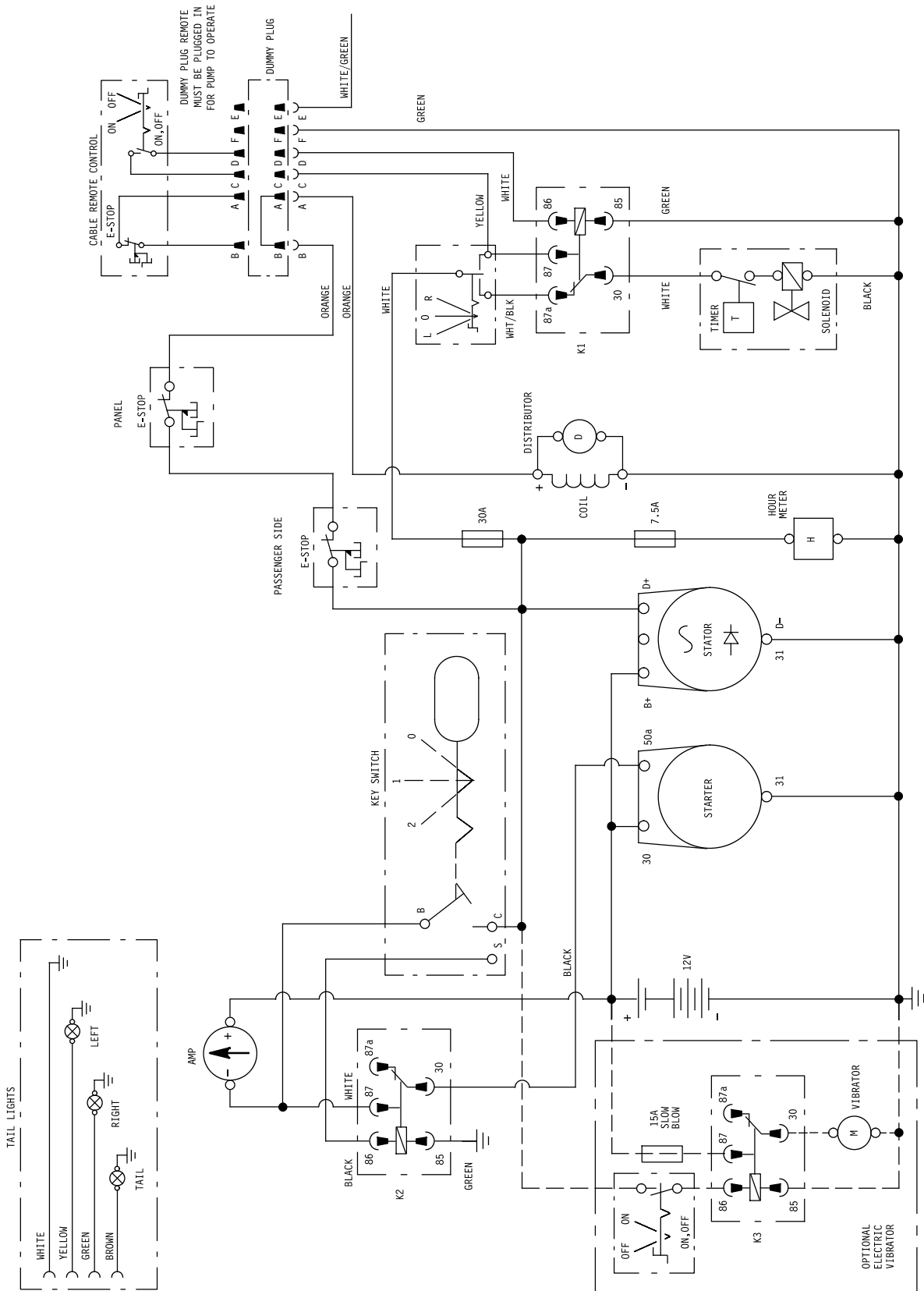
SCHWING

BATTERY INSTALLATION

SECTION

4

Pos.	Qty.	Description	Part No.
1	1	BATTERY, 12V, 24-5 (PM1071)	30373282
2	1	CABLE, NEGATIVE	30373455
3	1	CABLE, POSITIVE (PM1174)	30373511
4	2	NUT, 3/8" (PM9075)	30373893
5	1	BATTERY BOX WITH COVER & HOLD DOWN - OPTIONAL	30396492
6	4	BOLT, STEP, 1/4-20 X 1"	30393771
7	4	NUT, NYLOCK, 1/4"	30391374





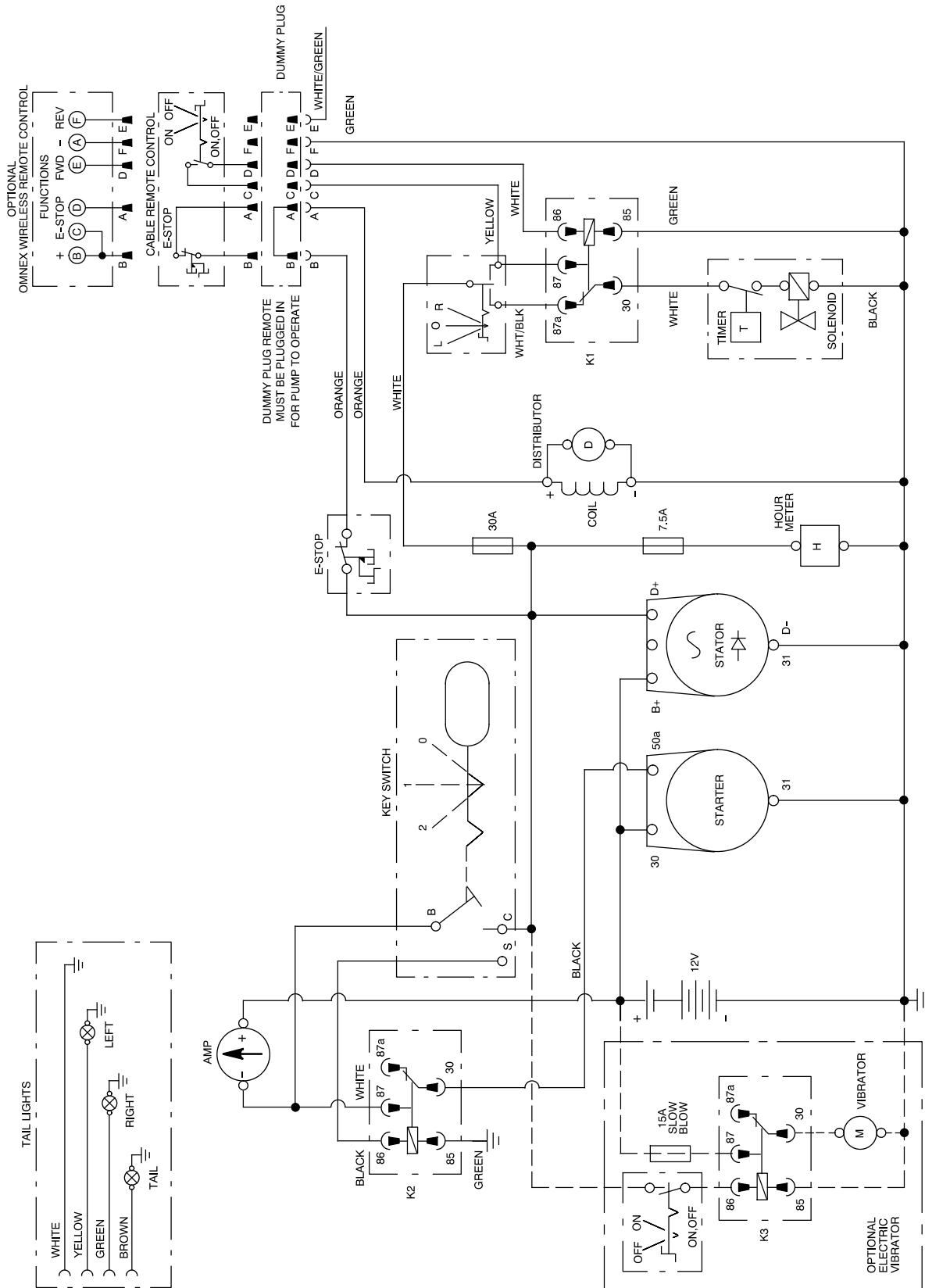
SCHWING

**WIRING DIAGRAM
2004**

SECTION

4

Pos.	Qty.	Description	Part No.
		ELECTRICAL SCHEMATIC, SP 88 GASOLINE	N/A





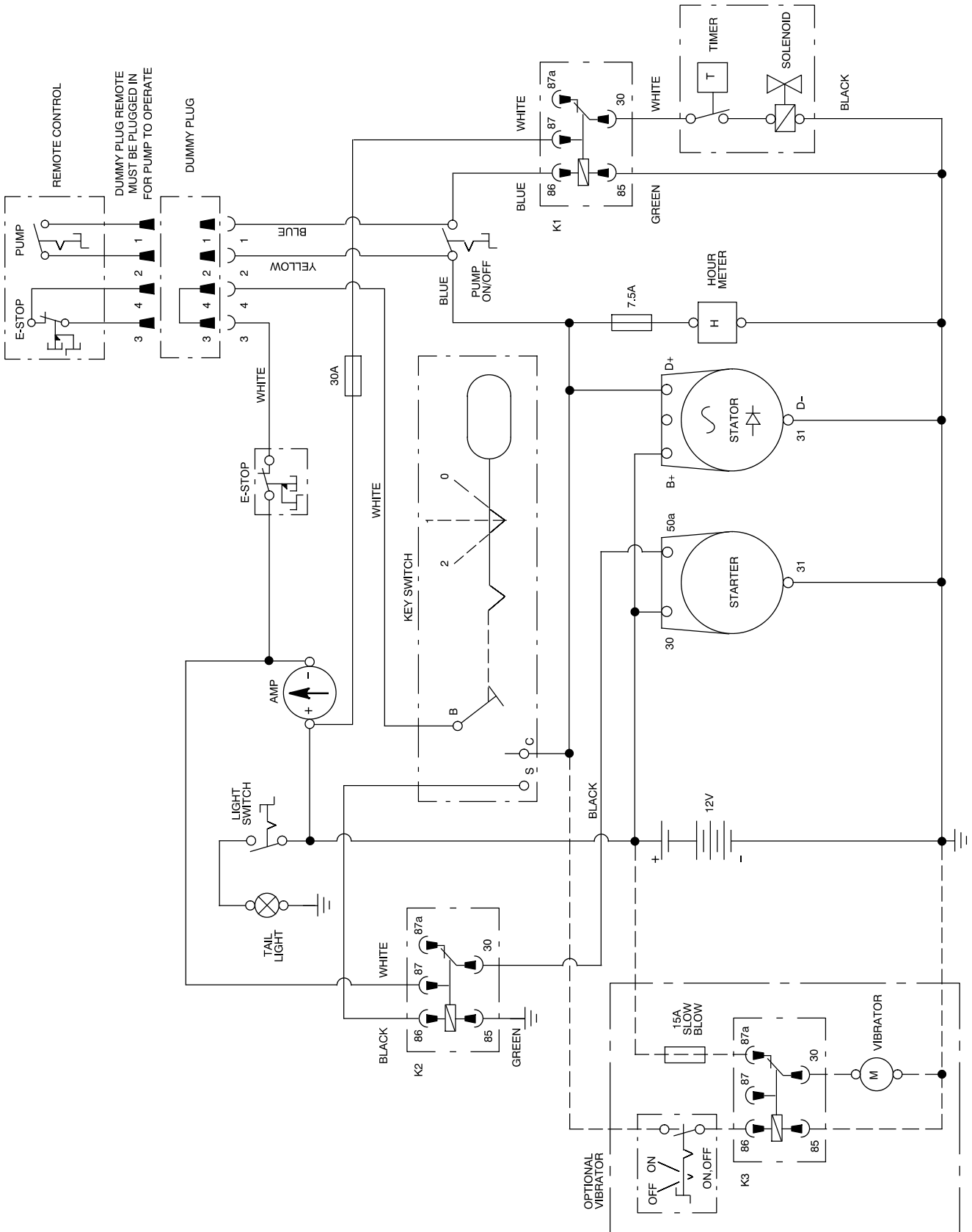
SCHWING

**WIRING DIAGRAM
2000 TO 2004**

SECTION

4

Pos.	Qty.	Description	Part No.
		ELECTRICAL SCHEMATIC, SP 88 GASOLINE	N/A





SCHWING

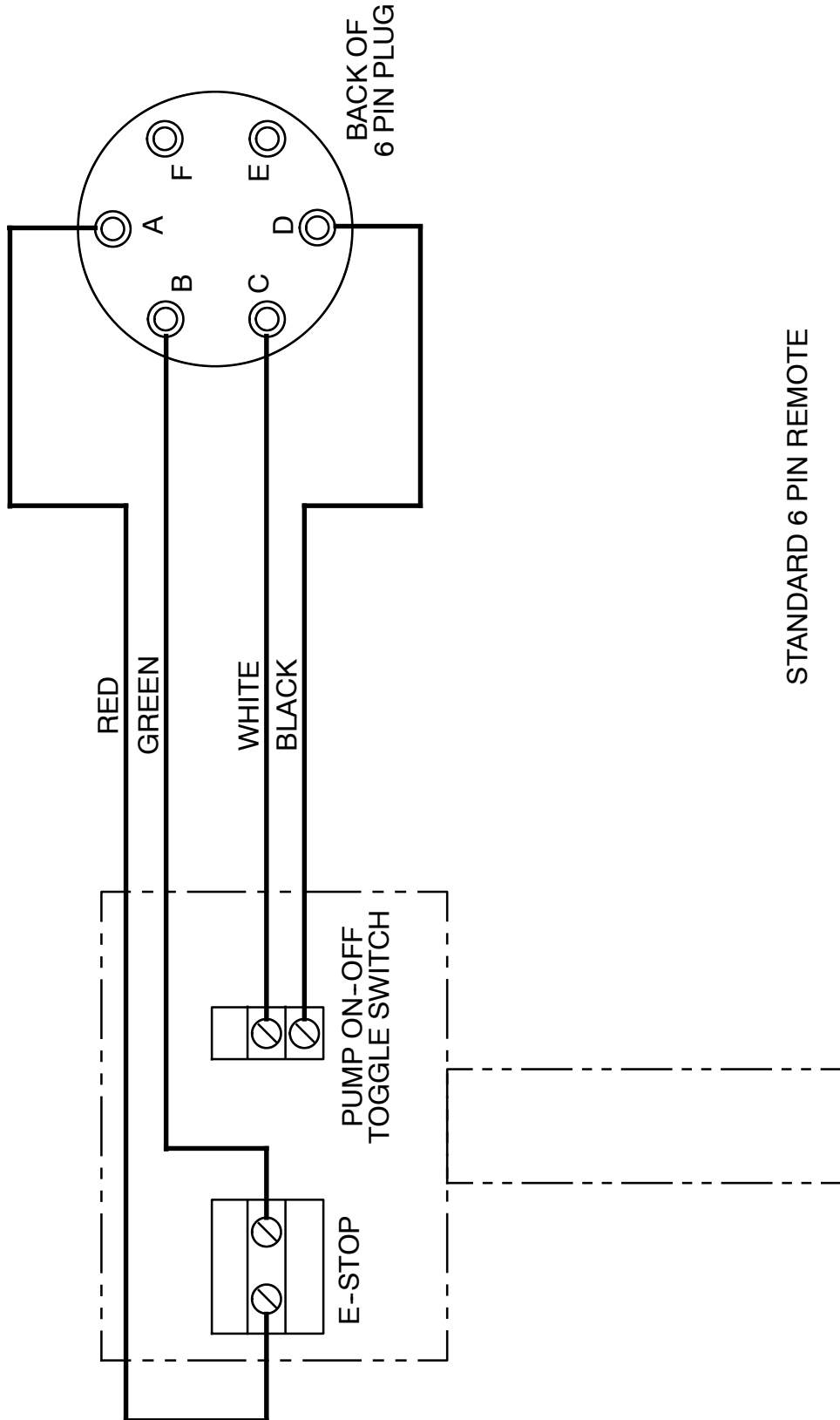
**WIRING DIAGRAM
BEFORE 2000**

30391854

SECTION

4

Pos.	Qty.	Description	Part No.
		ELECTRICAL SCHEMATIC, SP 88 GASOLINE	30391854



STANDARD 6 PIN REMOTE

30391589



SCHWING

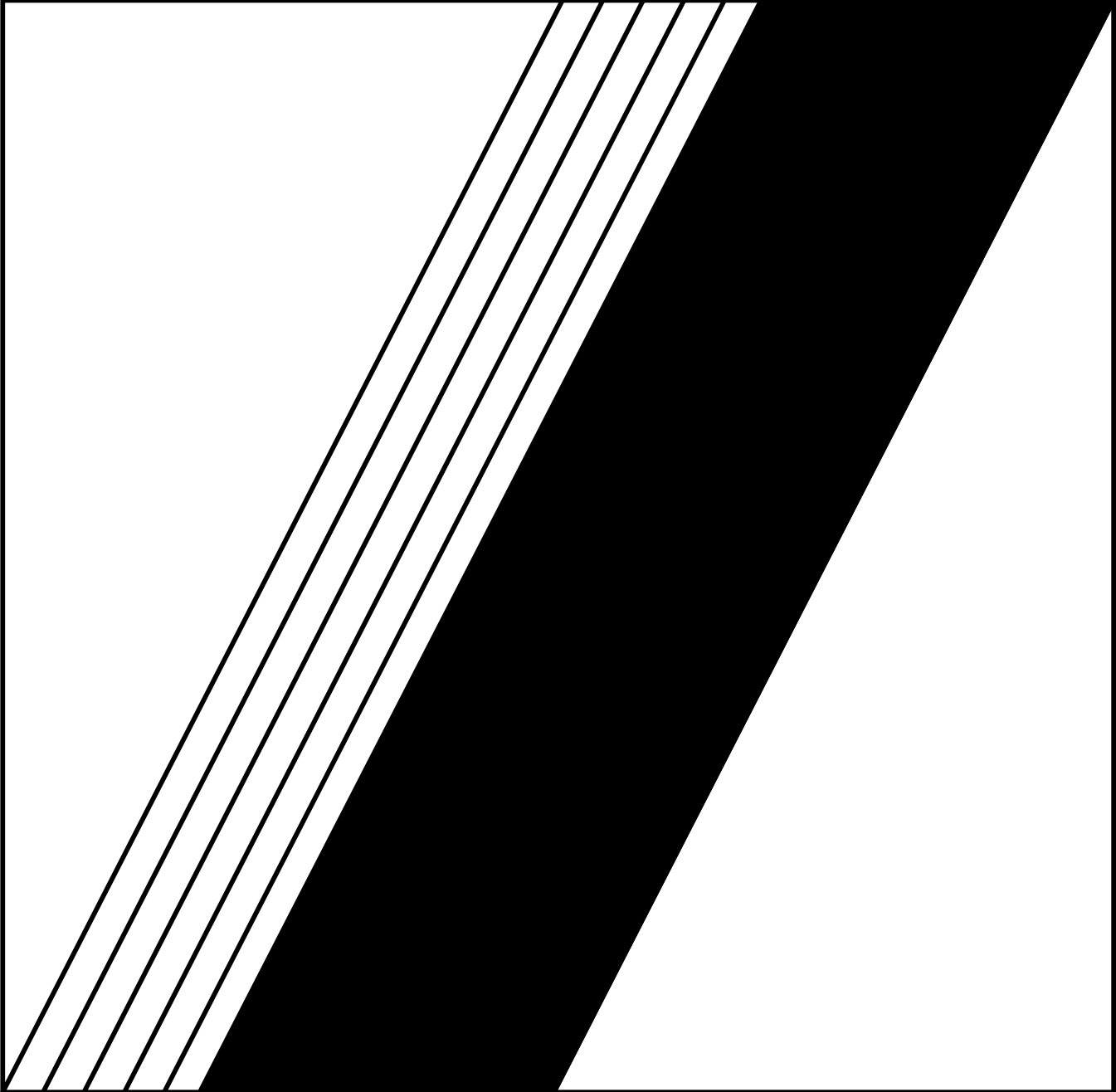
REMOTE CABLE WIRING DIAGRAM

SECTION

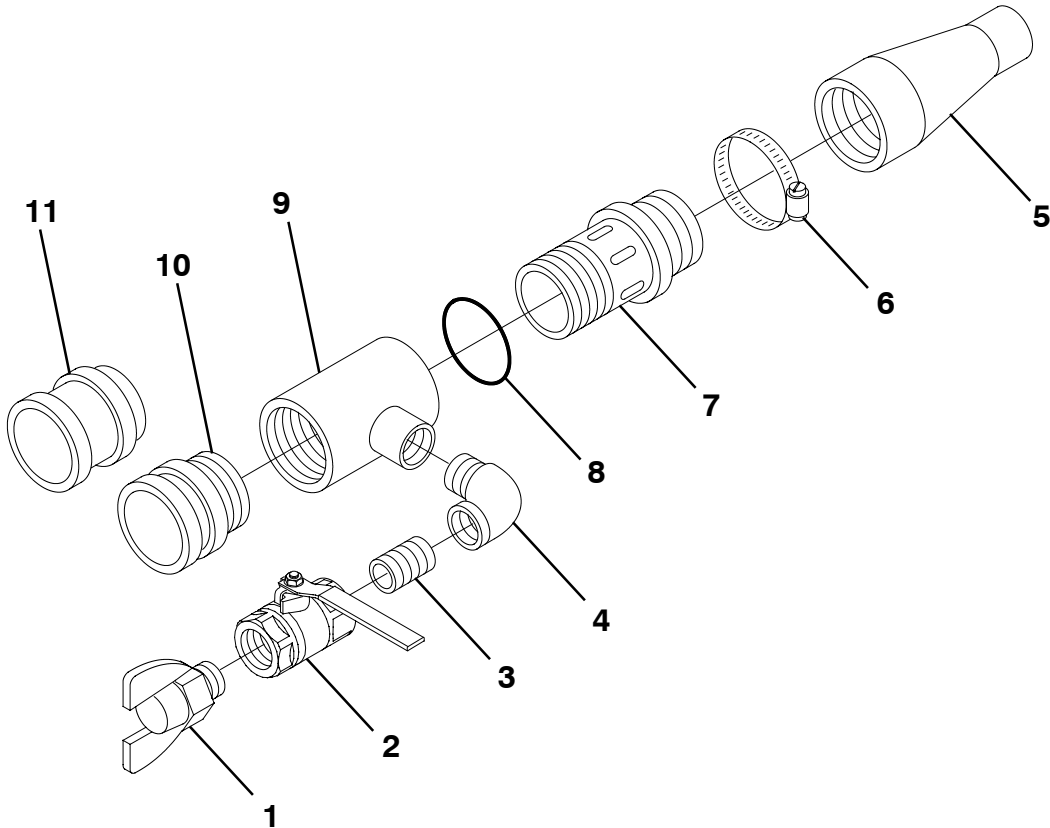
4

Pos.	Qty.	Description	Part No.
1		N/A	

SECTION 5



MISCELLANEOUS





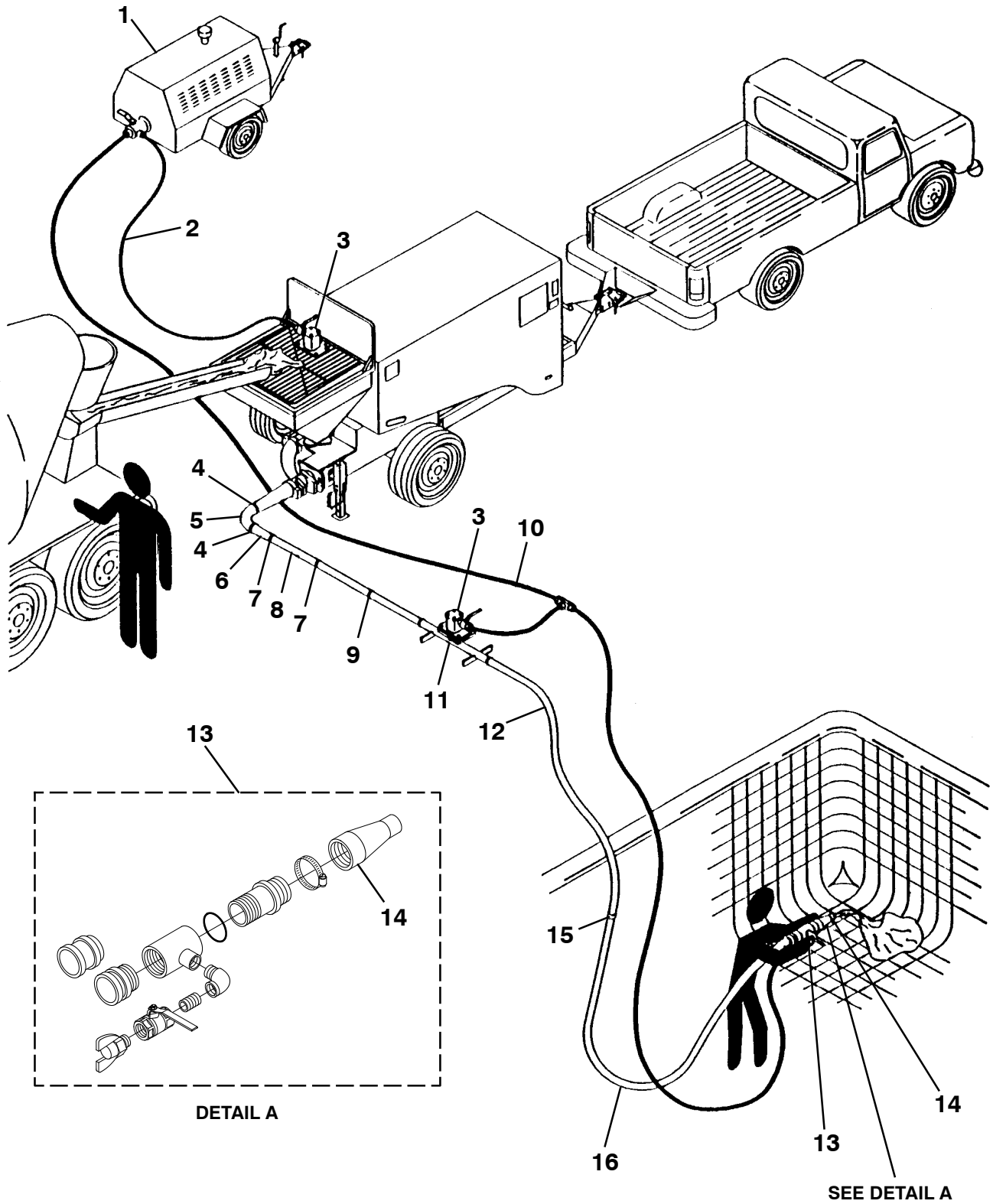
SCHWING

WET GUN NOZZLE

SECTION

5

Pos.	Qty.	Description	Part No.
1	1	AIR FITTING (PM1140M)	30373447
2	1	AIR VALVE (PM1138)	30373444
3	1	NIPPLE (PM1142)	30373453
4	1	ELBOW (PM1143)	30373454
5	1	NOZZLE (PM1141)	30373449
6	1	CLAMP (PM1060)	30373238
7	1	AIR INSERT (PM1136)	30373442
8	1	O-RING (PM1093)	30373330
9	1	AIR BODY (PM1135)	30373439
10	1	ADAPTER, 2" GROOVED - 2" MALE (PA2020ADGM)	30372958
11	1	ADAPTER, 2" HD - 2" MALE (PM2020ADHT)	30372960
		NEO NOZZLE TIP - NOT SHOWN (PM1141N)	30373451
		SHOTCRETE GUN COMPLETE 2" - NOT SHOWN (PM1135CWG)	30373441
		SHOTCRETE GUN COMPLETE 2-1/2" - NOT SHOWN (PM1125CWG)	30373411

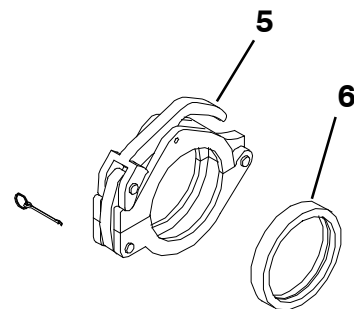
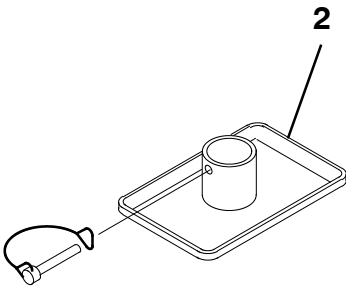
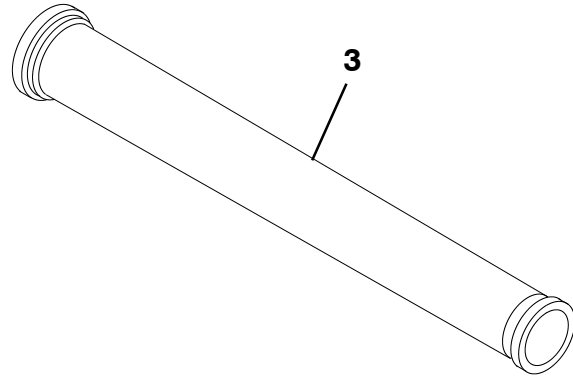
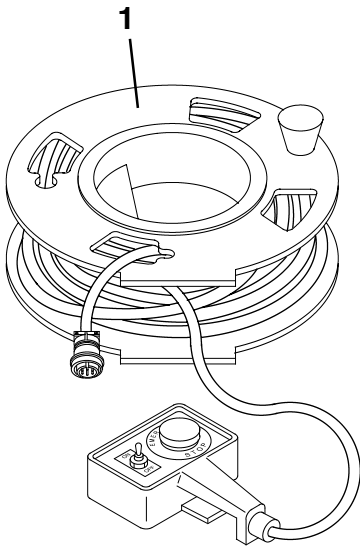




Pos.	Qty.	Description	Part No.
1	1	AIR COMPRESSOR, 150CFM - 250CFM - CUSTOMER SUPPLIED	NA
2	A/R	AIR HOSE, 1/2" X 50' WITH COUPLINGS - CUSTOMER SUPPLIED	NA
3	1	AIR VIBRATOR, IMPACT (PA194PO789)	30372947
4	2	SNAP CLAMP, 3" HD, WITH GASKET (PA3HSC)	30372216
	2	GASKET, 3" HD (PA3HDGSKT)	30372970
5	1	ELBOW, 3", 90° HD (PA3090HD)	30372981
6	1	REDUCER, 3" X 2-1/2" X 28 HD (PA302528HD)	30374177
7	1	SNAP CLAMP, 2-1/2" HD, WITH GASKET (PA25HDSC)	30372210
8	1	HOSE, 2-1/2" X 50" HD (PA2550HD)	30372917
	1	HOSE, 2-1/2" X 25" HD (PA2525HD)	30372370
9	1	GASKET, 2-1/2" HD (PA25HDGSKT)	30370108
10	A/R	AIR HOSE, 3/4" X 50' WITH COUPLINGS (PA3450AIRH)	30372982
11	1	REDUCER, 2-1/2" X 2" X 12 HD (PA252012HD)	30391830
12	1	HOSE, 2" X 50' HD (PAH2050HD)	30372360
13	1	NOZZLE ASSEMBLY, SPECIFY HD OR GROOVED ENDS	30373440
14	1	NOZZLE TIP, RUBBER (PM1141)	30373449
	1	6 PACK NOZZLE TIPS (PM1141PK)	30373452
15	A/R	CLAMP, 2" HD, WITH GASKET (PA2HDSC)	30372207
	1	GASKET, 2" HD (PA2HDGSKT)	30370106
16	1	HOSE, 2" X 25" HD (PAH2025HD)	30315857
OPTIONAL ACCESSORIES			
		PIPELINE, 2" X 10" HD (PA2010PHD)	30380243
		PIPELINE, 2-1/2" X 10" HD (PA2510PHD)	30380246
		PIPELINE, 3" X 10" HD (PA3010PHD)	30374403
		REDUCER, 3" X 2" X 28 HD (PA302028HD)	30374168

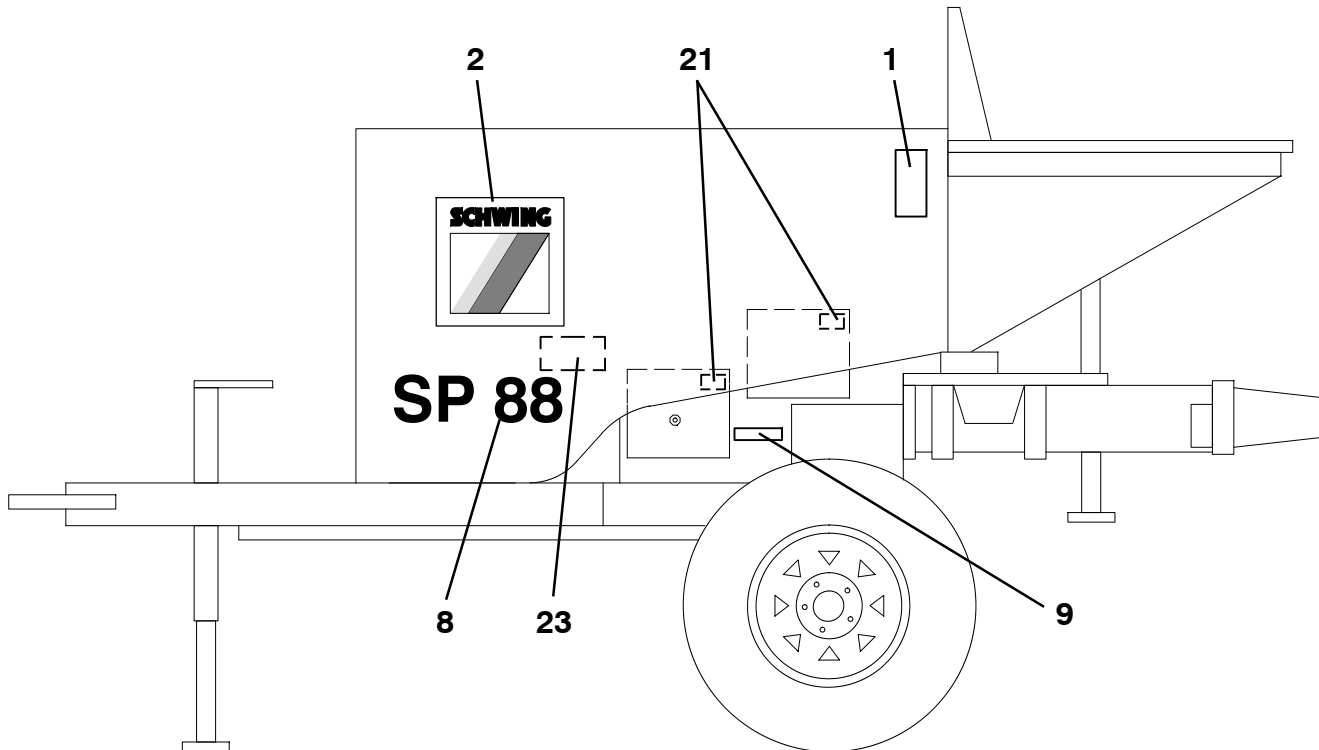
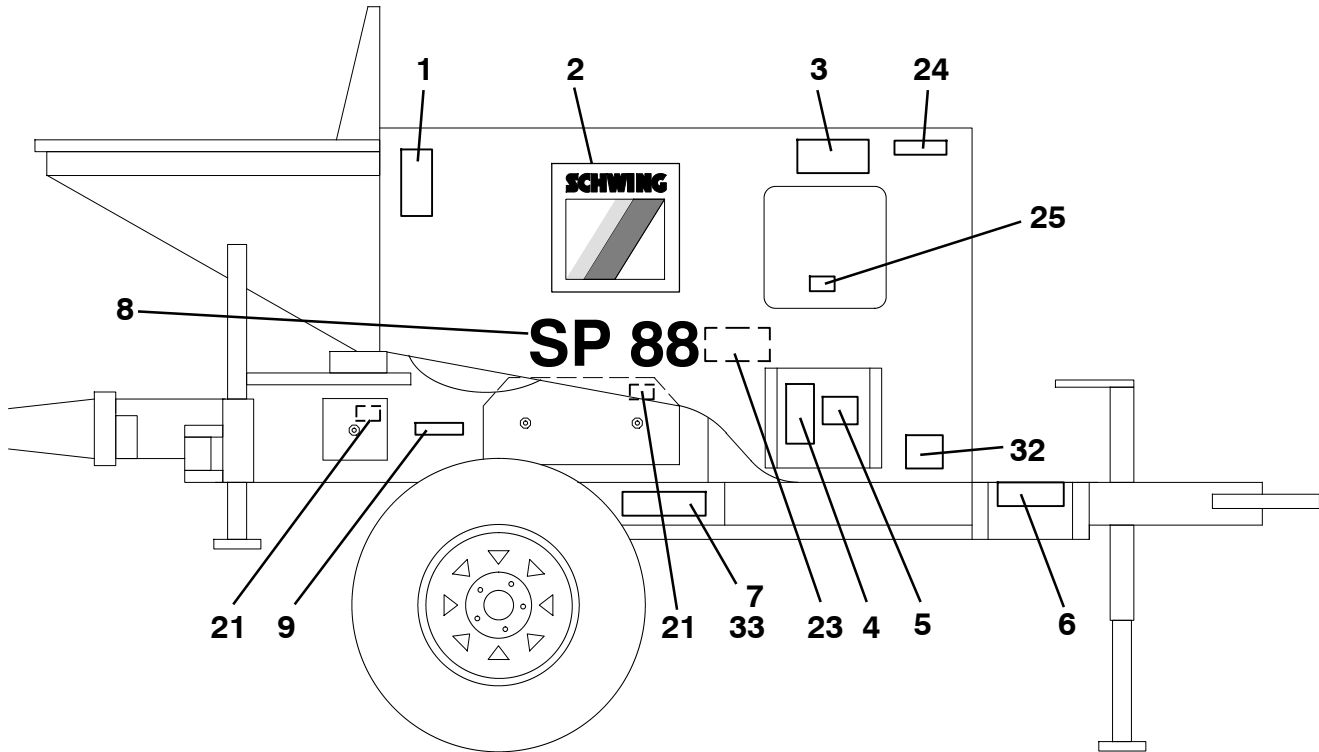
SCHWING RECOMMENDATION ON SHOTCRETING WITH BALL VALVE ONLY

1. AIR VIBRATOR MOUNTED ON REDUCER GREATLY IMPROVES PUMPABILITY, BUT NOT NECESSARY.
2. VIBRATORS SHOULD BE TURNED OFF WHEN PUMP IS STOPPED TO PREVENT SEPARATION OF CONCRETE MIX.
3. STEEL PIPE IS AVAILABLE AND WILL HELP REDUCE LINE PRESSURE AND IS RECOMMENDED.
4. AIR SHOULD BE LEFT ON AT NOZZLE TIP WHEN PUMP IS STOPPED TO PREVENT CLOGGING OF AIR INSERT HOLES.
5. USE STEEL ELBOW AT EDGE OF POOL TO PREVENT WEAR OF FABRIC HOSE AND COLLAPSE OF RUBBER HOSE.





Pos.	Qty.	Description	Part No.
ACCESSORIES INCLUDED WITH PUMP			
1	1	REMOTE CABLE ASSEMBLY	30391589
	1	REMOTE CABLE ASSEMBLY, DIESEL	30391629
	1	REMOTE CABLE ASSEMBLY, 200 FEET	30394753
2	1	FOOT, JACK (PM1155-1A)	30373476
	1	JACK PIN WITH CLIP	30394730
	1	JACK PIN WITH CLIP (REPLACED 01/02)	30373478
3	1	REDUCER, 3 X 2 X 28 HD (PA302028HD)	30374168
	1	REDUCER, 3 X 2 X 36 HD	30374173
4	1	ELBOW, 3", 90° HD (PA3090HD)	30372981
5	2	SNAP CLAMP, 3" HD, WITH GASKET (PA3HDSC)	30372216
6	2	GASKET, 3" HD (PA3HDGSKT)	30370111
7	1	ENGINE MANUAL - NOT SHOWN	NA
8	1	PARTS LIST/OPERATION MANUAL - NOT SHOWN	30372907
9	1	SAFETY MANUAL - NOT SHOWN	30327535
10	1	SAFETY MANUAL QUICK INDEX - NOT SHOWN	30327536
OPTIONAL ACCESSORIES			
		HOSE, 2" X 25' HD (PAH2025HD)	30315857
		HOSE, 2" X 50' HD (PAH2050HD)	30372360
		HOSE, 2-1/2" X 25' HD (PAH2525HD)	30372370
		HOSE, 3" X 25' HD (PAH3025HD)	30372378
		SNAP CLAMP, 2" HD, WITH GASKET (PA2HDSC)	30372207
		SNAP CLAMP, 2-1/2" HD, WITH GASKET (PA25HDSC)	30372210
		REDUCER, 3 X 2-1/2 X 28 HD	30374177
		SHOTCRETE GUN HD (PM1135CWD)	30373440
		ELBOW, 3", 90° HD, 16" (PA309016HD)	30315399
		ELBOW, 3", 45° HD, 16"	30372999
		PIPELINE, 2" X 10' HD	30380243
		PIPELINE, 3" X 10' HD	30374403
SCHWING PAINT COLORS			
	CREAM	SHERWIN WILLIAMS F10A3623 VALSPAR 7008101	
	GREEN	SHERWIN WILLIAMS J6V2324 VALSPAR 85262032	
	WHITE	SHERWIN WILLIAMS J51706 VALSPAR 700W1415 DUPONT IMRON 5000 751076HN RAL 9016	
DEUTZ ENGINE PAINT COLORS			
	SLATE GREY	DEUTZ 33637	
	MATTE	DEUTZ 33638	



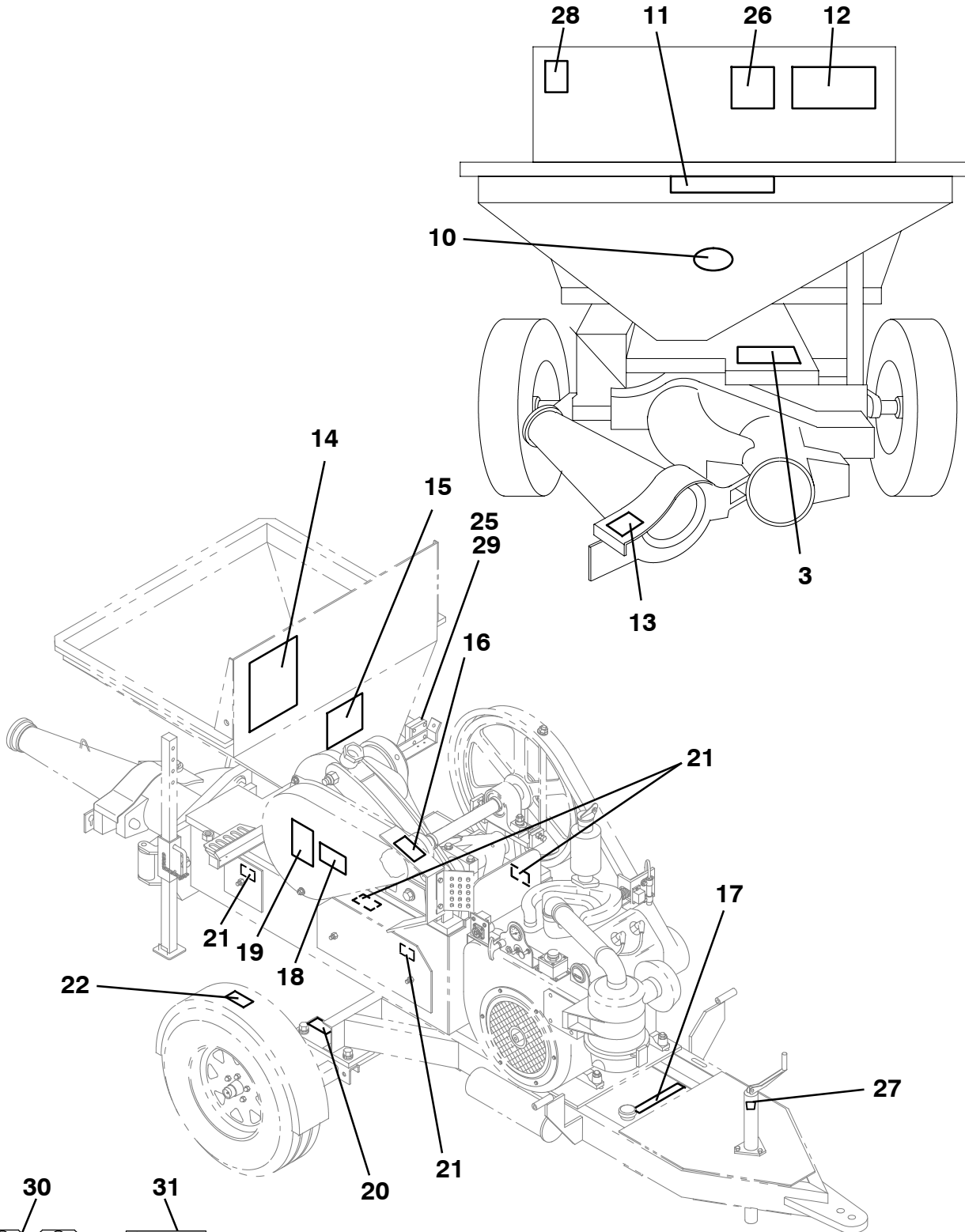
**SCHWING****SAFETY LABELS**

30390787

SECTION

5

Pos.	Qty.	Description	Part No.
1	2	WARNING, MOVING PARTS	30340492A
2	2	SCHWING LOGO, LARGE	30390162
3	2	WARNING, EYE & EAR PROTECTION	30336983D
4	1	WARNING, DO NOT OPERATE WITHOUT TRAINING	30335000B
5	1	ORDERING INFORMATION	30333268F
6	1	PARTS & OPERATION MANUAL	30390207
7	1	SERIAL NUMBER PLATE	30325023D
8	2	DECAL, SP 88	30390681A
9	2	WATER LEVEL INDICATION	30390461
10	1	MEMBER, CONCRETE PUMP MANUFACTURERS ASSOCIATION	30355887A
11	1	SCHWING LOGO, SMALL	30390179
12	1	WARNING, REMOTE CONTROL	30309999D
13	1	WARNING, EXPLOSION HAZARD	30393651
14	1	SAFETY INSTRUCTIONS	30312146B
15	1	ADJUSTMENT	30391921
16	1	CHAIN MANUFACTURER	SEE MFG
17	1	GASOLINE ONLY	30390567
	1	DIESEL ONLY	30349283
18	1	SAFETY INSTRUCTIONS	30390151A
19	1	WARNING, MOVING PARTS	30326445A
20	1	AXLE LUBRICATION INSTRUCTIONS	SEE MFG
21	6	WARNING, SAFETY GUARD IS MISSING	30337004A
22	2	WARNING, RETORQUE LUG NUTS	30350290B
23	2	WARNING, BURN HAZARD	30364523B
24	1	HAND SIGNALS	30365188A
25	2	EMERGENCY STOP	30340149A
26	1	WARNING, CEMENT DUST	30632340A
27	1	JACK CAPACITY, CEQUENT F3351	SEE MFG
28	3	WARNING, GRATES	30309998D
29	1	EMERGENCY STOP	30333578A
30	1	TAG, DO NOT OPERATE, BILINGUAL	30332962
31	1	MAGNETIC TAG, DO NOT OPERATE, BILINGUAL (IN TOOL BOX)	30332963
32	1	CPMA CERTIFICATION PLATE	30369730A
33	4	RIVET, POP, 1/8"	30373233
34	1	SAFETY LABEL SET, COMPLETE - SPECIFY FUEL TYPE	30390787



**SCHWING****SAFETY LABELS (CONTINUED)**

SECTION

5

30390787

Pos.	Qty.	Description	Part No.
1	2	WARNING, MOVING PARTS	30340492A
2	2	SCHWING LOGO, LARGE	30390162
3	2	WARNING, EYE & EAR PROTECTION	30336983D
4	1	WARNING, DO NOT OPERATE WITHOUT TRAINING	30335000B
5	1	ORDERING INFORMATION	30333268D
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7	1	SERIAL NUMBER PLATE	30325023F
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24	1	HAND SIGNALS	30365188A
25	2	EMERGENCY STOP	30340149A
26	1	WARNING, CEMENT DUST	30632340A
27	1	JACK CAPACITY, CEQUENT F3351	SEE MFG
28	3	WARNING, GRATES	30309998D
29	1	EMERGENCY STOP	30333578A
30	1	TAG, DO NOT OPERATE, BILINGUAL	30332962
31	1	MAGNETIC TAG, DO NOT OPERATE, BILINGUAL (IN TOOL BOX)	30332963
32	1	CPMA CERTIFICATION PLATE	30369730A
33	4	RIVET, POP, 1/8"	30373233
34	1	SAFETY LABEL SET, COMPLETE - SPECIFY FUEL TYPE	30390787



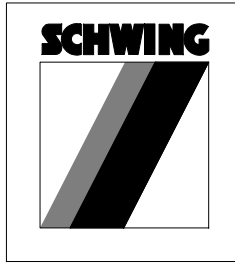
WARNING

Moving parts inside. Keep hood closed when engine is running.

ADVERTENCIA

Contiene piezas móviles. Mantenga cerrada la cubierta cuando el motor está en marcha.

1



2

ADVERTENCIA WARNING

Do not point laser at others or into eyes.

3

WARNING

Do not operate this machine without training. Understand the warnings in safety manuals and on decals.

ADVERTENCIA

No use esta maquinaria sin estar capacitado. Entienda las advertencias de los manuales de seguridad y de las calcomanías.

4

IMPORTANT	IMPORTANTE
You can order additional operation manuals, spare parts books, safety manuals and decal sets by contacting us at: Schwing America, Inc. (800)-237-8960 7:00 AM to 5:00 PM Eastern Time Monday through Friday	Usted puede solicitar manuales de operación, catálogos de refacciones, manuales de seguridad y juegos de calcomanías adicionales contactando a: Schwing America, Inc. (800)-237-8960 DE 7:00 AM a 5:00 PM Hora del este DE LUNES A VIERNES

Do not point over this label/No pintar encima de esta etiqueta. 3033386 D

5

**PARTS AND OPERATION
MANUAL**

6

SCHWING 3000 Conchita Dr. Wood Dale, IL 60191 Phone: 815-429-0999 www.schwing.com		SCHWING GmbH Helmuth-Göhring-Str. 1 Munich 85386, Germany www.schwing.de	
MODEL / MODELO	SERIAL # / # DE SERIE	YEAR / AÑO	
WEIGHT / PESO	TONGUE WEIGHT / PESO DE ENGANCHE	ENGINE RPM / RPM DE MOTOR	STROKES PER MINUTE / CARRILLAS POR MINUTO
			MATERIAL PRESSURE / PRESION MATERIAL

7

SP 88

8



9



10

SCHWING

11

WARNING

This machine is remote controlled and may start at any time. Stop engine before servicing unit.

ADVERTENCIA

Esta máquina funciona a control remoto y puede ponerse en marcha en cualquier momento. Apague el motor antes de realizar el mantenimiento.

12

WARNING

Before opening a blocked pipeline, relieve pressure.

30390551

13

SAFETY INSTRUCTIONS / INSTRUCCIONES DE SEGURIDAD

Read and understand all safety instructions before operating this machine. Failure to follow these instructions may result in injury or death.

1. Always wear your seat belt when operating the machine.

2. Do not drink alcohol or use drugs before operating the machine.

3. Do not operate the machine if you are tired or if you have been drinking alcohol or using drugs.

4. Do not operate the machine if you are under the influence of alcohol or drugs.

5. Do not operate the machine if you are wearing headphones or earplugs.

6. Do not operate the machine if you are wearing loose clothing or jewelry.

7. Do not operate the machine if you are wearing shoes without proper tread.

8. Do not operate the machine if you are wearing safety glasses that are not properly adjusted.

9. Do not operate the machine if you are wearing a watch or bracelet.

10. Do not operate the machine if you are wearing a ring.

11. Do not operate the machine if you are wearing a necklace.

12. Do not operate the machine if you are wearing a tie.

13. Do not operate the machine if you are wearing a belt.

14. Do not operate the machine if you are wearing a hat.

15. Do not operate the machine if you are wearing a scarf.

16. Do not operate the machine if you are wearing a jacket.

17. Do not operate the machine if you are wearing a sweater.

18. Do not operate the machine if you are wearing a shirt.

19. Do not operate the machine if you are wearing a pair of pants.

20. Do not operate the machine if you are wearing a pair of shoes.

21. Do not operate the machine if you are wearing a pair of socks.

22. Do not operate the machine if you are wearing a pair of underwear.

23. Do not operate the machine if you are wearing a pair of pajamas.

24. Do not operate the machine if you are wearing a pair of nightgowns.

25. Do not operate the machine if you are wearing a pair of slippers.

26. Do not operate the machine if you are wearing a pair of flip-flops.

27. Do not operate the machine if you are wearing a pair of sandals.

28. Do not operate the machine if you are wearing a pair of boots.

29. Do not operate the machine if you are wearing a pair of sneakers.

30. Do not operate the machine if you are wearing a pair of dress shoes.

31. Do not operate the machine if you are wearing a pair of loafers.

32. Do not operate the machine if you are wearing a pair of moccasins.

33. Do not operate the machine if you are wearing a pair of oxfords.

34. Do not operate the machine if you are wearing a pair of pumps.

35. Do not operate the machine if you are wearing a pair of sandals.

36. Do not operate the machine if you are wearing a pair of boots.

37. Do not operate the machine if you are wearing a pair of sneakers.

38. Do not operate the machine if you are wearing a pair of dress shoes.

39. Do not operate the machine if you are wearing a pair of loafers.

40. Do not operate the machine if you are wearing a pair of moccasins.

41. Do not operate the machine if you are wearing a pair of oxfords.

42. Do not operate the machine if you are wearing a pair of pumps.

43. Do not operate the machine if you are wearing a pair of sandals.

44. Do not operate the machine if you are wearing a pair of boots.

45. Do not operate the machine if you are wearing a pair of sneakers.

46. Do not operate the machine if you are wearing a pair of dress shoes.

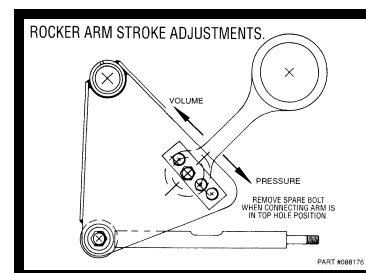
47. Do not operate the machine if you are wearing a pair of loafers.

48. Do not operate the machine if you are wearing a pair of moccasins.

49. Do not operate the machine if you are wearing a pair of oxfords.

50. Do not operate the machine if you are wearing a pair of pumps.

14



15



16



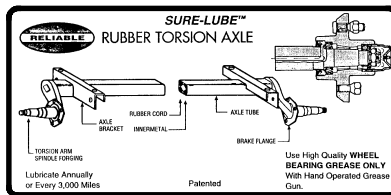
17

SAFETY INSTRUCTIONS	INSTRUCCIONES DE SEGURIDAD
Service chain every 8 to 16 hours	Haga el mantenimiento de la cadena cada 8 a 16 horas
1. Stop engine and remove key. 2. Put a "do not operate" tag on ignition switch. 3. Remove the guard. 4. Service the chain according to the operation manual. 5. Replace the guard. 6. Remove tag from ignition switch. 7. Replace key.	1. Detenga el motor y retire la llave. 2. Coloque una señal que diga "NO UTILIZAR" en el interruptor de arranque. 3. Retire la guarda. 4. Haga el mantenimiento de la cadena según se indica en el manual del operador. 5. Coloque nuevamente la guarda. 6. Retire la señal que colocó en el interruptor de arranque. 7. Coloque la llave nuevamente en su lugar.

18



19



20



21



22



23



24



25



26



27



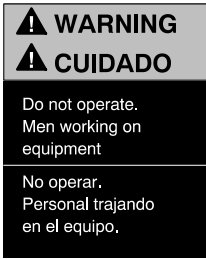
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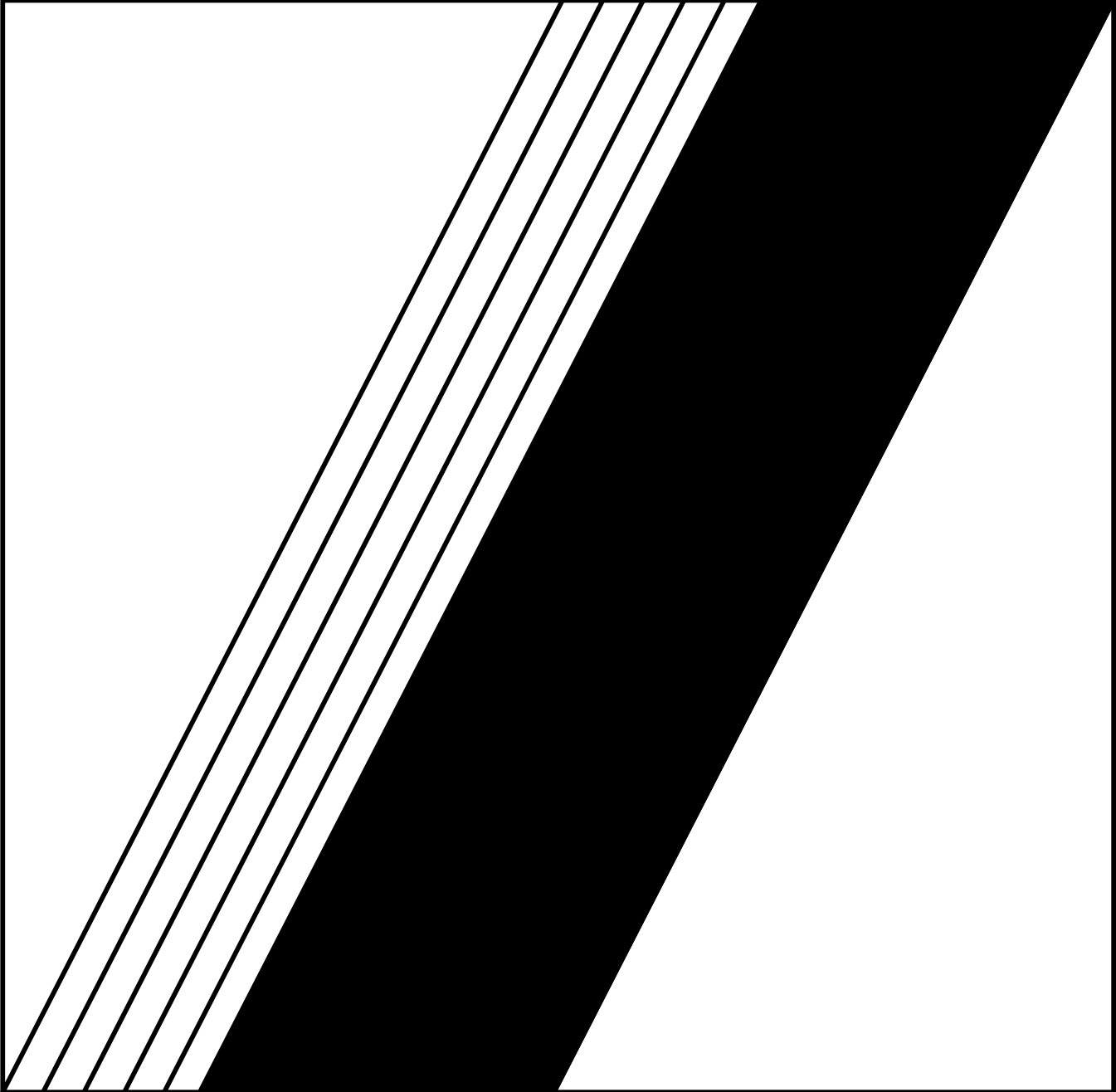


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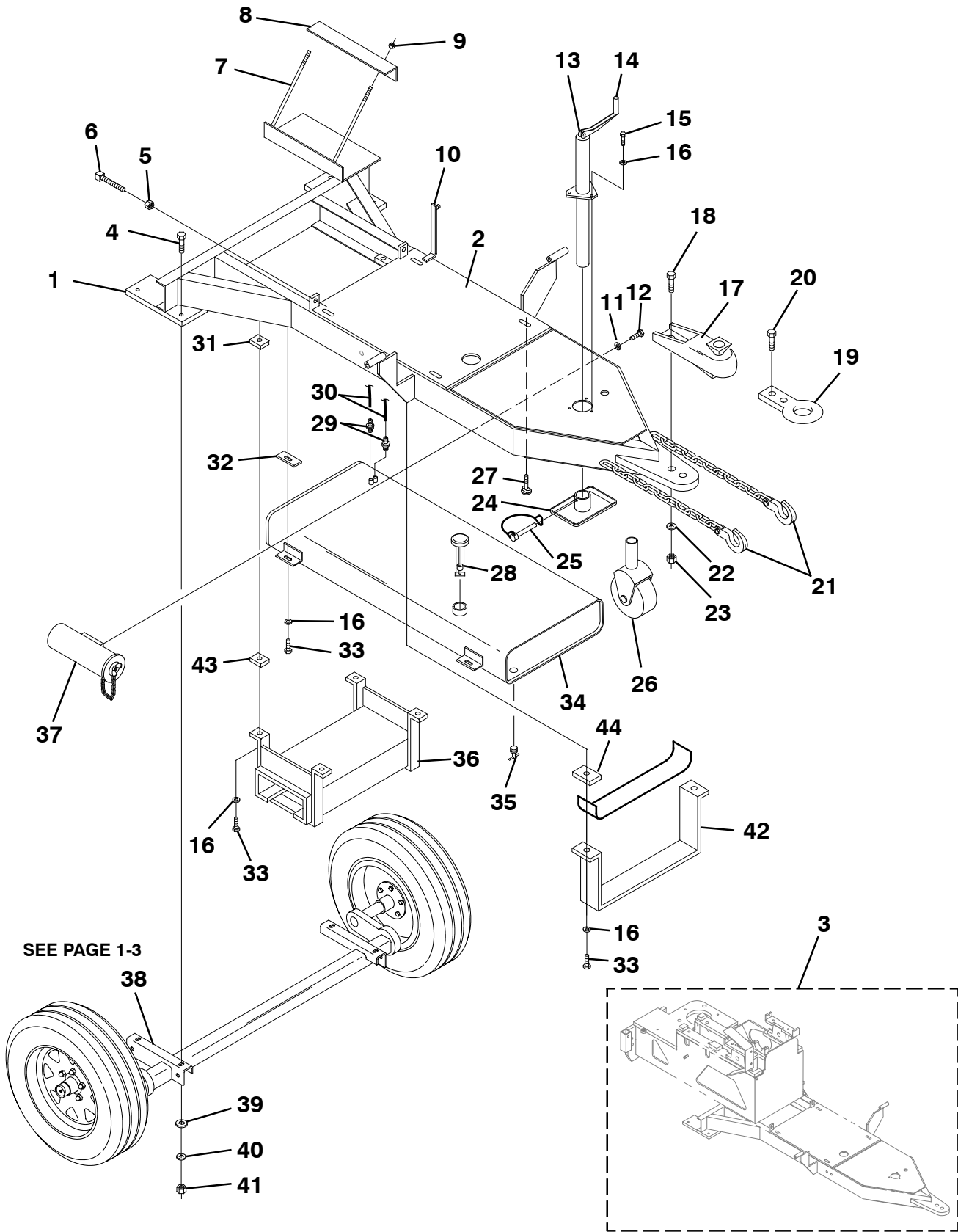


Pos.	Qty.	Description	Part No.
RECOMMENDED SPARE PARTS FOR SCHWING BALL VALVE			
	1	BALL VALVE KIT, DUAL, 6"	30373118
	1	BALL VALVE KIT, P125, 7"	30373121
	2	PISTON CUP, GREEN, NEO, 6"	30392560
	2	PISTON CUP, BLACK, BUNA, 6" (PM1031)	30373172
	2	PISTON CUP, RUST, NEO, 6"	30373126
	2	PISTON CUP, GREEN, NEO, 7"	30393593
	2	PISTON CUP, BLACK, BUNA, 7" (PM10317)	30373174
	2	PISTON CUP, RUST, NEO, 7"	30373175
	1	LOWER ROD BEARING KIT	30373571
	1	CAM ASSEMBLY SEAL PACK	30373570
	2	O-RING SEAL, CYLINDER BOX	30373160
	2	O-RING, CYLINDER	30373161
	1	O-RING, 12 PACK	30373304
	1	O-RING, 12 PACK	30373324
	2	V-BELT, DOUBLE B-91	30373203
	1	DIAMOND ROLLER CHAIN, INCLUDES MASTER & OFFSET LINK	30373397
	1	MASTER LINK, DIAMOND ROLLER CHAIN	30373211
	1	OFFSET LINK, DIAMOND ROLLER CHAIN	30373213
	6	FELT, LARGE CAM OILER	30373315
	1	PLUG, CAM OILER	30373316
	1	COMPRESSION SPRING, LARGE	30373335
	1	ROLL PIN	30373336
	1	PISTON ROD	30373345
	1	WEDGE KIT, 4 PACK	30373421
	1	RETAINING BOLT, 6"	30373423
	1	NUT, 1", FOR RETAINING BOLT	30373466
	1	EXPANSION PLUG	30373425
	1	AIR FILTER - AFTER 5/95	30390501
RECOMMENDED WEAR PART KIT FOR SCHWING BALL VALVE			
	1	WEAR PART KIT	30395754
		INCLUDES THE FOLLOWING ITEMS	
	1	BALL VALVE KIT, DUAL, 6"	30373118
	2	PISTON CUP, BLACK, BUNA, 6" (PM1031)	30373172
	1	DIAMOND ROLLER CHAIN, INCLUDES MASTER & OFFSET LINK	30373397
	1	O-RING, 12 PACK	30373304

SECTION 6



DIESEL OPTION



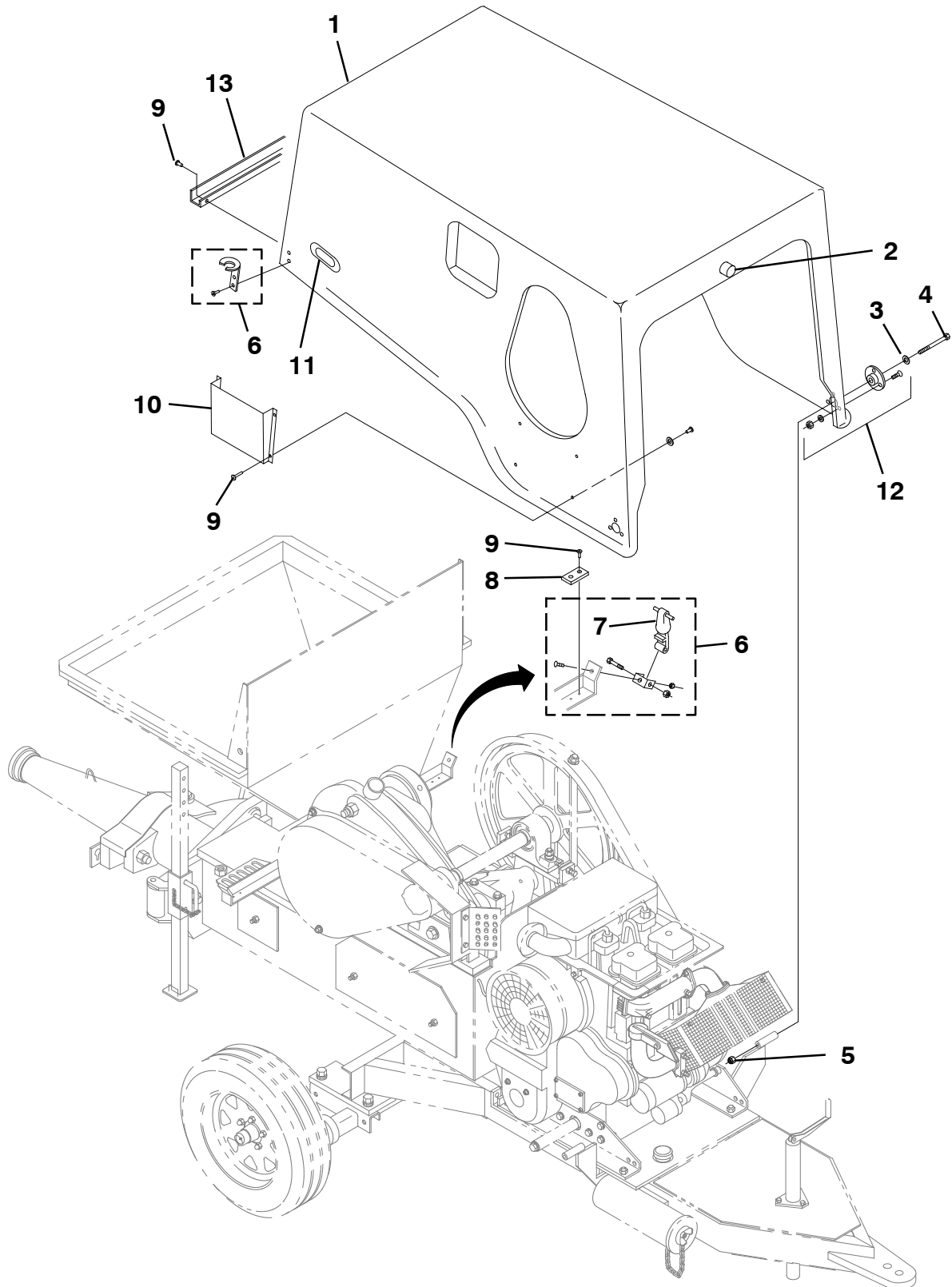


**SP 88 DIESEL
FRAME AND ATTACHMENTS**

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	DIESEL FRAME ASSEMBLY, INCLUDES ENGINE PLATE (SPECIFY)	30392036
2	1	ENGINE PLATE ONLY, DEUTZ F2L2011	30394634
	1	ENGINE PLATE ONLY, HATZ 2M41Z	30391186
3	1	FRAME, DEUTZ ENGINE PLATE AND WATER BOX WELDMENT	30394647
	1	FRAME ASSEMBLY, WITH WATER BOX, SKID MOUNT	30393849
	1	FRAME ASSEMBLY ONLY, SKID MOUNT	30392044
	1	WATER BOX ONLY, SKID MOUNT	30391178
4	4	BOLT, 1/2-13 X 2"	30337904
5	2	NUT, ADJUSTING, 1/2" (PM9029)	30373846
6	2	BOLT, SQUARE HEAD 1/2" X 3" (PM9049B)	30373866
7	2	STUD, BATTERY HOLD DOWN (PM1158)	30373482
8	1	BRACKET, BATTERY HOLD DOWN (PM1157)	30373481
9	2	NUT, NYLOCK, 3/8"	30389195
		ITEMS 7, 8 & 9 NOT REQUIRED WHEN 30396492 BATTERY BOX USED	
10	1	BRACKET	30392385
11	2	WASHER, LOCK, 1/4" (PM9035)	30373852
12	2	BOLT, 1/4-20 X 3/4"	30373841
13	1	JACK, SUPPORT (PM1155)	30373474
14	1	HANDLE, JACK	30390836
15	3	BOLT, 3/8" X 1"	30391549
16	11	WASHER, FLAT, 3/8" (PM9076)	30396619
17	1	BALL COUPLER, 2" (PM9087)	30373898
18	2	BOLT, 1"-14 X 2-1/2" GR8	30373191
		REPAIR KIT	30391015
19	1	TOW RING (OPTIONAL) (PM9098)	30391102
20	2	BOLT, 1"-14 X 3" GR8	30394890
21	2	SAFETY CHAIN (PM1156)	30373480
22	2	WASHER, FLAT, 1" SAE	30394650
23	2	NUT, NYLOCK, 1"	30373908
24	1	JACK FOOT (PM1155-1A) INCLUDES JACK PIN WITH CLIP	30373476
25	1	JACK PIN WITH CLIP	30394730
	1	JACK PIN WITH CLIP (REPLACED 01/02)	30373478
26	1	JACK, CASTER - OPTIONAL	30373477
27	4	BOLT, T-SLOT (PM9152)	30373940
28	1	FUEL CAP WITH GAUGE (PM1162-1P)	30373488
29	2	FITTING, BARBED, 1/4" (PM1163-2P)	30373495
30	A/R	FUEL LINE (PM1175)	30373513
31	4	NUT, WELDMENT	30329715
32	4	PAD, FUEL TANK (PM1163PAD)	30373496
33	8	BOLT, 3/8" X 1-3/4" (PM9168)	30373946
34	1	FUEL TANK (PM116348)	30373497
35	1	PETCOCK (PM1162-3P)	30373491
36	1	LIFTING BRACKET	30391196
37	1	MANUAL TUBE ASSEMBLY	30327997
	1	EXPANSION PLUG, WITH WING NUT	30391552
	1	WING NUT, 3/8-16	30392768
38	1	AXLE, ASSEMBLY (PM1099)	30373339
39	4	WASHER, FLAT, 1/2" SAE	30391335
40	4	WASHER, WILLIAMS, 1/2" (PM9026-W)	30373844
41	4	NUT, NYLOCK 1/2-13	30391247
42	2	STRAP, FUEL TANK	30391427
43	4	SPACER BLOCK	30394483
44	2	SPACER BLOCK	30394484





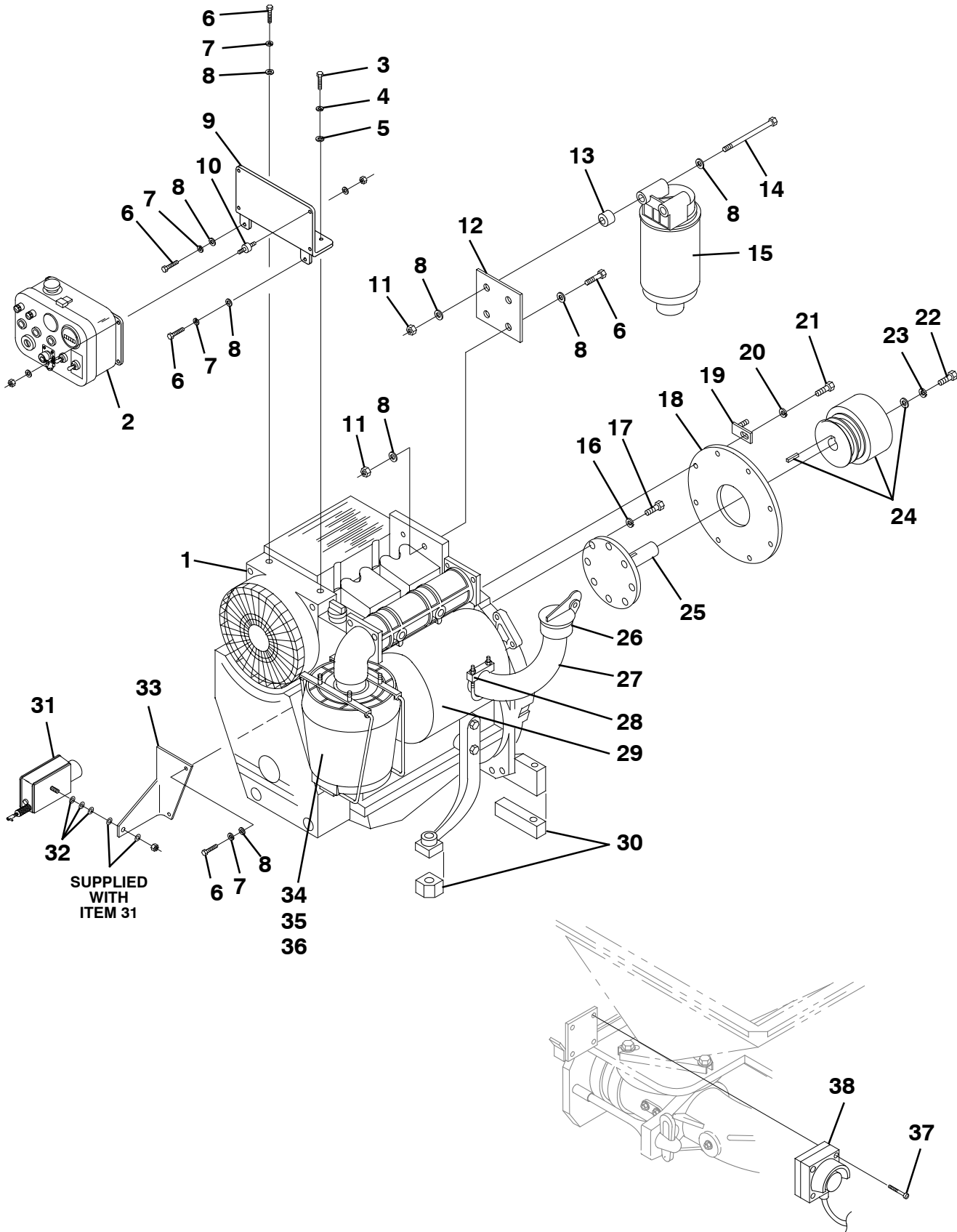
SCHWING

HOOD ASSEMBLY

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	HOOD, HATZ 2M40LZ	30390722
	1	HOOD, HATZ Z790, EXTENDED SIDE	30373227
	1	HOOD, DEUTZ F2L1011	30373225
2	1	BUMPER PAD (PM1161B)	30373433
3	2	WASHER, FLAT, 1/2" (PM9026)	30373843
4	2	BOLT, 1/2" X 4-1/2" NC (PM9047)	30373862
5	2	NUT, NYLOCK, 1/2" (PM9030)	30373847
6	2	HOOD LATCH ARM ASSEMBLY, INCLUDES ITEM 7 (PM1063-2P)	30373231
7	2	HOOD HOOK, RUBBER (PM1063R)	30373235
8	2	PAD, HOOD REST	30373434
9	12	RIVET, POP, 3/16" (PM1063-2PR)	30373232
10	1	POCKET, MANUAL HOLDER	30327999
11	2	HANDLE, RUBBER INSERT	30390894
12	2	PIVOT BUSHING KIT	30392668
13	1	HOODREST STRIP, UHMW	30392669
	1	HOOD ASSEMBLED COMPLETE, WITH DECALS, READY TO INSTALL - SPECIFY WHEN ORDERING - (INCLUDES SERVICE CHARGE FOR LABOR)	SEE MFG



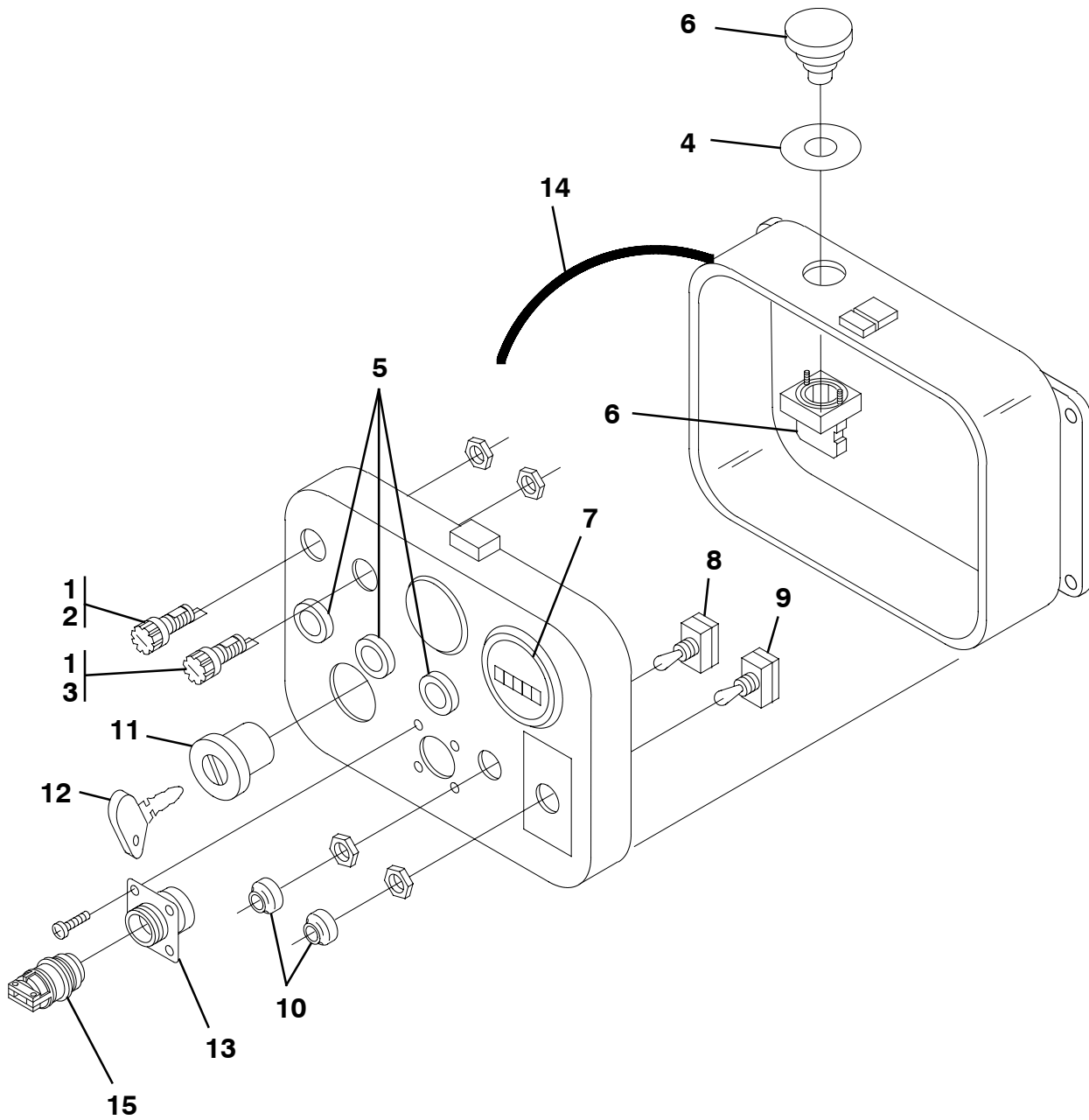


DEUTZ F2L2011 DIESEL ENGINE ASSEMBLY

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	DEUTZ DIESEL ENGINE F2L2011	30395440
2	1	CONTROL BOX ASSEMBLY	30395855
3	1	BOLT, M6 X 20, DIN 933, GR8.8	10001764
4	1	WASHER, LOCK, M6	10001553
5	1	WASHER, FLAT, M6, DIN 125, GR6.4	10011106
6	7	BOLT, M8 X 20, DIN 931	30392298
7	5	WASHER, LOCK, M8	10001572
8	13	WASHER, FLAT, M8, DIN 125, GR8.4	10010371
9	1	BRACKET, CONTROL PANEL SUPPORT	30394654
10	4	ISOLATION MOUNT	30394295
11	4	NUT, M8, NYLOCK	10098752
12	1	BRACKET, FUEL FILTER MOUNTING	30396692
13	2	SPACER, 16MM X 2.5 MM	30390588
14	2	BOLT, M8 X 70	10001256
15	1	FUEL FILTER, DEUTZ 01174482	30397046
16	8	WASHER, LOCK, M10	10001711
17	8	SCREW, SOCKET HEAD CAP, M10 X 25	30308336
18	1	COVER, HOUSING PLATE	30394652
19	1	BRACKET, BELT GUARD	30394712
20	8	WASHER, LOCK, M10	10001577
21	8	BOLT, M10 X 25	10001861
22	1	SCREW, HEX HEAD CAP, 1/2-13 X 2", NC, GR8	30337904
23	1	WASHER, LOCK, 1/2", MA19	30373845
24	1	CLUTCH, SPECIAL, HP 6060P058	30373272
25	1	STUB SHAFT	30392025
26	1	RAIN CAP, 2"	30312149
27	1	EXHAUST PIPE, ELBOW, 90°, 1-7/8" O.D., DEUTZ 2011	30394816
28	1	CLAMP, MUFFLER, 2"	30396986
29	1	EXHAUST SILENCER, DEUTZ 419-1470	30396743
	1	EXHAUST SILENCER, LONG (NOT SHOWN)	30396241
30	4	SPACER BLOCKS, SET OF FOUR, WELD	30394637
31	1	ACTUATOR ASSEMBLY, REMOTE CONTROL 720-0142	30333049
32	3	WASHER, FLAT, 1/2"	30391335
33	1	BRACKET, ACTUATOR SUPPORT	30394651
34	1	AIR CLEANER ASSEMBLY	30391100
	1	AIR FILTER INDICATOR	30330550
	1	AIR FILTER (INSERT) 4384102	30390446
35	2	HOSE CLAMP, 3"	30391561
36	1	ELBOW, AIR INTAKE, 45°	30390095
37	4	SCREW, SOCKET HEAD CAP, M4 X 30, 12.9	10087381
38	3	EMERGENCY STOP STATION, SIEMENS 3SB1831-8AQZ	10205385
	1	EMERGENCY STOP SWITCH ASSEMBLY, SIEMENS 3SB3603-1HA20	SEE MFG
	1	PUSH BUTTON, SIEMENS 3SB3500-1HA20	30396339
	1	CONTACT BLOCK (2005) SIEMENS 3SB3423-OC	10209386
		ADDITIONAL SPARE PARTS	
	1	FUEL FILTER ASSEMBLY, COMPLETE, DEUTZ SA029-2412	30394440
	1	FUEL FILTER, DEUTZ 116-4696	30373952
	1	FUEL FILTER, LONG, DEUTZ 117-4402 (AFTER NOV 2005)	30396683
	1	FUEL FILTER, W/WATER SEPARATOR, AFTER 2005, DEUTZ 117-4482	30397046
	1	OIL FILTER, DEUTZ 117-4416	30392789
	1	HIGH PRESSURE HOSE, 8 X 300, OIL DRAIN	10045794
	1	WIRING HARNESS, ENGINE	30394664
	1	V-BELT, COOLING FAN, 9J920	SEE MFG
	1	STARTER MOTOR, DEUTZ 118-2384	30396642



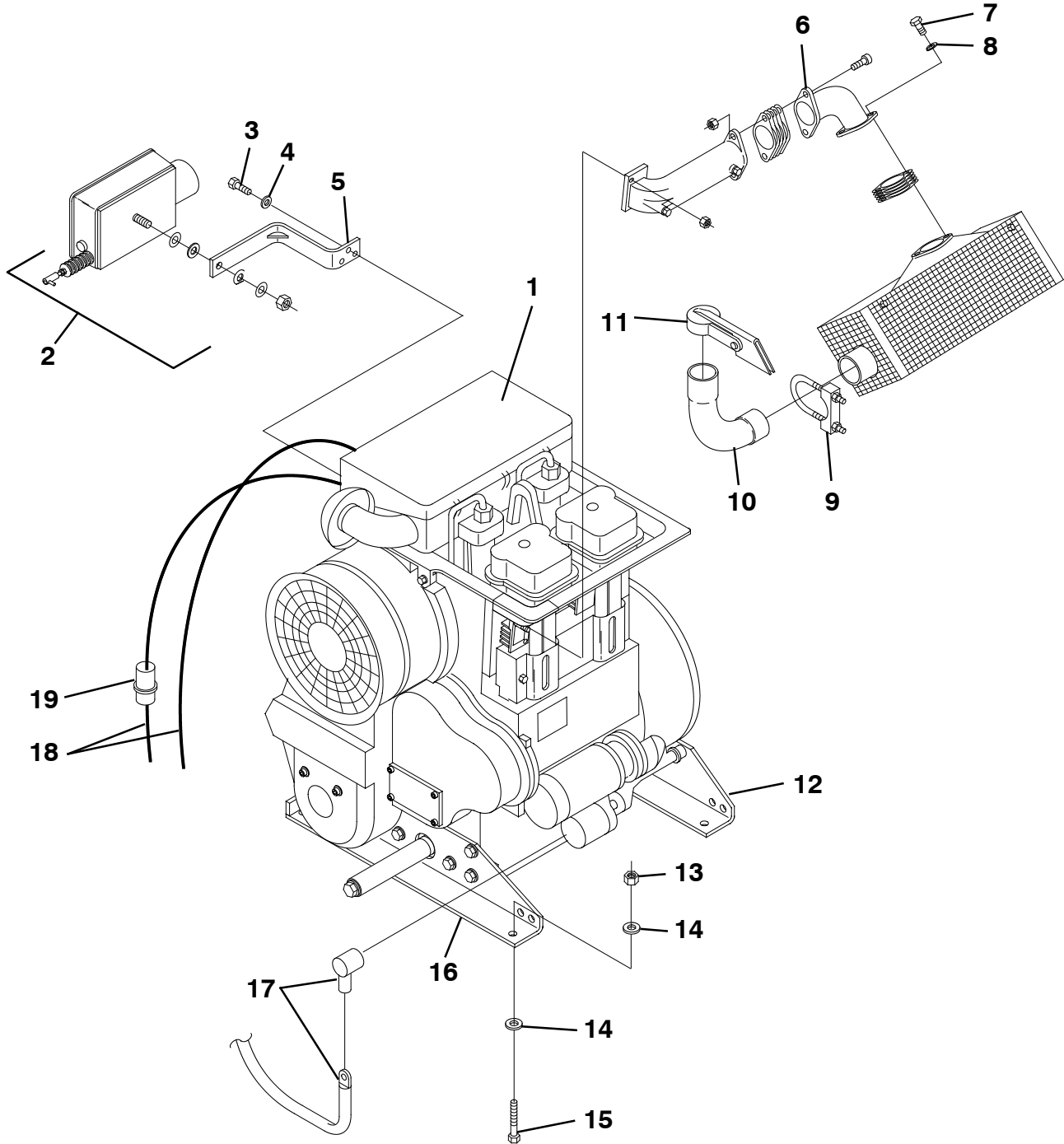
**SCHWING****DEUTZ F2L2011 DIESEL
CONTROL BOX ASSEMBLY**

30395855

SECTION

6

Pos.	Qty.	Description	Part No.
	1	CONTROL BOX ASSEMBLY - DUAL E-STOP	30395855
	1	CONTROL BOX ASSEMBLY - SINGLE E-STOP	30394662
1	2	FUSE HOLDER (LITTEL)	30391551
2	1	FUSE, 3 AMP, DEL CITY 79815 1/4" X 1-1/4"	SEE MFG
3	1	FUSE, 10 AMP	30391938
4	1	SAFETY LABEL, EMERGENCY STOP	30333578
5	3	INDICATOR LIGHT ASSEMBLY, RED	30390092
		LAMP	30390091
6	1	PUSH-BUTTON SWITCH ASSEMBLY	30396339
7	1	HOUR METER (FUSED, 6A)	30302179
8	1	TOGGLE SWITCH LOCAL/REMOTE	30314009
9	1	TOGGLE SWITCH, THROTTLE	30373456
10	2	RUBBER BOOT	30373458
11	1	IGNITION SWITCH, DEUTZ 1175809	30330502
12	1	KEY, IGNITION, DEUTZ 4350834	30391342
13	1	REMOTE PLUG, FEMALE, FLANGED	30391586
14	1	CABLE HARNESS ASSEMBLY - DUAL E-STOP	SEE MFG
	1	CABLE HARNESS ASSEMBLY - SINGLE E-STOP	30394740
15	1	DUMMY PLUG WITH CHAIN	30330545

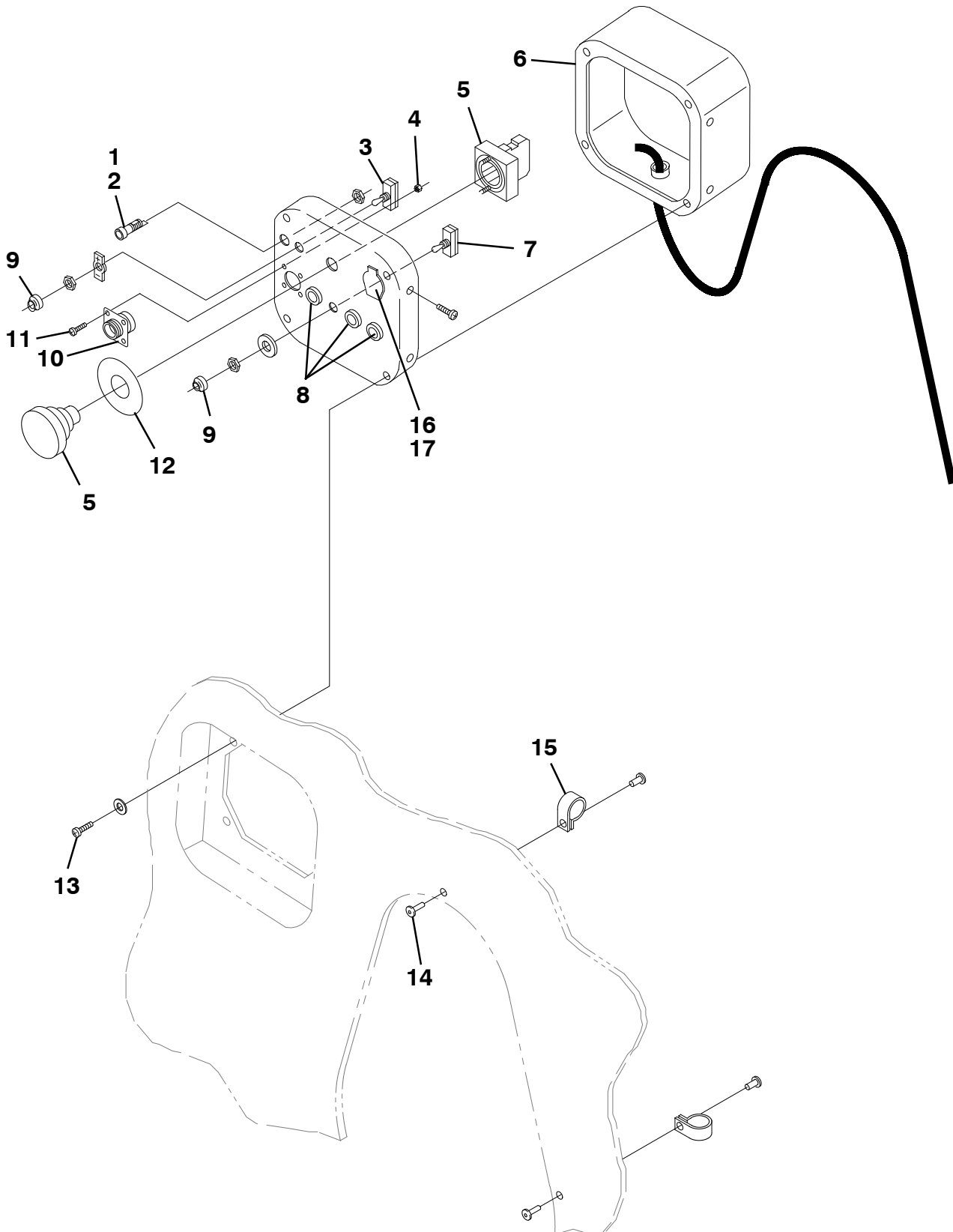
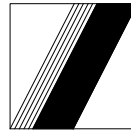


**SCHWING****HATZ 2M41Z DIESEL ENGINE ASSEMBLY**

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	HATZ 2M41Z DIESEL ENGINE, COMPLETE	30391199
		ENGINE ONLY	30391128
2	1	ACTUATOR	30333049
3	3	BOLT, M8 X 25	10001808
4	3	WASHER, LOCK, M8	10001572
5	1	BRACKET	30391628
6	1	ELBOW, EXHAUST MANIFOLD (PM9166)	30373945
7	2	BOLT, M10 X 25	10001859
8	2	WASHER, LOCK, M10	10001577
9	1	CLAMP	30390170
10	1	ELBOW, EXHAUST PIPE	30391200
11	1	RAIN CAP	30312149
12	1	MOTOR MOUNT, REAR	30391926
13	4	NUT, NYLOCK, 1/2" (PM9030)	30373847
14	8	WASHER, FLAT, 1/2"	30373843
15	4	BOLT, 1/2-13 X 2"	30309367
16	1	MOTOR MOUNT, FRONT	30391925
17	1	CABLE, BATTERY, POSITIVE WITH COVER (PM1174)	30373511
18	1	FUEL LINE (PM1175)	30373513
19	1	FUEL FILTER, INLINE (PM1175FF)	30373515
	1	FUEL FILTER, SPIN-ON (NOT SHOWN) HATZ 50251500	30391245
Additional spare parts			
20	1	STUB SHAFT	30391201
21	1	PRE-AIR FILTER (PM9181) HATZ 009-53700	30373949
22	1	AIR FILTER (PM9180) HATZ 009-52900	30373948
23	1	OIL FILTER (PM9182) HATZ 400-65300	30373950
24	1	ALTERNATOR, HATZ 401-21002	SEE MFG
25	1	ENGINE CATALYST	30394739
26	1	V-BELT, BLOWER, 9J920, HATZ 50203101	SEE MFG
27	1	SHUT-OFF VALVE, HATZ 017-62400	SEE MFG

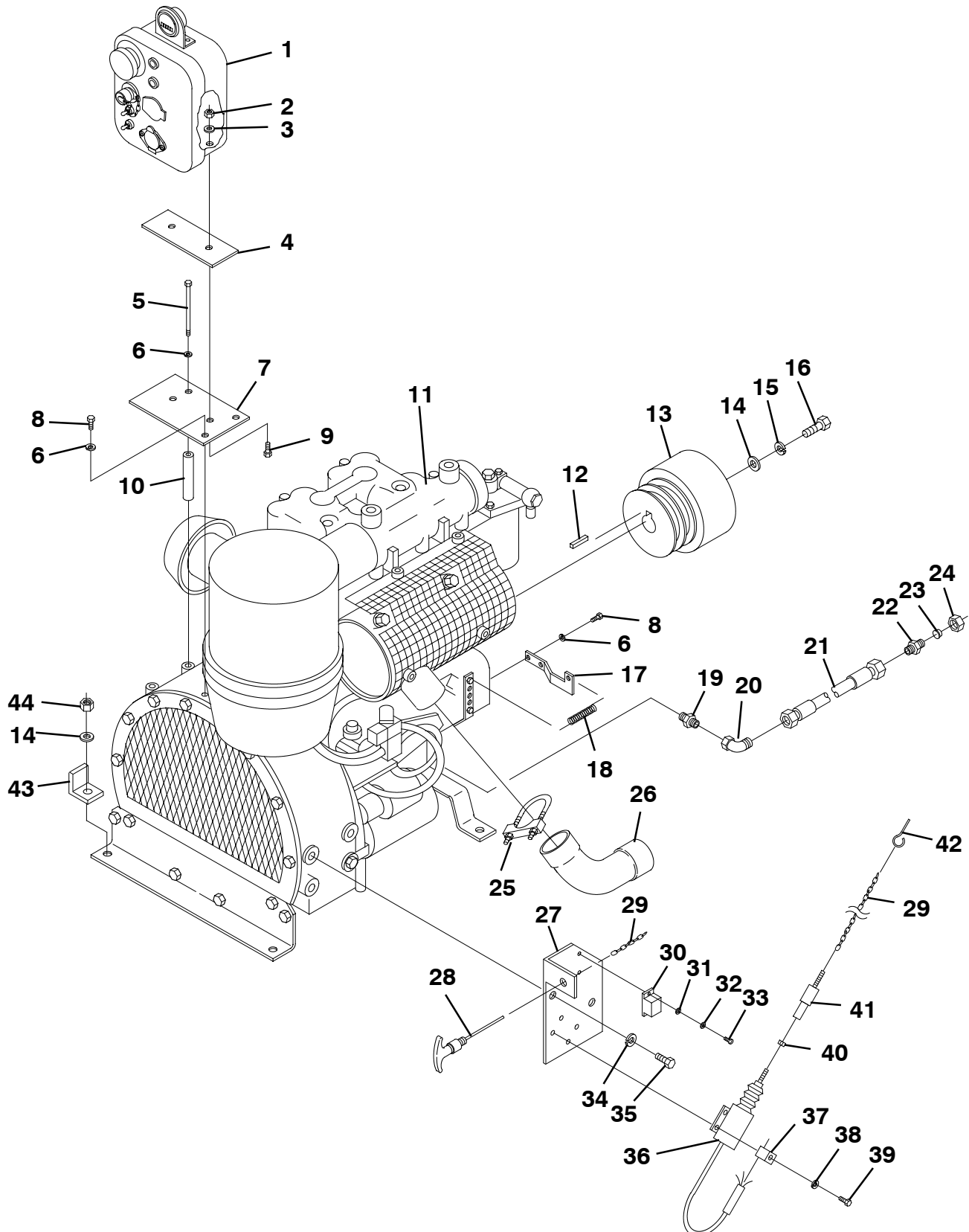


**SCHWING****HATZ 2M41Z DIESEL
CONTROL BOX ASSEMBLY**

SECTION

6

Pos.	Qty.	Description	Part No.
	1	CONTROL PANEL ASSEMBLY, COMPLETE	30393755
1	1	FUSE HOLDER	30302621
2	1	FUSE	30333195
3	1	TOGGLE SWITCH, THROTTLE	30373457
4	4	NUT, 4MM	SEE MFG
5	1	PUSH-BUTTON SWITCH ASSEMBLY	30396339
6	1	CONTROL PANEL ENCLOSURE	SEE MFG
7	1	TOGGLE SWITCH, LOCAL/REMOTE	30314009
8	3	INDICATOR LAMP, RED	30390092
9	2	RUBBER BOOT	30373458
10	1	REMOTE PLUG	30391586
11	4	SCREW, 4MM X 13MM, SS	SEE MFG
12	1	SAFETY LABEL	30319872
13	4	SCREW, SHEET METAL	10028879
14	2	POP RIVET, 3/16"	30373232
15	2	CLAMP	30391598
16	1	IGNITION SWITCH	30391168
17	1	KEY, IGNITION	30391167



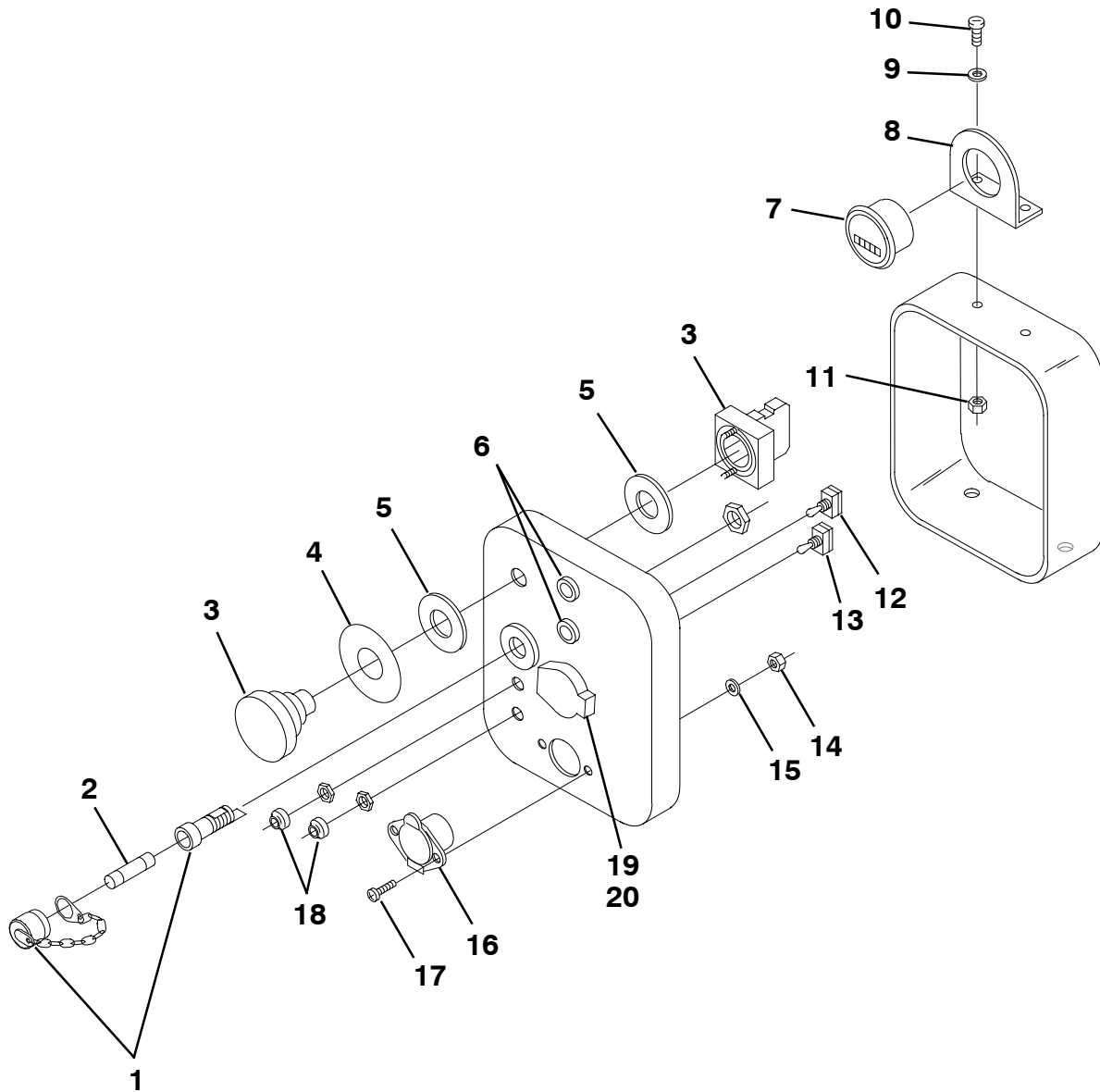


HATZ Z790 DIESEL ENGINE ASSEMBLY

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	CONTROL BOX ASSEMBLY	30393431
2	2	NUT, NYLOCK, M8	10098752
3	2	WASHER, FLAT, M8	10010371
4	1	SEAL	30373496
5	2	BOLT, M10 X 80	10001495
6	6	WASHER, LOCK, M10	10001577
7	1	PLATE, CONTROL BOX MOUNTING	30392196
8	4	BOLT, M10 X 25	10001859
9	2	BOLT, M8 X 20	30392298
10	2	SPACER, 16MM X 2-1/8"	SEE MFG
11	1	HATZ Z790 DIESEL ENGINE	30392145
12	1	KEY	30390531
13	1	CLUTCH ASSEMBLY	30373272
14	5	WASHER, FLAT, 1/2"	30373843
15	1	WASHER, LOCK, 1/2"	30373845
16	1	BOLT, 1/2-13 X 2"	30337904
17	1	BRACKET, THROTTLE	30390133
18	1	SPRING	30392333
19	1	PIPE COUPLING BODY, GES-16-SM	10009300
20	1	PIPE COUPLING BODY, EWSD-16-S	10019122
21	1	HIGH PRESSURE HOSE, 13 X 500	10049901
22	1	PIPE COUPLING BODY, GS-16-S	10008088
23	1	LOCKING PLUG, VS-16-S	10016803
24	1	CAP NUT, M-16-S	10001743
25	1	CLAMP	30390170
26	1	EXHAUST PIPE	30392306
27	1	BRACKET, SOLENOID	30392177
28	1	THROTTLE HANDLE ASSEMBLY	30373552
29	A/R	CHAIN	30391032
30	1	RELAY	30392547
31	2	WASHER, 3/16"	30391776
32	2	WASHER, LOCK, EXTERNAL TOOTH, 8-32	30391398
33	2	SCREW, PAN HEAD, 8-32 X 1/2"	30391399
34	2	WASHER, LOCK, M12	10001588
35	2	BOLT, M12 X 30	10001517
36	1	SOLENOID ASSEMBLY	30390867
37	2	CLAMP	30390855
38	4	WASHER, LOCK, 1/4"	30373852
39	4	BOLT, 1/4-20 X 1/2"	30303962
40	1	NUT, 1/4-20	30373857
41	1	SAFETY LINKAGE	30373297
42	1	EYE BOLT	30390690
43	2	JACKING BLOCK	30392332
44	4	NUT, NYLOCK, 1/2-13	30373847
Additional spare parts			
45	1	OIL FILTER, SPIN-ON, HATZ 400-38100	SEE MFG
46	1	FUEL FILTER, IN-LINE	30373515
47	1	FUEL FILTER, SPIN-ON, HATZ 400-07300	SEE MFG
48	1	PRE-FILTER, HATZ 503-17000	SEE MFG
49	1	SHUT-OFF VALVE, HATZ 017-62400	SEE MFG
50	1	STUB SHAFT	30394633
51	1	V-BELT, COOLING FAN, 9J920, HATZ 50203101	SEE MFG



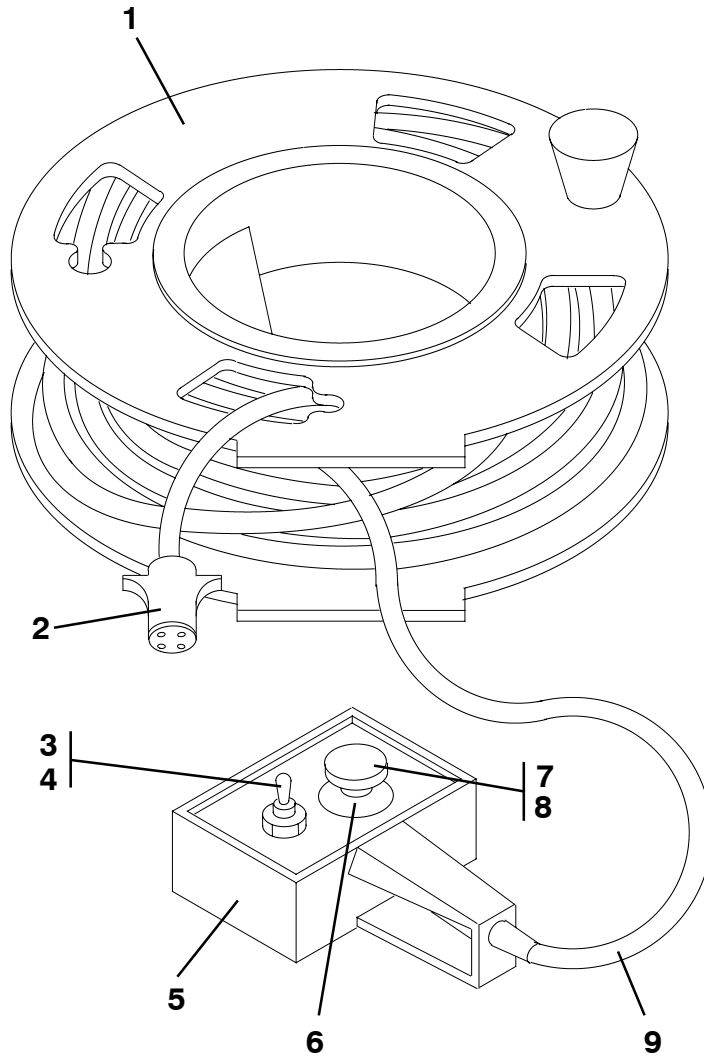
**SCHWING****HATZ Z790 DIESEL
CONTROL BOX ASSEMBLY**

30393431

SECTION

6

Pos.	Qty.	Description	Part No.
1	1	FUSE HOLDER (LITTEL)	30391551
2	1	FUSE, 30A	30390862
3	1	PUSH-BUTTON SWITCH ASSEMBLY	30396339
4	1	SAFETY LABEL, EMERGENCY STOP	30333578
5	2	WASHER	30373856
6	2	INDICATOR LIGHT ASSEMBLY, RED	30390092
		LAMP	30390091
7	1	HOUR METER (FUSED, 6A)	30302179
8	1	BRACKET, HOUR METER	30396063
	1	BRACKET, HOUR METER (USED BEFORE 8/04)	30393528
9	2	WASHER, LOCK, EXTERNAL TOOTH, 10-32	30391639
10	2	SCREW, PAN HEAD, 10-32 X 1/4"	30391389
11	2	NUT, 10-32	30391915
12	1	TOGGLE SWITCH LOCAL/REMOTE	30314009
13	1	TOGGLE SWITCH, THROTTLE	30373456
14	2	NUT, 8-32	30391397
15	2	WASHER, LOCK, EXTERNAL TOOTH, 8-32	30391398
16	1	REMOTE SWITCH ASSEMBLY	30390462
17	2	SCREW, PAN HEAD, 8-32 X 1/2	30391399
18	2	RUBBER BOOT	30373458
19	1	IGNITION SWITCH	30391168
20	1	KEY, IGNITION, HATZ 4L40C	30391167
21	1	DUMMY PLUG WITH CHAIN - NOT SHOWN	30330545





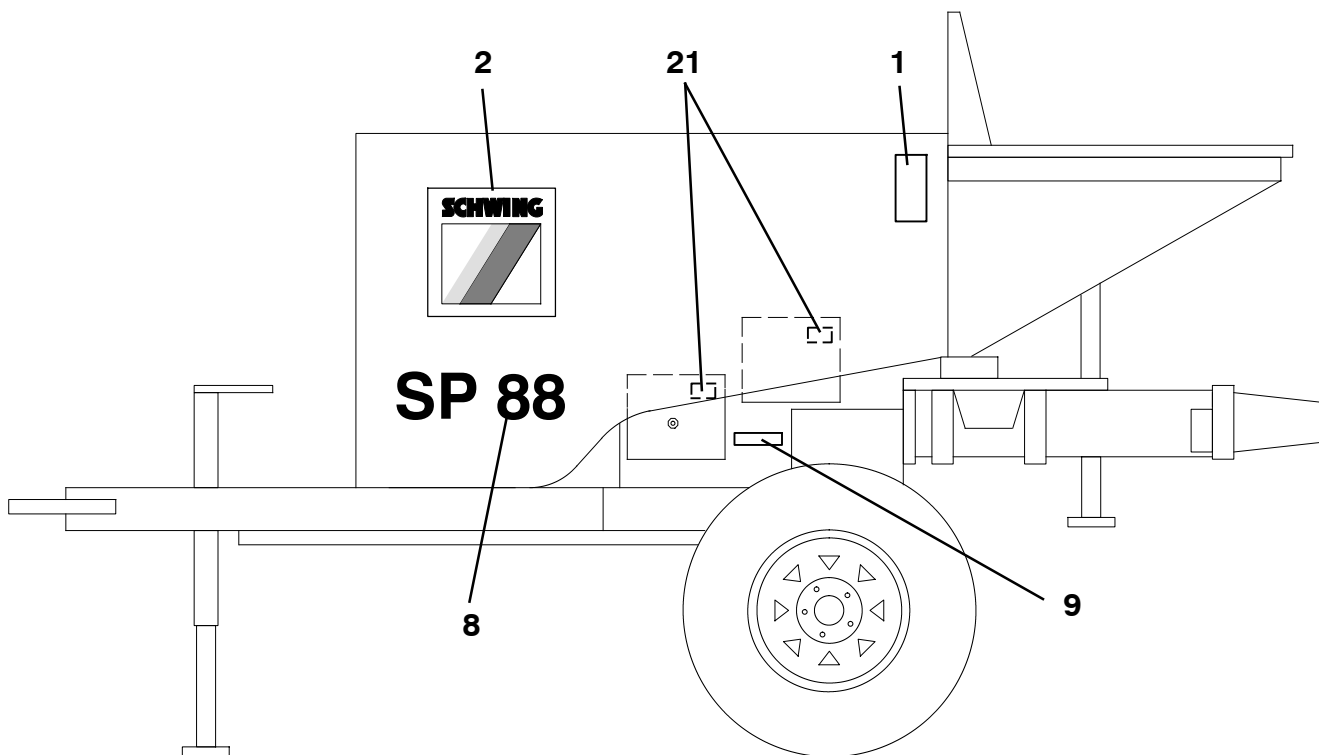
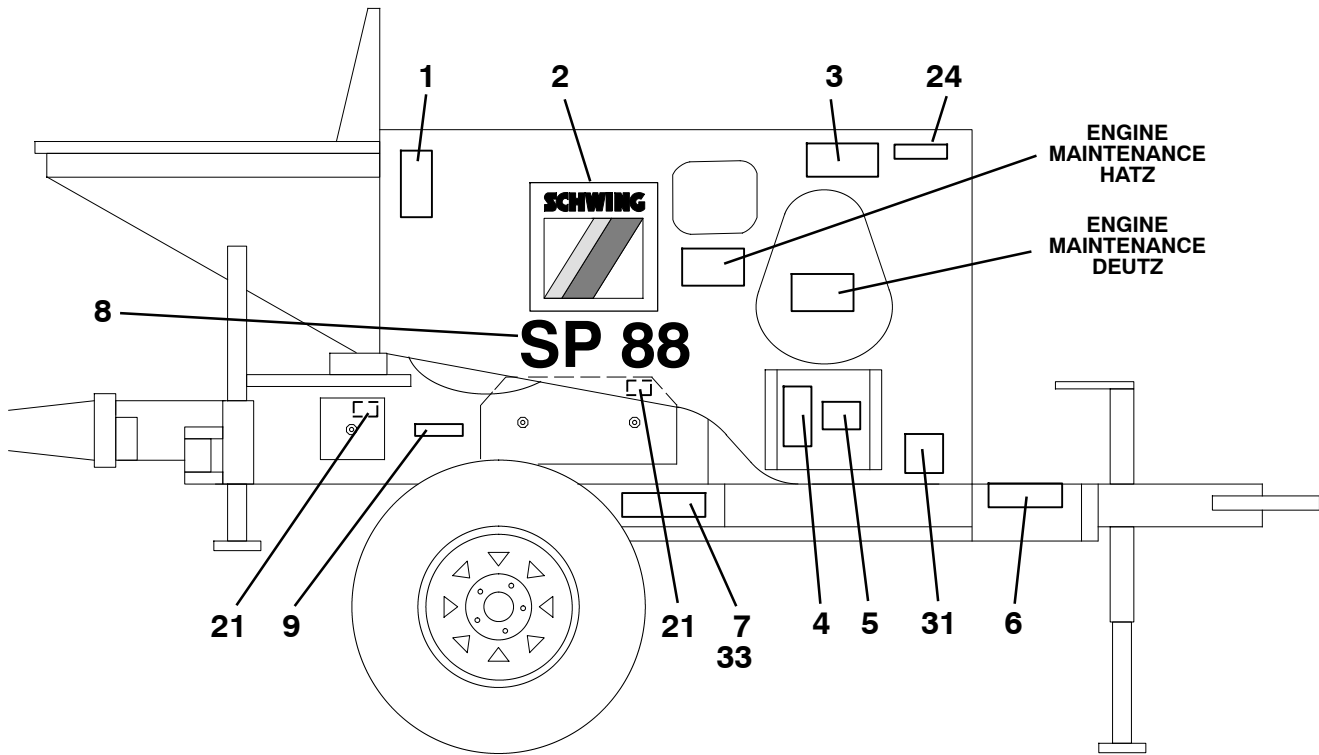
SCHWING

DIESEL REMOTE CABLE ASSEMBLY

SECTION

6

Pos.	Qty.	Description	Part No.
	1	REMOTE CABLE ASSEMBLY 4-WIRE, COMPLETE	30391629
	1	REMOTE CABLE ASSEMBLY 6-WIRE, COMPLETE	30391031
1	1	SPOOL	30391554
2	1	PLUG, 4-POLE	30390462
	1	WIRE HOLDER	30391587
	1	PLUG, 6-POLE	30391588
3	1	RUBBER BOOT (PM11463)	30373458
4	1	SWITCH, 3-WAY PARALLEL	30373457
5	1	E-STOP ENCLOSURE	30390169
6	1	SAFETY LABEL	30319872
7	1	E-STOP SWITCH	30391615
8	1	CONTACT BLOCK	30330019
9	1	CORD, 50 FT, 4-WIRE	30391553
	1	CORD, 50 FT, 6-WIRE	30391628
	FT	CORD, 6-WIRE	30396100

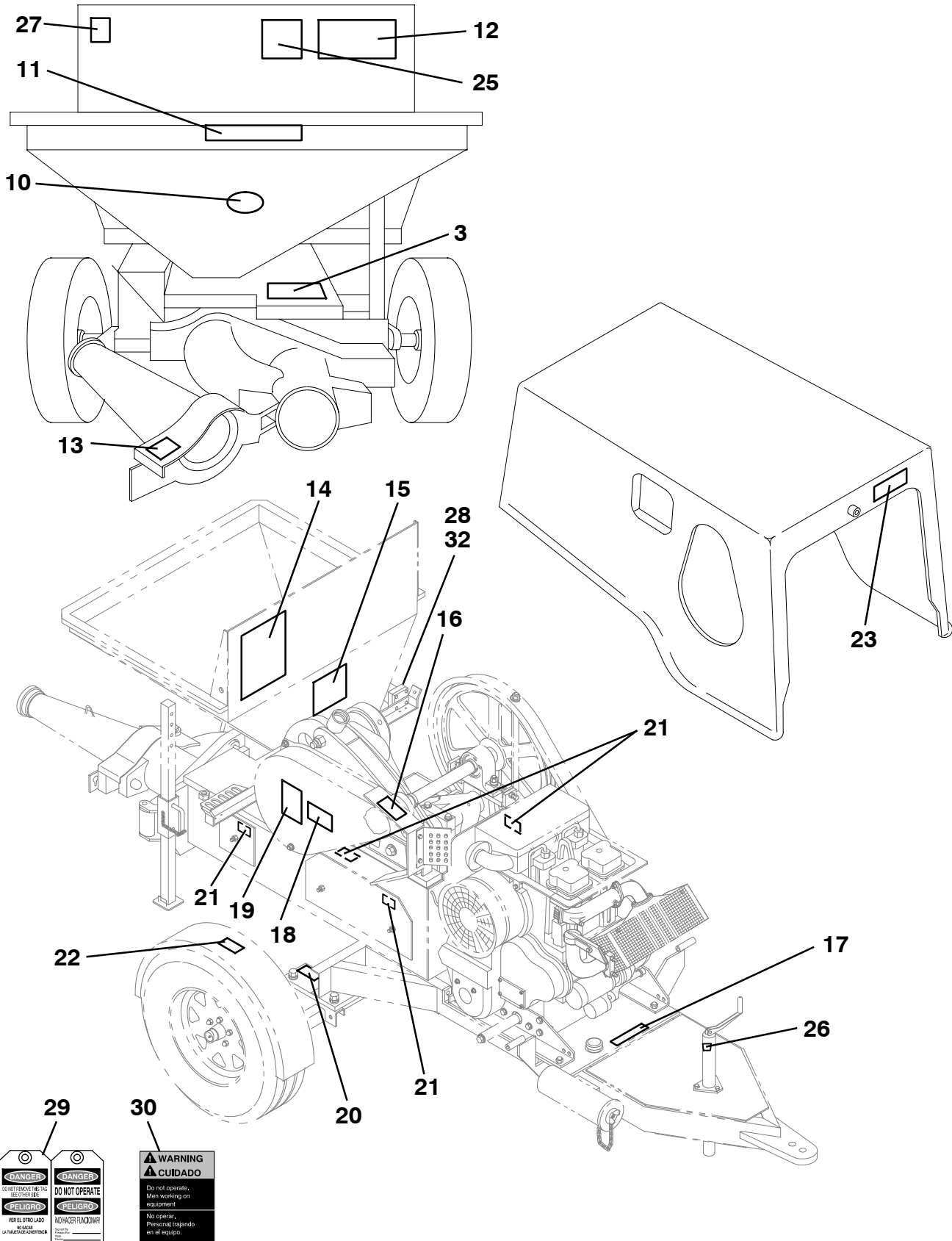


**SCHWING****SAFETY LABELS**

SECTION

6

Pos.	Qty.	Description	Part No.
1	2	WARNING, MOVING PARTS	30340492A
2	2	SCHWING LOGO, LARGE	30390162
3	2	WARNING, EYE & EAR PROTECTION	30336983D
4	1	WARNING, DO NOT OPERATE WITHOUT TRAINING	30335000B
5	1	ORDERING INFORMATION	30333268D
6	1	PARTS & OPERATION MANUAL	30390207
7	1	SERIAL NUMBER PLATE	30325023F
8	2	DECAL, SP 88	30390681A
9	2	WATER LEVEL INDICATION	30390461
10	1	MEMBER, CONCRETE PUMP MANUFACTURERS ASSOCIATION	30355887A
11	1	SCHWING LOGO, SMALL	30390179
12	1	WARNING, REMOTE CONTROL	30309999D
13	1	WARNING, EXPLOSION HAZARD	30393651
14	1	SAFETY INSTRUCTIONS	30312146B
15	1	ADJUSTMENT	30391921
16	1	CHAIN MANUFACTURER	SEE MFG
17	1	DIESEL ONLY	30349283
18	1	SAFETY INSTRUCTIONS	30390151A
19	1	WARNING, MOVING PARTS	30326445A
20	1	AXLE LUBRICATION INSTRUCTIONS	SEE MFG
21	6	WARNING, SAFETY GUARD IS MISSING	30337004A
22	2	WARNING, RETORQUE LUG NUTS	30350290B
23	1	WARNING, BURN HAZARD	30364523B
24	1	HAND SIGNALS	30365188A
25	1	WARNING, CEMENT DUST	30632340A
26	1	JACK CAPACITY, CEQUENT F3351	SEE MFG
27	3	WARNING, GRATES	30309998D
28	1	EMERGENCY STOP	30333578A
29	1	TAG, DO NOT OPERATE, BILINGUAL	30332962
30	1	MAGNETIC TAG, DO NOT OPERATE, BILINGUAL (IN TOOL BOX)	30332963
31	1	CPMA CERTIFICATION PLATE	30369730A
32	1	EMERGENCY STOP	30340149A
33	4	POP RIVET, 1/8"	30373233
34	1	SAFETY LABEL SET, COMPLETE - SPECIFY FUEL TYPE	30390787



**SCHWING****SAFETY LABELS (CONTINUED)**

SECTION

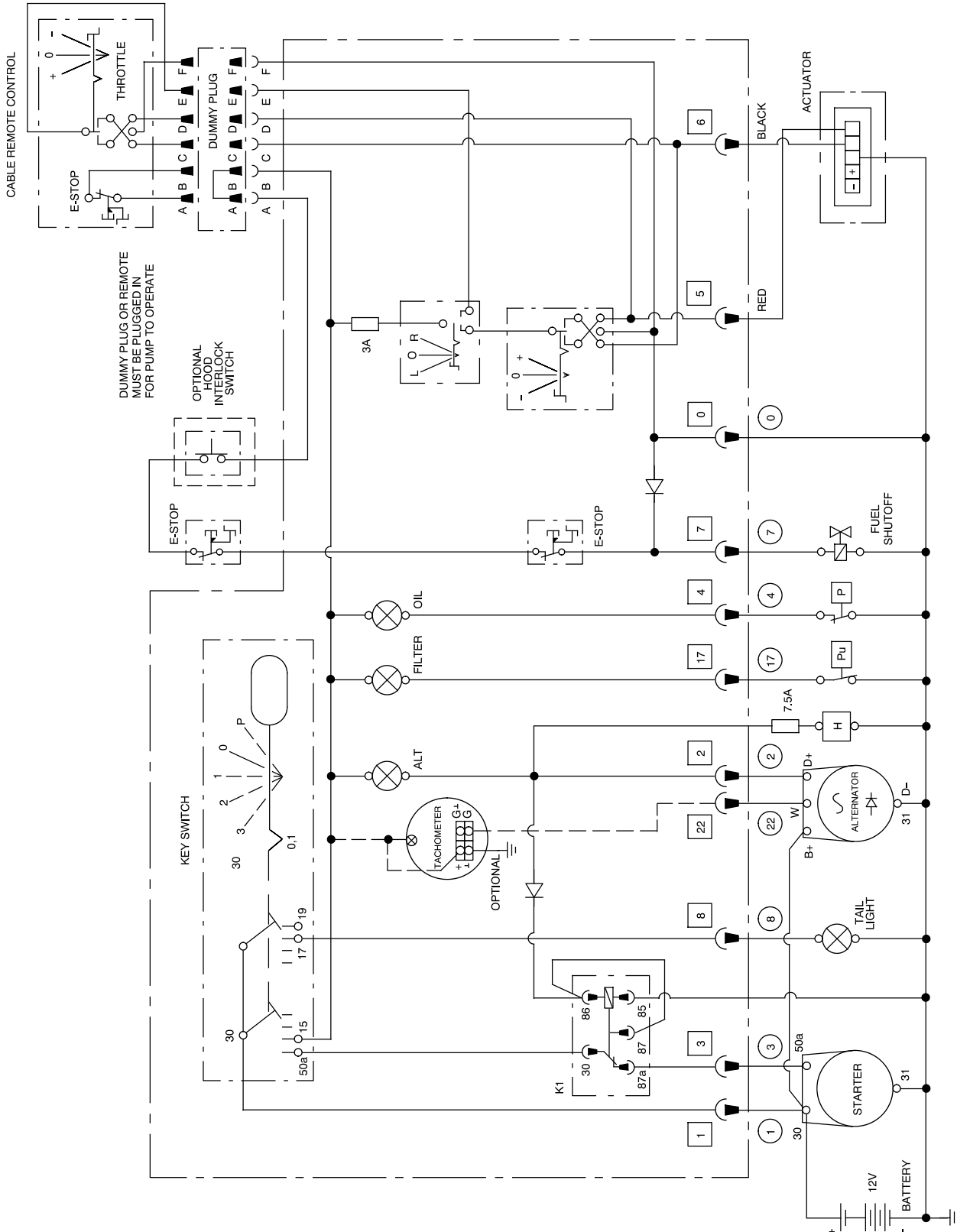
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Pos.	Qty.	Description	Part No.
1	2	WARNING, MOVING PARTS	30340492A
2	2	SCHWING LOGO, LARGE	30390162
3	2	WARNING, EYE & EAR PROTECTION	30336983D
4	1	WARNING, DO NOT OPERATE WITHOUT TRAINING	30335000B
5	1	ORDERING INFORMATION	30333268D
6	1	PARTS & OPERATION MANUAL	30390207
7	1	SERIAL NUMBER PLATE	30325023F
8	2	DECAL, SP 88	30390681A
9	2	WATER LEVEL INDICATION	30390461
10	1	MEMBER, CONCRETE PUMP MANUFACTURERS ASSOCIATION	30355887A
11	1	SCHWING LOGO, SMALL	30390179
12	1	WARNING, REMOTE CONTROL	30309999D
13	1	WARNING, EXPLOSION HAZARD	30393651
14	1	SAFETY INSTRUCTIONS	30312146B
15	1	ADJUSTMENT	30391921
16	1	CHAIN MANUFACTURER	SEE MFG
17	1	DIESEL ONLY	30349283
18	1	SAFETY INSTRUCTIONS	30390151A
19	1	WARNING, MOVING PARTS	30326445A
20	1	AXLE LUBRICATION INSTRUCTIONS	SEE MFG
21	6	WARNING, SAFETY GUARD IS MISSING	30337004A
22	2	WARNING, RETORQUE LUG NUTS	30350290B
23	1	WARNING, BURN HAZARD	30364523B
24	1	HAND SIGNALS	30365188A
25	1	WARNING, CEMENT DUST	30632340A
26	1	JACK CAPACITY, CEQUENT F3351	SEE MFG
27	3	WARNING, GRATES	30309998D
28	1	EMERGENCY STOP	30333578A
29	1	TAG, DO NOT OPERATE, BILINGUAL	30332962
30	1	MAGNETIC TAG, DO NOT OPERATE, BILINGUAL (IN TOOL BOX)	30332963
31	1	CPMA CERTIFICATION PLATE	30369730A
32	1	EMERGENCY STOP	30340149A
33	4	POP RIVET, 1/8"	30373233
34	1	SAFETY LABEL SET, COMPLETE - SPECIFY FUEL TYPE	30390787



SCHWING

Pos.	Qty.	Description	Part No.
		ELECTRCAL SCHEMATIC, DEUTZ F2L1011 DIESEL	





SCHWING

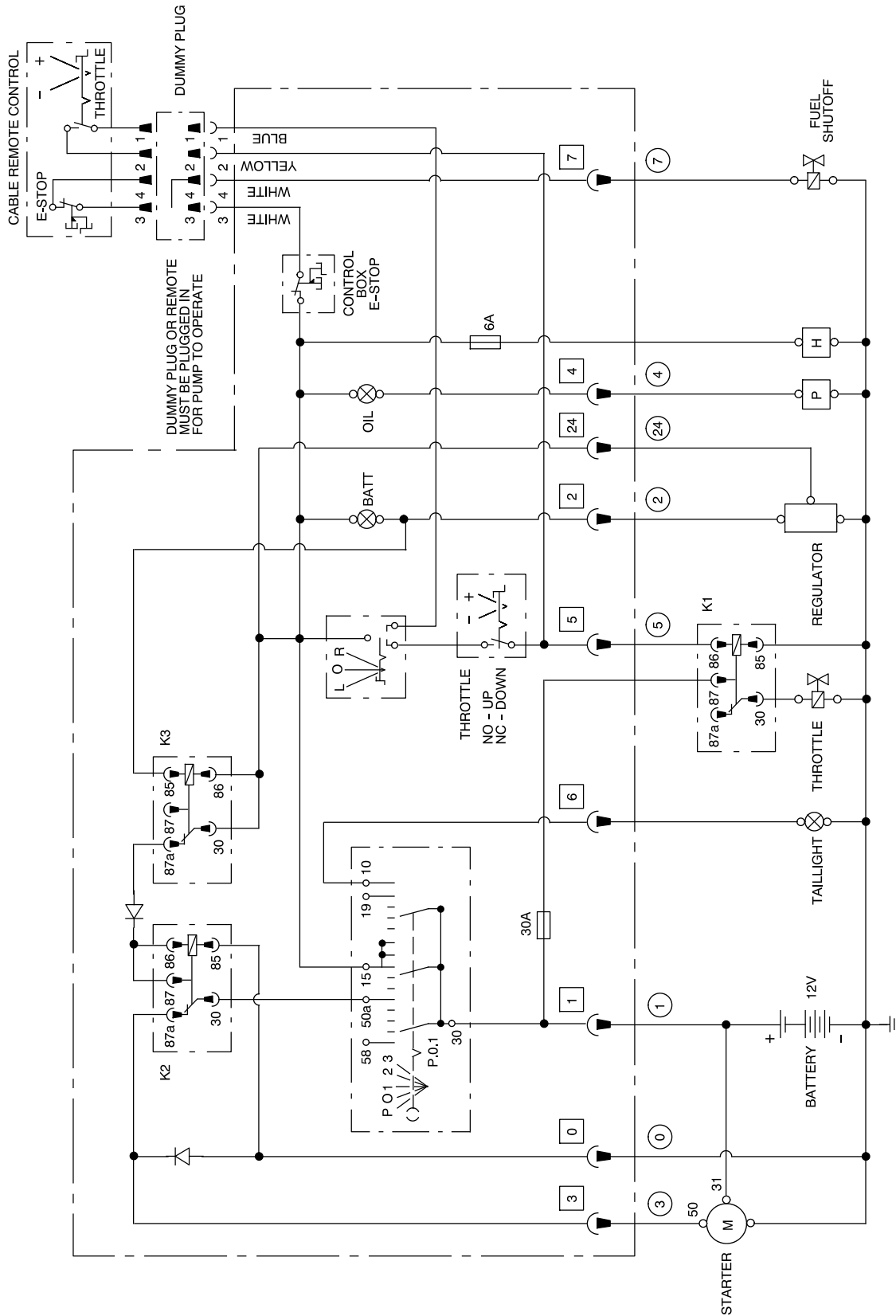
HATZ 2M41Z DIESEL WIRING DIAGRAM

SECTION

6

30391853

Pos.	Qty.	Description	Part No.
		ELECTRCAL SCHEMATIC, 2M40LZ HATZ DIESEL	30391853





SCHWING

HATZ Z790 DIESEL WIRING DIAGRAM

SECTION

6

Pos.	Qty.	Description	Part No.
		ELECTRCAL SCHEMATIC, HATZ Z790 DIESEL	

HATZ DIESEL OF AMERICA, INC.

ALABAMA

Southern Diesel
10896 County Road 51
P.O. Box 763
Jemison, AL 35085
205/ 688-4688
FAX: 205/ 688-3235

Laborde Products Inc.
SEE LOUISIANA

ALASKA

Perkins Pacific
SEE WASHINGTON

ARIZONA

Southwest Products
5143 W. Roosevelt
Phoenix, AZ 85043
P.O. Box 11267
Phoenix, AZ 85061
602/ 269-3581
FAX: 602/ 269-8448

ARKANSAS

Allied Construction Equip.
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CALIFORNIA

Hanco Industrial Engines
2760 Junipero Avenue
Long Beach, CA 90806
562/ 424-0913
FAX: 562/ 424-4517

Hanco Industrial Engines
2760 E. Cherokee
Stockton, CA 95205
209/ 462-8595
FAX: 209/ 462-9379

COLORADO

Central Motive Power
6301 N. Broadway
Denver, CO 80216
P.O. Box 17128TA
Denver, CO 80217
303/ 428-3611
FAX: 303/ 428-6785

CONNECTICUT

Bell Power Systems, Inc.
36 Plains Road
P.O. Box 980
Essex, CT 06426-0980
860/ 767-7502
FAX: 860/ 767-7290

DELAWARE

Bell Power Systems, Inc.
SEE CONNECTICUT

DISTRICT OF COLUMBIA

Pitt Auto Electric Company
SEE PENNSYLVANIA

FLORIDA

CK Power Products, Inc.
100 S.W. 52nd Avenue
Ocala, FL 34474-1894
352/ 237-7660
FAX: 352/ 237-0855

CK Power Products, Inc.
7200 N.W. 84th Avenue
Miami, FL 33166
305/ 463-7928
FAX: 305/ 463-7929

Ditec, Inc.
4325 Highway 60, West
P.O. Box 262
Mulberry, FL 33860
941/ 425-3039
FAX: 941/ 425-1277
1-888-823-2888

GEORGIA

Southeast Services
1721-E Oakbrook Drive
Norcross, GA 30093
770/ 448-4251
FAX: 770/ 446-5455

HAWAII

Southwest Products
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IDAHO

Perkins Pacific Inc.
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ILLINOIS

Charles Equipment Co.
1140 Fullerton Avenue
P.O. Box 388
Addison, IL 60101
630/ 834-6000
FAX: 630/ 543-4174

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INDIANA

Capitol Engine Co.
SEE OHIO

Charles Equipment Co.
SEE ILLINOIS

IOWA

Husker Power Products
SEE NEBRASKA

KANSAS

Kansas City Power
80 South James Street
Kansas City, KS 66118
913/ 321-7040
FAX: 913/ 321-7341

Husker Power Products
SEE NEBRASKA

KENTUCKY

Power Unlimited
830 South Ninth Street
Louisville, KY 40210
P.O. Box 3008
Louisville, KY 40201
502/ 581-0916
FAX: 502/ 584-4544

LOUISIANA

Laborde Products Inc.
74257 Highway 25
Covington LA, 70433
504/ 892-0107
FAX: 504/ 892-7656

M.G. Bryan Equipment Co.
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Pitt Auto Electric Company
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Bell Power Systems, Inc.
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1340 S. Waverly Road
Lansing, MI 48917
517/ 322-0846
FAX: 517/ 322-0864

MINNESOTA

Great Northern Equipment
20851 Commerce Blvd.
Rogers, MN 55374
612/ 428-2237
FAX: 612/ 428-4821
1-800-822-0295

MISSISSIPPI

Laborde Products Inc.
SEE LOUISIANA

Allied Construction Equip.
SEE TENNESSEE

MISSOURI

Allied Construction Equip.
4015 Forest Park Avenue
St. Louis, MO 63108
314/ 371-1818
FAX: 314/ 533-6973

Kansas City Power
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MONTANA

Perkins Pacific
SEE WASHINGTON

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Husker Power Products
2955 W. Highway 6
Hastings, NE 68901-7709
P.O. Box 2006
Hastings, NE 68902-2006
402/ 463-1531
FAX: 402/ 463-1313

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NEW HAMPSHIRE

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3740A Princeton Dr., N.E.
Albuquerque, NM 87107
505/ 884-2525
FAX: 505/ 884-1358

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Bell Power Systems, Inc.
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HATZ DIESEL OF AMERICA, INC.

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Julian, NC 27283
336/ 685-4100
FAX: 336/ 685-9007

NORTH DAKOTA

Great Northern Equipment
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Capital Engine Co.
97 Cypress St., S.W.
Reynoldsburg, OH 43068
740/ 964-0089
FAX: 740/ 964-0186

OKLAHOMA

M.G. Bryan Equipment Co.
SEE TEXAS

OREGON

Pacific Detroit Diesel Allison
5061 N. Lagoon
Portland, OR 97217-7694
503/ 283-0505
FAX: 503/ 240-4692

Pacific Detroit Diesel Allison
1493 Kingsley Drive
Medford OR 97504
541/ 779-4622
FAX: 541/ 779-8542

Pacific Detroit Diesel Allison
3436 Olympic Street
Springfield, OR 97477
541/ 746-1661
FAX: 541/ 746-8381

Pacific Detroit Diesel Allison
P.O. Box 730
Redmond, OR 97756
541/ 548-7479
FAX: 541/ 548-7493

PENNSYLVANIA

Pitt Auto Electric Co.
2900 Slayton Street
Pittsburgh, PA 15212
412/ 766-9112
FAX: 412/ 766-3229

RHODE ISLAND

Bell Power Systems, Inc.
SEE CONNECTICUT

SOUTH CAROLINA

Piedmont Power Products
SEE NORTH CAROLINA

SOUTH DAKOTA

Great Northern Equipment
SEE MINNESOTA

TENNESSEE

Allied Construction Equip.
2099 Thomas Rd., No. 13
Memphis, TN 38134
901/ 372-1817
FAX: 901/ 372-8011

North American Engine Co.
10375 Cedar Lane, Bldg. 5
Glen Allen, VA 23059
804/ 550-3162
FAX: 804/ 550-3202

TEXAS

M.G. Bryan Equipment Co.
4834 Reading Street
Dallas, TX 75247
P.O. Box 561465
Dallas, TX 75356-1465
214/ 631-9787
FAX: 214/ 638-6837

Cay Power Products
2613 Karbach
Houston, TX 77092
713/ 682-5022
FAX: 713/ 680-2214

Central Motive Power
SEE NEW MEXICO

UTAH

Perkins Pacific Inc.
SEE WASHINGTON

VERMONT

Bell Power Systems, Inc.
SEE CONNECTICUT

VIRGINIA

North American Engine Co.
10375 Cedar Lane, Bldg. 5
Glen Allen, VA 23059
804/ 550-3162
FAX: 804/ 550-3202

WASHINGTON

Perkins Pacific Inc.
7401 N.E. 47th Avenue
Vancouver, WA 98661
360/ 906-8298
FAX: 360/ 906-8297

Pacific Detroit Diesel Allison
7215 South 228th Street
Kent, WA 98032
253/ 854-0505
FAX: 253/ 850-2631

Pacific Detroit Diesel Allison
1810 East James
Pasco, WA 99301
509/ 547-1611
FAX: 509/ 547-1144

Pacific Detroit Diesel Allison
6615 East Malloon Avenue
Spokane, WA 99220-3167
509/ 535-3663
FAX: 509/ 535-3734

WEST VIRGINIA

Pitt Auto Electric Company
SEE PENNSYLVANIA

WISCONSIN

Total Energy Systems LLC
8525 North 87th Street
Milwaukee, WI 53224
414/ 357-7900
FAX: 414/ 357-6278

WYOMING

Perkins Pacific Inc.
SEE WASHINGTON

CANADA

International Power Systems
10 Diesel Drive
Toronto, ON M8W 2T8
416/ 201-0040
FAX: 416/ 259-6715

Alberta Diesel
7640-67th Street
Edmonton, AB T6B 2K4
780/ 466-8335
FAX: 780/ 465-9666

Marindustriel Enr.
8550 Delmeade
Montreal, QC H4T 1L7
514/ 342-2748
FAX: 514/ 342-6151

MEXICO

Contact:
Hatz Diesel of America
W229 N1645 Westwood
Drive
P.O. Box 258
Waukesha, WI 53187-0258
262/ 544-0254
FAX: 262/ 544-6120

PUERTO RICO

Puerto Rico Wire Products
Reparto Industrial Corujo
Carr. 866 K.M. 1.7 Lote 8
Hato Tejas Bay
Bayaman, PR 00936-3167
787/ 288-8080
FAX: 787/ 288-8074

Hatz Diesel Limited Engine Warranty

HATZ DIESEL OF AMERICA, INC., hereinafter referred to as "HATZ," warrants each new 4-cycle air-cooled diesel engine sold by Hatz to be free from defects in material and workmanship, under normal use and service, for a period of twelve (12) months after the date of delivery to the original retail purchaser, and Hatz will, at its option, repair or replace at Hatz's sales headquarters, or at a point designated by Hatz, any part or parts which shall appear to the satisfaction of Hatz upon inspection at such point, to have been defective in material or workmanship. This Warranty does not obligate Hatz to bear any transportation charges in connection with the repair or replacement of defective parts.

In order to obtain service under this Warranty, the original retail purchaser shall give notice in writing to Hatz within ten (10) days of the time that the defect becomes apparent.

This Warranty shall not apply to any engine which shall have been installed or operated in a manner not recommended by Hatz; nor to any engine which shall have been repaired, altered, neglected or used in any way which, in the opinion of Hatz, adversely affects its performance; nor to any engine in which parts not authorized by Hatz have been used, which parts or the use of which have damaged, caused defects in, or otherwise adversely affected the engine or its performance; nor to any accessories installed on the engine where the accessory manufacturer has its own warranty; nor to normal maintenance services or replacement of normal service items.

Hatz reserves the right to modify, alter, and improve any engine or parts without incurring any obligation to replace any engine or parts previously sold with such modified, altered or improved engine or parts.

Hatz reserves the right to require that any engine upon which warranty service is sought be made available to Hatz at Hatz's sales headquarters or point designated by Hatz free and clear of any liens and other encumbrances.

THIS WARRANTY, AND THE OBLIGATION OF HATZ HEREUNDER, ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, and all other obligations or liabilities, including special, incidental or consequential damages, lost profits, lost sales, lost time, lost use, or contingent liabilities arising out of the failure of any engine or part to operate properly. No person is authorized to give any other warranty or to assume any additional obligation on behalf of Hatz unless made in writing and signed by an officer of Hatz.



HATZ DIESEL OF AMERICA, INC.

P.O. Box 258

Waukesha, WI 53187-0258

DEUTZ ENGINE DISTRIBUTORS

U.S., North America, Central America, South America and Caribbean

ALABAMA

Williams Power Systems
1160 Bankhead Highway, West
Birmingham, AL 35204-1398
(800) 365 3780
Fax: (205) 324 9108

General Automotive Machine Co.
701 Dallas Street
Huntsville, AL 35801
(256) 539-0719
Fax: (256) 536-9881

H. R. Smith Tractor Company
4850 West State Highway. 52
Dothan, AL 36305
(334) 792-5256
Fax: (334) 794-2024

Saunders Engine & Equipment Co.
840 Dumaine Road
P.O. Box 1824
Mobile, AL 36610
(334) 456-4507
Fax: (334) 457-5563

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Stewart & Stevenson Power
2321 Cinnabar Loop
Anchorage, AK 99507
(907) 522-5030
Fax: (907) 522-5028

ARIZONA

Stewart & Stevenson Power Industrial
2211 West McDowell Road
Phoenix, AZ 85009
(602) 462-1636
Fax: (602) 462-1635

Diggins & Sons Power
1500 East 17th. Street
Tucson, AZ 85726
(520) 624-1744

High Desert Diesel
4945 West Highway
Bisbee, AZ 85603
(520) 805-0739

ARKANSAS

Baltz Equipment Co.
1001 South Bettis
Pocahontas, AR 72455
(870) 892 5254

IPSCO / Stewart & Stevenson
1111 Park Avenue South
P.O. Box 31
Stuttgart, AR 72160
(870) 673-3575
(870) 873-4843
Fax: (870) 673-7553

Burgess Heavy Equipment
1420 East 9th. Street
Little Rock, AR 72203
(501) 375-4665

Cox Implement Co. Highway. 63 East
P.O. Box 96
Hoxie, AR 72433
(870) 886-2291

Harold Implement Co.
701 North Missouri Avenue
Corning, AR 72422
(501) 857-3931

No. 9 Parts & Equipment

1010 South Highway. 9
Morrilton, AR 72110
(501) 354-1833

CALIFORNIA

Harbor Diesel & Equipment
537 West Anaheim Street
Long Beach, CA 90813
(562) 591-5665

Valley Detroit Diesel Allison
5725 Eastgate Drive
San Diego, CA 92121-2803
(858) 587-8524
Fax: (858) 587-4664

Torrences Farm Implements
190 East Highway. 86
P.O. Box C
Heber, CA 92249
(702) 399-1890

Valley Detroit Diesel Allison
720 West 17th. Street
Costa Mesa, CA 92624
(949) 646-4483
Fax: (949) 646-0142

Mc Clure Equipment
1131 33rd. Street
Bakersfield, CA 93301
(661) 325-5888

Mission Country Power
1363 West Main Street
Santa Maria, CA 93458
(805) 922 5741
Fax: (805) 922 5742

Ray Holmes Diesel Repair
2216 West Belmont Avenue
Fresno, CA 93728
(209) 499-0153

Coastal Tractor
1080 Harkins Road
Salinas, CA 93901
(831)757-4101

California Diesel & Power
150 Nardi Lane
Martinez, CA 94553
(925) 229-2700

General Equipment Maintenance
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Napa, CA 94558
(707) 226-7681

Air Cooled Engines
1076 North Tenth Street
San Jose, CA 95112
(408) 295-4789

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(805) 643 6185

Paul J. Holcomb & Sons Inc.
1420 North Hughes
Fresno, CA 93728
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Fax: (599) 442 6056

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5840 Dahlia Street
Commerce City, CO 80022
(303) 287-7441
Fax: (303) 286-4936

Diesel Services Inc
914 South Avenue
Grand Junction, CO 81501
(970) 243 6344

CONNECTICUT

R.A. Mitchell Company
103 Pope's Island
New Bedford, CT 06492
(203) 265 7871

Engine Distributors, Inc.
332 South 17th Street
Camden, NJ 08105-1798
(856) 365-8631
Fax: (856) 338-0606

On Site Equipment Repair
27 Watson Avenue
North Haven, CT 06473
(203) 234 9540
Fax: (203) 234 0484

Engine Parts Unlimited
6 Kirtlano Ct.
Wallingford, CT 06492
(203) 265 7871
Fax: (203) 284 0672

Shaw's Diesel LLC
105 Waterbury Road
Prospect, CT 06712
(203) 758 0642

DELAWARE

Diesel Equipment Specialists
RR #3
P.O. Box 325
Bridgeville, DE 19933
(302) 337-8742

FLORIDA

Suber & Weaver
317 Blounistown Highway
Tallahassee, FL 32304
(850) 576 1535

Motor-Services Hugo Stamp, Inc.
3190 SW 4th Avenue
Ft. Lauderdale, FL 33315
(954) 763 3660
Fax: (954) 763 2872

Tradewinds Power Corp
600 State Road 66
Sebring, FL 33875
(863) 382 2166
Fax: (863) 382 1206

Mark's Diesel Systems Inc.
1716 West Olive Street
Lakeland, FL 33815
(863) 683 5480
Fax: (863) 687 7563

Engine Distributors
2917 SW Second Avenue
Ft. Lauderdale, Florida 33315
(954) 525-6395
Fax: (954) 525-7721

Trans Diesel
3710 North Orange Blossom Trail
P.O. Box 6695 (32236)
Orlando, FL 32804
(407) 295 1221

Engine Distributors
505 Lane Avenue North
Jacksonville, FL 32254
(904) 781-7531
Fax: (904) 781-7634

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Deutz Corporation
3883 Steve Reynolds Boulevard
30093 Norcross, GA
(770) 564-7100
(800) 241-9886
Fax: (770) 564-7162

Williams Power Systems
1803 West Oakridge Drive
Albany, GA 31707-5263
(800) 283 9332
Fax: (299) 435 0676

Williams Power Systems
14 Westgate Boulevard.
Savannah, GA 31405-1475
(800) 283 9332
Fax: (912) 232 2607

Williams Power Systems, Inc.
25 North Drive S.E.
Acworth, GA 30102
(800) 783-4591
(678) 574-8128
Fax: (678) 574-8125

Hi-Tech Power Systems
2479 Doug Barnard Parkway
Augusta, GA 30906
(800) 283-8111
(706) 790-8111
Fax: (706) 790-4368

Lew's Diesel & Turbo
1051 Guy Paine Road
Macon, GA 31206
(478) 781-8383
Fax: (478) 781-9319

Williams Power Systems
2849 Moreland Avenue, SE
Atlanta, GA 30315-5723
(800) 545 7116
Fax: (404) 361 4818 / 401

Shiver Diesel Injection & Turbo
1702 Carpenter Road South
P.O. Box 1734
Tifton, GA 31394
(229) 382-1595
Fax: (229) 382-1573

Testmaster, Inc.
5574 Export Boulevard
Garden City, GA 31408
(912) 964-6642
Fax: (912) 964-1707

HAWAII

Pacific Detroit Diesel Allison
91-265 Kahaaloa Boulevard
Kapolei, HI 96707
(808) 682-2400

Valley DD/A
11128 Wright Road
P.O. Box 1686
Lynwood, CA 90262
(310) 636-8166
Fax: (310) 604-4171

IDAHO

Smith Detroit Diesel-Allison
4045 Transport Street
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Boise, IO 83705
(208) 345-1500
Fax: (208) 345-1619

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1711 E. 1st. Avenue
Milan, IL 61264
(309)787-2427

Illini Power Products

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Middlebury, IN 46540
(219) 642 1196

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P.O. Box 1009
Great Bend, KS 67530

Stewart & Stevenson Power

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Liberal, KS 67901

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Bluegrass Diesel Specialist

1663 Production Drive
Burlington, KY 41005
(859) 282 8785
Fax: (859) 372 2473

James Diesel

1810 South 4th Street
Paducah, KY 42002
(270) 443 0988
Fax: (270) 443 1881

Power Product Incorporated Products

3225 Greenup Avenue
Ashland, KY 41101
(606) 329-2418

LOUISIANA

Stewart & Stevenson Services

5407 S.E. Evangeline Thruway
P.O. Box 145
Broussard, Louisiana 70518-0145
(318) 837-9001
Fax: (318) 837-2317

see www.duetz.com for world listing

Donald Engine Center

Highway. 84 West
Vidalia, LA 71373
(318) 336-4274

Stewart & Stevenson Services

1400 Destrehan Avenue
P.O. Box 1776
Harvey, LA 70058
(504) 347-4326
Fax: (504) 348-8970

Stewart & Stevenson Services

15735 Club Deluxe Road
Hammond, LA 70403
(504) 345-3070
Fax: (504) 345-3038

MAINE

Atlantic Engine & Parts

697 Roosevelt Trail
Windham, ME 04062
(207) 892 8545

MARYLAND

Thomas Todd

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Queen Anne, MD 21657
(410) 758-0407

MASSACHUSETTS

Motor Services Hugo Stamp

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Fairhaven, MA 02719
(508) 9884 7330
Fax: (954) 763 2827

R.A. Mitchell Co.

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New Bedford, MA 02740
(508) 999-5685
Fax: (508) 997-8954

Jersey Engine Rebuilders, Inc.

249 Hartford Turnpike (Route 20)
Shrewsbury, Massachusetts 01545
(508) 831-1108
Fax: (508) 831-7412

MICHIGAN

D.A. MacPherson, Inc.

County Road 653
P.O. Box 32
Iron River, MI 49935-0032
(906) 265-5197
Fax: (906) 265-3112

McDonald Equipment

1217 Grand River
Portland, MI 48875
(517) 647 6855
Fax: (517) 647 6965

AIS Engine Corp.

4781 Clay Avenue SW
Grand Rapids, MI 49548
(616) 531-1200

Engine Center

2351 Hilton Road
Ferndale, MI 48220
(248) 399-0002

MINNESOTA

Interstate Detroit Diesel

8950 Eldorado Street N.E.
Blaine, MN 55449
(763) 786 7520
Fax: (763) 786 5051

Interstate Detroit Diesel

1921 16th Avenue West
Virginia, MN 55792
(218) 749 4484
Fax: (218) 749 3927

Interstate Detroit diesel

2501 East 80th Street
Minneapolis, MN 55425
(952) 854 5511
Fax: (952) 854 2999

MISSISSIPPI

Kennedy Engine Co.

980 Motsie Road
Biloxi, MS 39532
(228) 392 2200

IPSCO / Stewart & Stevenson

604 S. Broad
P.O. Box 307
Leland, MS 38756
(601) 686-2301
Fax: (601) 686-4359

MISSOURI

Diesel Power Equipment Co.

1501 New Perrine Road
Farmington, MO 63640
(573) 760-1400
Fax: (573) 760-1200

Diesel Exchange Inc.

3811 E. Kearny
Springfield, MO 65803
(417) 831 5600

Paul Byler Diesel

32304 Priarie Avenue
Jamesport, MO 64648
(660) 684-6418

MONTANA

Smith Detroit Diesel-Allison

4045 Transport Street
P.O. Box 5715
Boise, ID 83705
(208) 345-1500
Fax: (208) 345-1619

K&E Equipment Co.

2001 Old Hardin Road
Billings, MT 84104

NEBRASKA

Hilder Equipment

West Highway 30, Box 116
Central City, NE 688826
(308) 346 3886

Diesel Power Equipment Co.

15225 Industrial Road
Omaha, NE 68144-5455
(402) 330-5100
Fax: (402) 697-8827

NEVADA

Williams Detroit Diesel Allison

2680 Losee Road
Las Vegas, NV 89030
(702) 399- 1890

Smith Detroit Diesel-Allison

4900 East Idaho
Elko, NV 89801
(702) 738-7154
Fax: (702) 738-9325

Smith Detroit Diesel-Allison

8 Glendale Avenue
P.O.Box 1167
Sparks, Nevada 89431
(775) 359-1713
Fax: (775) 359-6579

Valley Detroit Diesel Allison

13624 E. Nelson Avenue
City of Industry, CA 91746-2387
(626) 330-2210
Fax: (626) 330-0411

Valley Detroit Diesel Allison

11300 Inland Avenue
Mira Loma, CA 91752-1160
(909) 681-9283
Fax: (909) 681-6607

NEW HAMPSHIRE

Jersey Engine Rebuilders

(See Massachusetts)

NEW JERSEY

Engine Distributors Inc.

332 South 17th Street
Camden, NJ 08105-1798
(856) 365-8631
Fax: (856) 338-0606

Engine Distributors Inc

400 University Court
Blackwood, NJ 08012
(856) 228 7298
Fax: (800) 220 2700

Bud's Auto & Truck Repair

1725 Hurffville Road
Sewell, NJ 08080
(856) 228-9448

Industrial Diesel Service

71 Lakewood Road
New Egypt, NJ 08533
(609) 758-6379

LT 'S Cream Ridge Equipment

764 Route 537
Cream Ridge, NJ 08514
(609) 758-1545

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Diesel Motive & Fuel Injection

620Industrial Avenue NE
Albuquerque, NM 87107
(505) 881 3511
Fax: (505) 875 1846

Stewart & Stevenson Power

2929 Vassar Drive N.E.
Albuquerque, NM 87107
(505) 881-3511
Fax: (505) 875-1846

T&B Industrial

1313 E. Orchard Lane
Carlsbad, NM 88220
(505) 875- 1846

Stewart & Stevenson Power

1515 West Murray Drive
Farmington, New Mexico 87401
(505) 325-5071
Fax: (505) 326-4218

NEW YORK

Ram Industrial Service, Inc.

195 Morris Avenue, Unit #55
Holtsville, NY 11742
(613) 642 1989

Formula Equipment Leasing

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(516) 654 1097

DEUTZ ENGINE DISTRIBUTORS

U.S., North America, Central America, South America and Caribbean

NORTH CAROLINA

Coastal Diesel Service
1700 Highway, 70 East
New Bern, NC 28560
(252) 633-2025

Engine Power Source

220 Olympic Drive
Charlotte, NC 28273
(704) 889-7511

Strickland Diesel Service

5451 Old Raleigh Road
Wilson, NC 27893
(252) 237-6935

Engine Distributors Industrial

303 Interstate Drive
Archdale, North Carolina 27263-3148
(910) 434-6616
Fax: (910) 434-6612

NORTH DAKOTA

Nicholson Engine Group
(See Minnesota)

OHIO

McDonald Equipment Co.
37200 Vine Street
Willoughby, OH 44094-6346
(440) 951-8222
Fax: (440) 951-2089

Environmental Machinery Co.

4921 Vulcan Avenue
Columbus, OH 43228
(614) 684 0035

Columbus Equipment

3038 Reynolds Road
Toledo, OH 43615
(419) 531-7101

Byler's Maytag & Engines

15459 butron Windsor Road
Middlefield, OH 44062
(440) 632 1807

R&R Engine & Machine

1004 Swartz Road
Akron, OH 44319
(330) 724-5526

OKLAHOMA

Industrial Engine Parts & Machinery

1016 NW First Street
Oklahoma City, OK 73106
(405) 235-0369

Tulsa Used Equipment & Industrial Engines

5006 East Admiral Court
Tulsa, OK 74105
(918) 832-1323

OREGON

Hamilton Engine Sales

5540 N.E. Columbia Boulevard
P.O. Box 13100
Portland, OR 97213-0100
(503) 288-6714
Fax: (503) 287-8289

Lane Parts Co.

940 Wilson Street
Eugene, OR 97402
(541) 345-8721

Oregon Idaho Diesel

210 North 9th Street
Nyassa, OR 97913
(541) 372 5268

PENNSYLVANIA

Nazar Diesel
1251 Midvalley Drive
Jessup, PA 18434
(570) 383-2004

Engine Distributors

332 South 17th Street
Camden, NJ 08105-1798
(856) 365-8631
Fax: (856) 338-0606

Anderson's Diesel Inc.

877 Mercer-Wilmington Road
New Wilmington, PA 16142
(724) 748-3612

Beteler Diesel

213 Elimsport Road
Montgomery, PA 17752
(570) 547-1874

Cold Water Diesel

545 Walnut Street
Belleville, PA 17004
(717) 935-2223

Engines, Inc.

1330 Nor-Bath Boulevard
18067Northhampton, PA 18067
(610) 262-3661

J & M Machinery Co.

Road #3
P.O. Box 107
Greensburg, PA 15601
(727) 668-7850

Rufus Brubaker Refrigeration

1028 Mt. Pleasant Road
Quarryville, PA 17566
(717) 786-1617

Keystone Diesel Engine Co.

7790 Meadville Road, 190 Exit 3
Girard, PA 16417
(814) 774 0424

Stauffer Diesel, Inc.

55 Billot Avenue
North Huntigdon, PA 15642
(724) 864-6969
Fax: (724) 864-9392

Jersey Engine Rebuilders

Road # 2
P.O. Box 402
Rome, PA 18837
(570) 395-3181
Fax: (570) 395-3780

Stauffer Diesel, Inc.

46 Pleasant Valley Road
P.O. Box 586
Ephrata, PA 17522-0586
(717) 738-2500
Fax: (717) 738-2550

RHODE ISLAND

Jersey Engine Rebuilders

(See Massachusetts)

SOUTH CAROLINA

Continental Engines

1201 Poinsett Highway.
Greenville, SC 29608
(803) 242-5567

Superior Diesel, Inc.

6881 Bulldog Drive
North Charleston, SC 29419
(843) 553 8331

SOUTH DAKOTA

Nicholson Engine Group
(See Minnesota)

TENNESSEE

G&W Diesel Service

892 Kansas Street
Memphis, TN 38106
(901) 948-1625

Diesel Power, Inc.

90 Parris Road
Nashville, TN 37210
(615) 256-8382
Fax: (615) 256-5352

Southeast Diesel, Inc.

2105 Orchard Knob Avenue
Chattanooga, TN 37404
(423) 622-1006
Fax: (423) 698-3015

Covington Detroit Diesel Allison

1435 Rock Springs Road
P.O. Box 5417
Kingsport, TN 37663
(423) 349-6141
Fax: (423) 349-5087

Nixon Dedicated Services Co.

297 Hill Avenue
Nashville, TN 37210
(615) 244 0650
Fax: (615) 244 0689

Water's Equipment Company, Inc.

842 Pleasant Hill Road
P.O. Box 5179
Maryville, TN 37802
(865) 546-9745
Fax: (865) 983-0388

TEXAS

Stewart & Stevenson Power

5815 East Berry Street
Ft. Worth , TX 76119
(817) 496 1355
Fax: (817) 496 0865

Stewart & Stevenson Services, Inc.

2701 North Cage
Pharr, TX 78577

Stewart & Stevenson Services

6530 Agnes
P.O. Box 4975 (78469-4975)
Corpus Christi, TX 78406
(361) 289-5350
Fax: (361) 289-6433

Stewart & Stevenson Services

3919 Irving Boulevard
P.O. Box 560343(753560343)
Dallas, TX 75247
(214) 631-5370
Fax: (214) 634-2811

Diesel Power Supply Co.

2525 S. University Parks Drive
Waco, TX 76706
(254) 753-1587

Dubose Eq. & Rental

408 West Marshall
Longview, TX 75601
(903) 758-3201

Earl Ladd & Sons

602 West American Boulevard
Muleshoe, TX 79347
(806) 272 3308

Stewart & Stevenson Services

8631 East Freeway
Houston, TX 77029
(713) 671-6220
Fax: (713) 671-6197

Stewart & Stevenson Power

2000 Slaton Highway.
P.O. Box 2529
Lubbock, TX 79408
(806) 745-4224
Fax: (806) 748-1165

Stewart & Stevenson Power

11120 West Highway, 80 East
P.O. Box 2848 (79760)
Odessa, TX 79765
(915) 563-4800
Fax: (915) 563-0121

Stewart & Stevenson Services

5717 IH 10 East
P.O. Box 201330
San Antonio, TX 78220-8330
(210) 662-1000
Fax: (210) 662-9832

Huston Machine Shop

1527 East Commerce
San Antonio, TX 78205
(210) 227-3801

Peerless Equipment Co.

5400 New Highway, 90 West
San Antonio, TX 78227
(210) 736- 3223

Safe Way Rental Equipment Co.

311 Bowie Street
San Antonio, TX 78703
(512) 476-7301

Stewart & Stevenson Services

2301 Central Freeway East
P.O. Box 839 (76307)
Wichita Falls, TX 76302
(940) 322-5227
Fax: (940) 322-4286

Stewart & Stevenson Services

7620 Beauxart Garden Road
Nederland, TX 77627
(409) 727 1436
Fax: (409) 724 6047

Mickelsons Pump Show, Inc.

Highway 71 North
El Campo, TX 77437
(409) 543 5281

Mid- South Machinery, Inc.

2201 East Highway 80
White Oak, TX 75693
(903) 297 0199

Diesel Specialist, Inc.

1215 Carpenter Road
Humble, TX 77396
(281) 446 1230

UTAH

Young's Machine Co.

1149 North Main
P.O. Box 489
Monticello, UT 84535
(435) 587-2292
Fax: (435) 587-2312

Smith Detroit Diesel- Allison

3065 West California Avenue
Salt Lake City, UT 84104
(801) 415-5000
(800) 658-5352
Fax: (801) 415-5750

DEUTZ ENGINE DISTRIBUTORS

U.S., North America, Central America, South America and Caribbean

Bullen's, Inc.

2570 North Main Street
Logan, UT 84321
(435) 752-7301

Mac's Mining Repair

225 West 400 South
Huntington, UT 84528
(435) 687-2244

Smith Detroit Diesel-Allison

855 South 1500 East
Vernal, UT 84078
(435) 789-1860
Fax: (435) 789-3259

VERMONT

Jersey Engine Rebuilders
(See Massachusetts)

VIRGINIA

Central Diesel, Inc.
1422 Commerce Road
Richmond, VA 23224
(804) 233-9814
Fax: (804) 233-7084

Industrial Diesel

2514 Alabamba Avenue
Norfolk, VA 23513
(757) 857-5391

Blue Ridge Diesel, Inc.

1016 Delaware Street
P.O. Box 867
Salem, VA 24153-0867
(540) 389-7296
Fax: (540) 387-2792

Payne Industrial & Farm Equipment

Route. 2
P.O. Box 355
North Tazewell, VA 24630
(540) 988-7563

Heavy Equipment Repair

Road 645
North Tazewell, VA 24630
(540) 988 9226

WASHINGTON

Pacific Detroit Diesel

6615 East Mallon
Spokane, WA 99220
(509) 535-3663

Pacific Detroit Diesel

1810 E. James Street
Pasco, WA 99301
(509) 547-1611

Torque A Matic, Inc.

12822 East Indiana
Spokane, WA 99214
(509) 928 0535
Fax: (509) 928 0539

Stewart & Stevenson Power

1221-D 29th Street N.W.
Auburn, Washington 98001
(253) 931-0138
Fax: (253) 931-1175

WEST VIRGINIA

C. Neil Grapes & Son

Rt. 3, Waxler Road
Keyser, WV 26726
(304) 726-8550

KSD Diesel

Old Route 50 East
Clarksburg, WV 26301
(304)624-7452

T & W Enterprises

1018 Oliver Street
St. Albans, WV 25177
(304)722-3668

WISCONSIN

S/W Engines & Power Systems

North 118
West 19328 Bunsen Drive
Germantown, WI 53022
(262) 502-0100
Fax: (262) 502-0200

Koenecke Equipment

52745 Twin Pine Road
Reedsburg, WI 53959
(608) 524 4361

Polk Diesel & Machine

2851 Allied Street
Green Bay, WI 54304
(920) 499-5135

Polk Diesel & Machine

5900 Haase Road
Madison, WI 53708
(608) 244-4784

Schmuckeres Sales & Service

South 1106 County Highway. D.
Cashion, WI 54619

WYOMING

Stewart & Stevenson Power, Inc.

1850 East iFi Street
P.O. Box 2559 (82602)
Casper, Wyoming 82602
(307) 234-6975
Fax: (307) 577-5831

Smith Detroit Diesel-Allison

20 Bowker Road
P.O. Box 1868
Rock Springs, WY 82901
(307) 382-4330
Fax: (307) 382-4354

CANADA

ALBERTA

Simson Maxwell

6447 2nd Street SE
Calgary, Alberta T2H 1J5
(403) 252-8131
Fax: (403) 252-6666

Simson Maxwell

9750 62nd Avenue
Edmonton, Alberta T6E 0E3
(403) 434-6431
Fax: (403) 436-0394

BRITISH COLUMBIA

Simson Maxwell

1605 Kebet Way
Port Coquitlam, British Columbia
V3C 5W9
(604) 944-7100
Fax: (604) 944-7300

Simson Maxwell

#12, 4132 Mostar Road
Nanaimo, British Columbia
V9T 5P8
(250) 756-7700
Fax: (250) 756-1654

Simson Maxwell

729 West 4th Avenue
Prince George, British Columbia
V2L 4T7
(250) 562-2728
Fax: (250) 562-6095

MANITOBA

Dieseltch, a Div. of Pritchard

Engineering Co. Ltd

100 Otter Street
Winnipeg, Manitoba
R3T 0M8
(204) 452-4334
Fax: (204) 452-7984

NEW BRUNSWICK

Sansom Equipment Ltd.

1475 Woodstock Road
Fredericton, New Brunswick
E3B 5C8
(506) 458-1888
Fax: (506) 458-1423

NEWFOUNDLAND

Sansom Equipment Ltd.

63A O'Leary Avenue
St. John's, Newfoundland
A1B 3N7
(709) 726-4344
Fax: (709) 726-4419

NOVA SCOTIA

Sansom Equipment Ltd.

80 Glenwood Drive
Truro, Nova Scotia
B2N 5N2
(902) 895-2885
Fax: (902) 893-7584

ONTARIO

Deutz Canada Inc.

Sudbury Service Center

1351 D Kelley Lake Road, Unit 10
Sudbury, Ontario
P3E 5P5
(705) 523-3377
Fax: (705) 523-3368

QUEBEC

Deutz Canada Inc.

4420 Garand Street
Montréal, Quebec
H4R2A3
(514) 335-3150
Fax: (514) 332-4173
Telex: CNP 5824954

CENTRAL AMERICA

COSTA RICA

C.P.M. S.A.

Apartado Postal 8421150
La Uruca, San Rosé
(506) 257-7842, 9162
Fax: (506) 257-8272

GUATEMALA

Auto Marina, S.A.

Km. 15 Carretera al Pacifico
Villa Nueva
(502) 631-2033
Fax: (502) 631-2034

HONDURAS

Comercial Laeisz Honduras, S.A.

Zona La Buerrera
Camayagua, D.D.
(205)23335 1615
Fax: (205)233-9531

Villa Nueva, Cortez Honduras

Honduras
(504) 670-5218
Fax: (540) 670-4393

MEXICO

Ottomotores, S.A.

Calzada San Lorenzo No. 1150

Colonia Cerro de la Estrella
Ejército Mexicano No. 2505
Mexico, D.F.
(52-5) 426-5522
Fax: (52-5) 4265581

Nautica Diesel Europea,

S.A. de C.V.

Mariano Escobedo 375 PH-3
11570 Mexico, D.F.

Mexico

(5) 2039777

Fax: (5) 5451385

Telex: 1 763 534 khd me

Deutz Refacciones, S.A. de C.V.

Nicolás Bravo No. 753

Col. San Carlos

Sector Reforma

Codigo Postal 44430

Guadalajara, Jalisco

Mexico

(33) 3619 1286

(33) 3619 9002

(33) 3650 2330

Fax: (33) 3650 2689

Diesel Industrial de Chihuahua

S.A..de C.V.

Ejército Mexicano 2906

Colonia Centro

Chihuahua, Chihuahua

C.P. 31000 Mexico

(614) 415-8787

(614) 439-4030

Fax: (614) 415-9747

PANAMA

Cardoze & Lindo S.A.

Via Tocumen, Frente a la Pulida

Apartado Postal 6-2997

El Dorado

Panama

(507) 274-1122

Fax: (507) 267-8103

Telex: (368) 647PANATRAC PA

SOUTH AMERICA

ARGENTINA

Deutz Agco Motores S.A.

Valentin Gómez 577

B1706FMI Haedo - Buenos Aires

Argentina

(11) 4469 7920

Fax: (11) 4469 7932

DEUTZ ENGINE DISTRIBUTORS

U.S., North America, Central America, South America and Caribbean

Deutz Vertragshändler
Empresa Walter Rittner S.A.
José Maria Moreno 1951/85
1607 Villa Adelina/Buenos Aires
Argentina
4766-4668
Fax: 4766-2600
Telex: 26299 wari ar

BOLIVIA

La Paz Motors
Federico Zuazo No. 2150,
Zona Central
La Paz
Bolivia
(2) 211 7716
712 73868 (24-hour service)
Fax: (2) 249 5317

Dyser S.R.L.

Calle Heroes Del Acre 1723
Zona San Pedro
La Paz
Bolivia
(2) 249 1611
Fax: (2) 249 0749

BRAZIL

Deutz do Brasil Ltda
Rua Agostino Togneri, 457
04690.090 São Paulo-SP
Brazil
(11) 5634 1424
Fax: (11) 5634 1264

CHILE

Mauricio Hochschild S.A.I.C.
Avda. Senador
Jaime Guzmán Errázuriz 3535
Casilla 153-D
Renca - Santiago de Chile
Chile
(2) 641-1195
Fax: (2) 641-1323

Mauricio Hochschild S.A.I.C.

San Martin 881
IQUIQUE
Chile
(057) 428-072
Fax: (057)428-105

Mauricio Hochschild S.A.I.C.

AV. Pedro Aguirre Cedra 11582
CASILLA 270
ANTOFAGASTA
Chile
(055) 212 877
Fax: (055) 212 875

Vina Del Mar

Limache 4705
Casilla 1092
Chile
(032) 678 445
Fax: (032) 678 448

Mauricio Hochschild S.A.I.C.
AVDA. ARTEAGA ALEMPARTE 8707
CASILLA 792
CONCEPCION
Chile
(041) 476 070
Fax: (041) 475 966

Temuco

AVDA. RUDENCINDO ORTEGA 0203
1783 CASILLA
Chile
(045) 223-282
Fax: (045) 220-723

Puerto Montt

CARDONAL No. 368
CAMINO A PARGUA
787 CASILLA
Chile
(065) 256-521
Fax: (065) 263-011

Punta Arenas

ROMULO CORREA 0945
43-D CASILLA
Chile
(061) 241-343
Fax: (061) 247-992

COLOMBIA

Stewart & Stevenson
Av. de las Américas No. 33-51
Bogotá, Colombia
Colombia
(571) 244-1900
Fax: (571) 244-1908

ECUADOR

Electro Ecuatoriana S.A.I.C.
Av. 10 de Agosto No. 36-239
Apartado 17-17-1500
Quito
Ecuador
(2) 245 9247
Fax: (2) 244 0040

Av. Juan Tanca Marengo

KM 1/2
Guayaquil, Ecuador
Ecuador
(593-4) 2285-744
Fax: (593-4) 2287-439

FRENCH GUIANA

Mach Deal
12 lot Dufournier, rte Baduel
Guyane Francaise
97 300 Cayenne
French Guyana
29 66 00
Fax: 31 41 86

GUIANA

Mach Deal
(See French Guiana)

PARAGUAY

Eberhard Lewkowitz S.R.L.
Paraguari 935
C.C. 523
Asuncion
Paraguay
214-44400
Fax: 214-44437

PERU

Hochschild Reinsa S.A.C.
Av. Salaverry # 3405
Lima 27, San Isidro
Lima
Peru
1 6156666
Fax: 1 6156667

Motores y Maquinarias S.A.C.

Av. Colonial 2565
Lima 1
Peru
(1) 564-1089
Fax: (1) 564-1303

SURINAM

Mach Deal
(See French Guiana)

URUGUAY

Arfil S.A.
Emilia Pardo Bazan 2270
Casilla Correo 212
C.P.11.800 Montevideo
Uruguay
(2) 924-2021
Fax: (2) 924-2044

VENEZUELA

Dieselven C.A.
Edificio BILBAO, P.B.
Calle11 - La Urbina
Ap. Postal 64512
1064 A Caracas
Venezuela
(58-2) 242-5392
Fax: (58-2) 242-5520
Telex: 25327 deutz vc

Navimeca

C.Soublette c Transversal Jardin 1
Apartado Postal 1220
Guarenas, Edo. Miranda
Venezuela
2 326 2820
Fax: 2 362 9595

Stewart & Stevenson Da Venezuela, S.A.

Km. 4.5. Via La Canada, Apdo 1087
Maracaibo, Edo. Zulia Venezuela
Venezuela
(58)(61) 316747
Fax: (061) 343326

CARIBBEANS

BAHAMAS

Lightbourne Marine
Division of Earthmovers Ltd.
East Bay Street
P.O. Box N 4894
Nassau, Bahamas
(809) 393-5285, 5549
Fax: (809) 393-6236

CUBA

CDM - Habana
Estrada Palma y Naval
Casablanca, Habana
Cuba
(53) 7-603511
Fax: (53) 7-338157
Telex: 511348 etmar cu

DOMINICAN REPUBLIC

Jaime Mendez Succ. C por A.
Avenida San Martin 98
SANTO DOMINGO
Dominican Republic
565-8861
Fax: 567-1445

GUADELOUPE

Assistance 97 Z.I. de Jarry
Rue Ferdinand Forest
97122 Baie Mahault
Guadeloupe
267979
Fax: 267460

JAMAICA

Delta Supply C. Ltd.
106 Hagley Park Road
Kingston 11
(809) 923-6025
Fax: (809) 923-4519

MARTINIQUE

SOCAMAT
Pelletier
97 232 Lamentin
Martinique
51 11 10
Fax: 51 58 40

Assistance 97

Z.I. LES MANGLES Acajou
97232 Le Lamentin
Martinique
427960
Fax: 504236

PUERTO RICO

Airequipo Inc.
Road 20, km 4.2
Guaynabo P.R. 00657
(787) 720-9531
Fax: (787) 720-8395



DEUTZ Warranty Statement

- 1 DEUTZ Corporation ("DC") warrants to the original retail customer: that every new DEUTZ diesel engine supplied by DC or an authorized distributor of DC, purchased by such customer and properly installed in an application, will be free from defects in material and workmanship under normal use and service. If, during the warranty period following the delivery of the engine it is shown there is a defect in material or workmanship caused solely by DC's failure to meet such standards, and customer has promptly notified DC in writing of such defect within that period, DC shall repair or replace, at DC's cost and option, such defective engine or part. Such repair or replacement will be made without charge to the customer at customer's premises, or, at the option of DC, at such other location as DC may designate. All engines and parts that are replaced shall become the property of DC. Any repaired or replaced engine shall be warranted until the expiration of the original warranty period. DC's warranty obligations are expressly conditioned on the customer fulfilling all of his obligations pursuant to his purchase order, including, without limitation, his payment obligations.
2. The warranty coverage will be as follows:

Warranty Period Months	Operating Hours	Warranty Coverage
12	Unlimited	All Components
24	1008,1008F 1000h	All Components
	1011,2011 2000h	
	1012,2012,1013 3000h	
	912,913,914 3000h	
	1015,2015 4000h	
36	1008,1008F 1500h	Main Components, Crankcase, Camshaft, Connecting Rods, Cylinder Head
	1011,2011 3000h	
	1012,2012,1013 4500h	
	912,913,914 4500h	
	1015,2015 6000h	

The warranty will commence at the time of sale to the first retail customer, or one year from the date of manufacture, whichever occurs first.

3. This warranty excludes damage caused by: (i) wear and tear or contaminants; (ii) exposure, corrosion or prolonged or improper storage; (iii) improper installation, use, fuels, lubricants, operation, maintenance, transportation or packing; (iv) misuse, alteration, negligence and accidents; (v) chemical or electrical action; and (vi) unauthorized repairs.
4. This warranty does not cover any components supplied by DC manufactured by someone other than DEUTZ AG, such as components obtained by DC from its suppliers (other than DEUTZ AG), and

DC makes no warranty whatsoever with respect to such components. Such components will be covered only by the warranties, if any, as may be issued by such suppliers themselves, which warranties will be made available to customers, upon request.

5. The warranties, obligations, liabilities and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. DC's total aggregate liability with respect to any engine or part that is defective shall not exceed the amount paid by the customer for such engine and customer agrees to release, defend, indemnify, and hold DC harmless from and against any and all further liability arising in any manner from such defective engine or part. To the fullest extent allowed by law, releases from, and limitations of liability shall apply notwithstanding the breach of contract, tort (including negligence), strict liability or other theory of legal liability of the party released or whose liability is limited. This warranty is governed by Georgia law.
6. UNDER NO CIRCUMSTANCES WILL THE CUSTOMER BE ENTITLED TO RECISSION OR TO A REDUCTION IN THE PURCHASE PRICE. CUSTOMER WAIVES ANY AND ALL CLAIMS FOR LOSS OF TIME, REPLACEMENT POWER, INCREASED COSTS, INCONVENIENCE, LOSS OF USE OR PROFIT, LOSS OF GOODWILL, COST OF CAPITAL, COST OF RENTALS OR ANY OTHER DIRECT, INDIRECT, PUNITIVE, SPECIAL, EXEMPLARY, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER.
7. THIS WARRANTY, AND THE LIMITED WARRANTY OF DC FOR EPA-APPROVED DEUTZ DIESEL ENGINES AND NEW DEUTZ DIESEL ENGINE PARTS INSTALLED IN SUCH ENGINES ARE IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES OF DC AND THE MANUFACTURER WITH RESPECT TO DEUTZ DIESEL ENGINES AND DEUTZ DIESEL ENGINE PARTS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. NEITHER DC NOR THE MANUFACTURER ASSUMES, NOR AUTHORIZES ANY DISTRIBUTOR OR OTHER PERSON TO ASSUME, ON THEIR BEHALF, ANY OTHER OBLIGATION OR LIABILITY.

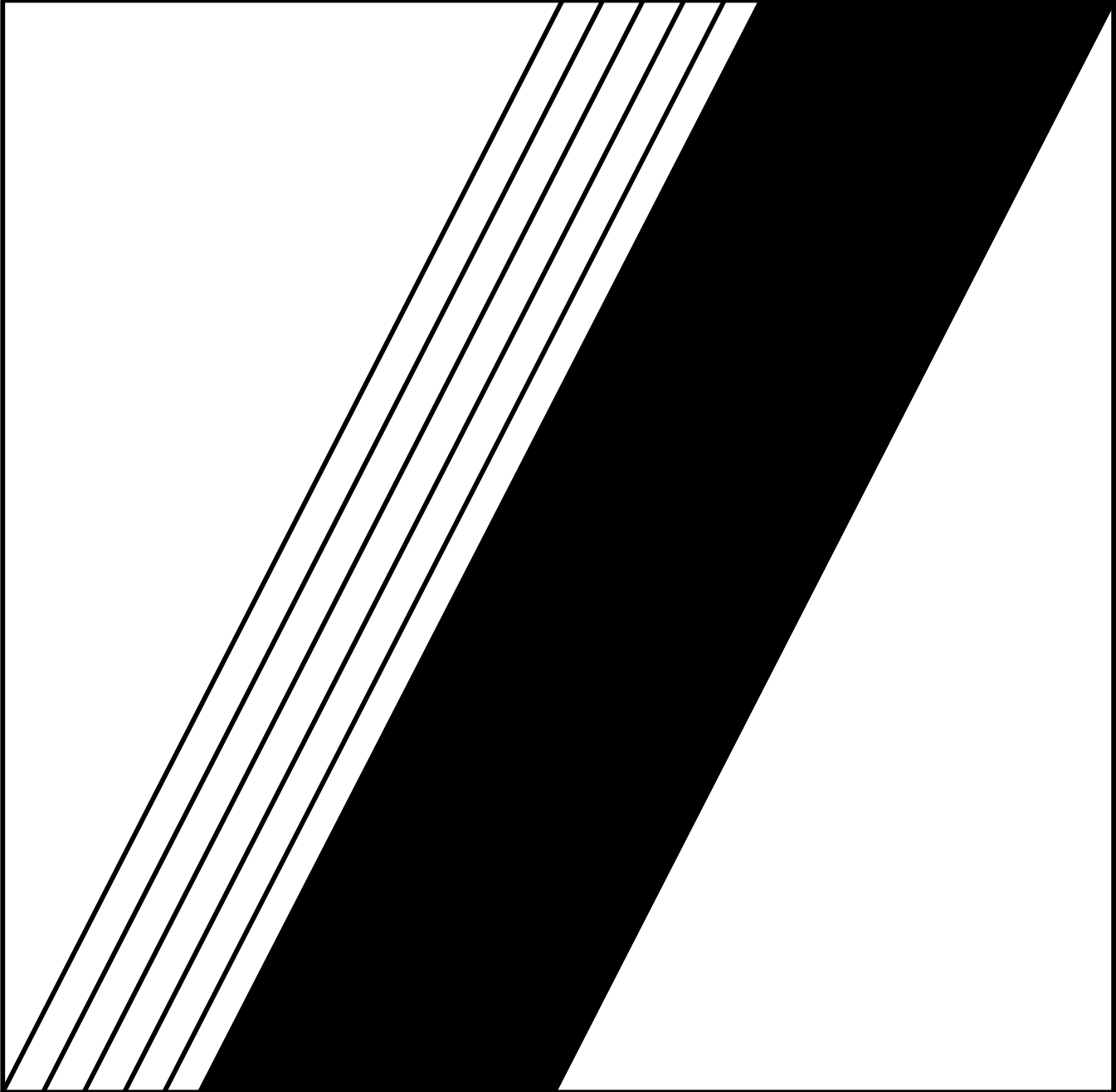
8. For complete details of the DEUTZ warranty please contact:

DEUTZ Corporation Inc.
3883 Steve Reynolds Blvd
Norcross, GA 30093
USA

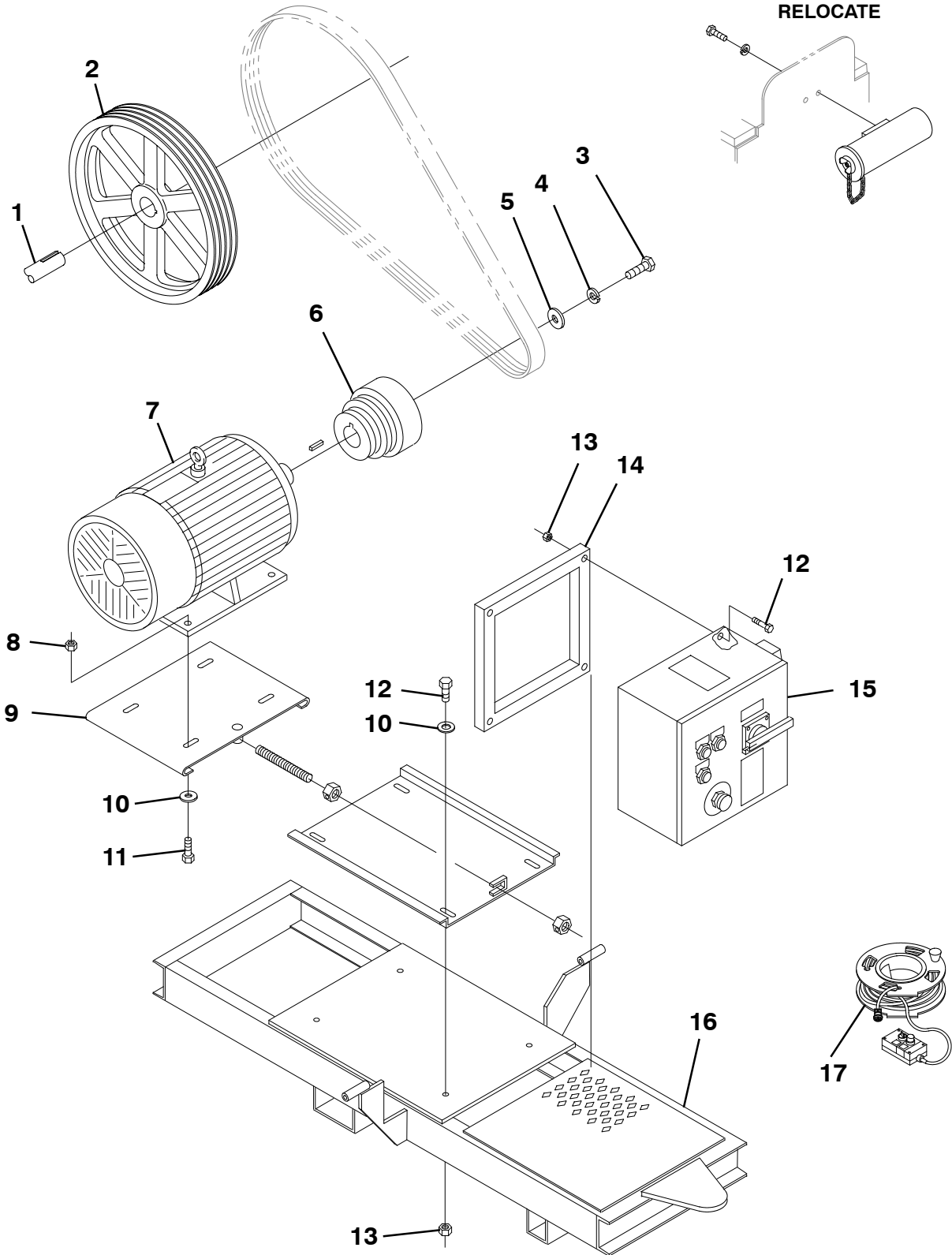
Tel.: 770-564-7100
Attn: Warranty Dept.

Date: 09-12-02

SECTION 7

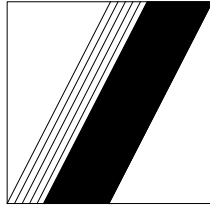


ELECTRICAL OPTION



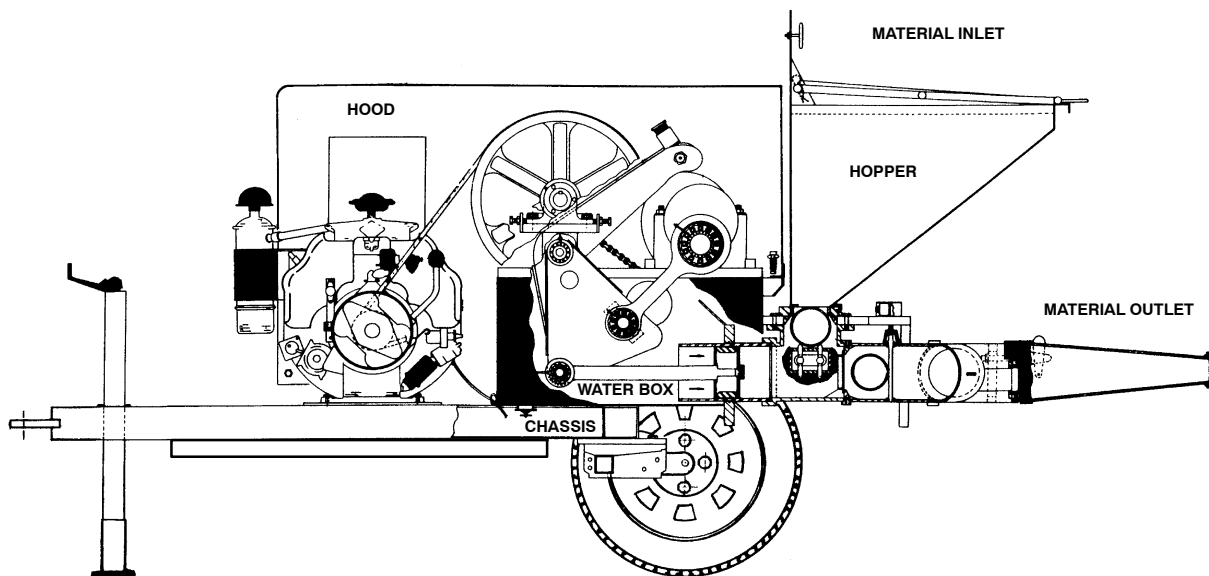


Pos.	Qty.	Description	Part No.
1	1	COUNTERSHAFT - LONG	30373195
2	1	SHEAVE, 4TB200-Q1	30390904
3	1	BOLT, 1/2-13 X 3", GR8	30391246
4	1	WASHER, LOCK, 1/2"	30373845
5	1	WASHER, FLAT, 1/2"	30373843
6	1	CLUTCH, 8000SERS	30390882
7	1	MOTOR, ELECTRIC, 20HP, 256T	30390905
8	4	NUT, 1/2-13, NYLOCK, GR8	30391247
9	1	MOTOR BASE ASSEMBLY, MB286TX	30390903
10	4	WASHER, FLAT, 1/2" SAE	30391335
11	4	BOLT, 1/2-13 X 2-1/2", GR8	30373825
12	4	BOLT, 1/2-13 X 2", GR8	30337904
13	4	NUT, 1/2-13, NYLOCK	30373847
14	1	FRAME, CONTROL PANEL	30390949
15	1	CONTROL PANEL ASSEMBLY	30390906
16	1	FRAME	30390931
17	1	REMOTE CABLE ASSEMBLY	SEE MFG



SCHWING

OPERATION MANUAL



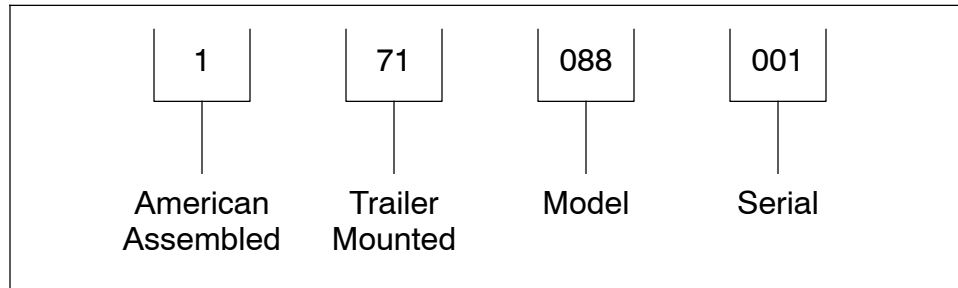
THE WORKS

MACHINE CHARACTERISTICS



The code designation of the concrete pumps can be broken down as follows:

Mechanical pump, trailer serial number explanation

Model Plate



The Model Plate is located on the righthand side of the machine.
The Serial No. additionally is punched into the machine frame just below the Model plate.

 SCHWING 5900 Centerville Rd White Bear, MN 55127 Phone: 651-429-0999 www.schwing.com		SUBSIDIARY OF SUBSIDIARIA DE		 SCHWING GmbH. Herne / Germany Phone: (02325) 7871 www.schwing.de	
This product is covered by one or more U.S. patents - see patent decal		Este producto está cubierto por una o más patentes de Estados Unidos - vea la etiqueta			
MODEL	MODEL #	SERIAL #	YEAR		
MODELO	# DE SERIE	AÑO			
	LBS.	MAX.	MAX.	MAX.	MAX PSI
WEIGHT	TONGUE WEIGHT	ENGINE RPM	STROKES PER MINUTE	MATERIAL PRESSURE	
PESO	PESO DE ENGANCHE	RPM DE MOTOR	CARRERAS POR MINUTO	PRESIÓN MATERIAL	

Please note the

Model # _____

and

Serial # _____

of your machine.



PREFACE

The operating instructions contain important information concerning the operation and maintenance of your

SCHWING MACHINE

A copy thereof should always be within easy reach of the machine operator and the members of the maintenance crew. Any handling of the machine implies knowledge and close observation of the operating instructions. It is advisable, therefore, especially prior to commissioning, to read the instructions carefully several times and to become familiar with the machine.

**Perfect operation and maintenance ensure
lasting operational reliability.**

Down times owing to avoidable maintenance work can largely be avoided if particular attention is given to the following points:

- Always operate the machine gently and without force!
- Carry out all the prescribed maintenance and inspection work completely and punctually!
- Use only lubricants and operating supplies according to our recommendations!
- During operation, read regularly all the built in monitoring instruments and note any unusual reactions (noises, lack of power, etc.)!
- Install only ORIGINAL SCHWING SPARES!

During operation and maintenance work, the relevant safety regulations must be strictly observed.

NOTE THE EXTRACT FROM THE TERMS OF WARRANTY.

**EXTRACT FROM THE TERMS OF WARRANTY**

The following extract from the terms of warranty deals with those damages which may result from incorrect operation and maintenance.

The warranty does not extend to:

- Defects arising in consequence of natural wear and tear, inadequate installation and erection work by third parties, inadequate commissioning, inadequate or negligent handling, subjection to unsuitable stresses and loadings.
- Defects caused by modifications or repair work carried out without prior approval by the purchaser or by third parties.

If a defective machine continues to be used in spite of the defect, the warranty shall be confined only to the original defect.

SCHWING

STATIONARY PUMPS

PRODUCT WARRANTY

Schwing, Stationary Pumps, warrants its new concrete pump equipment against defect in material and workmanship under normal use and service, and which shall not have been subject to misuse, negligence or accident, for a period of 1 year from the date of purchase.

Schwing will replace or repair free of charge, FOB Schwing warehouse, such part or parts thereof as in its sole judgement shall be deemed defective. This warranty does not obligate Schwing to bear the cost of labor in replacement of such defective parts or the cost of transportation of such parts.

This warranty shall not apply to any equipment manufactured by us which shall have been loaded or operated beyond its rate capacity as specified by Schwing. Damage resulting from improper installations or alterations outside our plant will be considered misuse and not as a defect. Certain parts of the concrete pump, the pumping cylinders, concrete valves, delivery system, pumping rams, etc., are subject to normal wear. This normal wear is not covered under this warranty. Schwing shall not be liable for consequential damages or injuries of any kind, or for expenses, losses, or delays incidental to any failure. Schwing reserves the right to make changes and improvements in its product without incurring any obligation to install any such changes or improvements in its products previously manufactured.

All warranties must be submitted within 60 days of invoice. Exceptions will be made for stock parts orders. Spare parts are warranted for 90 days and subject to the same limitations as new equipment. No labor will be granted for equipment out of the warranty period.

Schwing makes no warranty of its outside purchased components or accessory equipment such as, but not limited to, engines, tires, wheels, tools, etc., the same being subject to the warranties of their respective manufacturers.

This warranty is in lieu of any other warranty expressed or implied or any other obligation or liability on the part of Schwing, and no other person is authorized to make any representations or warranties beyond those herein expressed.

Without limiting the generalities of the foregoing. **THERE IS NO IMPLIED WARRANTY OF MARKETABILITY AND NO IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**



01/01/08



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1.0 Introduction

Schwing ball valve concrete pumps are dual cylinder piston type concrete pumps. Once the concrete is discharged into the pump hopper, both gravity and suction feed the material into the primary, or main cylinder. The piston in this primary cylinder pushes the material through a ball check valving system into the hose. The secondary, or compensating cylinder is used to smooth out the pulsations of the primary cylinder at the discharge point of the hose. A spring is installed on the compensating piston rod, and deflects on each main cylinder piston stroke. In connection with the special cam profile, this “Spring Cushion” acts to produce an uninterrupted smooth flow of material under average pumping conditions.

2.0 Eligibility

1. Equipment shall be operated only by experienced operators, or learners under the direct supervision of an experienced operator, and no unauthorized person shall be permitted to assist or remain in the immediate vicinity of the unit while it is in operation or during the performance of any maintenance, inspection, cleaning, repair, or make ready operation.
2. Equipment shall not be operated by individuals who cannot read and understand the signs, notices and operating instructions that form a part of the job (in the language in which it is printed).
3. Equipment shall only be operated by individuals who are familiar with the operating instructions, have received some on the job supervised training, and are familiar with the standard hand signal codes used at the construction site.
4. Equipment shall be operated only by individuals of legal age.
5. Equipment shall not be operated by anyone with seriously defective eyesight, or hearing, and physical or mental impairment (such as epilepsy, heart disease, or progressive neuromuscular deterioration), and that this be verified by a physical examination at least annually.
6. Equipment shall not be operated while the operator is eating, drinking, reading, or is more than 6' from the controls of the pump.
7. Equipment shall not be operated by an operator who has asked to be relieved because he feels physically or mentally unfit.
8. Equipment shall not be operated at any new site, or at the start of a new shift, until a visual inspection is made of the condition of the equipment.
9. Equipment shall have a sign off sheet attached to the vehicle where an operator can report any damage, defects, problems, or accidents to the next shift operator and work supervisor.
10. Equipment shall not be operated by anyone who is under the influence of alcohol, drugs, or any foreign substance prescribed or not prescribed.

3.0 Safety Procedures

FIRST AID

Always carry a first aid kit suitable for temporary application.

BEFORE DRIVING

The following instructions apply to driving any vehicle towing a concrete pump to and from the job site:

- All jack legs must be fully retracted and locked into position.
- Tires must be properly inflated.
- Inspect the tread depth on the tires. Look for cuts and excessive wear. Remove any stones caught in the tread.
- Prior to towing, secure safety chains to towing vehicle. Secure jacks, hood, grate, and reducer cone to eliminate any movement that may cause damage.

4.0 Operating Precautions

1. The operator must stay alert and observe instructions for safe concrete pumping.
2. Operator must wear safety goggles and a hard hat at all times when operating the unit.
3. Do not pump hopper empty of concrete. Once empty, the pump starts compressing air into the line which is then expelled on the return stroke. The compressed air will blow concrete upward, out of the hopper, causing possible damage and/or injury.
4. Never add fuel when the engine is running.
5. Never operate the unit in a closed shed or garage, unless exhaust gases can be vented to the outside.
6. Keep hands and objects out of the hopper at all times while machine is in operation.
7. Never pour concrete into the hopper without the grate in place.
8. Operator must monitor the batch being received from the concrete truck, looking out for unmixed or dry concrete, sticks, pieces of metal and other foreign objects.



5.0 Preliminary Checklist

The Schwing ball valve concrete pumps have been designed to give you many years of reliable service when operated and maintained properly. The following initial check points should prove helpful in the successful operation of your concrete pump:

1. Engine oil in crankcase (dipstick inspection). Use premium oil. SAE 30.
2. Fuel tank full (gasoline).
3. Liquid level in waterbox (6" minimum).
4. Check battery electrolyte level. Use only distilled water.
5. Insure that all parts are in good working order, and all fasteners are tight.
6. Check all discharge points for blockage, and rotate pump by hand through a complete revolution of the pumping cycle to insure that all parts move freely.



6.0 Specifications

6.1 Operating Instructions

6.1.1 Engine and Pump Start Up (see manufacturer manual)

Make sure E-stop button is in the out position and dummy plug is connected and verify that “Push to Stop” is pulled out to run position. Toggle remote switch is in “On” position. Push “Start” button. When engine starts, release to “Run” position.

NOTE: An automatic centrifugal clutch is installed to engage and disengage the pumping action without stopping or starting the engine. The centrifugal clutch is set at 1100 RPM release. Engine idle speed is approximately 750 RPM. Therefore, the clutch is completely disengaged at idle. So, while pumping, the throttle setting (black handle) should always maintain an engine RPM high enough to prevent the clutch from slipping and burning the clutch lining. The engine governor is pre-set at the factory to run approximately 2750 RPM at full throttle and without load condition.

6.1.2 Location and Set Up

Position the machine as close to the discharge or placing area as possible. Try to locate the machine so that it can be fed by the concrete truck from either side. This will lessen time lost in getting the trucks into position for discharging material into the hopper and permit uninterrupted pumping.

Set the machine on the rear jack stand, then lower the front jack with the crank until the machine is setting firm and some of the load is off the tires.

NOTE: Pump is more stable during operation if it can be hooked up to the towing vehicle. **BLOCK TIRES AND SET HAND BRAKE ON TOWING VEHICLE**

Connect hoses (pipe may be used for high vertical lines to reduce friction) and position them to point of discharge.

WARNING: Operate pump with hood closed at all times!

6.1.3 Priming the System

Before concrete is discharged into the hopper, it is suggested that the manifold and hose system be lubricated as follows:

Add 5 gallons of 1:1 sand and cement slurry plus 2-1/2 gallons for each 100 feet of 2" bore. (This amount will vary with the diameter of the line). Pump the grout into the hose or pipeline system. This procedure lubricates the hose and prevents separation and blockages in the hose. When the hopper is near empty, start to discharge the material to be pumped from the truck into the hopper and continue pumping.

NOTE: The operator should be very attentive when starting the pump to receive the first concrete of the pour. This can be one of the most critical operations of the job.

6.1.4 Pumpable Mixes

When ordering concrete, be certain to advise the concrete supplier that you require a "pump mix". The P-105 and P-125 can pump a wide variety of materials, but certain basic principles must be followed to insure successful pumping.

Generally speaking, the washed concrete sand and #4 aggregate (pea gravel) should conform to A.S.T.M. standards in regard to sieve analysis. Sands in some areas are washed clean of the #100 and #200 mesh fines, with resultant separation in the manifold and jamming while pumping under pressure. If this condition develops, check with your concrete supplier's engineers and get their recommendations for supplementing the lack of fines. The use of locally accepted admixes may be required. (For example, Pozzoloth, Plastiments, Bentonite Clay etc.) When properly prescribed, additives form the plastic paste sometimes necessary to hold the cement and aggregate together, lubricating the flow of mix through the discharge line.

When the pump is stopped for any reason during a pour, e.g., moving hose, waiting for another concrete truck to arrive, etc., the following suggestions are offered:

- Leave hopper full of concrete at time of shutdown.
- If shutdown period exceeds 2 or 3 minutes turn off engine so vibration does not separate mix in hopper which can cause a blockage in manifold when pumping is resumed.

NOTE: If this should occur, open hinged discharge cone. Flush "separated" concrete from manifold with water, close discharge cone and start pumping. It should not be necessary to disconnect the hose.

- If it is necessary to wait 10 minutes or more for another load of concrete, it is wise to start pump and pump 6-8 strokes every 5 minutes to prevent setting of the mix in the system. If waiting time is excessive, it would be wise to wash out the pump and hoses and start over when new truck arrives.
- When pumping stiff mixes and there is waiting time between concrete, it is advisable to add some water to the last hopper of material and mix with a shovel to insure an easier start with the following load.



- The same procedure would apply when first starting to pump with stiff mixes. After slurry is put in hopper, “wet up” the first couple of hoppers of mix to make it easier to pump through the clean hose.

6.1.5 Blockages or Material Jams

Blockage is the consequence of the immobility of the material in the hose or pipeline system. When blockage occurs, the engine will lug and the reciprocating of the rams will stop. When this happens, the operator should immediately shut down the engine to idle to prevent serious damage to the centrifugal clutch.

NOTE: If jamming conditions in the pump or hose occur for any reason at all, do not attempt to use more power to correct the condition. Determine the cause of the jamming, correct it, and resume pumping. Trying to force material through under jammed conditions may result in damage to the drive system, thus voiding warranty service.

- If the hose or pipeline connected to the reducer and hose starts to move or raise up as pressure is applied, the blockage is down stream. Check the system until you locate a soft spot in the hose or a hollow sound with a hammer if it is a pipe.
- If the reducer raises up but the hose is soft, you know the plug is in the reducer.

WARNING: Do not open clamps or valves until pressure is relieved. Extreme care and caution must be exercised when this condition occurs. The system may be under pressure due to compression of the compensator spring.

SAFETY WARNING ! ! ! Before starting the following procedure, insure that the wedge safety retaining pins are in place and the exhaust cone safety chain is installed loosely by two to three links. DO NOT attempt to remove wedges without safety pins and safety chain installed. Wear safety glasses at all times!

STAND ON SIDE AWAY FROM HINGE. Lightly tap the bottom of the wedge on reducing cone until pressure starts to bleed off around the connection. Do not attempt to remove wedge all at once; the wedge must be removed slowly to allow ample time for the pressure to be relieved. Only after there is no more pressure is the wedge safety pin removed and the wedge to be taken out completely and safety chain unhooked. Always bleed off line pressure in above manner before opening snap joint coupling at any point in the system.

Usually blockages occur at the small diameter end of the pipeline system reducers. They are caused by a number of factors. Check for these situations:

- Dirty pipeline, hose, or reducer sections (concrete left internally from previous use.)
 - Leaking points or clamps, absence of gaskets or seals, resulting in loss of cement paste or grout diminishing the lubrication properties of the concrete.
 - Difficult material proportions do not make a pumpable mix.
1. Bleeding or segregation of mix because of repelled water to cement ratio too high.
 2. Unsuitable aggregate condition.
 3. Inadequate fine aggregate content or too high a rock or coarse content.
 4. Excessive amounts of chemical additives such as accelerators.
 5. Material which sets early (high early cement Type III). High cement content per cubic yard and also extended intervals between pumping can allow setting.
 6. Careless handling of the pouring hose at the end of the system. Hoses must not be kinked.

If a blockage occurs in a hose, the hose will be soft immediately past the blockage. Elevate the hose at that point with the “blockage area” hanging down. Using a hammer, you can pound the “downstream edge” of the packed area until it is free to flow or shake out to end of hose.

6.1.6 Screen of Grating over the Hopper

The grating furnished with the machine is for the coarse mix design that the ball and seat valve can pass. Successful and trouble-free pumping can be accomplished by using the proper screen. The screen should be of the proper opening to accommodate design. When possible, you may experiment with various mixes in your area to determine the degree of versatility of your ball valve concrete pump. For example, the pump is specified as 1/2" minus pump, some operators use 300 to 400 lbs. of rock (1/2" aggregate) per yard in their mix.

Sample Design Mix

6-1/2 sacks cement (611 lbs.)
2120 lbs. washed concrete sand
850 lbs. pea gravel (1/2" minus aggregate)
230 lbs. water (27-1/2 gallons)
0.2 oz. Pozzoloth 3 per sack cement



6.1.7 Clean Up Procedures

Immediately upon completion of placing operation, attention must be given to clean out. During some pours hose and pipes can be cleaned out as they are being removed from the system still connected.

After completion of the pour, pump remaining concrete in hopper through discharge line. Stop pump, fill hopper with water, and resume pumping. The water will push concrete through the lines. When water runs clear at the end of hose disconnect lines and shake out all sand and sediment so line will be clean for next pour. Open hinged discharge cone on pump manifold and flush all remaining cement, rock and sand from system. Inspect thoroughly at this time to prevent concrete from setting up in manifold.

WARNING: When cleaning inside the hopper, make sure the grate is secured properly.

NOTE: The use of compressed air to clean out concrete from lines is HAZARDOUS. It is advisable to use only water pressure or city water pressure for the pump.

6.1.8 Towing

When towing, check the following points:

- Attach safety chains.
- Make sure the tongue jack is elevated to clear the roadway.
- Secure all covers and loose objects.
- Maintain proper air pressure in the tires.

6.2 Preventive Maintenance

Removal of safety devices

Sometimes you will have to remove a safety guard or other safety device in order to perform maintenance. For these situations, you must take extra care to be sure of your own safety, and that of your co-workers. If you have to put your hand, feet or any other body part into a part of the machine that would normally be guarded, be sure that the machine is turned off and that the key is in your pocket. If there is more than one key in existence, you should also put a "DO NOT OPERATE" sign on the controls or over the start switch.

Before restarting the machine after performing maintenance, be sure to put away all tools, parts and supplies, and clear the area of personnel. If your company has a "lock out - tag out" policy in place, abide by it.

Concrete pumps are big enough to hide a man. Be sure to yell "clear" before starting the unit at any time, and allow time for response before proceeding.

All concrete pumps require more frequent service and operator skill than most other pieces of construction equipment. Due to the highly abrasive nature of concrete under pressure, it is extremely important that expendable wear components be inspected at regular intervals between jobs to prevent having to replace these items during a pour. Experience has proven that inconsistency of batched concrete mixes and frequent moving of the line requires the operator to be readily available at all times during pumping to stop the pump and prevent abuse to the unit which may occur if unexpected blockages develop.

6.2.1 Maintenance Every 8 Hours

1. Fill fuel tanks. This eliminates condensation in the tanks.
2. Check engine oil level (dipstick inspection) - use only premium oil. See engine manual.
3. Check battery electrolyte level - use only distilled water.
4. A thorough inspection of drive components and greasing of all bearings will insure adequate lubrication and service to this unit which is normally operated in wet, gritty conditions.

NOTE: Over greasing of any bearing on your concrete pump will not damage the bearings.

USE ONLY PREMIUM GREASE FORTIFIED WITH RUST AND CORROSION INHIBITORS (Weather-proof). Schwing America Inc. Recommends Pennzoil/Mobil Multi-purpose White Grease 705.

5. Check liquid level in water box, maintain at 6" minimum.
6. Check tire pressure. Maintain at 32 PSI.
7. Check air cleaner.
8. Inspect all nuts and bolts for tightness. Special attention should be given to the rocker arm bolt. Replace bolt if it appears to be stretched or the threads are stripped.
9. The drive chain should be adjusted to remove all slack. Once all slack is taken out, do not over-adjust as this will overload the shaft bearings. A slack chain in this crank drive principle causes backlash and shock loads on shaft components. Lubricate chain regularly.

NOTE: It is advisable to carry a spare chain and/or master links for replacement in the field if necessary.

10. Drive belts should be regularly adjusted to prevent slippage. Loosen engine mounting bolt...adjust to proper tension and retighten. ($3/8$ " deflection or 4 to 5-1/2 lbs.)
11. Keep O-ring seals in good condition at all times, because leaking manifold seals or hose coupling gaskets leak air, water, and can cause separation and subsequent jamming at that point.
12. Keep entire pump washed of splashed concrete to prevent build-up. A light spray of hydraulic oil over entire pump will help prevent concrete from sticking to painted surfaces. Refer to Spare Parts List for proper identification of replacement parts.



6.2.2 Belt and Chain Adjustments

Inspect both chain and belt drive assemblies for excessive wear. Replace any parts that are not serviceable. Do not replace only links in the chain. It is recommended that the chain be replaced completely. At this time, check sprockets for wear and replace. A worn sprocket will reduce the life of a new chain.

When adjustments are required, it is suggested that the following procedures be utilized:

1. Adjust chain tension first.
2. Loosen the pillow block bearing bolts only to where the bolts will remain snug.
3. Turn each adjustment bolt clockwise an equal amount until all the slack has been removed, do not over-adjust as this will overload the shaft bearings. A slack chain on the crank drive creates backlash and shock loads on the shafts and bearings which results in shorter wear/life of the drive components.
4. It is very important that the pulley side and sprocket chain side are within 1/16" of an equal distance. This distance can be checked by using a tape measure or straight edge ruler, measuring from the inside of the adjustment bolt bracket to the face of the pillow block bearing.
5. Drive belt should be adjusted at this time. To adjust belts, loosen engine mounting bolts until there is 3/8" of belt deflection or (if you are using a deflection gauge), a reading of between 4 to 5-1/2 lb.
6. Retighten all bolts and locking nuts. A frequent inspection should be made on all drive components to make certain that all bolts and nuts remain tight.

NOTE: It is advisable to carry a spare belt, chain, and master link for replacement in the field, if necessary. This expenditure at this time will be far less than the time lost on the jobsite if a breakdown occurs.

6.2.3 Testing

After servicing pump or replacing components, components should be tested to ensure proper operation.

1. Test the condition of the sprocket chain and drive belt after replacement. See procedure for belt and chain adjustments in Section 6.2.2.
2. Test air pressure in tires after tires, wheels, axle, or related components have been repaired or replaced. Pressure reading should be at 32 PSI.
3. Use torque wrench to test tightness of lug nuts after servicing tires, wheels, axles. Torque should be set at 95 ft-lbs.

6.2.4 Return Spring Adjustments

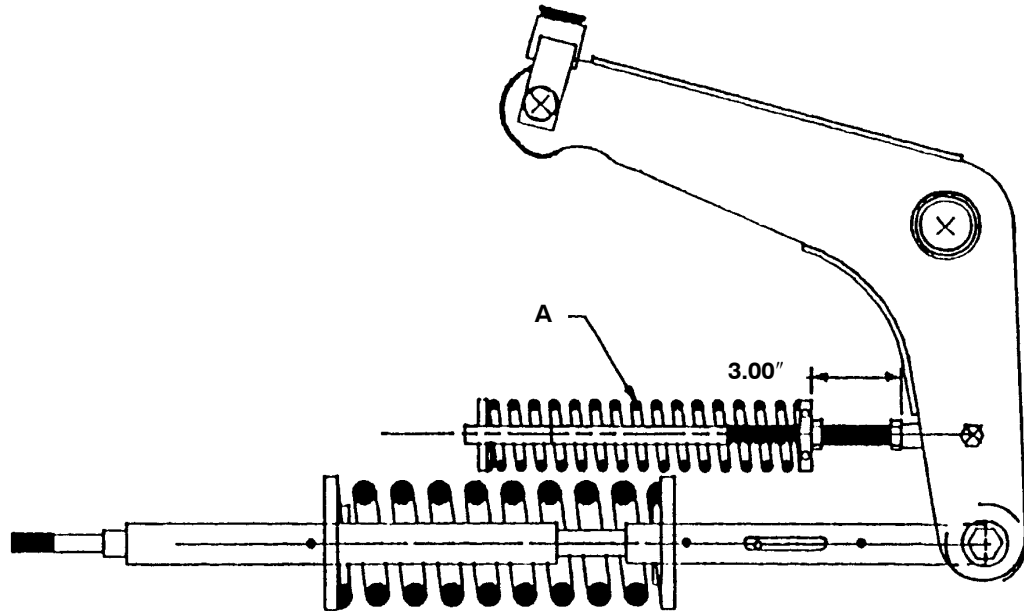


Figure 6-1

The above return spring is installed to eliminate shock and stress between cam roller and cam weldment when pump is in operation. If return spring "A" is removed or replaced for any reason, maintain backing plate dimension as shown to produce proper pre-loading of spring for smooth performance.

NOTE: This spring has nothing to do with the concrete pumping operation. It is there just to help the rocker arm ride the cam with low back pressure.

6.2.5 Maintenance Every 40 Hours

1. Service the engine in accordance with the engine manual.
2. Check waterbox system for leaks.
3. Drain water from waterbox and clean thoroughly. Fill to 6" minimum level. Add water soluble oil if desired. (see Component Maintenance).
4. Remove primary and secondary manifold sections after every few 100 cubic yards of pumping to inspect valves, stop pins piston cups, and bolts for wear and service. (see Component Maintenance).
5. Check the tightness of the material piston cup screw. Remove discharge manifold and the ball valve assembly. Using a 1-1/8" socket, engage the 3/4" cap screw head and tighten to 100 ft. lbs. torque.
6. Check piston cups for grout leakage. (see Component Maintenance).



6.3 Component Maintenance

6.3.1 Waterbox

The waterbox is the reservoir and connecting chamber for the water lubrication system of the pumping cylinder. Its function is to lubricate the material piston seal. As indicated, the water level should be checked periodically and maintained at a height of 6" minimum. Add recommended ratio of water soluble oil to water, if desired.

In freezing temperature, the waterbox should be filled just prior to starting the machine or getting ready to pump concrete. A small amount of water soluble oil mixed with the water can be used in lubricating the piston cup seals and cylinder walls. Upon completing the clean-up for the day, be sure to pull the drain plug (located on the bottom) and drain all the water to prevent freeze-up. Ice in the cylinders will damage the piston seals upon start-up. Also during freezing temperatures, it is a good practice to keep the hopper covered to prevent snow and water from entering the material cylinder from the hopper side. This could also damage the piston seals.

As the material piston seals wear, it will permit fine cement paste to collect in the waterbox and thus color the water. Discoloring can be tolerated. As the wear increases, so will the leakage and deposit of cement paste. If the cement paste builds up in the bottom of the box to approximately one half inch, it should be drained, cleaned, and new piston seals installed. Two plugs for draining the box are located in the bottom.

IMPORTANT: This is to notify all pump owners that if your machine is provided with a water box lubrication system, the water box could freeze up if the pump is going to be operated in areas where the temperature could drop below 32° fahrenheit. Therefore, Schwing America, Inc. recommends that antifreeze solution be added to the water box as follows:

Add 1-1/2 gallons of antifreeze, 1/3 gallon of lubricant oil (if desired) to 10 gallons of water

Allow time to mix.

Under no circumstances operate the pump with the water box frozen!

6.3.2 Material Piston Seal Replacement

When excessive wear and leakage has been determined, the piston seal must be replaced. The piston is attached to the ram cylinder rod by a single 3/4" hex nut. It is removed through the discharge end of the material cylinder. Drain waterbox through drain openings in the bottom.

With the engine stopped, drive out wedge pins holding discharge manifold and swing open. Remove hopper, unbolt ball valve assembly from hopper plate and remove.

With 1-1/8" socket, remove the 3/4" nut, O-ring, and piston cup seal.

Before replacing with a new piston cup seal, apply a thin coating of oil or grease to the piston cup lip.

NOTE: Refer to Piston Cup Installation Procedure. Replace piston cup seal(s) and O-rings. Torque 3/4" nut 50 100 ft. lbs. minimum.

6.3.3 Ball Valve and Wear Ring Replacement

If volume at end of hose starts to decrease gradually and eventually almost stops, it is quite likely that the valve seats and/or balls have had excessive wear and need replacement. Once they have reached a certain wear point, they may "channel out" rapidly and material will reciprocate past the ball on each stroke. (The hollow steel ball should be replaced when it starts to show dents or appears to be badly worn). Sand and aggregate materials in some areas are extremely sharp and hard, and therefore highly abrasive.

Under these conditions when pumping stiff mixes, or to high elevations which cause high line pressures, it will be noted that valve components may have a shorter wear life than in other areas.

If this condition exists, it is advisable to remove the discharge manifold only and inspect the upper and lower valve seats at the end of each day. (The upper valve seat can be inspected from the inside of the hopper).

6.3.4 Piston Cup Installation Procedure for Rams

(Not installed after 8-91)

1. Grease inside of cylinder and around piston cup with a moderate amount of premium grease or equivalent.
2. Insert the piston cup into back of cylinder. Use a 1/2" to 5/8" dia. pry bar, View B, and pry the piston cup sideways, until it falls inside the cylinder.
3. When all the rubber is inside the cylinder as shown in View C, proceed with installation as follows:
 - Place O-ring, P/N 30373323 (PM1088) on piston rod.
 - Install cylinder and cup on piston rod and slide cylinder into waterbox bore.
 - Install O-ring, P/N 30373323 (PM1088) over threaded section of rod and tighten the cap nut by hand with a 1-1/8" socket and a 1/2" drive ratchet.

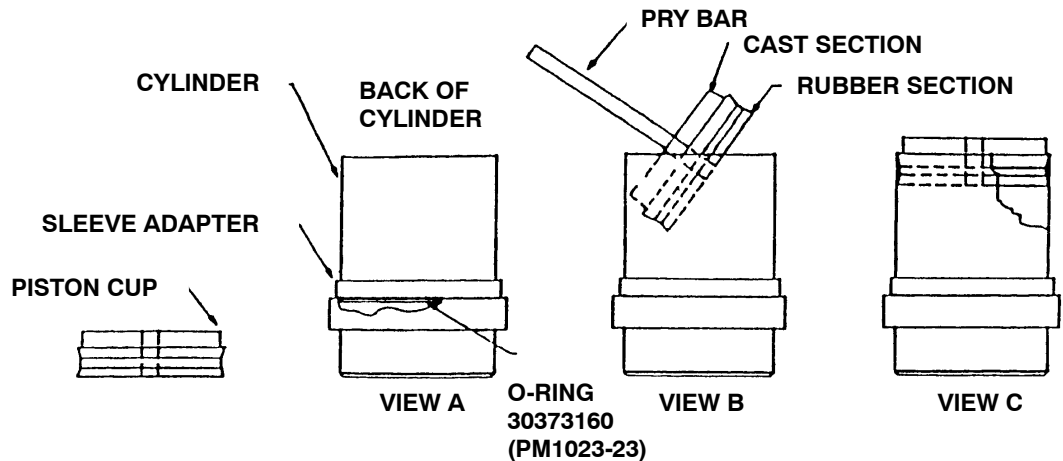


Figure 6-2



6.3.5 Typical Retaining Bolt Position

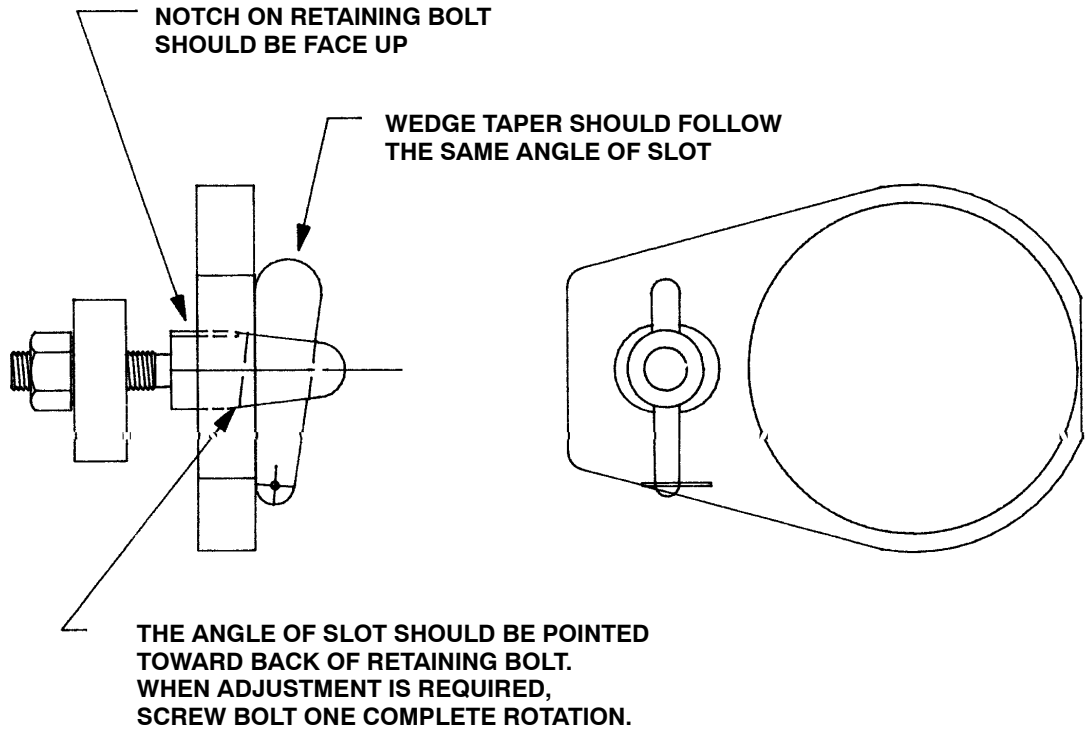
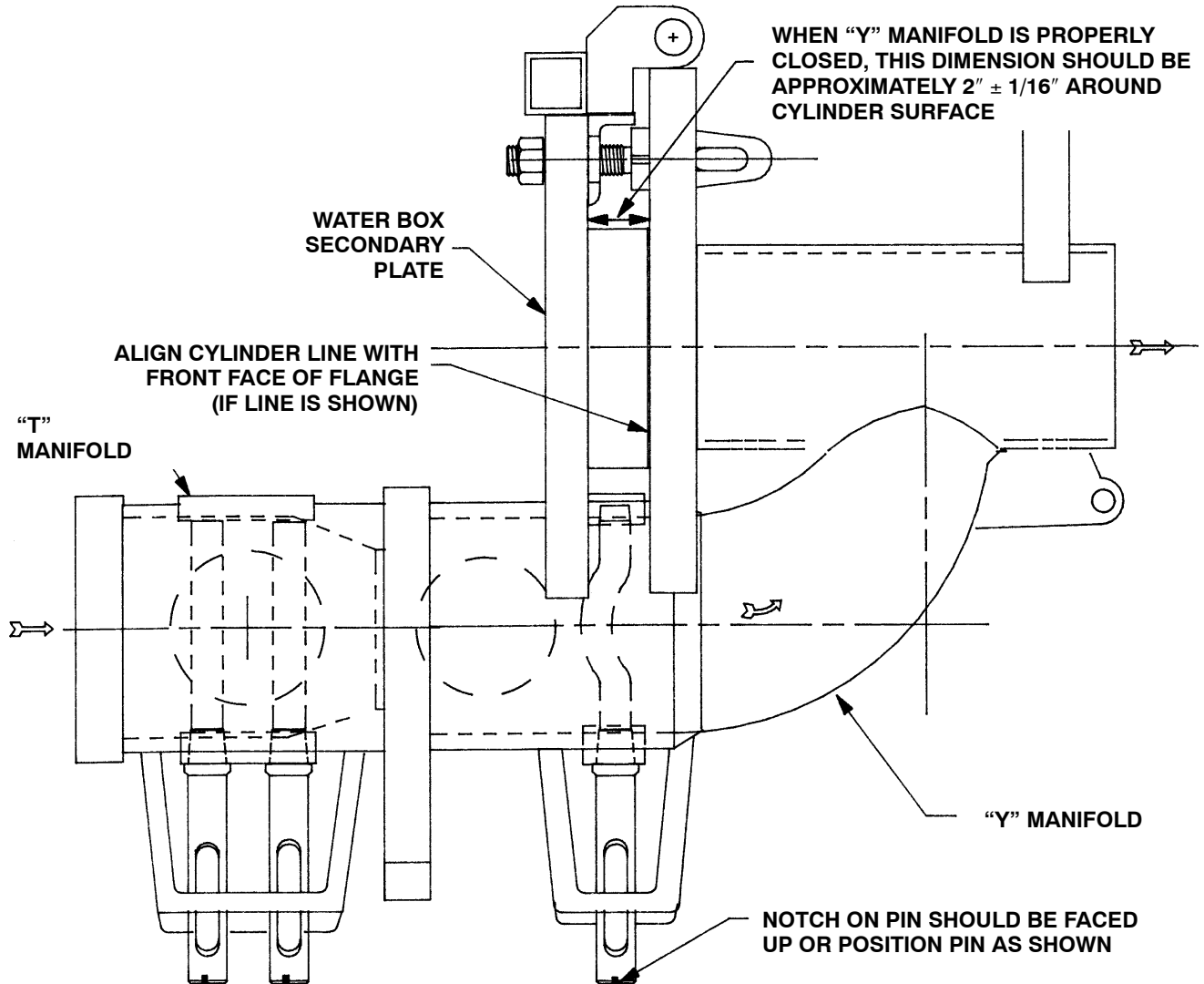


Figure 6-3

6.3.6 "Y" Manifold Shown On Proper Closing Position



THIS DIAGRAM ILLUSTRATES THE SV AND P-125 UNITS ONLY.

Figure 6-4

NOTE: Effective October, 1992, all pumps use a straight pin, P/N 30373820 (PM 844) instead of the special curved pin, P/N 30373821 (PM 846)

6.3.7 Rocker Arm Stroke Adjustments

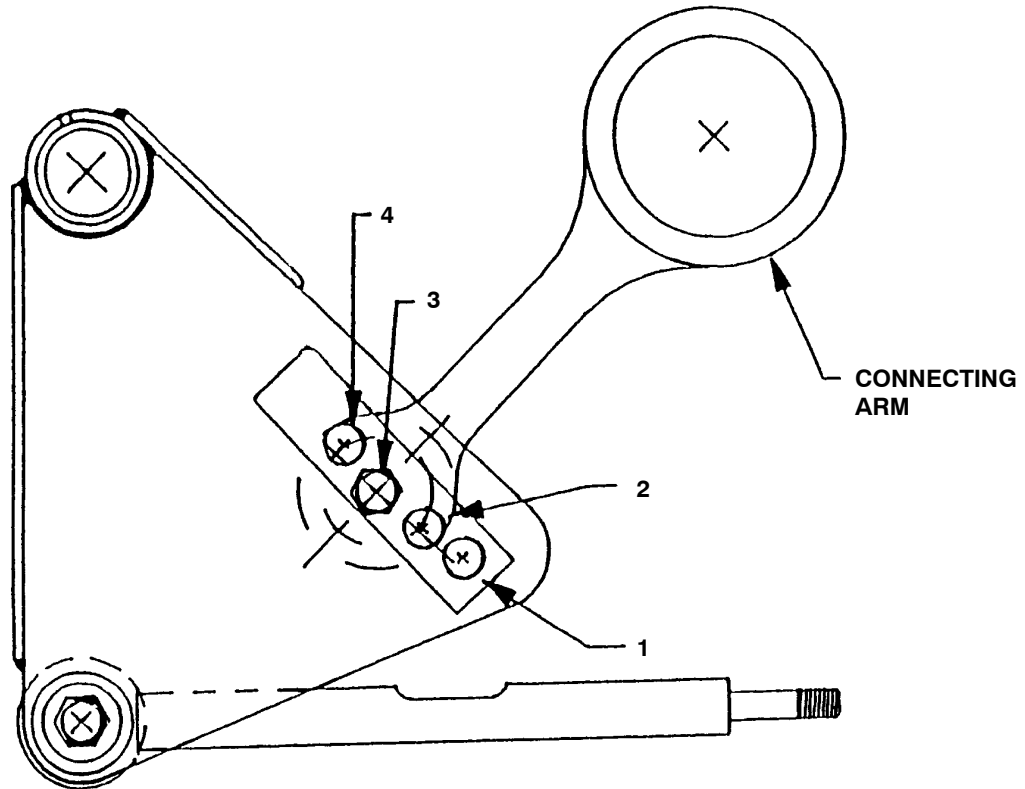


Figure 6-5

NOTE: Bolts should be checked for tightness periodically

The rocker arm is provided with four 1" diameter holes for adjustments on the stroke length by positioning the connecting arm in any desired hole.

The determination on which hole is to be used depends on the amount of pressure or volume required, as well as the mix characteristic to be pumped. The pumping pressure increases when the connecting arm is lowered from hole number 4 to hole number 1, as indicated on the drawing.



6.4 Pumping Tips and Troubleshooting

When pumping long distances or pumping stiff mixes you can expect a drop in volume compared to shorter lines and wetter mixes (due to change in valve efficiency or cavitation). Final crankshaft RPM should be approximately 120 RPM for average recommended production. When pumping stiff mixes, volume will fall off at higher RPM's as cavitation may occur at the outlet of the hopper. Decrease the engine speed accordingly, as stiff mixes do not flow as readily as 5" or 6" slump materials.

“Downhill pumping” can be difficult on some jobs. When pump is stopped, the material can flow slowly and cause hose to collapse. When pumping is resumed, you can expect a blockage at point of hose collapse. To prevent this, the hose can be kinked off at the discharge end when the pump is stopped. This will stop the gravity flow and will assure a smoother operation between cam roller bearing and cam plate.

When pumping vertically, up the side of a building (above 40 feet), we would recommend the installation of steel pipe securely fastened at intervals as necessary to support the pipe column. Ninety degree, long radius pipe sweeps, should be installed at the top and bottom of the steel line. Use a 25 ft. hose (or short section) off the pump and for the balance of the horizontal distance to the vertical line, use pipe. This type of installation has been satisfactory on many jobs being pumped in excess of 100 ft. high.

NOTE: Line pressures are always less using steel pipe as compared to hose.

Slight pulsation of the hose will always be noticeable near the pump. Excessive pulsation of the hose near the pump is normal due to higher than average line pressure caused by stiff, harsh mixes or extremely long pumping distances. The use of 2-1/2" I.D. hose in these extreme cases or the addition of slight amounts of water to the mix (if permissible) reduces line pressure and will permit easier pumping. The use of certain pumping admixtures may help.

If excessive pulsation exists in the hose, it is advisable to use burlap or some means of wear protection under the hose at points where the hose may wear through the outer cover, e.g., over forms or steel or sharp curbs.

If the cam roller does not ride the same profile smoothly, it may be caused by insufficient line back pressure, e.g., a wet mix with only 50 feet of hose (add more hose, if necessary). It could also be caused by cavitation of the passing of oversized aggregate through the valving, causing it to skip.

When using snap joint couplings with gaskets to join hose see that they are washed clean after each job. Dip both coupling and gasket in water before coupling hose for easier installation.

All new pumps are tested under negative and positive pressure at the factory before shipment. This procedure permits a thorough inspection of the entire drive system and valving under simulated full load conditions.

6.5 Clean Up Procedure for Ball Valve Concrete Pumps

Part A

1. Ensure that there is no blockage on the hose and line or in the manifold. If a blockage exists, clear it, as it dictates how the machine will pump the next time used.
2. At the end of every pour, or because of long delays during a pour, the pump and delivery system must be thoroughly cleaned by removing all concrete material.
3. Proper wash out of all material or build up within the pump manifold and hoses following the pumping operation will prevent problems when starting the next job. After completion of pour, pump concrete remaining in hopper through discharge line.
4. To avoid the possibility of separation, do not pump the concrete below the inlet ball in hopper. It is best to leave approximately 3" to 4" of concrete above the inlet ball.
5. Turn the pump engine off before filling the hopper with water. Engine vibration at idle only may separate material in the hopper, causing jamming in manifold when pumping is resumed.
6. Fill hopper with water and resume pumping. The water will push the concrete through the lines. When the water runs clear at the end of hose, disconnect lines and shake out all sand and sediment, so lines will be clean for next pour.
7. It is important that the hinged discharge cone on pump manifold be opened and all remaining concrete (rock and sand) be thoroughly washed out. This must be done after each job to prevent concrete build-up in the discharge manifolds and discharge elbow.

Part B

This section will explain the recommended procedure for using a sponge to clean out the lines. After completion of pour pump remaining concrete in hopper through discharge line. Using a shovel, clean the sides of the hopper.

NOTE: The pump engine should be turned off, as explained in Part A of the clean up procedure.

After the sides of the hopper have been cleaned, add a small amount of water to the remaining concrete in the hopper and mix with a shovel.

Start the pump engine and pump the hopper all the way down. Disconnect the hose from the pump. Fill the hopper with water, and pump the remaining concrete out of the pump. Open the hinged discharge cone and thoroughly wash out all remaining concrete (sand sediment) from the cone and pump manifolds. Close the discharge cone and lock in place. Take a sponge (2" x 4" x 6") and soak it with water or lubricant. Take the hose that is disconnected from the pump and shake out the concrete so that about 2 feet of it is clear. Insert the sponge into the hose. Reconnect the hose to the pump. Fill the hopper with water and resume pumping. Run the pump approximately half throttle. The sponge will be discharged at the end of the line followed by clear water. At this point the pump and lines will be completely clean and ready for the next job.



- WARNING:**
- 1. NEVER PUT HANDS OR ANY OTHER PARTS OF YOUR BODY IN THE HOPPER. HOPPER GRATE MUST ALWAYS BE IN DOWN POSITION WHILE PUMP IS IN OPERATION.**

 - 2. NEVER USE MURATIC ACID TO CLEAN THE PUMP. ACID WILL RUIN THE FINISH ON THE CYLINDER BORES.**

 - 3. WHEN USING A WASH OUT HOOK (2" X 6") TO CLEAN SYSTEM BACK INTO REDIMIX TRUCK, USE A SAFETY CHAIN TO SECURE THE CLEAN OUT HOOK FROM JUMPING OFF TRUCK'S HOPPER. RUN THE PUMP HALF THROTTLE.**

 - 4. NEVER USE AIR TO CLEAN OUT THE LINES.**

******* ALWAYS THINK SAFETY *******

6.6 Crankshaft Assembly Procedure

Before assembling the crankshaft, make sure all the components are included as listed on the parts book DET 6.2. Inspect the crankshaft for defects, dents or imperfections and free of any contaminants. Now proceed to install the shaft components in the following order:

1. Place spacer ring P/N 30373406 (PM1125-4) over the longest side of the crankshaft until the flat side of the spacer makes full contact with the back side of the crank.
2. Position O-ring P/N (PM1125-7) on outside diameter of spacer and install the bearing cone P/N 30373405 (PM1125-3), spacer P/N 30373408 (PM1125-6), and bearing block. Once the bearing block is in place, install the second bearing cone P/N 30373405 (PM1125-3) into the block.
3. Install outboard spacer P/N 30373407 (PM1125-5) with O-ring PM1125-7 on outside diameter of spacer.
4. Position cam weldment P/N 30373186 (PM1037HD) on crankshaft; install 5/8" key in slot, place bushing P/N 30373400 (PM1124) over key and insert bushing into cam weldment.
5. Tighten the three socket head cap screws supplied with bushing P/N 30373400 (PM1124) while applying pressure to bring cam weldment onto the tapered cam bushing.

To prevent bushing from sliding away from spacer during pump operation, the following procedure is strongly recommended:

1. Remove from bushing the three "dog type" allen set screws P/N 30373563 (PM1206A).
2. Use a 9/32" drill and, under each set screw drill a 1/8" deep indentation on shaft.
 - Reinstall "dog" screws making sure that each screw bottom in the indentation to prevent bushing from sliding laterally.
 - Install set screws supplied above of "dogs" to keep them from backing out.

Negligence to follow this procedure could cause bearing failure due to cone bearing separation from race when lateral forces are imposed to bearing during pumping operation; and consequently, crankshaft failure will occur.

NOTE: When removing bushing from sprocket, use the following procedure:

Remove capscrews and thread into tapped holes in bushing flange. Tighten progressively until bushing is free from sprocket taper.

Remove assembly from shaft.



6.7 Reference Data

Concrete Mix Designs Screen Analysis Terminology

The following information has been prepared to assist in the selection of concrete mix designs in certain areas where the use of concrete pumps is a new industry.

The result of several years experience of many concrete pump users and local aggregate suppliers has proven the importance of certain requirements necessary to successful concrete pumping. The strength and quality of the concrete is relative to the cement-water ratio and the type and gradation of the aggregate used.

Special emphasis is given to the gradation of the fine aggregate (sand) and coarse aggregate used in all pump mixes. Generally speaking, if the screen analysis of the local sand and rock conforms to the A.S.T.M. specifications shown on the following sheets and the proper ratio of sand and rock are used in a mix, it will be likely that you will have a pumpable mix.

If difficulty is experienced in pumping the mixes shown on the following sheets, it would be suggested that you consult your local aggregate supplier with this information and make adjustments, if necessary.

NOTE: All references to mixes of concrete, additives, etc., are strictly for use as guidelines only, and are not intended for strict compliance to. Many areas and differing conditions will require alterations of these mixes. Consult your concrete supplier for further information.

Reference Material

The following information has been extracted from actual testing laboratory reports. The purpose of this printing is only to help create a better understanding of the importance of uniform gradation and proportioning of materials which affect pumpability of concrete mixes. These weights and proportions illustrate that when the sieve analysis is ideal, the sand/rock ratio can be adjusted (65% sand - 35% rock) and pumpability should be excellent.



Example #1 (A California Test Lab. Report)

JOB: Building Foundations (Water Project)

Sacks per cu. yd: **6.5** Designed for **2,500** lbs. in 28 days

Gallons per sack: **8** Designed **7.1**

Washed Sand, No. 200 Wash: **1.3** Organic Matter: **OK**

Specific Gravity (SSD): Sand: **2.58** Pea Gravel: **2.60** 1" _____ 1.5" _____

Sieve Analysis: Percent Passing

Material	1.5"	1"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
W.C. Sand				100	99.7	79.1	60.4	36.5	14.3	4.	1.1
Pea Gravel				100	3.						
1" Rock											
1.5" Rock											
% Comb.				100	66	51	39	23	9	3	1

Design for One Yard of Concrete (Saturated & Surface Dry):

Absolute volume of aggregates in one cu. yd.: **17.78** cu. ft.

Specific Gravity of aggregates in one cu. yd.: **2.58**

Weight of aggregates in one cu. yd. batch: **2850** lbs.

	%	BATCH	SPEC. GRAVITY	ABS. VOL.	F.M.	1 SACK BATCH (SSD)
W.C. Sand	65	1850	2.58	11.56		
Pea Grav.	35	1000	2.60	6.22		
1" Rock						
1.5" Rock						
Water 46 gal.		1				
Cement 6.5 sk.		611				
Total				27.00		

Admixture: None

Slump: 4"

Remarks: This mix designed for pumping

NOTE: Due to availability of well graded sand as shown in the above sieve analysis, this mix was pumped very successfully.

**Example #2 (A New York Test Lab. Report)**

JOB: _____ **Spec. Rq. 2500 P.S.I. @ 28 days**
LBS.
 Cement: Type I Sacks **6.0** **564** Brand _____
 Fine Aggregate: No. **4** to No. **100** **1940** Source _____
 Coarse Aggregate - Pea Gravel to No. **4** **1045** Source _____
 Water: Gals. Added ____ Total Gals.: ____ gals/Sack ____ Actual Slump 5-1/2"
 Admixture: **Pozzolith** Amount: **3 oz./100#** Air-entrainment **4.0%**
Darex Amount: **3/4 oz. sk.**
 Weather: **Showers** Temperatures: Air **65°** Concrete **68°**

Compressive Strength Text (For Above Mix)

Cylinders Size 6 x 12 Inches

Area 28.27 Sq. Inches

Specimen Marking	Age Days	Lab. Number	Date Received	Date Tested	Total Load-Lbs.	Unit Load-PSI	Report No.
6 a	28		5-31-73	6-27-73	131,000	4,630	6
6 b	28		5-31-73	6-27-73	133,000	4,700	6
6 c	28		5-31-73	6-27-73	132,000	4,670	6

These two examples are not intended to be used as a mix design for your application. Your local engineers may want to refer to the reports as an aid to designing a pumpable mix for your job requirement, using small aggregate.

**Consolidated Rock Products Co., Division of Tests**

3/8" Pea Gravel STANDARD PUMP MIXES (one half inch minus)

NOTE: All weights shown are one cubic yard with S.S.D. aggregates

CRP Mix Number	6000	6001	6002	6003	6004	6005	6006	6007
Design Slump (in.)	6" (15 cm)	6"	6" (15 cm)	6"	6" (15 cm)	6" (15 cm)	6" (15 cm)	6" (15 cm)
Cement, Sxs.	6.5 —	6.5 —	6.5 —	6.5 —	7.0 —	7.0 —	7.0 —	7.0 —
Cement, lbs.	611 (276 kg)	611 (276 kg)	611 (276 kg)	611 (276 kg)	658 (298 kg)	658 (298 kg)	658 (298 kg)	658 (298 kg)
w/Con Sand (lbs.)	2062 (934)	2112 (957)	1924 (872)	1971 (893)	2062 (934)	2112 (957)	1924 (872)	1971 (893)
Gravel #4 (9.51 mm)	687 (311 kg)	704 (319)	825 (374)	845 (383)	977 (307 kg)	693 (314)	806 (365)	832 (377)
Total Aggregate	2749 (1245 kg)	2816 (1276)	2749 (1245)	2816 (1276)	2708 (1227)	2775 (1257)	2685 (1216)	2775 (1257)
Admixture Pozzoloth 3LA-lbs.	1.3 (.59 kg)	—	1.3 (.59 kg)	—	1.4	— (6.3)	1.4 (.63)	—
Water, Design (gals)	50.0 (189 liters)	53.0 (200)	50.0 (189)	53.0 (200)	50.0 (189 liters)	53.0 (200)	50.0 (189)	53.0 (200)
Water, Max. (gals)	50.0 (189 liters)	53.0 (200)	50.0 (189)	53.0 (200)	50.0 (189 liters)	53.0 (200)	50.0 (189)	53.0 (200)

NOTE: Multiply above kilograms and liters by 1.308 to obtain portions for one cubic meter of concrete.



A.S.T.M.* Standard Specification for Grading Concrete Aggregates

Screen sizes showing percentage by weight of aggregate passing sieve.

3/8" (9.51 mm) Peagravel Aggregate: Referred to as #4 Rock or gravel or 1/2" minus (12.7 mm) size.

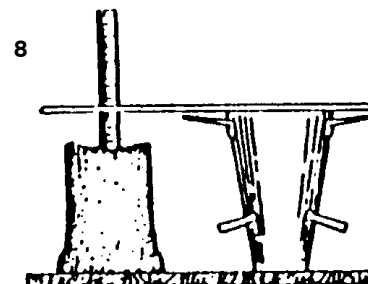
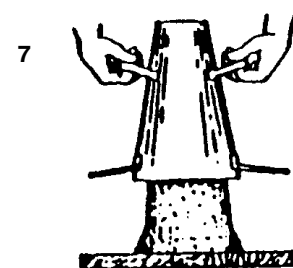
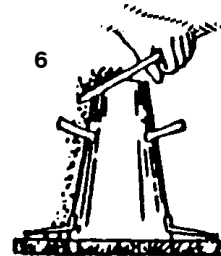
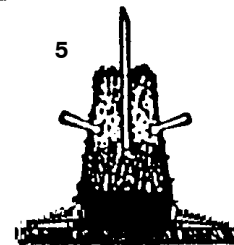
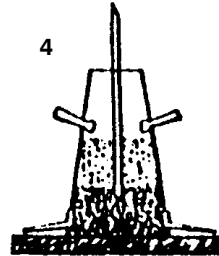
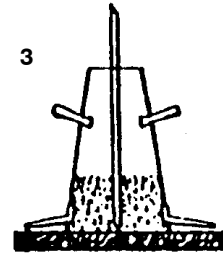
Screen	Size of Opening		Percentage Passing (by Weight)
	U.S.	Metric	
1/2"	1/2"	12.7 mm	100%
3/8"	3/8"	9.51 mm	85 to 100%
#4	4760 Micron	4.76 mm	10 to 30%
#8	2380 Micron	2.38 mm	0 to 10%
#16	1190 Micron	1.19 mm	0 to 5%


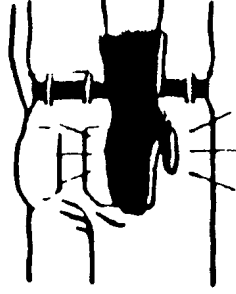
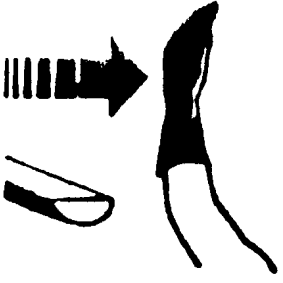
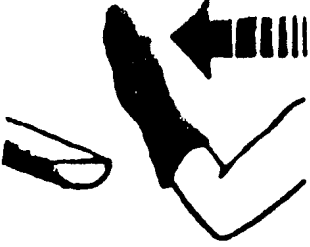
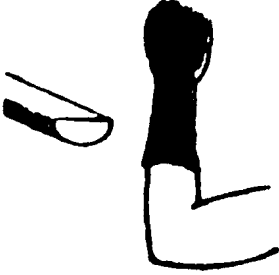
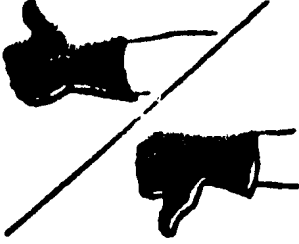


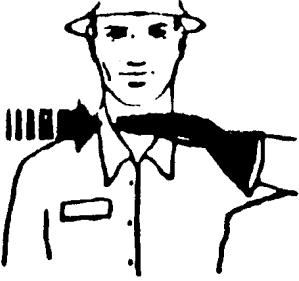
Fine Aggregate: Referred to as washed concrete sand

Screen	Size of Opening		Percentage Passing (by Weight)
	U.S.	Metric	
3/8"	3/8"	9.51 mm	100%
#4	4760 Micron	4.76 mm	95 to 100%
#8	2380 Micron	2.38 mm	80 to 100%
#16	1190 Micron	1.19 mm	50 to 85%
#30	590 Micron	595	25 to 60%
#50	297 Micron	297	10 to 30%
#100	149 Micron	149	2 to 10%

*American Society for Testing Materials (C-33-67)

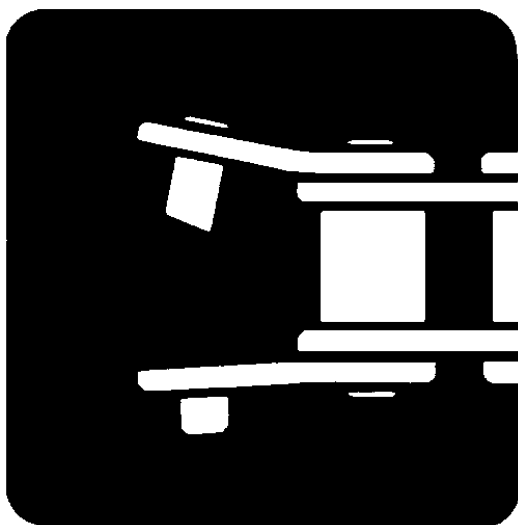
1. To obtain a representative sample, take samples from three or more regular intervals throughout the discharge of the mixer or truck. **DO NOT** take samples at the beginning or the end of the discharge.
2. Dampen inside of cone and place it on a smooth, moist, non-absorbent, level surface large enough to accommodate both the slumped concrete and the slump cone. Stand on foot pieces throughout the test procedure to hold the cone firmly in place.
3. Fill cone 1/3 full by volume and rod 25 times with 5/8" diameter x 24" long bullet pointed steel rod. (This is a specification requirement which will produce non-standard results unless followed exactly.) Distribute rodding evenly over the entire cross section of the sample.
4. Fill cone 2/3 full by volume. Rod this layer 25 times with rod penetrating into, but not through, first layer. Distribute rodding evenly over the entire cross section of the layer.
5. Fill cone to overflowing. Rod this layer 25 times with rod penetrating into, but not through, second layer. Distribute rodding evenly over the entire cross section of this layer.
6. Remove the excess concrete from the top of the cone, using tamping rod as a screen. Clean overflow from base of cone.
7. Lift cone vertically with slow, even motion. Do not jar the concrete or till the cone during this process. Invert the withdrawn cone, and place next to, but not touching the slumped concrete.
8. Lay a straight edge across the top of the slump cone. Measure the amount of slump in inches from the bottom of the straight edge to the top of the slumped concrete at a point over the original center of the base. The slump operation shall be completed in a maximum elapsed time of 1-1/2 minutes. Discard concrete. **DO NOT** use in any other tests.



STANDARD SIGNALS FOR MIXER OPERATORS AND CONTRACTOR GUIDES		
 <p>DRIVE IN</p>	 <p>BACK IN</p>	 <p>BACK UP</p>
 <p>PULL FORWARD</p>	 <p>STOP</p>	 <p>LOWER CHUTE</p>
 <p>START POURING</p>	 <p>MORE WATER</p>	 <p>STOP POURING</p>



WARNING



Chain will break if misused or abused.

Serious injury or property damage can result.

**Select, install, guard and maintain chain in accordance
with equipment manufacturer and
Diamond Chain Company's recommendations.**

**Read assembly instructions with carton before installation.
For further information request DCC Bulletin 1063 or other
literature related to your particular application.**

DIAMOND[®]
CHAIN COMPANY

402 Kentucky Avenue, Indianapolis, Indiana 46225-1174 • 1-800-U.S. CHAIN

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➡ **IMPORTANT INSTRUCTIONS ON REVERSE SIDE** ➡

INSTRUCTIONS

WHEN DISASSEMBLING OR ASSEMBLING CHAINS:

WARNING — The components of a chain are hardened parts. Striking these parts may cause metal chips to break off from the chain or the tools used resulting in personal injury. During all stages of chain disassembly and assembly, wear safety glasses to prevent metal parts or chips from entering your eyes and have personnel in the immediate area do likewise.

A. Pin Removal

- 1) If chain is of cotterpin-type construction, remove cotters.
- 2) If chain is riveted-type construction, grind pin heads off so pin ends are flush with the linkplate.
- 3) Drive pins out of linkplate using a pin extractor Model #113 or 135.
Some multiple strand chains or large pitch models will require a hammer and punch or a press to remove the pins.

B. Installation of Coversides

Coversides are manufactured three different ways: (1) Slip Fit, (2) Modified Press Fit, and (3) Full Press Fit. Modified and Full Press Fits require some patience and tools to assemble and/or disassemble.

C. Installation of Spring Locks and Cotterspines

After coversides have been installed, install spring locks or cotters (depending on chain design). Avoid using bent or worn cotters or spring locks. After spring locks (or cotters) are installed, lightly tap pin ends to position these parts snug against the coverside for additional support.

WHEN INSTALLING CHAIN DRIVES ON EQUIPMENT:

WARNING — You may be seriously injured if you attempt to install chain on equipment under power. Shut off power and lock out gears and sprockets before attempting installation.

Once installed, the chain drive must be guarded to prevent personal injury or property damage in the event the chain separates during operation. If chain drive is not guarded, contact equipment manufacturer for recommendations on guarding before using equipment.

Knowing more about how the chain is constructed may help in assembly and disassembly. Further information may be obtained by calling or writing Diamond Chain Company:

Call toll free: 1-800-872-4246
Or write: Diamond Chain Company
P.O. Box 7045
Indianapolis, Indiana 46207-7045
317/638-6431
FAX 317/633-2243

