Martin®
Gen 4 Railcar Opener

Go to Martin® Gen 4 Railcar Opener web page.

Operator's Manual
M4209

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) ANSI/ ASSP z244.1-2024, *The Control of Hazardous Energy Lockout, Tagout And Alternative Methods and Occupational Safety* and Health Administration (OSHA) Federal Register, Title 29 Subtitle B Chapter XVII Subpart J 1910.147, *Control of Hazardous Energy Source (Lockout/Tagout);* Final Rule.

The following symbols may be used in this manual:

⚠ DANGER

Danger: Immediate hazards that will result in severe personal injury or death.

⚠ WARNING

Warning: Hazards or unsafe practices that could result in personal injury.

⚠ CAUTION

Caution: Hazards or unsafe practices that could result in product or property damages.

IMPORTANT

Important: Instructions that must be followed to ensure proper installation/operation of equipment.

NOTE

Note: General statements to assist the reader.

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Introduction

General

The Martin® Gen 4 Railcar Opener is an air-powered wrench that opens the most stubborn hopper gates. Railcar opener specifications are provided in Table I.

Table I. Martin® Gen 4 Railcar Opener Specifications

Air Supply	**100 PSI (6.9 BAR)**	**75 CFM (2124 L/MIN)**
RPM at drive shaft	11 RPM (NO LOAD)	
Output force	3750 FT-LBS (5080 N-m)	

References

The following documents are referenced in this manual:

- American National Standards Institute ANSI/ASSP Z244.1-2024, *The Control of Hazardous Energy Lockout, Tagout and Alternative Methods* American National Standards Institute, Inc., 1180 6th Ave, 10th Floor New York, NY 10036.
- Federal Register, Title 29 Subtitle B Chapter XVII Subpart J 1910.147, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety and Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chciago, IL 60604.

Safety

All safety rules defined in the above documents and all owner/employer safety rules must be strictly followed when working on this equipment.

Materials required

Only standard hand tools are required to assemble and service this equipment.

Before Assembling Gen 4 Railcar Opener

IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims from damages. Contact your transportation agent for more information

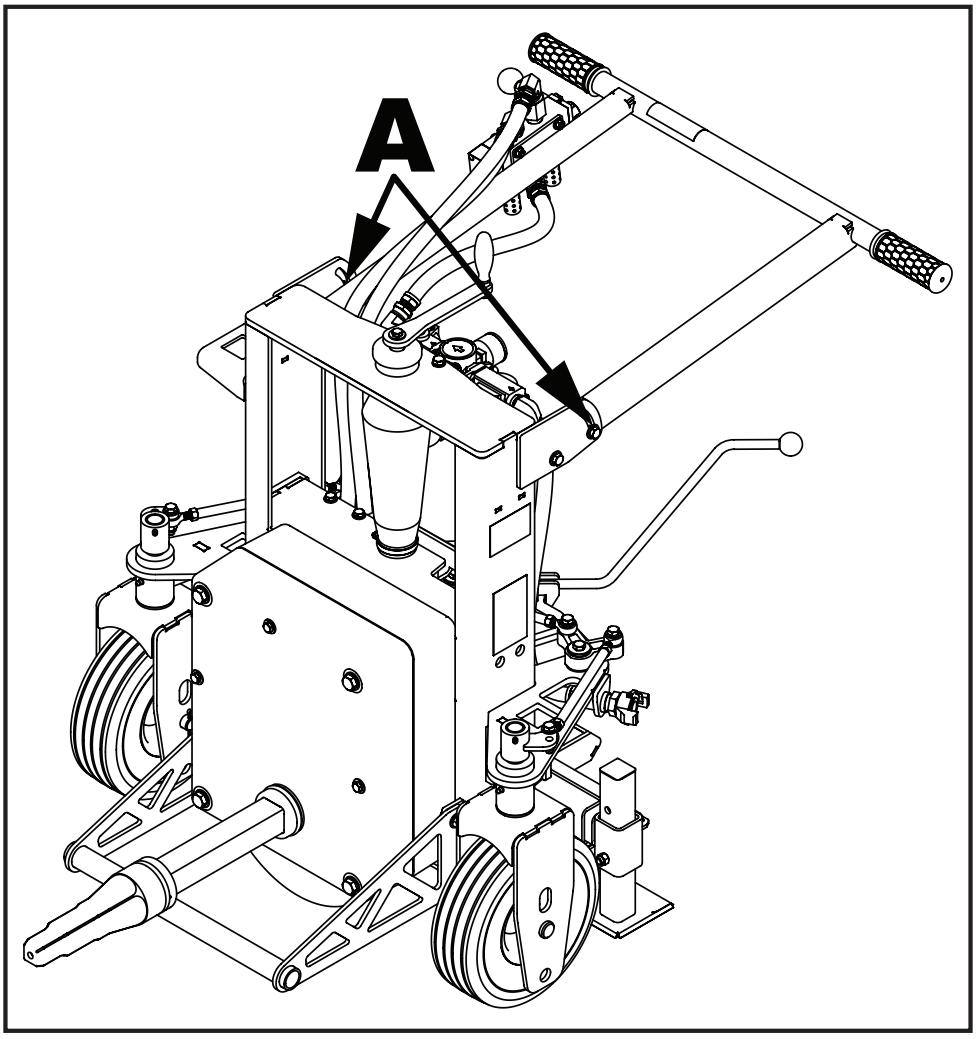
1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove railcar opener from shipping containers. Equipment in containers should include the following:
   - Martin® Railcar Opener
   - Capstan Adapter
   - Drive Shaft
   - Air Motor Oil
3. If anything is missing or damaged, contact Martin Engineering or a representative.

Assembling Gen 4 Railcar Opener

⚠WARNING

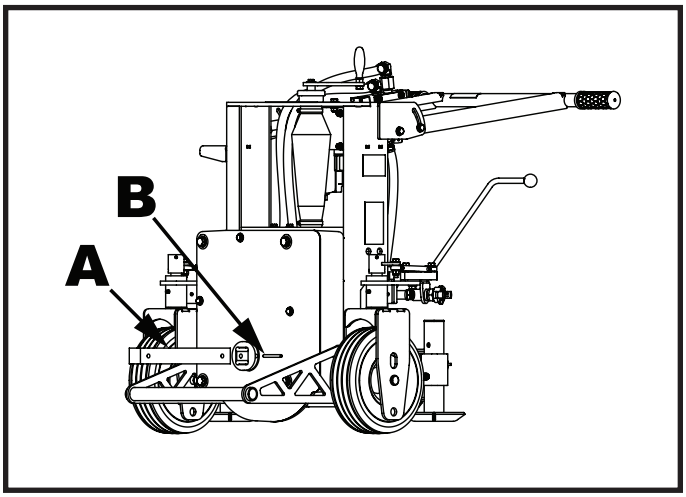
Before installing, servicing, or adjusting equipment, turn off and lockout/tagout energy sources to Railcar Opener according to ANSI standards or country specific safety standards (DIN, ISO, etc.). Failure to do so could result in serious injury or death. Read all instructions before proceeding.

Adjusting the handle

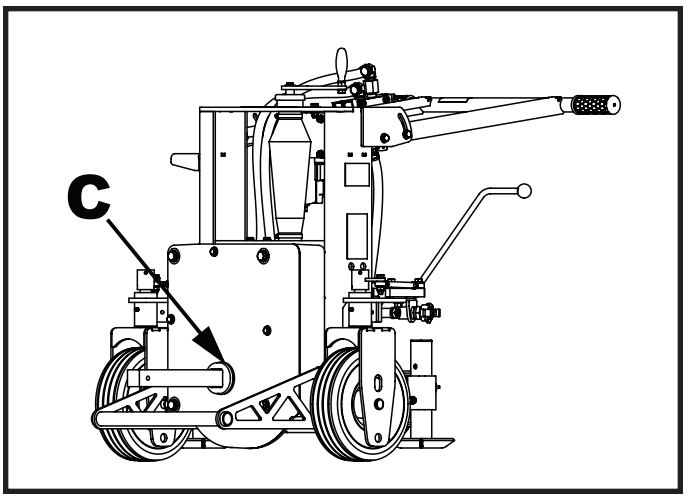


1. Loosen bolts (A) on each side to adjust angle position of handle. Retighten in the desired position.

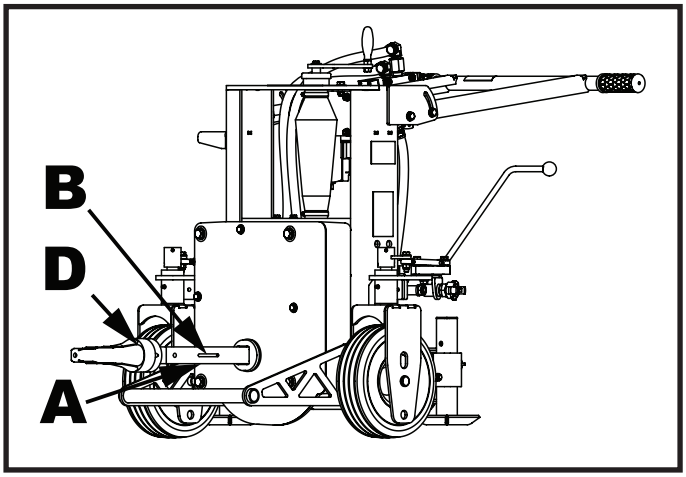
Attaching capstan extension



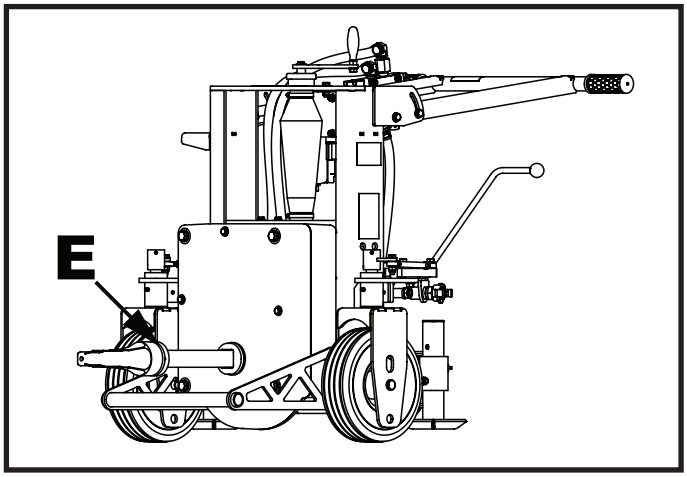
1. Insert driveshaft (A) into square hole making sure the holes are aligned for retaining pin entry, then insert the retaining pin (B) perpendicular to the shaft into the holes in driveshaft and driveshaft hub.



2. Apply o-ring #408 2.875” outside diameter (C) over top both the retaining pin and driveshaft hub.



3. Insert the capstan adapter (D) onto the driveshaft (A) aligning the square opening to the square driveshaft, making sure to align holes for retaining pin entry, then insert the retaining pin (B) perpendicularly through both the capstan adapter (D) and driveshaft (A).



4. Apply o-ring #409 3” outside diameter (E) over top both the retaining pin and capstan adapter.

Preparing the filter, regulator, and lubricator

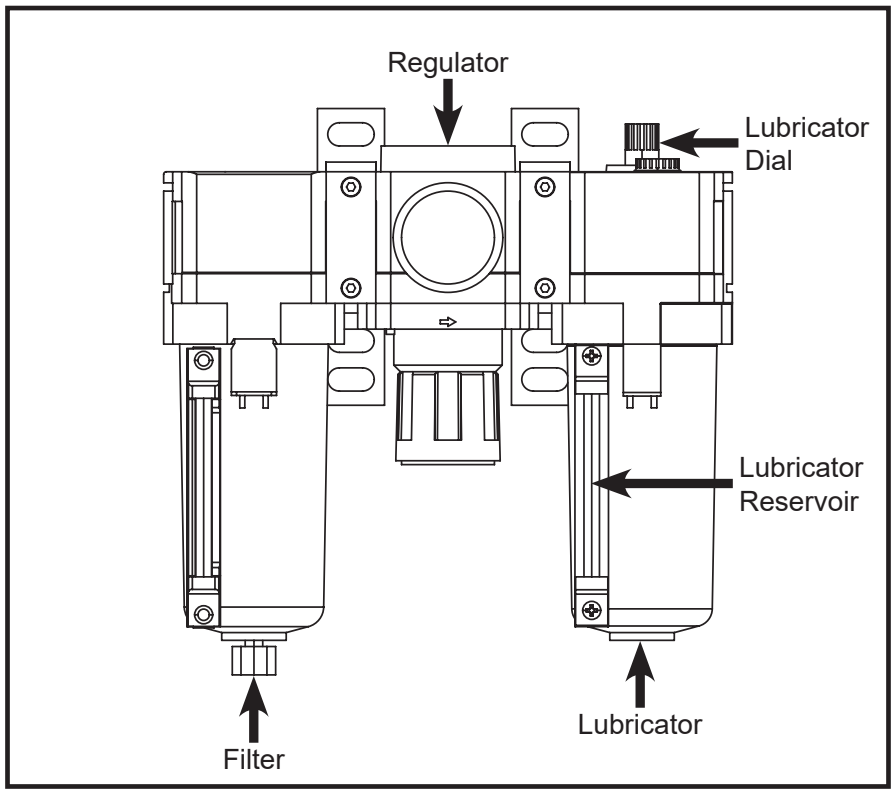


Figure 1. Martin® Gen 4 Railcar Opener Filter, Regulator, and Lubricator

NOTE

Refer to Filter, Regulator, and Lubricator operating instructions.

Installation and service instructions

1. Martin Engineering recommends using 1/2 in. hose or larger for air supply.
2. The manufactures installation and service instructions for the filter, regulator, and lubricator are included as separate items with this booklet.
3. Adhere to all safety information posted on these instructions.
4. Fill the Lubricator reservoir up to the full line with the air motor oil included with kit.

NOTE

Min 80 PSI - Max 125 PSI is necessary to properly operate Martin® Gen 4 Railcar Opener. Do not exceed this range.

5. With the plant air supply hose connected to the unit and regulator set at 100 psi [2124 L/min at 6.9 bar], hold the control valve open and set the lubricator to deliver 3-4 drops of oil per minute while the motor is being operated. Clockwise decreases rate and counterclockwise increases rate.

Attaching hose to plant air supply

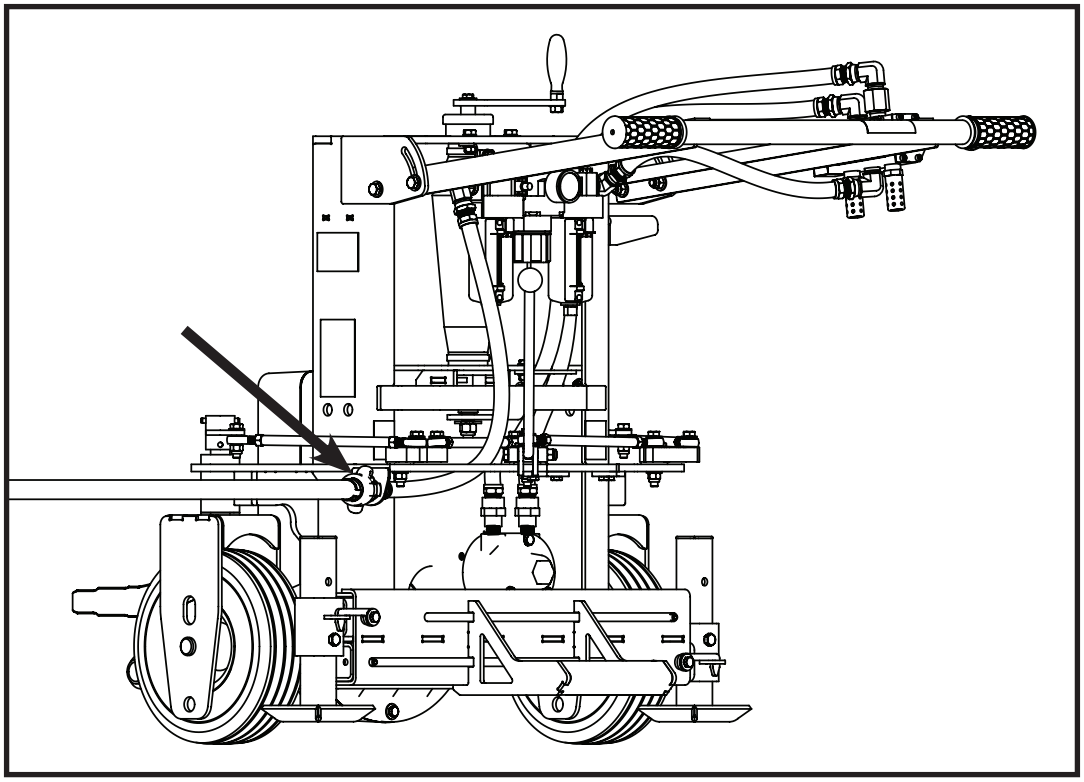


Figure 2. Martin® Gen 4 Railcar Opener Hose Attachment Point

⚠WARNING

Pins must be inserted to prevent hoses from coming apart.

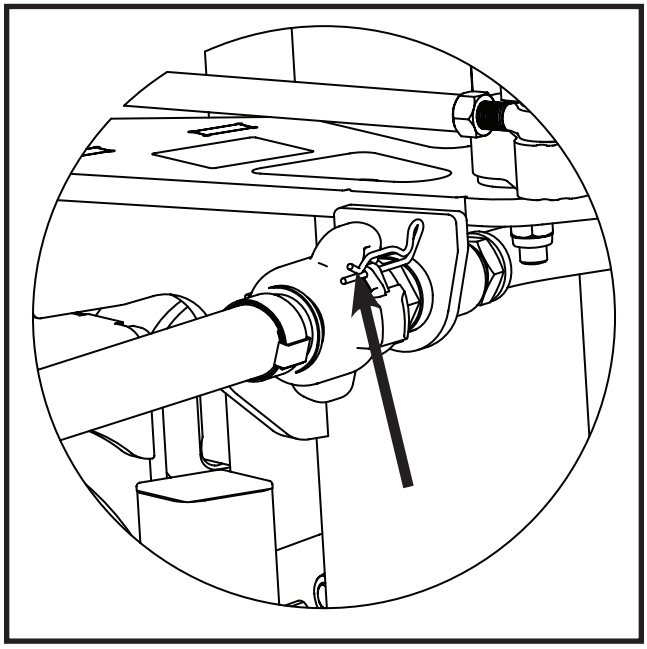


Figure 3. Martin® Gen 4 Railcar Opener Pin Attachment Point

Operating Gen 4 Railcar Opener

IMPORTANT

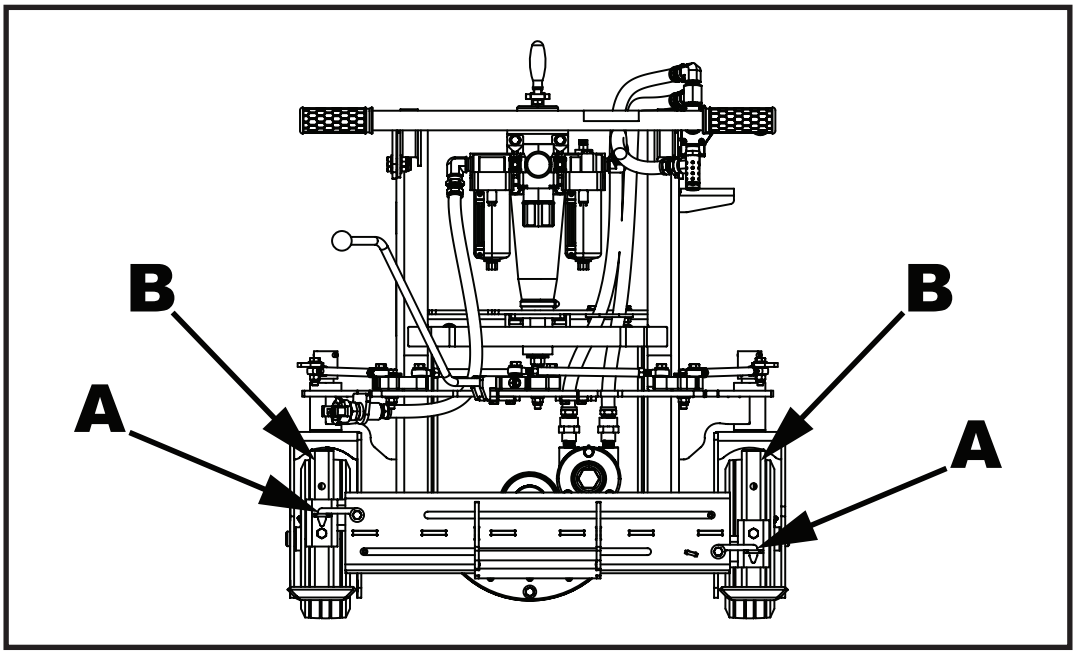
Martin® Gen 4 Railcar Opener is not designed for rapid directional change. Rapid reversal of railcar opener may cause damage to gears and chain.

1. Extend outriggers and make sure the drive shaft is level and square to the capstan of the railcar gate.

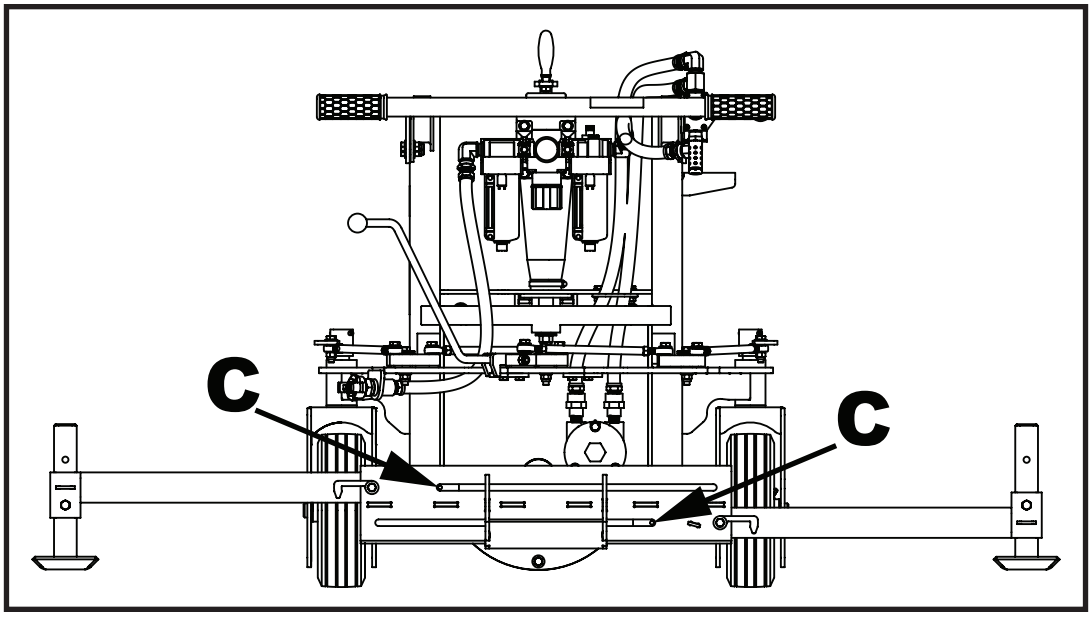
Extending outriggers

IMPORTANT

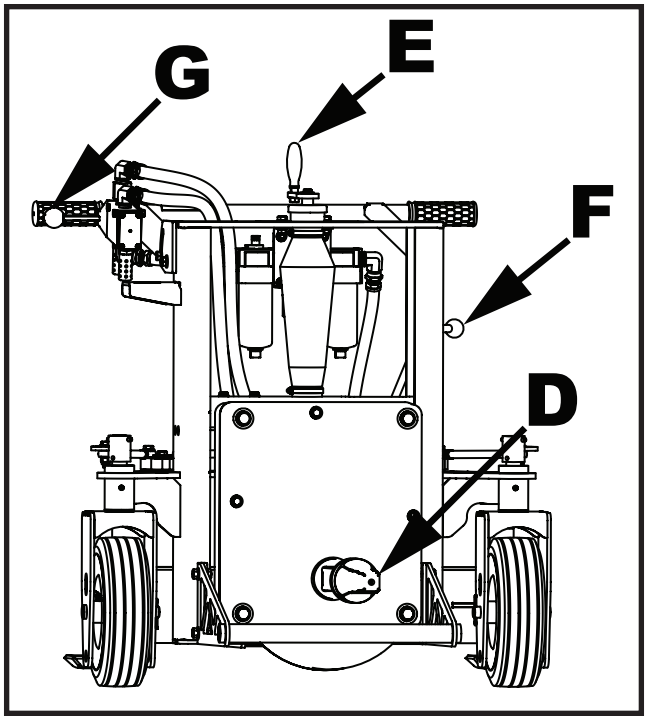
Outriggers should be fully extended when operating railcar opener.



1. Flip outrigger retainer clips (A) off from outrigger (B). Extend outriggers (B) out until they bump against stop pins (C).



2. Adjust height of drive shaft (D) by rotating handle (E).



3. Insert drive shaft (D) into capstan of the railcar gate.
4. Determine if the capstan travels or is stationary. If the capstan travels to open the gate, turn handle (F) to rotate the wheels so the Martin® Gen 4 Railcar Opener moves laterally as the gate is being open/closed.

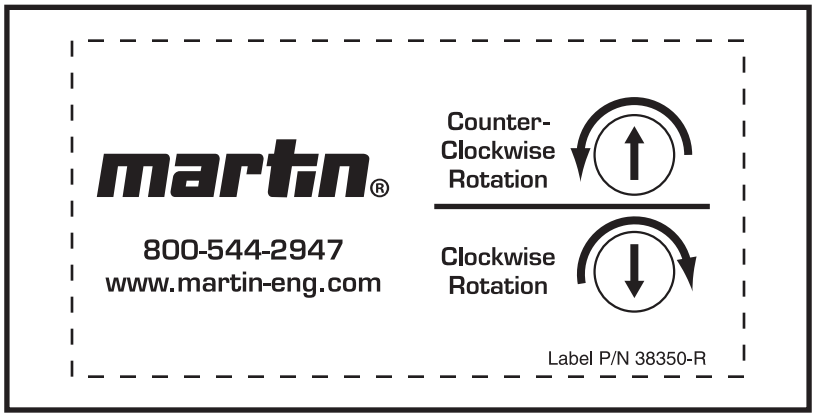


Figure 4. Martin® Railcar Opener Rotation Guide Label

5. Determine which way the capstan needs to be turned to open/close and engage the control lever (G) in the proper direction (clockwise/counter clockwise).
6. Once the control lever is engaged, leave it engaged for several seconds so that the Martin® Gen 4 Railcar Opener can build the required torque to open/close the gate. If after several seconds the capstan has not turned, disengage the control lever and verify that the air pressure is set correctly (75 cfm at 100 psi [2124 L/min at 6.9 bar]) and that the Martin® Gen 4 Railcar Opener is being operated in the proper direction to open/close the gate. Do not exceed an air pressure of 125 PSI when operating the Railcar Opener. Attempting to operate Railcar Opener above maximum air pressure can irreversably damage Railcar Opener components.

NOTE

If the gate/gate components are damaged or misaligned do not continue to attempt to open/close the gate using the Gen 4 Railcar Opener.

NOTE

The product comes shipped in the low wheel height with case down and motor down position. Outrigger height must be adjusted alongside wheel height. Refer to Figure 5. for possible height configurations.

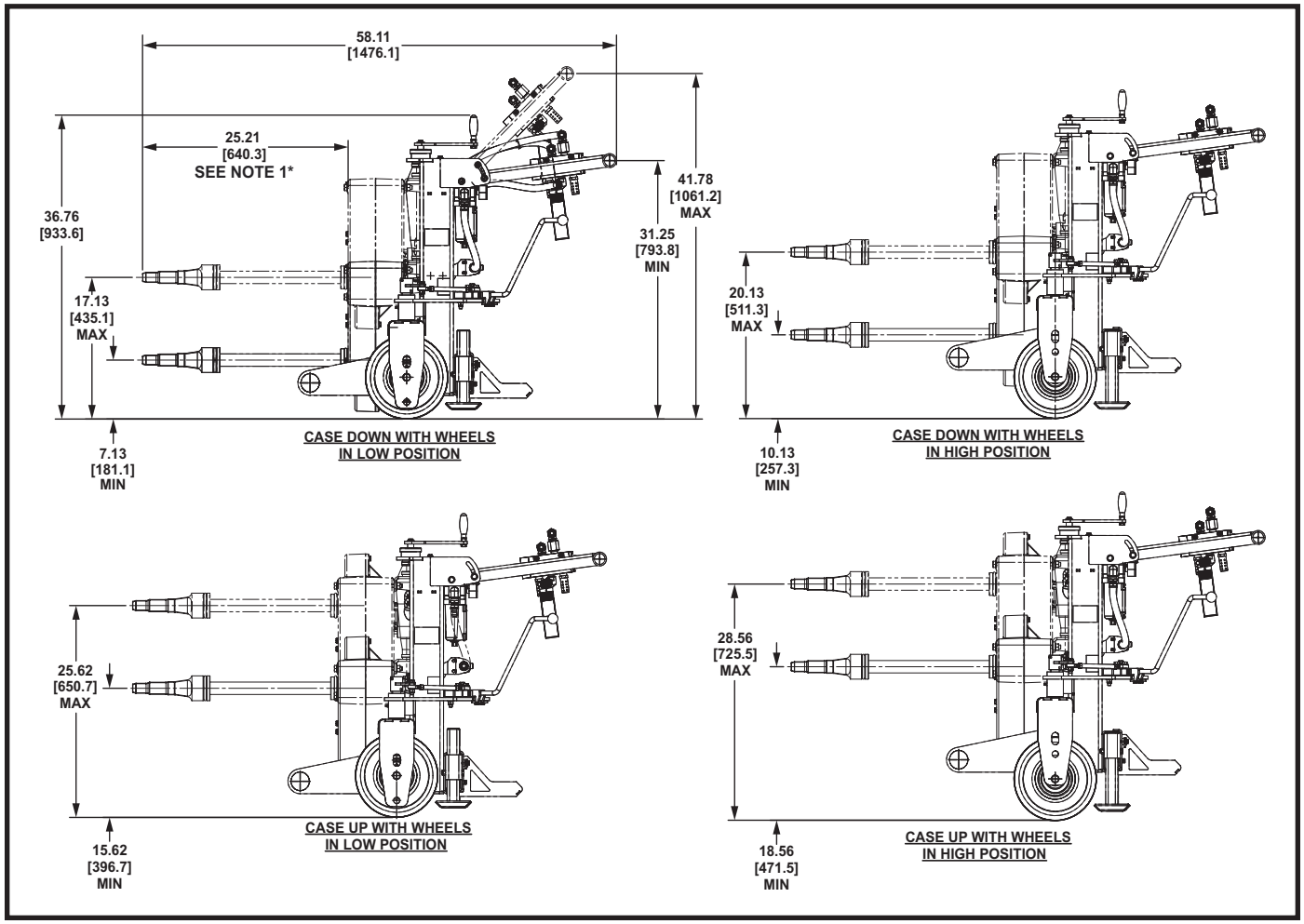
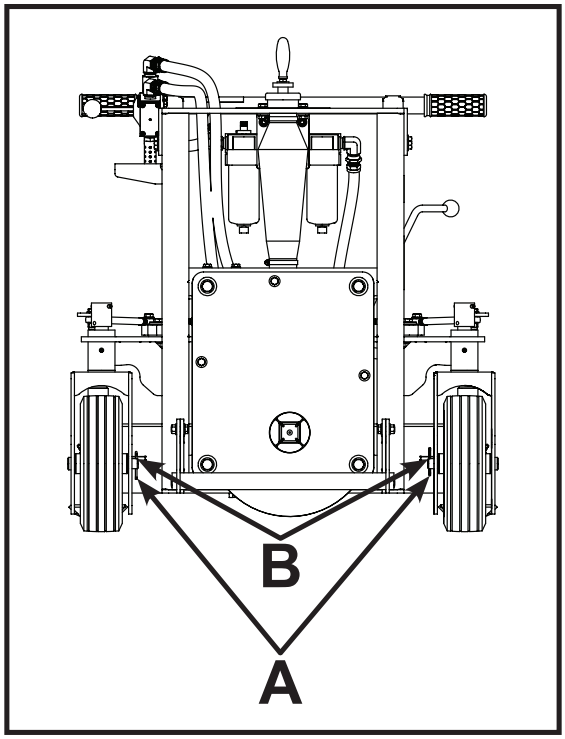


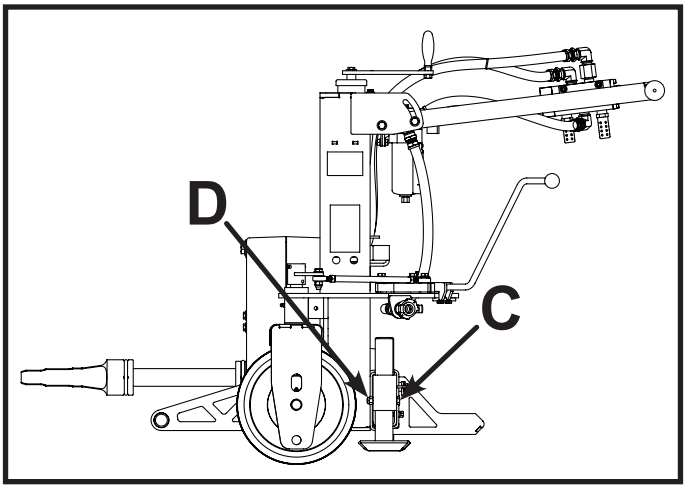
Figure 5. Martin® Gen 4 Railcar Opener Wheel and Outrigger Positions

Wheel repositioning



1. Remove cotter pins (A) from clevis pins (B).
2. Remove clevis pins (B) from wheels and frame structure.
3. Insert clevis pins (B) into desired height of frame and wheels (Refer to Figure 5).
4. Insert cotter pins (A) into clevis pins (B).

Adjusting outriggers alongside wheels in high position



5. Remove the screws (C) and hex nuts (D) from outriggers' default low position.
6. Extend outriggers vertically aligning the hole in frame to hole in desired height of outrigger (Refer to Figure 5).
7. Reinstall the screw (C) and hex nut (D) into the hole in desired height.

Rotating the case for more height of drive shaft

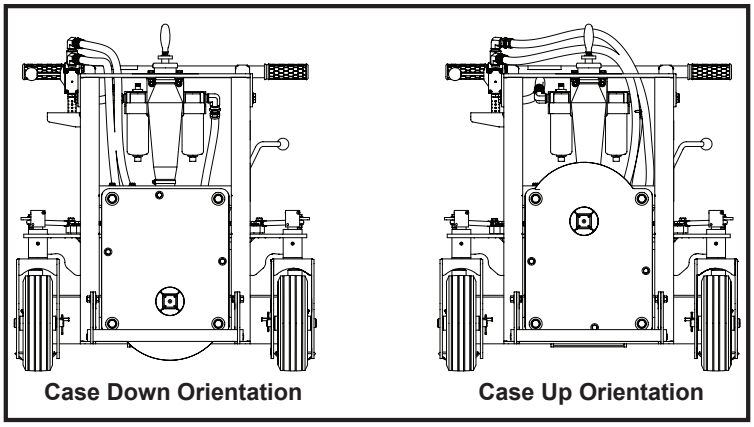
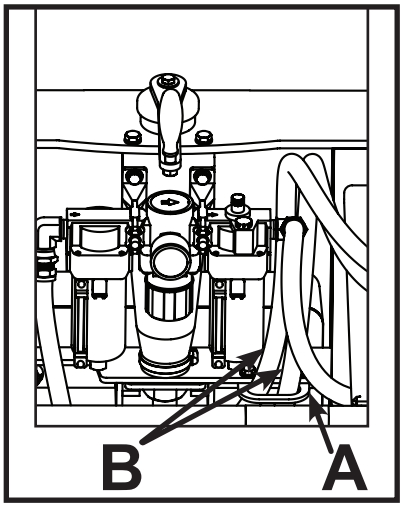
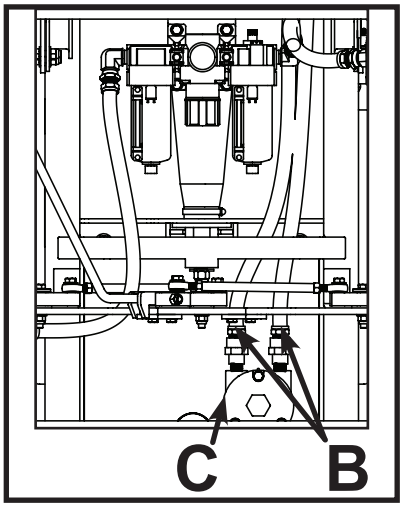


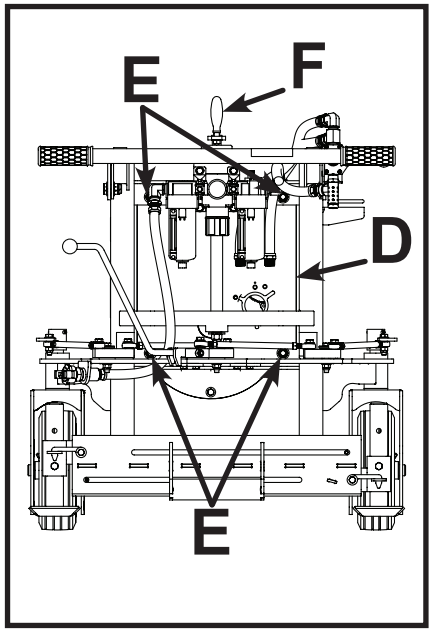
Figure 6. Martin® Gen 4 Railcar Opener Case Orientations.



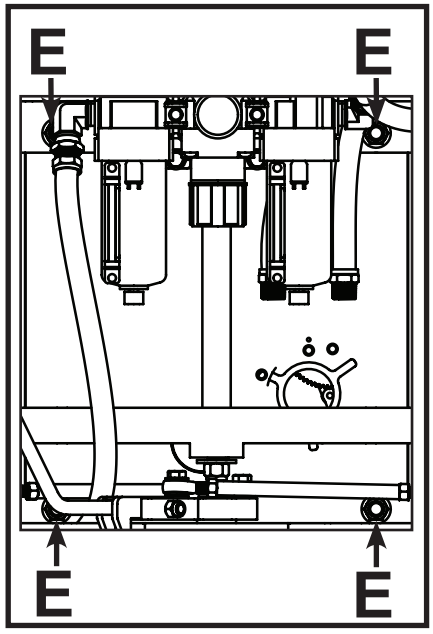
1. Remove bracket (A) if converting to case up orientation. Reinstall bracket (A) over hoses (B) if converting to case down orientation.



2. Detach the hoses (B) from the air motor (C) and remove the air motor (C) from the railcar opener.



3. Raise the case (D) to make the 4 screws (E) more accessible by rotating the crank handle (F) as necessary.



4. Remove the screws (E) from the case and frame.

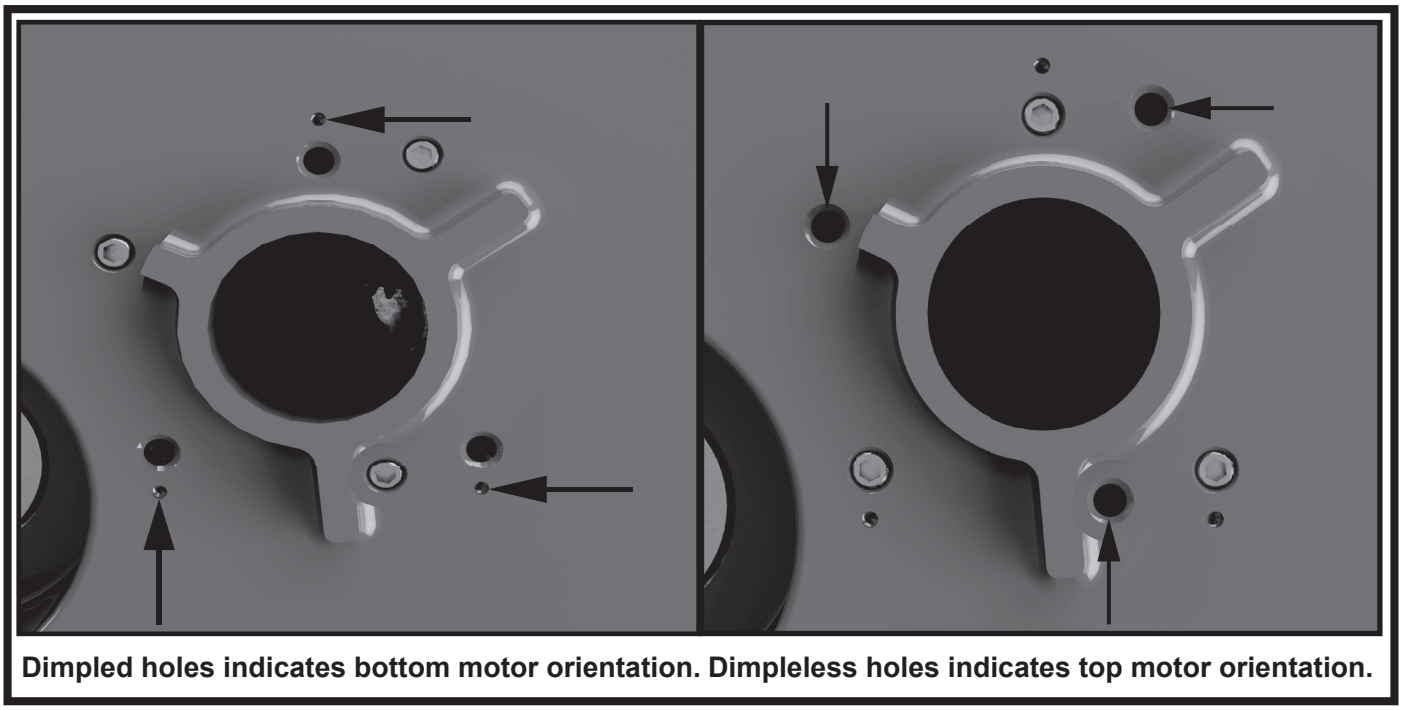


Figure 7. Martin® Gen 4 Railcar Opener Motor Hole Orientations

5. Remove the set screws from the intended orientation, placing the screws into the unused orientation. (Refer to Figure 7.) Reinstall the air motor making sure to use the dimpleless holes for the top motor orientation, the dimpled holes for bottom motor orientation. (Refer to Figure 8.)

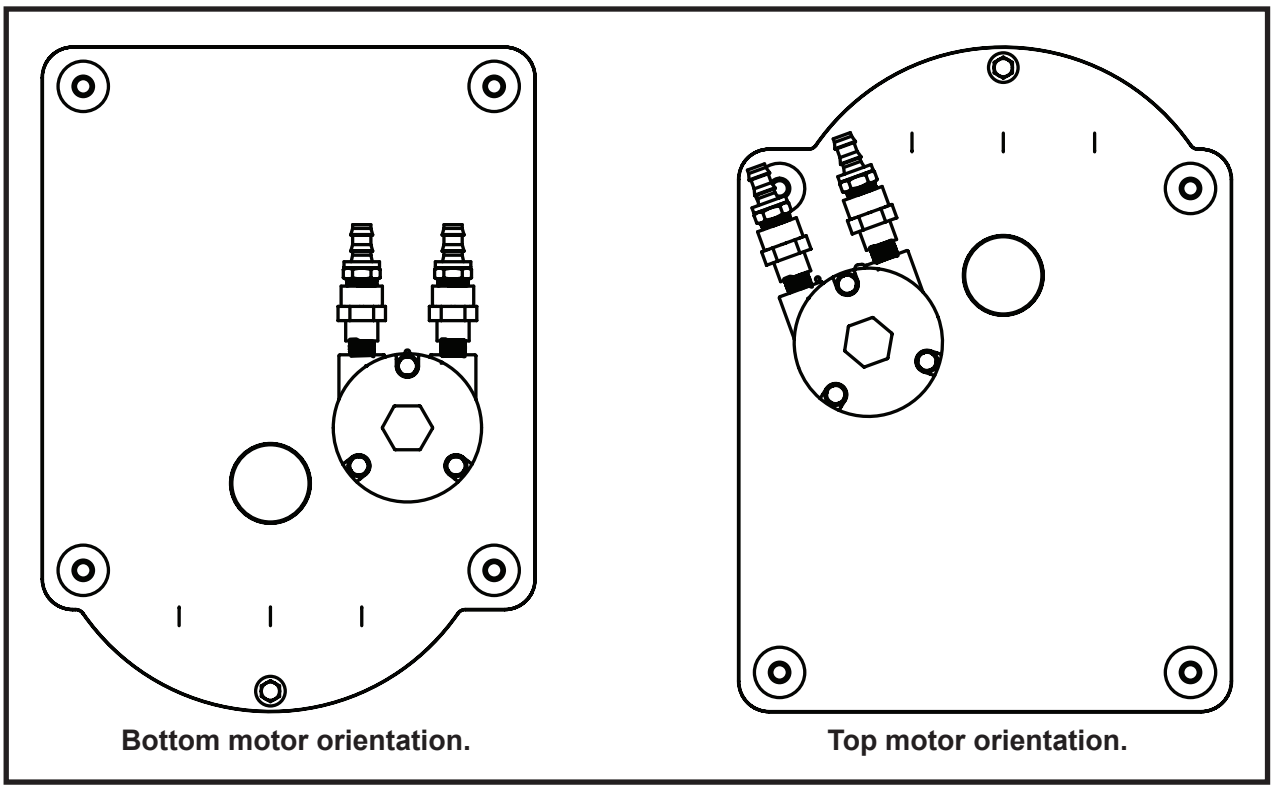
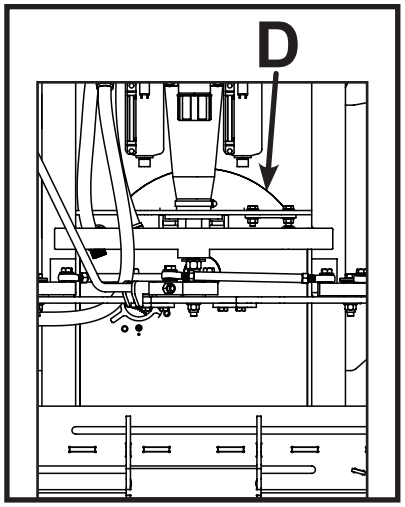
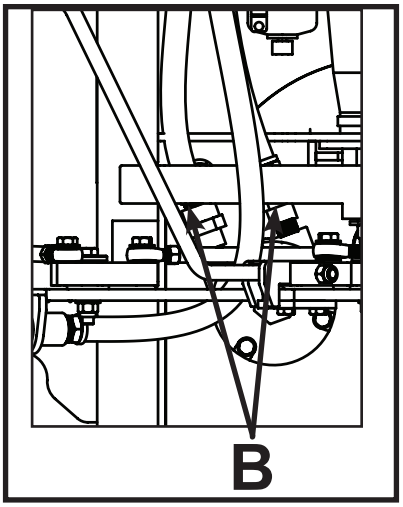


Figure 8. Martin® Gen 4 Railcar Opener Motor Orientations

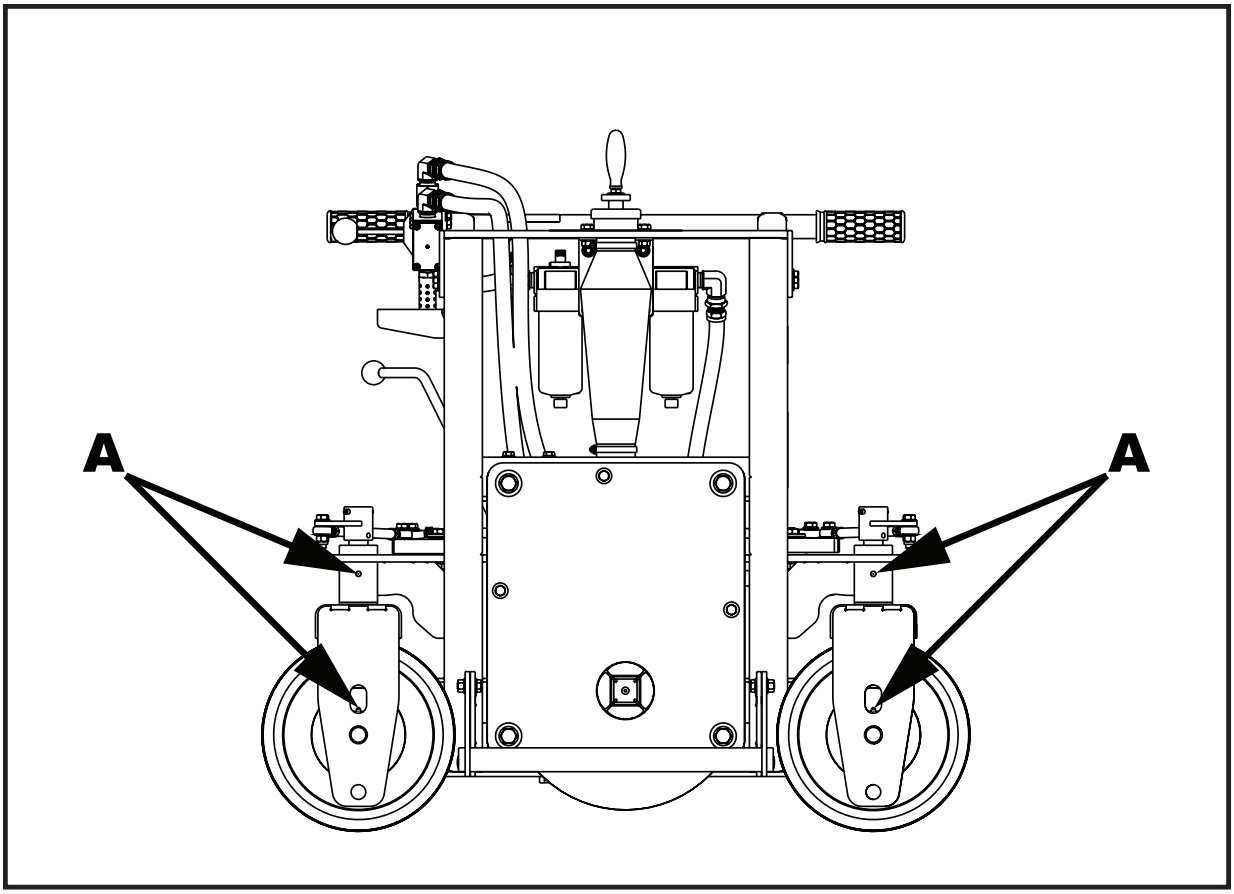


6. Rotate the case (D) into the desired orientation (Refer to Figure 6. for orientations) installing the 4 screws back into the case and frame in same location as previous orientation.



7. Reinstall the motor and hoses (B) back into the gear case.

Maintenance



1. Grease pivot points
   a. Clean area around grease fittings (A) with clean shop towel.
   b. Insert grease gun onto grease fitting and add grease.
2. Inspect all hardware and tighten if necessary.
3. Wipe all labels clean. If labels are not readable, contact Martin Engineering or a representative for replacements.

NOTE

Martin Engineering recommends the use of Air Motor Oil (P/N 14766) when servicing the lubricator.

Troubleshooting

Symptom	Corrective Action
Railcar opener will not operate or operating slow.	• Muffler on control valve is clogged. Clean or replace. • Lubricator is empty or out of adjustment. Refill or adjust to deliver 1 - 2 drops/min. • Insufficient air pressure and/or cfm. Check main source. Check regulator setting.

Part Numbers

This section provides product names and corresponding part numbers for the Martin® Railcar Opener and related equipment. Please reference part numbers when ordering parts:

Martin® Gen 4 Railcar Opener Assembly

Martin® Gen 4 Railcar Opener Assembly, **P/N RO10170P. See Figure 9.**

Loud Noise Warning Label, **P/N 34070. See Figure 13.**

Air Pressure Warning Label, **P/N 33378. See Figure 14.**

Martin® Gen 4 Railcar Opener Replacement Parts

Air Motor Assembly, **P/N RO10107. See Figure 12.**

Air Motor Oil - Qt., **P/N 14766.**

Air Filter Replacement Element, **P/N 14760-E.**

Control Valve Seal Service Kit, **P/N SUS10187-SK.**

Direction Control Valve Replacement Kit, **P/N RO10180. See Figure 10.**

Martin® Gen 4 Railcar Opener Hose Kit, **P/N RO10179. See Figure 9 Table II.**

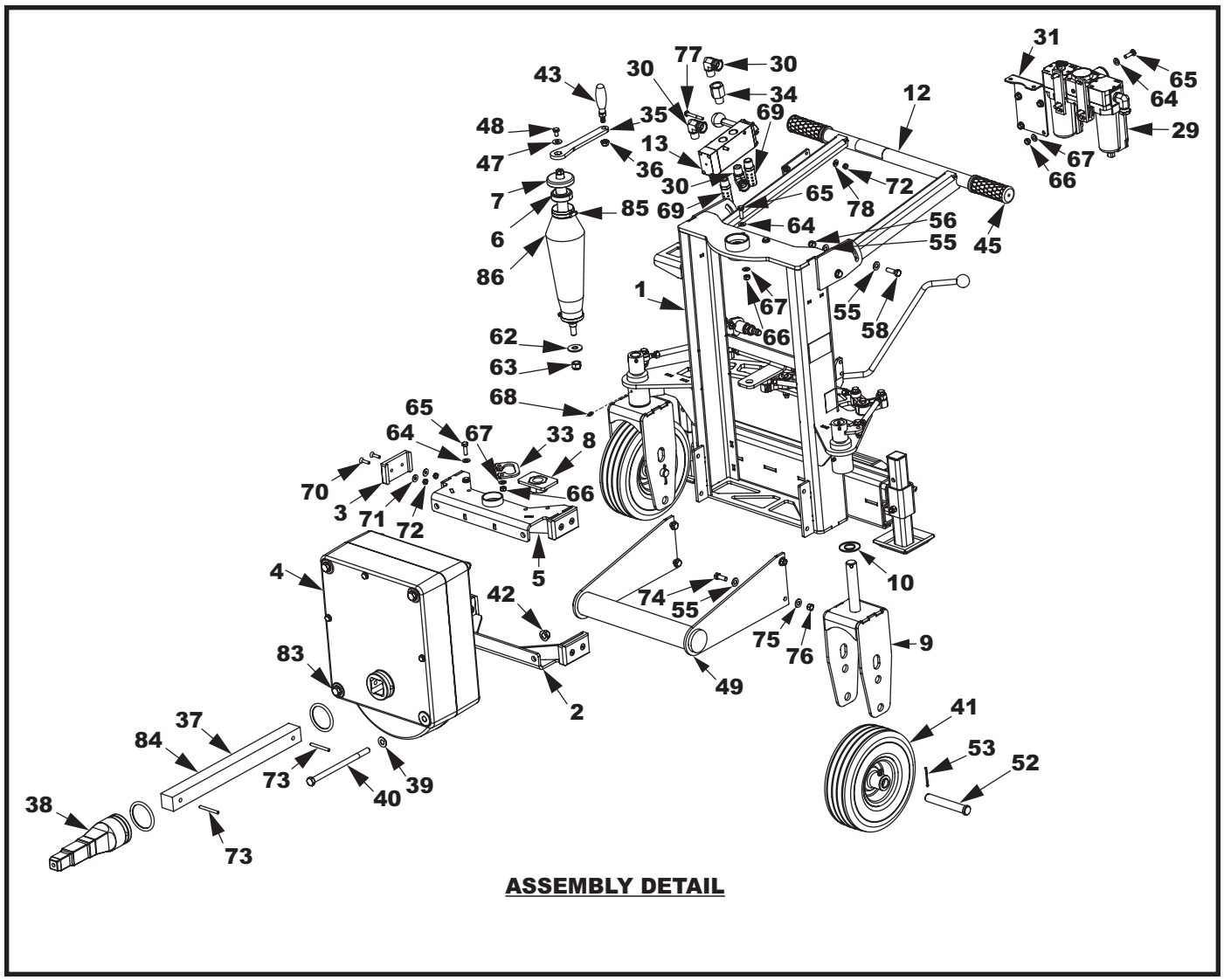


Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 1 of 6)

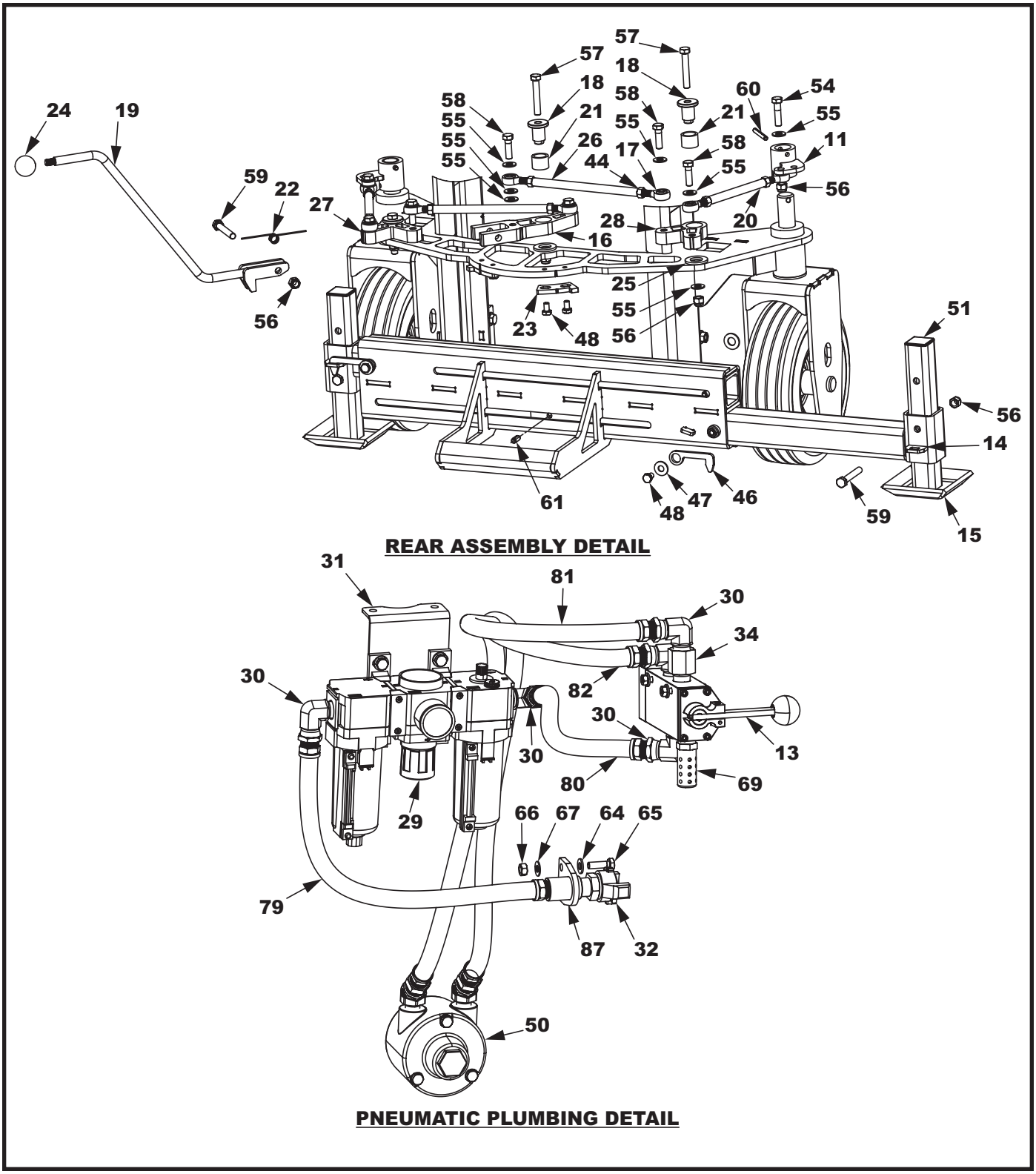


Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 2 of 6)

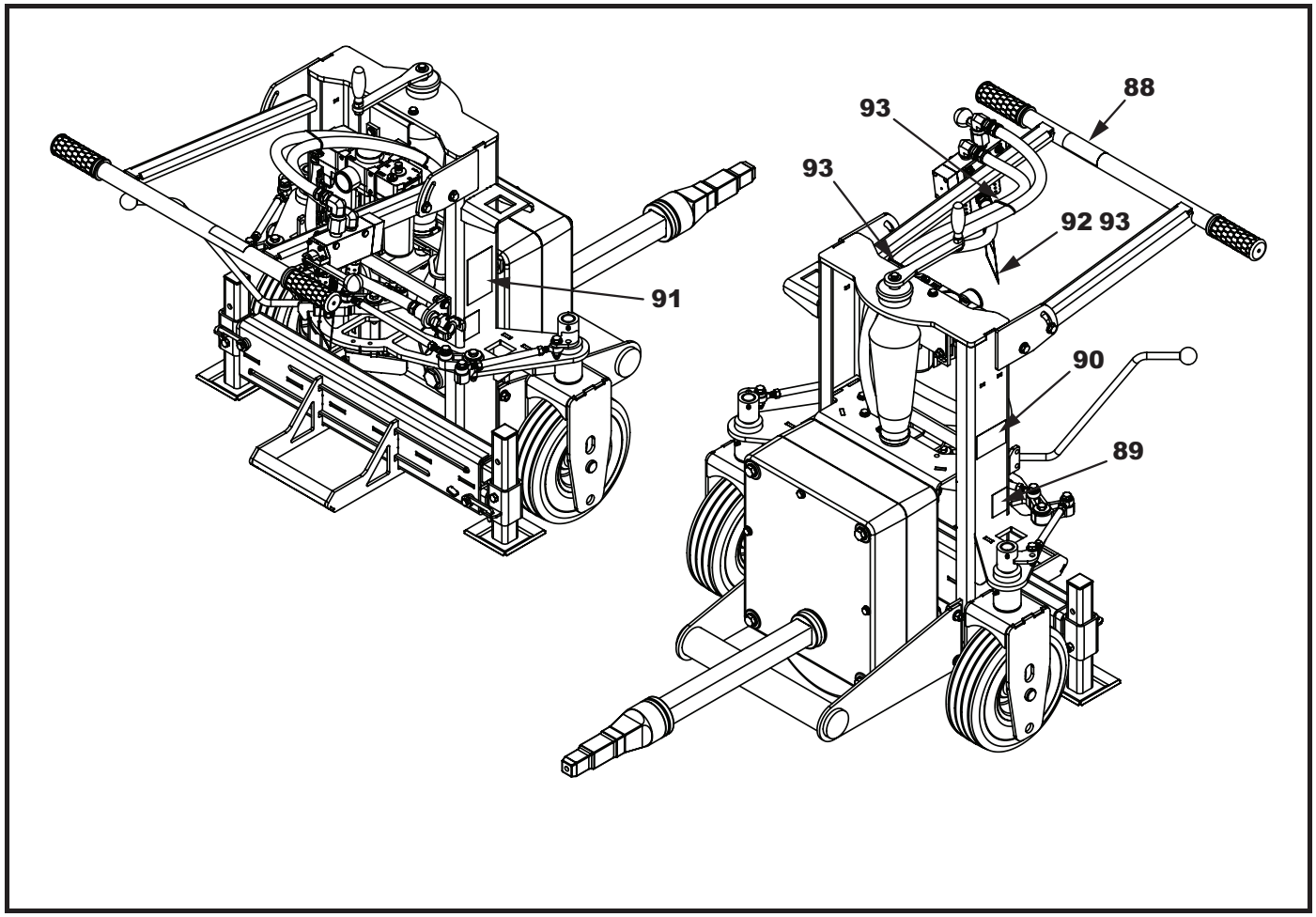


Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 3 of 6)

Item	Description	Part Number	Qty
1	Frame Weldment	RO10171P	1
2	Lower Case Support Weldment	RO10120P	1
3	UHMW Slider	RO10109	4
4	Gear Case Assembly	RO10106BP	1
5	Upper Case Support Weldment	RO10119P	1
6	Thrust Bearing	SUS10186	1
7	Adjustment Rod Weldment - ZP	RO10146-ZP	1
8	ACME Nut Plate Weldment	RO10112P	1
9	Wheel Fork Weldment	RO10123P	2
10	Washer Nylon 1.00 X 2.00 X .125	34097	2
11	Steering Tube Weldment	RO10028	2
12	Handle Weldment	RO10142P	1
13	Valve 1/2 - NPT	SUS10187	1
14	Outrigger Weldment	RO10127P	2
15	Outrigger Foot Weldment	RO10131P	2
16	Wheel Pivot Plate	RO10149P	1
17	Ball Joint Rod End 3/8-24NF ZP	38469	8
18	Wheel Direction Pivot Pin	RO10016	3
19	Wheel Pivot Handle Weldment	RO10138P	1
20	Steering Rod	RO10135SP	2
21	Bushing Bronze .75 ID X 1.00 OD X .75 LG	RO10051	3
22	Torsion Spring	RO10052	1
23	Adjustable Wheel Pivot Stop Tab Plate	RO10055	2
24	Ball Knob 3/8-16NC	38471	1
25	Washer Thrust .754 ID X 1.38 OD X .125 841 Bronze	SUS10190	3
26	Steering Rod	RO10135LP	2
27	Wheel Pivot Plate	RO10148P-L2	1
28	Wheel Pivot Plate	RO10148P-R1	1
29	FRL 1/2-NPT	14760	1
30	Elbow Pipe/Swivel 1/2 NPTF X 1/2 NPSM Swivel 90 Deg	13368	5
31	Regulator Mount Bracket	RO10151	1
32	Universal Twist Claw Coupling 1/2-NPT Male	39318	1
33	Hose Retainer	RO10150	1
34	Adapter 1/2-NPT Male X 1/2-NPT Female ZP	SUS10167	1
35	Crank Handle	RO10143	1
36	Nut Hex Flange 3/8-16NC ZP	16741	1
37	Drive Shaft 18.19 LG	RO10105P-26	1
38	Capstan Drive Point Adapter	RO10108P	1

Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 4 of 6)

Item	Description	Part Number	Qty
39	Washer Compression 1/2	11750	4
40	Screw HHC 1/2-13NC X 8 ZP	SUS10168	4
41	Wheel ASM 10.00 OD With .75 ID Bearings	SUS10189	2
42	Nut Hex Flange 1/2-13NC ZP	18843	4
43	Crank Handle 3/8-16NC ZP SS	SUS10188	1
44	Nut Hex 3/8-24NF GR 2 ZP	13646	8
45	Handle Grip for 1.25 OD Bar	SUS10193	2
46	Outrigger Latch Plate	RO10128	2
47	Washer Flat 5/16 Wide ZP	13847	3
48	Screw HHC 5/16-18NC X 1/2 ZP GR 5 ZP	19134	7
49	Park Stand Weldment	RO10134P	1
50	Air Motor ASM	RO10107	1
51	Cap Plug for 1-3/8 Tube 10-14 GA Wall	SUS10196	2
52	Pin Clevis 3/4 X 5	33046-01	2
53	Pin Cotter 1/8 X 1-3/4 ZP	14210	2
54	Screw HHC 3/8-16NC X 1-1/2 GR 5 ZP	32719	2
55	Washer Flat 3/8 Narrow SS	16206	25
56	Nut Hex Elastic Lock 3/8-16NC ZP	14201	12
57	Screw HHC 3/8-16NC X 2-1/4 GR 5 ZP W/ Full Thrd	35900	3
58	Screw HHC 3/8-16NC X 1-1/4 GR 5 ZP	12215	10
59	Screw HHC 3/8-16NC X 2-1/2 GR 5 ZP W/ Full Thrd	22169	3
60	Pin Slotted Spring 1/4 X 2	35434	2
61	Pin Slotted Spring 5/16 X 3/4 SS	SUS10191	2
62	Washer Flat 1/2 Wide ZP	17328	1
63	Nut Hex Elastic Lock 1/2-13NC ZP	18577	1
64	Washer Flat 5/16 Narrow ZP	17083	10
65	Screw HHC 5/16-18NC X 1 GR 5 ZP	32583	10
66	Nut Hex 5/16-18NC GR 2 ZP	11963	10
67	Washer Compression 5/16	11452	10
68	Fitting Grease Drive In 3/16	38584	2
69	Muffler Metal 1/2 NPT	210317	2
70	Screw HSFCHC 1/4-20NC-2A X 1 ZP	SUS10192	8
71	Washer Compression 1/4 ZP	11521	8
72	Nut Hex 1/4-20NC GR 2 ZP	11769	10
73	Drive Shaft Retaining Pin	RO10110	2
74	Screw HHC 3/8-16NC X 1 GR 5 ZP	11746-02	4
75	Washer Compression 3/8	11747	4
76	Nut Hex 3/8-16NC GR 5 ZP	11770	4

Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 5 of 6)

Item	Description	Part Number	Qty
77	Screw HHC 1/4-20NC X 2 GR 2 Zinc CHR	30793	2
78	Washer Flat 1/4 Narrow ZP	39308	2
79	Hose ASM 1/2-NPT X 14.00 LG	RO10179-1	1
80	Hose ASM 1/2-NPT X 21.00 LG	RO10179-2	1
81	Hose ASM 1/2-NPT X 32.00 LG	RO10179-3	1
82	Hose ASM 1/2-NPT X 36.00 LG	RO10179-4	1
83	O-Ring #408 2.350 ID X .275 CS N70A 2. 2.875” OD	SUS10195	1
84	O-Ring #409 2.475 ID X .275 CS N70A 3” OD	SUS10197	1
85	Worm Drive Hose Clamp	20339-05	2
86	Adjustment Rod Bellow	RO10172	1
87	Pipe Coupling Weldment	RO10184P	1
88	Label RCO Rotation Guide	38350-R	1
89	Label Pinch Point	30528	2
90	Label Martin Product	38048	1
91	Label Air Pressure Warning	33378	1
92	Loud Noise Warning Tag	34070	1
93	Tie Nylon Cable 6/6 Nylon 5.60 LG	30916	3
(NS) 94	Manual Operator’s	M4209	1
(NS) 95	Air Motor Oil - Quart	14766	1

NS = Not Shown

Figure 9. Martin® Gen 4 Railcar Opener Assembly, P/N RO10170P (Sheet 6 of 6)

Table II. Martin® Gen 4 Railcar Opener Hose Kit Part Numbers, P/N RO10179

Item	Description	Part Number	Qty
1	Hose ASM 1/2” X 14.00”	RO10179-1	1
2	Hose ASM 1/2” X 21.00”	RO10179-2	1
3	Hose ASM 1/2” X 32.00”	RO10179-3	1
4	Hose ASM 1/2” X 36.00”	RO10179-4	1

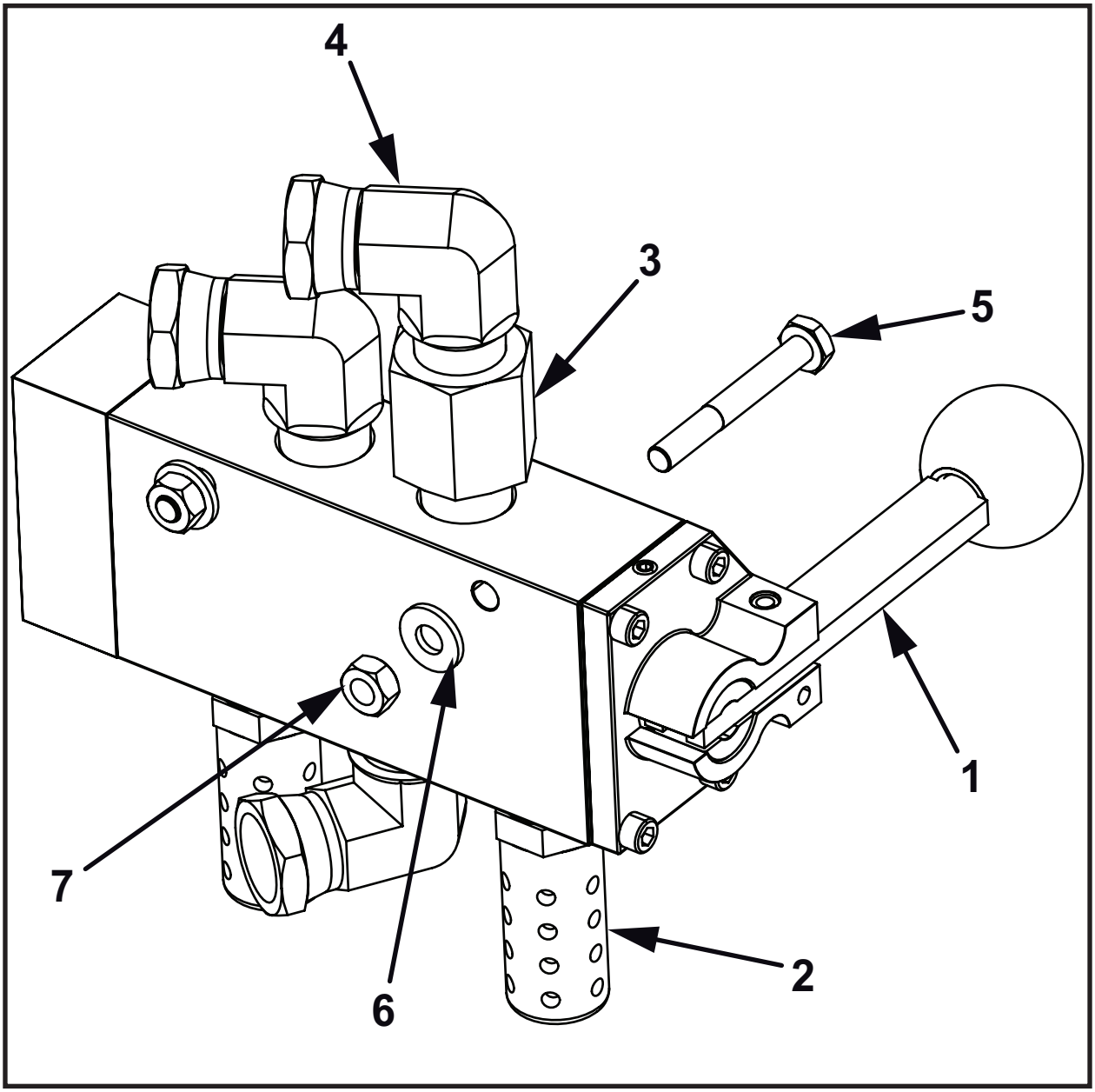


Figure 10. Martin® Gen 4 Railcar Opener Direction Control Valve Replacement Kit, P/N R01080

Item	Description	Part Number	Qty
1	Valve 1/2-NPT	SUS10187	1
2	Muffler Metal 1/2 NPT	210317	2
3	Adapter 1/2-NPT Male X 1/2-NPT Female ZP	SUS10167	1
4	Elbow Pipe/Swivel 1/2 NPTF X 1/2 NPSM Swivel	13368	3
5	Screw HHC 1/4-20NC X 2 GR 2 Zinc CHR	30793	2
6	Washer Flat 1/4 Narrow ZP	39308	2
7	Nut Hex 1/4-20NC GR 2 ZP	11769	2

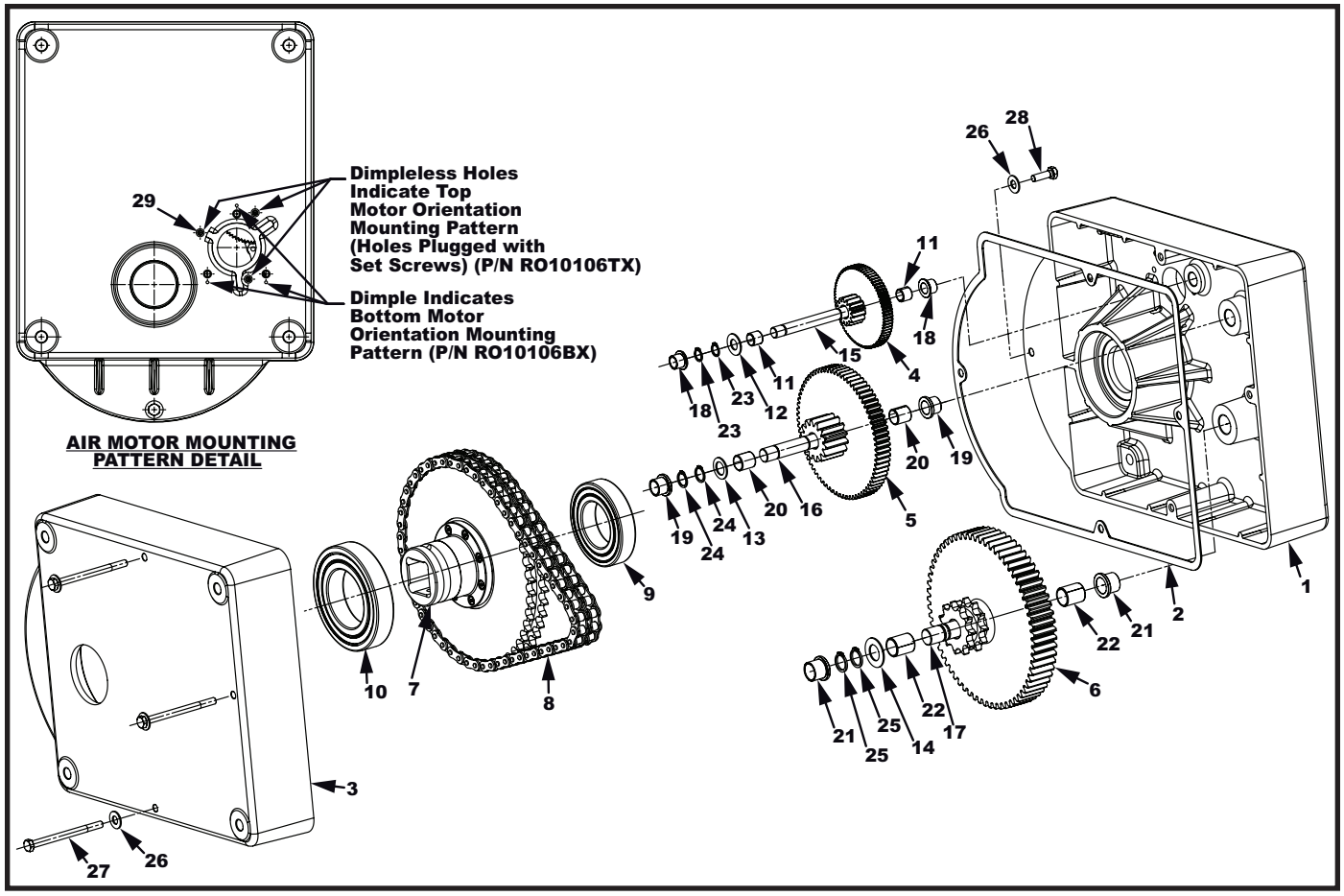


Figure 11. Martin® Gen 4 Railcar Opener Gearcase Assembly, P/N RO10106BP (Sheet 1 of 2)

Item	Description	Part Number	Qty
1	G4 RCO Motor Side Case - Machined	RO10092P	1
2	GR RCO Case Gasket	RO1013	1
3	Gr RCO Output Side Case - Machined	RO10093P	1
4	Spur Gear Combo 20DP 75T-12DP 14T	RO10095	1
5	Gear Combo 12DP 72T - 8DP 14TP	RO10096	1
6	Gear Combo 8DP 64T - #50-2 Sprocket	RO10097	1
7	Drive Hub Shaft & Sprocket ASM	RO10098-A	1
8	Chain #50-2 X 28 Links	RO10099	1
9	Bearing Sealed 6211-2RS 55MM ID	35748	1
10	Bearing Sealed 6214-2RS 70MM ID	SUS10155	1
11	Sleeve Bearing .500 X .5938 X .50 Steel/PTFE	SUS10160	2
12	Washer Thrust .502 ID X 1.000 OD X .063 841 Bronze	SUS10163	1
13	Washer Thrust .627 ID X 1.000 OD X .063 841 Bronze	SUS10159	1
14	Washer Thrust .755 ID X 1.375 OD X .063 841 Bronze	M970	1
15	Reduction Gear Shaft 1	RO10100	1
16	Reduction Gear Shaft 2	RO10101	1
17	Reduction Gear Shaft 3	RO10102	1
18	Flanged Sleeve Bearing .501 ID 841 Bronze	SUS10156	2
19	Flanged Sleeve Bearing .625 ID 841 Bronze	SUS10157	2
20	Sleeve Bearing .625 X .7188 X .75 Steel/PTFE	SUS10161	2
21	Flanged Sleeve Bearing .751 ID 841 Bronze	SUS10158	2
22	Sleeve Bearing .750 X .875 X 1.00 Steel/PTFE	SUS10162	2
23	Retaining Ring Ext Heavy Duty .50 DIA Shaft	SUS10164	2
24	Retaining Ring Ext Heavy Duty .63 DIA Shaft	SUS10165	2
25	Retaining Ring Ext Heavy Duty .75 DIA Shaft	SUS10166	2
26	Washer Compression 5/16	11452	4
27	Screw HHC 5/16-18NC X 4 ZP GR 5 ZP	36292	3
28	Screw HHC 5/16-18NC X 1 ZP	32583	1
29	Screw Set HSCP 5/16-18 X 3/8 NAT	18270	3

Figure 11. Martin® Gen 4 Railcar Opener Gearcase Assembly, P/N RO10106XX (Sheet 2 of 2)

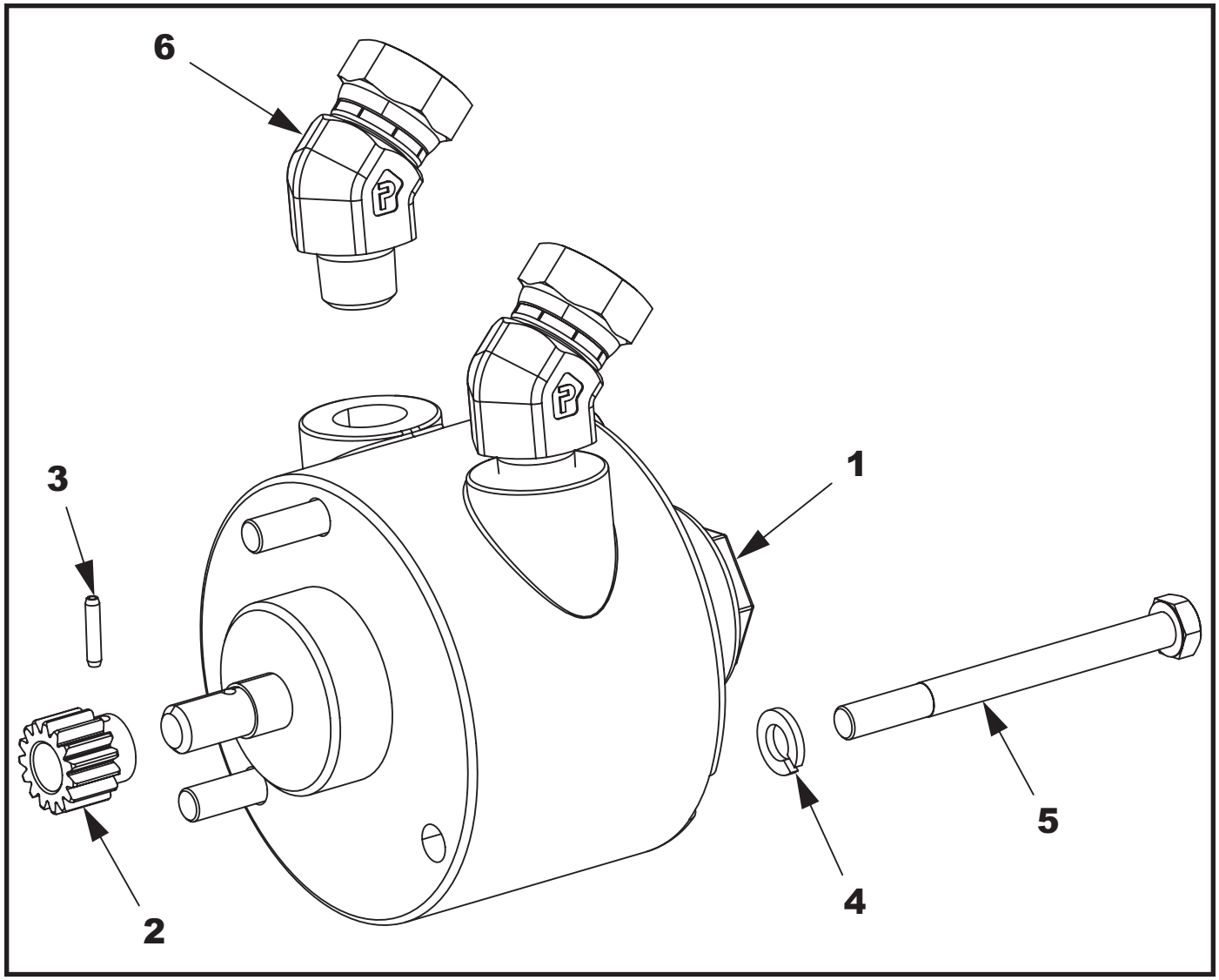


Figure 12. Martin® Gen 4 Railcar Opener Air Motor Assembly, P/N RO10107

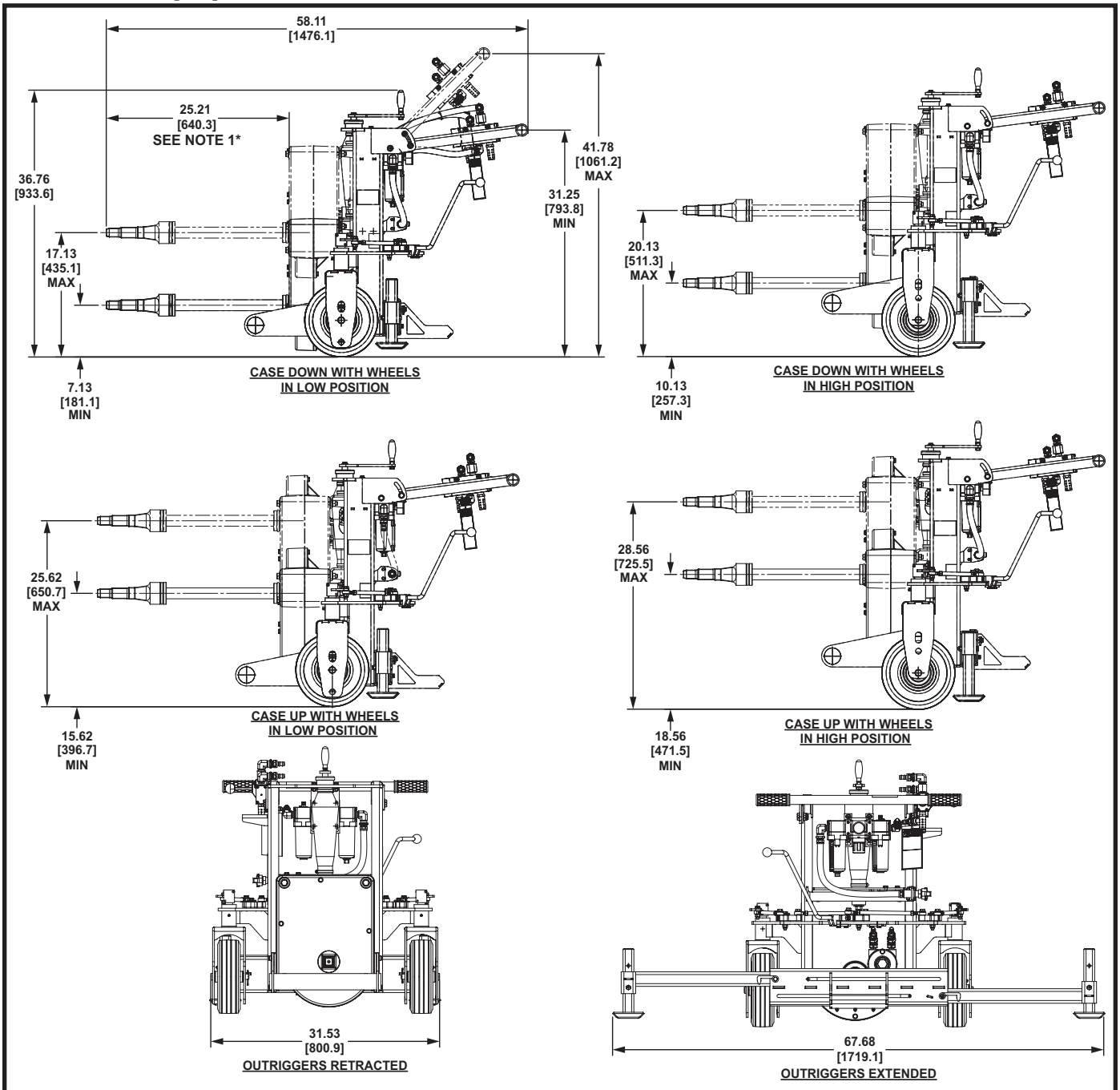
Item	Description	Part Number	Qty
1	Air Motor	35749	1
2	Spur Gear 20DP 15T 20PA Heat Treated	RO10094	1
3	Pin Slotted Spring 1/8 X 5/8 ZP	12081	1
4	Washer Lock Helical Spring 5/16 ZP	M209	3
5	Screw HHC 5/16-18NC X 3-1/2 GR 5 ZP	11712	3
6	Elbow 45 Deg 3/8-NPT X 1/2 NPSM	SUS10228	2

Figure 13. Loud Noise Warning Tag, P/N 34070

Figure 14. Air Pressure Warning Label , P/N 33378

Appendix
Martin® Gen 4 Railcar Opener Overall Dimensions

DIMENSIONS—in. [mm]



NOTE 1*: OTHER LENGTHS OF DRIVE SHAFTS ARE AVAILABLE. CONTACT MARTIN ENGINEERING OR A REPRESENTATIVE FOR ASSISTANCE.

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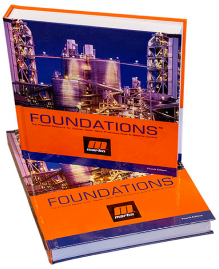

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