POW-R-QUIK
ENGINE STARTING SYSTEMS

PRQ 22p

AIR/GAS TURBINE STARTER

Pre-Engaged Drive

USER MANUAL

Product Webpage:
https://powrquik.com/turbine-starters/prq-22-series/

User Manual:
https://powrquik.com/wp-content/uploads/2024/08/PRQ-22p-User-Manual.pdf

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1.1. Purpose

This manual contains installation and service instructions for the POW-R-QUIK model 22p Series turbine air starter (pre-engaged type).

1.2. Application

These engine starting systems are primarily utilized in petroleum drilling and production, gas compression, water well drilling, marine, construction, power generation and co-generation equipment. When in doubt regarding the proper starting system for a particular application, the detailed installation instructions should be reviewed or a POW-R-QUIK starting system specialist should be consulted. The starting system is designed to work with compressed air, natural gas or nitrogen (for other gaseous fluids, please contact factory)
The PRQ 22p turbine air starters do not require any lubrication in the air/gas supply.

1.3. Parts and Service

For guaranteed reliability use only original Pow-R-Quik parts and repair kits. The parts are available at our distributors and re-sellers.
Starting system components are available as components or complete system from Pow-R-Quik / Maradyne or its distributors and re-sellers.
Our distributors are equipped to service our air starters
Contact factory for identifying distributors and re-sellers in your area.

1.4. Air/Gas Starting System / Typical Installation

The POW-R-QUIK Model PRQ 22p pre-engaged drive air and gas starting system consists of three basic components: starter, operating valves, air filtration and air/gas supply.

Repair technicians or service organizations without turbine starter experience should not attempt to repair this starter until they receive factory approved training from POW-R-QUIK, or its representatives. Proper operation and service of your POW-R-QUIK turbine will assure continuous reliability and best performance for many years.

Refer to the part number / nameplate on your turbine starter when ordering replacement parts or speaking to a POW-R-QUIK representative concerning your starter.

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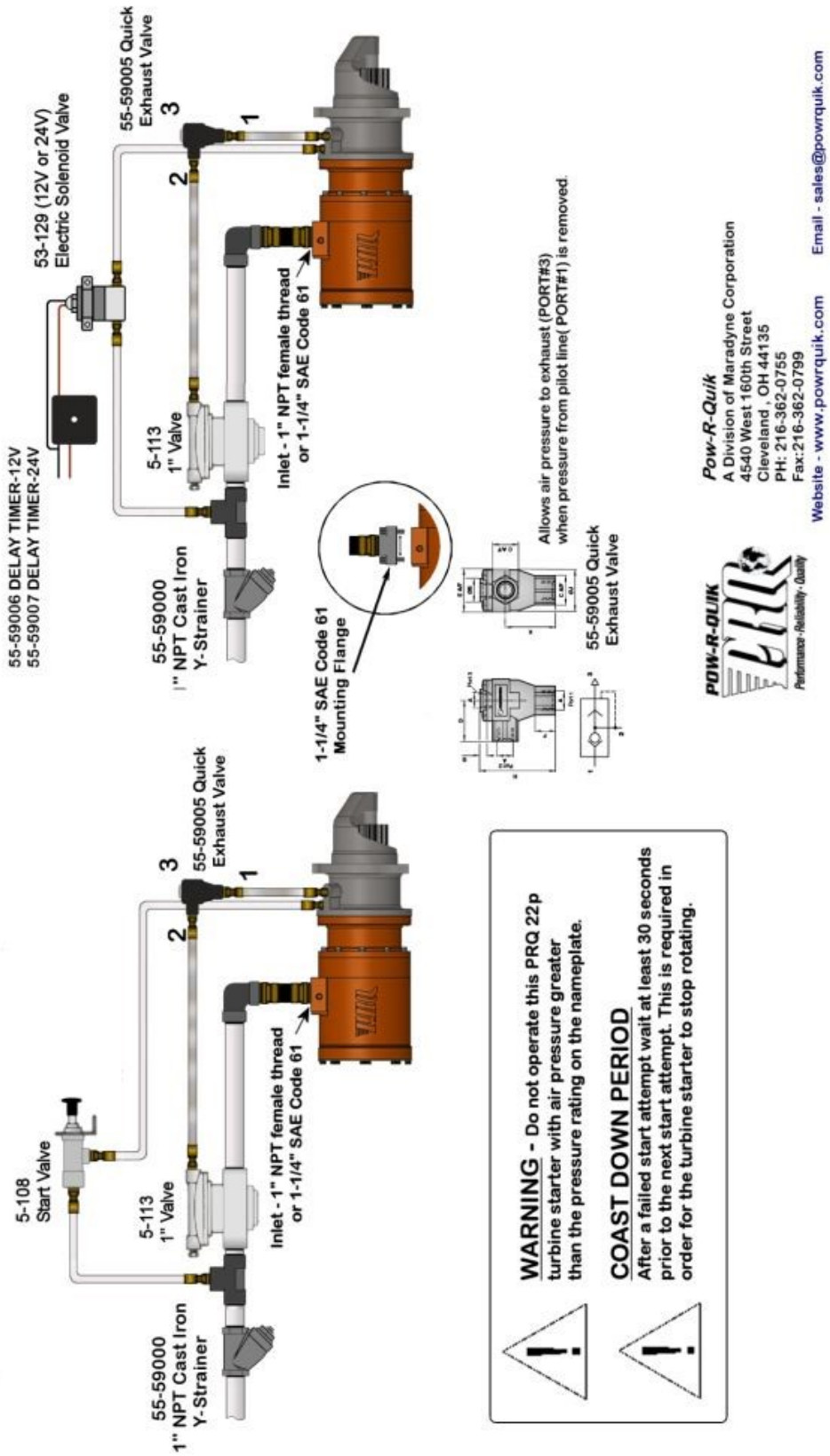
TYPICAL AIR INSTALLATIONS



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2.1 Starter.

The PRQ 22p turbine air starter with pre-engaged drive may be operated using compressed air, natural gas or nitrogen (for other gaseous fluids, please contact factory).
Controlling the air turbine starter can be done locally or remotely, using manual activation (hand valve, push button) or electric solenoid.
The starter is designed for use on compressed ignited (diesel) engines with displacements up 22L and spark ignited (gas) engines with displacements up to 44L (the engine displacements are to be used as for guidelines only) - **For proper sizing of the starter to the engine, the engine breakaway torque and the parasitic loads are required for a given starting temperature.**
If unsure how to choose the starter for the engine, contact factory or a distributor

2.2 See Annex 1 for starter dimensions and air ports.

2.3 See Annex 2 for air Flow and technical performance.

3.1 General.

Field repairs on air turbine starters shall be avoided. All repairs shall be done in a shop environment with access to an arbor press. Experienced mechanics will have no difficulty performing these repairs on the PRQ 22p air starter. For guaranteed quality and reliability, use only genuine Pow- R-Quik parts and repair kits.

3.2 Periodic Maintenance Inspections.

The following inspections should be performed monthly or during all regular engine servicing or inspections

1. Inspect all threaded connections for tightness.
2. If an air filter with a manual drain is used, check for moisture accumulation and drain if necessary. Check the filter element and clean or replace as required. If the Y strainer is used, it should be drained regularly removing the collected water and debris.

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3.3 Starter Installation:

1. Position properly the starter drive housing in the engine flywheel housing pad
2. Align the bolt holes in the mounting flange of the flywheel housing with the proper bolts. Torque properly the mounting bolts per engine manual
3. Install the air hose on the inlet adaptor, maintaining the same size (or larger) as the starter port
4. Install the control line air hoses to the control ports of the starter as per typical air installations found on pg. 4 of this manual.
5. Install exhaust piping or muffler (if applicable 2" or larger). If extended lengths exhaust piping is used, please consult with the factory

3.4 Starter Removal

1. Remove the air hose from the starter's inlet adapter, control ports and, if applicable, remove any exhaust piping or muffler.
2. Loosen, but do not remove the starter mounting bolts.
3. Support the starter with one hand and remove the mounting bolts with the other. Proper support is required as the starter can be heavy.
4. Remove the starter from the engine

3.5 Starter Disassembly for Repair / Refresh Kit (*Refer to parts exploded view for parts/kits identification)*

<u>Starter Refresh Kit (55-70048)</u>

This kit contains all bolts, bearings and seals needed to refresh your PRQ turbine starter to maintain its best technical performance. It is also to be used in conjunction with kits 55-70039 (air motor major rebuild), 55-70041 (primary turbine wheel kit), 55-70042 (secondary turbine wheel kit) and 55-70040 (gear rebuild) should more extensive reconditioning be necessary. For any other parts needed see exploded view and table found in addendum below.

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3.5.1 Disassembly

General Guidelines

- Do not disassemble the starter any further than necessary to replace a worn or damaged part.
- Do not remove any part, which is a press fit in or on a subassembly unless the removal of that part is necessary for the replacement or repair.
- Always have a complete set of seals and O-rings on hand before starting any overhaul of the starter.
- Never reuse old seals or O-rings.
- In order to prevent surface damage or distortion when clamping turbine components in a vise it is important to always use some form of covering on the jaws of the vise, be it leather or copper covering.
- Do not remove any needle bearings from a press fit unless you have a new needle bearing on hand to replace it. Needle bearings are always damaged during the removal process.
- All greasing done is with EP-2 moly or equivalent grease.

1. Using some method mark the orientation of the drive housing (40), spool (6), nozzle (14), air motor housing (15) and any exhaust adapter that is being used to each other to allow them to be reassembled in the same configuration as they are removed.
2. Using a 9/32” Allen wrench remove the 10 screws (36) and internal tooth washers (49) retaining the drive housing (40) to the spool (6) and discard the screws and washers.
3. Remove the drive housing (40) from the spool (6).
4. Using a 1/8” Allen wrench remove and discard cylinder retaining screws (45) from drive housing (40) and remove cylinder (47), drive / piston assembly, and spring (48) from drive housing.
5. Remove and discard O-rings (16) and (17) from cylinder (47).
6. Remove and discard snap ring (44) and O-rings (17) from piston (46).
7. Press drive (31) from piston (46).
8. Press out and discard needle bearing (37) from the drive housing (40).
9. Using a 3/16” Allen wrench remove the ten screws (27) retaining the spool (6) to the nozzle (14) and discard seven of the screws. Keep three screws to be used in step 13.

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10. Grasp the arbor shaft (12) and remove spool assembly from nozzle (14), set assembly aside, remove and discard O-ring 39.
11. Using a 5/32”Allen wrench remove the exhaust screen (9) or adapter if so equipped by removing the eight 10-32 x .625” screws (34) and discard the screws.
12. Using a 5/32”Allen wrench remove the secondary turbine wheel retaining screw (23) and motor shaft washer (24). Discard the washer the screw will be used in the next step before discarding it.
13. Thread in the three screws removed in step 9 through the nozzle (14) a couple of threads. Now with the turbine supported on the three screws just installed, thread the screw (23) removed in step 12 into the motor shaft (1) a few threads. Press the motor shaft (1) out of the secondary turbine wheel (3), once clear remove the wheel and the turbine wheel key (30). Discard the key.

    If kit 55-70039 or 55-70042 are being installed discard the turbine wheel.
14. Continue to press the motor shaft (1) out of the rear motor bearing (21). This will force the nozzle (14) out of the air motor housing (15) to facilitate the further disassembly of the turbine air motor. Once the motor shaft is through the rear bearing the nozzle assembly will come free from the air motor housing. Remove the three screws (27) and discard them.
15. Remove the rear motor bearing (21) and bearing spring (25) from air motor housing (15) and discard bearing and spring.
16. Remove the short shaft spacer (8) from the motor shaft (1).

    If kit 55-70039 is being installed then discard spacer.
17. Remove the primary turbine wheel (2) and the wheel key (30) from the motor shaft (1). Discard the key.

    If kit 55-70039 or kit 55-70041 is being installed then discard turbine wheel.
18. Remove the long shaft spacer (7) from the motor shaft.

    If kit 55-70039 is being installed then discard spacer.
19. Press the motor shaft (1) out of front motor bearing (21).

    If kit 55-70039 or 55-70040 is being installed then discard shaft.
20. **If kit 55-70040** is being installed then remove annulus gear (4) and annulus gear retaining pin (29) from nozzle (14), discard annulus gear and pin otherwise go to step 22.

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21. If re-using nozzle (14) go to step 22. If replacing nozzle (14) remove annulus gear (4) and gear retaining pin (29) and discard nozzle with nozzle snap ring (26), O-ring (33) and motor shaft seal (19). **Note:** If replacing nozzle be sure to transfer alignment marks made in step 1 of disassembly procedure. To remove annulus gear, cut the nozzle annulus gear enclosure through to the gear to relieve the press fit condition, allowing for easy extraction.

22. Remove O-ring (33) and nozzle snap ring (26) from nozzle (14) and discard both.

23. Press out the motor bearing (21) and the motor shaft seal (19) from nozzle (14) and discard both.

24. Press the arbor shaft / planetary assembly from the spool assembly set aside earlier in step 11, discard the drive spacer (13).

25. Using a 5/64" Allen wrench remove the five bearing retention plate screws (43) and the bearing retention plate (42) from the spool (6) and discard the screws.

If installing kit 55-70040 then discard plate also.

26. Remove the spool bearing (38) and the arbor shaft seal (32) from the spool (6) and discard both.

27. Remove and discard the three snap rings (20) from the planetary gear shafts (11).

28. Remove the planetary gear idler shafts (11), glide washers (10) and planet gears (5) from the planet carrier (18). Discard the glide washers and snap rings.

If installing kit 55-70040 then discard the idler shafts and planetary gears also.

29. If re-using planetary gears (5) the press out the planetary gear needle bearings (22) from the gears and discard the bearings..

This completes the disassembly of the turbine starter.

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3.6 Starter Assembly (Refer to exploded view in Annex 3)

3.6.1 Re-assembly

1. **If installing Gear Rebuild kit 55-70040** then the annulus gear (4) must be installed into the nozzle (14) at this point as follows, otherwise proceed to step 6.
2. Using Air motor housing (15) as a base for support, insert nozzle (14) into it in preparation for installation of annulus gear (4).

   Note: Failure to use the air motor housing as a base for support of the nozzle for the installation of the annulus gear can result in damage to the nozzle.
3. Install annulus gear retention pin (29) into nozzle (14) half way.
4. Apply a light assembly grease to the outside of annulus gear (4). Position it atop the nozzle (14) while aligning the gear retention pin (29) with the gear cutout and press gear into nozzle.
5. Drive the gear retention pin (29) the rest of the way into the nozzle (14) flush with the annulus gear surface and below surface of nozzle (14).
   This completes the annulus gear (14) installation.
6. It is important to read through steps 7-11 below before beginning the rebuilding process, because the motor shaft seal has a time constraint on its installation time once remove from the shipping rod.
7. Gather the following parts for the first part of the turbine build-up: motor shaft (1), motor shaft seal (19), motor bearing (21), and nozzle snap ring (26).
8. Grease the motor shaft seal (19) lip and slide the seal onto tool F-550000 with the seal lip facing the tool, then press the motor shaft seal into the nozzle (14).

   Note: This tool is designed to insert this seal by pressing only on the outside casing to avoid distorting and damaging the seal. This seal shrinks to fit the shaft and so from the point the seal has been removed from the shipping rod the motor shaft must be pressed into place within 15 minutes.
9. Using the other end of the same tool F-550000 press the motor bearing (21) into the nozzle (14).

   Note: This tool is designed to apply the press forces to the outer race of the bearing to avoid damaging this bearing during this press operation. These motor bearings operate at very high speeds and applying stresses to these bearings improperly will shorten the life of the bearings.

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10. Install the nozzle snap ring (26).

11. Using tool F-550008 to support the motor bearing on the inner race from the motor side, press in the motor shaft (1) from the drive side of the nozzle (14) to its shoulder.

Note: This tool is designed to support the inner race of the bearing to avoid damaging this bearing during this press operation. These motor bearings operate at very high speeds and applying stresses to these bearings improperly will shorten the life of the bearings.

12. Slide the long spacer (5) (new if installing kit 55-70039) onto the motor shaft (1) (new if installing kit 55-70039 or 55-70040).

13. Install the primary turbine wheel key (30) onto the motor shaft (1).

14. Slide the primary turbine wheel (2) (new if installing kit 55-70039 or 55-70041) with the three machined holes near the hub of the wheel facing up (towards the exhaust end of the turbine) so as to be visible while installing the wheel for RH starters and down (towards the drive end of the turbine) for LH starters onto the primary turbine wheel key (30) and motor shaft (1). The primary turbine wheel can be distinguished from the secondary turbine wheel by the shape and number of the turbine vanes. There are 33 primary turbine wheel vanes compared to 37 secondary turbine wheel vanes and they are thicker.

Note: Failure to orient the turbine wheel properly will result in low performance of the turbine.

15. Lubricate and install the nozzle O-ring (33) onto nozzle (14).

16. Using alignment marks made in step 1 of disassembly process align nozzle (14) and install two of the ten ¼-28 x 2.5” screws (27) to facilitate final nozzle alignment to air motor housing (15) carefully press nozzle into air motor housing. Remove alignment screws.

17. Slide the short spacer (8) (new if installing kit 55-70039) onto the motor shaft (1).

18. Clean the inside bore of the bearing pocket on stator housing (15) using Loctite cleaner 7471. Allow to dry and apply Loctite 641 to the inner race in preparation for rear motor bearing (21) installation.

19. Install the bearing spring (25) into the bearing pocket with the tangs pointing upward or towards the exhaust of the turbine.

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20. Clean the outer race of motor bearing (21) using Loctite 7471, allow to dry. Using tool F-550006 placed under motor shaft (1) to prevent shaft movement during pressing operation, press the rear motor bearing onto the motor shaft and into bearing pocket in stator assembly (15) till bottoms out on short shaft spacer (8).

Note: The above tools are used to avoid damaging the motor bearings during this press operation it is important to press only on the inner race of the rear bearing while supporting the gear end of the motor shaft. Failure to prevent movement of the motor shaft can result in stress being transferred to the front motor bearing. These motor bearings operate at very high speeds and applying stresses to these bearings improperly will shorten the life of the bearings.

21. Install secondary turbine wheel key (30) onto the motor shaft (1).

22. Slide the secondary turbine wheel (3) (new if installing kit 55-70039 or 55-70042) with the three machined holes near the hub of the wheel facing up (towards the exhaust end of the turbine) so as to be visible while installing the wheel for RH starters and down (towards the drive end of the turbine) for LH starters onto the secondary turbine wheel key (30) and motor shaft (1).

Note: Failure to orient the turbine wheel properly will result in low performance of the turbine.

Note: If force is needed to install the wheel be sure that the motor shaft is supported with tool F-550006 to prevent stresses from being applied to the motor bearings. These motor bearings operate at very high speeds and applying stresses to these bearings improperly will shorten the life of the bearings.

23. Install motor washer (24) and motor shaft screw (23). While holding secondary turbine wheel (3) torque the screw to 83-89 in lbs.

24. Install exhaust screen (9) or exhaust adapter and its associated O-ring (not shown) if so equipped. Align alignment marks made earlier between the air motor housing (15) and exhaust adapter if equipped and secure using the required number of the eight 10-32 x .625” exhaust screen screws (34). Lightly snug all the screws before torqueing them to the final torque. Use a crisscross pattern to torque screws to final torque of 83 - 89 in. lbs.

This completes the motor assembly portion on the rebuilding process and this assembly can be set aside.

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The next steps involve the re-assembly of the drive end of the turbine starter.

25. If installing arbor shaft kit 55-70049 or 50 or if desiring to install new arbor shaft keys (35) keys in arbor shaft / planetary gear housing assembly then proceed as follows otherwise skip to step 29.

26. Press out arbor shaft (12) from planetary gear housing (18) and remove and discard arbor shaft keys (35).

27. Clean arbor shaft (12) and planetary gear housing (18) with Loctite cleaner 7471. Apply Loctite 641 to arbor shaft keys (35), arbor shaft and planetary gear housing.

28. While supporting planetary gear housing (18) with tool F-550002 and tool F-550006 to prevent collapse of gear housing press arbor shaft (12) with keys (35) into planetary gear housing up to shaft shoulder with tool F-550003.

Note: This is a very robust press operation and it is imperative the shaft remain straight while pressing into the gear housing. Check bottom of shaft in gear housing for any ruptures of the gear housing edges and remove any burrs from housing if present to prevent chips from entering gear set.

29. Install new planetary gear needle bearings (22) onto the planetary gears (5) using tool F-550007. Then grease needle bearings.

Note: Be sure to press from the lettered side of the bearing only. This side of the bearing is designed to support the pressing operation without distorting the bearing shell and causing damage to the bearing.

30. If installing kit 55-70040, install the three idler shaft spring pins (28) into the three planetary idler shafts (11) until they are fully seated.

31. Insert the planetary idler shaft (11) snap ring end first into the planet gear housing (18) from the arbor shaft end.

32. Grease both sides of a glide washer (10) and slide it onto the planetary idler shaft (11).

33. Slide a planetary gear (5) into place and push the planet shaft (11) into the gear.

34. Grease both sides of another glide washer (10) and slide it between planetary gear (5) and planetary gear housing (18) and onto planetary idler shaft (11).

35. Push the planetary idler shaft (11) the rest of the way through the glide washer (10) and planetary gear housing (18). Rotate the shaft until the spring pin (28) in the shaft drops into the groove on the planetary gear housing.

36. Install snap ring (20) onto the planetary idler shaft (11) to secure shaft.

37. Repeat steps 30 – 37 for the two remaining planetary gears.

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38. Using tool F-550004 install new drive seal (32) into the spool (6) with the seal lip pointing toward the planetary gear assembly side of the spool.

39. Lubricate the drive seal (23) lip with grease.

40. Clean both the drive bearing pocket of spool (6) and outer surface of new drive bearing (38) with Loctite 7471 and allow to dry.

41. Apply Loctite #641 to the outer surface of the spool bearing (38) and the bearing pocket in the spool (6) and using tool F-550004, press the drive bearing into the spool.

Note: This tool is designed to press on the outer drive bearing race to prevent damage to the bearing.

42. Install bearing retention plate (42) onto spool (6) and secure with five 6-32 FHCS screws (43). Torque to 21 – 25 in-lbs.

43. Clean the portion of the arbor shaft (12) that will be pressed into the spool bearing (38) with Loctite 7471 and allow to dry.

44. Apply Loctite 641 to the arbor shaft (12) and slide the spool assembly onto the arbor shaft. Using tool F-550003, F-550002 and F-550006 press the spool assembly until bearing is fully seated on the shaft.

Note: The tools used here are designed to direct the pressing force to the inner race of the drive bearing (18) to prevent damage to the bearing while keeping it centered on the shaft preventing damage to the drive seal (23) and supporting the planetary carrier assembly without putting pressure on the idler gear snap rings.

45. Clean the inner race of the drive spacer (13) with Loctite primer 7471 allow to dry.

46. Apply Loctite #641 to the inner bore of the drive spacer (13) and slide drive spacer onto the arbor shaft (12). Using tool F-550003, F-550002 and F-550006 press the drive spacer onto the arbor shaft until fully seated against the bearing inner race.

47. Grease the planet gears (5) by packing the gear teeth so as to fill them with grease. Gears should appear as solid cylinders when complete.

48. Install an O-ring (39) on the spool (6). Use a light coat of grease to hold them in place if needed.

49. Grease the annulus gear (41) and the motor shaft gear teeth (1) with grease by filling the teeth with grease.

50. Pack the motor shaft seal cavity located where the motor shaft comes through the nozzle (14) with grease.

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51. Line up the alignment marks on the spool and nozzle (14) made in step 1. Insert two 2.5"- ¼"-28 screws (27) 180˚ apart through the spool (6) and nozzle (14) and start them into the air motor housing (15) as guide pins. While slightly rotating back and forth the arbor shaft (12) to mesh the planetary gear assembly with the motor shaft (1). Continue this until the spool assembly is fully mated with the nozzle / motor assembly.

52. Install the remaining eight screws (27) and torque all to 113 -119 in. lbs.

Note: Use a crisscross pattern when tightening the screws and check to make sure the O-rings are not damaged during the process.

53. Press in a new needle bearing (37) into the drive housing (40) from the inside of the drive housing.

Note: Be sure to press the needle bearing from the numbered end of the bearing to prevent damage to the bearing.

54. Grease the needle bearing (37).

55. Inspect drive (31) replace if necessary.

56. Press drive (31) gear end first into piston (46) from the small diameter end.

57. Install snap ring (44) to secure drive (31).

58. Install two O-rings (17) onto piston (46).

59. Install one O-ring (17) to the outer groove on cylinder (47) and one O-ring (16) to the inner groove.

60. Install spring (48), drive / cylinder assembly and piston assembly into drive housing (40) and secure with two 10-24 x ½" FHCS screws (45), torque to 55-60 in-lbs.

61. Grease the arbor shaft (12) and slide drive housing assembly onto arbor shaft, line up the alignment marks made in step 1 of the disassembly procedure and secure with ten 10-32 x 1.0" screws (36) and internal tooth washers (49), torque to 65-70 in lbs.

This completes the reassembly of the PRQ turbine.

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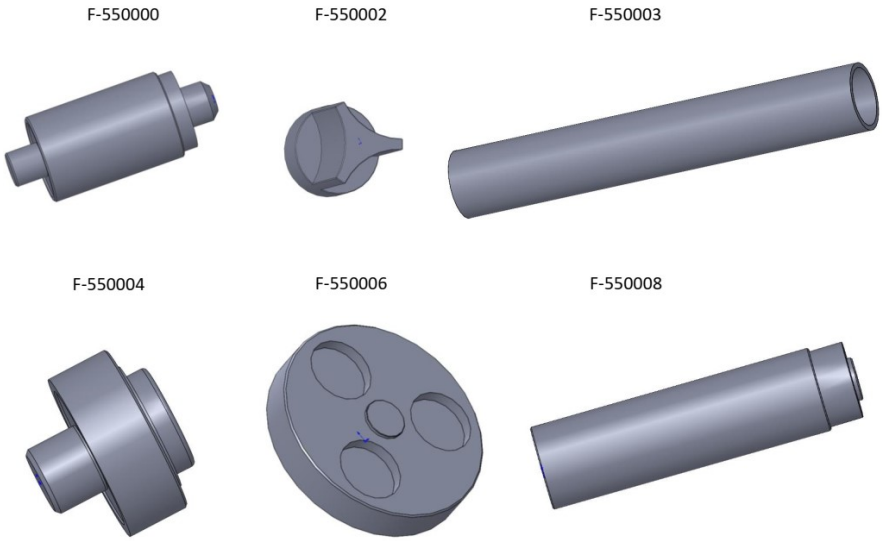
Special Tools



4.1. Warranty.

Pow-R-Quik provides a limited warranty on the products it manufactures and sells under the company name against the failure to perform properly within certain limits of time, application, performance, installation, abuse, and alteration because of a defect in material and/or workmanship.

Pow-R-Quik's standard product Warranty is available on the company's website (https://powrquik.com/pow-r-quik warranty/) and on request.

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Email: sales@powrquik.com

Website: https://powrquik.com/

Always check our website for the latest info:

Product Webpage:
https://powrquik.com/turbine-starters/prq-22-series/

User Manual:
https://powrquik.com/wp-content/uploads/2024/08/PRQ-22p-User-Manual.pdf

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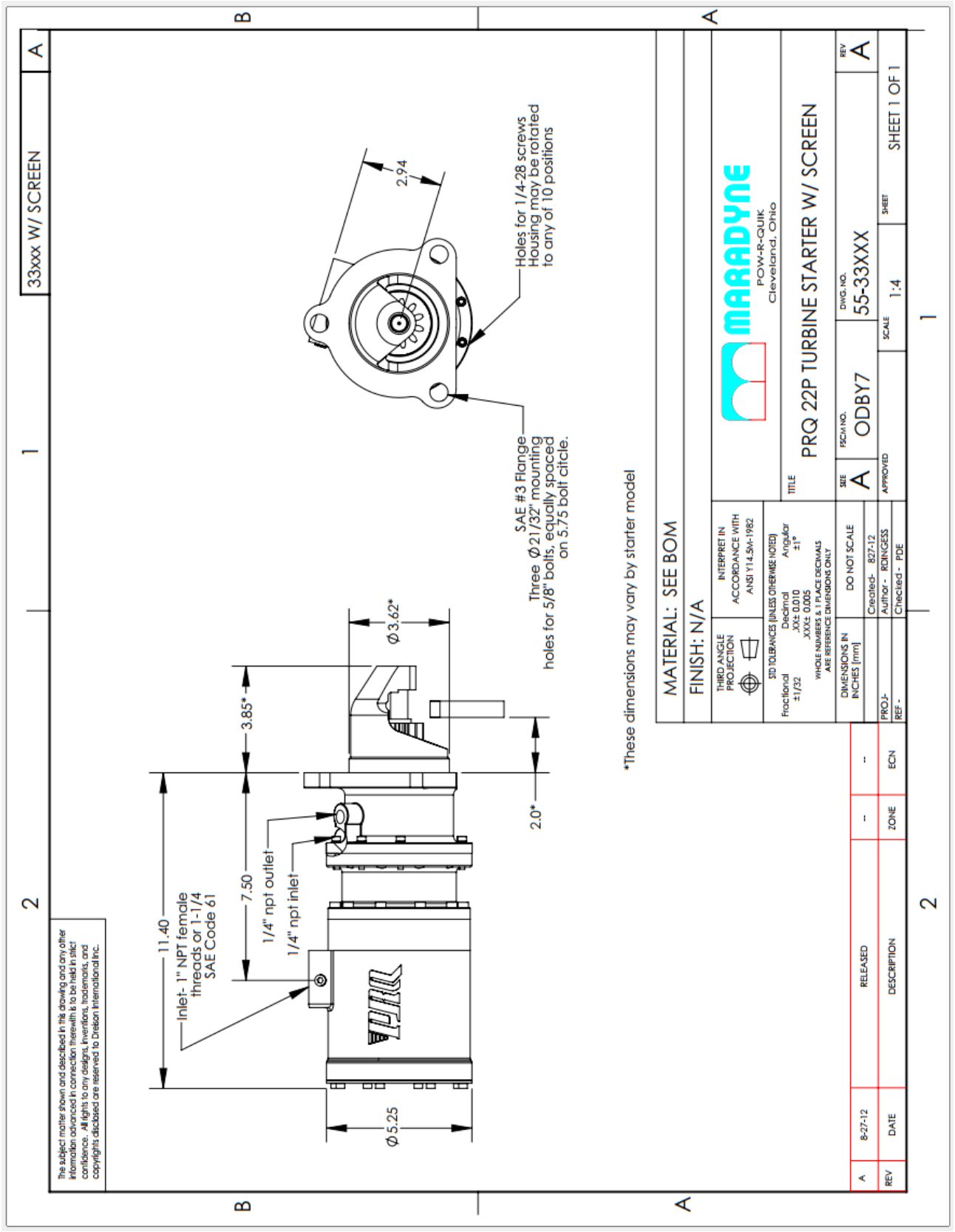
ANNEX 1 (1 of 2) - PRQ 22p, Dimensional Drawing with Screen Exhaust



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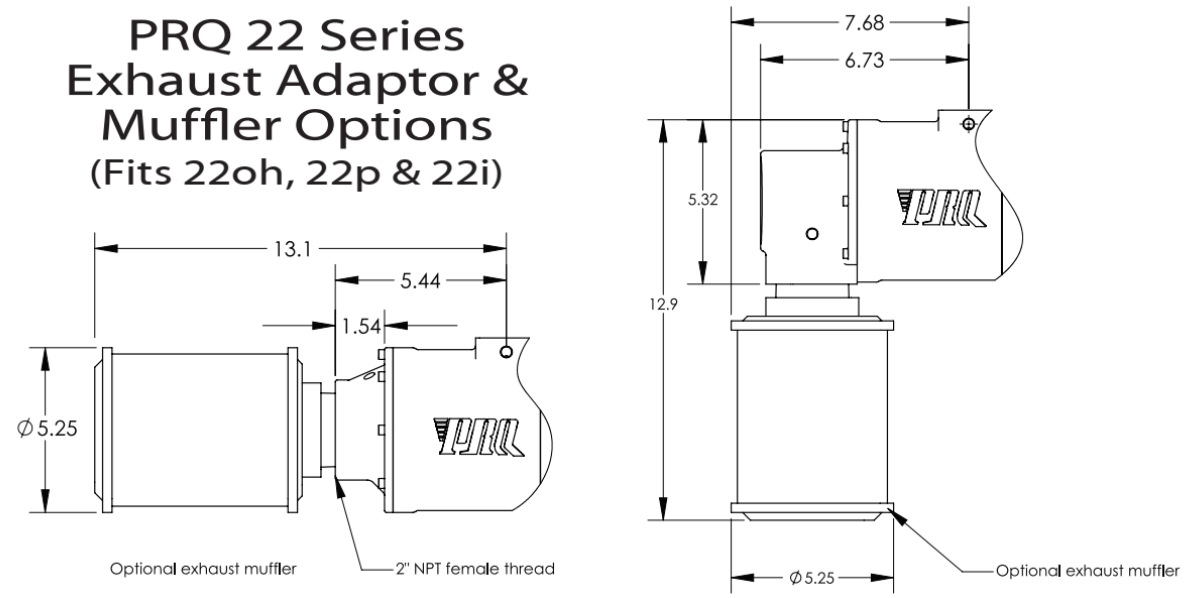
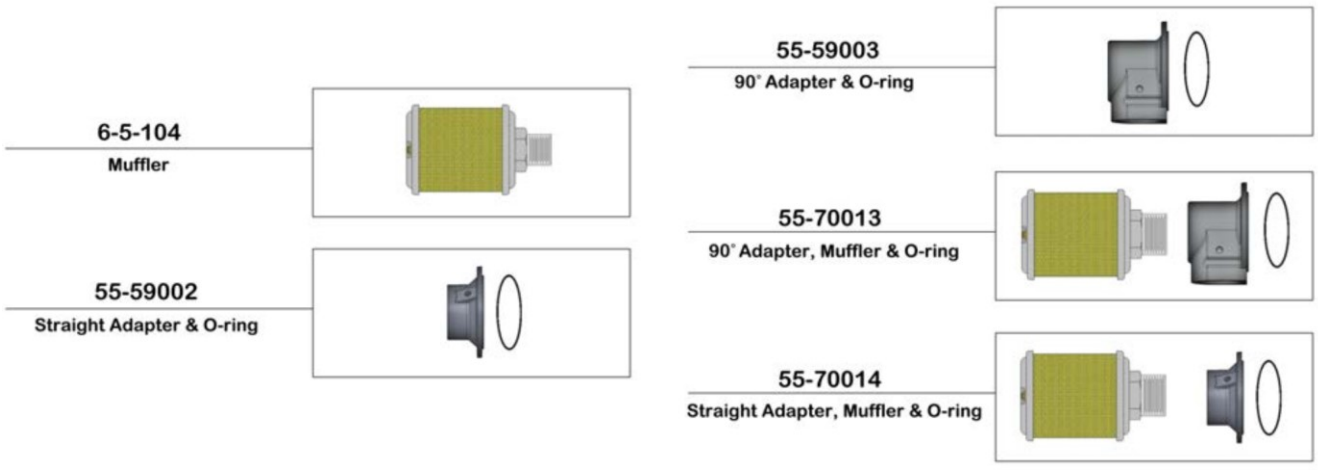
ANNEX 1 (2 of 2) - PRQ 22i Dimensional Drawing, Exhaust Adapters and Muffler





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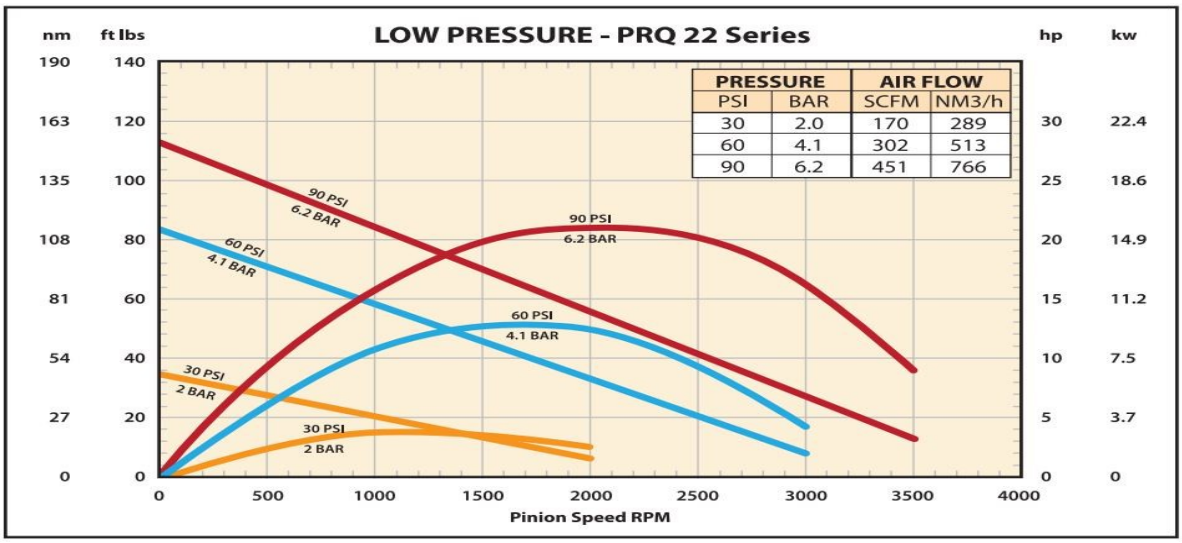
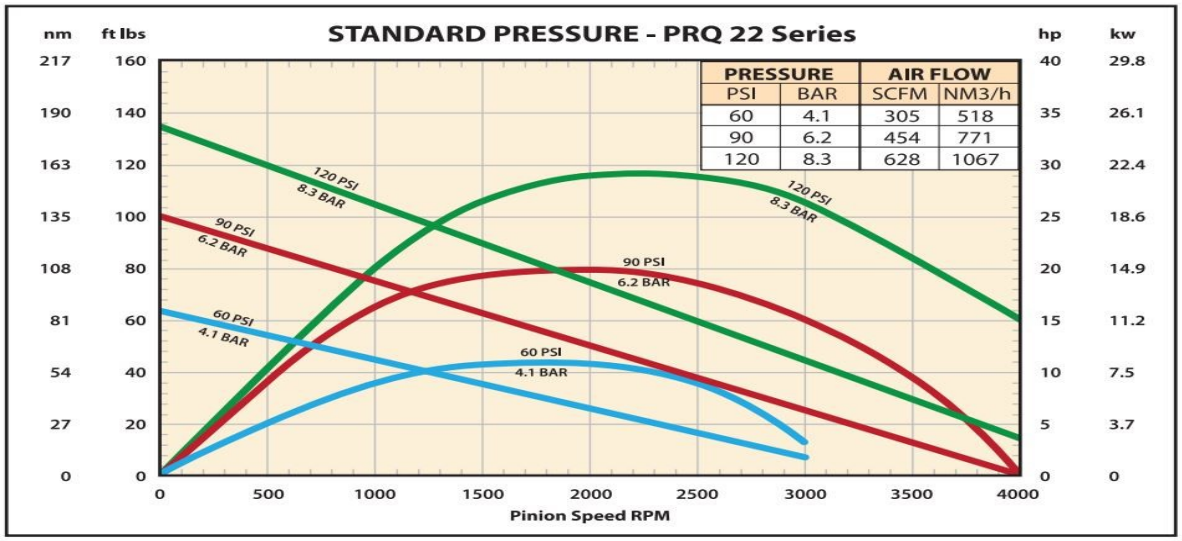
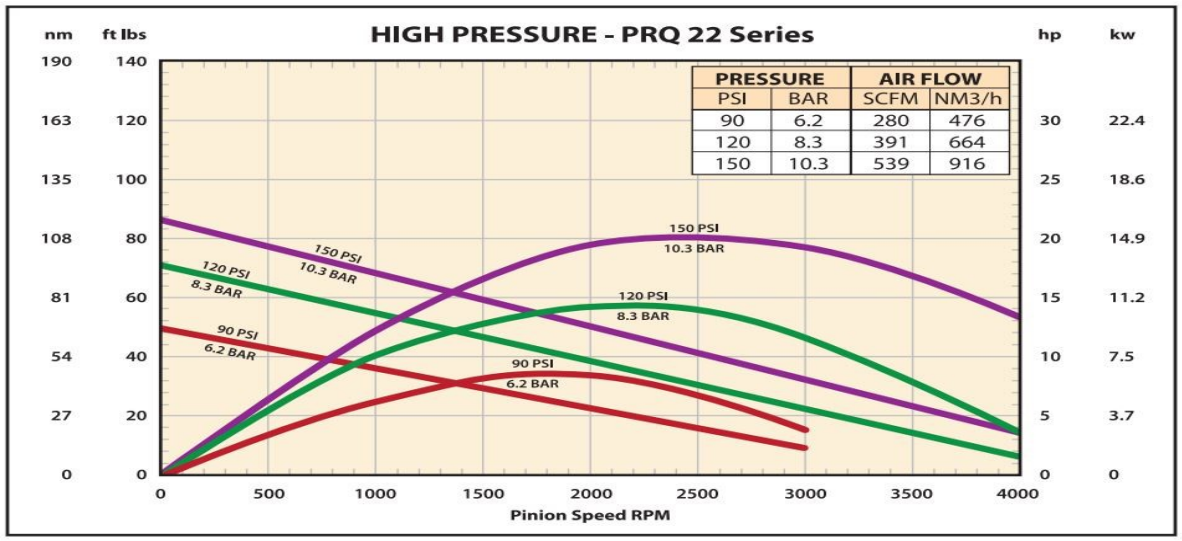
ANNEX 2 - PRQ22p, Air Flow and Technical Performance Curves







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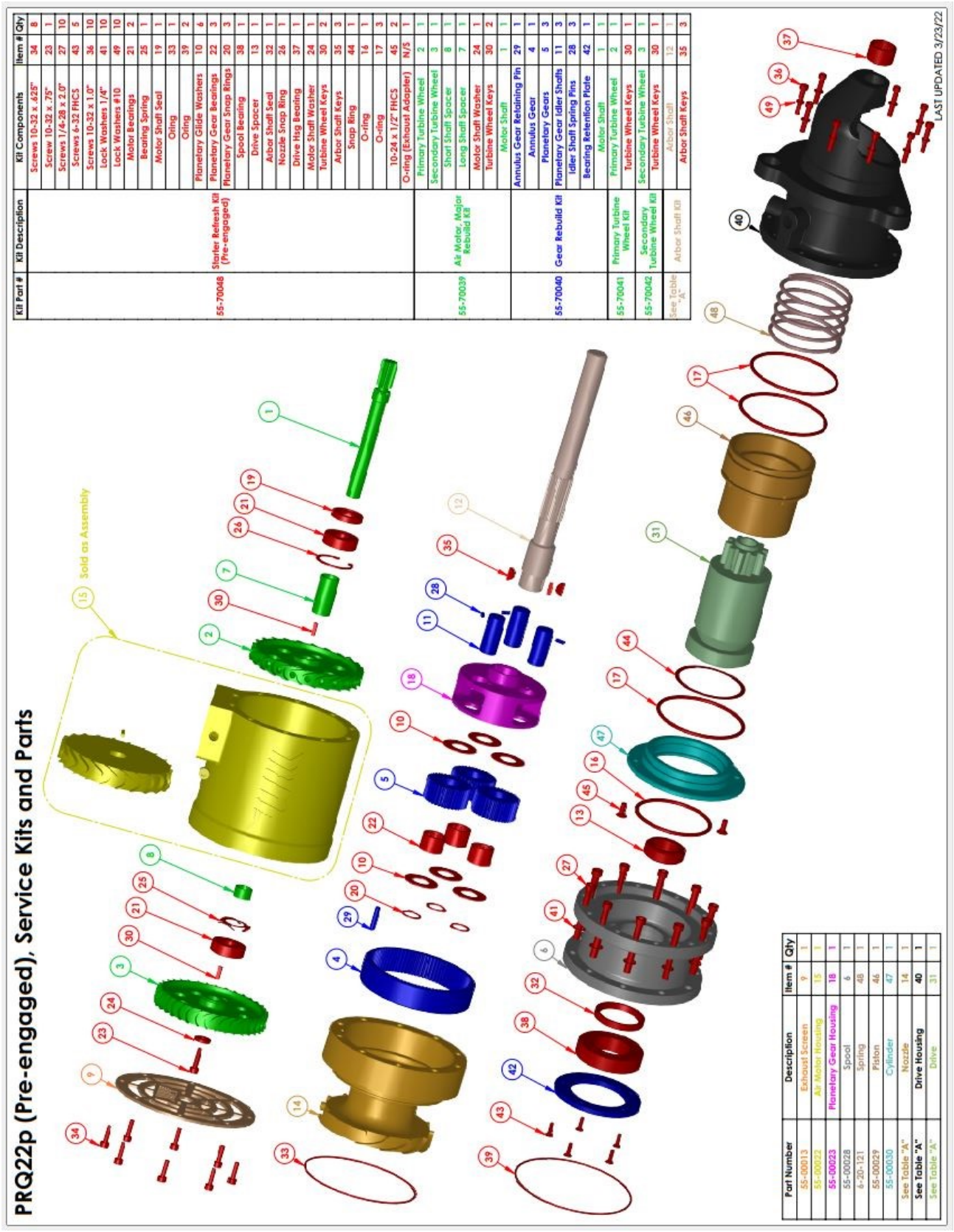
ANNEX 3 – Parts Exploded View (Sheet 1 of 2)

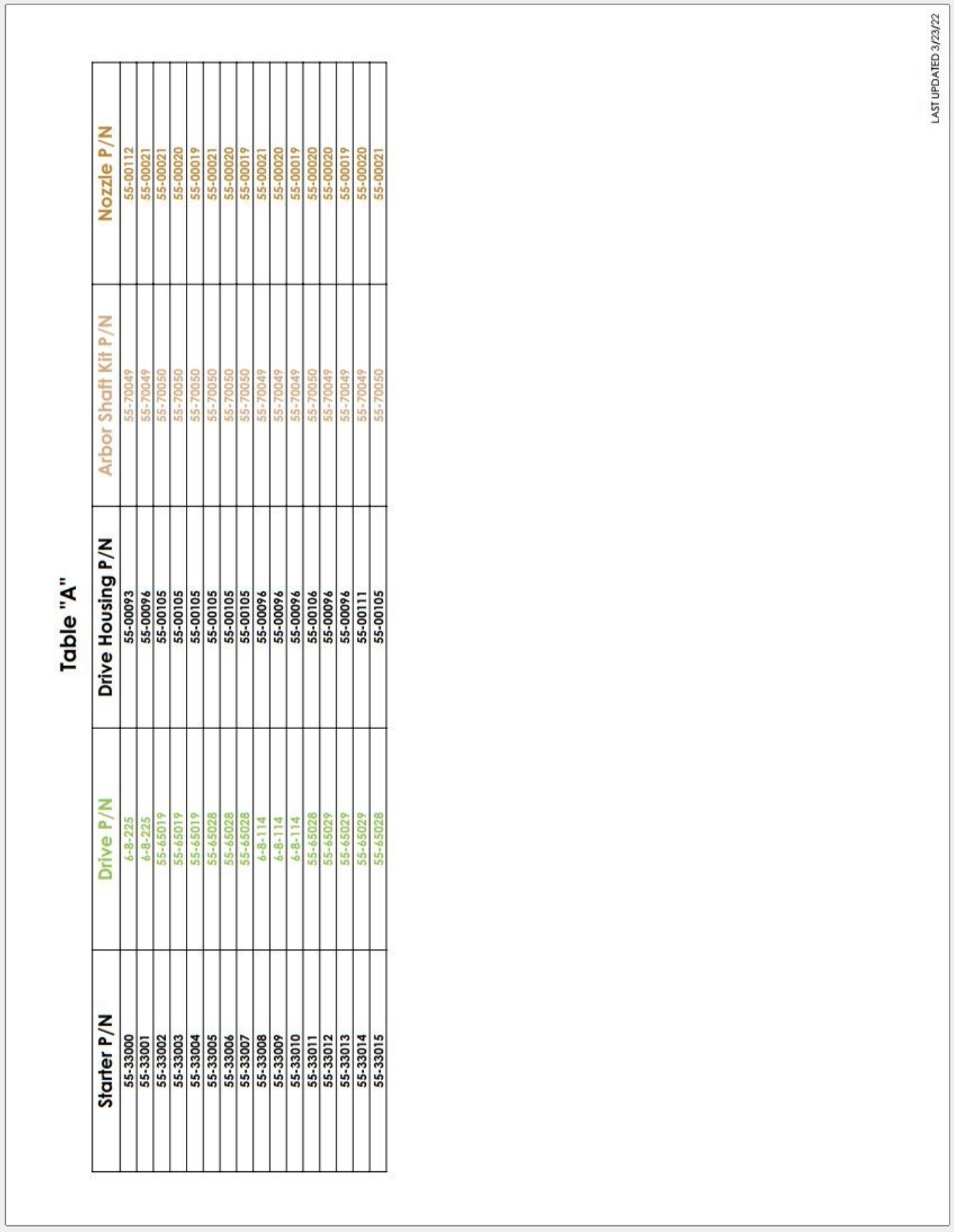


Kit Part #	Kit Description	Kit Components	Item #	Qty
55-70048	Starter Refresh Kit (Pre-engaged)	Screws 10-32 x .625"	34	8
		Screw 10-32 x .75"	23	1
		Screws 1/4-28 x 2.0"	27	10
		Screws 6-32 FHCS	43	5
		Screws 10-32 x 1.0"	36	10
		Lock Washers 1/4"	41	10
		Lock Washers #10	49	10
		Motor Bearings	21	2
		Bearing Spring	25	1
		Motor Shaft Seal	19	1
		Oring	33	1
		Oring	39	2
		Planetary Glide Washers	10	6
		Planetary Gear Bearings	22	3
		Planetary Gear Snap Rings	20	3
		Spool Bearing	38	1
		Drive Spacer	13	1
		Arbor Shaft Seal	32	1
		Nozzle Snap Ring	24	1
		Drive Hsg Bearing	37	1
		Motor Shaft Washer	24	1
		Turbine Wheel Keys	30	2
		Arbor Shaft Keys	35	3
		Snap Ring	44	1
		O-ring	16	1
		O-ring	17	3
		10-24 x 1/2" FHCS	45	2
		O-ring (Exhaust Adapter)	N/S	1
55-70039	Air Motor, Major Rebuild Kit	Primary Turbine Wheel	2	1
		Secondary Turbine Wheel	3	1
		Short Shaft Spacer	8	1
		Long Shaft Spacer	7	1
		Motor Shaft Washer	24	1
		Turbine Wheel Keys	30	2
		Motor Shaft	1	1
55-70040	Gear Rebuild Kit	Annulus Gear Retaining Pin	29	1
		Annulus Gear	4	1
		Planetary Gears	5	3
		Planetary Gear Idler Shafts	11	3
		Idler Shaft Spring Pins	28	3
		Bearing Retention Plate	42	1
		Motor Shaft	1	1
55-70041	Primary Turbine Wheel Kit	Primary Turbine Wheel	2	1
		Turbine Wheel Keys	30	1
55-70042	Secondary Turbine Wheel Kit	Secondary Turbine Wheel	3	1
		Turbine Wheel Keys	30	1
See Table "A"	Arbor Shaft Kit	Arbor Shaft	12	1
		Arbor Shaft Keys	35	3

Part Number	Description	Item #	Qty
55-00013	Exhaust Screen	9	1
55-00022	Air Motor Housing	15	1
55-00023	Planetary Gear Housing	18	1
55-00028	Spool	6	1
A-20-121	Spring	48	1
55-00029	Piston	46	1
55-00030	Cylinder	47	1
See Table "A"	Nozzle	14	1
See Table "A"	Drive Housing	40	1
See Table "A"	Drive	31	1

POW-R-QUIK
ENGINE STARTING SYSTEMS

ANNEX 3 – Parts Exploded View (Sheet 2 of 2)



LAST UPDATED 3/23/22

Table "A"

Starter P/N	Drive P/N	Drive Housing P/N	Arbor Shaft Kit P/N	Nozzle P/N
55-33000	6-8-225	55-00093	55-70049	55-00112
55-33001	6-8-225	55-00096	55-70049	55-00021
55-33002	55-65019	55-00105	55-70050	55-00021
55-33003	55-65019	55-00105	55-70050	55-00020
55-33004	55-65019	55-00105	55-70050	55-00019
55-33005	55-65028	55-00105	55-70050	55-00021
55-33006	55-65028	55-00105	55-70050	55-00020
55-33007	55-65028	55-00105	55-70050	55-00019
55-33008	6-8-114	55-00096	55-70049	55-00021
55-33009	6-8-114	55-00096	55-70049	55-00020
55-33010	6-8-114	55-00096	55-70049	55-00019
55-33011	55-65028	55-00106	55-70050	55-00020
55-33012	55-65029	55-00096	55-70049	55-00020
55-33013	55-65029	55-00096	55-70049	55-00019
55-33014	55-65029	55-00111	55-70049	55-00020
55-33015	55-65028	55-00105	55-70050	55-00021

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