

Please read and save this Repair Parts Manual. Read this manual and the General Operating Instructions carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. The Safety Instructions are contained in the General Operating Instructions. Failure to comply with the safety instructions accompanying this product could result in personal injury and/or property damage! Retain instructions for future reference. AMT reserves the right to discontinue any model or change specifications at any time without incurring any obligation.  
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Periodic maintenance and inspection is required on all pumps to ensure proper operation. Unit must be clear of debris and sediment. Inspect for leaks and loose bolts. Failure to do so voids warranty.

# IPT Series 2G4X & 2G5X Pumps



Refer to pump manual 1808-633-00 for General Operating and Safety Instructions.

## DESCRIPTION

IPT engine driven pumps are commercial duty, centrifugal, self-priming (to 20 ft. vertical lift after initially filling casing with liquid), portable units. Pumps are equipped with industry standard mechanical shaft seals. Iron suction and discharge manifolds are standard NPT threads for connection to swivel hose fitting with gasket using pipe nipple provided or standard NPT pipe fittings. Discharge manifold can be rotated 180° (in 90° increments); left side discharge, front discharge or right side discharge. Pump components will handle liquids with a temperature range of 40° to 200°F (4° to 93° C). Pump only nonflammable liquids compatible with pump component materials. Standard pumps are close coupled to internal combustion engines manufactured by Honda, Briggs & Stratton & Hatz, AMT specification engines and others. All engines meet current EPA emissions requirements. Pumps (70cc and larger) are preempted from emissions regulation in California. Bearing housing/pedestal drive pumps are also available for direct or drive belt connection.

## SPECIFICATIONS

Standard units are constructed of cast iron casing, volute, and suction and discharge manifolds. Standard seals are EPDM/EPR with carbon-ceramic wear faces.

## UNPACKING

1. Remove pump from packaging materials.
2. Package should include: pump/engine mounted in roll frame, strainer, nipple pack, general/safety manual, specification/parts manual and engine manual. Pump kits: pump end, general safety manual and specification/parts manual.
3. Make sure all components are accounted for before discarding packaging material.
4. Inspect all components for damage.
5. No assembly is required for standard engine driven pumps. Pump kits must be constructed on appropriate engine.

## PREPARING UNIT FOR OPERATION

### Placing Pump

1. Always place the pump as close to the liquid source as possible. Priming efficiency and pump output will be reduced if a long (>20 ft.) suction line is used. Keep all lines as short and straight as possible. Avoid any sharp bends. Suction line cannot have loops or high spots, hose must have a gradual slope up to pump.
2. Pump/engine must be located on a solid level surface.

### Connecting Hose or Piping

**IMPORTANT:** Pipe Dope/Thread Sealant must be used on all suction and discharge connections.

1. (2) Male NPT Pipe Nipples are included for use with specific hose connections.

2. All suction hose/piping connection must be air tight. Pump will not prime if there are any air leaks in the suction line or connections.
3. Use only non-collapsible hose or pipe on the suction. If collapsible hose is used on the discharge, the end of discharge line is submerged in liquid or a check valve is placed in the discharge line, a means of venting air out of the pump during the priming cycle must be employed.
4. Always use a suction strainer to keep large debris out of the pump. Position strainer well below liquid surface and on a bed of rocks or other suitable surface. If possible tie strainer up so it is suspended off pit bottom. As a last resort, tie the strainer in a large submerged bucket if bottom of water source is too soft or muddy.

### Before Starting Engine

1. Fill engine crankcase with oil. Follow engine manufacturer recommendations for service classification and viscosity of oil as detailed in engine manual.
2. Fill fuel tank with clean, fresh fuel. Follow engine manufacturer's guidelines as listed in engine manual.
3. Always fill pump with liquid through the priming port located on top of the discharge manifold or pump casing before starting engine. Remember the pump is self-priming only when the pump is filled with liquid.

### Operation

1. Make certain pump is filled with liquid before starting engine. Failure to do so will result in damage to the mechanical shaft seal. Never run pump dry.

### **▲ WARNING**

**DO NOT USE PUMP IN EXPLOSIVE ATMOSPHERE. DO NOT PUMP VOLATILE OR FLAMMABLE LIQUIDS.**

2. Follow engine manufacturer's starting procedure. Run engine at full speed during priming. After pump has primed, speed may be reduced to regulate pump output.

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- Pump will self-prime to a vertical height of 10' in less than one minute, 20' may take up to 4 minutes. If pump doesn't prime: check for air leaks, move pump closer to liquid, shorten suction line, remove loops and high spots from suction line, refill pump with liquid or see troubleshooting guide in this manual.
- Always allow engine to cool before refueling.

## After Pump is Shut Down

- Always flush the pump out at the end of operation if the liquid being pumped may leave a solid or sticky residue inside of pump or if a buildup of sediment inside the pump is expected.
- Always drain pump completely of liquid if there is a chance of freezing.

## Storing Pump

- When pump is out of service for an extended period of time, completely drain liquid from casing and store pump in a dry, protected, well-ventilated area.
- Add fuel stabilizer to engine fuel tank or drain fuel from tank. Turn fuel tank valve to the off position.

## COMPLETE PUMP ASSEMBLY PROCEDURE

*Reference Repair/Replacement Part Exploded View and Lists*

**NOTE:** Do not use petroleum based lubricants with EPDM / EPR rubber seal parts and o-rings. Petroleum based products will damage EPDM/EPR components.

**NOTE:** Apply a small amount of anti-seize lubricant to bore, threaded or keyed, in impeller. If petroleum based anti-seize lubricant is used, do not allow it to contact EPDM/EPR components.

## Install Seal Stationary Half

- Lay seal plate (Ref. No. 4) on a solid surface, engine mount down. Apply silicone sealant (Loctite® RTV or similar) to outside metal case of shaft seal stationary half (Ref. No. 5). Position in cast bore of the bracket with polished seal ring up. Install by pressing on metal housing of the seal with a piece of plastic pipe or similar stock until metal case lip seats against seal plate. Do not press on lapped seal surface to install.

## Install Bracket

- Lay engine (Ref. No. 1) down on recoil starter with PTO shaft up vertical. Clean PTO shaft and mounting surface.
- Position bracket on engine. Fit locating diameter on back of bracket into PTO bearing bore in engine crankcase cover. Make sure bracket sits flat on engine crankcase cover. Rotate until bracket feet align with engine block mounting base.
- Install four screws (Ref. No. 3) through bracket into engine crankcase cover. Torque screws to 140 in-lb.
- Install seal plate into bracket, orient cast arrow on back of seal plate upward.

## Install Semi-Open Impeller -3/4" Keyed Pump Kits

- Temporarily install impeller (Ref. No. 8) on PTO shaft. End of PTO shaft must contact bottom of shaft bore in impeller hub. If impeller rear shroud contacts seal plate before end of PTO shaft contacts bottom of shaft bore in impeller, install shims (Ref. No. 7) in bore until impeller clears seal plate.
- Measure normal distance from impeller vane front face to seal plate volute mount face with a micrometer or similar accurate measuring instrument.
- Lay volute (Ref. No. 12) on its nose exposing seal plate mounting surface. Measure normal distance from volute mounting surface to impeller wear face.
- Adjust amount of impeller shims until assembled clearance between impeller face and seal plate volute mount face is 0.01" to 0.03". Remove impeller from shaft.
- Insert shaft key (Ref. No. 6) into impeller keyway.
- Install shaft seal rotating half (Ref. No. 5) into bore in impeller hub. Lubricate rubber cup of the seal with soapy water. Position in impeller hub bore with polished face out. Protect polished face of the seal from damage with a piece of cardboard or cloth. Press seal into bore until it bottoms.
- Install O-ring (Ref. No. 10) into bore in front of impeller nose. Slide impeller screw (Ref. No. 9) into center hole through impeller. If required install shims used to set impeller clearance inside impeller bore, position on exposed screw end.
- Align key with PTO shaft keyway. Slide impeller onto PTO shaft. Fix on shaft with screw. Torque screw to 140 in-lb.

## Install Volute

- Slide volute over impeller until volute contacts seal plate. Rotate volute until suction nose is on top.
- Install two screws (Ref. No. 13) tight with screw driver.

## Install Casing

- Install volute gasket (Ref. No. 14) on volute nose.
- Install #263 O-ring (Ref. No. 11) on volute body.
- Install casing (Ref. No. 15) on volute. Slide on until casing bottoms against seal plate. Rotate casing until casing bolt ears align with ears in bracket.
- Install four screws (Ref. No. 17) and nuts (Ref. No. 18). Tighten screws to 100 in-lbs.

## Install Ports and Plugs

- Install an o-ring (Ref. No. 21) on plug (Ref. No. 22). Thread plug into fill port on discharge manifold (Ref. No. 20). Install casing drain plug (Ref. No. 16) and casing fill plug (Ref. No. 16) using pipe sealant/Teflon tape.
- Align gasket (Ref. No. 19) onto discharge flange of casing. Install discharge manifold onto casing with four screws (Ref. No. 23). Torque screws to 100 in-lbs., alternate tightening screws in a cross pattern to eliminate crushing the gasket.
- Align check valve assembly (Ref. No. 24) onto suction flange of casing. Flapper hinge of check valve must be positioned up towards the discharge flange.

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4. Install suction flange (Ref. No. 25) onto casing with four screws (Ref. No. 23). Torque screws to 100 in-lbs., alternate tightening screws in a cross pattern to eliminate crushing check valve.
5. Check for proper check valve operation.

## REPAIR AND MAINTENANCE INSTRUCTIONS

### **Shaft Seal Replacement**

1. Loosen four screws (Ref. No. 17) until screw disengages nut (Ref. No. 18) in bracket.
2. Remove casing assembly from bracket.
3. Remove screws (Ref. No. 13) holding volute (Ref. No. 12) to seal plate (Ref. No. 4).
4. Remove volute.
5. Remove impeller (Ref. No. 8). Keyed shaft impellers; remove impeller screw (Ref. No. 9), inspect o-ring (Ref. No. 10) replace, if required.
6. Pry worn rotating half of shaft seal (Ref. No. 5) from impeller hub. Discard seal.
7. Remove seal plate from bracket.
8. Press stationary half of shaft seal (Ref. No. 5) from seal plate. Discard seal.
9. Replace any o-rings (Ref. Nos. 10 & 11) that show signs of wear or damage.
10. Rebuild pump with new shaft seal. Follow Pump End Assembly Instructions.

### **Cleaning Pump**

1. Loosen four screws (Ref. No. 17) until screw disengages nut (Ref. No. 18) in bracket.
2. Remove casing assembly from bracket.
3. Remove screws (Ref. No.13) holding volute (Ref. No. 12) to seal plate.
4. Remove volute.
5. Clean debris and sediment from inside of casing, volute and impeller. Clean all volute passages and impeller vanes. Make sure closed impeller vane passages are clean by running a wire from impeller outside diameter to impeller eye. Remove any foreign objects clogging passages.
6. Check all parts for excessive wear or damage. Replace parts as required.
7. Reassemble pump.

### **Periodic Maintenance**

1. Clean outside of pump and engine to remove accumulated dirt, oil and grime.
2. Maintain engine according to engine manufacturer's recommendations.
3. It is recommended that a replacement shaft seal and seal kit be kept on hand at all times.
4. Check for leaks during pump operation. Leaks may occur at shaft seal, casing to bracket connection, suction and discharge manifold connections and through pump casing and bracket. Investigate and repair any leaks immediately.

**NOTE:** Engine failure due to water intrusion into crankcase caused by a leaking seal will not be covered by engine or pump warranty.

5. Mechanical shaft seals are a wear item and require periodic replacement. Seal life is dependent on many factors including: liquid pumped, sediment type, operating point and suction conditions.
6. Inspect for loose fasteners. Tighten any loose fasteners immediately.

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Problem	Possible Cause(s)	Corrective Action
Pump fails to prime	1 Pump not filled with liquid.	1 Add liquid to pump through priming port.
	2 Air leak at suction line connection.	2 Add sealant to connection.
	3 Worn suction connection gasket.	3 Replace suction gasket.
	4 Leaking suction line.	4 Inspect, repair, or replace suction line.
	5 Engine speed too low.	5 Run engine at maximum speed.
	6 Worn or broken volute or impeller.	6 Replace parts as required.
	7 Leaking/worn mechanical shaft seal.	7 Replace mechanical shaft seal.
	8 Clogged suction strainer/line.	8 Clean strainer and suction line.
	9 Suction lift too great (25 ft. max).	9 Reduce lift.
	10 Suction line too long.	10 Reduce length to under 30 feet.
	11 Pump is air locked.	11 Vent pump discharge through priming port.
<p>Priming remedies that will NOT work:</p> <p style="padding-left: 40px;">Holding suction line out of liquid source and forcing liquid into end while pump is running.</p> <p style="padding-left: 40px;">Pinching off the discharge line to “build up pressure”.</p> <p style="padding-left: 40px;">Holding hand against end of suction line or pump suction port to “feel” for suction.</p> <p>Follow above priming troubleshooting guide.</p> <p>If pump still will not prime after all corrective action is exhausted, check pump priming capacity by:</p> <ol style="list-style-type: none"> <li>1. Install a vacuum gauge on capped suction port. Gauge to suction port connection must be 100% air tight.</li> <li>2. Fill pump casing completely with water.</li> <li>3. Run pump at full speed, some water will be thrown out of discharge.</li> <li>4. Vacuum gauge should register 18-22 inches of mercury within a minute or so. <ol style="list-style-type: none"> <li>a. If vacuum registers below 18 in of hg check gauge to pump connection for air leaks, inspect/replace volute, impeller and shaft seal as required.</li> <li>b. If vacuum gauge value is within range pump is working correctly. The problem is not the pump.</li> </ol> </li> </ol>		
Reduced capacity or discharge pressure	1. Clogged strainer or lines.	1. Clean strainer, suction and discharge lines.
	2. High friction loss in line.	2. Remove kinks and elbows, reduce length.
	3. Discharge head too high.	3. Lower end of discharge line, remove nozzles.
	4. Engine speed too low.	4. Increase engine speed.
	5. Drop in engine output.	5. Repair engine.
	6. Clogged impeller.	6. Remove clog.
	7. Worn/damaged impeller or volute.	7. Replace parts as required.
Pump will not work/engine will not turn over	1. Clogged pump.	1. Remove clog between impeller and volute.
	2. Pump parts rusted together.	2. Disassemble pump, free parts.
	3. Damaged impeller or volute.	3. Replace volute or impeller.
	4. Engine seized.	4. Remove pump from engine, check engine itself.
Pump will not work/engine runs	1. Impeller stripped/key sheared.	1. Disassemble pump, replace parts/engine.
	2. Pump impeller/volute clogged.	2. Clean pump.
	3. Will not prime.	3. See Priming Troubleshooting section.
	4. Insufficient liquid supply.	4. Increase liquid supply.

# IPT Series 2G4X & 2G5X Pumps

**For Repair Parts contact dealer where pump was purchased.**

Please provide following information:

-Model Number

-Serial Number (if any)

Part description and number as shown in parts list

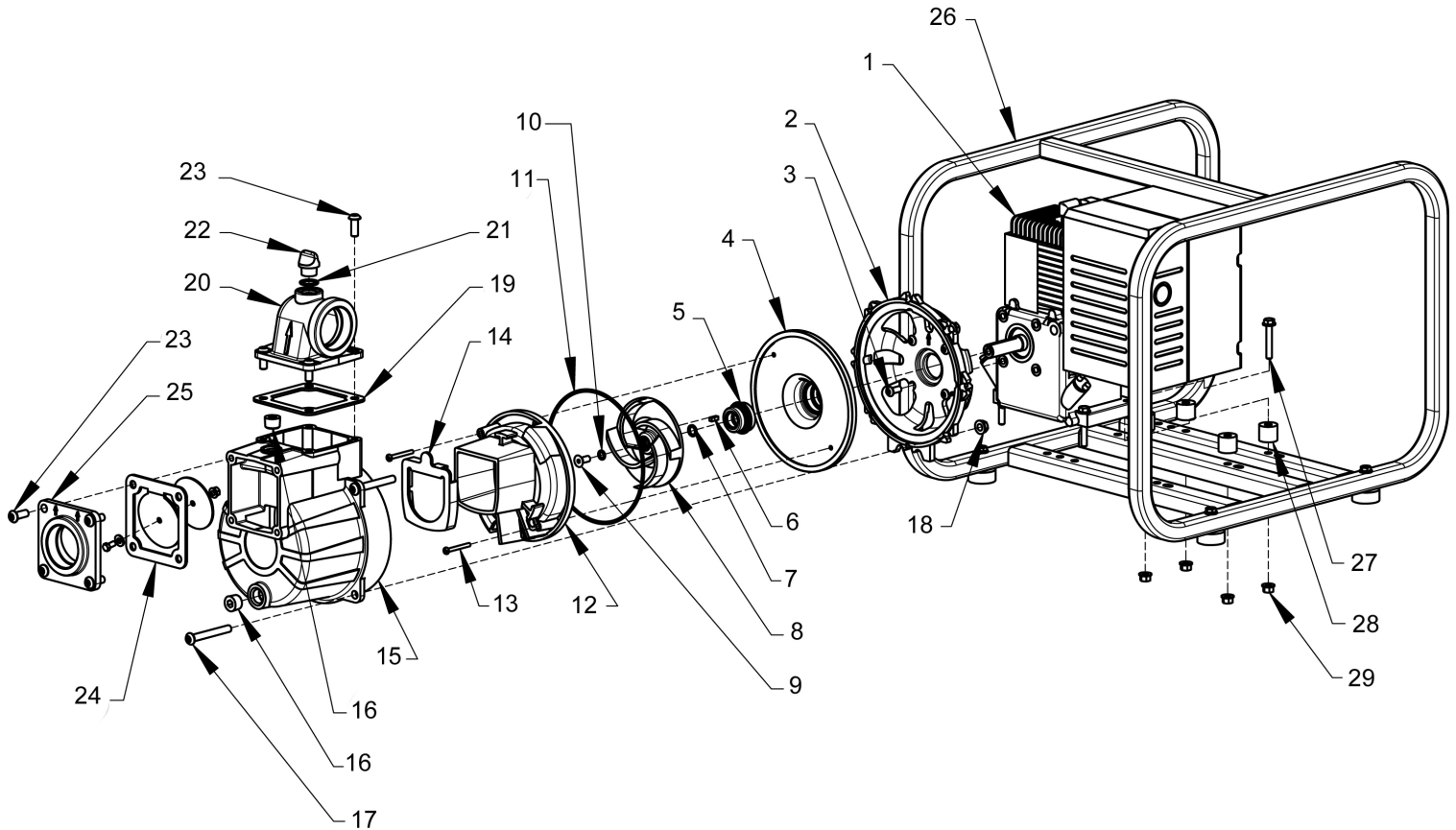


Figure 1 - Repair Parts Illustrations



## Repair Parts List

Ref. No.	Description	Part Number for Models:			Qty.
		2G4XACR	2G5XZCR	2G5XQCR	
1	Engine	1630-009-00	DISCONTINUED	1639-040-00	1
2	Bracket/Adapter Kit (includes Ref. Nos. 2 and 3)	2G4X-030-95	2G4X-030-95	2G4X-030-95	1
3	5/16-24 x 3/4" Hex Flange Screw	Incl. w/Ref 2	Incl. w/Ref 2	Incl. w/Ref 2	4
4	Seal Plate	2G4X-020-95	2G4X-020-95	2G4X-020-95	1
5	Shaft Seal Assembly	1640-162-93	1640-162-93	1640-162-93	1
6	Shaft Key	Incl. w/Ref 8	Incl. w/Ref 8	Incl. w/Ref 8	1
7	Impeller Shim Kit	22-253-1	22-253-1	22-253-1	1
8	Impeller Kit (includes Ref. Nos. 6, 7, 8 and 9)	2G4X-010-95	2G5X-011-95	2G5X-011-95	1
9	5/16-24 x 3/4" Flat Head Socket Screw	Incl. w/Ref 8	Incl. w/Ref 8	Incl. w/Ref 8	1
10	#109 O-Ring	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
11	#263 O-Ring	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
12	Volute Kit (includes Ref. Nos. 12 and 13)	2G4X-150-95	2G5X-150-95	2G5X-150-95	1
13	10-24 x 2" SS HD Screw	Incl. w/Ref 12	Incl. w/Ref 12	Incl. w/Ref 12	2
14	Volute Gasket	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
15	Casing Kit (includes Ref. Nos. 15, 16, 17 and 18)	2G4X-001-95	2G4X-001-95	2G4X-001-95	1
16	1/2" Pipe Plug	*	*	*	2
17	3/8-16 x 3" Button Head Screw	Incl. w/Ref 15	Incl. w/Ref 15	Incl. w/Ref 15	4
18	3/8-16 Flange Hex Nut	Incl. w/Ref 15	Incl. w/Ref 15	Incl. w/Ref 15	4
19	Discharge Gasket	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
20	Discharge Manifold Kit (includes Ref. Nos. 20 and 23)	2G4X-080-95	2G4X-080-95	2G4X-080-95	1
21	#117 O-Ring	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
22	1/2" NPT Fill Plug	Incl. w/Ref KIT	Incl. w/Ref KIT	Incl. w/Ref KIT	1
23	3/8-16 x 1" Button Head Screw	Incl. w/Ref 20 & 25	Incl. w/Ref 20 & 25	Incl. w/Ref 20 & 25	8
24	Flapper Valve Assembly	2GXE-070-90	2GXE-070-90	2GXE-070-90	1
25	Suction Flange Kit (includes Ref. Nos. 23 and 25)	2G4X-050-95	2G4X-050-95	2G4X-050-95	1
26	Frame Kit	2760-104-K0	3120-105-K0	2760-104-K0	1
27	5/16-18 x 2" Hex Head Cap Screw	Incl. w/Ref 30	Incl. w/Ref 30	Incl. w/Ref 30	4
28	Spacer	Incl. w/Ref 30	Incl. w/Ref 30	Incl. w/Ref 30	2
29	5/16-18 Hex Flange Nut	Incl. w/Ref 30	N/A	Incl. w/Ref 30	4
30	Frame Hardware Kit	C403-420-91	C400-100-92	C403-420-91	1
KIT	EPDM O-Ring/Gasket/Shaft Seal Kit (includes Ref. Nos. 5, 10, 11, 14, 19 21 and 22)	2GXE-301-90	2GXE-301-90	2GXE-301-90	1
N/S	Strainer (not shown)	C230-170-00	C230-170-00	C230-170-00	1
N/S	2" NPT Pipe Nipple (not shown)	C366-90	C366-90	C366-90	1

(\*) Standard Hardware Item, Available Locally