

# OPERATOR'S SAFETY AND SERVICE MANUAL

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## 480

This manual covers the following serial numbers and higher for each model listed:

480R / 481R.....4811476

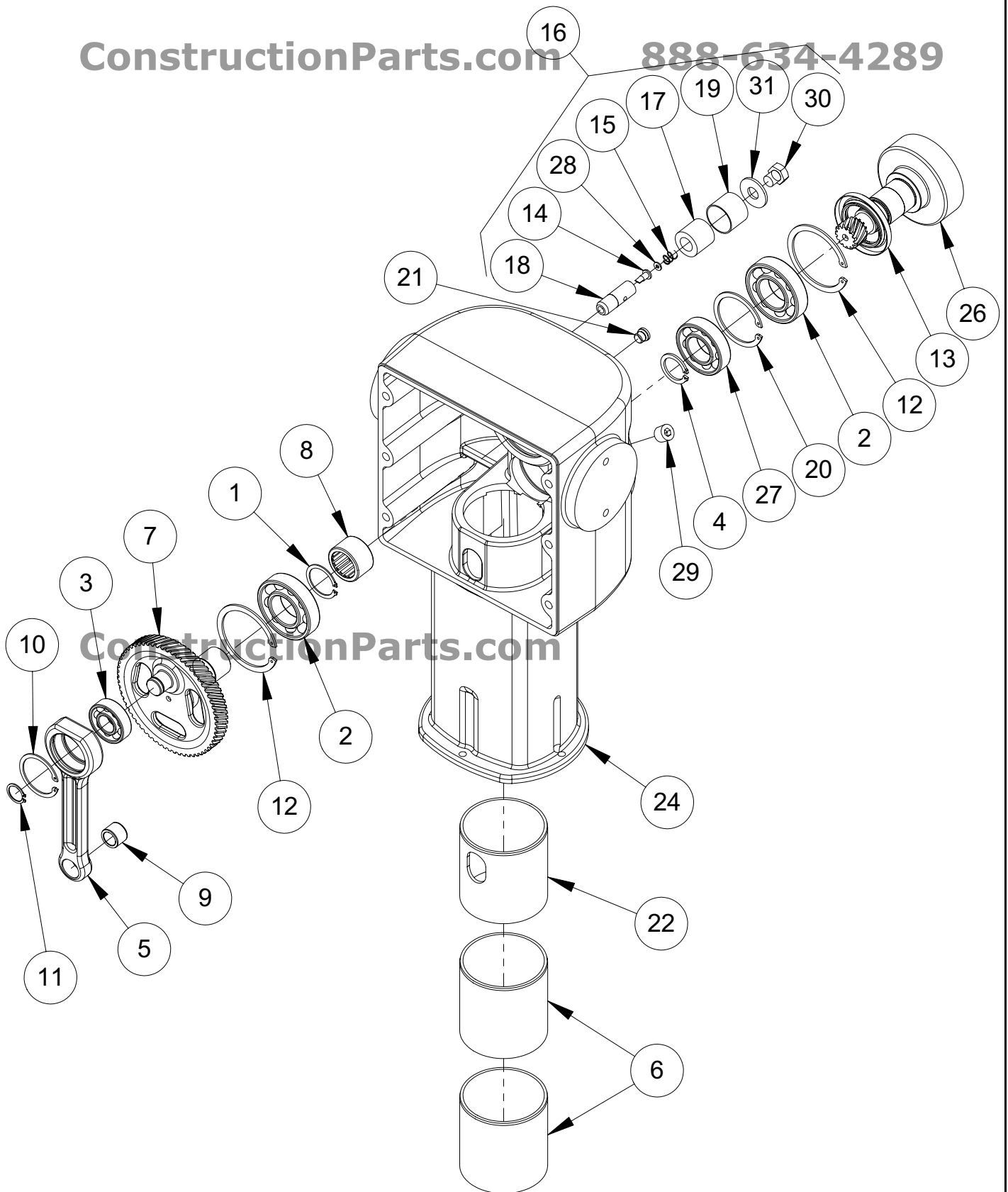
480H / 481H.....4850323



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## SMART RAMMERS

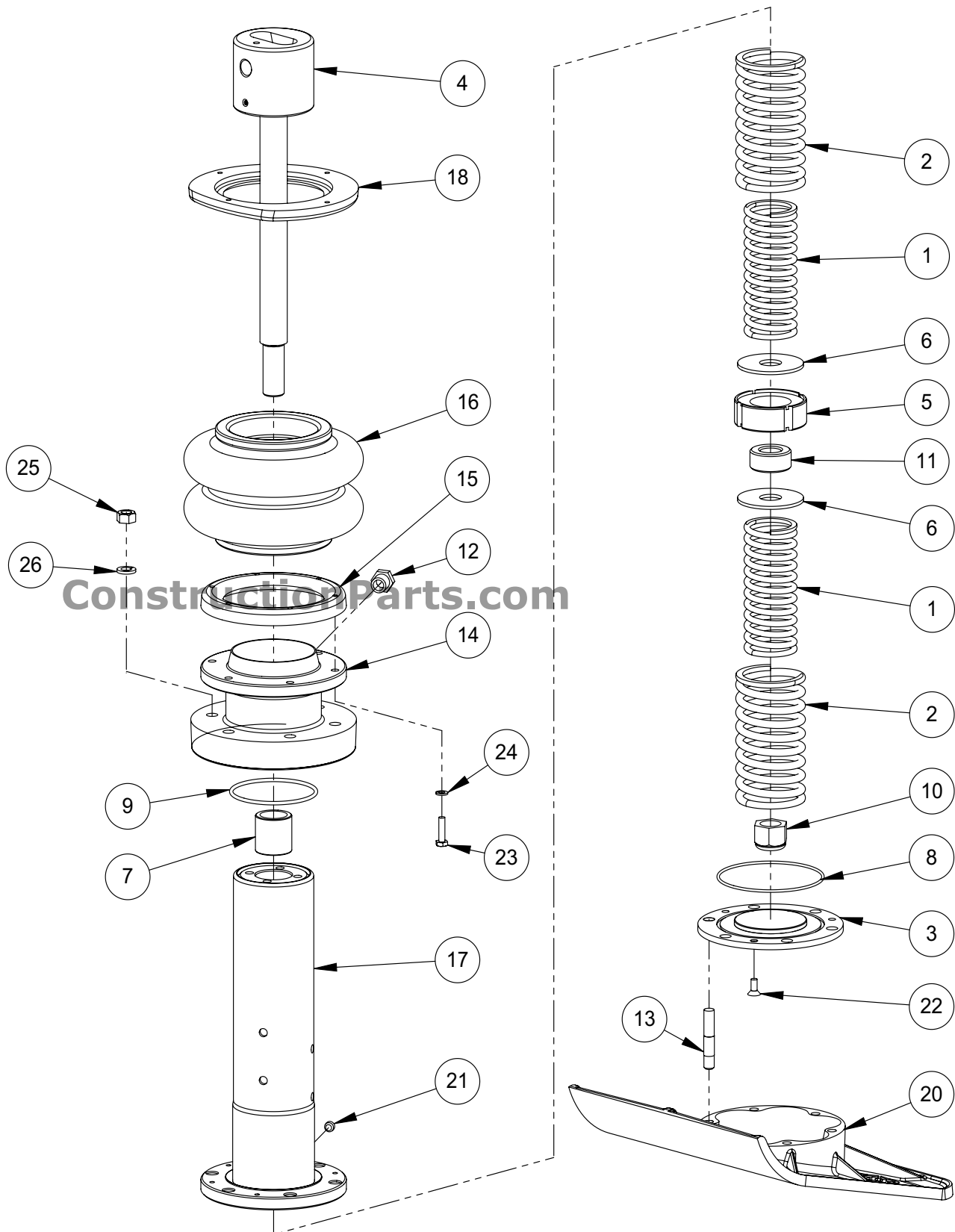
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| ITEM | PART NO.   | DESCRIPTION                                                | QTY |
|------|------------|------------------------------------------------------------|-----|
| 1.   | 01001      | RETAINING RING, EXT. 5100-137                              | 1   |
| 2.   | 01103      | BEARING, BALL                                              | 2   |
| 3.   | 01105      | BEARING, BALL                                              | 1   |
| 4.   | 01244      | RETAINING RING, EXT. 5160-112                              | 1   |
| 5.   | 06161      | ROD ASM, CONNECTING                                        | 1   |
| 6.   | 06180      | BEARING, SLIDE                                             | 2   |
| 7.   | 13733      | GEAR (480 SERIES)                                          | 1   |
| 8.   | 06259      | BEARING, NEEDLE                                            | 1   |
| 9.   | 06262      | BUSHING                                                    | 1   |
| 10.  | 06264      | RETAINING RING, INT.N5000-187                              | 1   |
| 11.  | 06265      | RETAINING RING, EST.5100-78                                | 1   |
| 12.  | 06266      | RETAINING RING, INT.N5000-281                              | 2   |
| 13.  | 06274      | SEAL                                                       | 1   |
| 14.  | 06413      | BALBE                                                      | 1   |
| 15.  | 06423      | SPRING, COMP. .420 OD                                      | 1   |
| 16.  | 06904      | BREATHER SUB-ASM (includes 14, 15, 17, 18, 19, 28, 30, 31) | 1   |
| 17.  | 06905      | FILTER, BREATHER                                           | 1   |
| 18.  | 06908      | TUBE, BREATHER COVER                                       | 1   |
| 19.  | 06910      | COVER                                                      | 1   |
| 20.  | 09476      | RETAINING RING, INT. V5000-244                             | 1   |
| 21.  | 09618      | FITTING, PLUG PARKER 4HP50N                                | 1   |
| 22.  | 14590      | BEARING, SLIDE W/ CUT-OUT                                  | 1   |
| 23.  | 14757      | SPACER, OIL SEAL                                           | 1   |
| 24.  | 15950      | HOUSING, RAMMER                                            | 1   |
| 25.  | 15952      | GEARBOX, 480 (includes all items listed)                   | 1   |
| 26.  | 15959      | PINION GROUND, LR (480 series)                             | 1   |
| 27.  | 16021      | BEARING, BALL - 6206                                       | 1   |
| 28.  | F01PW      | WASHER, 5/32 X 3/8 X 18ga ZP                               | 1   |
| 29.  | F0618SPP   | PLUG, PIPE 3/8-18                                          | 1   |
| 30.  | F081305HCS | HHCS, 1/2-13 X 5/8 GR5 ZP                                  | 1   |
| 31.  | F08SW      | WASHER, 9/16 X 1-3/8 X 12ga ZP                             | 1   |
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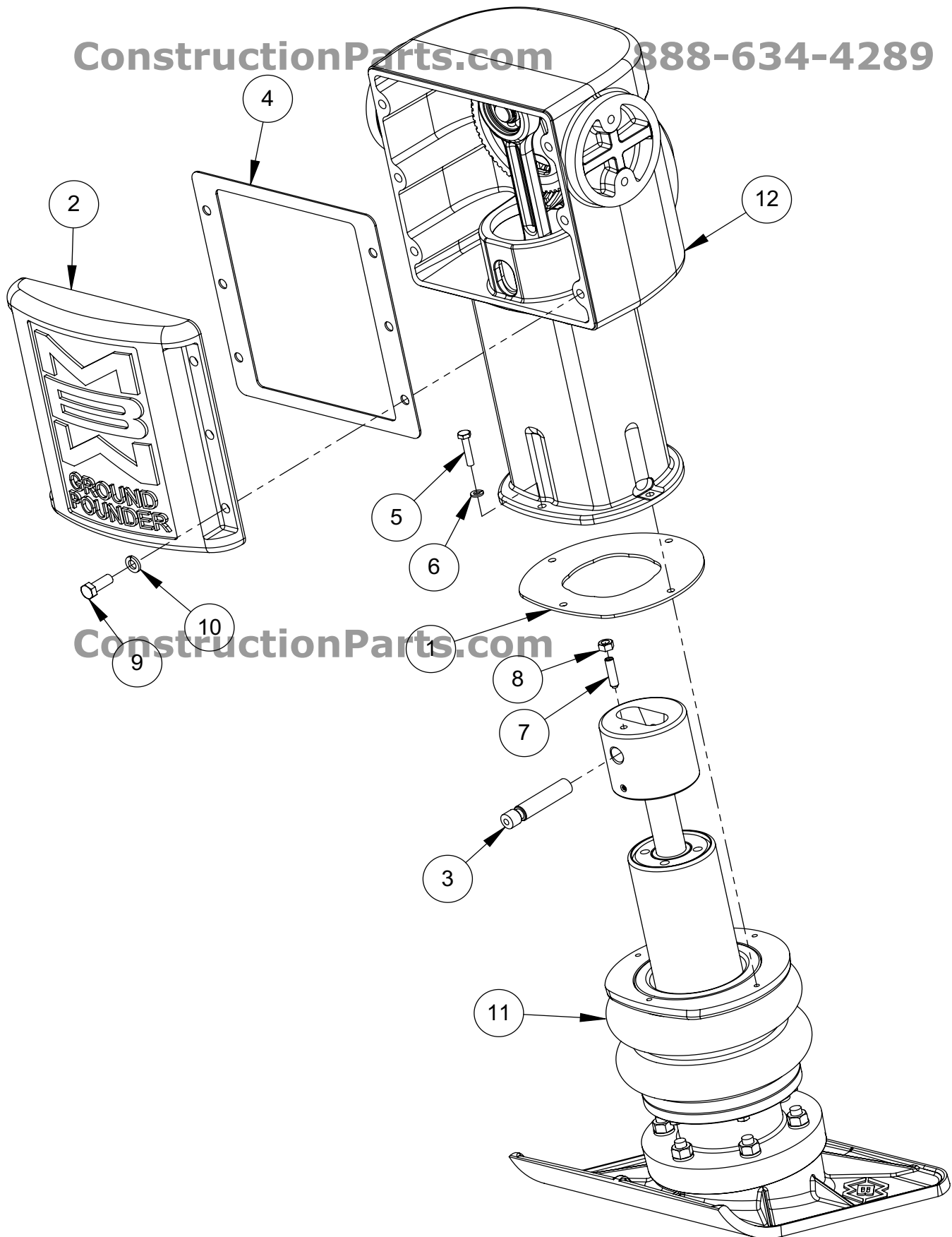
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| ITEM | PART NO.   | DESCRIPTION                                                              | 480 | 481 |
|------|------------|--------------------------------------------------------------------------|-----|-----|
| 1.   | 03167      | SPRING, COMP. 2.188 OD                                                   | 2   | 2   |
| 2.   | 03168      | SPRING, COMP. 2.875 OD                                                   | 2   | 2   |
| 3.   | 06173      | COVER                                                                    | 1   | 1   |
| 4.   | 06174      | RAM SUB-ASM                                                              | 1   | 1   |
| 5.   | 06179      | PISTON                                                                   | 1   | 1   |
| 6.   | 06181      | WASHER                                                                   | 2   | 2   |
| 7.   | 06194      | BEARING, BRONZE                                                          | 1   | 1   |
| 8.   | 06237      | O-RING, 4.22 ID X .103                                                   | 1   | 1   |
| 9.   | 06239      | O-RING, 3.36 ID X .139 DIA                                               | 1   | 1   |
| 10.  | 06257      | NUT, HEX 7/8-14 ELASTIC LOCK ZP                                          | 1   | 1   |
| 11.  | 06399      | SPACER, PISTON                                                           | 1   | 1   |
| 12.  | 06457      | GAGE, VIEW                                                               | 1   | 1   |
| 13.  | 07151      | STUD                                                                     |     | 6   |
|      | 19581      | STUD, 7/16-14, SELF LOCKING                                              | 6   |     |
| 14.  | 07153      | MOUNT, MACHINED                                                          | 1   | 1   |
| 15.  | 07154      | RING, CLAMPING                                                           | 1   | 1   |
| 16.  | 11694      | BELLOWS, 4 PLY                                                           | 1   | 1   |
| 17.  | 11696      | SPRINGBOX, HEAVY DUTY (includes item 7)                                  | 1   | 1   |
| 18.  | 14493      | RING, CLAMPING                                                           | 1   | 1   |
| 19.  | 14571      | LOWER UNIT ASSY (13" SHOE) (4x1 series) (includes all listed components) |     | 1   |
|      | 14577      | LOWER UNIT ASSY (11" SHOE) (4x0 series) (includes all listed components) | 1   |     |
| 20.  | 19586      | SHOE, MACHINED, 11", 15 DEG (4x0 series) (includes item 13 #19581)       | 1   |     |
|      | 14879      | SHOE, MACHINED, 13" 15 DEG (4x1 series)                                  |     | 1   |
| 21.  | F0227SPP   | SOCKET PIPE PLUG, 1/8-27                                                 | 1   | 1   |
| 22.  | F042005FSS | FHSS, 1/4-20x5/8                                                         | 3   | 3   |
| 23.  | F042008HCS | HHCS, 1/4-20 x 1 GR5 ZP                                                  | 6   | 6   |
| 24.  | F04LW      | LOCKWASHER, 1/4 ZP                                                       | 6   | 6   |
| 25.  | F0714HN    | NUT, HEX 7/16-14 ZP                                                      | 6   | 6   |
| 26.  | F07LW      | LOCKWASHER, 7/16 ZP                                                      | 6   | 6   |
|      |            |                                                                          |     |     |
|      |            | <b><u>SERVICE PARTS:</u></b>                                             |     |     |
|      | 19622      | SPRINGBOX ASsembly (Includes items 1 thru 11, 17, 21 & 22)               |     |     |
|      |            |                                                                          |     |     |
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Gearbox and Lower Unit Assembly

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| ITEM | PART NO.    | DESCRIPTION                      | QTY |
|------|-------------|----------------------------------|-----|
| 1.   | 14757       | SPACER, OIL SEAL                 | 1   |
| 2.   | 14490       | COVER, HOUSING                   | 1   |
| 3.   | 14719       | PIN, PISTON, GROOVED             | 1   |
| 4.   | 15667       | GASKET, COVER                    | 1   |
| 5.   | F042010HCS  | HHCS, 1/4-20 x 1-1/4 GR5 ZP      | 4   |
| 6.   | F04LW       | LOCKWASHER, ZP                   | 4   |
| 7.   | F051810SSSD | SSSD, 5/16-18UNC X 1.25LG DOG PT | 1   |
| 8.   | F0518HN     | NUT, HEX 5/16-18 ZP              | 1   |
| 9.   | F061608HCS  | HHCS, 3/8-16 x 1 GR5 ZP          | 6   |
| 10.  | F06LW       | LOCKWASHER, 3/8 ZP               | 6   |
| 11.  | 14571       | LOWER UNIT ASSY (13" SHOE)       | 1   |
|      | 14577       | LOWER UNIT ASSY (11"SHOE)        | 1   |
| 12.  | 15951       | GEARBOX, 460/470                 | 1   |
|      | 15952       | GEARBOX, 480                     | 1   |
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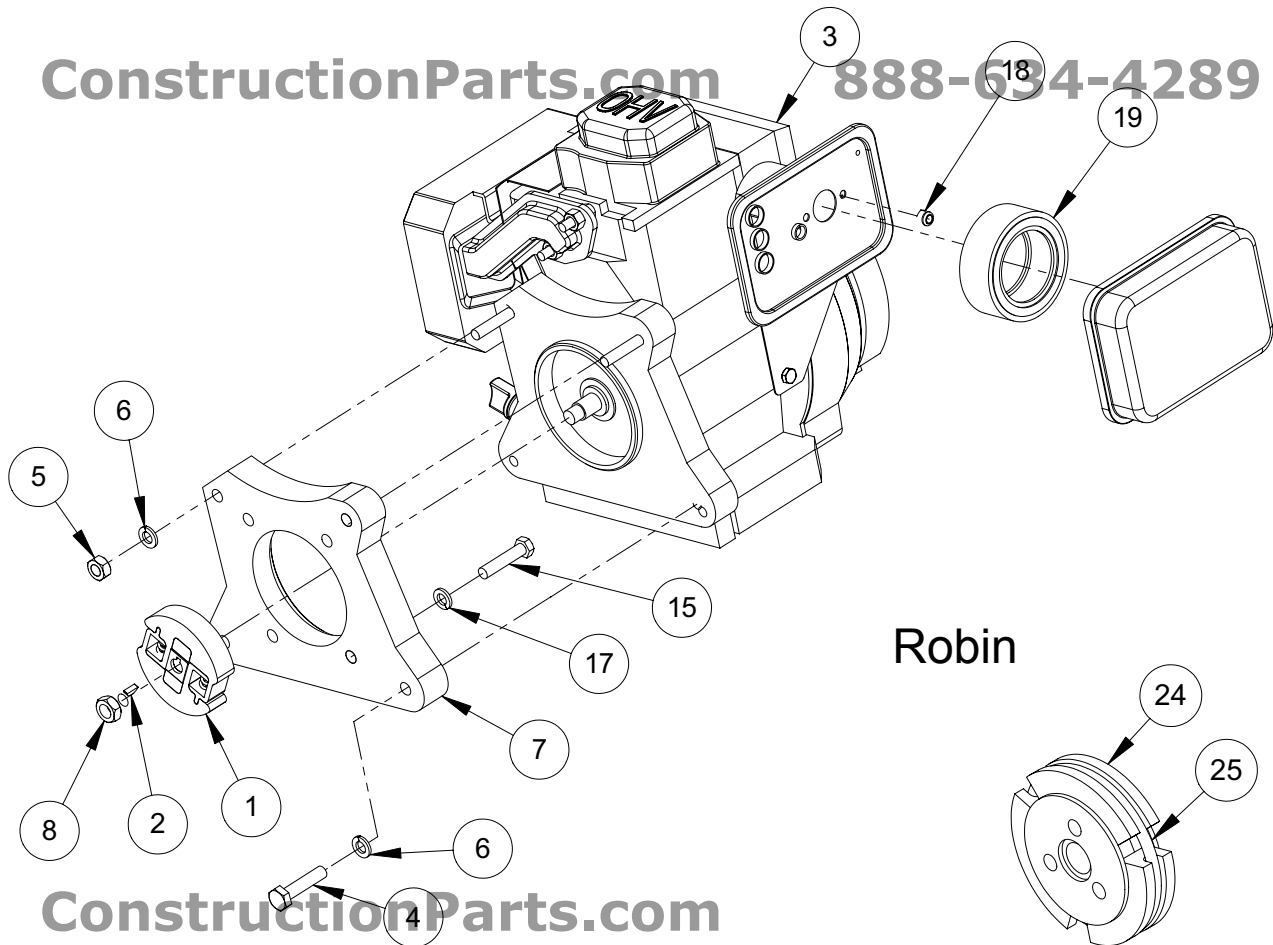


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| ITEM | PART NO.   | DESCRIPTION                                                                        | QTY |
|------|------------|------------------------------------------------------------------------------------|-----|
| 1.   | 01045      | FILTER, FUEL                                                                       | 1   |
| 2.   | 01052      | CLAMP, HOSE, 1/2"                                                                  | 4   |
| 3.   | 01145      | CLAMP, CABLE                                                                       | 1   |
| 4.   | 01034      | HOSE, FUEL, 1/4" X 6" (480H/481H ONLY)                                             | 1   |
|      | 02293      | HOSE, FUEL, 1/4" X 13" (480R/481R ONLY)                                            | 1   |
| 5.   | 07172      | LOCKWASHER, 5/16 HIGH COLLAR                                                       | 4   |
| 6.   | 07351      | TORSION MOUNT                                                                      | 2   |
| 7.   | 16572      | CASING, THROTTLE, 30" (480/481 ONLY)                                               | 1   |
| 8.   | 16573      | WIRE, THROTTLE, 34.5" (480/481 ONLY)                                               | 1   |
| 9.   | 07916      | FERRULE, THROTTLE LEVER                                                            | 1   |
| 10.  | 14715      | THROTTLE, RATCHET STYLE                                                            | 1   |
| 11.  | 14965      | BRACKET, MOUNTING, HANDLE                                                          | 2   |
| 12.  | 15183      | HOSE, FUEL, 1/4" X 1-1/2"                                                          | 1   |
| 13.  | 16303      | TANK, FUEL                                                                         | 1   |
| 14.  | 16414      | VALVE, FUEL                                                                        | 1   |
| 15.  | 17062      | TACHOMETER & HOURMETER KIT                                                         | 1   |
| 16.  | 16565      | HANDLE                                                                             | 1   |
|      | 18877      | HANDLE <b>FOR SERIAL NO. (480R #4811476 &amp; 480H #4850323 AND UP)</b>            |     |
| 17.  | 16567      | GUARD, ENGINE ( 480R/481R ONLY)                                                    | 1   |
| 18.  | 16568      | SLEEVING, POLY, 14"                                                                | 1   |
| 19.  | 16586      | GROMMET, 1/2"                                                                      | 1   |
| 20.  | 16666      | CAP, 1-3/4" (for engines with float carburetor)                                    | 1   |
|      | 14714      | CAP, 1-3/4" (for engines with diaphragm carburetor)                                | 1   |
| 21.  | 18527      | GUARD, ENGINE (PLATE STYLE GUARD - 480H/481H ONLY)                                 | 1   |
| 22.  | F033206PMS | PAN HEAD MACHINE SCREW, #10-32 X 3/4 ZP                                            | 2   |
| 23.  | F0332HN    | NUT, HEX #10-32 ZP                                                                 | 2   |
| 24.  | F042004HCS | HEX HEAD CAP SCREW, 1/4-20 X 1/2 ZP                                                | 4   |
| 25.  | F051808FWS | FLANGE SCREW, 5/16-18 X 1 ZP                                                       | 8   |
| 26.  | F051808SCS | SOCKET HEAD CAP SCREW, 5/16-18 X 1 ZP                                              | 4   |
| 27.  | F051812FWS | FLANGE SCREW, 5/16-18 X 1-1/2 ZP (480R/481R ONLY)                                  | 4   |
| 28.  | F0518FN    | NUT, FLANGE, 5/16-18 ZP                                                            | 12  |
| 29.  | M08C035FWS | FLANGE SCREW M8-1.25 X 35MM ZP (480H/481H ONLY-TUBE STYLE GUARD)                   | 4   |
| 30.  | M08C025FWS | FLANGE SCREW M8-1.25 X 25MM ZP (480H/481H ONLY-PLATE STYLE GUARD)                  | 4   |
|      |            |                                                                                    |     |
| 31.  | 16575      | WIRE CLAMP, ADHESIVE BACKED (NOT SHOWN)                                            | 3   |
| 32.  | 07592      | TERMINAL, SCOTCHLOK SPLICE (NOT SHOWN)                                             | 1   |
| 33.  | F032402FSS | FLAT HEAD SCREW, #10-24 X 1/4" ZP <b>SERIAL NO. (4811476 &amp; 4850323 AND UP)</b> | 2   |
| 34.  | 18742      | THROTTLE, RACHET STYLE , <b>SERIAL NO. (4811476 &amp; 4850323 AND UP)</b>          | 1   |
|      |            |                                                                                    |     |
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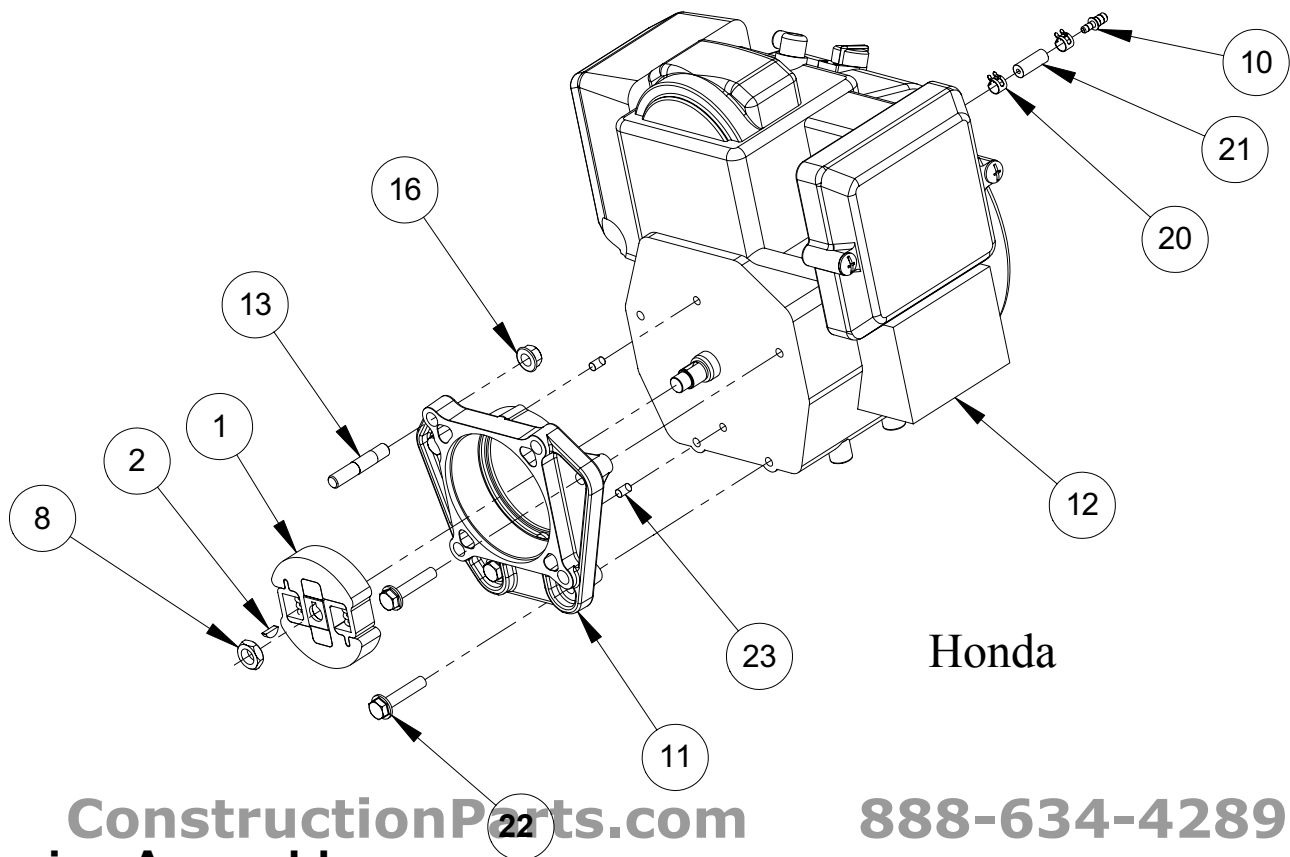
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Robin

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Honda

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Engine Assembly

| ITEM | PART NO.    | DESCRIPTION                                                                         | QTY |
|------|-------------|-------------------------------------------------------------------------------------|-----|
| 1.   | 17593       | CLUTCH, RAMMER, 4-STROKE (SEE NOTE BELOW)                                           | 1   |
| 2.   | 18053       | KEY, WOODRUFF, METRIC 4 X 13                                                        | 1   |
| 3.   | 14872       | ROBIN EH12 ENGINE WITH RATCHET THROTTLE                                             | 1   |
| 4.   | 15086       | HHCS, M10-1.5 X 45MM                                                                | 2   |
| 5.   | 15184       | NUT, HEX M10-1.5 PITCH                                                              | 2   |
| 6.   | 15185       | LOCKWASHER, M10                                                                     | 2   |
| 7.   | 15226       | ADAPTER, ENGINE (ROBIN EH12)                                                        | 1   |
| 8.   | M12CHJN     | JAMNUT, HEX, 12MM-1.25 ZP                                                           | 1   |
| 10   | 17217       | REDUCER, BARBED                                                                     | 1   |
| 11   | 17406       | ADAPTER, ENGINE (HONDA GX100)                                                       | 1   |
| 12   | 17407       | HONDA GX100 ENGINE, FLOAT STYLE (includes items: 1, 2, 8, 11, 22 & 23)              | 1   |
|      | 18554       | HONDA GX100 ENGINE, DIAPHRAGM STYLE (includes items: 1, 2, 8, 11, 22 & 23)          | 1   |
| 13   | 17432       | STUD (HONDA ONLY)                                                                   | 4   |
| 15   | F061614HCS  | HHCS, 3/8-16 X 1-3/4 GR5 ZP                                                         | 4   |
| 16   | F0616FN     | NUT, FLANGE 3/8-16 ZP                                                               | 4   |
| 17   | F06LW       | LOCKWASHER, 3/8 ZP                                                                  | 4   |
| 18   | J0176060020 | NUT, SELF LOCKING                                                                   | 2   |
| 19   | J2523260107 | ELEMENT (ROBIN EH12)                                                                | 1   |
| 20   |             | CLIP, FUEL LINE (Not provided by MBW Inc.)                                          | 2   |
| 21   |             | FUEL LINE, 3/16 ID X 1" LONG (Not provided by MBW Inc.)                             | 1   |
| 22   |             | HEX HEAD FLANGE SCREW, M8-1.25 X 40MM (Not provided by MBW Inc.)                    | 4   |
| 23   |             | PIN, DOWEL, 6MM X 10MM (Not provided by MBW Inc.)                                   | 2   |
| 24   | 06026       | KIT, SHOE & SPRING (Includes item 25 and (3) shoes, see note below)                 | 1   |
| 25   | 01581       | SPRING (See note below)                                                             | 1   |
|      |             | Note: Service Items 24 and 25 may be ordered for clutch rebuild only. After machine |     |
|      |             | Serial Numbers listed below, new style clutch (Item 1) used.                        |     |
|      |             | 480H - 4850099                                                                      |     |
|      |             | 481H - 4850099                                                                      |     |
|      |             | 480R - 4811090                                                                      |     |
|      |             | 480H - 4811090                                                                      |     |
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