



Specialised Air Motors and Transmission

TONSON®

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Piston Air Motors Parts List



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Specialised Air Motors & Transmission (SAMT) - incorporating TONSON - was founded in 1966 and provides efficient solutions and equipment to all major industries including mining, chemical, food, paper, plastic, power transmission, manufacturing and pharmaceutical.

Our commitment to you is best service, quick lead times and very competitive prices.

Innovation & Quality

Specialised Air Motors & Transmission is committed to providing clever solutions for all hazardous environments and continues to develop smart ways to meet requirements from all different industries; our products meet CE standards ISO9002, ISO9001 and patents are registered globally including USA, Taiwan and China.

Unlike other conventional methods our products mainly use air instead of electricity as the source of power. This eliminates the chance of electricity shock and fire, which are the most crucial factors for industries involved in chemical, flammable or volatile contents.

Specialised Air Motors & Transmission products include air/electric motors, air/electric mixers and air fans which are engineered to meet the highest standards featuring 100% explosion-proof, low air consumption, light weight, high torque, reversible step less speed control, easy maintenance and various mounting methods. And can be used in very harsh conditions such as humidity, high temperature and flammable environments.

Products & Services

SAMT's other popular products include Pressure Tanks up to 200L (with and without integrated mixer), spray guns, pneumatic double diaphragm pumps, vertical pumps, magic drum carriers, non-spark drum openers, propellers, plus many more exciting and innovative products.

We also have the technical capability and expertise to provide complete power transmission solutions to meet your specific requirements, including full engineering assistance with design, selection and site installation. We also specialise in the supply of all types of Industrial gearboxes including Helical, Worm, Bevel-Helical, Bevel, screw jacks and planetary. All are interchangeable with other internationally recognised brands.

SAMT can also customise any product to suit your specific requirements and will investigate the possibilities of developing new products to satisfy your special specifications.



Features and applications

Piston Air Motor features include:

- 100% Explosion-proof
- Stalling Safety
- Step less Speed Control
- Never Burn Out
- Self-Sealing & Cool Running
- Positive Start
- Mounting Flexibility (Flange, Foot, Hub, IEC, Nema, Custom Mounting Available)
- All Plane Operation
- Toleration of Environment
- High Start Torque
- Instantly Reversible
- Rugged Design
- Intrinsically safe in hazardous environment (ex. Mines, Petrochemical, Volatile atmosphere)
- Modular Design: All motors may be equipped with Gear Reducer, Brake, Hand, Remote, Pendant control as options

Piston Air Motor applications are unlimited including:

- Hoist / Winches
- Pump Drives
- Automation Devices
- Hose Reels
- Conveyor Drives
- Choppers / Grinders
- Turntables
- Mixing Equipment
- Food / Pharmacy Packaging
- Lifting Device
- Mining Equipment



Chromium-plated
Also available
Full Stainless Steel Construction

Air Motors have many Patterns and Mounting to meet different application, such as Dual-Shaft (DS), Air Mixer-reserved. Mounting methods including Flange, Foot, Butterfly, IEC, NEMA, and many special flange plates can be customized.

Also other materials:
Stainless Steel & Chromium-plated.

M1



M1-T
Standard

M1-ET
Chromium
Plated

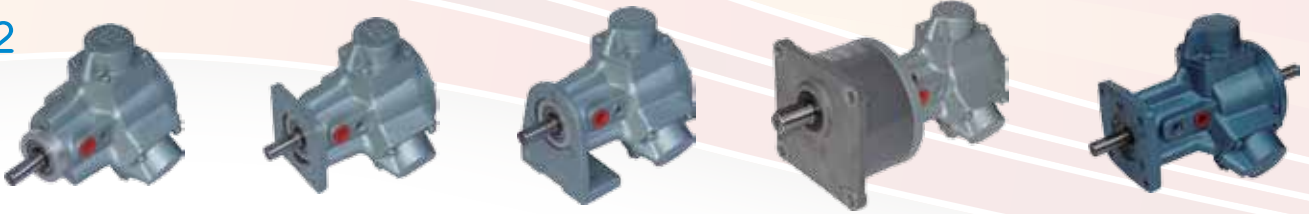
M1-F
Flange

M1-L
Foot

M1-I
Metric

M1-LWG20
w/ Worm Gearbox

M2



M2-T
Standard

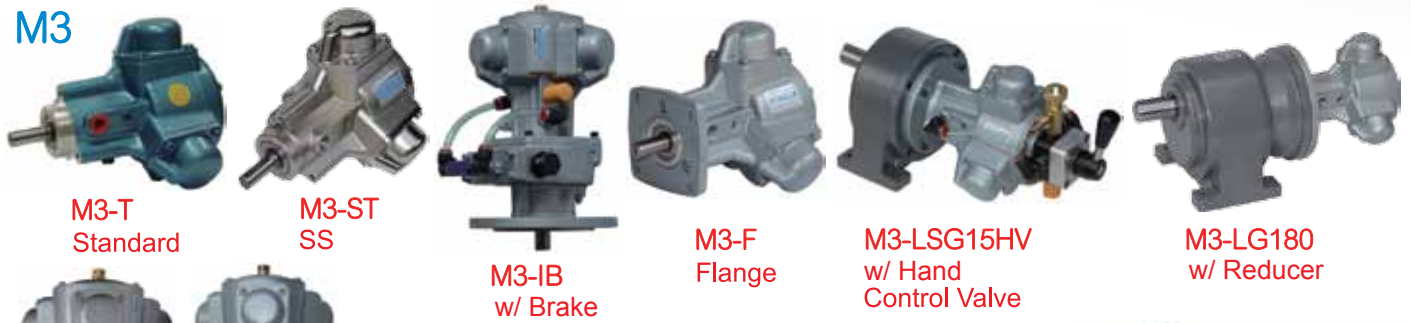
M2-F
Flange

M2-L
Foot

M2-FGS
w/ Compact
Reducer

M2-FDS
Double Shaft

M3



M3-T
Standard

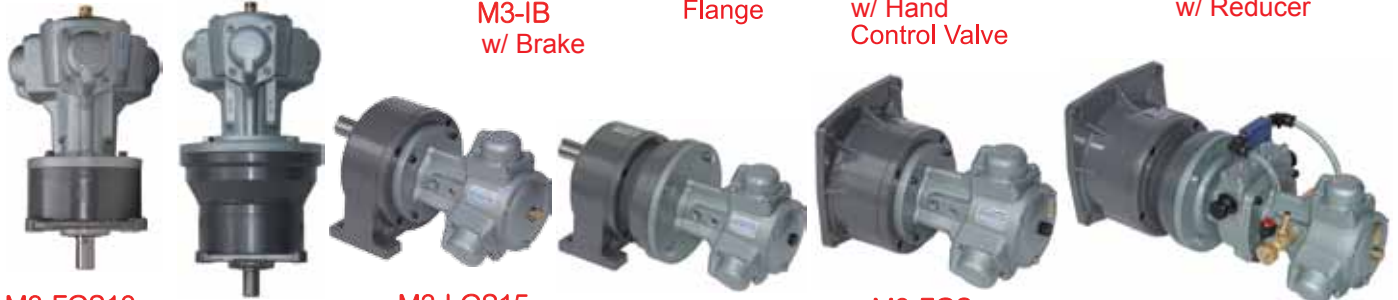
M3-ST
SS

M3-IB
w/ Brake

M3-F
Flange

M3-LSG15HV
w/ Hand
Control Valve

M3-LG180
w/ Reducer



M3-FGS10
w/ Compact
Reducer

M3-FG5
w/ Reducer

M3-LGS15
w/ Compact
Reducer

M3-LG30
w/ Reducer

M3-FGS
w/ Compact
Reducer

M3-FBG
w/ Reducer & Brake

M4



M4-ET
Chromium
Plated

M4-T
Standard

M4-F
Flange

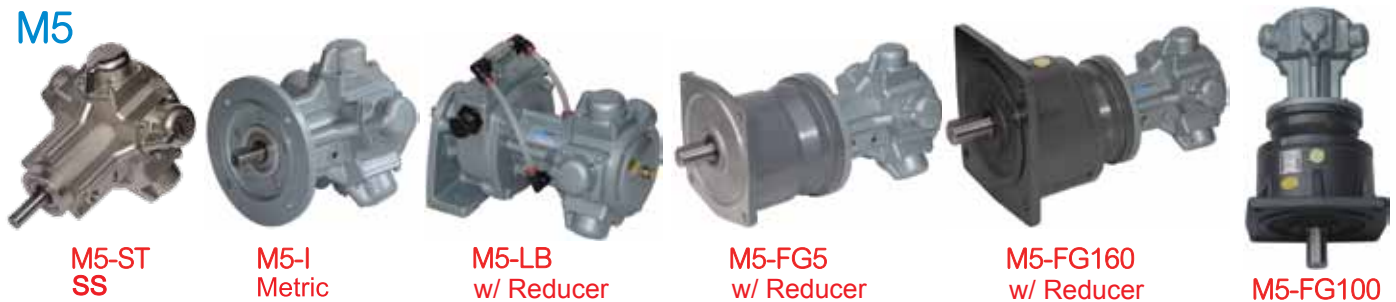
M4-I
Metric

M4-L
Foot

M4-LWG60
w/ Underdriven
Worm Gearbox

M4-FG60
w/ Reducer

M5



M5-ST
SS

M5-I
Metric

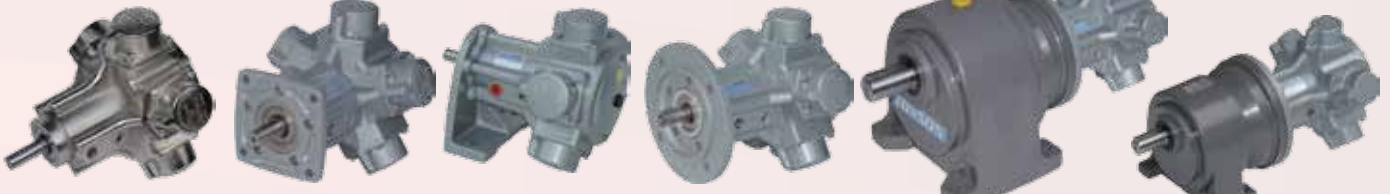
M5-LB
w/ Reducer

M5-FG5
w/ Reducer

M5-FG160
w/ Reducer

M5-FG100

M6



M6-ET
Chromium
Plated

M6-F
Flange

M6-L
Foot

M6-I
Metric

M6-LG200
w/ Reducer

M6-LG5
w/ Reducer

| Series | Gear Ratio | Performance at Maximum Speed (at 6 bar) | | | | | | Max. Torque | | | |
|-------------|------------|-----------------------------------------|------|--------|-------|-------|-----------|-------------|-------|--------|-------|
| | | Power | | Torque | | Speed | Air Comp. | | Speed | Torque | |
| | | HP | kW | N-m | lb-in | RPM | l/min | CFM | RPM | N-m | lb-in |
| M1 (010) | 1:1 | 0.10 | 0.07 | 0.637 | 5.64 | 1100 | 200 | 7 | 220 | 1.12 | 9.9 |
| | 5:1 | | | 2.84 | 25.1 | 220 | | | 44 | 4.99 | 44.2 |
| | 10:1 | | | 5.69 | 50.4 | 110 | | | 22 | 10 | 88.5 |
| | 15:1 | | | 8.53 | 75.5 | 73.3 | | | 14.7 | 15 | 133 |
| | 20:1 | | | 11.5 | 102 | 55 | | | 11 | 20.2 | 179 |
| | 30:1 | | | 16.4 | 145 | 36.7 | | | 7.3 | 28.9 | 256 |
| M2 | 1:1 | 0.16 | 0.12 | 0.84 | 7.43 | 1000 | 211 | 7 | 200 | 1.5 | 13.3 |
| | 5:1 | 0.12 | 0.09 | 3.61 | 32.0 | 200 | | | 40 | 6.4 | 56.6 |
| | 10:1 | | | 7.22 | 63.9 | 100 | | | 20 | 12.7 | 112 |
| | 15:1 | | | 10.8 | 95.9 | 66.7 | | | 13.3 | 19.1 | 169 |
| | 20:1 | | | 14.4 | 128 | 50 | | | 10 | 25.4 | 225 |
| | 30:1 | | | 21.7 | 192 | 33.3 | | | 6.7 | 38.1 | 337 |
| M3 (015) | 1:1 | | | 0.25 | 0.19 | 1.37 | 12.1 | 900 | 260 | 9 | 180 |
| | 5:1 | 5.88 | 52.0 | | | 180 | 36 | 10.8 | | | 95.6 |
| | 10:1 | 11.8 | 104 | | | 90 | 18 | 21.6 | | | 191 |
| | 15:1 | 17.7 | 157 | | | 60 | 12 | 32.4 | | | 287 |
| | 20:1 | 23.5 | 208 | | | 45 | 9 | 42.8 | | | 379 |
| | 30:1 | 35.3 | 312 | | | 30 | 6 | 64.2 | | | 568 |
| | 40:1 | 47.1 | 417 | | | 22.5 | 4.5 | 85.7 | | | 759 |
| | 50:1 | 58.8 | 520 | | | 18 | 3.6 | 107 | | | 947 |
| | 60:1 | 70.6 | 625 | | | 15 | 3 | 129 | | | 1137 |
| | 80:1 | 93.2 | 825 | | | 11.2 | 2.2 | 170 | | | 1501 |
| | 100:1 | 118 | 1044 | | | 9 | 1.8 | 214 | | | 1891 |
| | 120:1 | 137 | 1213 | | | 7.5 | 1.5 | 248 | | | 2195 |
| | 160:1 | 176 | 1558 | | | 5.6 | 1.1 | 319 | | | 2820 |
| | 200:1 | 233 | 2062 | | | 4.5 | 0.9 | 422 | | | 3732 |
| M4 | 1:1 | 0.33 | 0.25 | 2.16 | 19.1 | 850 | 267 | 9 | 170 | 3.95 | 35.0 |
| | 5:1 | 0.22 | 0.17 | 9.29 | 82.2 | 170 | | | 34 | 17.0 | 150 |
| | 10:1 | | | 18.6 | 164 | 85 | | | 17 | 34.0 | 301 |
| | 15:1 | | | 27.9 | 247 | 56.7 | | | 11.3 | 51.0 | 451 |
| | 20:1 | | | 37.2 | 329 | 42.5 | | | 8.5 | 67.9 | 601 |
| | 30:1 | | | 55.7 | 493 | 28.3 | | | 5.7 | 102 | 902 |
| M5 (030) | 1:1 | | | 0.5 | 0.37 | 2.94 | 26.0 | 750 | 400 | 14 | 150 |
| | 5:1 | 12.7 | 112 | | | 150 | 30 | 23.5 | | | 208 |
| | 10:1 | 26.5 | 235 | | | 75 | 15 | 49.0 | | | 434 |
| | 15:1 | 39.2 | 347 | | | 50 | 10 | 72.1 | | | 638 |
| | 20:1 | 53 | 469 | | | 37.5 | 7.5 | 97.5 | | | 863 |
| | 30:1 | 78.5 | 695 | | | 25 | 5 | 144 | | | 1278 |
| | 40:1 | 106 | 938 | | | 18.7 | 3.7 | 195 | | | 1726 |
| | 50:1 | 132 | 1168 | | | 15 | 3 | 243 | | | 2150 |
| | 60:1 | 157 | 1390 | | | 12.5 | 2.5 | 289 | | | 2557 |
| | 80:1 | 203 | 1797 | | | 9.3 | 1.9 | 374 | | | 3306 |
| | 100:1 | 250 | 2213 | | | 7.5 | 1.5 | 463 | | | 4093 |
| | 120:1 | 300 | 2655 | | | 6.2 | 1.2 | 555 | | | 4912 |
| | 160:1 | 396 | 3505 | | | 4.6 | 0.92 | 733 | | | 6484 |
| | 200:1 | 500 | 4425 | | | 3.7 | 0.74 | 925 | | | 8187 |
| M6 | 1:1 | 0.75 | 0.56 | 4.40 | 38.9 | 700 | 507 | 18 | 140 | 8.1 | 71.7 |
| | 5:1 | 0.43 | 0.32 | 18.9 | 167 | 140 | | | 28 | 34.8 | 308 |
| | 10:1 | | | 37.8 | 335 | 70 | | | 14 | 69.6 | 616 |
| | 15:1 | | | 56.8 | 502 | 46.7 | | | 9.3 | 104 | 919 |
| | 20:1 | | | 75.7 | 670 | 35 | | | 7 | 138 | 1226 |
| | 30:1 | | | 114 | 1005 | 23.3 | | | 4.7 | 208 | 1839 |
| M7 (507) | 1:1 | | | 1 | 0.75 | 28 | 248 | 320 | 985 | 35 | 60 |
| | 3:1 | 0.89 | 0.66 | 65 | 575 | 100 | 20 | 116 | | | 1030 |
| | 5:1 | | | 110 | 974 | 64 | 12.8 | 197 | | | 1743 |
| | 10:1 | | | 212 | 1876 | 30 | 6 | 379 | | | 3359 |
| | 20:1 | | | 423 | 3744 | 16 | 3.2 | 757 | | | 6702 |
| | 20:1 | | | 850 | 7523 | 8 | 1.6 | 1522 | | | 13466 |
| M9 (403) | 1:1 | | | 0.35 | 0.26 | 1.67 | 14.8 | 1500 | 450 | 16 | 300 |
| | 5:1 | 0.31 | 0.23 | 6.86 | 60.7 | 300 | 60 | 12.2 | | | 108 |
| | 10:1 | | | 13.7 | 121 | 150 | 30 | 24.4 | | | 216 |
| | 15:1 | | | 20.6 | 182 | 100 | 20 | 36.7 | | | 325 |
| | 20:1 | | | 27.5 | 243 | 75 | 15 | 49.0 | | | 433 |
| | 30:1 | | | 41.2 | 365 | 50 | 10 | 73.3 | | | 649 |



M6-LBG20
w/ Reducer & Brake

M7



M7-I
Metric

M7-L
Foot



M7-FG30
Flange w/ Reducer



M7-LBG
Foot w/ Reducer & Brake

M9



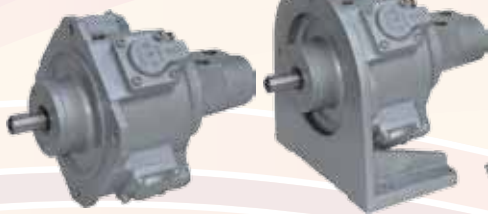
M9-I
Metric

M10



M10-L
Foot

M11



M11-F
Flange



M11-L
Foot



M11-LBG30
w/ Reducer
& Brake



M11-FB
w/ Brake

M12



M12-F Flange



M12-I Metric



M12-FG10
Flange w/ Reducer



M12-LG5
Foot w/ Reducer

M13



M13-F
Flange

M13S



M13S-F Flange

| Series | Gear Ratio | Performance at Maximum Speed (at 6 bar) | | | | | | Max. Torque | | | |
|---------------|------------|-----------------------------------------|------|--------|-------|-------|-----------|-------------|-------|--------|-------|
| | | Power | | Torque | | Speed | Air Comp. | | Speed | Torque | |
| | | HP | kW | N·m | lb·in | RPM | l/min | CFM | RPM | N·m | lb·in |
| M10 (404) | 1:1 | 0.77 | 0.57 | 3.63 | 32.1 | 1500 | 950 | 34 | 300 | 6.5 | 57.5 |
| | 5:1 | 0.69 | 0.51 | 15.7 | 139 | 300 | | | 60 | 28.1 | 249 |
| | 10:1 | | | 31.4 | 278 | 150 | | | 30 | 56.2 | 497 |
| | 15:1 | | | 47.1 | 417 | 96 | | | 19.2 | 84.3 | 746 |
| | 20:1 | | | 62.8 | 556 | 72 | | | 14.4 | 112 | 995 |
| 30:1 | 94.1 | 833 | 48 | 9.6 | 168 | 1491 | | | | | |
| M11 (405) | 1:1 | 1.36 | 1.00 | 6.57 | 58.1 | 1450 | 1750 | 62 | 290 | 11.5 | 102 |
| | 5:1 | 1.22 | 0.91 | 29.4 | 260 | 290 | | | 58 | 51.5 | 455 |
| | 10:1 | | | 58.8 | 520 | 145 | | | 29 | 103 | 911 |
| | 15:1 | | | 88.3 | 782 | 96 | | | 19.2 | 155 | 1368 |
| | 20:1 | | | 118 | 1044 | 72 | | | 14.4 | 207 | 1828 |
| 30:1 | 177 | 1567 | 48 | 9.6 | 310 | 2742 | | | | | |
| M12 (406) | 1:1 | 3.31 | 2.47 | 17.5 | 155 | 1350 | 3700 | 131 | 270 | 31 | 274 |
| | 5:1 | 3 | 2.24 | 78.5 | 695 | 270 | | | 54 | 139 | 1231 |
| | 10:1 | | | 157 | 1390 | 135 | | | 27 | 278 | 2462 |
| | 15:1 | | | 235 | 2080 | 90 | | | 18 | 416 | 3684 |
| | 20:1 | | | 314 | 2779 | 67.5 | | | 13.5 | 556 | 4923 |
| | 30:1 | | | 471 | 4169 | 45 | | | 9 | 834 | 7385 |
| | 40:1 | | | 602 | 5328 | 33.8 | | | 6.8 | 1066 | 9438 |
| | 60:1 | | | 903 | 7992 | 22.5 | | | 4.5 | 1600 | 14158 |
| | 100:1 | | | 1505 | 13320 | 13.5 | | | 2.7 | 2666 | 23596 |
| | 120:1 | | | 1806 | 15984 | 11.3 | | | 2.3 | 3199 | 28315 |
| 160:1 | 2408 | 21313 | 8.44 | 1.7 | 4266 | 37754 | | | | | |
| 200:1 | 3010 | 26641 | 6.75 | 1.4 | 5332 | 47192 | | | | | |
| M13 (506) | 1:1 | 4.2 | 3.09 | 21.6 | 191 | 1350 | 4200 | 148 | 270 | 39 | 345 |
| | 5:1 | 3.8 | 2.83 | 98.1 | 868 | 270 | | | 54 | 177 | 1563 |
| | 10:1 | | | 196 | 1735 | 135 | | | 27 | 353 | 3123 |
| | 15:1 | | | 294 | 2602 | 90 | | | 18 | 529 | 4684 |
| | 20:1 | | | 392 | 3469 | 67.5 | | | 13.5 | 706 | 6245 |
| | 30:1 | | | 583 | 5160 | 45 | | | 9 | 1049 | 9288 |
| | 40:1 | | | 745 | 6594 | 33.8 | | | 6.8 | 1341 | 11869 |
| | 60:1 | | | 1115 | 9865 | 22.5 | | | 4.5 | 2006 | 17756 |
| | 100:1 | | | 1858 | 16441 | 13.5 | | | 2.7 | 3344 | 29594 |
| | 120:1 | | | 2229 | 19729 | 11.3 | | | 2.3 | 4012 | 35513 |
| 160:1 | 2972 | 26306 | 8.4 | 1.7 | 5350 | 47350 | | | | | |
| 200:1 | 3715 | 32882 | 6.8 | 1.4 | 6687 | 59188 | | | | | |
| M13S (110) | 1:1 | 2.28 | 1.7 | 8.10 | 71.7 | 2000 | 1920 | 68 | 400 | 12 | 106 |
| | 3:1 | 2.05 | 1.53 | 21.9 | 194 | 666 | | | 133 | 32.4 | 287 |
| | 5:1 | | | 36.5 | 323 | 400 | | | 80 | 54 | 478 |
| | 10:1 | | | 72.9 | 645 | 200 | | | 40 | 108 | 956 |
| | 15:1 | | | 109 | 968 | 133 | | | 26.6 | 162 | 1434 |
| | 20:1 | | | 146 | 1290 | 100 | | | 20 | 216 | 1912 |
| | 30:1 | | | 219 | 1936 | 66 | | | 13.2 | 324 | 2868 |
| | 40:1 | | | 292 | 2581 | 50 | | | 10 | 432 | 3824 |
| 60:1 | 413 | 3656 | 33 | 6.6 | 612 | 5417 | | | | | |
| 80:1 | 551 | 4875 | 25 | 5 | 816 | 7222 | | | | | |



M13S-L Foot



M13S-I IEC

M14



M13S-FBHCV



M14-F Flange



M14-I IEC



M14-L Foot



M14-FBG40
w/ Reducer & Brake

M15



M15-F
Flange



M15-IBRCV
w/ Brake



M15-I
Metric



M15-L
Foot



M15-LHCV
w/ Hand Control Valve

M16



M16-I IEC



M16-F
Flange



M16-L Foot



M16-N Imperial



M16-FBHCV
w/ HCV & Brake



M16-FG
w/ Reducer



M17-FHCV
w/ Hand Control Valve



M17-FBRCV
w/ Remote Control
Valve & Brake



M18-IRCV
IEC w/ Remote
Control Valve



M18 FBHCV
w/ Hand Control
Valve & Brake

| Series | Gear Ratio | Performance at Maximum Speed (at 6 bar) | | | | | | | Max. Torque | | |
|--------------|------------|-----------------------------------------|------|--------|-------|-------|-----------|-------|-------------|--------|-------|
| | | Power | | Torque | | Speed | Air Comp. | | Speed | Torque | |
| | | HP | kW | N·m | lb·in | RPM | l/min | CFM | RPM | N·m | lb·in |
| M14 (210) | 1:1 | 5.36 | 4 | 20 | 177 | 1900 | 5880 | 208 | 380 | 34 | 301 |
| | 3:1 | 4.80 | 3.58 | 54 | 478 | 633 | | | 126.7 | 94.5 | 836 |
| | 5:1 | | | 90 | 797 | 380 | | | 76 | 158 | 1394 |
| | 10:1 | | | 180 | 1593 | 190 | | | 38 | 315 | 2788 |
| | 15:1 | | | 270 | 2390 | 127 | | | 25.3 | 473 | 4182 |
| | 20:1 | | | 360 | 3186 | 95 | | | 19 | 630 | 5576 |
| | 30:1 | | | 540 | 4779 | 63.3 | | | 12.7 | 945 | 8364 |
| | 40:1 | | | 720 | 6373 | 47.5 | | | 9.5 | 1260 | 11152 |
| | 60:1 | | | 1080 | 9559 | 31.7 | | | 6.3 | 1890 | 16728 |
| 80:1 | 1440 | | | 12745 | 23.8 | 4.75 | 2520 | 22304 | | | |
| M15 (310) | 1:1 | 10.1 | 7.5 | 42 | 372 | 1800 | 9840 | 347 | 360 | 70 | 620 |
| | 3:1 | 9.55 | 7.12 | 113 | 1004 | 647 | | | 129 | 189 | 1673 |
| | 5:1 | | | 189 | 1673 | 358 | | | 71.6 | 315 | 2788 |
| | 10:1 | | | 378 | 3346 | 203 | | | 40.6 | 630 | 5576 |
| | 15:1 | | | 567 | 5018 | 136 | | | 27.2 | 945 | 8364 |
| | 20:1 | | | 756 | 6691 | 86 | | | 17.2 | 1260 | 11152 |
| | 30:1 | | | 1134 | 10037 | 57 | | | 11.4 | 1890 | 16728 |
| | 40:1 | | | 1512 | 13382 | 45 | | | 9 | 2520 | 22304 |
| | 50:1 | | | 1890 | 16728 | 36 | | | 7.2 | 3150 | 27880 |
| 60:1 | 2142 | | | 18958 | 32 | 6.4 | 3570 | 31597 | | | |
| 80:1 | 2856 | 25278 | 21 | 4.2 | 4760 | 42130 | | | | | |
| M16 (410) | 1:1 | 18.8 | 14 | 85 | 752 | 1600 | 15600 | 551 | 320 | 140 | 1239 |
| | 3:1 | 13 | 9.70 | 227 | 2009 | 533 | | | 106.7 | 374 | 3308 |
| | 5:1 | | | 378 | 3348 | 320 | | | 64 | 623 | 5514 |
| | 10:1 | | | 757 | 6696 | 160 | | | 32 | 1246 | 11028 |
| | 15:1 | | | 1135 | 10043 | 107 | | | 21.3 | 1869 | 16542 |
| | 20:1 | | | 1513 | 13391 | 80 | | | 16 | 2492 | 22056 |
| | 30:1 | | | 2270 | 20087 | 53.3 | | | 10.7 | 3738 | 33084 |
| | 40:1 | | | 3026 | 26782 | 40 | | | 8 | 4984 | 44112 |
| | 60:1 | | | 4539 | 40174 | 26.7 | | | 5.3 | 7476 | 66168 |
| M17 (510) | 1:1 | | | 21.7 | 16.2 | 140 | 1239 | 1100 | 19810 | 700 | 220 |
| | 3:1 | 19 | 14.2 | 374 | 3308 | 367 | 73.3 | 627 | | | 5553 |
| | 5:1 | | | 623 | 5514 | 220 | 44 | 1046 | | | 9256 |
| | 10:1 | | | 1246 | 11028 | 110 | 22 | 2092 | | | 18511 |
| | 20:1 | | | 2464 | 21808 | 55 | 11 | 4136 | | | 36607 |
| | 30:1 | | | 3696 | 32712 | 36.7 | 7.3 | 6204 | | | 54910 |
| 40:1 | 4928 | | | 43616 | 27.5 | 5.5 | 8272 | 73213 | | | |
| M18 (610) | 1:1 | 31.2 | 23.3 | 155 | 1372 | 1500 | 22500 | 795 | 300 | 235 | 2080 |
| | 3:1 | 28.7 | 21.4 | 414 | 3663 | 500 | | | 100 | 627 | 1722 |
| | 5:1 | | | 690 | 6105 | 300 | | | 60 | 1046 | 1935 |
| | 10:1 | | | 1380 | 12210 | 150 | | | 30 | 2092 | 3617 |
| | 20:1 | | | 2728 | 24145 | 75 | | | 15 | 4136 | 8367 |
| | 30:1 | | | 4092 | 36217 | 50 | | | 10 | 6204 | 9612 |
| 40:1 | 5456 | | | 48290 | 37.5 | 7.5 | 8272 | 10543 | | | |

Control Vales



HV1 Mini Reverse Control

HV2 Reverse Control

HV3 Reverse Control

HV4 Reverse Control

HCV Hand Control Valve

RCV Remote Control Valve

Pressure Gauge

Air Regulator

APPLICATION

| Model | Piston Air Motor | | | | | | | | | | | | | | | | | |
|------------------|------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M9 | M10 | M11 | M12 | M13 | M13S | M14 | M15 | M16 | M17 | M18 |
| HV1 Mini (1/4") | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | |
| HV2(1/4") | | | | | | | | ● | | | | | | | | | | |
| HV3(1/2") | | | | | | | ● | | ● | ● | | | | | | | | |
| HV4(1") | | | | | | | | | | | ● | ● | | | | | | |
| HCV1(RCV1)1/2" | | | | | | | | | | | | | ● | | | | | |
| HCV2(RCV2)3/4" | | | | | | | | | | | | | | ● | | | | |
| HCV3(RCV3)1" | | | | | | | | | | | | | | | ● | | | |
| HCV4(RCV4)1-1/4" | | | | | | | | | | | | | | | | ● | | |
| HCV5(RCV5)1-1/2" | | | | | | | | | | | | | | | | | ● | |
| HCV6(RCV6)2" | | | | | | | | | | | | | | | | | | ● |

● Standard
★ Better Performance

Silencer



| Model | SC2 | TC1 | TC2S | TC3 | TC4 | MF1 | MF3 | MF5 | MF7 | MF9 | MF11 | NM1 | NM2 | NM3 | SM1 | SM2 | SP1 | SP2 | SP2L | SP3 | SP4 | PL1 | PL2 | PL3 | PL4 | PL5 | PL6 |
|-------------|--------------|--------------------------|--------|--------|-----|-----------------------------------|------|------|-----|--------|------|----------------------|------|-------------------|------|---------------------|------|------|------|-----------------------------------------------------|------|------|------|------|------|------|-----|
| Caliber(PT) | 2" | 1" | 1-1/2" | 1-1/2" | 2" | 3/8" | 1/2" | 3/4" | 1" | 1-1/2" | 2" | 1/8" | 1/4" | 1/2" | 1/4" | 1/2" | 1/8" | 1/4" | 1/4" | 3/8" | 1/2" | 1/8" | 1/4" | 3/8" | 1/2" | 3/4" | 1" |
| Dia. O | 86 | 100 | 70 | 100 | 100 | 80 | 90 | 100 | 112 | 132 | 150 | 48 | 76 | 78 | 40.5 | 65 | 16 | 16 | 20 | 26 | 28 | 12 | 19 | 20 | 24 | 40 | 49 |
| Height mm | 256 | 202 | 164 | 217 | 211 | 129 | 147 | 171 | 195 | 259 | 312 | 48 | 58 | 107 | 50 | 80 | 34 | 37 | 62 | 67 | 70 | 30 | 42 | 57 | 55 | 113 | 112 |
| Material | Carbon Steel | Filter:Fiber Shell:Steel | | | | Filter:A5052P.SPCC Shell:PC.A2011 | | | | | | Adsorb Active Carbon | | Industrial Cotton | | Forming Resin (5µm) | | | | Filter: Plastic Particle Shell: Engineering Plastic | | | | | | | |

FRL (Filter, Regulator, and Lubricator)



| Model | Piston Air Motor | | | | | | | | | | | | | | | | | | Caliber | Mass (kg) | | | | | | | |
|-------------|-------------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|---------|-----------|--|--|--|--|--|--|--|
| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M9 | M10 | M11 | M12 | M13 | M13S | M14 | M15 | M16 | M17 | M18 | | | | | | | | | |
| FRL1/4 Mini | FOR TONSON AIR FAN ONLY | | | | | | | | | | | | | | | | | | 1/4" | 0.2 | | | | | | | |
| FRL1/4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | | |
| FRL1/2 | | | | | | | | ● | | ● | ● | | | ● | | | | | | | | | | | | | |
| FRL1 | | | | | | | | | | | | ● | ● | | ★ | ● | | | | | | | | | | | |
| FRL1-1/4 | | | | | | | | | | | | | | | | ★ | ● | | | | | | | | | | |
| FRL2 | | | | | | | | | | | | | | | | | ★ | ● | ● | ● | | | | | | | |

Temperature Range: -5~60°C
Maxx Pressure: 9.5 (kgf/cm²)

Pressure Range: 0.5~8.5 (kgf/cm²)
Lubrication Recommended: ISO VG or Equivalent

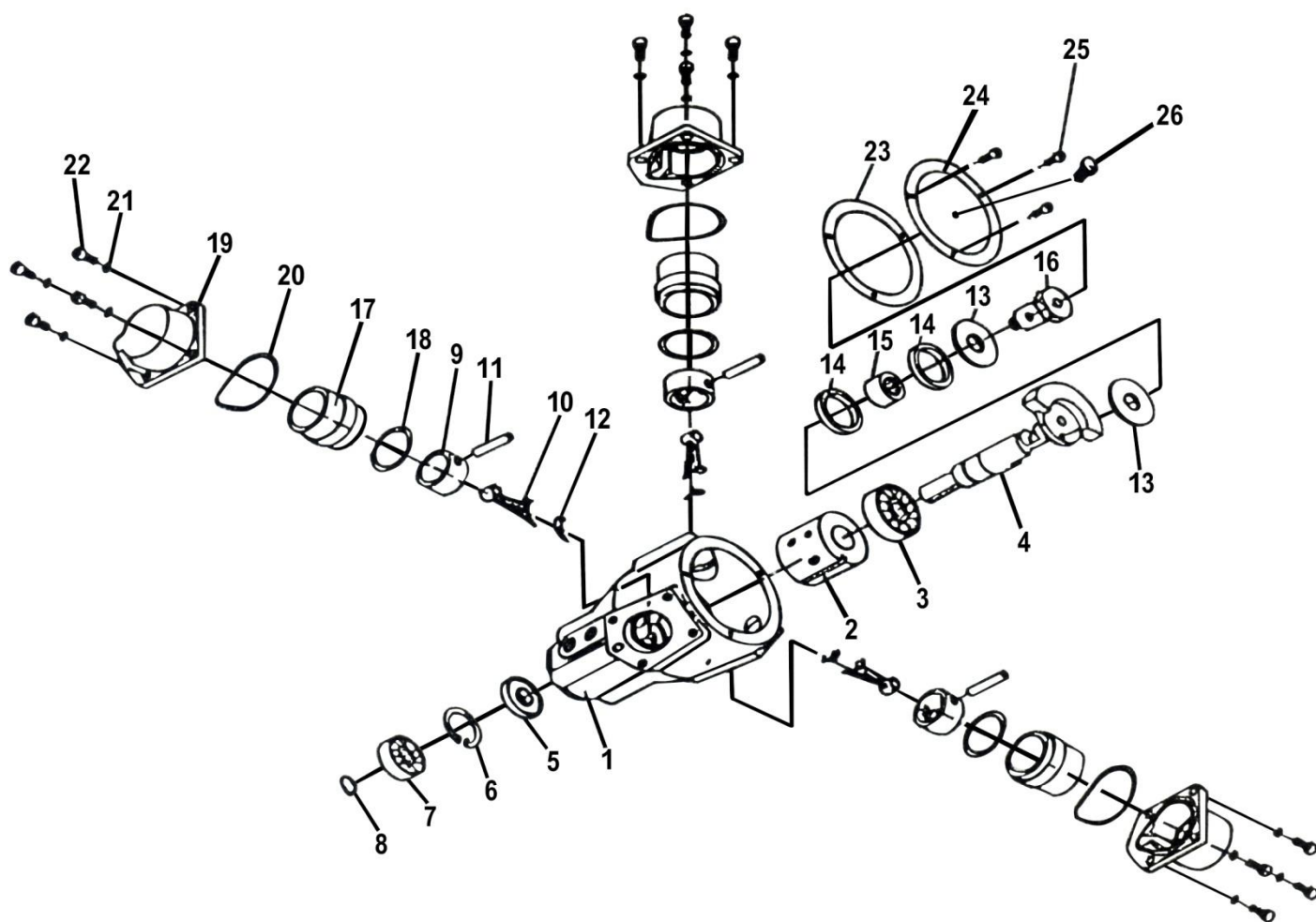
● Standard
★ Better Performance

| Model | FRL1/4Mini | FRL1/4 & FRL1/2 | SS1/4 | FRL1 | FRL2 |
|---------------|------------|-----------------|-------------|-----------|----------|
| Dimension(cm) | 9x4.5x17.5 | 16x7x23.5 | 11.5x7x24.5 | 17.8x7x28 | 65x16x72 |

FRL (Filter, Regulator, and Lubricator) are recommendd to improve air motor performance and provide longer life.

Working Fluid: Compressed Air Operating Pressure: 6kg/cm² Max. Operating Pressure: 7kg/cm² Ambient Temperature: -10 ~+120°C
Air Motors are designed to operate by compressed air and to be used with filter, regulator and lubricator to improve performance and provide longer life. Users should be responsible for determining suitable of the product for intended use and assuming all risk and liability whatsoever in connection therewith.

Parts List - M1 Series



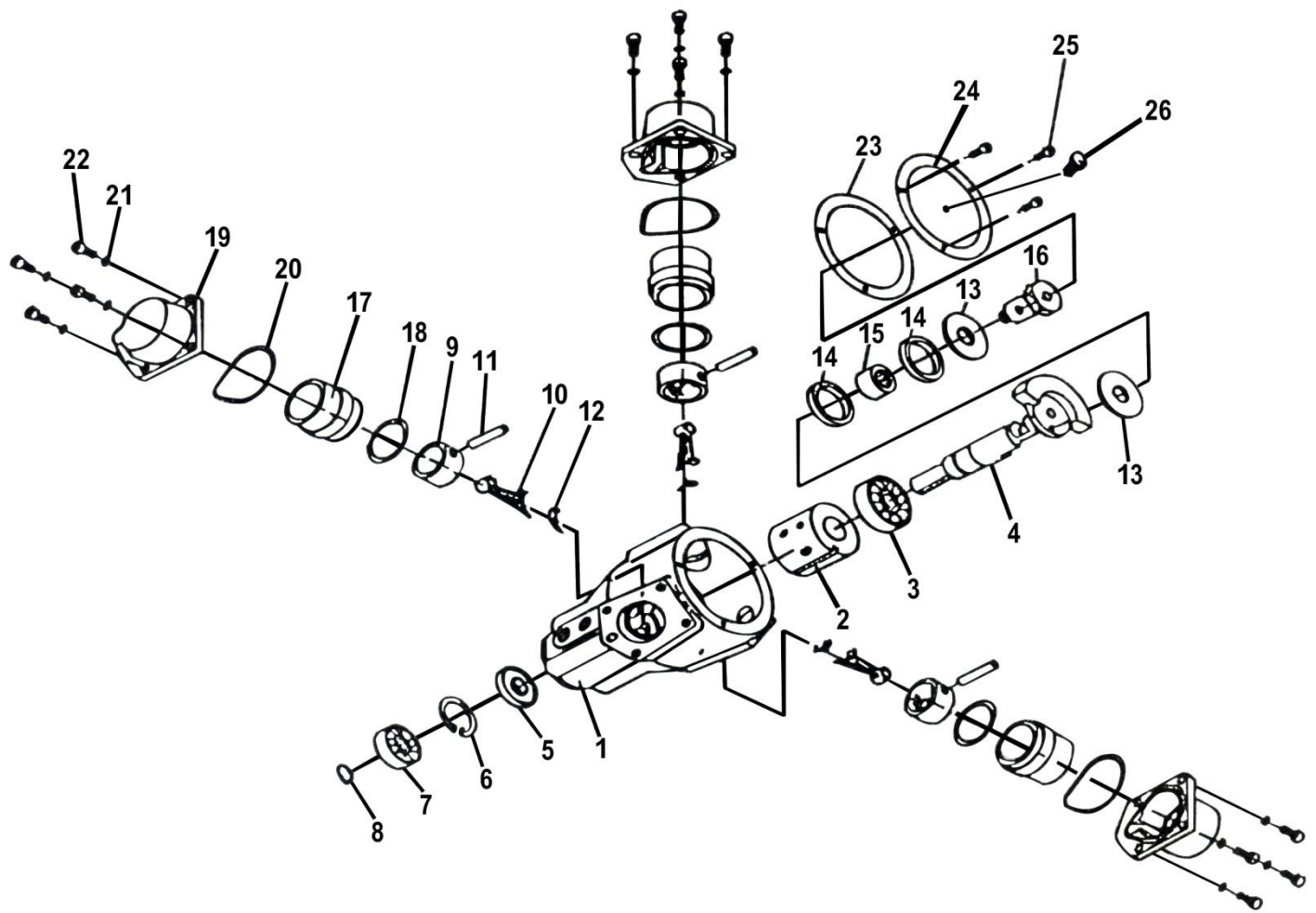
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 7 | Bearing | 1 | 17 | Sleeve | 3 | 27 | Flange type | 1 |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | 28 | Foot type | 1 |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | 29 | Silencer | 1 |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

Parts List - M2 Series



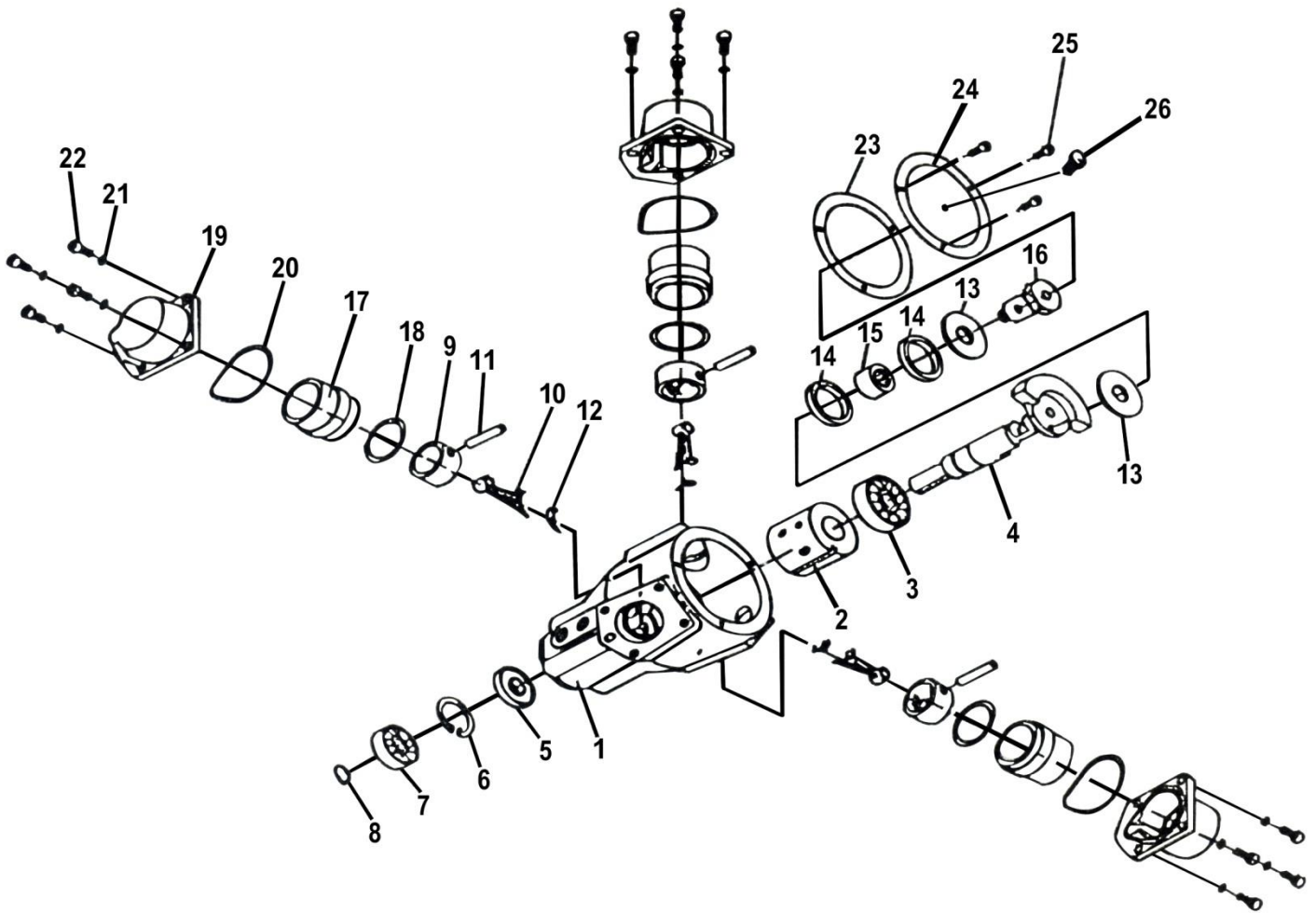
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 7 | Bearing | 1 | 17 | Sleeve | 3 | | | |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | | | |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | | | |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

Part List - M3 Series



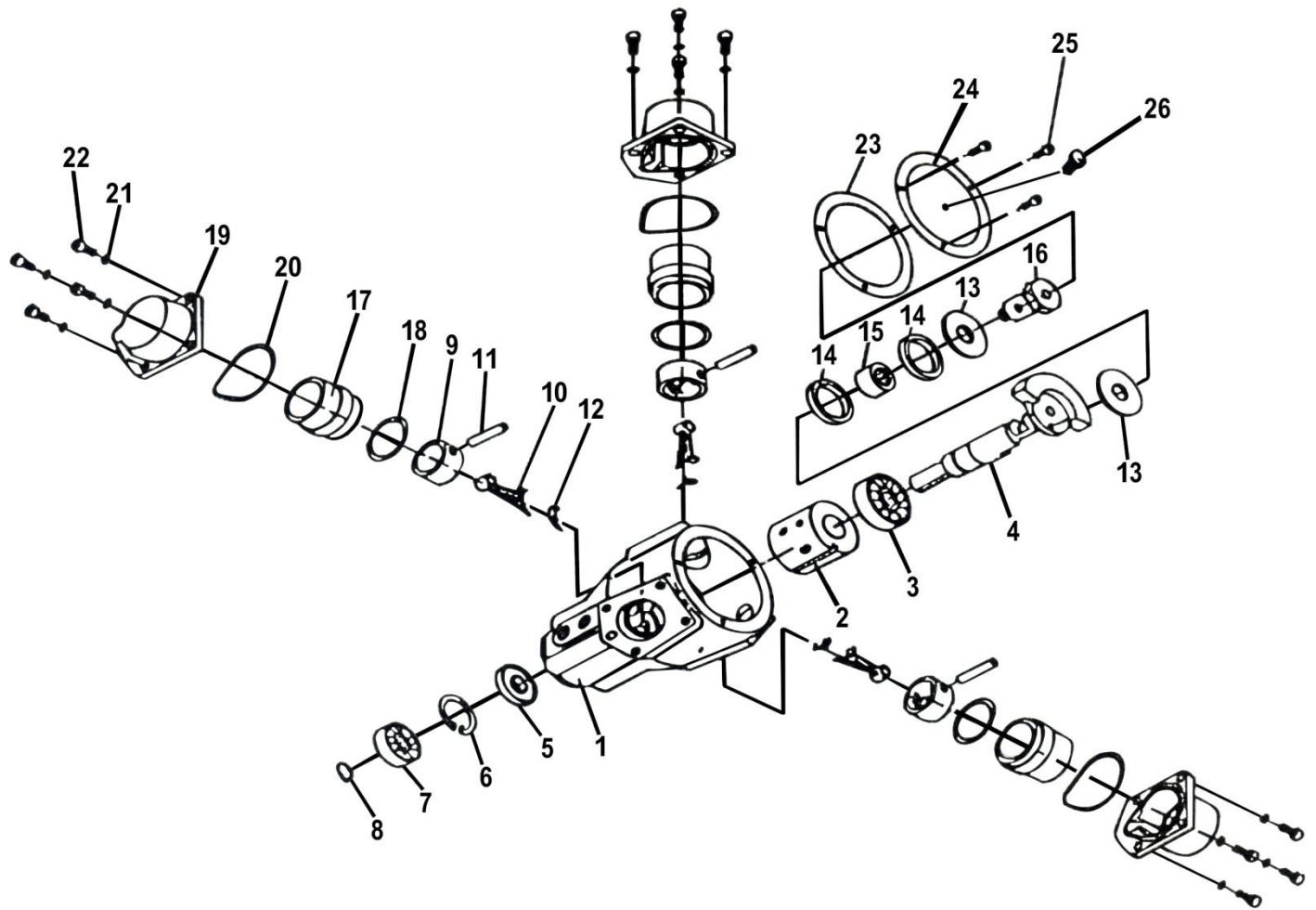
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 7 | Bearing | 1 | 17 | Sleeve | 3 | | | |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | | | |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | | | |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

Parts List - M4 Series



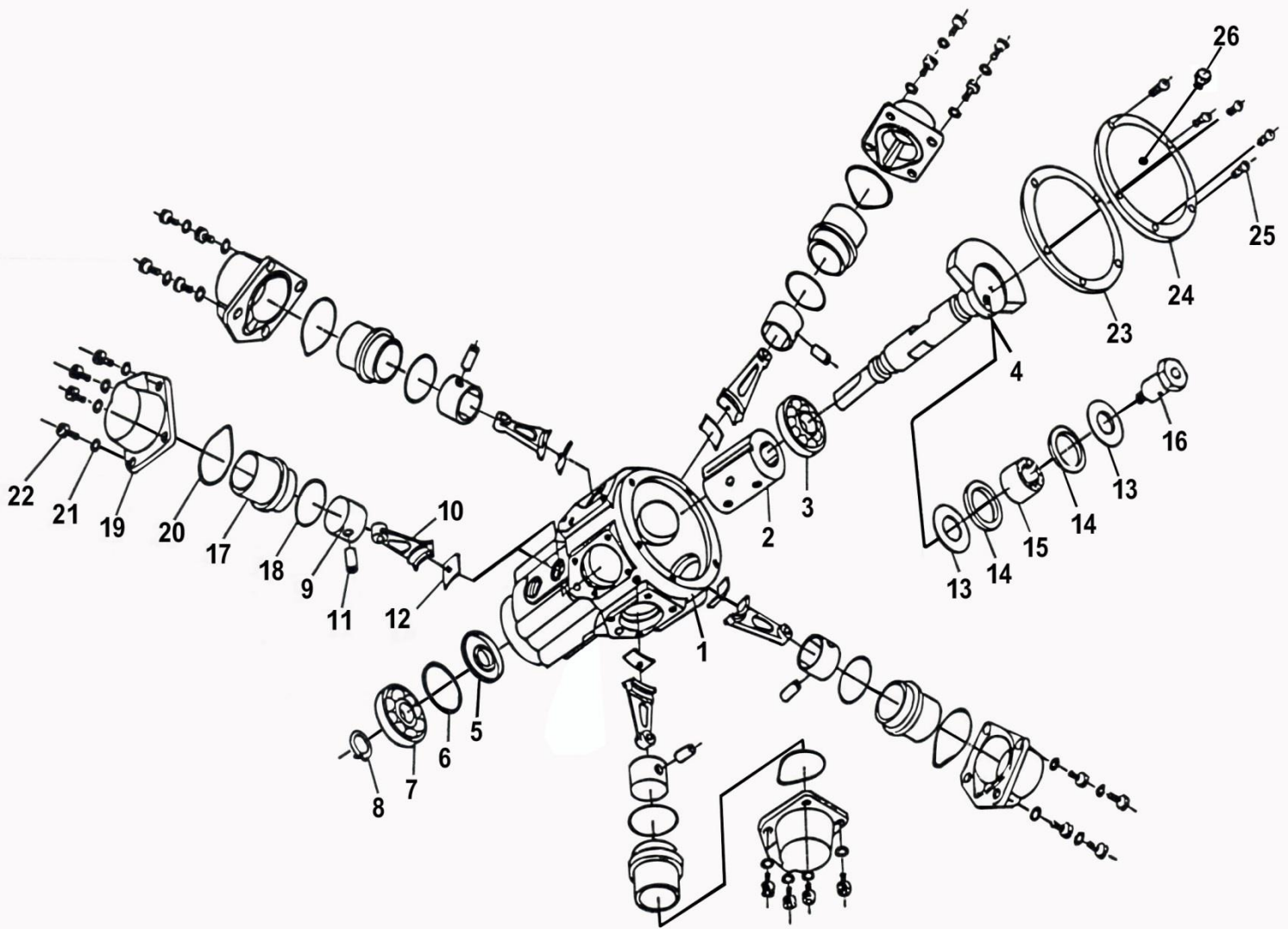
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 7 | Bearing | 1 | 17 | Sleeve | 3 | | | |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | | | |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | | | |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

Parts List - M5 Series



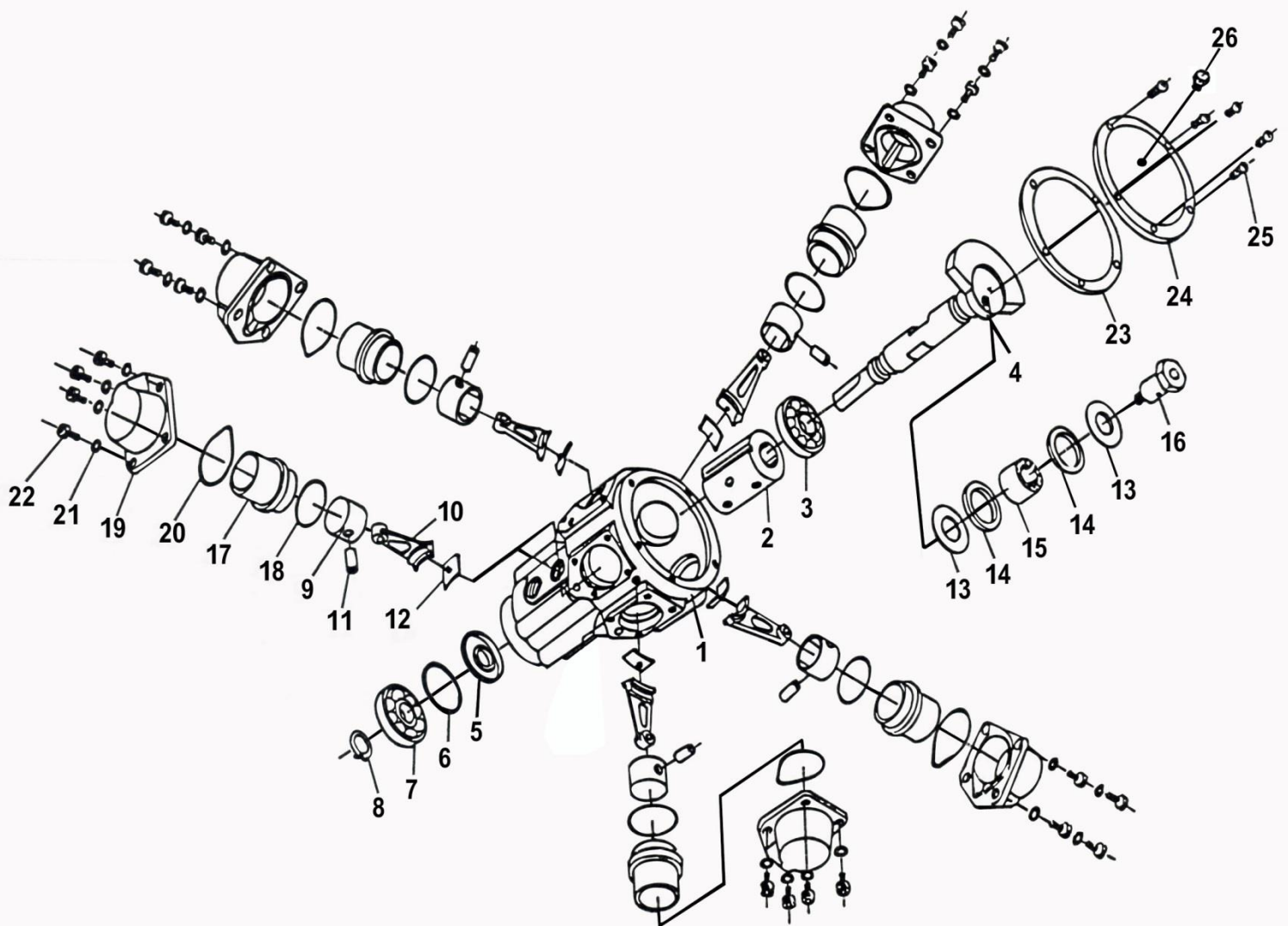
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 5 | Bearing | 1 | 17 | Sleeve | 3 | 27 | Foot type | 1 |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | 28 | Flange type | 1 |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | 29 | Silencer | 1 |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

Parts List - M6 Series



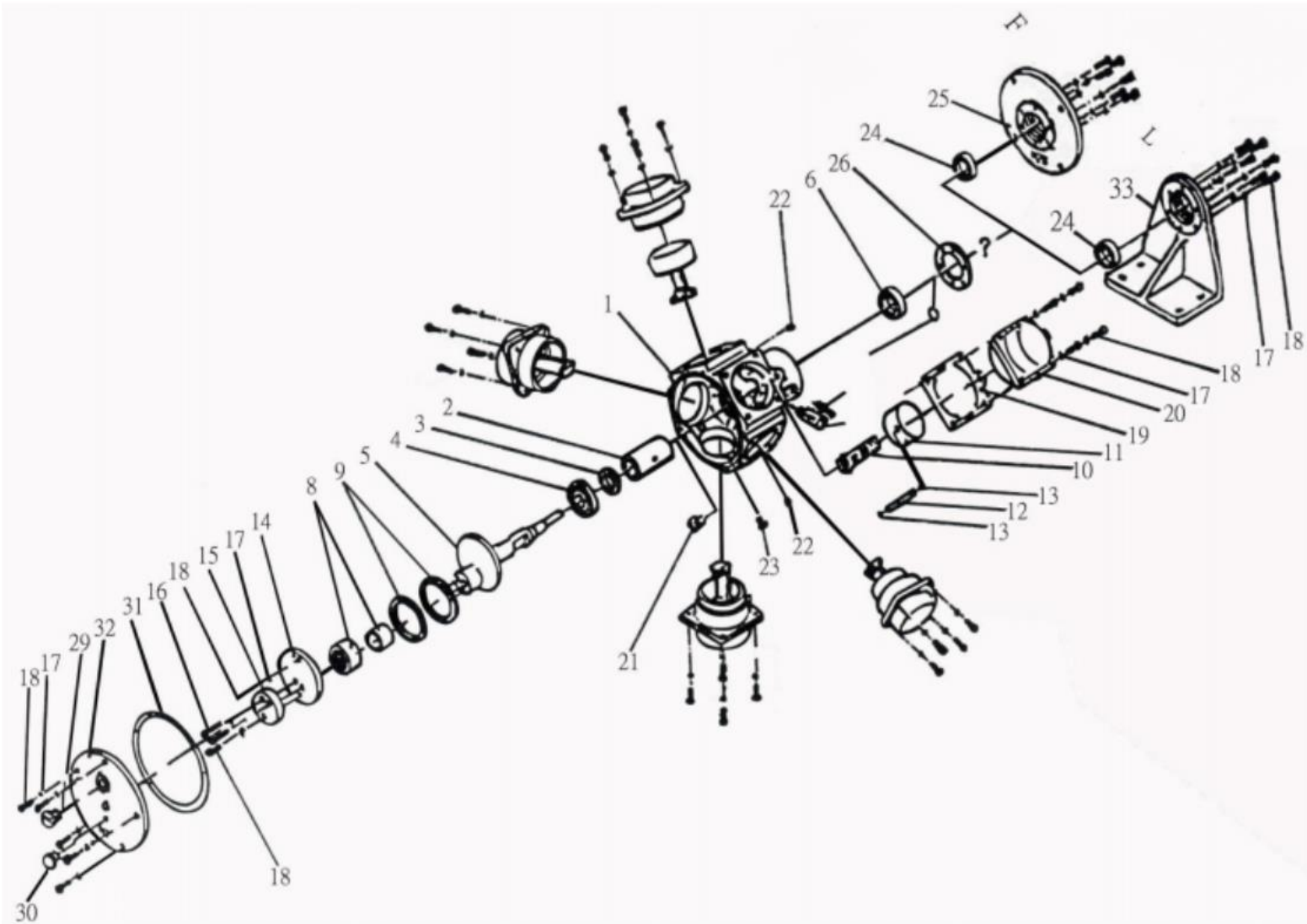
| NO. | Description | Qty | NO. | Description | Qty | NO. | Description | Qty |
|-----|----------------|-----|-----|----------------|-----|-----|-------------------|-----|
| 1 | Casing | 1 | 11 | Piston Pin | 3 | 21 | Spring washer | 12 |
| 2 | Valve bushing | 1 | 12 | Gasket | 3 | 22 | Screw | 12 |
| 3 | Bearing | 1 | 13 | Thrust washer | 2 | 23 | Gasket | 1 |
| 4 | Shaft | 1 | 14 | Ring | 2 | 24 | Casing cover | 1 |
| 5 | Oil seal | 1 | 15 | Needle bearing | 1 | 25 | Screw | 3 |
| 6 | Snap ring | 1 | 16 | Crank pin | 1 | 26 | Air through screw | 1 |
| 5 | Bearing | 1 | 17 | Sleeve | 3 | 27 | Foot type | 1 |
| 8 | Snap ring | 1 | 18 | O-Ring | 3 | 28 | Flange type | 1 |
| 9 | Piston | 3 | 19 | Cylinder cover | 3 | 29 | Silencer | 1 |
| 10 | Connecting rod | 3 | 20 | O-Ring | 3 | | | |

All Items in RED are included in the Seal Kit

All Items in RED & PURPLE are included in the Repair Kit

All Items in BLUE are included in the Piston Kit

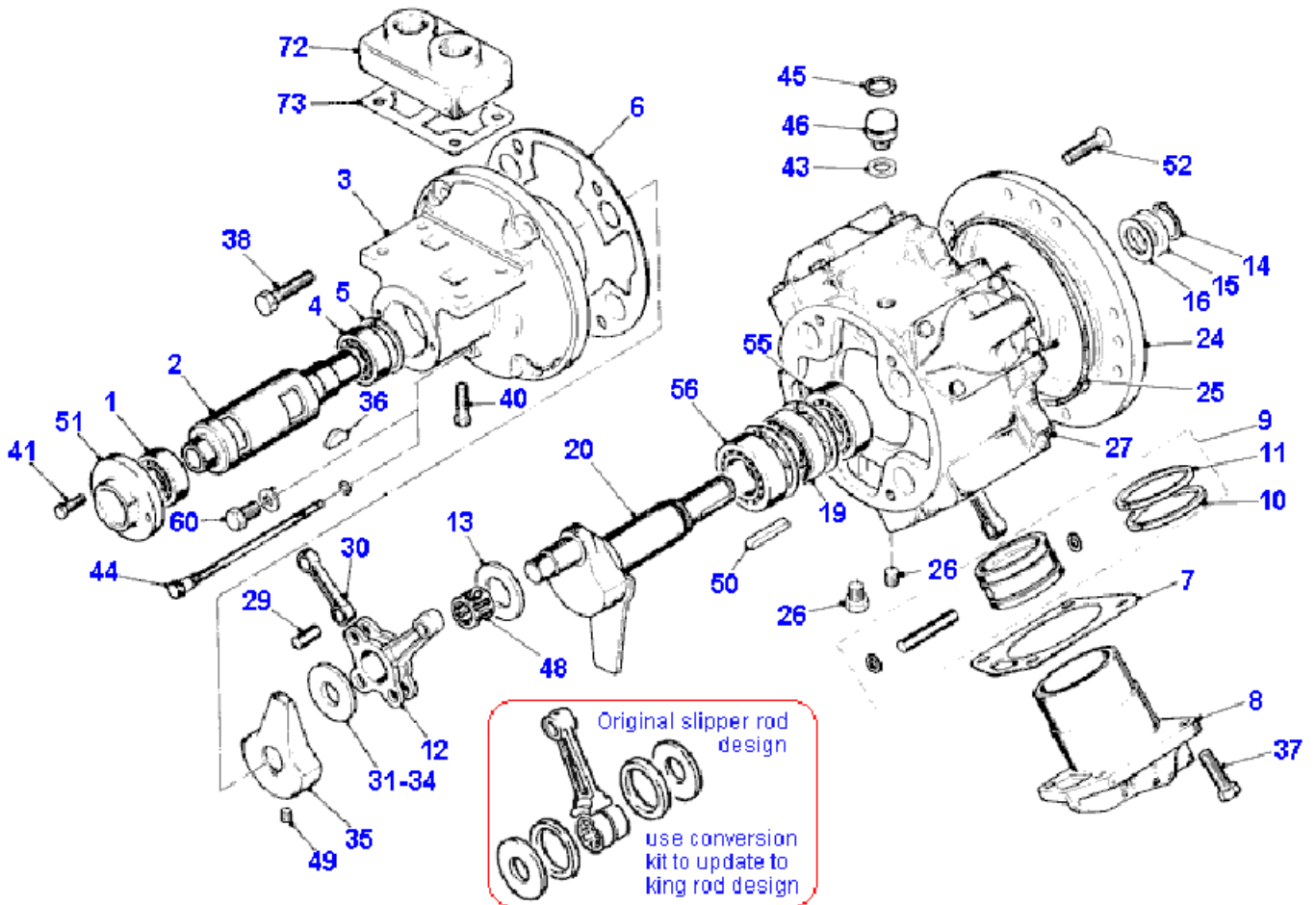
Parts List - M7 Series



| NO. | Name | Qty | NO. | Name | Qty | NO. | Name | Qty |
|-----|----------------|-----|-----|---------------------------|-----|-----|------------------------|-----|
| 1 | Casing | 1 | 12 | Piston Pin | 5 | 23 | Air Through Screw | 1 |
| 2 | Valve Bushing | 1 | 13 | O-Ring | 10 | 24 | Oil Seal | 1 |
| 3 | Oil Seal | 1 | 14 | Balance Block A | 1 | 25 | Flange | 1 |
| 4 | Bearing | 1 | 15 | Balance Block B | 1 | 26 | Gasket | 1 |
| 5 | Shaft | 1 | 16 | Hexagon Socket Head Screw | 2 | 27 | 3/8" Adapter | 1 |
| 6 | Bearing | 1 | 17 | Spring Washer | 33 | 28 | Muffler | 1 |
| 7 | Snap Ring | 1 | 18 | Hexagon Socket Head Screw | 33 | 29 | Transparency Oil Cover | 1 |
| 8 | Needle Bearing | 1 | 19 | Gasket | 5 | 30 | Oil Cover | 1 |
| 9 | Ring | 2 | 20 | Cylinder Cover | 5 | 31 | Gasket | 1 |
| 10 | Connecting Rod | 5 | 21 | Oil Measuring Gauge | 1 | 32 | Casing Cover | 1 |
| 11 | Piston | 5 | 22 | Screw | 1 | 33 | Foot Mounting | 1 |

All Items in RED are included in the Seal Kit
 All Items in RED & PURPLE are included in the Repair Kit
 All Items in BLUE are included in the Piston Kit

Parts List - M13S Series

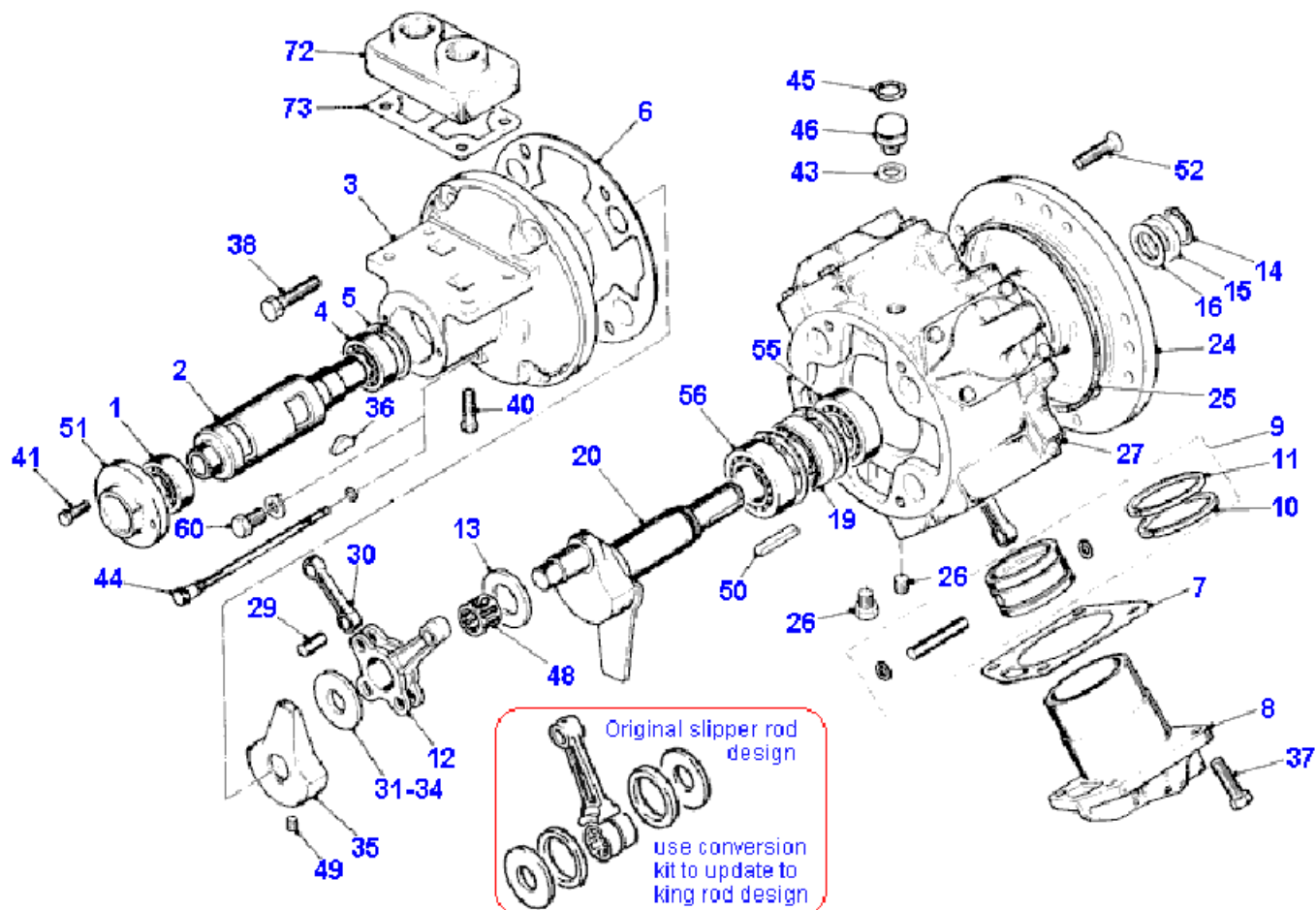


| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|-------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 34 | Crank Spacer | 1 |
| 2 | Rotary Valve | 1 | 35 | Balance Weight | 1 |
| 3 | Rotary Valve Housing | 1 | 36 | Woodruff Key | 1 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 37 | Cylinder Bolts | 16 |
| 5 | Rotary Valve Bearing Circlip | 1 | 38 | Valve Housing Bolts | 4 |
| 6 | Rotary Valve Housing Gasket | 1 | 40 | Adapter Plate Bolts | 4 |
| 7 | Cylinder Gasket | 4 | 41 | Exhaust Cover Bolts | 2 |
| 8 | Cylinder | 4 | 43 | Breather Plug Seals | 1 |
| 9* | Piston Assembly | 4 | 44 | Dipstick (Vertical Mounting) | 1 |
| 10* | Compression Ring | 4 | 45 | Seal (Transit Only) | 1 |
| 11* | Oil Control Ring | 4 | 46 | Breather Plug | 1 |
| 13 | Crankshaft Spacer | 1 | 48 | Needle Bearing | 1 |
| 14 | Crankshaft Circlip | 1 | 49 | Grub Screw | 1 |
| 15 | Crankshaft Spacer | 1 | 50 | Key | 1 |
| 16 | Crankshaft Spacer Shim | 5 | 51 | Rotary Valve Exhaust Cover | 1 |
| 19 | Crankshaft Oilseal | 1 | 52 | Countersunk Flange Bolts | 4 |
| 20 | Crankshaft Assembly | 1 | 53 | Connecting Rod (Slipper Type) | 4 |
| 24 | Flange Plate | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 25 | Flange Plate Seal | 1 | 56 | Output Shaft Bearing (Inner) | 1 |
| 26 | Plug | 1 | 60 | Oil Level Plug | 1 |
| 27 | Engine Case | 1 | 72 | Inlet Adapter Plate | 1 |
| 31 | Crank Spacer | 1 | 73 | Inlet Adapter Plate Gasket | 1 |
| 32 | Crank Spacer | 1 | 74 | Retaining Ring | 2 |
| 33 | Crank Spacer | 1 | 75 | Dipstick Seal | 1 |

All Items in BLUE are included in the Piston Kit

All Items in RED are included in the Seal Kit

Parts List - M14 Series

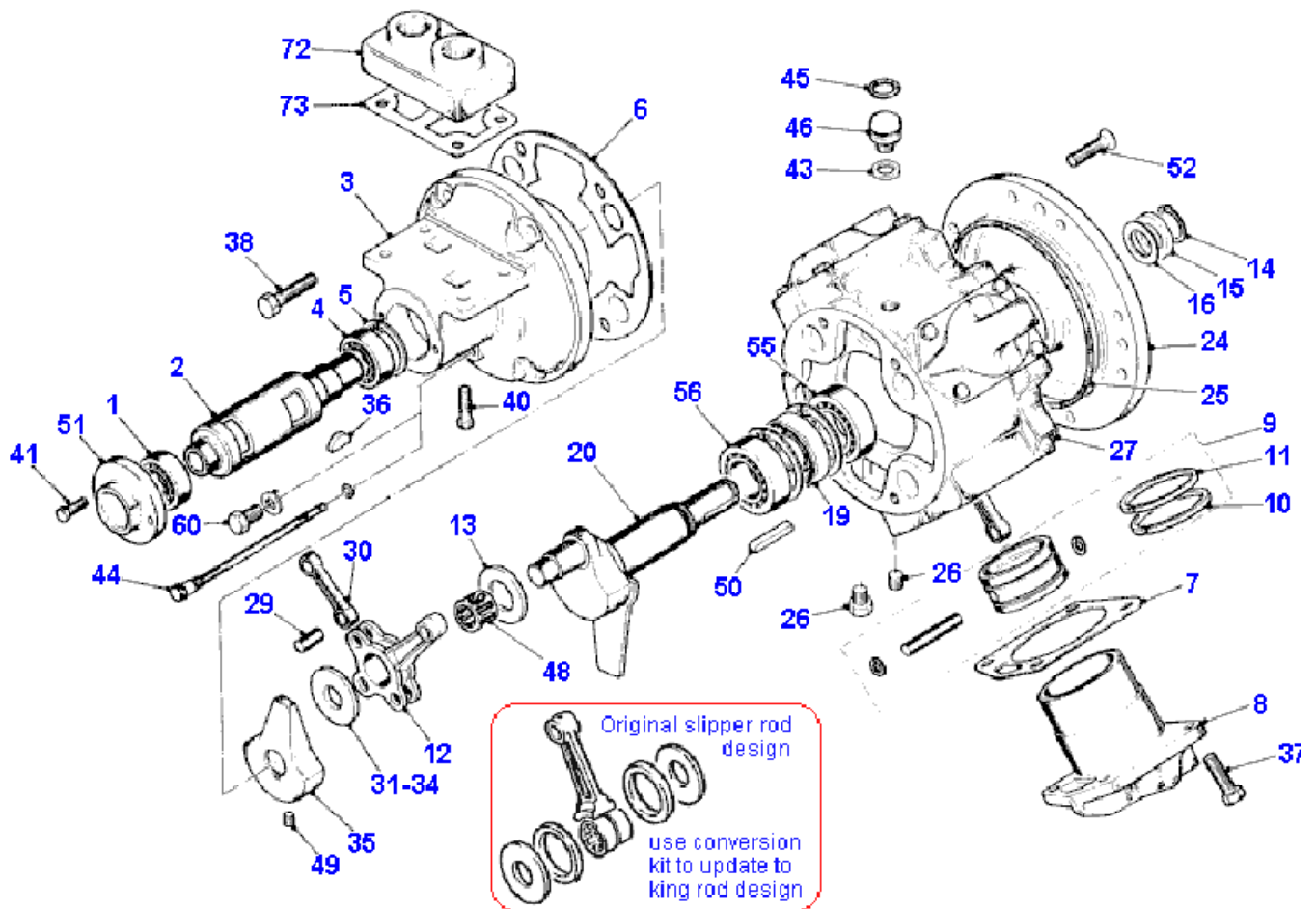


| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 31 | Crank Spacer | 1 |
| 2 | Rotary Valve | 1 | 33 | Crank Spacer | 1 |
| 3 | Rotary Valve Housing | 1 | 34 | Crank Spacer | 1 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 35 | Balance Weight | 1 |
| 5 | Rotary Valve Bearing Circlip | 1 | 36 | Woodruff Key | 1 |
| 6 | Rotary Valve Housing Gasket | 1 | 37 | Cylinder Bolts | 16 |
| 7 | Cylinder Gasket | 4 | 38 | Valve Housing Bolts | 4 |
| 8 | Cylinder | 4 | 39 | Washer for Item 38 | 4 |
| 9* | Piston Assembly | 4 | 40 | Adapter Plate Bolts | 4 |
| 10* | Compression Ring | 4 | 41 | Exhaust Cover Bolts | 2 |
| 11* | Oil Control Ring | 4 | 43 | Breather Plug Seals | 1 |
| 12 | King Rod | 1 | 44 | Dipstick (Vertical Mounting) | 1 |
| 13 | Crankshaft Spacer | 1 | 45 | Seal (Transit Only) | 1 |
| 14 | Crankshaft Circlip | 1 | 46 | Breather Plug | 1 |
| 15 | Crankshaft Spacer | 1 | 48 | Needle Bearing | 1 |
| 16 | Crankshaft Spacer Shim | 5 | 49 | Grub Screw | 1 |
| 18 | Crankshaft Bearing Circlip | 2 | 50 | Key | 1 |
| 19 | Crankshaft Oilseal | 1 | 51 | Rotary Valve Exhaust Cover | 1 |
| 20 | Crankshaft Assembly | 1 | 52 | Countersunk Flange Bolts | 4 |
| 24 | Flange Plate | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 25 | Flange Plate Seal | 1 | 56 | Output Shaft Bearing (Inner) | 1 |
| 26 | Plug | 1 | 60 | Oil Level Plug | 1 |
| 27 | Engine Case | 1 | 72 | Inlet Adapter Plate | 1 |
| 29 | Queen Rod Pivot | 3 | 73 | Inlet Adapter Plate Gasket | 1 |
| 30 | Queen Rod | 3 | 75 | Dipstick Seal | 1 |

All Items in BLUE are included in the Piston Kit

All Items in RED are included in the Seal Kit

Part List - M15 Series

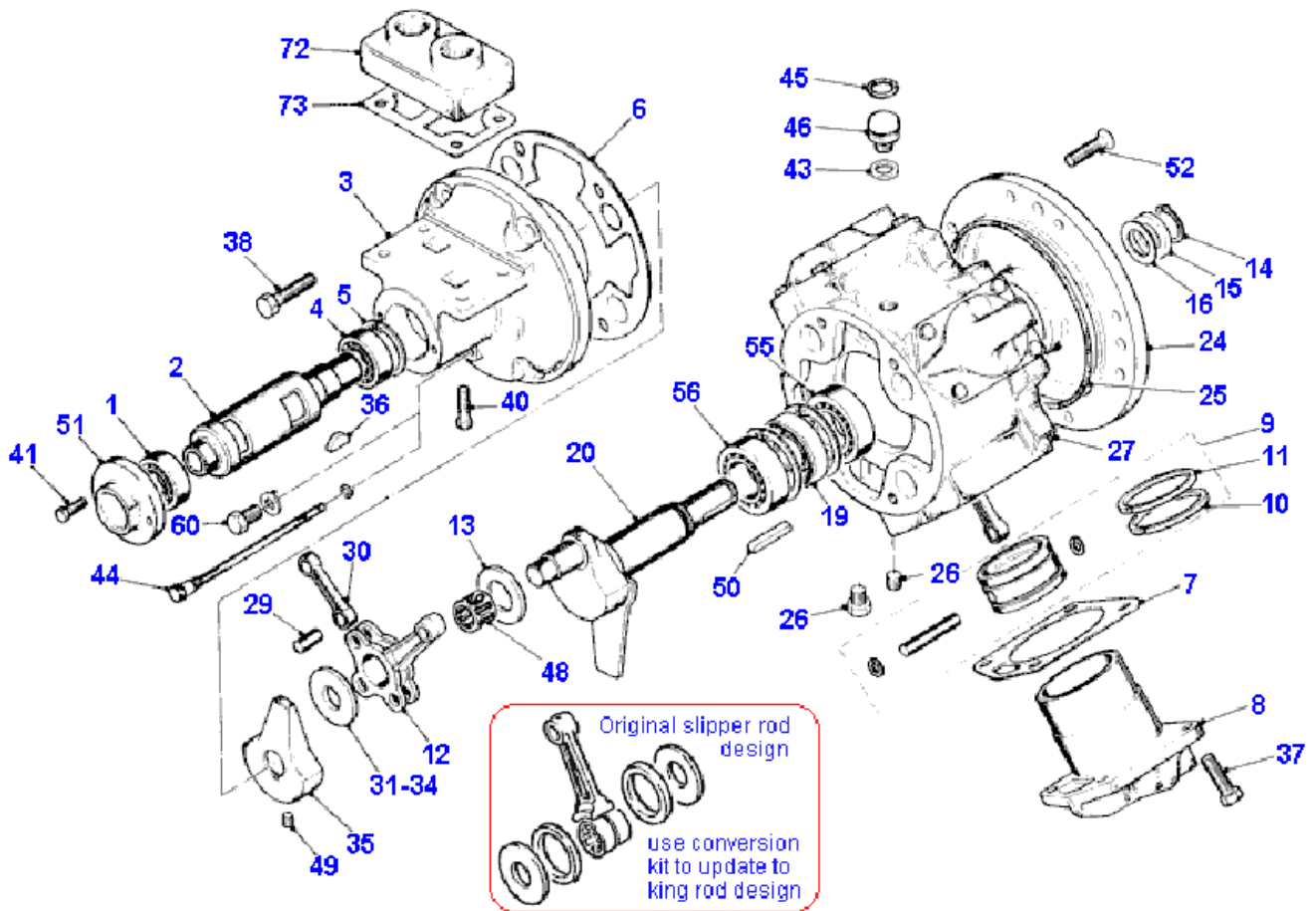


| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 30 | Queen Rod | 3 |
| 2 | Rotary Valve | 1 | 31 | Crank Spacer | 1 |
| 3 | Rotary Valve Housing | 1 | 32 | Crank Spacer | 1 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 33 | Crank Spacer | 1 |
| 5 | Rotary Valve Bearing Circlip | 1 | 35 | Balance Weight | 1 |
| 6 | Rotary Valve Housing Gasket | 1 | 36 | Woodruff Key | 1 |
| 7 | Cylinder Gasket | 4 | 37 | Cylinder Bolts | 16 |
| 8 | Cylinder | 4 | 40 | Adapter Plate Bolts | 4 |
| 9* | Piston Assembly | 4 | 41 | Exhaust Cover Bolts | 2 |
| 10* | Compression Ring | 4 | 43 | Breather Plug Seals | 1 |
| 11* | Oil Control Ring | 4 | 44 | Dipstick (Vertical Mounting) | 1 |
| 12 | King Rod | 1 | 45 | Seal (Transit Only) | 1 |
| 13 | Crankshaft Spacer | 1 | 46 | Breather Plug | 1 |
| 14 | Crankshaft Circlip | 1 | 48 | Needle Bearing | 1 |
| 15 | Crankshaft Spacer | 1 | 49 | Grub Screw | 1 |
| 16 | Crankshaft Spacer Shim | 5 | 50 | Key | 1 |
| 18 | Crankshaft Bearing Circlip | 2 | 51 | Rotary Valve Exhaust Cover | 1 |
| 19 | Crankshaft Oilseal | 1 | 52 | Countersunk Flange Bolts | 4 |
| 20 | Crankshaft Assembly | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 24 | Flange Plate | 1 | 56 | Output Shaft Bearing (Inner) | 1 |
| 25 | Flange Plate Seal | 1 | 60 | Oil Level Plug | 1 |
| 26 | Plug | 1 | 72 | Inlet Adapter Plate | 1 |
| 27 | Engine Case | 1 | 73 | Inlet Adapter Plate Gasket | 1 |
| 29 | Queen Rod Pivot | 3 | 75 | Dipstick Seal | 1 |

All Items in BLUE are included in the Piston Kit

All Items in RED are included in the Seal Kit

Parts List - M16 Series

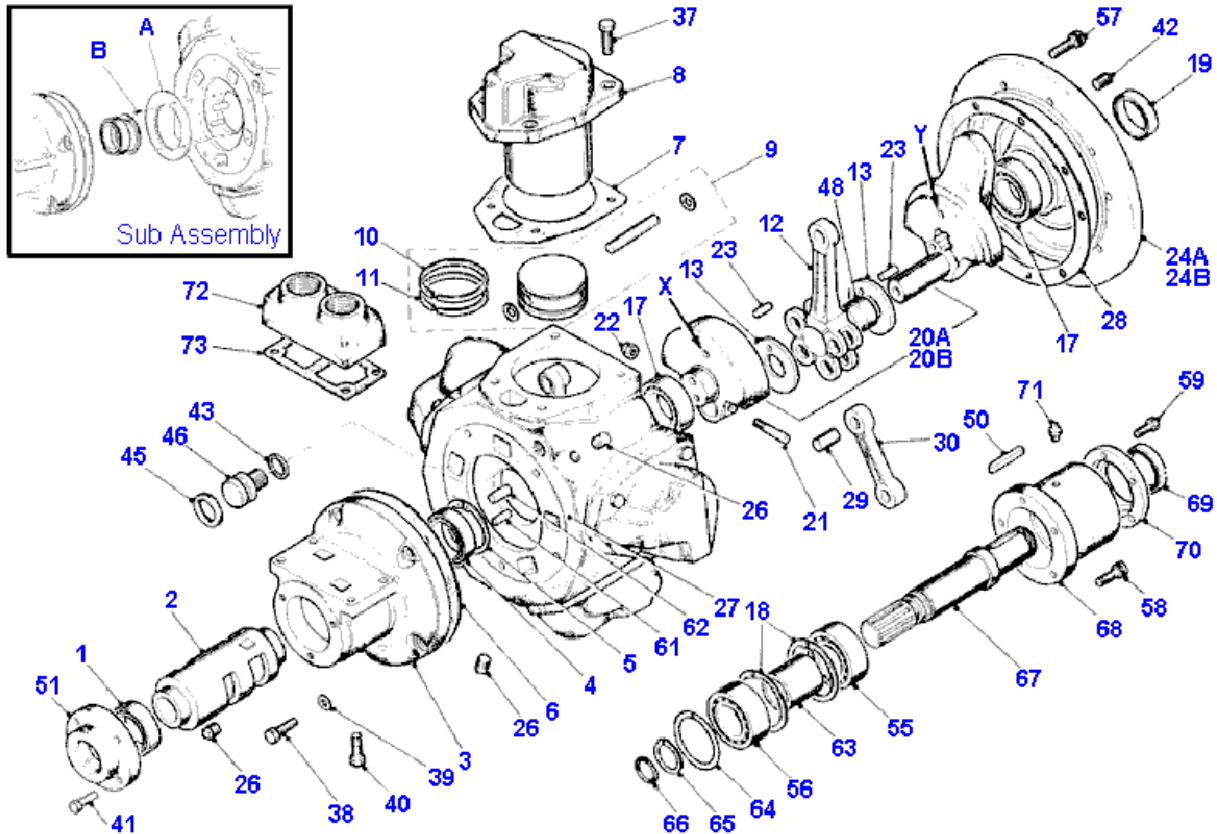


| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 31 | Crank Spacer | 1 |
| 2 | Rotary Valve | 1 | 32 | Crank Spacer | 1 |
| 3 | Rotary Valve Housing | 1 | 33 | Crank Spacer | 1 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 35 | Balance Weight | 1 |
| 5 | Rotary Valve Bearing Circlip | 1 | 36 | Woodruff Key | 1 |
| 6 | Rotary Valve Housing Gasket | 1 | 37 | Cylinder Bolts | 16 |
| 7 | Cylinder Gasket | 4 | 38 | Valve Housing Bolts | 4 |
| 8 | Cylinder | 4 | 40 | Adapter Plate Bolts | 4 |
| 9* | Piston Assembly | 4 | 41 | Exhaust Cover Bolts | 2 |
| 10* | Compression Ring | 4 | 43 | Breather Plug Seals | 1 |
| 11* | Oil Control Ring | 4 | 45 | Seal (Transit Only) | 1 |
| 12 | King Rod | 1 | 46 | Breather Plug | 1 |
| 13 | Crankshaft Spacer | 1 | 47 | Oil Seal Carrier | 1 |
| 14 | Crankshaft Circlip | 1 | 48 | Needle Bearing | 1 |
| 15 | Crankshaft Spacer | 1 | 49 | Grub Screw | 1 |
| 16 | Crankshaft Spacer Shim | 5 | 50 | Key | 1 |
| 18 | Crankshaft Bearing Circlip | 2 | 51 | Rotary Valve Exhaust Cover | 1 |
| 19 | Crankshaft Oilseal | 1 | 52 | Countersunk Flange Bolts | 4 |
| 20 | Crankshaft Assembly | 1 | 54 | Nylon Washer | 1 |
| 24 | Flange Plate | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 25 | Flange Plate Seal | 1 | 56 | Output Shaft Bearing (Inner) | 1 |
| 26 | Plug | 1 | 60 | Oil Level Plug | 1 |
| 27 | Engine Case | 1 | 72 | Inlet Adapter Plate | 1 |
| 29 | Queen Rod Pivot | 3 | 73 | Inlet Adapter Plate Gasket | 1 |
| 30 | Queen Rod | 3 | | | |

All Items in BLUE are included in the Piston Kit

All Items in RED are included in the Seal Kit

Parts List - M17 Series

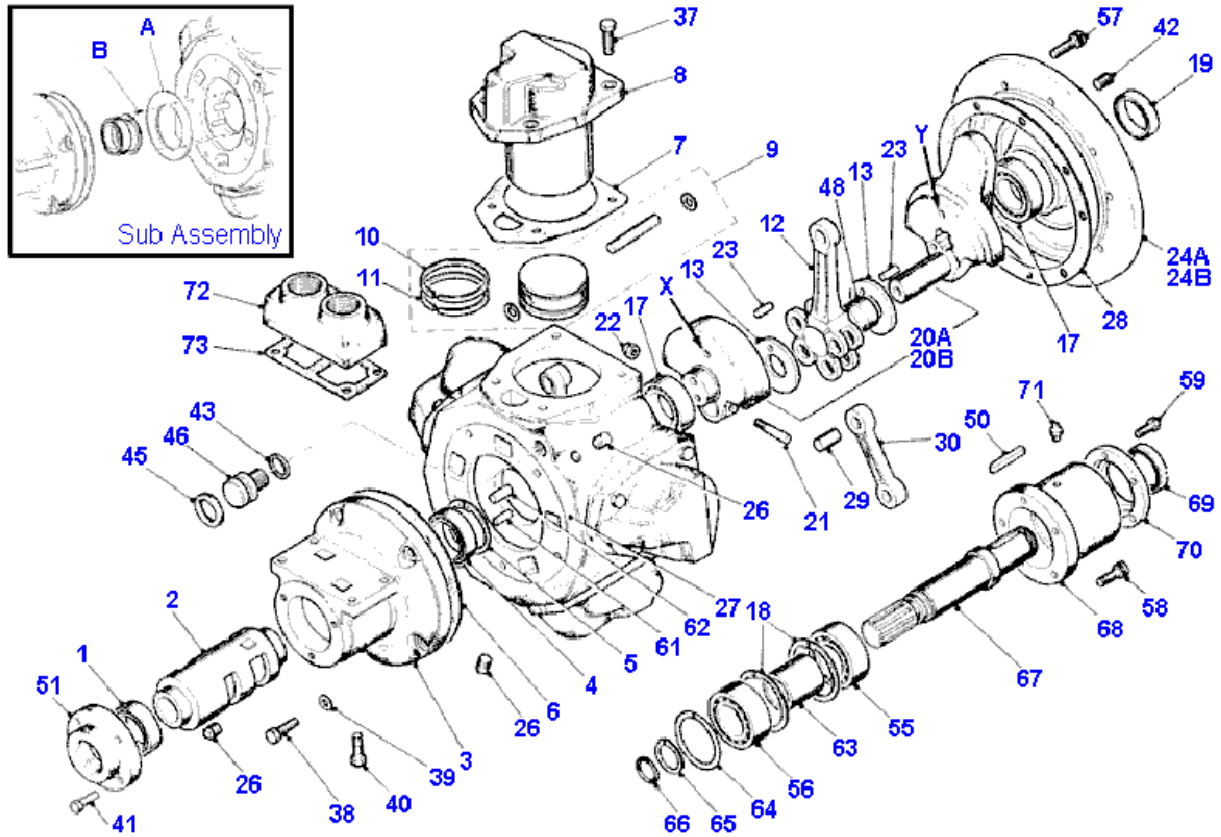


| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 38 | Valve Housing Bolts | 10 |
| 2 | Rotary Valve | 1 | 39 | Washer for Item 38 | 10 |
| 3 | Rotary Valve Housing | 1 | 40 | Adapter Plate Bolts | 4 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 41 | Exhaust Cover Bolts | 4 |
| 5 | Rotary Valve Bearing Circlip | 1 | 42 | Flange Plate Plugs | 5 |
| 6 | Rotary Valve Housing Gasket | 1 | 43 | Breather Plug Seals | 1 |
| 7 | Cylinder Gasket | 5 | 45 | Seal (Transit Only) | 1 |
| 8 | Cylinder | 5 | 46 | Breather Plug | 1 |
| 9 | Piston Assembly | 5 | 48 | Needle Bearing | 1 |
| 10* | Compression Ring | 5 | 50 | Key | 1 |
| 11* | Oil Control Ring | 5 | 51 | Rotary Valve Exhaust Cover | 1 |
| 12 | King Rod | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 13 | Crankshaft Spacer | 1 | 59 | Output Housing Cover Bolts | 5 |
| 17 | Crankshaft Bearing | 2 | 61 | Drive Pin (Dia. 10mm) | 1 |
| 18 | Crankshaft Bearing Circlip | 2 | 62 | Drive Pin (Dia. 12mm) | 1 |
| 19 | Crankshaft Oilseal | 1 | 63 | Output Shaft Bearing Spacer | 1 |
| 20 | Crankshaft Assembly | 1 | 64 | Output Shaft Spring Ring | 1 |
| 21 | Crank Bolt | 1 | 65 | Output Shaft Circlip | 1 |
| 22 | Crank Nut | 1 | 66 | Output Shaft Seal | 1 |
| 23 | Spring Dowel | 2 | 67 | Output Shaft | 1 |
| 24 | Flange Plate | 1 | 68 | Output Shaft Housing | 1 |
| 26 | Plug | 3 | 69 | Output Shaft Oil Seal | 1 |
| 27 | Engine Case | 1 | 70 | Output Shaft Housing Cover | 1 |
| 28 | Engine Case Gasket | 1 | 71 | Output Shaft Grease Nipple | 1 |
| 29 | Queen Rod Pivot | 4 | 72 | Inlet Adapter Plate | 1 |
| 30 | Queen Rod | 4 | 73 | Inlet Adapter Plate Gasket | 1 |
| 37 | Cylinder Bolts | 16 | | | |

All Items in **BLUE** are included in the Piston Kit

All Items in **RED** are included in the Seal Kit

Parts List - M18 Series



| Part No | Description | QTY | Part No | Description | QTY |
|---------|------------------------------|-----|---------|------------------------------|-----|
| 1 | Rotary Valve Bearing (Outer) | 1 | 38 | Valve Housing Bolts | 10 |
| 2 | Rotary Valve | 1 | 39 | Washer for Item 38 | 10 |
| 3 | Rotary Valve Housing | 1 | 40 | Adapter Plate Bolts | 4 |
| 4 | Rotary Valve Bearing (Inner) | 1 | 41 | Exhaust Cover Bolts | 4 |
| 5 | Rotary Valve Bearing Circlip | 1 | 42 | Flange Plate Plugs | 5 |
| 6 | Rotary Valve Housing Gasket | 1 | 43 | Breather Plug Seals | 1 |
| 7 | Cylinder Gasket | 5 | 45 | Seal (Transit Only) | 1 |
| 8 | Cylinder | 5 | 46 | Breather Plug | 1 |
| 9 | Piston Assembly | 5 | 48 | Needle Bearing | 2 |
| 10* | Compression Ring | 5 | 50 | Key | 1 |
| 11* | Oil Control Ring | 5 | 51 | Rotary Valve Exhaust Cover | 1 |
| 12 | King Rod | 1 | 55 | Output Shaft Bearing (Outer) | 1 |
| 13 | Crankshaft Spacer | 1 | 59 | Output Housing Cover Bolts | 5 |
| 17 | Crankshaft Bearing | 2 | 61 | Drive Pin (Dia. 10mm) | 1 |
| 18 | Crankshaft Bearing Circlip | 2 | 62 | Drive Pin (Dia. 12mm) | 1 |
| 19 | Crankshaft Oilseal | 1 | 63 | Output Shaft Bearing Spacer | 1 |
| 20 | Crankshaft Assembly | 1 | 64 | Output Shaft Spring Ring | 1 |
| 21 | Crank Bolt | 1 | 65 | Output Shaft Circlip | 1 |
| 22 | Crank Nut | 1 | 66 | Output Shaft Seal | 1 |
| 23 | Spring Dowel | 2 | 67 | Output Shaft | 1 |
| 24 | Flange Plate | 1 | 68 | Output Shaft Housing | 1 |
| 26 | Plug | 3 | 69 | Output Shaft Oil Seal | 1 |
| 27 | Engine Case | 1 | 70 | Output Shaft Housing Cover | 1 |
| 28 | Engine Case Gasket | 1 | 71 | Output Shaft Grease Nipple | 1 |
| 29 | Queen Rod Pivot | 4 | 72 | Inlet Adapter Plate | 1 |
| 30 | Queen Rod | 4 | 73 | Inlet Adapter Plate Gasket | 1 |
| 37 | Cylinder Bolts | 16 | | | |

All Items in BLUE are included in the Piston Kit

All Items in RED are included in the Seal Kit

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