GAP POWER
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Parts & Service

ALKOTA
CLEANING SYSTEMS, INC.

# Service Manual


## X4 Series Engine Driven
### Model 4355X4

**p/n 4355X-000000 4355X-00P000**
**p/n 4355X-000020 4355X-00P020**

**S/N 267618 & UP**

20170308

# Table of Contents

# Specifications

## PERFORMANCE

| | |
|---|---|
| **Discharge Volume** | |
| | 3.7 gal/m / 14.0 L/m |
| **Pump Head Pressure** | |
| | 3500 psi / 242 bar |
| **Combustion Smoke/Bacharach Scale** | |
| | #1 OR #2 SMOKE |
| **Carbon Monoxide Allowed** | |
| | 0.01% |
| **Draft/Stack Installation** | |
| | 0.2” – 0.04” WC READING |
| **Heat Input** | |
| | 235,200 Btu/h / 59,270 kcal/h |
| **Combustion Smoke/Bacharach Scale** | |
| | #1 OR #2 SMOKE |

## GENERAL

| | |
|---|---|
| **Minimum Inlet Water Pressure** | *over 65 psi may require water inlet regulator* |
| | 10 psi / 0.68 bar |
| **Weight** | |
| | 690 lbs / 313 Kg |
| **Engine Fuel Tank Capacity** | |
| | 8gal / 30.3 Ltr |
| **Dimensions** | |
| | 43 ½”” Long x 41 High x 41” Wide |
| **Pump** | |
| | Triplex, Oil Bath Crankcase, Solid Ceramic Plungers |
| **Spray Tip** | |
| | (#4.0 - 40˚) p/n JA0-40040-2 |
| **Steam Impact Nozzle (optional)** | |
| | #42 Orifice p/n J05-00342 |
| **Belt** | |
| | p/n R02-00241 |
| **Coil** | |
| Standard | 14” OD x 1/2” ID x 126’ Schedule 80 |
| Coil Back Pressure (New) | 5 psi / 0.34 bar |
| Coil Back Pressure Requiring Descaling | 50 psi / 3.40 bar |
| **Discharge Hose Assembly** | |
| | 3/8” x 50’, Quick Coupled 4000Psi |

| | |
|---|---|
| **Trigger Gun & Wand** | |
| | p/n J06-00158-B |
| - Trigger Gun | p/n J06-00158 |
| - Trigger Wand | ¼ x 42”, Quick Couplers, Vented Handles p/n J06-00104EZ |

## Pump Engine

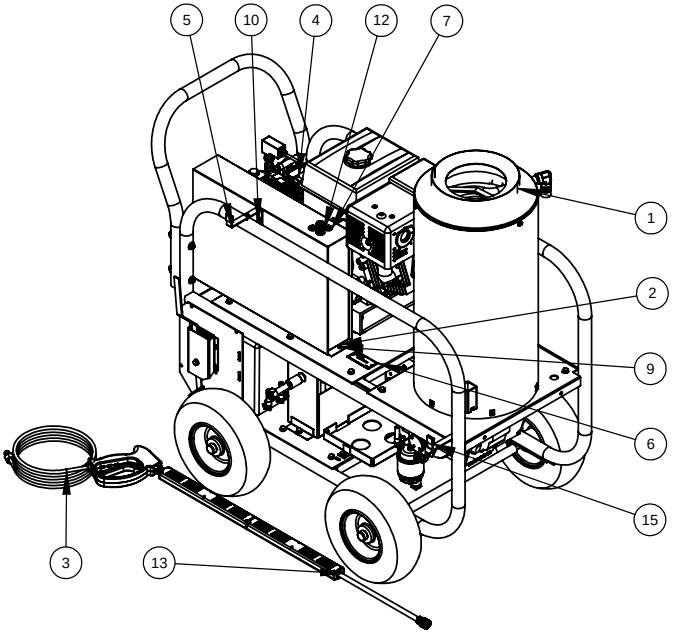
| | |
|---|---|
| p/n | F05-00488 |
| Make | Honda GX390 |
| Horsepower | 13 hp / 9.7 kw |
| Fuel | Gasoline |
| Engine Starting | Electric |
| Engine Air Filter | p/n F05-000462-10 |
| Engine Air Pre-Cleaner | None |
| Engine Oil Filter | None |
| Fuel Tank Capacity | 6.4 Qt / 6.5 L |
| Oil Capacity | 1.16 Qtl / 6.5 L |
| Engine Oil Alert | Yes |

## BURNER

| | |
|---|---|
| Burner Part Number | V00-173140 |
| Burner Type | Pressure Atomizing |
| Voltage | 12VDC |
| Horsepower | 1/8 HP |
| Fuel Type | Kerosene, #1 or #2 Diesel |
| Fuel Pressure | 125 PSI / 9 BAR |

| | |
|---|---|
| **Burner Nozzle** | 2.25 Gallon per Hour 80 Degree B p/n V2.25 80DB |
| **Fuel Consumption** | 2.52 Gal/Hr / 9.5 L/Hr |

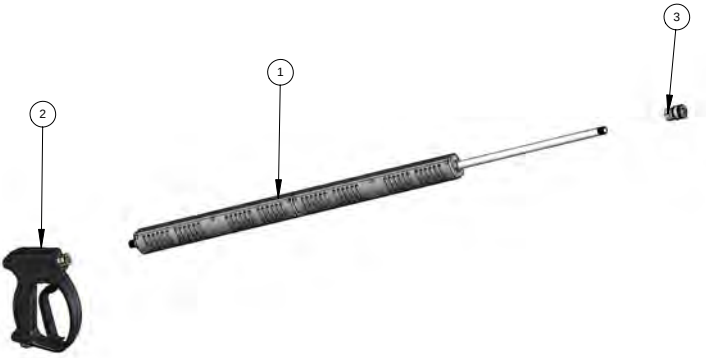
# Final Assembly




**ASSEMBLY, FINAL**
**p/n: 4355X-000000**
**11/18/2008**

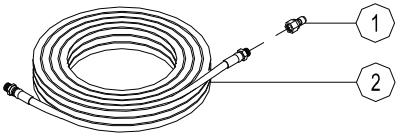
| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 2122-00210 | ASSEMBLY, COIL TOP | 1 |
| 2 | 3305X-00150 | WELDMENT,PULLEY-SHIELD | 1 |
| 3 | 3401-00710 | ASS'Y, HOSE - 3/8 X 50 2 WIRE 5000PSI | 1 |
| 4 | 4355X-00603 | ASSEMBLY CLEANER | 1 |
| 5 | AB18-00807PB | HANGER, GUN | 1 |
| 6 | D02-00001E | DECAL, SERIAL NO | 1 |
| 7 | F04-00451 | GROMMET, RUBBER | 4 |
| 8 | F05-00210-2 | STRAP,BATTERY-BOX | 1 |
| 9 | H04-19011 | SCREW, SELF TAP | 5 |
| 10 | H06-25003 | NUT, HEX | 3 |
| 11 | H09-12500 | RIVET, POP | 2 |
| 12 | J00-15040-2 | TIP, SPRAY - #1504 | 1 |
| 13 | J06-00158-B | ASSEMBLY, GUN & WAND - 42" | 1 |
| 14 | Y02-00061 | GAUGE, GAS - CAP | 1 |
| 15 | Z01-00014 | CAP, VINYL | 2 |

# Gun & Wand Assembly

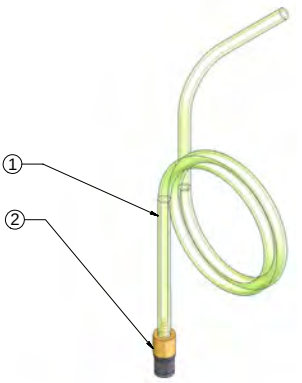



**ASSEMBLY, GUN & WAND - 42"**
**p/n: J06-00158-B**
**6/2/2009**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | J06-00104E | ASSEMBLY, WAND - 42" | 1 |
| 2 | J06-00158 | GUN, TRIGGER | 1 |
| 3 | W04-24225-A | COUPLER, 1/4F X 1/4FNPT | 1 |




| 2102-00710 PART LIST | | |
|---|---|---|
| ITEM | PART NUMBER | PART DESCRIPTION |
| 1 | W04-31231-B | Coupler, 3/8M X 3/8FNPT |
| 2 | K02-03150E5 | Assembly, Hose – 3/8 X 50' |




| 4120-00902P PART LIST | | |
|---|---|---|
| ITEM | PART NUMBER | PART DESCRIPTION |
| 1 | C04-00131 | Screen, Chemical |
| 2 | Z01-08413-2 | Hose, Poly Braid – 84" |

# Trigger Gun

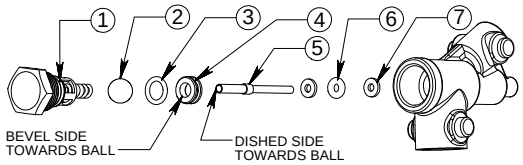
## *BREAKDOWN, GUN - TRIGGER*

### *EXPLODED VIEW - P/N J06-00158*

## *SPECIFICATIONS*

MAXIMUM VOLUME.....10.0 GPM / 37.9 LPM
MAXIMUM PERSSURE.....5000 PSI / 344.7 BAR
RATED TEMPERATURE.....300 F / 150 C
WEIGHT.....1.8 LBS. / 0.8 KG
INLET .....3/8" NPT FEMALE
OUTLET.....1/4" NPT FEMALE

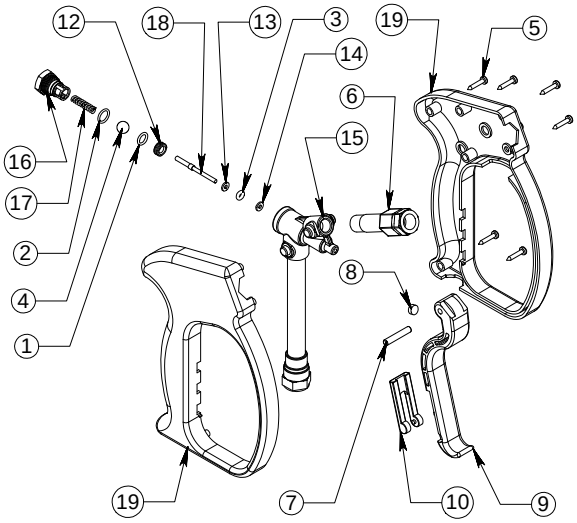
YG3500




## *REPAIR INSTRUCTIONS*

1. Remove screws from handles and remove handle housings.
2. With 18mm socket remove retainer being careful to catch the spring and ball as they fall out of the housing.
3. Remove and replace parts with those found in the kit.
4. Assembly in reverse order.

***KIT, REPAIR PART - NUMBER J06-99158C***



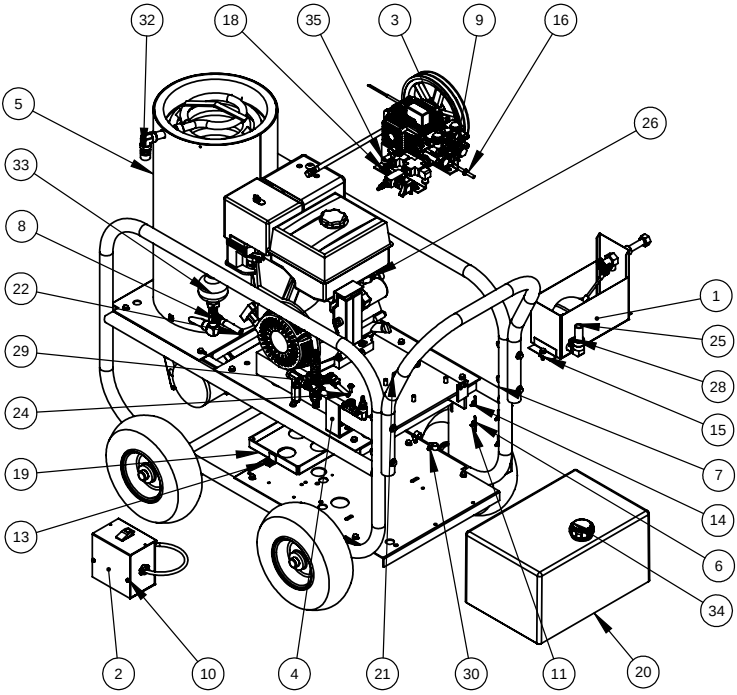

***WARNING:***
***DO NOT USE ACID CONCENTRATES THROUGH THE GUN***

***WARNING:***
***Never secure trigger gun in an open postion (trigger pulled back) by means other than the operator's hand. Bodily harm may occur if the operator loses control of the trigger gun.***

***CAUTION:***
Always engage trigger safety latch when not in use.

| *PART LISTS* | | | |
|---|---|---|---|
| *ITEM* | *PART NUMBER* | *PART DESCRIPTION* | *QTY.* |
| 1 | C07-01300-08 | O-RING - 1/16CS X 5/16ID | 1 |
| 2 | C07-01425 | FILTER, WATER | 1 |
| 3 | J06-00121-07 | O-RING - 3/32 CS X 1/8 ID | 1 |
| 4 | J06-00121-15 | BALL, SS 5/16 | 1 |
| 5 | J06-00132-19 | SCREW, SELF TAP - 3.5MM X 18MM | 7 |
| 6 | J06-00158-01 | FITTING, DISCHARGE - 1/4 FNPT | 1 |
| 7 | J06-00158-02 | PIN, TRIGGER - 5MM X 27.5MM | 1 |
| 8 | J06-00158-03 | CAM | 1 |
| 9 | J06-00158-04 | TRIGGER | 1 |
| 10 | J06-00158-05 | LATCH, SAFETY | 1 |
| 11 | J06-00158-06 | FITTING, INLET - 3/8 FNPT | 1 |
| 12 | J06-00158-08A | SEAT, VALVE | 1 |
| 13 | J06-00158-09 | WASHER, FLAT | 1 |
| 14 | J06-00158-10 | WASHER, FLAT - BRASS | 1 |
| 15 | J06-00158-11 | HOUSING, VALVE | 1 |
| 16 | J06-00158-12A | RETAINER, VALVE | 1 |
| 17 | J06-00158-13 | SPRING, COMPRESSION | 1 |
| 18 | J06-00158-14 | PIN, VALVE - 4MM X 44MM | 1 |
| 19 | J06-99158A | HOUSING, HANDLE | 1 |

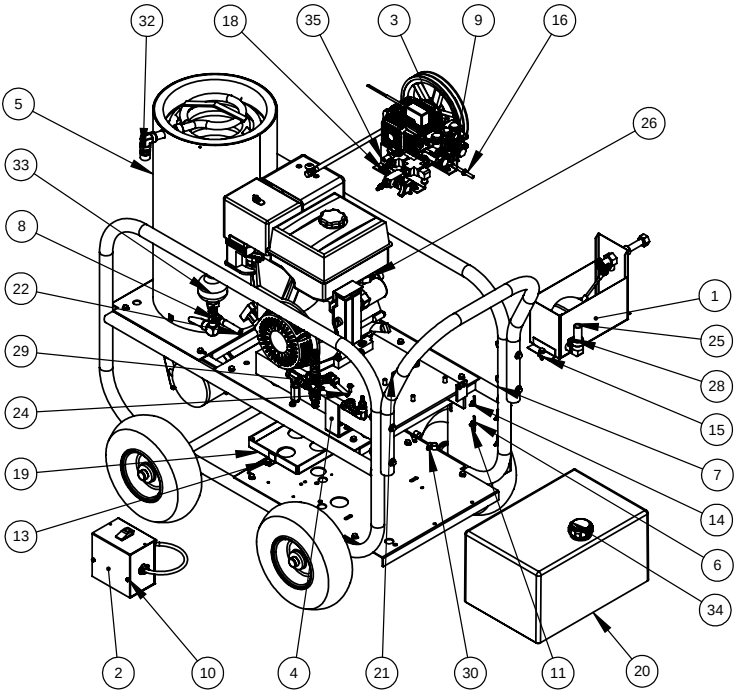
# General Assembly
## (4355X-000000)




**ASSEMBLY CLEANER**
**4355X-00603**
**11/18/2008**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 4305X-01121 | ASSEMBLY, TANK - FLOAT | 1 |
| 2 | 4355X-00304 | ASSEMBLY, JUNCTION BOX | 1 |
| 3 | 4355X-00501 | ASSEMBLY, PUMP | 1 |
| 4 | 4355X-00515 | ASSEMBLY, UNLOADER | 1 |
| 5 | 4355X-00657 | PRE CLEANER ASSEMBLY | 1 |
| 6 | AS14-00616-NPB | BRACKET, BRAKE | 1 |
| 7 | D430M-10176R | HANDLE, BRAKE | 1 |
| 8 | E10-00021-58 | TEE, STREE - 3/8 | 1 |
| 9 | H03-31311 | BOLT,J-5/16-18UNC x 3 1/2 | 1 |
| 10 | H04-19011 | SCREW, SELF TAP | 3 |
| 11 | H04-25002 | SCREW, CAP | 8 |
| 12 | H04-25035 | SCREW, SET - 1/4-20UNC x 1 | 2 |
| 13 | H04-31313 | SCREW, CAP - 5/16-18UNC X 1 | 5 |
| 14 | H06-25003 | NUT, HEX | 14 |
| 15 | H06-25006 | NUT, TINNERMAN - 5/16 | 2 |
| 16 | H06-31300 | NUT, LOCK - 5/16" | 7 |
| 17 | H06-31309 | NUT, LOCK | 1 |
| 18 | H06-37500 | NUT,LOCK-3/8-16UNC HEX | 4 |
| 19 | I3305-00193A | WELDMENT, BATTERY BOX | 1 |
| 20 | i4355-00125 | TANK, FUEL - PLASTIC, 8 GAL | 1 |
| 21 | K02-03216A2 | ASSEMBLY, HOSE | 1 |
| 22 | K02-03222A2 | ASSEMBLY, HOSE - 3/8 x 22"" | 1 |
| 23 | K23 | HOSE, FUEL - 1/4 X 2.5' | 2 |
| 24 | K33-01300 | HOSE, WATER - 3/8 X 13" | 1 |
| 25 | K60-02800 | HOSE, WATER - 5/8 X 29" | 1 |
| 26 | R03-00741 | PULLEY,DBL V-2BK41H | 1 |
| 27 | R04-00006 | BUSHING, PULLEY | 1 |
| 28 | W02-00031 | CLAMP, HOSE | 2 |
| 29 | W02-00032 | CLAMP, HOSE | 2 |
| 30 | W02-00033 | CLAMP, HOSE | 6 |
| 31 | W02-10031 | BARB, HOSE | 2 |
| 32 | W04-34155-A | COUPLER, 3/8F X 1/2MNPT | 1 |
| 33 | Y01-00123 | ACCUMULATOR | 1 |
| 34 | Y02-00061 | GAUGE, GAS - CAP | 1 |
| 35 | Z01-01113-2 | HOSE, POLYBRAID - 1/4 x 11 | 1 |

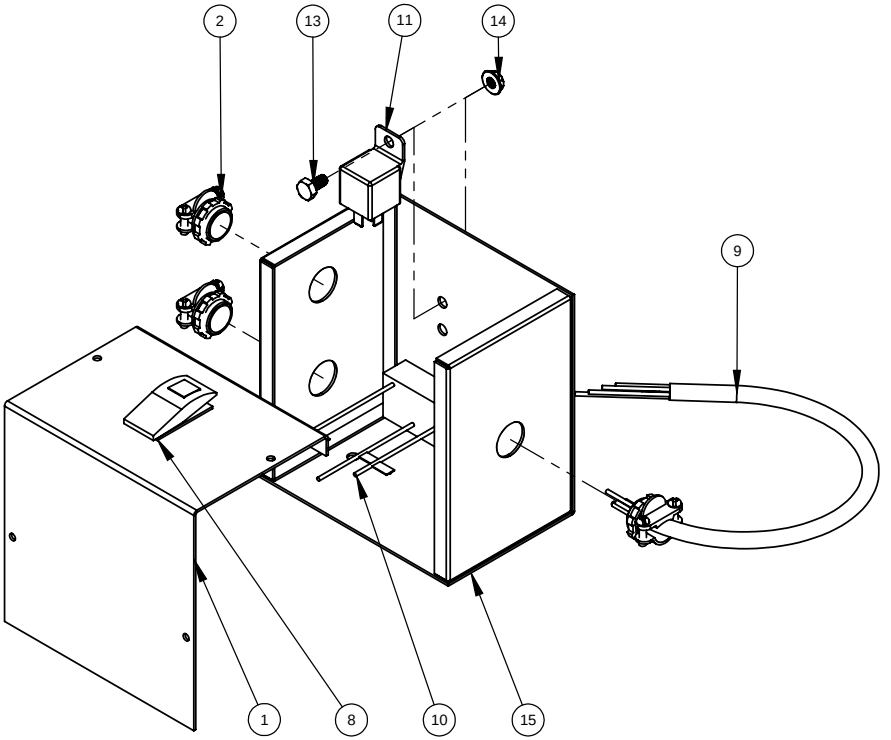
# (4355X-000020)




**ASSEMBLY CLEANER**
**4355X-07603A**
**11/18/2008**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 4305X-01121 | ASSEMBLY, TANK - FLOAT | 1 |
| 2 | 4355X-00304 | ASSEMBLY, JUNCTION BOX | 1 |
| 3 | 4355X-00501 | ASSEMBLY, PUMP | 1 |
| 4 | 4355X-00515 | ASSEMBLY, UNLOADER | 1 |
| 5 | 4355X-05657 | PRE CLEANER ASSEMBLY | 1 |
| 6 | AS14-00616-NPB | BRACKET, BRAKE | 1 |
| 7 | D430M-10176R | HANDLE, BRAKE | 1 |
| 8 | E10-00021-58 | TEE, STREE - 3/8 | 1 |
| 9 | H03-31311 | BOLT,J-5/16-18UNC x 3 1/2 | 1 |
| 10 | H04-19011 | SCREW, SELF TAP | 3 |
| 11 | H04-25002 | SCREW, CAP | 8 |
| 12 | H04-25035 | SCREW, SET - 1/4-20UNC x 1 | 2 |
| 13 | H04-31313 | SCREW, CAP - 5/16-18UNC X 1 | 5 |
| 14 | H06-25003 | NUT, HEX | 14 |
| 15 | H06-25006 | NUT, TINNERMAN - 5/16 | 2 |
| 16 | H06-31300 | NUT, LOCK - 5/16" | 7 |
| 17 | H06-31309 | NUT, LOCK | 1 |
| 18 | H06-37500 | NUT,LOCK-3/8-16UNC HEX | 4 |
| 19 | I3305-00193A | WELDMENT, BATTERY BOX | 1 |
| 20 | i4355-00125 | TANK, FUEL - PLASTIC, 8 GAL | 1 |
| 21 | K02-03216A2 | ASSEMBLY, HOSE | 1 |
| 22 | K02-03222A2 | ASSEMBLY, HOSE - 3/8 x 22"" | 1 |
| 23 | K23 | HOSE, FUEL - 1/4 X 2.5' | 2 |
| 24 | K33-01300 | HOSE, WATER - 3/8 X 13" | 1 |
| 25 | K60-02800 | HOSE, WATER - 5/8 X 29" | 1 |
| 26 | R03-00741 | PULLEY,DBL V-2BK41H | 1 |
| 27 | R04-00006 | BUSHING, PULLEY | 1 |
| 28 | W02-00031 | CLAMP, HOSE | 2 |
| 29 | W02-00032 | CLAMP, HOSE | 2 |
| 30 | W02-00033 | CLAMP, HOSE | 6 |
| 31 | W02-10031 | BARB, HOSE | 2 |
| 32 | W04-34155-A | COUPLER, 3/8F X 1/2MNPT | 1 |
| 33 | Y01-00123 | ACCUMULATOR | 1 |
| 34 | Y02-00061 | GAUGE, GAS - CAP | 1 |
| 35 | Z01-01113-2 | HOSE, POLYBRAID - 1/4 x 11 | 1 |

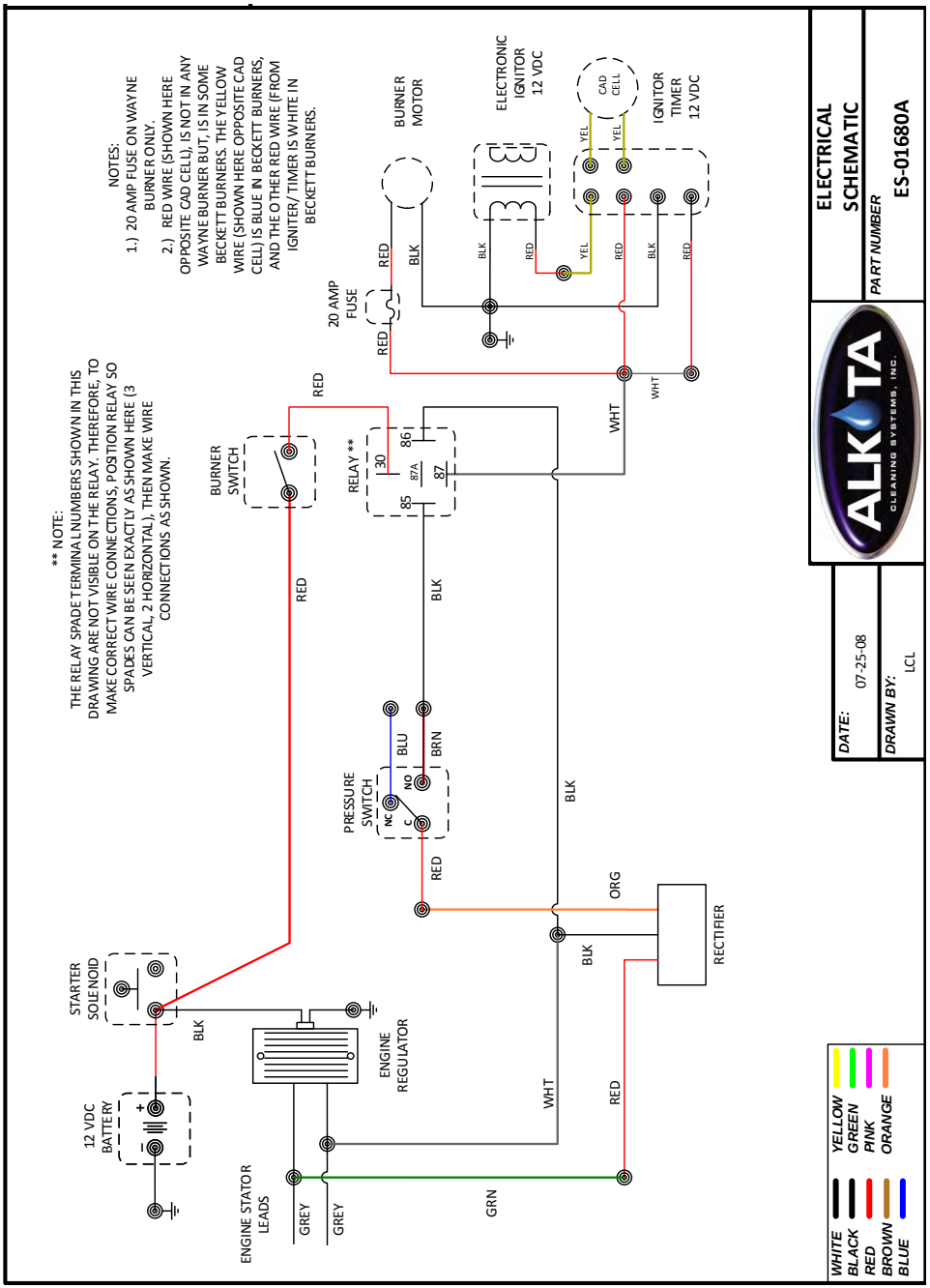
# Assembly, Control Panel




**ASSEMBLY, JUNCTION BOX**
**p/n: 4355X-00304C**
**12/16/2009**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | AS16-01068PB | COVER-J-BOX | 1 |
| 2 | F04-00310 | CONNECTOR, CONDUIT | 3 |
| 3 | F04-00615 | TERM, SPLICE | 2 |
| 4 | F04-00616 | TERM, INSULATOR | 2 |
| 5 | F04-00616-1 | TERM, SPLICE 18-6 WIRE | 2 |
| 6 | F04-00616-2 | INSULATOR, SPLICE - 18-6 | 2 |
| 7 | F04-00618 | INSULATED SPADE | 7 |
| 8 | F04-00693 | SWITCH, ROCKER - 12V | 1 |
| 9 | F04-05053 | CORD, ELEC - 16/5SOOW X 50" | 1 |
| 10 | F05-00168A | MODULE, RECTIFIER | 1 |
| 11 | FA5-00063 | RELAY, AUTOMOTIVE | 1 |
| 12 | H04-13805 | SCREW, MACHINE | 2 |
| 13 | H04-25000 | SCREW, CAP | 1 |
| 14 | H06-25003 | NUT, HEX | 1 |
| 15 | I4405-00310 | WELDMENT,J-BOX | 1 |

# Electrial Schematic - ES-01680A

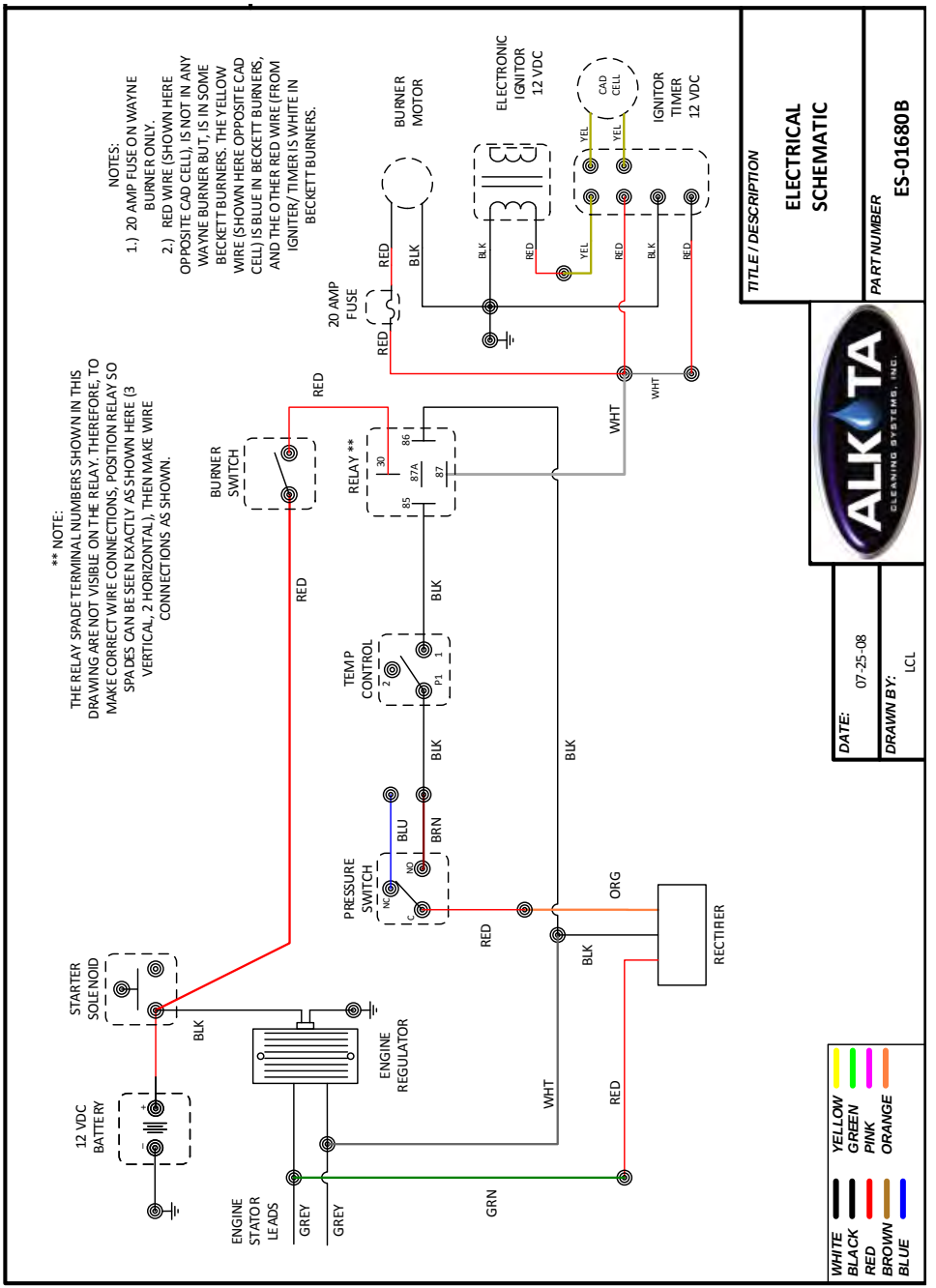


# Assembly, Control Panel - Temp Control

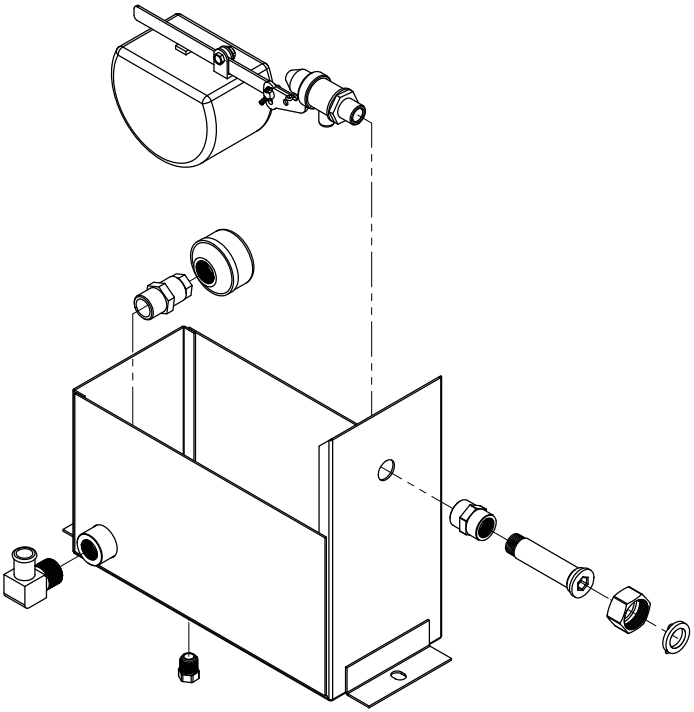

**ASSEMBLY, WIRING**
**p/n: 4355X-00304A**
**7/30/2012**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 4355E-00310 | WELDMENT, JUNCTION BOX | 1 |
| 2 | AS16-01055-PB | COVER, JUNCTION BOX | 1 |
| 3 | F04-00310 | CONNECTOR, CONDUIT | 1 |
| 4 | F04-00411 | BUSHING, STRAIN RELIEF | 2 |
| 5 | F04-00604 | TERMINAL, FORK | 1 |
| 6 | F04-00610 | TERM, FORK | 4 |
| 7 | F04-00615 | TERM, SPLICE | 4 |
| 8 | F04-00616 | TERM, INSULATOR | 4 |
| 9 | F04-00618 | INSULATED SPADE | 8 |
| 10 | F04-00693 | SWITCH, ROCKER - 12V | 1 |
| 11 | F04-00830 | THERMOSTAT, ADJUSTABLE | 1 |
| 12 | F04-02433 | CORD, ELEC - 14/4SO X 24" | 1 |
| 13 | FA5-00063 | RELAY, AUTOMOTIVE | 1 |

# Electrial Schematic - ES-01680B



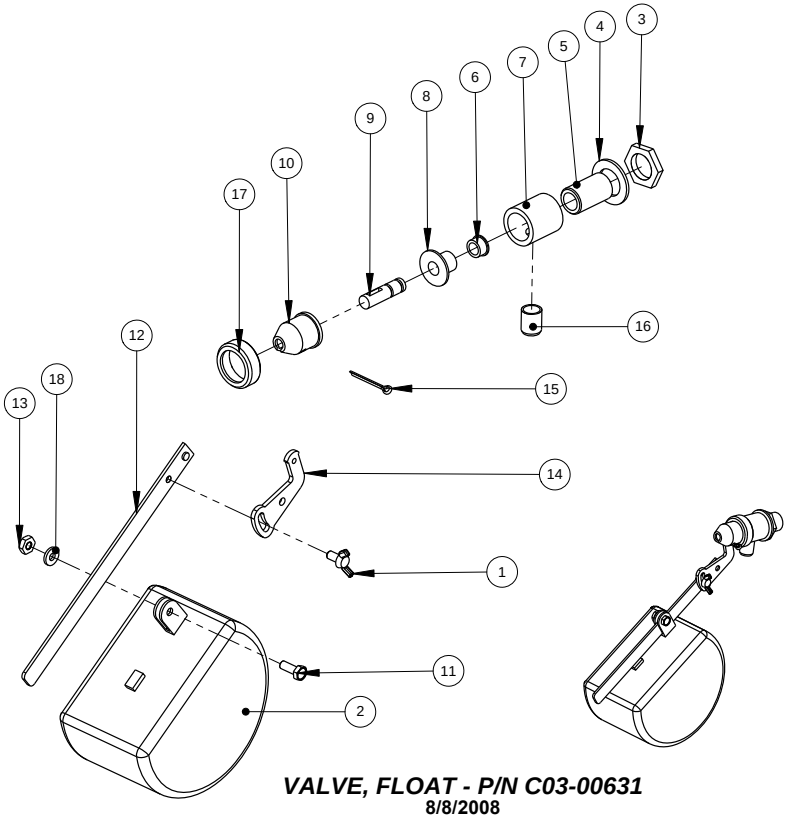
# Float Tank Assembly



**ASSEMBLY, FLOAT-TANK**
**p/n: 4305X-01121**
**3/8/2017**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 2120-04120B | TANK, FLOAT | 1 |
| 2 | 4120-10540 | ASSEMBLY, RESTRICTOR | 1 |
| 3 | C03-00631 | FLOAT VALVE | 1 |
| 4 | C04-00120 | FILTER, SOAP SCREEN | 1 |
| 5 | C05-00264 | ADAPTER,SWIVEL | 1 |
| 6 | C05-00270-1 | NUT, GARDEN HOSE | 1 |
| 7 | C05-00271 | WASHER, GARDEN HOSE | 1 |
| 8 | E06-00028 | COUPLING,FULL-HP | 1 |
| 9 | E09-00002-P | PLUG, PIPE - NYLON | 1 |
| 10 | W02-10057-8 | BARB, HOSE | 1 |

# Float Valve




***VALVE, FLOAT - P/N C03-00631***

**8/8/2008**

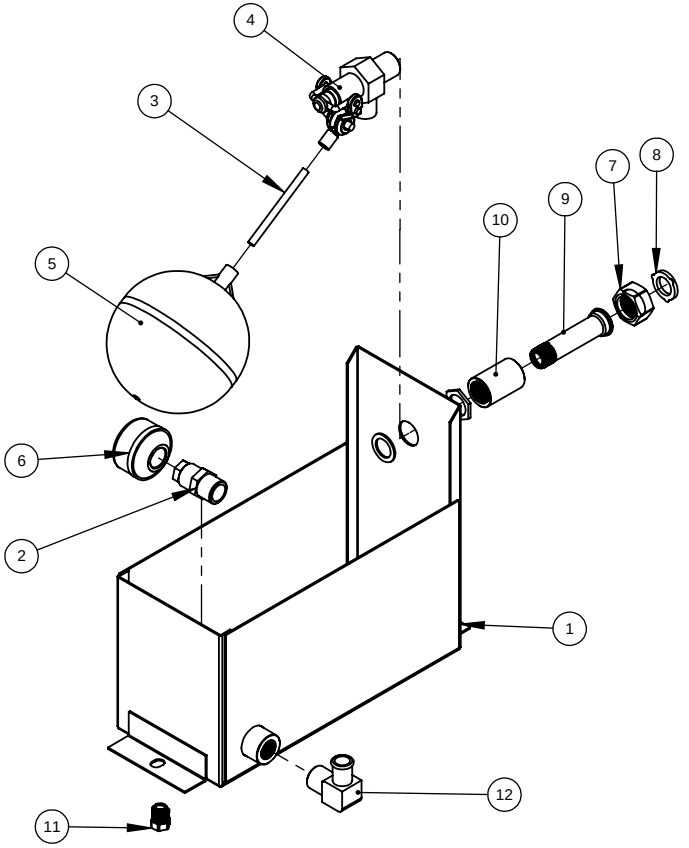
## *PARTS LIST*

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | C03-00625-10 | SCREW, WING - 10-32UNF | 1 |
| 2 | C03-00628 | FLOAT, PLASTIC | 1 |
| 3 | C03-00631-01 | NUT,HEX - 3/8FNPT | 1 |
| 4 | C03-00631-02 | WASHER, FLAT - RUBBER | 1 |
| 5 | C03-00631-03 | NIPPLE, BRASS - 3/8NPT | 1 |
| 6 | C03-00631-04 | SEAT, VALVE-NYLON | 1 |
| 7 | C03-00631-05 | HOUSING, VALVE | 1 |
| 8 | C03-00631-06 | PISTON | 1 |
| 9 | C03-00631-07 | ROD, PISTON-5/16CS X 1 1/4 PLASTIC | 1 |
| 10 | C03-00631-08 | GUIDE, PISTON | 1 |
| 11 | C03-00631-10 | SCREW, CAP | 1 |
| 12 | C03-00631-11 | ARM, FLOAT | 1 |
| 13 | C03-00631-14 | NUT, HEX - BRASS | 1 |
| 14 | C03-00631-16 | LEVER - BRASS | 1 |
| 15 | C03-00631-17 | KEY, COTTER | 1 |
| 16 | C03-00631-18 | NIPPLE, TOE | 1 |
| 17 | C03-0631-09 | NUT, RETAINER | 1 |
| 18 | H05-18700 | WASHER, FLAT | 1 |

## *SPECIFICATIONS*

**MAXIMUM VOLUME.....7 GPM / 26 LPM**
**MAXIMUM PRESSURE.....140 PSI / 10 BAR**
**MAXIMUM TEMPERATURE .....140 ° F/60 ° C**
**PORT SIZE - INLET.....3/8" NPT**
**DIMENSIONS...11.4 X 4.1 X 2.8 IN / 290 X 104 X 71MM**
**WEIGHT.....0.6 LB / 0.3 KG**
**HOUSING MATERIAL .....BRASS**
**O-RING MATERIAL.....BUNA-N**

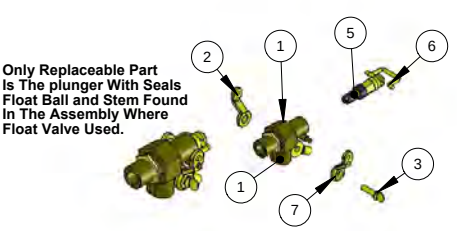
# Float Tank Assembly - before 2015




**ASSEMBLY, TANK - FLOAT**
**P/N 4305X-01121**
**8/21/2008**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 4120-01120 | TANK, FLOAT | 1 |
| 2 | 4120-10540 | ASSEMBLY, RESTRICTOR | 1 |
| 3 | AR14-00300 | ROD,THREAD 1/4-20UNC X 3 | 1 |
| 4 | C03-00620-Q | VALVE, FLOAT | 1 |
| 5 | C03-00622-B | BALL,FLOAT-PLASTIC | 1 |
| 6 | C04-00120 | FILTER, SOAP SCREEN | 1 |
| 7 | C05-00270-1 | NUT, GARDEN HOSE | 1 |
| 8 | C05-00271 | WASHER, GARDEN HOSE | 1 |
| 9 | C05-00272 | ADAPTER, GARDEN HOSE | 1 |
| 10 | E06-00008-2 | COUPLING, FULL | 1 |
| 11 | E09-00002-P | PLUG, PIPE - NYLON | 1 |
| 12 | W02-10057-8 | BARB, HOSE | 1 |

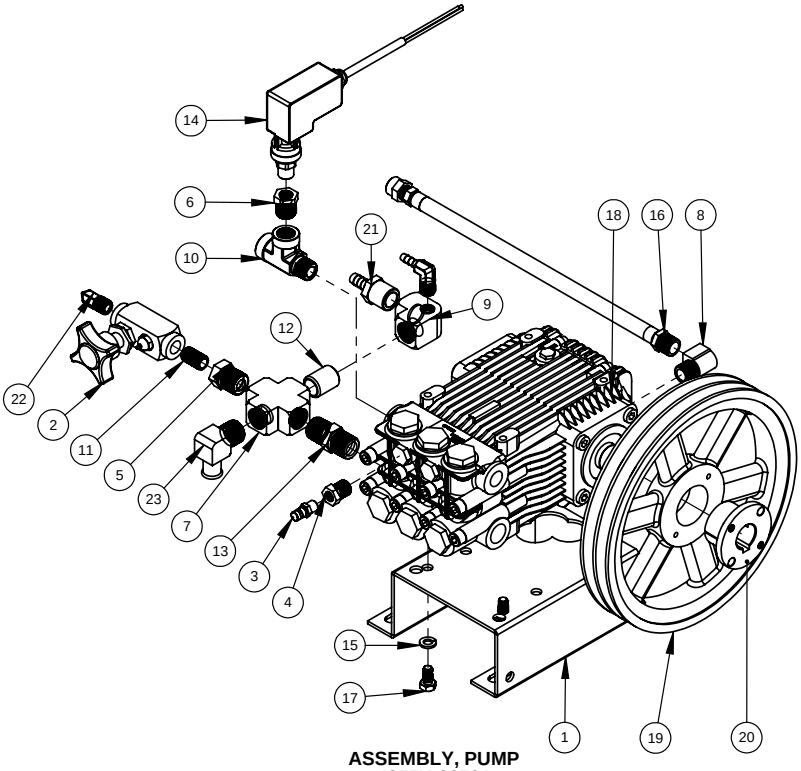
# Float Valve




**VALVE, FLOAT**
**p/n C03-00620-Q**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | ---------- | HOUING-VALVE | 1 |
| 2 | ---------- | ARM,PLUNGER | 1 |
| 3 | ---------- | NUT,WING | 1 |
| 4 | ---------- | ARM,BALL | 1 |
| 5 | C03-99620-Q | PLUNGER | 1 |
| 6 | ---------- | LINK,PLUNGER | 1 |
| 7 | ---------- | ARM,PLUNGER | 1 |
| 8 | ---------- | WASHER, FIBER | 1 |
| 9 | ---------- | NUT, HEX | 1 |

# Water Pump




**ASSEMBLY, PUMP**
**4355X-00501**
**10/30/2008**

| ITEM NO. | Part Number | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 4355EB-00513 | MOUNT, PUMP | 1 |
| 2 | C03-00307 | VALVE, METERING | 1 |
| 3 | C03-00810 | VALVE, AIR | 1 |
| 4 | E04-00001-58 | BUSHING, PIPE | 1 |
| 5 | E04-00005-48 | BUSHING, PIPE | 1 |
| 6 | E04-00016-58 | BUSHING, 3/8 - 1/4 | 1 |
| 7 | E07-00001-4 | CROSS, PIPE | 1 |
| 8 | E08-00011-48 | 3/8"MNPT X 3/8"FNPT X 90D | 1 |
| 9 | E08-00016-4T | ELBOW, 1/2" FNPT | 1 |
| 10 | E10-00021-58 | TEE, STREE - 3/8 | 1 |
| 11 | E13-00010-2 | NIPPLE, PIPE - 1/4" | 1 |
| 12 | E15-00010-48 | NIPPLE, CLOSE - 1/2"NPT | 1 |
| 13 | E15-00010-58 | NIPPLE, HEX | 1 |
| 14 | F04-00790 | SWITCH, PRESSURE | 1 |
| 15 | H05-31304 | WASHER | 4 |
| 16 | K21-02214-3/8 | KIT, OIL DRAIN - 3/8" | 1 |
| 17 | N07-20048 | SCREW, CAP | 4 |
| 18 | N09-00053 | PUMP, WATER - RK1528HN | 1 |
| 19 | R03-00794 | PULLEY, DBL | 1 |
| 20 | R04-00001 | BUSHING, PULLEY | 1 |
| 21 | W02-10030-8 | BARB, HOSE | 1 |
| 22 | W02-10031 | BARB, HOSE | 2 |
| 23 | W02-10057-8 | BARB, HOSE | 1 |

# Pump Maintenance

1. Drain all of the water out of the pump.
2. Run a 50% solution of a RV or non-toxic/biodegradable antifreeze through the pump.
3. Flush the pump with fresh water before the next use.
4. In freezing conditions failure to do this may cause internal pump damage.
5. For long periods of storage in non-freezing areas the solution will keep the seals and O-rings lubricated.

## Service Pumps

### Servicing the Valves

The inlet and discharge valves in this series pumps are all the same. The valves are located under the six 24mm hex plugs. The inlet valves are located on the lower row and the discharge valves are located on the top row of the pump head.

Tools required: 24mm socket, ratchet, needle nose pliers, mechanics pick and torque wrench.

### Valve Removal:

1. Remove the valve cap.
2. Inspect the valve cap O-ring for any damage, replace if necessary. (See Figure 10)
3. Use the needle nose pliers to remove the valve. (See Figure 11)

**Figure 10**

**Figure 11**

## Service Pumps (continued)

4. Use a small probe to move the poppet up and down to assure that the valve is functioning properly and that no debris is stuck in the valve. (See Figure 12)


**Figure 12**

5. Using the mechanics pick remove the valve seat O-ring and inspect for any damage, replace if necessary. (See Figure 13)


**Figure 13**

### Valve Assembly:

1. Install the valve seat O-ring squarely into the bottom of the manifold. (See Figure 14)


**Figure 14**

2. Insert the valve assembly squarely into the port pushing it into the O-ring. (See Figure 15)


**Figure 15**

3. Install the valve cap and torque to the proper specification. (See Figure 16) (See parts breakdown)


**Figure 16**

### Servicing the Packings/Seals

To access the water seals for inspection or replacement, you will first need to remove the head of

Tools required: 6mm hex socket, ratchet, (2) long screwdrivers, reversible pliers, mechanics pick and torque wrench.

### Disassembly:

1. First remove the eight 6mm head bolts. (See Figure 17)


**Figure 17**

2. Place the screwdrivers as shown between the head and crankcase of the pump, lifting one up and the other down. The head should start to lift off of the plungers. (See Figure 18)


**Figure 18**

3. When you remove the head you may notice that some of the water seals have stayed on the plungers and some in the head. (See Figure 19) To remove the seals from the plungers simple turn the assemblies and pull off.


**Figure 19**

4. If the seal assemblies are in the head use the reversible pliers to grab the seal retainer on the inside bore

(**NOTE:** Use a rag so you do not mar the piston guide area), twist the retainer in either direction


**Figure 20**

## Service Pumps (continued)

(**NOTE:** This is done to free the retainer O-ring which is stuck to the manifold) and lift out. (See Figure 20 & 21)

Figure 21

5. With your fingers pull the high pressure seal and head ring out of the head. (See Figure 22)

Figure 22

6. The low-pressure seal is located in the brass seal retainer. Using the mechanics pick go in between the seal and retainer, twist and pull, the seal will come out of the gland. (See Figure 23 & 24)

Figure 23

7. Remove the seal retainer O-ring with the mechanics pick. (See Figure 25)

Figure 24

### Assembly:

1. Install the plastic head ring into the head *(the flat side is on the bottom).* (See Figure 26)

Figure 25

2. Install the high-pressure seal. Place the seal so the open "V" portion is toward the head ring. You need to place the seal at an angle and pull and push to work the seal into position with your fingers *(do not use and tools you may damage the seal)*. Make sure the seal is totally seated against the head ring. (See Figure 27 & 28)

Figure 26

Figure 27

Figure 28

3. Installing the low-pressure seal. You want the open side of the seal to be pointed toward the water side of the head (toward the high-pressure seal) and the flat side toward the drive end of the pump.

Figure 29

Place the seal into the gland at an angle, with your finger push the exposed side of the seal towards the center and work the seal (See Figure 29, 30 & 31) into position. After the seal is in the gland you can work it into it proper position.

Figure 30

Figure 31

4. Install the retainer O-ring. (See Figure 32)

Figure 32

## Service Pumps (continued)

5. Squarely seat the retainer into the head and push with even pressure until it snaps into position. (See Figure 33)


Figure 33

### Servicing the Plungers

If the plungers are not damaged they do not need any servicing.

Tools required: 16mm socket, ratchet, mechanics pick, taper blade gasket scraper, thread sealant and torque wrench.

**NOTE:** Be very careful when working with the plungers, they are made from ceramic which is brittle and can be damaged.

Any time you remove a plunger it is recommended you replace the slinger washer, O-ring and top plunger washer. The washers are a cushion for the ceramic plunger and compress when first used and the O-ring will take a set to create a seal and usually will not spring back to its original shape. By not replacing these parts you run the risk of breaking a plunger or having a water leak.

### Disassembly:

1. Remove the plunger retainer nut. (See Figure 34)


Figure 34

2. Insert the gasket scraper between the copper washer and plunger to remove the washer. (See Figure 35)


Figure 35

3. Twist and pull the plunger off the plunger rod.
4. Remove the plunger rod O-ring seal and split back-up ring with the mechanics pick. (See Figure 36 & 37)


Figure 36

5. Remove brass slinger. At this point clean any thread locker that is left on the plunger rod and retaining nut threads. (See Figure 38)


Figure 37


Figure 38

### Assembly:

1. Install the slinger washer. (See Figure 39)


Figure 39

2. Install the plunger rod O-ring and split back-up ring. Place a light film of oil on the O-ring and back-up ring. (See Figure 40)

   **NOTE:** The O-ring is closest to the threaded end of the rod.


Figure 40

3. Install the plunger by pushing straight down and twisting slightly in either direction (See Figure 41)


Figure 41

(**NOTE:** Be sure that the back-up ring is fully seated). Make sure you fully seat the plunger.

## Service Pumps (continued)

4. Install the small copper washer on top of the plunger and place a small quantity of thread sealant in the thread. Install the plunger nut and tighten to the required torque. (See Figure 42 & 43) (See parts breakdown)

Figure 42

Figure 43

### Pump head to drive end Installation

1. Turn the crankshaft to align the plungers as shown. (See Figure 44)
2. Place the head evenly onto the plungers and push it until it makes contact with the drive end of the pump. (See Figure 45)
3. Torque the head bolt as shown in the tightening sequence diagram. (See Figure 46 & 47) (See parts breakdown).

Figure 44

Figure 45

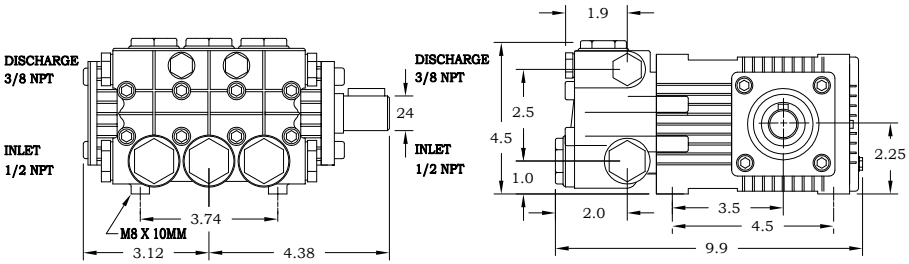
Figure 46


Figure 47

## Oil Change

Change oil after first 50 hours of use. Then every 500 hours. Refer to parts breakdown for oil type.

# Pump
## Specifications




ALL DIMENSIONS ARE IN
INCHES UNLESS OTHERWISE
NOTED. 25.4 MM = 1 INCH

### *PERFORMANCE*

DISCHARGE VOLUME.....4.0 GPM / 15.1 LPM
PUMP HEAD PRESSURE.....4000 PSI / 275.0 BAR

### *GENERAL*

CRANKSHAFT ROTATION.....CLOCKWISE AND COUNTER CLOCKWISE
MAXIMUM SPEED.....1450 RPM
MAXIMUM PUMPED FLUID TEMPERATURE.....165°F / 74°C
INLET PRESSURE.....-9 IN HG @ 75°F TO 116 PSI / -0.3 BAR @ 24°C TO 8 BAR
WEIGHT (WET).....20.0 LBS / 8.8 KG

### *LUBRICATION*

OIL CHANGE INTERVAL .....AFTER FIRST 50 HOURS THEN AFTER 500 HOURS
OIL TYPE.....SAE 30 (NON-DERTERGENT)
CRANKCASE CAPACITY.....15.0 FL OZ / 0.44 LT

### *TORQUE*

VALVE PLUG.....40 FT LBS / 5.5 KG M
MOUNT TO CRANKCASE.....32 FT LBS / 4.4 KG M
* PLUNGER NUT TO CROSSHEAD.....8.8 FT LBS / 1.2 KG M
REAR COVER TO CRANKCASE.....18 FT LBS / 2.4 KG M
RETAINER TO CRANKCASE.....18 FT LBS / 2.4 KG M
HEAD TO CRANKCASE.....18.0 FT LBS / 2.5 KG M

*__NOTE:__ When plunger nut is removed, install a new copper washer and flinger washer to ensure proper fit and seal of ceramic plunger. If same copper washers are reused cracking or a poor seal may result.

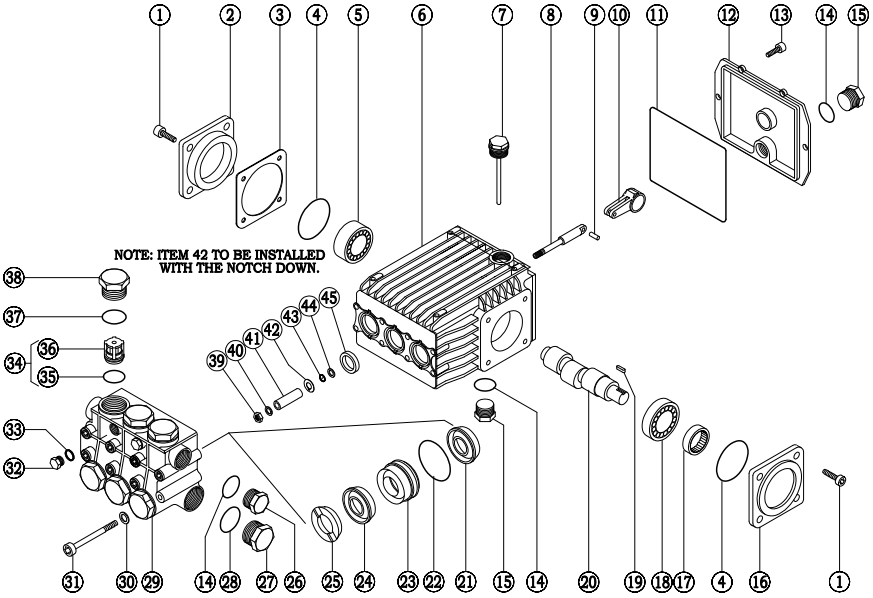
### *REPAIR PARTS PACKAGES*

| *PART NO.* | *DESCRIPTION* | *ITEM* | *QTY* |
|---|---|---|---|
| N09-992864 | VALVE ASSEMBLIES | | |
| | ASS'Y, CHECK VALVE | 36 | 6 |
| | O-RING | 35 | 6 |
| N09-991855 | OIL SEALS & O-RINGS | | |
| | O-RING, RETAINER | 4 | 2 |
| | O-RING, COVER | 11 | 1 |
| | SEAL, OIL | 45 | 3 |
| | SEAL, OIL - CRANKSHAFT | 17 | 1 |

| *PART NO.* | *DESCRIPTION* | *ITEM* | *QTY* |
|---|---|---|---|
| N09-991857 | V-PACKING, SEAL, & O-RING | | |
| | SEAL, WATER | 21 | 3 |
| | O-RING | 22 | 3 |
| | PACKING, V - 18MM | 24 | 3 |

| *PART NO.* | *DESCRIPTION* | *ITEM* | *QTY* |
|---|---|---|---|
| N09-992757 | PLUNGERS - 18MM | | |
| | PLUNGERS | 41 | 3 |
| N09-991829 | ADAPTER, MALE - 18MM | | |
| | ADAPTER, MALE | 25 | 3 |

# Exploded View




*PARTS LIST*

| *ITEM* | *PART NO.* | *DESCRIPTION* | *ITEM* | *PART NO.* | *DESCRIPTION* |
|---|---|---|---|---|---|
| 1 | N09-850370 | SCREW, CAP | 24 | N09-880320 | V-PACKING - 18MM |
| 2 | N09-1380050 | RETAINER, BEARING - CLOSED | 25 | N09-960110 | ADAPTER, MALE - 18MM |
| 3 | N09-1380120 | SHIM - 0.1 MM | 26 | N09-1981180 | PLUG - 3/8" NICKEL PLATED |
| 4 | N09-640030 | O-RING | 27 | N09-960870 | PLUG - 1/2" NICKEL PLATED |
| 5 | N09-2280240 | BEARING | 28 | N09-180101 | O-RING |
| 6 | N09-1382770 | CRANKCASE | 29 | N09-1381070 | HEAD, PUMP - NICKEL PLATED |
| 7 | N09-0880130 | DIPSTICK, OIL | 30 | N09-1381850 | WASHER, FLAT |
| 8 | N09-1380920 | CROSSHEAD | 31 | N09-820150 | SCREW, CAP |
| 9 | N09-1380060 | PIN, CROSSHEAD | 32 | N09-1380690 | PLUG - 1/4" NICKEL PLATED |
| 10 | N09-1383050 | ROD, CONNECTING | 33 | N07-20028 | O-RING |
| 11 | N09-1780510 | O-RING | 34 | N09-992864 | KIT, VALVE ASSEMBLY |
| 12 | N09-1789010 | COVER, PUMP HOUSING - REAR | 35 | P04-00212 | O-RING |
| 13 | N09-1343510 | SCREW, CAP | 36 | ---------- | ASSEMBLY, VALVE |
| 14 | C03-00503-01 | O-RING | 37 | N09-0960160 | 0-RING |
| 15 | N09-880530 | PLUG - 3/8" | 38 | N09-960850 | PLUG - S.S. |
| 16 | N09-1380040 | RETAINER, BEARING - OPEN | 39 | N09-962010 | NUT, HEX |
| 17 | N09-880520 | SEAL, OIL | 40 | N09-962000 | WASHER, FLAT - COPPER |
| 18 | N09-840370 | BEARING | 41 | N09-1380940 | PLUNGER - 18MM |
| 19 | N09-1380520 | KEY | 42 | N09-1380950 | WASHER, FLINGER - COPPER |
| 20 | N09-2280060 | CRANKSHAFT | 43 | N09-600180 | O-RING |
| 21 | N09-880330 | SEAL, WATER - 18MM | 44 | N09-1080401 | RING, ANTI-EXTRUSION |
| 22 | N07-20016 | O-RING | 45 | N09-880520 | SEAL, OIL |
| 23 | N09-1380090 | ADAPTER, FEMALE - 18MM | | | |

# Pump Maintenance Record

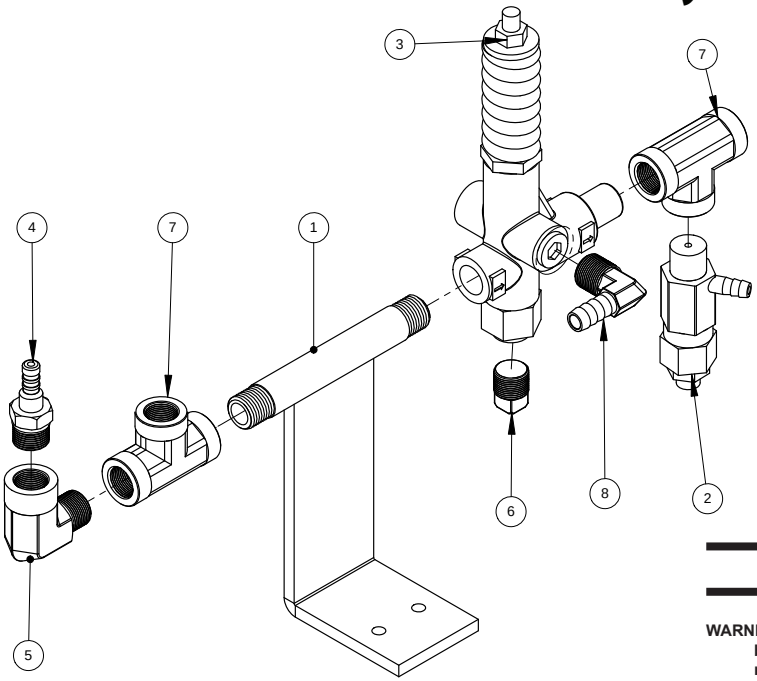
## Oil Change

| Month/Day/Year | Operating Hours | Oil Brand & Type |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## Pump Service

| Month/Day/Year | Operating Hours | Type of Service |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Unloader Assembly




**ASSEMBLY, UNLOADER**
**4355X-00515**
**2/12/2014**

| ITEM NO. | Part Number | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 3305X-00514 | BRACKET, UNLOADER | 1 |
| 2 | C03-00509-45 | VALVE, RELIEF - SS | 1 |
| 3 | C07-04504-MA | VALVE UNLOADER | 1 |
| 4 | C09-00008 | VALVE, EASY START | 1 |
| 5 | E08-00011-58 | ELBOW, PIPE | 1 |
| 6 | E09-00003-2 | PLUG, PIPE | 1 |
| 7 | E10-00003-5 | TEE, PIPE | 2 |
| 8 | W02-10040-8 | BARB, HOSE | 1 |

## *Relief Valve*

**WARNING: The relief valve has been factory set and is a field nonadjustable part. Please contact the factory before setting the valve and will void the manufacturer warranty.**

**If pressure from should exceed safe limits it will automatically open to relieve dangerous system pressure overloads which can harm equipment and can also be dangerous for the operator.**

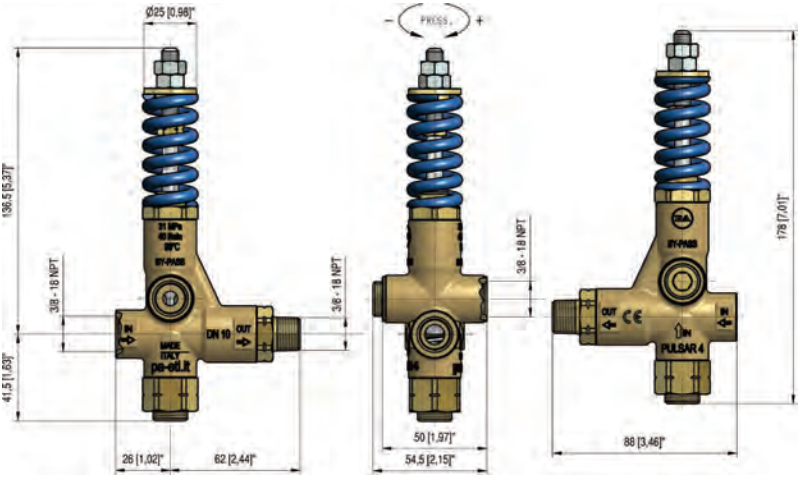
***Caution: Inspect relief valve annually for any obstruction.***

# Specifications

## p/n C07-04504M-A

### *Specifications*

| | |
|---|---|
| Maximum Flow | 10.5 gal/m / 40L/m |
| Unloading Press | |
| Rated | 4050 psi / 280 bar |
| Max | 4500 psi / 310 bar |
| Maximum Temperature | 195˚F / 88˚C |
| Weight | 1.54 lbs / 700 G |
| Bypass | 3/8 FNPT |
| Inlet | 3/8 FNPT |
| Discharge | 3/8 MNPT |



# Parts List

## p/n C07-04504M-A

| Item | Part Number | Description | Qty | Kit |
|---|---|---|---|---|
| **1** | C07-04504-11 | Guide, Piston | 1 | |
| **2** | C07-04504-01 | O-Ring | 2 | * |
| **3** | C07-04504-09 | Piston – SS | 1 | |
| **4** | C07-04504-02 | Ring, Back-Up | 1 | * |
| **5** | N07-20028 | O-Ring | 1 | * |
| **6** | ---------- | Housing | 1 | |
| **7** | C07-04500A-05 | Kit Seat & O-Ring | 1 | * |
| **7A** | C07-02300-08 | O-Ring 1/16CS x 11/16OD | 1 | |
| **9** | C07-04500-03 | Ball, SS-13/32 | 1 | |
| **10** | C07-04504-03 | Spring, 1.6x11x20MM | 1 | |
| **11** | C07-04504-04 | Coupling, Inlet 3/8 NPT | 1 | |
| **12** | N16-28110084 | Washer, Flat | 2 | |
| **13** | C07-04504-05 | Plug-3/8NPT | 2 | |
| **14** | C07-04504-07 | Ring, back-up | 1 | * |
| **15** | P04-00215 | O-Ring, 1.78 x 6.07mm | 1 | * |
| **16** | C07-04504-08 | O-Ring, 3 x 6mm | 2 | * |
| **17** | C07-04504-12 | Valve, Check | 1 | |
| **18** | C07-01009A-18 | Spring, Compression | 1 | |
| **19** | C07-04504-16 | O-Ring, 1/16cs x 5/8 | 1 | * |
| **20** | C07-04504M-10 | Fitting, Outlet – 3/8”M | 1 | |
| **21** | C07-04504-14 | Nut, Hex | 2 | |
| **22** | C07-04504-13 | Follower, Spring | 1 | |
| **23** | C07-04504-15 | Nut, Hex - Brass | 1 | |
| **24** | C07-04500-13 | Spring, Comp. Blue | 1 | |
| | **C07-9904504** | **Kit, Repair - Parts Package** | | * |

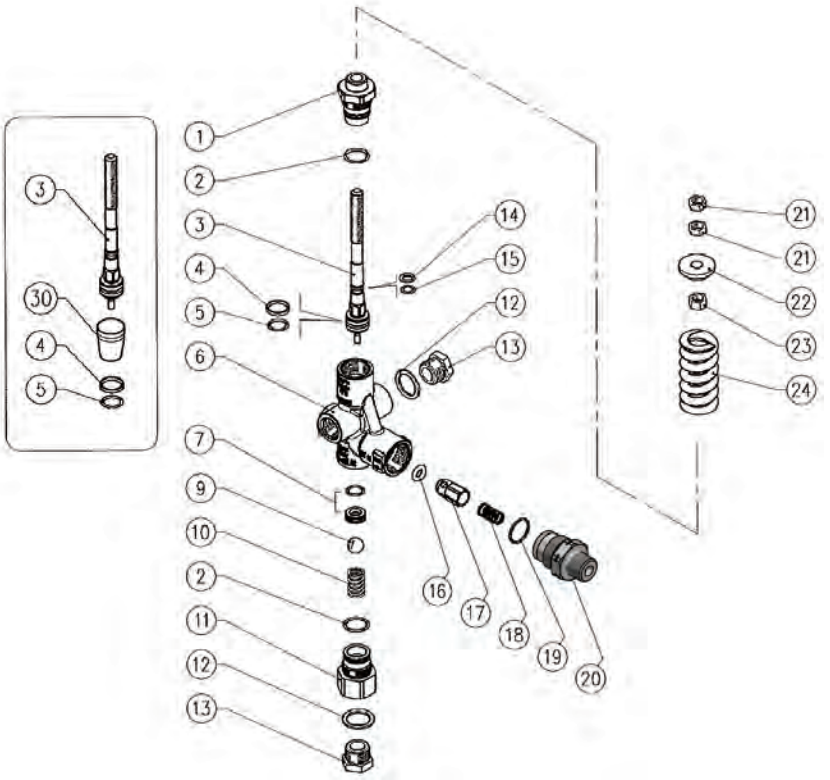
ATTENTION: the nut in position 21 is a mechanical security device that limits the maximum pressure; it must absolutely NOT be removed.

MAINTENANCE STANDARD: every 400 working hours, check and lubricate the seals with water resistant grease.

***NOTE: CONVERTING***
C07-04504-A to C07-04504M-A
Replace outlet fitting item #24 p/n C07-04500-17 with item #20 C07-04505M-10
NOTE: Outlet connection fittings will have to be changed.

# Maintenance - Exploded View

**p/n C07-04504M-A**




## UNLOADER PRESET AT FACTORY – DO NOT READJUST

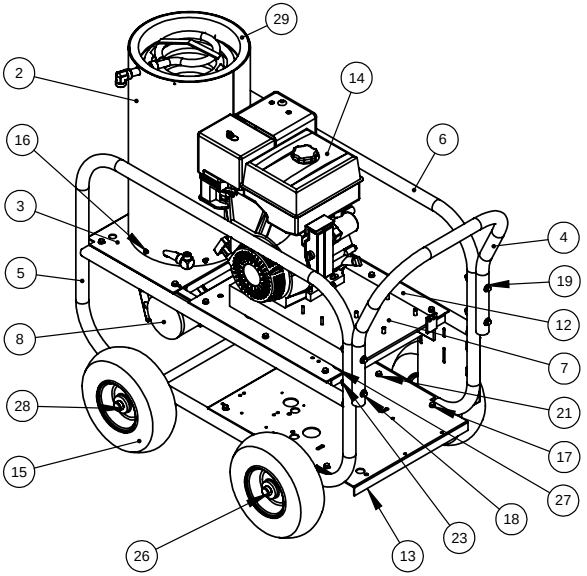
### Unloading Adjustment – Adjustment only after repair or replacement

1. Install an appropriate pressure gauge in pump head outlet. The gauge should have a range twice the operating pressure.
2. Install the spray nozzle in the end of the wand.
3. Ensure the relief valve is set properly.
4. Loosen top lock nut (upper Item 21) and turn the nut (lower Item 21) counter clockwise until minimum spring tension.
5. With machine turned on, open the trigger gun, start the pump, and observe pressure gauge reading. Slowly loosen the nut (lower Item 21) until pressure starts to drop on the gauge.
6. Tighten adjusting nut (lower Item 21) on the unloader. Pressure should start to increase. Tighten adjusting nut (lower Item 21) until pressure stops climbing.
7. Close and open the trigger gun to check unloading pressure and bypass function of the unloader valve. The unloading pressure should not exceed operating pressure more than 400 PSI.
8. Lock the setting by tightening the lock nut (upper Item 21).

# Troubleshooting

| Trouble | Possible Cause | Remedy |
|---|---|---|
| **Frequent valve recycles** | Damaged check valve O-ring | Remove and replace |
| | Leaking connections | Check or renew |
| | Restricted bypass or too small diameter of | Clean or adapt passage diameter |
| **Valve does not reach pressure** | Piston O-rings worn out | Remove and replace |
| | Debris between seat and shutter | Clean the seat |
| | Seat worn out | Remove and replace |
| | Nozzle worn out | Remove and replace |
| | Incorrect choice of nozzle | Fit with smaller nozzle |
| **High pressure peaks at gun closure** | There is not a minimum of 5% of total flow discharged in bypass | Reset Correctly |
| | Excessive flow in bypass | Change type of valve or adjust passages |
| | Adjustment with spring totally compressed | Loosen adjustment screw and eventually |
| **Valve does not discharge at low pressure at gun closure** | Jammed check valve | Jammed check valve |
| | Debris on check valve | Clean |

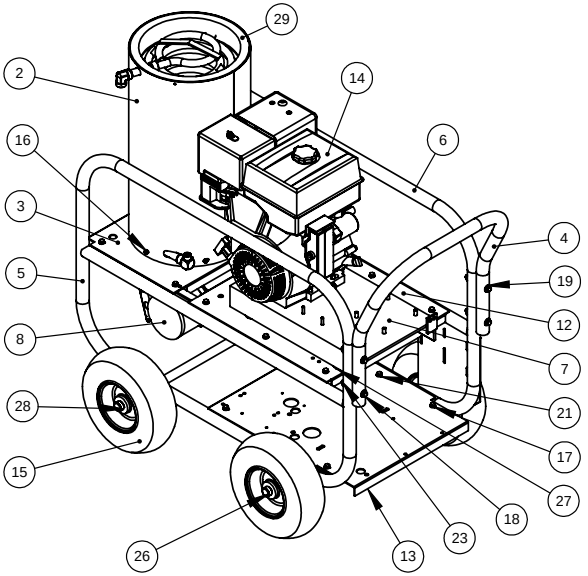
# Pre-Cleaner Assembly
## (4355X-000000)




**PRE CLEANER ASSEMBLY**
**4355X-00657 S/N 271645 & UP**
**08/08/2014**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 216AX-00164F | HANGER, GUN | 1 |
| 2 | 3242-00206 | COIL, PIPE - TALL | 1 |
| 3 | 330X-00138 | BASE - COIL MOUNT WELDMENT | 1 |
| 4 | 330X-00179F | HANDLE, POWDER COAT | 1 |
| 5 | 4355X-00130FL | FRAME, END - LEFT | 1 |
| 6 | 4355X-00130FR | FRAME, END - RIGHT | 1 |
| 7 | 4355X-00133 | CHANNEL, MOTOR-MOUNT | 1 |
| 8 | 4355X-00400 | ASSEMBLY, BURNER | 1 |
| 9 | 90-00119 | INSULATION - 1 x 14DIA | 1 |
| 10 | AP34-01803 | PIPE, 3/4" X 18 3/4" | 2 |
| 11 | AR34-03000 | AXLE ROD | 2 |
| 12 | AS11-02408NPB | BASE PLATE | 1 |
| 13 | AS11-02513NPB | FUEL TANK MOUNT | 1 |
| 14 | F05-00488 | 13HP HONDA | 1 |
| 15 | G02-10016C | ASS'Y, TIRE & RIM - 13" | 4 |
| 16 | H04-25002 | SCREW, CAP | 6 |
| 17 | H04-31313 | SCREW, CAP - 5/16-18UNC X 1 | 16 |
| 18 | H04-31331 | SCREW, CAP | 4 |
| 19 | H05-31300 | WASHER, FLAT - 5/16 | 8 |
| 20 | H05-50001 | WASHER, HELICAL LOCK - 1/2" | 8 |
| 21 | H06-25006 | NUT, TINNERMAN - 5/16 | 16 |
| 22 | H06-25007 | NUT, TINNERMAN - 1/4" | 6 |
| 23 | H06-31300 | NUT, LOCK - 5/16" | 4 |
| 24 | H06-37500 | NUT,LOCK-3/8-16UNC HEX | 3 |
| 25 | H06-50001 | NUT, 1/2 - 20UNF | 8 |
| 26 | H06-75002 | COLLAR, SHAFT - 3/4" | 4 |
| 27 | H10-50000 | MOUNT, SHOCK | 4 |
| 28 | Z01-00048 | CAP, VINYL - ROUND | 4 |
| 29 | Z01-05043 | INSULATION, CERAMIC FIBER | 2 |
| 30 | Z02-02611 | PALLET ASSEMBLY | 1 |

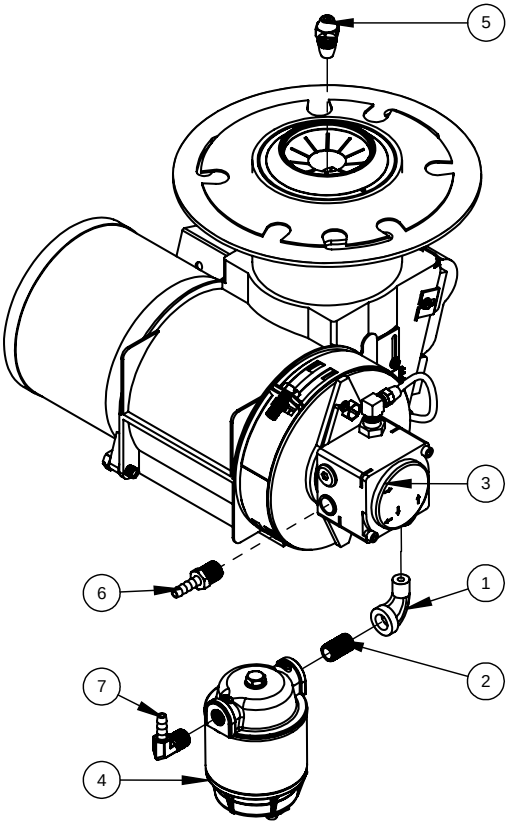
# (4355X-000020)




**PRE CLEANER ASSEMBLY**
**4355X-05657 S/N 271645 & UP**
**08/08/2014**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 216AX-00164F | HANGER, GUN | 1 |
| 2 | S3242-05206 | COIL, PIPE - TALL | 1 |
| 3 | 330X-00138 | BASE - COIL MOUNT WELDMENT | 1 |
| 4 | 330X-00179F | HANDLE, POWDER COAT | 1 |
| 5 | 4355X-00130FL | FRAME, END - LEFT | 1 |
| 6 | 4355X-00130FR | FRAME, END - RIGHT | 1 |
| 7 | 4355X-00133 | CHANNEL, MOTOR-MOUNT | 1 |
| 8 | 4355X-00400 | ASSEMBLY, BURNER | 1 |
| 9 | 90-00119 | INSULATION - 1 x 14DIA | 1 |
| 10 | AP34-01803 | PIPE, 3/4" X 18 3/4" | 2 |
| 11 | AR34-03000 | AXLE ROD | 2 |
| 12 | AS11-02408NPB | BASE PLATE | 1 |
| 13 | AS11-02513NPB | FUEL TANK MOUNT | 1 |
| 14 | F05-00488 | 13HP HONDA | 1 |
| 15 | G02-10016C | ASS'Y, TIRE & RIM - 13" | 4 |
| 16 | H04-25002 | SCREW, CAP | 6 |
| 17 | H04-31313 | SCREW, CAP - 5/16-18UNC X 1 | 16 |
| 18 | H04-31331 | SCREW, CAP | 4 |
| 19 | H05-31300 | WASHER, FLAT - 5/16 | 8 |
| 20 | H05-50001 | WASHER, HELICAL LOCK - 1/2" | 8 |
| 21 | H06-25006 | NUT, TINNERMAN - 5/16 | 16 |
| 22 | H06-25007 | NUT, TINNERMAN - 1/4" | 6 |
| 23 | H06-31300 | NUT, LOCK - 5/16" | 4 |
| 24 | H06-37500 | NUT,LOCK-3/8-16UNC HEX | 3 |
| 25 | H06-50001 | NUT, 1/2 - 20UNF | 8 |
| 26 | H06-75002 | COLLAR, SHAFT - 3/4" | 4 |
| 27 | H10-50000 | MOUNT, SHOCK | 4 |
| 28 | Z01-00048 | CAP, VINYL - ROUND | 4 |
| 29 | Z01-05043 | INSULATION, CERAMIC FIBER | 2 |
| 30 | Z02-02611 | PALLET ASSEMBLY | 1 |

# Oil Burner



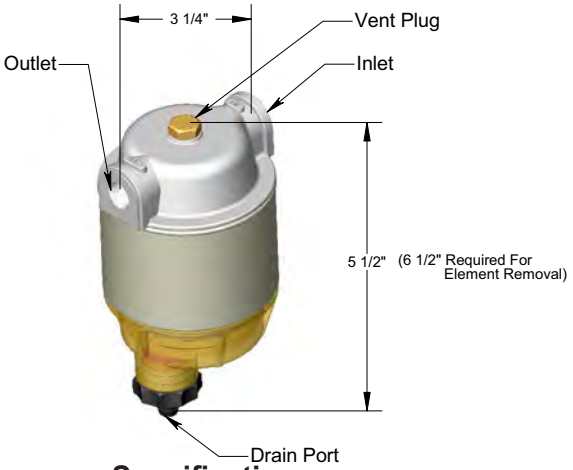

**ASSEMBLY, BURNER**
**p/n: 4355X-00400**
**10/29/2008**

| ITEM NO. | PART NUMBER | PART DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | E08-00006-2 | ELBOW, PIPE | 1 |
| 2 | E13-00010-2 | NIPPLE, PIPE - 1/4" | 1 |
| 3 | V00-173140 | BURNER, OIL | 1 |
| 4 | V04-00308 | FILTER, FUEL | 1 |
| 5 | V2.25 80DB | NOZZLE, BURNER | 1 |
| 6 | W02-10019-8 | BARB, HOSE | 1 |
| 7 | W02-10031 | BARB, HOSE | 1 |

# Fuel Filter

## Specifications, Trouble Shooting

**p/n V04-00308**




### Specifications

| | |
|---|---|
| Maximum Flow | 15 GPM / 57 LPM |
| Maximum Filtration | 2 Microns |
| Maximum Temperature | 212˚F / 100˚C |
| Weight | 1.0lbs / 340km |
| Inlet | ¼ NPT |
| Outlet | ¼ NPT |

All dimensions are in inches unless otherwise noted.
25.4 mm = 1 inch

### Maintenance Procedures

**Priming the machine**

Shut off the fuel tank valves. Spin off the clear bowl, fill with clean fuel and coat the round gasket (3) with fuel. Reinstall the clear bowl and tighten ¼ to 1/3 turns after the gasket contacts the upper housing. Turn on the fuel tank valves. Start the machine and check that there are no leaks.

**Draining water**

Check the collection bowl daily. Drain off water contaminants by unscrewing the clear bowl turning counter-clockwise. Start the machine and allow air to purge from the fuel system prior to operating the equipment.

**Element replacement frequency**

Frequency of element replacement is determined by contamination level in the fuel. Replace the element every 500 hours.

Note: Foul smelling diesel fuel is an indication of microbiological contamination. A change in fuel source is recommended. Always carry a spare filter element as one tank full of contaminated fuel will plug the fuel filter element prematurely.

**Element replacement procedure**

1. Shut off the fuel tank valves.
2. Unscrew the clear bowl turning counter-clockwise.
3. Remove and discard the filter element.
4. Follow listed procedures under “PRIMING.”

# Maintenance Schedule

## Filter, Fuel
**p/n V04-00308**

| Maintenance Schedule | Weekly | EVRERY 100 HRS |
|---|---|---|
| **Gaskets** | | |
| Inspect for deterioration or tearing. | • | |
| Remove and replace. | | • |
| **Bowls** | | |
| Inspect rim of bowl to insure it is free of nicks, cracks, or scratches. | • | |
| **Filter Element** | | |
| Inspect for damage or deterioration. | • | |
| Remove and replace. | | |
| **Fuel Bowl** | | |
| If contaminants are found, check more frequently. | • | |


| PART LIST | | | |
|---|---|---|---|
| ITEM | PART NUMBER | PART DESCRIPTION | QTY |
| 1 | V04-00308-02 | Housing, Upper | 1 |
| 2 | V04-00308-07 | Assembly, Drain | 1 |
| 3 | V04-00308-K | Bowl, Amber – 3” | 1 |
| 4 | V04-00308-01 | Element, Filter | 1 |
| 5 | V04-00308-05 | O-Ring – 3/32CS x 2 1/2ID | 1 |
| 6 | V04-01300-08 | O-Ring – 1/16CS x 5/16ID | 1 |
| 7 | ---------- | Plug, Pipe | 1 |
| 8 | V04-00308-03 | Ring, Flat | 1 |
| 9 | V04-00308-K | Kit, Replacement Bowl | 1 |
| 10 | V04-00308-04 | Vent Plug & O-ring | 1 |

# Troubleshooting

| Trouble | Possible Cause | Remedy |
|---|---|---|
| **Fuel bowl leaking** | Deteriorated gasket | Remove and |
| | Housing cracked | Remove and replace housing |
| | Bowl rim cracked, nicked, ors cracked | Remove and replace bowl |
| | Gasket missing | Replace gasket |
| | Loose fuel bowl | Tighten fuel bowl onto filter |
| **Air leaking into system (indicated by air bubbles in bowl during operation)** | Cracked component | Inspect filter bowl, filter housing, and gasket |
| | Loose filter bowl | Tighten fuel bowl onto fuel filter |
| | Loose valve assembly | Tighten valve assembly |

# Burner Maintenance
## Fuel Filter, Adjustment Air Band , Fuel Pressure

### Air Band Adjustment

Note: The air band adjustment on this burner has been preset at the factor (elevation approximately 1400 feet). On equipment installed where elevation is substantially different, the air band(s) must be readjusted.

1. Loosen the cap screw retaining the air bands.
2. Move the air bands as indicated below with the machine in operation. Note: The air band should be set so the exhaust gives the smoke spot specified in the GENERAL section of the MACHINE SPECIFICATIONS on a Shell-Bacharach scale. If a smoke tester is not available, a smoky exhaust, oily odor, or sweet smell indicates insufficient air while eye-burning fumes indicate too much air.
3. Tighten the cap screw retaining the air bands.

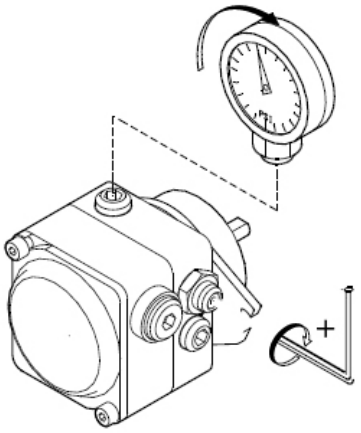
### Fuel Pump Filter

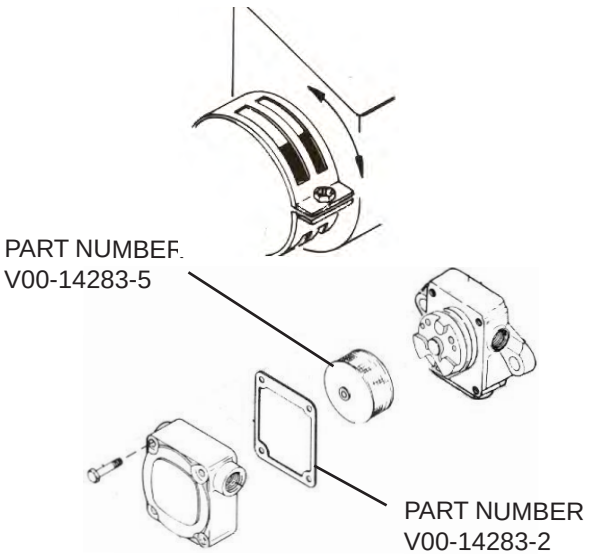
Suntec Pump

1. Shut off fuel supply.
2. Loosen the 4 screws holding the cover to the fuel pump housing.
3. Take cover and cover gasket off and pull strainer off of pump housing.
4. Clean out any dirt remaining in the bottom of strainer cover. If there is evidence of rust inside of the unit, be sure to remove water in supply tank and fuel filter.
5. Turn on fuel supply. Failure to do so will result in fuel pump damage.

### Fuel Pump Pressure Adjustment

1. Install a 0-200 PSI Pressure Gauge.
2. Remove Plug on top of the fuel pump.
3. Insert a 1/8" Allen Wrench and turn clockwise to increase pressure and counter clockwise to decrease.
4. Remove Gauge and reinstall plug.

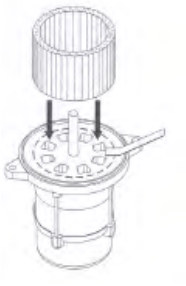




# Blower Fan Replacement, Transformer Test, Bus Bar Alignment

## Blower Fan Replacement

1. Shut off power to the burner and disconnect wires.
2. Loosen the two screws securing blower motor and fan to the housing.
3. Remove the blower.
4. Install the blower onto the shaft and place .030 feller gauge on the motor as shown, sliding blower until it contacts feeler the gauge. Rotate wheel until set screw is centered on the flat of the motor shaft. Tighten set screws onto motor shaft.
5. Reinstall motor and blower assembly.
6. Reconnect wires and turn on power.



## Transformer Test

1. Remove burner junction box cover.
2. Turn on burner and make sure ignition transformer is receiving rated voltage.
3. Turn off burner.
4. Loosen screw and swing transformer away from burner gun assembly.
5. Turn on burner.
6. Short the high voltage terminals.
7. Open gap by drawing screwdriver away from one electrode while touching the other.
8. The spark should jump between 5/8 inches and ¾ inches, if it doesn't jump, replace the transformer.
9. Turn burner off.
10. Partially close transformer. Check if buss bars align and contact transformer electrodes. If buss bars do not contact, see Buss Bar Alignment.
11. Close transformer, reposition retainer clip and tighten

**⚠ WARNING**

**Use screwdriver with a well insulated handle to avoid shock.**

CORRECT

INCORRECT

## Buss Bar Alignment

1. With burner off, loosen screw and swing the transformer away from burner gun assembly.
2. Inspect the buss bars and transformer electrodes for pitting or corrosion.
3. Partially close the transformer. Check if the buss bars contact and are in alignment with transformer electrodes.
4. Proper adjustment is obtained by gently bending the buss bars until they spring against, parallel, and are in full contact with the transformer electrodes.
5. With buss bars aligned, carefully close and fasten the transformer.

# Burner Gun Removal & Replacement, Accessories, Elctrode Adjustment

## Burner Gun Removal & Installation

1. Disconnect the fuel line from the burner gun assembly oil line fitting. Loosen the other end of the line and swing line out of the way.
2. Remove the retaining nut.
3. Loosen screw and swing transformer away from burner gun assembly.
4. Carefully remove the burner gun assembly.
    1) Check and replace electrode insulators if cracked.
    2) Clean burnt buss bars.
    3) Clean carbon off electrodes.
    4) Clean carbon off oil nozzle (use caution not to scratch face of nozzle or orifice).
    5) Check for a loose oil nozzle. Note: Check with dealer and/or replace nozzle with proper nozzle.
5. Gently replace burner gun assembly in air tube. CAUTION: Do not force. Forcing will cause electrode misalignment.
6. Reinstall the retaining nut.
7. Reinstall the oil line making sure both ends are tight.
8. Partially close transformer. Check if buss bars align and contact the transformer electrodes. If buss bars do not contact, see Buss bar Alignment.
9. Close transformer, reposition retainer and tighten screw.

## Accessories

| | |
|---|---|
| p/n Y01-00041 | Gauge-0- 200 PSI |
| p/n Z09-00004 | Bacharach Smoke Tester |
| p/n Y01-00090 | Allen Wrench 1/8" #8 |
| p/n z01-00092 | Fuel Nozzle Changing Wrench |

**Z01-00095**

## Electrode Assembly Adjustment

1. Loosen screws holding electrode assemblies.
2. Raise electrode tips 5/32" above surface plane or end of oil nozzle.
3. Place each electrode tip 5/16" from center of spray nozzle hole, maintaining previous measurement.
4. Spread electrode tips to 1/8" gap maintaining previous measurements.
5. When the proper measurements are obtained, gently tighten screws that hold electrode assembly in place. CAUTION: Do not over tighten, as this will cause the electrode insulator to fail.

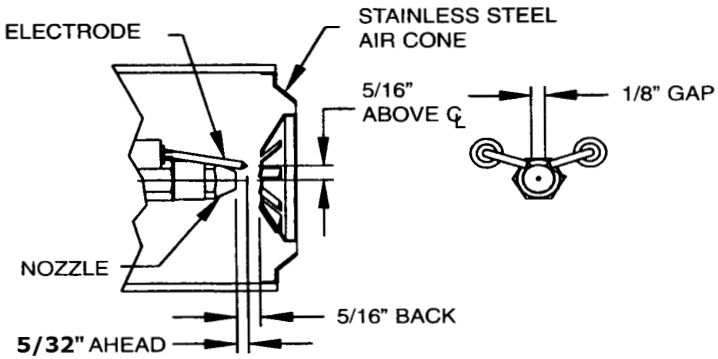
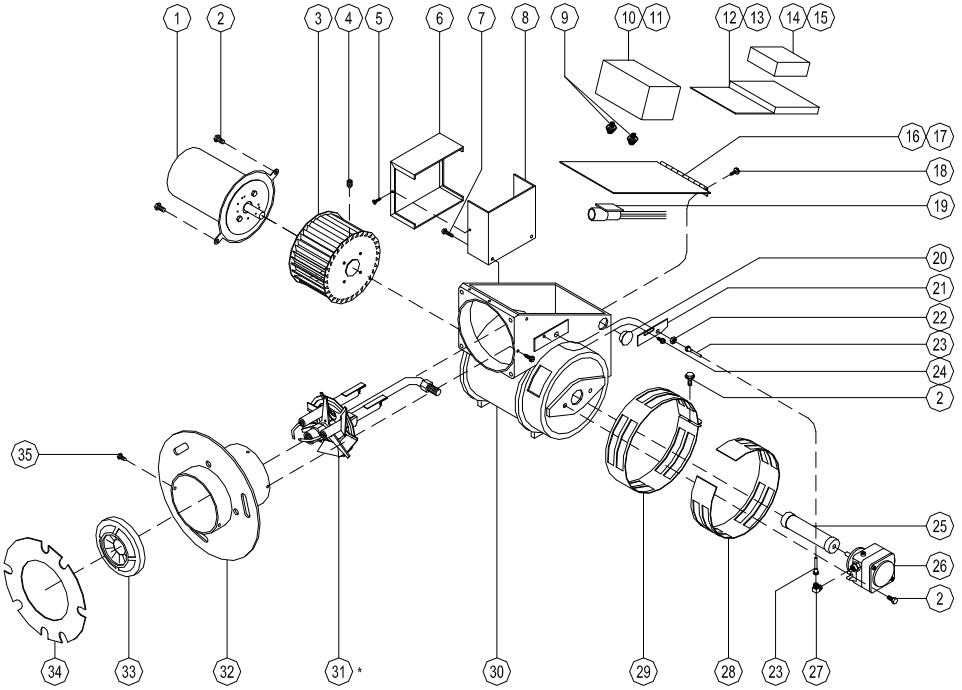


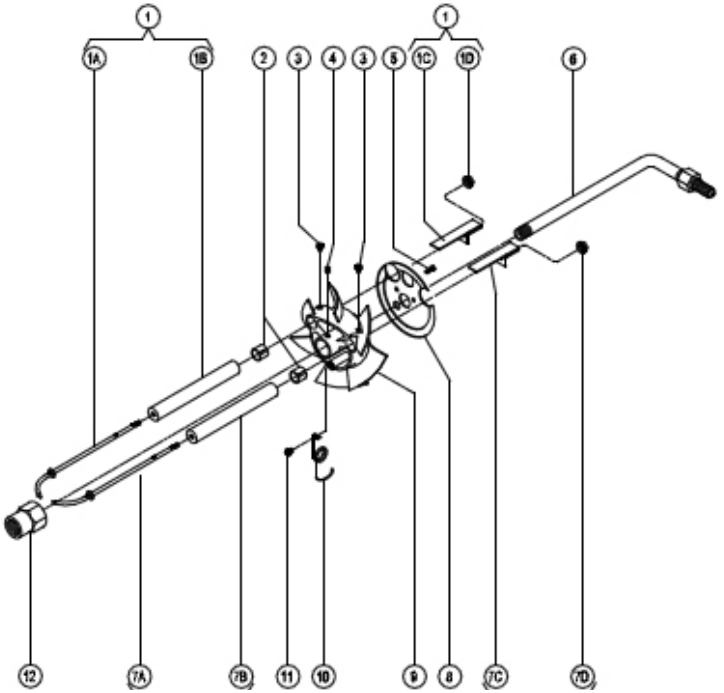

FIGURE 1

# Burner Breakdown

**V00-173140**




**V-30537-011**



# Burner Parts List

## Burner Breakdown Parts List p/n V00-173140

**20130502**

| Item | Part No. | Description |
|---|---|---|
| 1 | V-101126-002 | Kit, Motor/Adapter |
| 1A | V-21993-006 | Motor, El.–12VDC 3900 RPM |
| 1B | --- | Adapter, Motor |
| 1C | --- | Bushing |
| 1D | V-101119-001 | Coupling, Shaft |
| 2 | H04-19000 | Screw, Self Tap |
| 3 | V00-101317001 | Fan, Burner w/ Set Screw |
| 4 | H04-31302 | Screw, Set |
| 5 | V-100603 | Screw |
| 6 | V-62899-001 | Cover, Control Box |
| 7 | H04-19010 | Screw, Machine |
| 8 | V-63355-001 | Box, Control – Side Mount |
| *9 | V-100732-001 | Spring, Comp. (w/V00-99006) |
| *10 | V-101308-001 | Igniter, 12V (w/V00-99006) |
| *11 | V-100603-016 | Screw, Self Tap |
| *12 | V-100730-003 | Mount, Igniter |
| *13 | V-100603-015 | Screw, Self Tap (w/ V0099006) |
| 14 | V-100889-002 | Timer, Igniter – 12V |
| *15 | V00-12694 | Screw, Machine |
| *16 | V-21723-014 | Cover, Housing – Rear Hinge |
| 17 | V-101256-001 | Gasket, Cover – Rear Hinge |
| 18 | H04-31301 | Screw, Self Tap |
| 19 | V04-00401 | Detector, Cad Cell |
| 20 | V-12689 | Plug |
| 21 | V00-13392 | Cover, Slot |
| 22 | V00-14296 | Nut, Lock – Oil Line |
| 23 | V00-14452-1 | Line, Oil |
| 24 | H04-31313 | Screw, Cap |
| 25 | V-101119-001 | Coupling, Shaft |
| 26 | V00-14283 | Pump, Fuel |
| 27 | V00-13494-1 | Elbow, Flare |
| 28 | V-20602-002 | Band, Air – Outer |
| 29 | V-20601-002 | Band, Air – Inner |
| 30 | V-21866-002 | Assembly, Housing |
| 31 | V-30537-011 | Assembly, Gun |
| 32 | V-22044-004 | Air Tube |
| 33 | V00-14160 | Cone, Air - #4A |
| 34 | V00-12484 | Gasket |
| 35 | V00-12699 | Screw, Air Cone |
| * | V00-99006 | Kit, 12V Igniter |

## Burner Gun Breakdown Parts List p/n V-30537-011

| Item | Part No. | Description |
|---|---|---|
| 1 | V-100597-002 | Ass'y, Electrode – RH |
| *1A | --- | Stem, Electrode – RH |
| 1B | V00-12574 | Insulator, Electrode |
| 1C | V-13499-002 | Bar, Buss – T |
| 1D | V00-13110 | Nut, Pal |
| 2 | V00-12408 | Bushing, Insulator |
| 3 | V00-12694 | Screw, machine |
| 4 | H04-19002 | Screw, Set |
| 5 | V00-12695 | Screw, Machine |
| 6 | ---------- | Assembly, Oil Pipe – 7" |
| 7 | V-100598-002 | Ass'y, Electrode – LH |
| *7A | ---------- | Stem, Electrode – LH |
| 7B | V00-12574 | Insulator, Electrode |
| 7C | V-13499-002 | Bar, Buss – T |
| 7D | V00-13110 | Nut, Pal |
| 8 | V00-13409 | Plate, Baffle – 2 1/2" |
| 9 | V00-14310 | Support, Electrode |
| 10 | V00-14442 | Spring, Electrode Support |
| 11 | H04-16400 | Screw, Thread Cutting |
| 12 | V00-12362 | Adapter, Nozzle |

# Troubleshooting
## Pump

| Trouble | Possible Cause | Remedy |
|---|---|---|
| Oil leaking in the area of water pump crankshaft | Worn crankshaft seal, bad bearing, grooved shaft, or failure of retainer o-ring. | Remove and replace. |
| Excessive play on crankshaft | Defective bearings. | See “Worn bearing.” |
| | Excess shims. | Set up crankshaft. |
| Loud knocking in pump | Loose connecting rod screws. | Tighten connecting rod screws per PUMP SPECIFICATIONS |
| | Worn connecting rod. | Replace connecting rod per PUMP MAINTENANCE. |
| | Worn bearings. | Replace bearings per PUMP MAINTENANCE. |
| | Loose plunger bushing screw. | Tighten plunger screw per PUMP SPECIFICATIONS. |
| Oil leaking at the rear portion of the pump | Damaged or improperly installed oil gauge window gasket or rear cover. | Replace gasket or o-ring. |
| | Oil gauge loosed. | Tighten oil gauge. |
| | Rear cover screws loose. | Tighten rear screws to torque values in PUMP SPECIFICATIONS. |
| | Pump overfilled with oil, displaced through crankcase breather hole in oil cap/dipstick. | Drain oil. Refill to recommended oil level as stated in OIL LEVEL in PUMP MAINTENANCE. |
| Water in crankcase | May be caused by humid air condensing into water inside. | Maintain or step up lubrication schedule. |
| | Worn or damaged plunger screw o-ring. | Remove and replace. See PLUNGER SERVICE in PUMP MAINTENANCE. |
| Worn bearing | Excessive belt tension. | See BELT TENSION in MACHINE MAINTENANCE. |
| | Oil contamination. | Check oil type and change intervals per PUMP SPECIFICATIONS. |
| Short bearing life | Excessive belt tension. | See BELT TENSION in MACHINE MAINTENANCE. |
| | Misalignment between pump and motor. | Re-align pump and motor. |
| | Oil has not been changed on regular basis. | Check oil type and change intervals per PUMP SPECIFICATIONS. |
| Short seal life | Damaged plunger bushing. | Replace plunger bushing. |
| | Worn connecting rod. | Replace connecting rod. |
| | Excess pressure beyond the pump’s maximum rating. | Match pressure stated in PUMP SPECIFICATIONS. |
| | High water temperature. | Lower water temperature stated in PUMP SPECIFICATIONS. |

| | | |
|---|---|---|
| Dirty or worn check valves | Normal wear. | Remove and replace. |
| | Debris. | Check for lack of water inlet screens. |
| Presence of metal particles during oil change | Failure of internal component. | Remove and disassemble to find probable cause. |
| | New pump. | New pumps have machine fillings and debris and should be drained and refilled per PUMP SPECIFICATIONS. |
| Water leakage from under head | Worn packing. | Install new packing. |
| | Cracked/scored plunger. | Remove and replace plunger. |
| | Failure of plunger retainer o-ring. | Remove and replace plunger retainer o-ring. |
| Loud knocking noise in pump | Pulley loose on crankshaft. | Check key and tighten set screw. |
| | Defective bearing. | Remove and replace bearing. |
| | Worn connecting rod, crankshaft, or crosshead. | Remove and replace. |
| Frequent or premature failure of the packing | Scored, damaged, or worn plunger. | Remove and replace plungers. |
| | Overpressure to inlet manifold. | Reduce inlet pressure. |
| | Abrasive material in the fluid being pumped. | Install proper filtration on pump inlet pumping. |
| | Excessive pressure and/or temperature of fluid being pumped. | Check pressures and fluid inlet temperature. Be sure they are within specified range. |
| | Over pressure of pumps. | Reduce pressure. |
| | Running pump dry. | Do not run pump without water. |
| Low Pressure | Dirty or worn check valves. | Clean/replace check valves. |
| | Worn packing. | Remove and replace packing. |
| | Belt slipping. | See BELT TENSION in MACHINE MAINTENANCE. |
| | Improperly sized spray tip or nozzle. | See MACHINE SPECIFICATIOSN for specified spray tip or nozzle. |
| | Inlet filter screen is clogged. | Clean inlet filter screen. |
| | Pitted valves. | See VALVE SERVICE in PUMP MAINTENANCE. |
| Erratic pressure; pump runs rough | Dirty or worn check valves. | Clean/replace check valves. |
| | Foreign particles in valve assemblies. | |
| | High inlet water temperature. | See temperature in PUMP SPECIFICATIONS. |

| | | |
|---|---|---|
| Excessive vibration | Dirty or worn check valves | See “Dirty or worn check valves.” |
| Scored plungers | Abrasive material in fluid being pumped. | Install proper filtration on pump inlet plumbing. |
| Fitted plungers | Cavitation. | Decrease inlet water temperature and/or increase inlet water pressure. |
| Cavitation | High inlet fluid temperature, low inlet pressure. | Lower inlet fluid temperature and raise inlet fluid pressure. |

## Burner

| Trouble | Possible Cause | Remedy |
|---|---|---|
| Burner will not ignite | Electrodes out of alignment. | See “ADJUSTING ELECTRODE ASSEMBLY” in BURNER MAINTENANCE SECTION. |
| | Electrode insulator failure. | Remove and replace if there are breaks, cracks, or spark trails. |
| | Water flow switch not closing. | Adjust, repair, or replace switch. |
| | Vacuum switch not closing. | Adjust, repair, or replace switch. |
| | Temperature control switch not closing. | Adjust or replace the TEMPERATURE CONTROL. |
| | Fuel solenoid valve not opening. | Clean, repair, or replace solenoid. |
| | Weak transformer. | Clean and check transformer terminals. Check transformer for spark pre “TRANSFORMER TEST” in BURNER MAINTENANCE SECTION. |
| | Faulty cad cell (if equipped). | Clean and test cad cell, replace if required. |
| | Faulty primary control (if equipped). | Replace primary control. |
| | Burner motor thermal protector locked out. | See “Burner motor thermal protector locked out.” |
| | Wiring. | All wire contacts are to be clean and tight. Wire should not be cracked or frayed. |
| | Burner switch. | Test switch operation. Remove and replace as necessary. |
| | Pump pressure. | See “Low fuel pressure.” |
| | Venting. | A downdraft will cause delayed ignition. Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required. |
| | Sooting. | Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required. |
| | No fuel. | See “No fuel.” |

| | | |
|---|---|---|
| No fuel | Clogged fuel filter. | Remove and replace filter per FUEL FILTER SECTION. |
| | Fuel leak. | Repair as necessary. |
| | Kinked or collapsed fuel line. | Remove and replace fuel line. |
| | Low fuel pressure. | See “Low fuel pressure.” |
| | Faulty burner oil pump. | Adjust pressure or replace. |
| | Air leak in intake lines. | Tighten all fittings. |
| | Clogged burner nozzle. | Remove and replace (do not clean). |
| Low fuel pressure | Clogged fuel filter. | See “No Fuel.” |
| | Clogged fuel pump filter screen. | Remove pump cover and clean strainer using a brush and clean fuel oil, diesel oil or kerosene. |
| | Fuel oil too viscous. | Operate a lighter oil or in warmer area. |
| | Air leaks in intake lines. | Tighten all fittings. |
| | Kinked or collapsed fuel line. | Remove and replace. |
| | Burner shaft coupling slipping. | Remove and replace. |
| | Fuel nozzle worn. | Remove and replace with specified nozzle on BURNER ASSEMBLY. |
| | Faulty oil pump. | Remove and replace. |
| Pulsating pressure | Partially clogged fuel pump strainer or filter. | Remove and replace strainer per FUEL PUMP FILTER in OIL BURNER MAINTENANCE section. |
| | Air leaking around fuel pump cover. | Check fuel pump cover screws for tightness and damaged gasket. |
| Unit smokes | Improper fuel. | Refuel with FUEL specified on MACHINE SPECIFICATIONS. |
| | Air to burner insufficient. | See AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section. |
| | Fuel nozzle interior loose. | Replace nozzle. |
| | Water in fuel | Inspect fuel filter for water presence. |
| | Gun out of alignment. | Bend oil pipe to center burner nozzle. |
| Burner motor thermal protector kicked out | Low voltage. | Voltage must match those specified in the BURNER section of MACHINE SPECIFICATIONS section. |
| | Fuel too viscous. | See “Low fuel pressure.” |
| | Fuel pump defective. | Check that fuel pump turns freely. |
| | Motor defective. | Call service technician or take motor to repair/ warranty station. |

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| Delayed ignition (rumbling, noise starts) | Dirty or damaged electrodes. | Clean or replace. |
| | Air adjustment open too far. | Readjust per AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section. |
| | Poor fuel spray pattern. | Remove and replace with fuel nozzle specified in BURNER ASSEMBLY. |
| | Incorrect electrode setting. | Readjust per ADJUSTING ELECTRODE ASSEMBLY in OIL BURNER MAINTENANCE section. |
| | Weak transformer. | See TRANSFORMER CHECK on OIL BURNER MAINTENANCE section. |
| Burner does not electrically come on | Burner motor reset button tripped. | Reset if necessary. CAUTION: Do not keep hitting the "reset" button if you have oil pressure you are just filling the burner combustion chamber with oil and if ignited will cause an explosion. |
| | High limit temp control reset tripped if so equipped. | Reset if necessary. |

## Water Heater

| *Trouble* | *Possible Cause* | *Remedy* |
|---|---|---|
| Machine will not rise to operating temperature | Low fuel pressure. | See BURNER on MODEL SPECIFICATIOSN for specified pressure. |
| | Water in fuel piping. | Drain fuel tank and remove and replace filter per FUEL FILTER INSERT. |
| | Fuel filter clogged. | Remove and replace fuel filter element per FUEL FILTER INSERT. |
| | Poor combustion. | See "Poor combustion." |
| | Improper fuel supply. | Use fuel specified in BURNER section of the MODEL SPECIFICATIONS. |
| | Temperature control inoperative (if equipped). | See TEMPERATURE CONTROL INSERT. |
| Machine overheats | Insufficient water. | See "Low operating pressure" on MACHINE TROUBLESHOOTING insert. |
| | Temperature control inoperative. | See TEMPERATURE CONTROL INSERT. |
| | Improper fuel supply. | Use fuel specified in BURNER section of the MODEL SPECIFICATIONS. |
| Dry steam (very little moisture, very hot steam) | Insufficient water. | See "Low operating pressure" on MACHINE TROUBLESHOOTING insert. |
| | Improper fuel supply. | Use fuel specified in BURNER section of the MACHINE SPECIFICATIONS. |
| | Improper fuel pressure. | See BURNER on MODEL SPECIFICATIONS for specified pressure. |

## Water Heater

| | | |
|---|---|---|
| Machine smokes (sweet smelling exhaust) | Improper fuel supply. | Use fuel specified in BURNER section of MODEL SPECIFICATIONS. |
| | Insufficient combustion air. | See AIR BAND ADJUSTMENT on OIL BURNER MAINTENANCE insert. |
| | Leaking fuel system. | Correct leakage problem. |
| | Clogged or improper burner nozzle. | Remove (DO NOT CLEAN) and replace nozzle per BURNER ASSEMBLY INSERT. |
| | Loose burner nozzle. | See BURNER MAINTENANCE insert. |
| Machine fumes (exhaust burns eyes) | Too much combustion air. | See BURNER TROUBLESHOOTING insert. |
| | Improper fuel pressure. | See FUEL on MODEL SPECIFICATIONS for specified pressure. |
| Excessive oil dripping from laydown coil condensate. | Loose nozzle. | See BURNER TROUBLESHOOTING insert. |
| | Fuel pressure too high. | See FUEL PRESSURE ADJUSTMENT section on BURNER MAINTENANCE insert. |
| | Burner nozzle defective. | Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert. |
| | Incorrect burner nozzle. | Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert. |
| Poor combustion | Low fuel pressure. | See “Low fuel pressure” on BURNER TROUBLESHOOTING insert. |
| | Improper fuel supply. | See “Low fuel pressure” on BURNER TROUBLESHOOTING insert. |
| | Insufficient combustion air. | See AIR BAND ADJUSTMENT section on OIL BURNER MAINTENANCE. |

# Warranty Policy

Machines are guaranteed to be free from defects in material or workmanship under normal use and service for period of one year after delivery from the factory. Any part (other than vendor items) that is determined to be warranty will be repaired or replaced at **NO CHARGE** provided the warranty registration form is filled out in its entirety and the part is sent back freight prepaid. Any replacement parts accepted as warranty will be returned to you freight prepaid.

Our heating coil will carry a seven-year prorated warranty credit. The manufacturer will repair or replace the coil without charge for five years after delivery date from the factory for any defect in the coil that was caused by workmanship or defective steel. After the five years have expired, the credit will be prorated as follows:

| | |
|---|---|
| First 5 years | 100% Credit |
| Years 6 & 7 | 50% Credit |
| After 7 Years | No Credit Allowed |

All parts supplied to us by other manufacturers will be subject to their guarantee and warranty. Generators, motors, and engines are required by vendors to be repaired or replaced by authorized warranty repair stations. The manufacturer will assist you in locating warranty stations around the country in cases where that is necessary. Select items carry a six-month warranty such as unloaders, triggers guns, etc.

The manufacturer, at its option, will repair or replace defective parts only, and does not allow for field labor charges for removal, installation, analysis, travel expense, or special freight expenses incurred for replacement parts.

Warranty does not apply to normal wear and tear including, but not limited to, freezing damage, freight damage, damage caused by misuse or misapplication, chemical related failures, contaminated filters and screens, moisture related fuel pump failures, stuck check valves, pump packings or seals, nozzles or orifices, paint, hoses, and gauges.

# Evaporative Emission Control Warranty Statement

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The EPA and California Air Resources Board and Alkota Cleaning Systems is pleased to explain the evaporative emission control system's warranty on your 2017 small off-road engine equipment. New equipment that use small off-engines must be designed, built, and equipped to meet the stringent anti-smog standards. Alkota Cleaning Systems must warrant the evaporative emission control system on your small off-road engine for the period listed below provided there has been no abuse, neglect or improper maintenance of your equipment.

Your evaporative emission control system may include parts such as: fuel tanks, fuel lines, fuel caps, valves, canisters, filters, vapor hoses, clamps, connectors, and other associated components**.**

MANUFACTURER'S WARRANTY COVERAGE:

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by Alkota Cleaning Systems.

OWNER'S WARRANTY RESPONSIBILITIES:

- As the small off-road engine equipment owner, you are responsible for performance of the required maintenance listed in your owner's manual. Alkota Cleaning Systems recommends that you retain all receipts covering warranty issues on your Evaporative system (tank, fuel cap-fuel line and canister) but Alkota Cleaning Systems cannot deny warranty solely for the lack of receipts.
- As the small off-road engine equipment owner, you should however be aware that Alkota Cleaning Systems may deny you warranty coverage if your fuel tank and related evaporative components have failed due to abuse, neglect, or improper maintenance or unapproved modifications.
- You are responsible for presenting your Evaporative components to an Alkota Cleaning Systems service center as soon as the problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact: Kenny Barnes(1-605-934-2222,Ext 1440)

GENERAL EVAPORATIVE EMISSIONS WARRANTY COVERAGE

The evaporative emissions warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser. Alkota Cleaning Systems warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board; and free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to the part as described in the manufacturer's application.

THE WARRANTY ON EVAPORATIVE EMISSIONS RELATED PARTS IS AS FOLLOWS:

(1) Any warranted part that is not scheduled for replacement as required maintenance is warranted for the warranty period stated above. If any such part fails during the period of warranty coverage, the part will be repaired or replaced by Alkota Cleaning Systems at no charge to the owner. Any such part repaired or replaced under the warranty will be warranted for the remaining warranty period.

(2) Any warranted part that is scheduled only for regular inspection is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.

(3) Any warranted part that is scheduled for replacement as required maintenance is warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced by (the manufacturer) at no charge to the owner. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

(4) Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim. The manufacturer will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

a) **Evaporative Emission Warranty Parts List**:
**Fuel tank**
**Fuel cap**
**Carbon canister**
**Fuel line**

Alkota Cleaning Systems, Inc.
105 Broad Street
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phone: 1-800-255-6823
fax: 1-800-325-5682
email: info@alkota.com
web: www.alkota.com

Check us out on Facebook for updates and info

**For full warranty information, contact your delivering distributor or contact the manufacturer at info@warrantysvc.com**