# **OPERATION MANUAL**



# **R-14EH**



R14E-H: 1/2 HP, 10,000 psi Hydraulic Pump

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.



195 Internationale Blvd Glendale Heights, IL 60139 Phone 800-860-6170 Fax 800-345-3767 www.spartacogroup.com



# **REGISTRATION/ TABLE OF CONTENTS**

## THANK YOU...

for purchasing a Huskie Tools product. Our mission is to supply the finest steel cable connecting and cutting tools and cable-related products to the transmission and distribution markets. Huskie Tools products represents the state-of-the-art tools and are dependable & safe. Trust, integrity, teamwork and mutual respect - these words are something we take to heart here at Huskie Tools.

Please take the time to read this manual carefully to learn how to correctly operate and maintain your tool.

## **Table of Contents**

| Registration/ Contents  |
|-------------------------|
| Warranty 3              |
| Safety 4                |
| Specifications5         |
| Operating Instructions6 |
| Break Down              |
| Parts List9             |
| TroubleShooting Guide10 |



#### Warranty

Huskie Tools products carry a warranty that makes us a leader in the tool industry. No other manufacturer dares to back its tools as we do.

All Huskie REC-SERIES battery operated products carry a 5 year warranty. The ECO-SERIES battery operated products carry a 1 year warranty. The BP-80 & BP-84 batteries carry a 5 year warranty from the date stamped on the battery. The BP-82 battery carries a 1 year warranty.

#### PRODUCT WARRANTY

REC-Series battery operated products ECO-Series battery operated products Batteries (BP-80, BP-84) Chargers (CH-90, CH-94) 5 Years 1 Years

5 years/ (BP-82) 1 year

5 Years

The warranty does not cover any damages incurred from a Huskie tool including damages to property, bodily injuries and lost wages resulting from such injuries. This warranty solely covers the repair or replacement of tools supplied by Huskie. These remedies are exclusive, and the total liability of Huskie Tools, LLC whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the tool. In no event shall Huskie Tools, LLC be liable for consequential, incidental or special damages.

HUSKIE TOOLS, LLC MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

Huskie reserves the right to determine all warranty claims. Huskie will not warranty tools containing parts or batteries not originally supplied by Huskie. Failure due to misuse, improper maintenance, misapplication, not following instructions or warnings, abuse or repairs attempted by anyone other than Huskie Tools, LLC, or an authorized service center renders this warranty null and void.

Repair and Warranty Claims

All claims must be sent to Huskie for inspection and authorization. A Return Goods Authorization (RGA) is required before shipping tools to Huskie. Secure the authorization by telephoning or writing to Huskie's main office with details of the claim. Non-warranty repairs are handled using the same procedure. Repairs exceeding 50 percent of the cost of a new tool will be advised before repairs are made.

#### **Payment Terms**

Upon credit approval Huskie's standard payment terms are net-30 days. Visa, Mastercard, Discover and American Express are also accepted.

#### **Freight**

All Huskie tools are FOB, Glendale Heights, Illinois. Goods will be shipped pre-paid and added, unless otherwise specified. Freight shipments over \$17,000 are pre-paid.

#### Quotations

Special quantity quotations should be phoned in to discuss the scope of your tool requests.

#### **Complete Support Services**

Our customers have direct access to us for training, service, and problem solving. As specialists in tools, we maintain a trained repair staff and a large stock of parts. This contrasts with many tool suppliers who carry tools as a sideline without offering support services. Here are some reasons why our customers love to do business with us:

- Quick delivery
- We maintain inventory at our headquarters.
- Training and troubleshooting services.
- · Fast repair service.
- Design and engineering service for special tool needs.





## **Safety Alert Symbol:**

This safety alert symbol indicates a potential personal injury hazard; it is not used for messages related to property damage only.



# Wear eye protection:

when operating this tool. Failure to wear eye protection could result in serious eye injury from flying debris.



### **Electric Shock hazard:**

Use proper personal protective equipment when using this unit on or near energized electrical lines.



Compression Dies at high force can cause severe personal injury. Keep all body parts away from moving parts of the tool while operating.



# **MODEL SPECIFICATIONS**

R-14EH: MOTOR

## **HYDRAULIC PUMP (R-14EH)**

Weight: 34 lbs. Type: Commutator

Size: 11"L x 7.5"W x 16"H R.P.M.: 1200 Motor Size: 1/2 HP - 6.5 Amp **AC 110V** Voltage: Delivery @200 psi: 157 cu/in./m Frequency: 50/60 Hz Delivery @10,000: 19 cu/in. Current: 6.5 A 120 cu/in. Horse Power: 1/2 Oil Capacity:

### 1/2 HP, 10,000 PSI HYDRAULIC PUMP

• Remote Operation Allows Full Operator Control

- Advance and Hold Feature Standard
- Manual Control Directly on Pump Motor
- Pressure Adjustment from 4,000 10,000

#### R-14EH: PUMP

Low Pressure: (300 psi)
Delivery: 157 in3/min.
High Pressure: 10,000 psi
Delivery: 19 in3/min.
Reservoir Capacity: 66 gal
Weight: 35 lbs.

Fluid Type: T-15 or equal

The **R-14EH** remote operated pump gives the operator complete control. Push buttons permit the user to advance and retract at will. The user is never committed to a full cycle, and can always back off at any time during the advance even under pressure. This feature increases efficiency because cuts and crimps can be adjusted as necessary, simply by stopping the advance or retract mode. A 10-foot remote control cable provides both safety and convenience. The user can set up an operation and then move away from the work site before engaging the tool. An over-ride switch on the pump allows full control at the pump motor. The low amperage of this pump allows it to be used virtually anywhere. The pressure can be easily adjusted between 4,000 and 10,000 psi and determined by using our PG-1 in-line gauge. Consult factory for proper adjusting procedure.

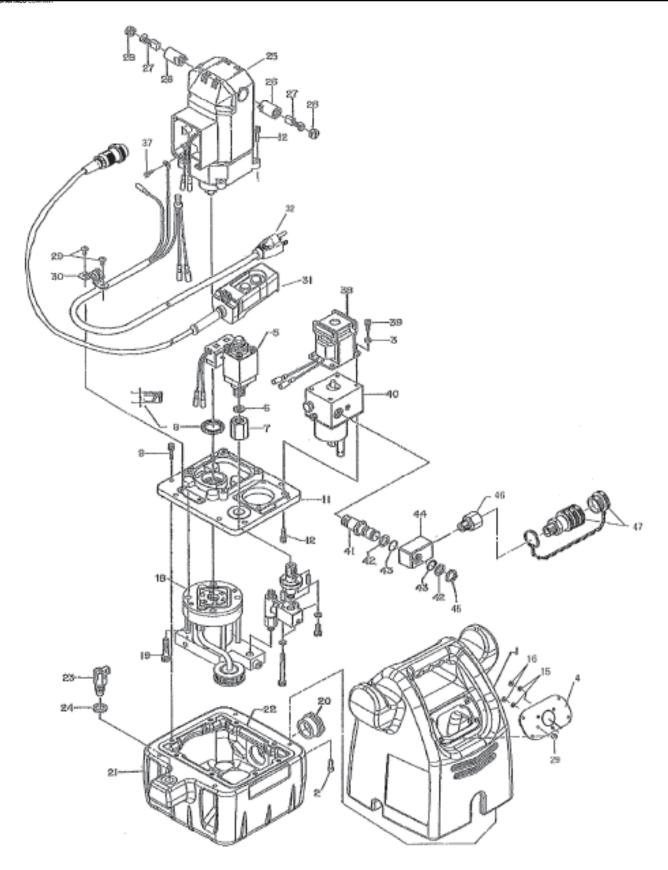
**NOTE:** When using any of these high pressure tools, always use 10,000 psi rated non-conductive hose (NC-16 series).

# **OPERATING INSTRUCTIONS**

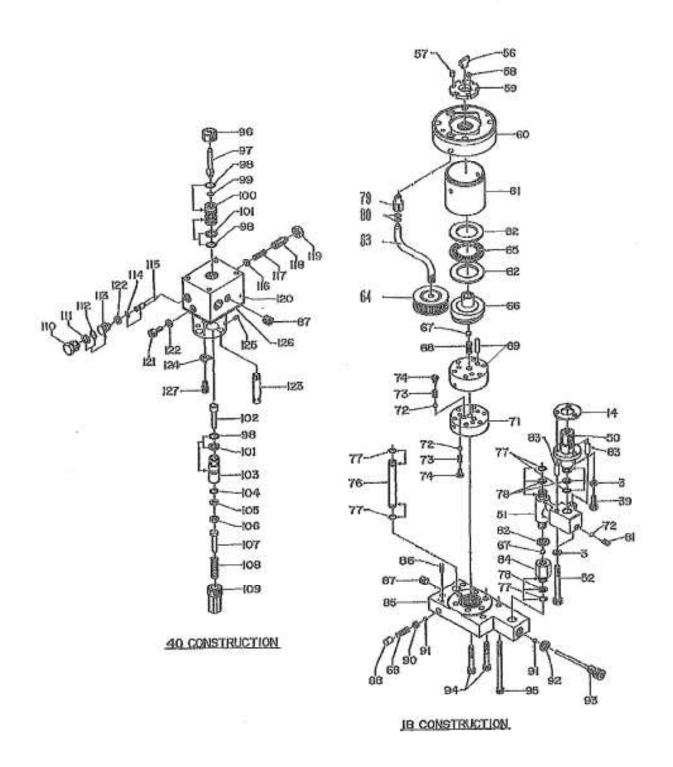
#### **OPERATING INSTRUCTIONS FOR R-14EH**

- 1. Connect all couplers on tool, hose, and pump. Make sure all couplers are secure before operating.
- 2. Plug electrical cord into 110 volt AC outlet.
- 3. Open air vent before operation. Flip lever up on oil filler port to vent. Close lever when storing or transporting.
- 4. To check the release solenoid, depress "DOWN" button on the remote control switch. An audible "click" will be heard.
- 5. By pressing the "UP" button, motor will begin to run, generating oil flow and tool will advance.
- 6. To stop motor (and pump), release "UP" button. Oil pressure will remain constant until "DOWN" button is depressed to relieve pressure. To continue the increase in oil pressure, depress "UP" button.
- 7. By pressing "UP" button and holding, pump will generate a maximum pressure of 10,000 psi. At that point, an automatic pressure switch will activate and further pressure cannot be generated. The pump will automatically shut off when pressure setting is reached. An in-line gauge (Huskie PG-1) can be used to determine output pressure. The pressure is factory set at 10,000 psi.
- 8. To relieve oil pressure, depress the "DOWN" button and hold. Oil in tool cylinder will return to tank and the tool will be ready to begin the next cycle.
- 9. Occasionally check oil level through the visual oil port just below the vent. Oil level should be on or just above the red dot in the center of the window. If oil needs to be added, remove the vent from the reservoir and fill to proper level.











| OMPANY           |                                 |           |              |
|------------------|---------------------------------|-----------|--------------|
| NO.              | DESCRIPTION                     | CODE      | QTY.         |
| 1                | Pump Cover                      | RH-01     | 1            |
| 2                | M5 X 10 Screw                   | RF1-01    | 4            |
| 3                | MS Lock Washer                  | 410-09    | 4            |
| 4                | Cover Plate                     | RH-09     | 1            |
| 5                | Pressure Switch KP\$700-1       | RF-O3     | 1            |
| 6                | Copper Gasket (3)               | RF-04     | 1            |
| 7                | Switch Adapter                  | R9-03     | 1            |
| 8                | Oil Seal OS17233                | RB-10     | 1            |
| 9                | M5 x 18 Screw (sems)            | RC33-03   | 8            |
| 11               | Main Base (R14E-H)              | RH-04     | 1            |
| 12               | M5 X 22 Screw (sems)            | RF1-IB    | 8            |
| 18               | Pump Ass'y                      | RF-10     | 1            |
| 19               | M8 X 35 Screw                   | 32C-02    | 4            |
| 20               | Oil Gauge (R14E-H)              | RH-05     | 1            |
| 21               | Oil Reservoir (R14E-H)          | RH-06H    | 1            |
| 22               | Gasket for Reservoir            | RH-07     | 1            |
| 23               | Air Valve Ass'y                 | RF-13     | 1            |
| 24               | W-14 SI Seal Washer             | RB-09     | 1            |
| 25               | Motor (120v)                    | RF-14HA   | 1            |
| 26               | Brush Holder                    | RF-29A    | 1 2          |
| 27               | Brush                           | RF-158    | 2            |
| 28               |                                 | RF-158    | 2            |
| 29               | Brush Cap                       | RF-18     | <del>-</del> |
| 30               | M4 X 6 Screw<br>Conduit Saddle  | RF-15     | 1            |
| 31               | Switch Ass'y (R14E-H)           | P600-01   | 1            |
|                  |                                 |           | _            |
| 32               | Power Cord                      | RF-55     | 1            |
| 33               | Cap NCS-254-Rca<br>M3 X 8 Screw | E1-06     | 1            |
| 37               | M4X5Soew                        | RFL1-IB   | 1            |
|                  |                                 |           | _            |
| 38               | Solencial (120v)                | RF-20A    | 1            |
| 39               | M5 X 14 Screw                   | RF-49     | 4            |
| 40               | Solenoid Valve Ass'y            | RF-21     | 1            |
| 41               | Male Swivel Joint               | RF-22     | 1 2          |
| 42               | P-16 Back-Up Ring (B.C.)        | 22-24     | _            |
| 43               | P-16 O-King                     | 22-25     | 2            |
| 44               | Female Swivel Joint             | RF-24     | 1            |
| 45               | JG-16 Snap King                 | RF-23     | 1            |
| 46               | Adapter 3/8" PT-M. 3/8" NPT-F.  | P85-80    | 1            |
| 47               | Female Coupler                  | FC-8/DP-8 | 1            |
| 50               | Holder<br>Uish Ossassa bisat    | RF1-09    | 1            |
| 51               | High Pressure Joint             | RF1-10    | 1            |
| 52               | M5 x 55 Screw                   | RF1-06    | 1            |
| 56               | Key (1)                         | RB-30     | 1            |
| 57               | 6 X 6 Roller                    | RB-31     | -            |
| 58               | Key (2)                         | RB-32     | 1            |
| 559              | Rotor                           | RB-33     | 1            |
| 60               | Vane Cap Ass'y                  | RB-34     | 1            |
| <u> 61</u>       | Drum                            | RB-35     | 1            |
| <u>€2</u>        | Bearing Plate AS-1106           | RB-36     | 2            |
| - <del>1</del> 3 | Suction Fipe                    | RCP-29    | 1            |
| <del>64</del>    | Strainer                        | RF-25     | 1            |
| <u> </u>         | Needle Thrust Bearing           | RB-37     | 1            |
| 56               | Cam Ass'y                       | RF-26     | 1            |
| - 67             | 1/4" Ball                       | 25-22     | 2            |

| NO.   DESCRIPTION   CODE   QTY  |     |                     | PAI     | <b>\</b>      |
|---|-----|---------------------|---------|---------------|
| 69 Cylinder Ass'y R3-46A 1 71 Check Valve (1) R8-47 1 72 3/16" Ball 16-49 7 73 Spring [4] 16-48 6 74 Spring Holder R8-48 6 76 Low Pressure Fipe R8-53 1 77 P-7 O-Ring 16-60 5 78 P-7 Back-Up Ring (B.C.) R8-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ling 85-34 1 81 Misa6 Screw (F.P.) 490-14 1 82 Copper Gasket (7) R8-45 1 85 Base RF-32 1 86 3 X 18 Drive Pin (AW) RF-33 1 87 PT 1/8" Screw R8-55 2 88 Spring Holder (1) R8-57 1 90 Ball Holder (1) R8-57 1 90 Ball Holder (1) R8-57 1 91 7/32" Ball 16-26 2 92 Copper Gasket (4) 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Pin RF-34 1 98 P-16/A O-Ring R8-63 1 99 P-4 O-Ring R8-65 3 99 P-4 O-Ring R8-65 1 160 Valve Seat (1) R8-67 1 161 P-10A Back-Up Ring (B.C.) R8-63 1 163 Release Valve Holder R8-69 1 164 P-6 O-Ring R8-65 1 165 P-6 Back-Up Ring (B.C.) R8-63 1 169 Release Valve Holder R8-70 1 165 P-6 Back-Up Ring (B.C.) R8-70 1 166 Stopper Ring R8-70 1 167 Shaft RF-35 1 168 Spring (119) R8-74 1 169 Ping (1) R8-75 1 160 Valve Seat (2) R8-73 1 161 P-9 O-Ring R8-70 1 162 R8-63 C-1 R8-70 1 163 P-6 Back-Up Ring (B.C.) R8-74 1 164 P-6 O-Ring R8-75 1 165 Stopper Ring R8-70 1 166 Stopper Ring R8-70 1 167 R8-74 1 168 Spring (119) R8-75 1 169 Ping (1) R8-75 1 160 Valve Seat (2) R8-38 1 161 P-9 O-Ring R8-70 1 162 R8-63 C-1 R8-75 1 163 R8-64 C-1 R8-75 1 164 P-9 O-Ring R8-70 1 165 P-6 Back-Up Ring (B.C.) R8-74 1 166 Stopper Ring R8-75 1 167 R8-75 1 168 Spring (119) R8-75 1 169 R9-79 C-1 R8-79 1 160 R8-79 R8-79 1 161 P-10A Back-Up Ring (B.C.) R8-74 1 162 R8-79 R8-79 1 163 R8-79 R8-79 R8-79 1 164 R8-79 R8-79 R8-79 1 165 R8-79 R8-79 R8-79 R8-79 1 166 R8-79 | NO. | DESCRIPTION         | CODE    | QTY.          |
| 69         Cyfinder Ass'y         R8-46A         1           71         Check Valve (1)         R8-47         1           72         3/16° Ball         16-49         7           73         Spring (4)         16-48         6           74         Spring Holder         R8-48         6           76         Low Pressure Fipe         R8-53         1           77         P-7 Back-Up Ring (B.C.)         R8-49         3           79         Suction Joint         RC-28         1           80         P-8 O-ring         85-34         1           81         Mica's Screw (F.P.)         400-14         1           82         Copper Gashet (7)         E-68         1           84         Joint (2)         RF-46         1           85         Base         RF-32         1           86         3 X 18 Drive Pin (AW)         RF-33         1           87         FT 1/8* Screw         R8-55         2           88         Spring Holder (1)         R8-57         1           80         3 X 18 Drive Pin (AW)         RF-33         1           87         FT 1/8* Screw         R8-55         2   | 62  | Spring (70)         | RB-44   |               |
| 71 Check Valve [1] RB-47 1 72 3/16" Ball 16-49 7 73 Spring [4] 16-48 6 74 Spring Holder RB-48 6 75 Law Pressure Pipe RB-53 1 76 Law Pressure Pipe RB-53 1 77 P-7 O-Ring 16-60 5 78 P-7 Back-Up Ring [B.C.] RB-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 M6a6 Screw (F.P.) 4RU-14 1 82 Copper Gashet (7) E3-68 1 84 Joint (2) RF-46 1 85 Base RF-32 1 86 3 X 18 Drive Pin (AW) RF-33 1 87 PT 1/8" Screw RB-55 2 88 Spring Holder (1) RB-57 1 90 Ball Holder RB-58 1 91 7/32" Ball 16-26 2 92 Copper Gashet (4) RB-57 1 93 Stopper Screw RB-61 7 95 M6 X 40 Screw RB-61 7 95 M6 X 40 Screw RB-61 7 95 M6 X 85 Screw RB-63 1 97 Push Pin RF-34 1 98 P-16A O-Ring RB-65 3 99 P-4 O-Ring RB-65 3 99 P-4 O-Ring RB-65 1 160 Valve Seat (1) RB-57 1 161 R-18A Back-Up Ring (B.C.) RB-66 2 162 Release Valve Holder RB-59 1 163 Release Valve Holder RB-59 1 164 P-6 O-Ring RB-70 1 165 P-6 Back-Up Ring (B.C.) RB-67 1 166 Stopper Ring RB-70 1 167 Shaft RF-35 1 168 Spring (119) RB-71 1 169 Phug (1) RB-71 1 160 Washes Seat (2) RB-73 1 161 P-10 RB-67 1 162 RP-6 Back-Up Ring (B.C.) RB-66 2 164 RP-6 O-Ring RB-70 1 165 P-6 Back-Up Ring (B.C.) RB-67 1 166 Stopper Ring RB-70 1 167 Shaft RF-35 1 168 Spring (119) RB-75 1 169 Phug (1) RB-75 1 160 Washer RF-86 1 111 P-9 Back-Up Ring (B.C.) RB-76 1 112 RB-70 Ring RF-78 1 113 Valve Seat (2) RF-38 1 114 P-3 O-Ring RF-38 1 115 Valve Seat (2) RF-38 1 116 Washer RF-41 1 117 Spring (194) RF-75 1 118 Adjusting Screw RF-84 1 119 Lock Nut RB-84 1 110 Washer RF-41 1 111 RB-74 RB-74 RB-75 1 112 RB-75 Screw RF-84 1 113 RB-75 Screw RF-84 1 114 RB-75 Screw RF-85 1 115 Washer RF-84 1 116 Washer RF-84 1 117 Spring (194) RF-46 1 118 Adjusting Screw RF-84 1 119 Lock Nut RB-84 1 120 Walve Body RF-44 1 121 MG X12 Screw RF-85 1 124 Retainer RF-47 1 125 M44 Screw RF-86 1   |     |                     | _       | ī             |
| 72 3/16° Ball 16-49 7 73 Spring (4) 16-48 6 74 Spring (4) 16-48 6 75 Law Pressure Fipe R8-53 1 77 P-7 O-Ring 16-60 5 78 P-7 Back-Up Ring (B.C.) R8-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 M6a6 Screw (F.P.) 480-14 1 82 Capper Gasket (7) E3-68 1 84 Joint (2) RF-46 1 85 Base RF-32 1 86 3 X 18 Drive Fin (AW) RF-33 1 87 PT 1/8° Screw R8-55 2 88 Spring Holder (1) R8-57 1 90 Ball Holder R8-58 1 91 7/32° Ball 16-26 2 92 Capper Gasket (4) 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Fin RF-34 1 98 P-16/A O-Ring R8-63 1 99 P-4 O-Ring 410-48 1 160 Valve Seat (1) R8-67 1 161 P-16/A Back-Up Ring (B.C.) R8-63 1 163 Release Valve R8-63 1 164 P-6 O-Ring R8-70 1 165 P-6 Back-Up Ring (E.L.) R8-71 1 166 Stopper Screw R7-35 1 167 Shaft RF-35 1 168 Spring (119) R8-74 1 169 Plug (1) R8-75 1 160 Walve Seat (2) R8-63 1 170 Stopper Ring (E.L.) R8-71 1 160 Valve Seat (2) R8-63 1 171 P-8 Back-Up Ring (B.C.) R8-63 1 172 Release Valve R8-68 1 173 Release Valve R8-68 1 174 P-6 O-Ring R8-70 1 175 P-6 Back-Up Ring (B.C.) R8-64 1 176 Stopper Screw R7-35 1 177 Shaft RF-35 1 178 Spring (119) R8-74 1 179 Pag Back-Up Ring (B.C.) R8-74 1 170 Stopper Screw R7-36 1 171 P-8 Back-Up Ring (B.C.) R8-74 1 172 P-9 O-Ring R8-75 1 173 Valve Stem R7-84 1 174 R-3 O-Ring R8-75 1 175 Valve Stem R7-84 1 176 Washer RF-84 1 177 Spring (194) RF-35 1 177 Spring (194) RF-36 1 178 Retainer RF-84 1 179 Lock Nut R8-84 1 170 Washer R8-84 1 171 M6 X12 Screw R8-85 1 172 Retainer RF-84 1 173 Retainer RF-84 1 174 Retainer RF-84 1 175 M4 X4 Screw R8-88 1 176 Gasket (22) RF-486 1   |     |                     | _       | $\overline{}$ |
| 73 Spring [4] 16-48 6 74 Spring Holder R8-48 6 76 Low Pressure Pipe R8-53 1 77 P-7 O-Ring 16-60 5 78 P-7 Back-Up Ring [B.C.] R8-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 M666 Screw [F.P.] 400-14 1 82 Copper Gasket [7] E3-68 1 84 Joint [2] RF-46 1 85 Base RF-32 1 86 3 X 18 Drive Pin [AW] RF-33 1 87 PT 1/8* Screw R8-57 1 89 Ball Holder [1] R8-57 1 90 Ball Holder [1] R8-57 1 90 Ball Holder [1] R8-58 1 91 7/32* Ball 16-26 2 92 Copper Gasket [4] 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug [2] R8-63 1 97 Push Pin RF-34 1 98 P-16A O-Ring R8-65 3 99 P-4 O-Ring 410-48 1 160 Valve Seat [1] R8-67 1 161 P-1BA Back-Up Ring [8.C.] R8-63 1 163 Release Valve R8-63 1 164 P-6 O-Ring R8-65 2 165 Release Valve R8-65 1 166 Stopper Ring [E.L.] R8-71 1 167 Shaft RF-35 1 168 Spring (119) R8-75 1 169 P-6 Back-Up Ring [8.C.] R8-63 1 169 P-6 Back-Up Ring [8.C.] R8-65 1 160 Valve Seat [1] R8-71 1 161 P-1BA Screw R8-60 1 162 Release Valve R8-63 1 163 Release Valve R8-65 1 164 P-6 O-Ring R8-75 1 165 P-6 Back-Up Ring [8.C.] R8-66 1 166 Stopper Ring [8.C.] R8-74 1 167 Shaft RF-35 1 168 Spring (119) R8-75 1 169 Ping [1] R8-75 1 160 Yalve Seat [2] RF-36 1 170 Stopper Screw RF-36 1 171 P-9 Back-Up Ring [8.C.] R8-78 1 172 P-9 O-Ring R8-73 1 173 Valve Stem RF-74 1 174 P-3 O-Ring R8-75 1 175 Valve Stem RF-86 1 177 Spring (194) RF-36 1 178 R8-87 1 179 Lock Nut R8-84 1 170 Valve Body RF-44 1 170 Retainer RF-45 1 171 R8-77 1 172 Copper Body RF-46 1 173 R8-87 1 174 Retainer RF-47 1 175 M4 X 4 Screw R8-88 1 176 Gasket (22] RF-486 1   |     |                     | _       |               |
| 74 Spring Holder RB-53 1 76 Low Pressure Pipe RB-53 1 77 P-7 O-Ring 16-60 5 78 P-7 Back-Up Ring (B.C.) RB-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 Miles Screw (F.P.) 40H-14 1 82 Copper Gastlet (7) 40H-14 1 84 Joint (2) RF-46 1 85 Base RF-32 1 86 3X 18 Drive Pin (AW) RF-33 1 87 PT 1/8" Screw RB-55 2 88 Spring Holder (1) RB-57 1 90 Ball Holder RB-58 1 91 7/32" Ball 16-26 2 92 Copper Gastlet (4) 26-20 1 93 Stopper Screw RB-60 1 94 M6 X 40 Screw RB-61 7 95 M6 X 85 Screw RB-62 4 96 Plug (2) RB-63 1 97 Push Pin RF-34 1 98 P-16A O-Ring RB-63 1 100 Valve Seat (1) RB-67 1 101 P-1BA Back-Up Ring (B.C.) RB-66 2 102 Release Valve RB-63 1 103 RB-65 Napper RB-70 1 104 P-6 O-Ring RB-71 1 105 P-6 Back-Up Ring (B.C.) RB-66 1 106 Stopper Screw RB-60 1 107 Shaft RF-35 1 108 Spring (119) RB-74 1 109 Plug (1) RB-75 1 109 Plug (1) RB-75 1 109 Plug (1) RB-75 1 109 RB-74 O-Ring RB-75 1 109 RB-75 O-Ring RB-76 1 109 Plug (1) RB-76 1 109 Plug (1) RB-76 1 109 Plug (1) RB-76 1 110 Stopper Screw RF-86 1 111 P-9 Back-Up Ring (B.C.) RB-78 1 112 P-9 O-Ring RB-78 1 113 Valve Stem RF-86 1 114 P-3 O-Ring RB-74 1 115 Valve Stem RF-86 1 116 Washer RF-87 1 117 Spring (194) RF-82 1 118 Adjusting Screw RF-83 1 119 Lock Nut RB-84 1 120 Valve Stem RF-84 1 121 M6 X 12 Screw RB-87 1 122 Copper Gastlet (2) RF-88 1 123 Edward RF-86 1 124 RB-86 RF-87 1 125 M4 X 4 Screw RF-88 1 126 Gastlet (22] RF-846 1  |     |                     |         |               |
| 76  |     |                     | _       | $\overline{}$ |
| 77 P-7 O-Ring 16-60 S 78 P-7 Back-Up Ring (B.C.) R8-49 3 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 M&a6 Screw (F.P.) 4RL-14 1 82 Copper Gasket (7) E3-68 1 84 Joint (2) RF-46 1 85 Base RF-32 1 86 3 X 18 Drive Pin (AW) RF-33 1 87 PT 1/R* Screw R8-52 2 88 Spring Holder (1) R8-57 1 90 Ball Holder R8-58 1 91 7/32* Ball 16-26 2 92 Copper Gasket (4) 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Pin (RF-34 1 98 P-4 O-Ring R8-55 3 99 P-4 O-Ring R8-65 3 100 Valve Seat (1) R8-67 1 101 P-1BA Back-Up Ring (B.C.) R8-68 1 103 Release Valve R8-69 1 104 P-6 O-Ring R8-70 1 105 P-6 Back-Up Ring (E.L.) R8-71 1 106 Stopper Ring R8-70 1 107 Shaft RF-35 1 108 Spring (119) R8-74 1 109 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-9 Back-Up Ring (B.C.) R8-63 1 112 P-9 O-Ring R8-72 1 113 Valve Seat (2) R7-38 1 114 P-3 O-Ring R8-74 1 115 Valve Sterm RF-36 1 116 Washer RF-36 1 117 Spring (194) RF-36 1 118 Adjusting Screw RF-36 1 119 Lock Nut R8-84 1 110 Valve Sterm RF-40 1 111 P-9 Back-Up Ring (B.C.) RR-38 1 112 P-9 O-Ring RF-38 1 113 Valve Sterm RF-40 1 114 P-3 O-Ring RF-38 1 115 Valve Sterm RF-40 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X12 Screw R8-85 1 122 Copper Gasket (2) RF-486 1 123 Echaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-88 1 126 Gasket (22] RF-446 1  |     |                     | _       |               |
| 78  P-7 Back-Up Ring (B.C.)  RB-49  3 79  Suction Joint  RCP-28  1 80  P-8 O-ring  85-34  1 81  M&ad Screw (F.P.)  40H-14  1 82  Copper Gaslet (7)  E3-68  1 84  Joint (2)  RF-46  1 85  Base  RF-32  1 86  3 X 18 Drive Pin (AW)  RF-33  1 87  PT 1/8" Screw  RB-55  2 88  Spring Holder (1)  RB-57  1 90  Ball Holder  RB-58  1 91  7/32" Ball  16-26  2 92  Copper Gaslet (4)  26-20  1 93  Stopper Screw  RB-60  1 94  M6 X 40 Screw  RB-61  7 95  M6 X 85 Screw  RB-62  4 96  Plug (2)  RB-63  1 97  Push Pin  RF-34  1 98  P-10A O-Ring  RB-65  3 99  P-4 O-Ring  88-65  3 99  P-4 O-Ring  88-65  3 100  Valve Seat (1)  RB-67  1 101  P-10A Back-Up Ring (B.C.)  RB-63  1 103  Release Valve  RB-60  1 104  P-6 D-Ring  RB-70  1 105  P-6 Back-Up Ring (B.C.)  RB-71  1 106  Stopper Ring  RB-72  1 107  Shaft  RF-35  1 108  Spring (119)  RB-75  1 110  Stopper Screw  RF-36  1 111  P-9 Back-Up Ring (B.C.)  RB-74  1 112  P-9 C-Ring  16-36  1 113  Valve Steat (2)  RF-39  1 114  P-3 O-Ring  16-36  1 115  Valve Steam  RF-40  1 116  Washer  RF-41  1 117  Spring (194)  RF-42  1 118  Adjusting Screw  RF-43  1 119  Lock Nut  RB-87  1 120  Valve Steam  RF-40  1 121  M6 X 12 Screw  RF-88  1 122  Copper Gaslet (2)  RF-87  1 123  Eshaust Fipe  RB-88  1 124  Restairer  RF-47  1 125  M4 X 4 Screw  RF-86  1 126  Gaslet (22)  RF-846  1  |     |                     | _       | $\overline{}$ |
| 79 Suction Joint RCP-28 1 80 P-8 O-ring 85-34 1 81 M6afi Screw (F.P.) 40H-14 1 82 Copper Gashet (7) E3-68 1 84 Joint (2) RF-46 1 85 Base RF-32 1 86 3X 18 Drive Pin (AW) RF-33 1 87 PT 1/8" Screw R8-55 2 88 Spring Holder (1) R8-57 1 90 Ball Holder (1) R8-57 1 90 Ball Holder (1) R8-57 1 91 7/32" Ball 16-26 2 92 Copper Gashet (4) 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Pin RF-34 1 98 P-16A O-Ring R8-65 3 99 P-4 O-Ring 410-48 1 100 Valve Seat (1) R8-67 1 101 P-10A Back-Up Ring (B.C.) R8-66 2 102 Release Valve R8-63 1 103 Release Valve R8-63 1 104 P-6 D-Ring R8-70 1 105 P-6 Back-Up Ring (E.L.) R8-71 1 106 Stopper Ring R8-70 1 107 Shaft RF-35 1 108 Spring (119) R8-74 1 109 Plug (1) R8-75 1 109 Plug (1) R8-74 1 109 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-9 Back-Up Ring (B.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-39 1 114 P-3 O-Ring RF-38 1 115 Yalve Sterm RF-40 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 110 Valve Sterm RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 110 Retainer RF-47 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1 126 Gasket (22] RF-446 1  |     |                     |         |               |
| 80   P-8 O-ring   85-34   1     81   M6afs Screw (F.P.)   400-14   1     82   Copper Gasket (7)   E3-68   1     84   Joint (2)   RF-46   1     85   Base   RF-32   1     86   3 X 18 Drive Pin (AW]   RF-33   1     87   FT 1/8" Screw   R8-55   2     88   Spring Holder (1)   R8-57   1     90   Ball Holder   R8-58   1     91   7/32" Ball   16-26   2     92   Copper Gasket (4)   26-20   1     93   Stopper Screw   R8-60   1     94   M6 X 40 Screw   R8-61   7     95   M6 X 85 Screw   R8-62   4     96   Plug (2)   R8-63   1     97   Push Pin   RF-34   1     98   P-16A O-Ring   R8-65   3     99   P-4 O-Ring   410-48   1     100   Valve Seat (1)   R8-67   1     101   P-16A Back-Up Ring (8.C.)   R8-68   1     102   Release Valve   R8-63   1     103   Release Valve   R8-63   1     104   P-6 O-Ring   R8-70   1     105   P-6 Back-Up Ring (E.L.)   R8-71   1     106   Stopper Ring   R8-72   1     107   Shaft   RF-35   1     108   Spring (119)   R8-75   1     109   Plug (1)   R8-75   1     110   Stopper Screw   RF-36   1     111   P-9 Back-Up Ring (B.C.)   32A-01   1     112   P-9 O-Ring   RF-38   1     113   Valve Seat (2)   RF-39   1     114   P-3 O-Ring   RF-38   1     115   Valve Seat (2)   RF-39   1     116   Washer   RF-40   1     117   Spring (194)   RF-42   1     118   Adjusting Screw   RF-43   1     119   Lock Nut   R8-84   1     120   Valve Body   RF-44   1     121   M6 X 12 Screw   R8-87   1     122   Copper Gasket (2)   RF-48   1     124   Retairer   RF-47   1     125   M4 X 4 Screw   RF-48   1     126   Gasket (22]   RF-486   1  |     |                     |         | 3             |
| 81  | 79  | Suction Joint       | RCP-28  | 1             |
| 82         Copper Gaslet (7)         E3-68         1           84         Joint (2)         RF-46         1           85         Base         RF-32         1           86         3 X 18 Drive Pin (AW)         RF-33         1           87         PT 1/8" Screw         R8-55         2           88         Spring Holder (1)         R8-57         1           90         Ball Holder         R8-58         1           91         7/32" Ball         16-26         2           92         Copper Gaslet (4)         26-20         1           93         Stopper Screw         R8-60         1           94         M6 X 40 Screw         R8-61         7           95         M6 X 85 Screw         R8-61         7           95         M6 X 85 Screw         R8-62         4           96         Plug (2)         R8-63         1           97         Push Fin         R8-62         1           98         P-10A O-Ring         R8-65         3           99         P-4 O-Ring         410-42         1           101         P-10A Back-Up Ring (8.C.)         R8-63         1           102 </td <td>80</td> <td></td> <td>85-34</td> <td>1</td>  | 80  |                     | 85-34   | 1             |
| 84         Joint (2)         RF-46         1           85         Base         RF-32         1           86         3 X 18 Drive Fin (AW)         RF-33         1           87         FT 1/8" Screw         RB-55         2           88         Spring Holder (1)         RB-57         1           90         Ball Holder         RB-58         1           91         7/32" Ball         16-26         2           92         Copper Gastet (4)         26-20         1           93         Stopper Screw         RB-60         1           94         M6 X 40 Screw         RB-61         7           95         M6 X 85 Screw         RB-62         4           96         Plug (2)         RB-63         1           97         Push Fin         RF-34         1           98         P-10A O-Ring         RB-65         3           99         P-4 O-Ring         410-42         1           100         Valve Seat (1)         RB-67         1           101         P-10A Back-Up Ring (B.C.)         RB-68         1           102         Release Valve Holder         RB-68         1 <td< td=""><td>81</td><td>Milati Screw (F.P.)</td><td>40U-14</td><td>1</td></td<>   | 81  | Milati Screw (F.P.) | 40U-14  | 1             |
| 84         Joint (2)         RF-46         1           85         Base         RF-32         1           86         3 X 18 Drive Fin (AW)         RF-33         1           87         FT 1/8" Screw         RB-55         2           88         Spring Holder (1)         RB-57         1           90         Ball Holder         RB-58         1           91         7/32" Ball         16-26         2           92         Copper Gastet (4)         26-20         1           93         Stopper Screw         RB-60         1           94         M6 X 40 Screw         RB-61         7           95         M6 X 85 Screw         RB-62         4           96         Plug (2)         RB-63         1           97         Push Fin         RF-34         1           98         P-10A O-Ring         RB-65         3           99         P-4 O-Ring         410-42         1           100         Valve Seat (1)         RB-67         1           101         P-10A Back-Up Ring (B.C.)         RB-68         1           102         Release Valve Holder         RB-68         1 <td< td=""><td>82</td><td>Copper Gasket (7)</td><td>E3-68</td><td>1</td></td<>  | 82  | Copper Gasket (7)   | E3-68   | 1             |
| 85         Base         RF-32         1           86         3 X 18 Drive Pin (AW)         RF-33         1           87         PT 1/8" Screw         RB-55         2           88         Spring Holder (1)         RB-57         1           90         Ball Holder         RB-58         1           91         7/32" Ball         16-26         2           92         Copper Gasket (4)         26-20         1           93         Stopper Screw         RB-60         1           94         M6 X 40 Screw         RB-61         7           95         M6 X 85 Screw         RB-61         7           95         M6 X 85 Screw         RB-62         4           96         Plug (2)         RB-63         1           97         Push Pin         RF-34         1           98         P-10A O-Ring         RB-63         1           100         Valve Seat (1)         RB-65         2           101         P-10A Back-Up Ring (B.C.)         RB-66         2           102         Release Valve         RB-63         1           103         Release Valve         RB-63         1 <th< td=""><td>84</td><td></td><td>RF-46</td><td>1</td></th<>   | 84  |                     | RF-46   | 1             |
| 86         3 X 18 Drive Pin (AW)         RF-33         1           87         PT 1/8" Screw         RB-55         2           88         Spring Holder (1)         RB-57         1           90         Ball Holder         RB-58         1           91         7/32" Ball         16-26         2           92         Copper Gasket (4)         26-20         1           93         Stopper Screw         RB-60         1           94         M6 X 40 Screw         RB-61         7           95         M6 X 85 Screw         RB-62         4           96         Plug (2)         RB-63         1           97         Push Fin         RF-34         1           98         P-10A O-Ring         RB-65         3           99         P-4 O-Ring         410-42         1           100         Valve Seat (1)         RB-67         1           101         P-10A Back-Up Ring (B.C.)         RB-68         1           102         Release Valve         RB-63         1           103         Release Valve Holder         RB-63         1           104         P-6 D-Ring         RB-63         1   | 85  |                     | _       | ī             |
| 87 PT 1/8" Screw RB-55 2 88 Spring Holder (1) RB-57 1 90 Ball Holder RB-58 1 91 7/32" Ball 16-26 2 92 Copper Gastet (4) 26-20 1 93 Stopper Screw RB-60 1 94 M6 X 40 Screw RB-61 7 95 M6 X 80 Screw RB-61 7 96 Plug (2) RB-63 1 97 Push Pin RF-34 1 98 P-16A O-Ring RB-63 3 99 P-4 O-Ring 410-48 1 160 Valve Seat (1) RB-67 1 161 P-16A Back-Up Ring (B.C.) RB-68 2 162 Release Valve RB-68 1 163 Release Valve RB-68 1 164 P-6 Back-Up Ring (E.L.) RB-70 1 165 P-6 Back-Up Ring (E.L.) RB-71 1 166 Stopper Ring RB-72 1 167 Shaft RF-35 1 168 Spring (119) RB-74 1 169 Plug (1) RB-75 1 110 Stopper Screw RF-36 1 111 P-8 Back-Up Ring (B.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-38 1 114 P-3 O-Ring RF-38 1 115 Valve Stem RF-41 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut RB-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw RB-87 1 122 Copper Gastet (2) RF-45 2 123 Exhaust Fipe RB-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-88 1 126 Gastet (22] RF-446 1  |     |                     |         | $\overline{}$ |
| 88         Spring Holder (1)         R8-57         1           90         Ball Holder         R8-58         1           91         7/32" Ball         16-26         2           92         Copper Gashet (4)         26-20         1           93         Stopper Screw         R8-60         1           94         M6 X 4G Screw         R8-61         7           95         M6 X 3S Screw         R8-62         4           96         Plug (2)         R8-63         1           97         Push Fin         RF-34         1           98         P-16A O-Ring         R8-63         1           99         P-4 O-Ring         R8-65         3           99         P-4 O-Ring         R8-65         1           100         Valve Seat (1)         R8-66         2           101         R-10A Back-Up Ring (8.C.)         R8-66         2           102         Release Valve Holder         R8-68         1           103         Release Valve Holder         R8-69         1           104         P-6 D-Ring (8.C.)         R8-70         1           105         P-6 Back-Up Ring (8.C.)         R8-71         1     <  |     |                     | _       |               |
| 90 Ball Holder R8-58 1 91 7/32* Ball 16-26 2 92 Copper Gashet (4) 26-20 1 93 Stopper Screw R8-60 1 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Fin RF-34 1 98 P-16A O-Ring R8-65 3 99 P-4 O-Ring 410-48 1 160 Valve Seat (1) R8-67 1 161 P-16A Back-Up Ring (8.C.) R8-66 2 162 Release Valve R8-68 1 163 Release Valve R8-68 1 164 P-6 O-Ring R8-70 1 165 P-6 Back-Up Ring (E.L.) R8-71 1 166 Stopper Ring R8-72 1 167 Shaft RF-35 1 168 Spring (119) R8-74 1 169 Plug (1) R8-75 1 169 P-9 O-Ring RF-36 1 111 P-9 Back-Up Ring (8.C.) R5-36 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-38 1 114 P-3 O-Ring RF-36 1 115 Valve Stem RF-40 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw R8-87 1 122 Copper Gashet (2) RF-45 2 123 Eshaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1 126 Gashet (22] RF-46 1  |     |                     | _       |               |
| 91  |     |                     | _       |               |
| 92  |     |                     |         | _             |
| 93         Stopper Screw         RB-60         1           94         M6 X 40 Screw         RB-61         7           95         M6 X 85 Screw         RB-62         4           96         Plug (2)         RB-63         1           97         Push Fin         RF-34         1           98         P-10A O-Ring         RB-65         3           99         P-4 O-Ring         410-48         1           160         Valve Seat (1)         RB-67         1           161         P-11A Back-Up Ring (B.C.)         RB-66         2           162         Release Valve         RB-68         1           163         Release Valve         RB-68         1           164         P-6 D-Ring         RB-70         1           165         P-6 Back-Up Ring (E.L.)         RB-71         1           166         Stopper Ring         RB-72         1           167         Shaft         RB-73         1           168         Spring (119)         RB-74         1           169         Plug (1)         RB-75         1           169         Plug (1)         RB-75         1           110   |     |                     | _       | -             |
| 94 M6 X 40 Screw R8-61 7 95 M6 X 85 Screw R8-62 4 96 Plug (2) R8-63 1 97 Push Fin RF-34 1 98 P-10A O-King R8-65 3 99 P-4 O-Ring 410-48 1 100 Valve Seat (1) R8-67 1 101 P-10A Back-Up Ring (8.C.) R8-66 2 102 Release Valve R8-68 1 103 Release Valve R8-68 1 104 P-6 O-Ring R8-70 1 105 P-6 Back-Up Ring (E.L.) R8-71 1 106 Stopper Ring R8-72 1 107 Shaft RF-35 1 108 Spring (119) R8-74 1 109 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-9 Back-Up Ring (8.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-39 1 114 P-3 O-Ring 16-36 1 115 Valve Stem RF-40 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw R8-87 1 122 Copper Gashet (2) RF-45 2 123 Eshaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1   | 92  |                     | _       |               |
| 95  | 93  |                     | RB-60   | 1             |
| 96 Plug (2) R8-63 1 97 Push Fin RF-34 1 98 P-10A O-King R8-65 3 99 P-4 O-Ring 410-48 1 100 Valve Sest (1) R8-67 1 101 P-10A Back-Up Ring (8.C.) R8-66 2 102 Release Valve R8-68 1 103 Release Valve R8-69 1 104 P-6 O-Ring R8-70 1 105 P-6 Back-Up Ring (E.L.) R8-71 1 106 Stopper Ring R8-72 1 107 Shaft RF-35 1 108 Spring (119) R8-74 1 109 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-9 Back-Up Ring (8.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Sest (2) RF-39 1 114 P-3 O-Ring RF-40 1 115 Valve Stem RF-40 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw R8-87 1 122 Copper Gashet (2) RF-45 2 123 Exhaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1 126 Gashet (22) RF-486 1  | 94  | M6 X 40 Screw       | RB-61   | 7             |
| 97  | 95  | M6 X 85 Screw       | RB-62   | 4             |
| 97  | 96  | Plug (2)            | KB-63   | 1             |
| 98 P-16A O-Ring R8-65 3 99 P-4 O-Ring 410-48 1 160 Valve Seat (1) R8-67 1 161 P-16A Back-Up Ring (8.C.) R8-66 2 162 Release Valve R8-68 1 163 Release Valve Holder R8-69 1 164 P-6 O-Ring R8-70 1 165 P-6 Back-Up Ring (E.L.) R8-71 1 166 Stopper Ring R8-72 1 167 Shaft RF-35 1 168 Spring (119) R8-74 1 169 Plug (1) R8-75 1 169 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-9 Back-Up Ring (B.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-39 1 114 P-3 O-Ring 16-36 1 115 Valve Stem RF-41 1 116 Washer RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw R8-87 1 122 Copper Gashet (2) RF-45 2 123 Eshaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1   | 97  |                     | RF-34   | 1             |
| 99 P.4 O-Ring 410-48 1 160 Valve Seat (1) R8-67 1 161 P-10A Back-Up Ring (8.C.) R8-66 2 162 Release Valve R8-68 1 163 Release Valve Holder R8-69 1 164 P-6 O-Ring R8-70 1 165 P-6 Back-Up Ring (E.L.) R8-71 1 166 Stopper Ring R8-72 1 167 Shaft RF-35 1 168 Spring (119) R8-74 1 169 Plug (1) R8-75 1 110 Stopper Screw RF-36 1 111 P-8 Back-Up Ring (8.C.) 32A-01 1 112 P-9 O-Ring RF-38 1 113 Valve Seat (2) RF-39 1 114 P-3 O-Ring 16-36 1 115 Valve Stem RF-41 1 117 Spring (194) RF-42 1 118 Adjusting Screw RF-43 1 119 Lock Nut R8-84 1 120 Valve Body RF-44 1 121 M6 X 12 Screw R8-87 1 122 Copper Gashet (2) RF-45 2 123 Exhaust Fipe R8-88 1 124 Retainer RF-47 1 125 M4 X 4 Screw RF-48 1   |     |                     | _       | 1             |
| 160         Valve Seat (1)         RB-67         1           161         P-HA Back-Up Ring (B.C.)         RB-66         2           162         Release Valve         RB-68         1           163         Release Valve Holder         RB-69         1           164         P-6 O-Ring         RB-70         1           165         P-6 Back-Up Ring (E.L.)         RB-71         1           166         Stapper Ring         RB-72         1           167         Shaft         RF-35         1           168         Spring (119)         RB-74         1           169         Plug (1)         RB-74         1           169         Plug (1)         RB-74         1           110         Stopper Screw         RF-36         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Seat (2)         RF-39         1           124         P-3 O-Ring         16-36   |     |                     |         |               |
| 161         P-IBA Back-Up Ring (B.C.)         R8-66         2           162         Release Valve Holder         R8-68         1           163         Release Valve Holder         R8-69         1           164         P-6 O-Ring         R8-70         1           165         P-6 Back-Up Ring (E.L.)         R8-71         1           166         Stopper Ring         R8-72         1           167         Shaft         RF-35         1           168         Spring (119)         R8-74         1           169         Plug (1)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Seat (2)         RF-38         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1   |     |                     |         | _             |
| 162         Release Valve         R8-68         1           163         Release Valve Holder         R8-69         1           164         P-6 O-Ring         R8-70         1           165         P-6 Back-Up Ring (E.L.)         R8-71         1           166         Stopper Ring         R8-72         1           167         Shaft         RF-35         1           168         Spring (119)         R8-74         1           169         Plug (1)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1   |     |                     | _       |               |
| 163         Release Valve Holder         R8-69         1           164         P-6 O-Ring         R8-70         1           165         P-6 Back-Up Ring (E.L.)         R8-71         1           166         Stopper Ring         R8-72         1           167         Shaft         RF-35         1           168         Spring (119)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-45         2           1   |     |                     | _       | -             |
| 164         P-6 O-Ring         R8-70         1           165         P-6 Back-Up Ring (E.L.)         R8-71         1           166         Stopper Ring         R8-72         1           167         Shaft         RF-35         1           168         Spring (119)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Statt (2)         RF-38         1           114         P-3 O-Ring         RF-36         1           115         Valve Statt         RF-40         1           116         Washer         RF-40         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-85         1           122 <td></td> <td></td> <td>_</td> <td></td>   |     |                     | _       |               |
| 165         P-6 Back-Up Ring (E.L.)         R8-71         1           166         Stopper Ring         R8-72         1           167         Shaft         RF-35         1           168         Spring (119)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-36         1           113         Valve Statt (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Statt         RF-40         1           116         Washer         RF-40         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gashet (2)         RF-45         2 <td< td=""><td></td><td></td><td></td><td></td></td<>   |     |                     |         |               |
| 106         Stopper Ring         RB-72         1           107         Shaft         RF-35         1           108         Spring (119)         RB-74         1           109         Plug (1)         RB-75         1           110         Stopper Screw         RF-36         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gastet (2)         RF-45         2           123         Enhaust Fipe         RB-88         1           124  |     |                     | _       | -             |
| 167         Shaft         RF-35         1           168         Spring (119)         RB-74         1           169         Plug (1)         RB-75         1           110         Stopper Screw         RF-36         1           111         P-8 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gasket (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-48         1           125  | 165 |                     | _       | 1             |
| 168         Spring (119)         R8-74         1           169         Plug (1)         R8-75         1           110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seart (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stern         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Pipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-486         1           126 <td>106</td> <td>Stupper Ring</td> <td>KB-72</td> <td>1</td>   | 106 | Stupper Ring        | KB-72   | 1             |
| 169         Plug (1)         RB-75         1           110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gasket (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-466         1   | 107 |                     | RF-35   | 1             |
| 110         Stopper Screw         RF-36         1           111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-466         1  | 108 | Spring (119)        | RB-74   | 1             |
| 111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-466         1  | 109 | Plug (1)            | RB-75   | 1             |
| 111         P-9 Back-Up Ring (B.C.)         32A-01         1           112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-466         1  |     |                     | _       |               |
| 112         P-9 O-Ring         RF-38         1           113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-42         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   |     |                     |         |               |
| 113         Valve Seat (2)         RF-39         1           114         P-3 O-Ring         16-36         1           115         Valve Stern         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gasket (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   |     |                     |         |               |
| 114     P-3 O-Ring     16-36     1       115     Valve Stern     RF-40     1       116     Washer     RF-41     1       117     Spring (194)     RF-42     1       118     Adjusting Screw     RF-43     1       119     Lock Nut     R8-84     1       120     Valve Body     RF-44     1       121     M6 X 12 Screw     R8-87     1       122     Copper Gastet (2)     RF-45     2       123     Exhaust Fipe     R8-88     1       124     Retainer     RF-47     1       125     M4 X 4 Screw     RF-48     1       126     Gastet (22)     RF-446     1  |     |                     |         |               |
| 115         Valve Stem         RF-40         1           116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1  |     |                     |         |               |
| 116         Washer         RF-41         1           117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   |     |                     |         |               |
| 117         Spring (194)         RF-42         1           118         Adjusting Screw         RF-43         1           119         Lock Nut         RB-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gashet (2)         RF-45         2           123         Ethaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gashet (22)         RF-446         1  |     |                     |         |               |
| 118         Adjusting Screw         RF-43         1           119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gasket (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   |     |                     |         |               |
| 119         Lock Nut         R8-84         1           120         Valve Body         RF-44         1           121         M6 X 12 Screw         R8-87         1           122         Copper Gashet (2)         RF-45         2           123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   |     |                     | _       |               |
| 120         Valve Body         RF-44         1           121         M6 X 12 Screw         RB-87         1           122         Copper Gasket (2)         RF-45         2           123         Exhaust Fipe         RB-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1  |     |                     | RF-43   | 1             |
| 121     M6 X 12 Screw     R8-87     1       122     Copper Gashet (2)     RF-45     2       123     Exhaust Fipe     R8-88     1       124     Retainer     RF-47     1       125     M4 X 4 Screw     RF-48     1       126     Gasket (22)     RF-446     1   | 119 | Lock Nut            | RB-84   | 1             |
| 122         Copper Gashet (2)         RF-45         2           123         Exhaust Kipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   | 120 | Valve Body          | RF-44   | 1             |
| 122         Copper Gashet (2)         RF-45         2           123         Exhaust Kipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gasket (22)         RF-446         1   | 121 |                     | RB-87   | 1             |
| 123         Exhaust Fipe         R8-88         1           124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gastet (22)         RF-446         1   |     |                     |         |               |
| 124         Retainer         RF-47         1           125         M4 X 4 Screw         RF-48         1           126         Gastet (22)         RF-446         1  |     |                     | _       |               |
| 125 M4 X 4 Screw RF-48 1<br>126 Gastet (22) RF-446 1  |     |                     | _       |               |
| 126 Gasket (22) RF-446 1  |     |                     | _       |               |
|   |     |                     |         |               |
| 127 MEXIII SCIEW   RP-1-UL   1  |     |                     |         |               |
|   | 127 | MEXIII Screw        | HO-1-U1 | 1             |

# TROUBLESHOOTING GUIDE

#### TROUBLESHOOTING GUIDE

- 1. All electrical pumps are designed to operate on 110 Volt AC. All are 2 stage rapid advance. See individual pump specifications for flow ratings.
- 2. Hoses over 50 feet in length can be used but with sacrifice of oil speed flow. Hose lengths of 25' or less are ideal.
- 3. The R14EA is a larger remotely controlled automatic pump with a few more features that the R14EH unit. This unit has an auto mode which when activated runs the unit up to pressure and automatically releases the pressure when 10,000 psi or predetermined pressure is reached and the oil is dumped back to the oil reservoir. This pump is used for production cutting or compressing applications where portability is not a factor.
- 4. When attaching hoses, please be sure all couplers are securely fastened. 90% of problems arise out of a loose coupler connection. If the unit fails to pump or retract, the problem usually lies with the couplers.
- 5. Always keep couplers clean by wiping oil and debris from surfaces before connecting hoses to pump or tool.
- 6. Never move pump by pulling on the electrical cords.
- 7. Occasionally check the fluid level of the pump. See individual pump operating instructions for proper oil level. When adding fluid, always use T-15 or equivalent hydraulic fluid.
- 8. Always open the air breather vent cap on the oil filler port before operating the tool. This will eliminate the problem of a vacuum situation when the oil is pumped from the tank. Always close the air vent when storing to eliminate the problem of oil leakage if the unit is turned over.
- 9. Pressure setting is preset at 10,000 psi but can be changed to lower settings if desired. An in-line gauge (Huskie PG-1) should be used periodically to determine your required operating pressure. Consult factory for proper adjusting procedure.





A **SPARTACO** COMPANY

195 Internationale Blvd Glendale Heights, IL 60139 Phone 800-860-6170 Fax 800-345-3767 www.spartacogroup.com