



PARTS MANUAL

FOR HALE

SINGLE STAGE BOOSTER PUMPS

AP



RSD



CBP



MBP



BY

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TABLE OF CONTENTS

Section	Title	Page
1.	SAFETY.....	1
1.1.	Safety Summary	1
2.	HALE BOOSTER PUMP ILLUSTRATED BREAKDOWNS	7
2.1.	Gearbox Illustrated Breakdowns	7
2.2.	AP Illustrated Breakdowns.....	8
2.2.1	AP Installation	9
2.2.2	AP Gearbox And Discharge Positions	9
2.2.3	AP Repair Part Kits.....	9
2.2.4	AP Pump Parts Identification.....	9
2.3.	CBP Illustrated Breakdowns	9
2.3.1	CBP Installation.....	9
2.3.2	CBP Gearbox And Discharge Positions.....	9
2.3.3	CBP Repair Part Kits	9
2.3.4	CBP Pump Parts Identification	9
2.4.	MBP Illustrated Breakdowns	10
2.4.1	MBP Installation.....	10
2.4.2	MBP Gearbox And Discharge Positions	10
2.4.3	MBP Repair Part Kits	10
2.4.4	MBP Pump Parts Identification	10
2.5.	RSD Illustrated Breakdowns.....	10
2.5.1	RSD Installation	10
2.5.2	RSD Gearbox And Discharge Positions.....	10
2.5.3	RSD Repair Part Kits.....	11
2.5.4	RSD Pump Parts Identification.....	11
3.	OPTIONS	13
3.1.	Anode	13
3.2.	Pump Priming	13
3.2.1	ESP/ESPS	13
3.2.1.1	PVG Shutoff Valve.....	13
3.2.1.2	SPV Shutoff Valve	13
3.3.	Pump Shift Indicator Lights	13
3.4.	TRV (120°F or 170°F) and TRV-L.....	13
APPENDIX A.	MANUFACTURER'S INFORMATION.....	1

FSG-MNL-00185 REVISION HISTORY		
CHANGE	DATE	AFFECTED PAGES
Revision A	8 May 2019	All – Initial Release
Revision B	22 July 2020	Page 7 – Added Hydraulic Drive Reference for FSG-PL-01481 Sheet 4

Abbreviations and Acronyms

The abbreviations used in this manual are limited to standard (commonly used and accepted) scientific units of measure and therefore are NOT defined or listed. The acronyms used in this manual are defined in this listing (in numerical-alphabetical order) and are NOT defined within the text.

AHJ	Authority Having Jurisdiction
AKA	Also Known As
ATP	Around The Pump
AWG	American Wire Gauge
CAN	Controller Area Network (Bus)
GPM	Gallons Per Minute
IDEX	IDEX Corporation
KZCO	KZ Valve Incorporated
OIM	Operation Installation Maintenance (Manual)
P/N	Part Number
QTY	Quantity
SAE	Society of Automotive Engineers
R&R	Remove And Replace
SGX	Starter or Ground Cross-Linked Polyethylene
VIC	Victaulic
w/	With

1. SAFETY

This section provides definitions and a listing of the safety headings used in this Parts Manual (FSG-MNL-00185) and the OIM (FSG-MNL-00183) and Technical (FSG-MNL-00184) manuals.

Before attempting installation, repair, or operation, please follow the safety guidelines listed in this section and adhere to all cautions, dangers, notices, and warnings found in the manuals.

All installers, operators, and maintainers must read the safety section carefully, understand and adhered to it strictly before attempting to install or operate a Hale booster pump.

DANGERS, WARNINGS, CAUTIONS, or NOTICES that immediately precede a step apply directly to that step and all sub steps. DANGERS, WARNINGS, CAUTIONS, or NOTICES that precede an entire procedure apply to the entire procedure. DANGERS, WARNINGS, CAUTIONS, and NOTICES consist of two parts: a heading (that identifies possible result if disregarded) and a statement of the hazard (that provides the minimum precautions). The headings used and their definitions are.

ATTENTION ▲ DANGER

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED WILL RESULT IN SERIOUS INJURY OR DEATH.

ATTENTION ▲ WARNING

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED COULD RESULT IN SERIOUS INJURY OR DEATH.

ATTENTION ▲ CAUTION

INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH IF NOT AVOIDED MAY RESULT IN MINOR OR MODERATE INJURY.

IMPORTANT ▲ NOTICE

ADDRESSES PRACTICES NOT RELATED TO PERSONAL INJURY.

NOTE

Highlights an essential aspect of an operating or maintenance procedure, condition, or statement and/or provides pertinent ancillary information.

1.1. Safety Summary

The following warnings and cautions are used throughout the Hale booster pump manuals (and/or the items they references) and are provided here as a safety summary.

ATTENTION ▲ WARNING

A PRESS PRESENTS A POTENTIAL CRUSH HAZARD (FROM MOVING PARTS) AND/OR STRIKE HAZARD (FROM EJECTED PARTS). WEAR APPROPRIATE PPE.

ATTENTION ▲ WARNING

A PRESSURE HAZARD MAY EXIST EVEN WHEN THE PUMP IS NOT RUNNING. PRIOR TO REMOVING HOSES OR CAPS FROM PUMP CONNECTIONS, RELIEVE PRESSURE BY OPENING DRAINS. BLEEDER VALVES SHOULD ALSO BE USED WHEN CONNECTING TO AN INTAKE FROM A PRESSURIZED SOURCE.

ATTENTION ⚠ WARNING

ALWAYS FOLLOW LOCAL GUIDELINES FROM THE AHJ AND THE APPARATUS MANUFACTURER.

ATTENTION ⚠ WARNING

ALWAYS FOLLOW PROPER OPERATING PROCEDURES. THE PUMP OPERATOR MUST BE FAMILIAR WITH THE PUMP OPERATING INSTRUCTIONS AS WELL AS OTHER OPERATING GUIDELINES FOR THE APPARATUS AND ACCESSORIES.

ATTENTION ⚠ WARNING

DO NOT EXCEED OPERATING PRESSURE LIMITS OF PUMP, INSTALLED PLUMBING, HOSE(S), OR EQUIPMENT IN USE.

ATTENTION ⚠ WARNING

DO NOT LEAVE THE DRIVERS POSITION IN THE CAB OR OPEN THE THROTTLE UNLESS ALL SAFETY INTERLOCK INDICATORS ARE ILLUMINATED.

ATTENTION ⚠ WARNING

OPERATORS, INSTALLERS, AND MAINTENANCE PERSONNEL MUST BE TRAINED AND QUALIFIED FOR ALL THE ACTIVITIES THEY PERFORM.

ATTENTION ⚠ WARNING

THE PUMP SHIFT CONTROL AND PUMP SHIFT INDICATOR SYSTEM ON THE APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND REGULATIONS SUCH AS NFPA.

ATTENTION ⚠ CAUTION

ALWAYS USE PROPER PPE. OIL MAY BE TOXIC. DISPOSE OF OIL PROPERLY PER AHJ GUIDELINES.

ATTENTION ⚠ CAUTION

FAILING TO REDUCE SYSTEM PRESSURE BEFORE SYSTEM SHUTDOWN OR FLUSHING COULD RESULT IN WATER HAMMERING.

ATTENTION ⚠ CAUTION

FOLLOW DEPARTMENT PROCEDURES TO SET WHEEL CHOCKS WHEN PUMPING

ATTENTION ⚠ CAUTION

THE AP PUMP AND GEARBOX ASSEMBLIES WEIGH APPROXIMATELY 140 LBS (64 KG). USE PROPER LIFTING DEVICE/JACK WHEN REMOVING OR INSTALLING THE PUMP AND GEARBOX ASSEMBLY.

ATTENTION ⚠ CAUTION

THE CBP PUMP AND GEARBOX ASSEMBLIES WEIGH APPROXIMATELY 100 LBS (45 KG). USE PROPER LIFTING DEVICE WHEN REMOVING OR INSTALLING THE PUMP AND GEARBOX ASSEMBLY.

ATTENTION ▲ CAUTION

THE MBP PUMP AND GEARBOX ASSEMBLIES WEIGH APPROXIMATELY 170 LBS (77 KG). USE PROPER LIFTING DEVICE WHEN REMOVING OR INSTALLING THE PUMP AND GEARBOX ASSEMBLY.

ATTENTION ▲ CAUTION

THE RSD PUMP AND GEARBOX ASSEMBLIES WEIGH APPROXIMATELY 225 LBS (102 KG). USE PROPER LIFTING DEVICE WHEN REMOVING OR INSTALLING THE PUMP AND GEARBOX ASSEMBLY.

ATTENTION ▲ CAUTION

USE PPE TO PROTECT HANDS AND FINGERS FROM SHARP EDGES. THE EDGES OF THE BLADES ON THE INDUCER MAY BE SHARP.

IMPORTANT ▲ NOTICE

A MECHANICAL SEAL IS A PRECISION ENGINEERED DEVICE. CARE MUST BE TAKEN NOT TO DAMAGE THE MATING FACES (SEAL FORMING PORTION) OF THE SEAL. ENSURE THE FACES REMAIN ABSOLUTELY CLEAN THROUGHOUT THE ENTIRE INSTALLATION. SEAL FACES MUST BE CLEANED WITH THE ALCOHOL WIPES PROVIDED WITH THE REPAIR KIT.

IMPORTANT ▲ NOTICE

ALWAYS INSTALL NEW BEARINGS WHEN INSTALLING THE PUMP GEAR OR PUMP SHAFT (ESPECIALLY IF METAL WAS FOUND IN THE GEAR OIL). FAILURE TO INSTALL NEW BEARINGS MAY RESULT IN PREMATURE PUMP FAILURE OR ADDITIONAL EQUIPMENT DAMAGE.

IMPORTANT ▲ NOTICE

ALWAYS USE AND ONLY USE PAC-EASE RUBBER LUBRICANT EMULSION (OR EQUIVALENT) WHEN INSTALLING THE MECHANICAL SEAL. USING ANY OTHER LUBRICANT OR NOT USING THE LUBRICANT MAY DAMAGE THE MECHANICAL SEAL AND SEAT.

IMPORTANT ▲ NOTICE

BE SURE TO OPEN AT LEAST ONE DISCHARGE VALVE SLIGHTLY TO PREVENT THE PUMP FROM OVERHEATING. IF THE PUMP RUNS COMPLETELY CLOSED, IT MAY HEAT THE WATER ENOUGH TO SCALD A PERSON. OVERHEATING CAN DAMAGE THE PUMP SEAL, AND OTHER PUMP PARTS.

IMPORTANT ▲ NOTICE

DO NOT ALLOW PUMP GEAR TO SLIDE THRU SUPPORTS. DO NOT ALLOW THE NEW OIL SEAL TO BE CUT ON THE KEYWAY OR PINCHED BETWEEN THE ADJACENT PUMP SHAFT COMPONENTS OR BE DAMAGED IN ANY OTHER WAY. DAMAGING THE OIL SEAL WILL RESULT IN AN OIL LEAK AND POSSIBLE EQUIPMENT DAMAGE AND/OR FAILURE.

IMPORTANT ▲ NOTICE

DO NOT ALLOW THE PRESSURE ON THE INTAKE GAUGE TO GO BELOW ZERO. PLACING A VACUUM ON THE WATER MAIN MAY RESULT IN SERIOUS DAMAGE TO OR FAILURE OF THE WATER MAIN.

IMPORTANT ▲ NOTICE

DO NOT CUT THRU THE CLEARANCE RING. CUTTING THRU THE CLEARANCE RING WILL DAMAGE THE VOLUTE AND MAY RESULT IN PUMP FAILURE.

IMPORTANT ▲ NOTICE

DO NOT DRIVE THE CLEARANCE RING INTO THE PUMP HEAD AT AN ANGLE OR UNEVENLY (ALL THE WAY FROM ONE SIDE AT A TIME). BENDING, WARPING, OR CHIPPING THE CLEARANCE RING MAY RESULT IN POOR PERFORMANCE OR PUMP FAILURE.

IMPORTANT ▲ NOTICE

DO NOT DRIVE THE CLEARANCE RING INTO THE VOLUTE AT AN ANGLE OR UNEVENLY (ALL THE WAY FROM ONE SIDE AT A TIME). BENDING, WARPING, OR CHIPPING THE CLEARANCE RING MAY RESULT IN POOR PERFORMANCE OR PUMP FAILURE.

IMPORTANT ▲ NOTICE

DO NOT INSTALL A USED COTTER PIN. A USED PIN MAY FAIL RESULTING IN DEBRIS GOING THRU THE PUMP AND/OR LOOSENING OF THE CASTLE NUT THAT SECURES THE IMPELLER RESULTING IN EQUIPMENT DAMAGE.

IMPORTANT ▲ NOTICE

DO NOT LOOSEN THE CASTLE NUT TO INSTALL THE COTTER PIN. CONTINUE TO TIGHTEN THE CASTLE NUT UNTIL THE COTTER PIN CAN BE PUSHED THRU THE HOLE IN PUMP SHAFT. LOOSENING THE CASTLE NUT MAY RESULT IN EQUIPMENT DAMAGE.

IMPORTANT ▲ NOTICE

DO NOT LUBRICATE VANES OR VANE SLOTS. USING LUBRICANT ON THE VANES OR VANE SLOTS DURING DISASSEMBLY, CLEANING, OR ASSEMBLY EVENTUALLY CAUSES A GUMMY RESIDUE TO DEVELOP, RENDERING THE SYSTEM INOPERATIVE.

IMPORTANT ▲ NOTICE

DO NOT OPEN THE THROTTLE UNLESS THE GREEN INDICATOR LIGHT IS ON. SEE ERROR! REFERENCE SOURCE NOT FOUND.. FAILURE TO WAIT FOR THE ILLUMINATED GREEN INDICATOR MAY RESULT IN EQUIPMENT DAMAGE OR FAILURE.

IMPORTANT ▲ NOTICE

DO NOT OPEN THE THROTTLE UNLESS THE OK TO PUMP (GREEN INDICATOR LIGHT) IS ON. SEE ERROR! REFERENCE SOURCE NOT FOUND.. FAILURE TO WAIT FOR THE ILLUMINATED GREEN INDICATOR MAY RESULT IN EQUIPMENT DAMAGE OR FAILURE.

IMPORTANT ▲ NOTICE

DO NOT OVER FILL THE GEARBOX. EXCEEDING THE OIL LEVEL MAY RESULT IN EQUIPMENT DAMAGE.

IMPORTANT ▲ NOTICE

DO NOT REPLACE FASTENERS WITH ANYTHING OTHER THAN HALE PART NUMBERS PROVIDED.

IMPORTANT ▲ NOTICE

DO NOT RUN THE PRIMER FOR MORE THAN 45 SECONDS IF PRIME IS NOT ACHIEVED. IF PRIME IS NOT ACHIEVED IN 45 SECONDS, STOP AND LOOK FOR CAUSES (AIR LEAKS OR BLOCKED SUCTION HOSE). RUNNING THE PRIMER FOR LONGER PERIODS WITHOUT ACHIEVING PRIME MAY RESULT IN PRIMER AND/OR PUMP DAMAGE OR FAILURE.

IMPORTANT ▲ NOTICE

DO NOT STRIKE THE IMPELLER. STRIKING THE IMPELLER MAY RESULT IN IRREPARABLE DAMAGE.

IMPORTANT ▲ NOTICE

DO NOT STRIKE THE INDUCER OR IMPELLER. STRIKING THE INDUCER OR IMPELLER MAY RESULT IN IRREPARABLE DAMAGE.

IMPORTANT ▲ NOTICE

IF A PUMP IS OPERATED WITHOUT WATER, OR WITHOUT DISCHARGING WATER, IT MAY OVERHEAT. FAILURE TO FLOW WATER MAY DAMAGE THE MECHANICAL SEAL OR THE DRIVE MECHANISM.

IMPORTANT ▲ NOTICE

IF IN 30 TO 45 SECONDS ONE OF THE FOLLOWING (BULLETS) DOES NOT OCCUR STOP THE PUMP AND CHECK FOR AIR LEAKS OR A POSSIBLE PUMP TROUBLE.

- THE DISCHARGE GAUGE READING INCREASES
- THE INTAKE GAUGE READING FALLS BELOW ZERO
- THE PRIMING PUMP DISCHARGES WATER TO THE GROUND

CONTINUING TO RUN THE PRIMING PUMP MAY RESULT IN PUMP FAILURE OR DAMAGE.

IMPORTANT ▲ NOTICE

IF THE DISCHARGE GAUGE READING DOES NOT INCREASE, THE INTAKE GAUGE READING DOES NOT FALL BELOW ZERO, OR THE PRIMING PUMP DOES NOT DISCHARGE WATER TO THE GROUND IN 30 TO 45 SECONDS, DO NOT CONTINUE TO RUN THE PRIMING PUMP. STOP THE PUMP AND CHECK FOR AIR LEAKS OR POSSIBLE PUMP TROUBLE.

IMPORTANT ▲ NOTICE

NEVER STRIKE AN IMPELLER. THE IMPACT MAY CAUSE DAMAGE THAT WOULD REQUIRE IMPELLER REPLACEMENT.

IMPORTANT ▲ NOTICE

OIL AND GREASE (INCLUDING SKIN OILS) WILL DAMAGE THE MECHANICAL SEAL FACE. NEVER TOUCH THE MATING FACES OF THE MECHANICAL SEAL. WEAR PROTECTIVE GLOVES TO PREVENT TOUCHING THE SEAL FACES WITH YOUR BARE HANDS. (USE RUBBER, ACRYLIC, LATEX, ETC. – DO NOT USE CLOTH OR LEATHER.)

IMPORTANT ▲ NOTICE

RUNNING THE ENGINE AT SPEEDS HIGHER THAN 1200 RPM DURING PRIMING IS NOT RECOMMENDED SINCE IT WILL NOT IMPROVE PRIMING OPERATION AND MAY CAUSE DAMAGE TO THE PUMP.

IMPORTANT ▲ NOTICE

THE PRESSURE INDICATOR ON THE PANEL IS ONLY A ROUGH INDICATION OF THE TPM SETTING. ALWAYS USE THE PROCEDURE TO PROPERLY SET THE TPM RELIEF VALVE SYSTEM. FAILURE TO USE THE PROCEDURE MAY RESULT IN TPM RELIEF VALVESYSTEM DAMAGE OR FAILURE.

IMPORTANT ▲ NOTICE

USE ONLY PAC-EASE RUBBER LUBRICANT EMULSION (OR EQUIVALENT) ON THE RUBBER MECHANICAL SEAL PARTS TO EASE INSTALLATION. USING ANY OTHER LUBRICANT CAN DAMAGE THE SEAL AND SEAT.



2. HALE BOOSTER PUMP ILLUSTRATED BREAKDOWNS

All Hale booster pump drawings are available on the memory stick (flash drive) provided with the pump and on the Hale Products website (<https://www.haleproducts.com>).

For the purposes of parts identification, the Hale Flex gearbox (see drawing FSG-PL-01481) is common to all of the Hale single stage booster pumps (AP/CBP/MBP/RSD), this is accomplished by considering the pump shaft and all of gearbox located supporting components to part of the pump assembly. NOTE: Using your pumps serial number and the Hale website (or Customer Service) is the best way to ensure you receive/utilize the correct replacement parts for your pump.

Each Hale booster pump drawing provides the information required to install, maintain, and repair the covered Hale booster pump including their common design gearbox. Additionally, the drawings provide information about the available Hale options for the associated booster pump. The following paragraphs organize each pumps data into sections applicable to that pump.

2.1. Gearbox Illustrated Breakdowns

Refer to the five (5) sheet drawing package FSG-PL-01481 (current revision) for the details associated with the gearbox which is common to all Flex series booster pumps.

NOTE

Drawing revision is critical to obtaining correct/current data as superseded drawings are obsoleted when the newest revision is released.

Sheet 1 of the Flex gearbox drawing provides three types of data: drawing views (central area) including detail views (upper right), revisions, (lower left), and title block (lower right). The drawing views provide dimensions pertinent to installing a Hale Flex series gearbox including dimensions, cooling connection point(s), gear oil fill/breather, oil level sight glass, and drain plug default locations (locations vary depending on gearbox positioning. Pay close attention to the identification of metric verses SAE threads/hardware as the Hale Flex series gearbox utilizes both. The sheet also shows the location of identification labels and notices. The detail area includes multiple details related to the input shaft. Part numbers are provided for applicable optional drive flanges. The title block and revision includes all relevant manufacturers/drawing information.

Sheet 2 provides a listing of gearbox components and a listing of gear ratios, the associated codes, and the associated gear part numbers/tooth counts for easy cross reference/ identification. Sheet 2 also provides a cross sectional and two exploded views of the gearbox for parts identification and R&R purposes.

NOTE

Separate exploded views detail the components removed from the input and pump sides of the gearbox.

Sheet 3 provides companion drive flange information (including associated parts listing) when the gearbox is PTO driven and PTO auxiliary drive information (also including associated parts listing).

Sheet 4 provides hydraulic drive information (including associated parts listing) when the gearbox is driven by a hydraulic motor (-H option).

Sheet 5 provides the same types of data as sheet 3 (for PTO) except for the engine mounted drive coupling (-M option).

Sheet 6 shows views of the six (6) gearbox positions the Hale Flex gearbox supports.

NOTES

Gear oil components (drain, fill, and level sight) move depending on gearbox position.

Refer to the HALE TECHNICAL MANUAL FOR HALE SINGLE STAGE BOOSTER PUMPS (FSG-MNL-00184) for detailed repair kit applications, troubleshooting, and R&R instructions.

2.2. AP Illustrated Breakdowns

Refer to the six (6) sheet drawing package FSG-PL-01483 (current revision) for the details associated with each of the following subparagraphs (organized by title).

NOTE

Drawing revision is critical to obtaining correct/current data as superseded drawings are obsoleted when the newest revision is released.

Sheet 1 of the Hale AP booster pump drawing provides five types of data: NOTES (upper left corner), drawing views (central area), details (upper right), revisions, (lower left), and title block (lower right).

The Hale AP booster pump NOTES provide available options, gear oil (type and quantity), minimum fastener strength requirement, and general mounting information.

The drawing views provide dimensions pertinent to installing a Hale AP Flex Series booster pump including dimensions, center of gravity, drain connection point(s), gear oil fill location, and pump identification labels.

The details section includes multiple listings. Drawing numbers are provided for applicable pump options and accessories. Gear ratios are listed for the associated model number. Input shaft inertia data is provided also by model number in both SAE and metric units. A maximum input RPM listing and appropriate references to torque and hydro pressures (static and dynamic) are provided along with a marking example (for reading the identification label) and pump weights.

The title block and revision includes all relevant manufacturers/drawing information.

Sheet 2 shows views of the six (6) gearbox positions, and the 24 discharge positions (volute rotation) the Hale AP booster pump configurations provide.

NOTES

Gear oil components (drain, fill, and level sight) move depending on gearbox position.

ER versus OER volute orientations are grouped for easy identification.

Sheet 3 provides repair kit content/purpose ordering information. Call Hale Products Customer Service at 800-533-3569 to verify your application or if additional parts are required. Be prepared to provide the following information when calling Customer Service.

- Pump ID plate (MODEL NUMBER and SERIAL NUMBER)
- Gearbox ID plate (MODEL NUMBER and SERIAL NUMBER)
- Observed symptoms and conditions under which the symptoms occur.

Refer to the HALE TECHNICAL MANUAL FOR HALE SINGLE STAGE BOOSTER PUMPS (FSG-MNL-00184) for detailed repair kit applications, troubleshooting, and R&R instructions.



Sheet 4 provides cross sectional views and an exploded view of the pump for parts identification purposes. NOTE: Sheet 5 provides the exploded view details for the pump shaft/gearbox component for the differences for a pump utilizing a 3.74:1 gear ratio.

Sheet 6 repeats the NOTES and pump weight information, lists the Hale plate drawings for the available options, lists the available gear ratios, and provides dimensioned views of the pump, gearbox, and engine mount for installation purposes.

2.2.1 AP Installation

Refer to the current revision of sheets 1, 2, and 6 of drawing package FSG-PL-01483 when installing a Hale AP single stage booster pump.

2.2.2 AP Gearbox And Discharge Positions

Refer to the current revision of sheet 2 of drawing package FSG-PL-01483 for the 24 available volute positions (12 for ER and 12 for OER) when installing a Hale AP single stage booster pump.

2.2.3 AP Repair Part Kits

Refer to the current revision of sheet 3 of drawing package FSG-PL-01483 for a listing of the Level 1, Level 2, and Level 3 repair kits and the Impeller Renew kits available for the Hale AP single stage booster pump.

2.2.4 AP Pump Parts Identification

NOTE

The pump shaft and associated gearbox components for the 3.74:1 gear ratio differ from the pump shaft and components for all other gear ratios.

Refer to the current revision of sheets 3, 4, and 5 of drawing package FSG-PL-01483 for the exploded and cross sectional views, parts listings, and discharge connection option available for a Hale AP single stage booster pump.

2.3. CBP Illustrated Breakdowns

Refer to the six (6) sheet drawing package FSG-PL-01482 (current revision) for the details associated with each of the following subparagraphs (organized by title).

2.3.1 CBP Installation

Refer to the current revision of sheets 1, 2, and 6 of drawing package FSG-PL-01482 when installing a Hale CBP single stage booster pump.

2.3.2 CBP Gearbox And Discharge Positions

Refer to the current revision of sheet 2 of drawing package FSG-PL-01482 for the 16 available volute positions (8 for ER and 8 for OER) when installing a Hale CBP single stage booster pump.

2.3.3 CBP Repair Part Kits

Refer to the current revision of sheet 3 of drawing package FSG-PL-01482 for a listing of the Level 1, Level 2, and Level 3 repair kits and the Impeller Renew kits available for the Hale CBP single stage booster pump.

2.3.4 CBP Pump Parts Identification

NOTE

The pump shaft and associated gearbox components for the 3.74:1 gear ratio differ from the pump shaft and components for all other gear ratios.



Refer to the current revision of sheets 3, 4, and 5 of drawing package FSG-PL-01482 for the exploded and cross sectional views and the associated parts listings available for a Hale CBP single stage booster pump.

2.4. MBP Illustrated Breakdowns

Refer to the six (6) sheet drawing package FSG-PL-01486 (current revision) for the details associated with each of the following subparagraphs (organized by title).

2.4.1 MBP Installation

Refer to the current revision of sheets 1, 2, and 6 of drawing package FSG-PL-01486 when installing a Hale MBP single stage booster pump.

2.4.2 MBP Gearbox And Discharge Positions

Refer to the current revision of sheet 2 of drawing package FSG-PL-01486 for the 12 available volute positions (6 for ER and 6 for OER) when installing a Hale MBP single stage booster pump.

2.4.3 MBP Repair Part Kits

Refer to the current revision of sheet 3 of drawing package FSG-PL-01486 for a listing of the Level 1, Level 2, and Level 3 repair kits and the Impeller Renew kit available for the Hale MBP single stage booster pump.

2.4.4 MBP Pump Parts Identification

NOTE

The pump shaft and associated gearbox components for the 3.74:1 gear ratio differ from the pump shaft and components for all other gear ratios.

Refer to the current revision of sheets 3, 4, and 5 of drawing package FSG-PL-01486 for the exploded and cross sectional views and the associated parts listings available for a Hale MBP single stage booster pump.

2.5. RSD Illustrated Breakdowns

Refer to the six (6) sheet drawing package FSG-PL-01487 (current revision) for the details associated with each of the following subparagraphs (organized by title).

2.5.1 RSD Installation

Refer to the current revision of sheets 1, 2, 5, and 6 of drawing package FSG-PL-01487 when installing a Hale RSD single stage booster pump. NOTE: Sheet 5 provides optional suction head configurations for the RSD.

2.5.2 RSD Gearbox And Discharge Positions

NOTE

The 3.74:1 gear ratio is NOT available for the RSD.

Refer to the current revision of sheet 2 of drawing package FSG-PL-01487 for the 24 available volute positions (12 for ER and 12 for OER) when installing a Hale RSD single stage booster pump.

The RSD provides a side discharge (K port) to support installation of an anode or thermal relief valve (TRV-120, TRV-170, or TRV-L). See the current revision of drawing PL869 for applicable anode information and the current revision of drawing PL729 for applicable thermal relief valve information.



2.5.3 RSD Repair Part Kits

Refer to the current revision of sheet 3 of drawing package FSG-PL-01487 for a listing of the Level 1, Level 2, and Level 3 repair kits and the Impeller Renew kits available for the Hale RSD single stage booster pump.

2.5.4 RSD Pump Parts Identification

NOTES

The 3.74:1 gear ratio is NOT available for the RSD.

The suction head, impeller, and clearance rings for the 1500 GPM rated pump differ from the rest of the lower GPM rated RSDs.

Refer to the current revision of sheets 3, 4, and 5 of drawing package FSG-PL-01487 for the exploded and cross sectional views and the associated parts listings available for a Hale RSD single stage booster pump.



3. OPTIONS

This section shows the parts list for optional add-ons and ancillary equipment available for the Hale Flex Series single stage booster pumps.

- Anode
- Priming Pump (ESP)
- Priming Pump (PVG)
- Pump Shift Indicator Lights
- TRV (120°F or 170°F) and TRV-L

3.1. Anode

Hale offers multiple sizes and types of sacrificial galvanic anodes to protect the pump from corrosion. The Hale RSD single stage booster pump provides the K port for easy installation (using a 115 flange to 1-1/4-in NPT adaptor) of an anode. Refer to the current revision of PL869 for applicable anode information.

3.2. Pump Priming

Hale offers two (2) pump priming systems: the ESP/ESPS with the PVG or with the SPV.

3.2.1 ESP/ESPS

The ESP/ESPS priming pump can be ordered for a 12 VDC or 24 VDC apparatus electrical system. The primer weighs approximately 27 lbs., produces approximately 25 inHg of vacuum, and does not require a lubricant tank. Refer to the current revision of drawing PL821 for applicable primer information.

3.2.1.1 PVG Shutoff Valve

Refer to the current revision of drawing PL480 for applicable PVG information.

3.2.1.2 SPV Shutoff Valve

Refer to the current revision of drawing PL819 or PL828 for applicable SPV information.

3.3. Pump Shift Indicator Lights

Utilize NFPA compliant indications for the pump operator panel and driving compartment for all Hale single stage booster pumps. Refer to the current revision of drawing PL825 for the system available from Hale for the single stage booster pumps.

3.4. TRV (120°F or 170°F) and TRV-L

Hale offers multiple temperatures of TRV and a light kit for the TRV. Refer to the current revision of drawing PL729 for applicable thermal relief valve information.

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APPENDIX A. MANUFACTURER'S INFORMATION

This section provides a list that includes the name, address, and telephone number of the manufacturer's points of contact. Each provides the name address and telephone number of the manufacturer's representative and/or service organization that can provide replacements and is most convenient to the project sight.

Additionally, included herein is warranty information.

MANUFACTURER'S INFORMATION

Division	Address	Telephone
Class 1	Mailing: 607 NW 27th Ave, Ocala, FL 34475 Email: https://www.haleproducts.com	(800) 533-3569
Hale Products	Mailing: 607 NW 27th Ave, Ocala, FL 34475 Email: https://www.haleproducts.com	(800) 533-3569
Godiva LTD (A Unit of IDEX Corp.)	Mailing: Charles Street, Warwick, England, CV34 5LR Email: godiva@idexcorp.com	Tel: +44 (0) 1926 623600 FAX: +44 (0) 1926 623666

WARRANTY

See the Hale website (www.haleproducts.com) for product specific warranty and warranty procedures.