

Demco manufacturing

Dethmers Manufacturing Company

DOING OUR BEST TO PROVIDE YOU THE BEST

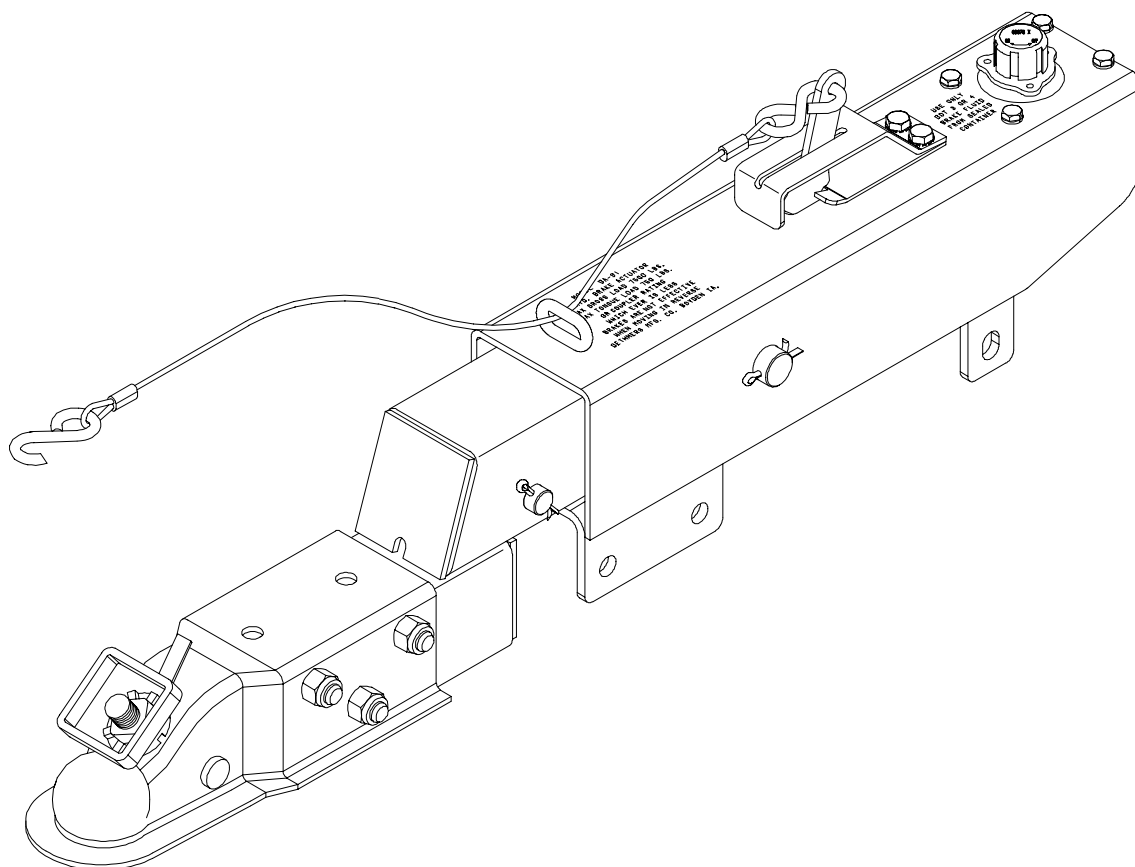
MODEL 91

BRAKE ACTUATORS

OWNER/OPERATOR MANUAL

ASSEMBLY
CALIBRATION
OPERATION
REPLACEMENT PARTS

READ complete manual CAREFULLY
BEFORE attempting operation.



DEMCO MODEL DA91 ACTUATOR

Model DA91 is a heavy duty surge brake actuator for trailers with two or four wheels. When brakes are applied on the towing vehicle, forward inertia of trailer toward towing vehicle applies brakes on trailer in direct relation to manner brakes are applied on towing vehicle. Brake towing vehicle hard and brakes on trailer are applied hard. Master cylinder push rod spring assembly protects system from hydraulic pressure overload.

WARNING: To Prevent Serious Injury or Death

- Review following instructions before installation and use of hydraulic brake actuator.
- Dealers or distributors must review these instructions with ultimate user.
- Failure to follow these instructions, or failure to properly maintain braking system after installation, can result in loss of braking action.

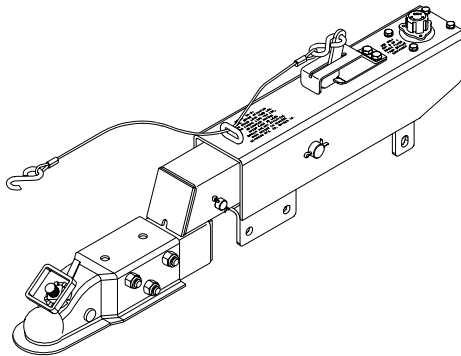


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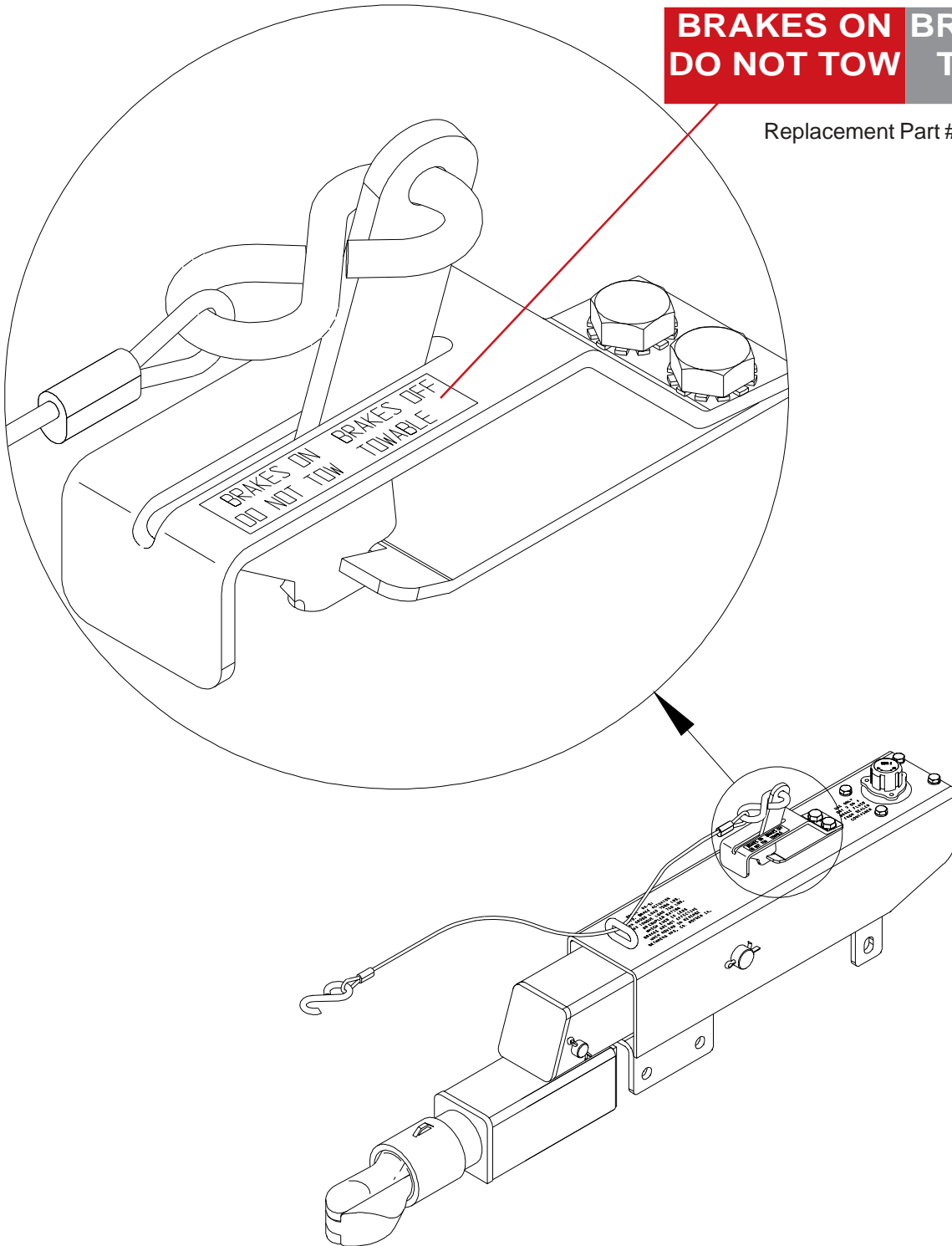
SAFETY SIGN LOCATIONS

Types of safety sign and locations on equipment are shown in illustration below. Good safety requires that you familiarize yourself with various safety signs, type of warning, and area or particular function related to that area, that requires your SAFETY AWARENESS.

This decal is positioned as shown

BRAKES ON DO NOT TOW	BRAKES OFF TOWABLE BH21003
---------------------------------	--

Replacement Part #BH21003 Qty. 1



Tighten all bolts to torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt chart as guide. Replace hardware with same grade bolt.

NOTE: Unless otherwise specified, high-strength Grade 5 hex bolts are used throughout assembly of equipment.



Torque Specifications

Bolt Torque for Standard bolts *

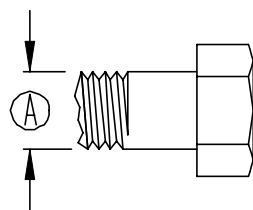
"A"	GRADE 2		GRADE 5		GRADE 8	
	lb-ft	(N.m)	lb-ft	(N.m)	lb-ft	(N.m)
1/4"	6	(8)	9	(12)	12	(16)
5/16"	10	(13)	18	(25)	25	(35)
3/8"	20	(27)	30	(40)	45	(60)
7/16"	30	(40)	50	(70)	80	(110)
1/2"	45	(60)	75	(100)	115	(155)
9/16"	70	(95)	115	(155)	165	(220)
5/8"	95	(130)	150	(200)	225	(300)
3/4"	165	(225)	290	(390)	400	(540)
7/8"	170	(230)	420	(570)	650	(880)
1"	225	(300)	630	(850)	970	(1310)

Bolt Torque for Metric bolts *

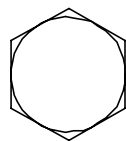
"A"	CLASS 8.8		CLASS 9.8		CLASS 10.9	
	lb-ft	(N.m)	lb-ft	(N.m)	lb-ft	(N.m)
6	9	(13)	10	(14)	13	(17)
7	15	(21)	18	(24)	21	(29)
8	23	(31)	25	(34)	31	(42)
10	45	(61)	50	(68)	61	(83)
12	78	(106)	88	(118)	106	(144)
14	125	(169)	140	(189)	170	(230)
16	194	(263)	216	(293)	263	(357)
18	268	(363)	--	--	364	(493)
20	378	(513)	--	--	515	(689)
22	516	(699)	--	--	702	(952)
24	654	(886)	--	--	890	(1206)

Torque figures indicated are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

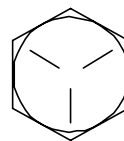
* GRADE or CLASS value for bolts and capscrews are identified by their head markings.



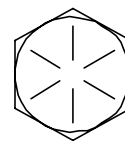
GRADE-2



GRADE-5



GRADE-8



CLASS 8.8



CLASS 9.8



CLASS 10.9





WARNING: TO AVOID PERSONAL INJURY OR PROPERTY DAMAGE, OBSERVE THE FOLLOWING INSTRUCTIONS:

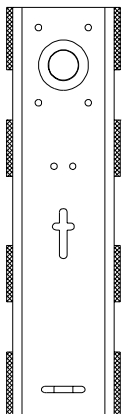
The weight rating of the coupler is dependent on the correct bolts being used. You must use the bolts provided with the product. If you are missing bolts, refer to your Operator's Manual and obtain replacements from Demco, or use the exact size, grade, and number of bolts as specified. Using the wrong size, grade, or number of bolts will reduce the weight rating of the coupler and could cause separation of your towing equipment from the towing vehicle. If you have questions about the correct bolts for your application call Demco at any of the following telephone numbers:

(712) 725-2311
(712) 725-2302
1-800-543-3626
FAX: 1-800-845-6420

WELDING

NOTE: disassembly of the actuator before welding is recommended

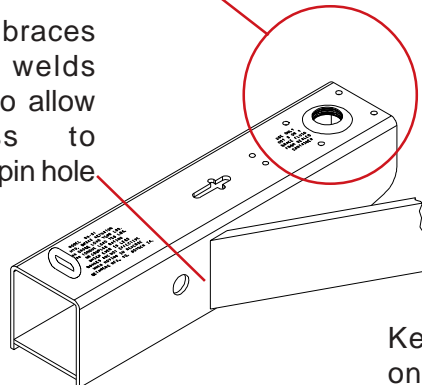
Tack Actuator down on the four corners then weld in a criss cross pattern using 2" to 2-1/2" welds with 2" spaces between welds (when welding down to a flat area of the tongue)



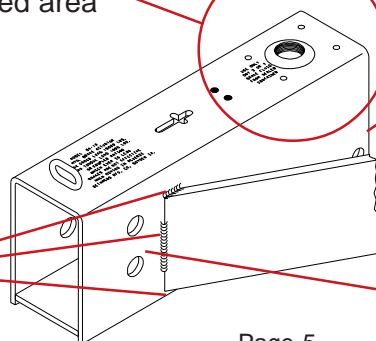
Weld as shown

Do not weld in the circled area

Keep braces and welds back to allow access to shock pin hole



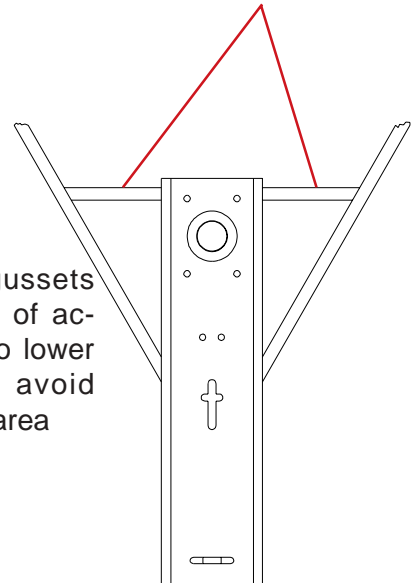
Do not weld in the circled area



Keep gussets on rear of actuator to lower half to avoid circled area

Keep braces and welds back to allow access to shock pin holes

Use gussets to support the back of the actuator if welding in position shown





DEMCO MODEL DA91 BRAKE ACTUATOR

WARNING To Prevent Serious Injury Or Death:

- Review all of the following instructions before installation and use of hydraulic brake actuator.
- Dealers or Distributors must review these instructions with ultimate user.
- Failure to follow these instructions, or failure to properly maintain braking system after installation, can result in loss of braking action which could cause severe property damage, personal injury or death.

Model DA91 brake actuator has a maximum load rating of 8,000 lbs. GVWR and 750 lbs. tongue load.



WARNING To avoid personal injury or death, do not exceed lowest of (1) the rated capacity of Model DA91 actuator, or (2) rated capacity of ball, hitch, and coupler being used, or (3) trailer's Gross Vehicle Weight Rating (GVWR).

Model DA91 brake actuator has a maximum tongue load equal to 10% of the maximum load rating.

INSTALLATION

(SEE PAGE 10 FOR BREAKDOWN AND REFERENCE NUMBERS)

Model DA91 is completely assembled and ready to bolt or weld into place.

1. Standard DA91 actuators come with a variety of mounting channels. (see Page 11)
2. Connect and tighten all brake lines.
3. Fill master cylinder (#21) with DOT 3 or 4 brake fluid.
4. Bleed brake system using a pressure-type brake bleeder or manually, as follows:
 - a. Remove two 5/16" hex head bolts (#13) and lock washers (#8) that hold lever guide (#23) and flat emergency lever spring (#12). Remove lever guide and emergency lever spring. Using short strokes, pull forward on emergency lever (#16), pumping master cylinder until brake fluid within master cylinder stops bubbling.
 - b. Attach a bleeder hose to bleeder valve on one of the wheels and submerge other end of hose into a transparent container partially filled with brake fluid. Loosen bleeder valve one turn and, watching hose in transparent container, use emergency lever to pump master cylinder as long as air bubbles continue to leave the hose. When bubbles stop, close bleeder valve, move to next wheel, and repeat process until all brakes have been bled. (Note: Check fluid level in master cylinder frequently while bleeding brakes (every 4 or 5 strokes). Refill as necessary to keep level above half full.)

5. Once bleeding is completed, refill master cylinder and attach cap (#17) securely. Replace emergency lever spring, lever guide, lock washers and 5/16" hex head bolts.
6. Test brakes by pulling emergency lever (#16) forward until it locks into its second notch position. (Lever should be approximately straight up.) Attempt to rotate wheels in a forward direction. If any wheels rotate, brakes must be adjusted. To adjust brakes, release emergency lever from locked position, set each wheel's brake adjustment up 2 or 3 notches (per instructions in appropriate brake cluster manual). Repeat test procedure as necessary.



MAINTENANCE

1. Frequently check brake fluid level. (Fluid must be approved, clean, and uncontaminated.)
2. Make sure actuator mounting bolts are secure.
3. Inspect actuator, replace bent, worn, or damaged parts.
4. Be constantly aware of systems braking quality, make periodic checks as described in brakes owner's manual. Consult certified brake specialist to make necessary adjustments or repairs. Failure to do so could result in loss of braking.

SERVICING THE EMERGENCY LEVER

(SEE PAGE 10 FOR BREAKDOWN AND REFERENCE NUMBERS)

If emergency lever (#16) of actuator is applied, it can be disengaged by using a screwdriver to lift upward on front of flat emergency lever spring (#12) while pulling lever forward until released. A thorough inspection of emergency lever, emergency lever spring, and cable with S-hooks is required. Damaged parts must be replaced as follows:

- a. Remove master cylinder (#21) and push rod assembly (#18). Be careful not to get dirt into master cylinder. (A new Master Cylinder Gasket (#20) should be used when reinstalling.)
- b. Remove Cable S-hook (#10) from emergency lever (#16), emergency lever guide (#23) and flat emergency lever spring (#12), then pull lever out of actuator outer case (#7) through cross-slot in top.
- c. Install new emergency lever through cross-slot in top of outer case. Attach new emergency lever spring and emergency lever guide.
- d. Insert S-hook on emergency cable (#10) into hole in emergency lever (#16) and squeeze shut.
- e. Add adequate brake fluid to master cylinder and bleed brake system per instructions 4-6 in installation section.

DEMCO BRAKE PRODUCTS - LIMITED WARRANTY

1. **Extent and Duration of this Warranty:**

Your Demco brake product is warranted to be free from defects in materials and workmanship under normal use and service for a period of one year after date of purchase by original owner when properly installed, used and maintained by purchaser.

When this Demco brake product is used as part of complete Demco braking system (actuators, brake lines, and back plates), Demco warrants system to be free from defects in materials and workmanship for two years when properly installed, used, and maintained by purchaser.

Any part of Demco brake system found to be defective in materials or workmanship will be repaired or replaced at manufacturers option without charge for parts or labor to original owner.

2. **Manufacturer and Warrantor of Trailer:**

Dethmers Manufacturing Co.
4010 320th Street
P.O. Box 189
Boyden, IA 51234
(712) 725-2311

3. **Repair or Replacement Procedure:**

If your Demco brake product develops a defect during warranty period, promptly notify Dethmers Manufacturing Co. customer service department. Until such notice is received, warrantor will not be responsible for any repair or replacement.

Upon receipt of timely notice from you, warrantor will have a choice of options in replacing any part it determines to be defective:

- a) Warrantor may require you at your own expense to deliver or ship part to its factory or authorized dealer. Any defective part will be repaired or replaced and returned to you or your authorized dealer free of charge. Any part returned to warrantor and found not to be defective will be returned to you freight collect with explanation.
- b) Warrantor may ship a new part to dealer to be exchanged free of charge for defective part returned by you.
- c) Warrantor may ship or deliver a replacement part to you at your address.

4. **Limitations on Warranty Coverage:**

Coverage under this warranty will be effective only when a copy of original invoice, showing date and location of purchase, accompanies any claim for warranty.

Warrantor has no liability whatsoever and this warranty is null and void if any Demco brake product has been misassembled or subjected to damage or neglect, negligence, misuse, accident or operated in any way contrary to operating and maintenance instructions as specified in Demco owners manual for that product.

This warranty does not cover any product that has been altered or modified so as to affect the product's operation, performance or durability, or that has been modified to change intended use of product.

In addition, warranty does not extend to repairs made necessary by abnormal use, damage, unreasonable use including failure to provide reasonable and necessary maintenance, or by use of parts, accessories or other equipment which are incompatible with Demco brake products or affect its operation, performance or durability.

DEMCO BRAKE PRODUCTS - LIMITED WARRANTY CONTINUED

This warranty does not cover:

- a) normal wear and tear.
- b) road film or gravel damage to paint.
- c) paint.
- d) rust damage.
- e) any Demco brake product that has been loaded in excess of load capacity stated on identification label.
- f) Accessory parts, materials or components.

Warrantor has a policy of continuous product improvement. We reserve the right to change or improve design of any Demco brake product, including but not limited to state of the art changes, without assuming any obligation to modify any product previously manufactured.

Warrantor assumes no responsibility to owner for loss of use of product, loss of time, inconvenience or other damage consequential or otherwise, including, but not limited to expense for gasoline, expense of transporting product to dealer and expense of returning product, mechanics travel time, telephone, telegram, fax, overnight delivery, or postage charges, road service/towing charges, rental during time warranty repairs are being performed, travel, lodging, loss or damage to personal property or loss of revenue or earnings.

5. **Limitations of Implied Warranties:**

All implied warranties, if any, expire and terminate upon expiration of this warranty. Some states do not allow limitation on how long an implied warranty lasts, so this limitation may not apply to you.

6. **Limitation of Consequential Damages:**

Warrantor's responsibility under this warranty extends solely to repair or replacement of your Demco brake product and its component parts. Warrantor does not assume responsibility for, nor shall it be liable for, any special, incidental or consequential damages. Some states do not allow exclusion or limitation of incidental or consequential damages, so above exclusion or limitation may not apply to you.

7. **Purchasers Rights:**

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

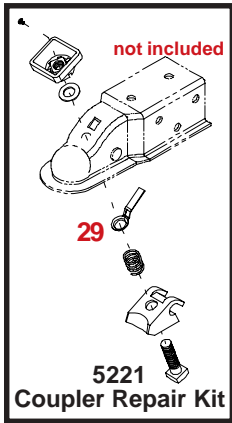
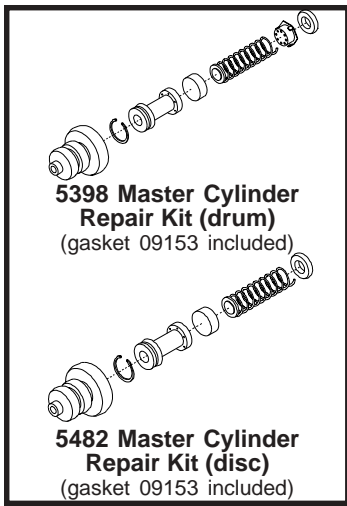
8. **Exclusive Warranty:**

This is the only express warranty made by Dethmers Manufacturing Co. on your Demco product and no agent, employee, or other person is allowed to change or add to this warranty. This warranty extends solely to repair or replacement of your Demco brake product and its component parts. Warrantor does not assume any liability or responsibility not expressly covered by this limited warranty. This warranty supersedes all prior warranties, written or implied.

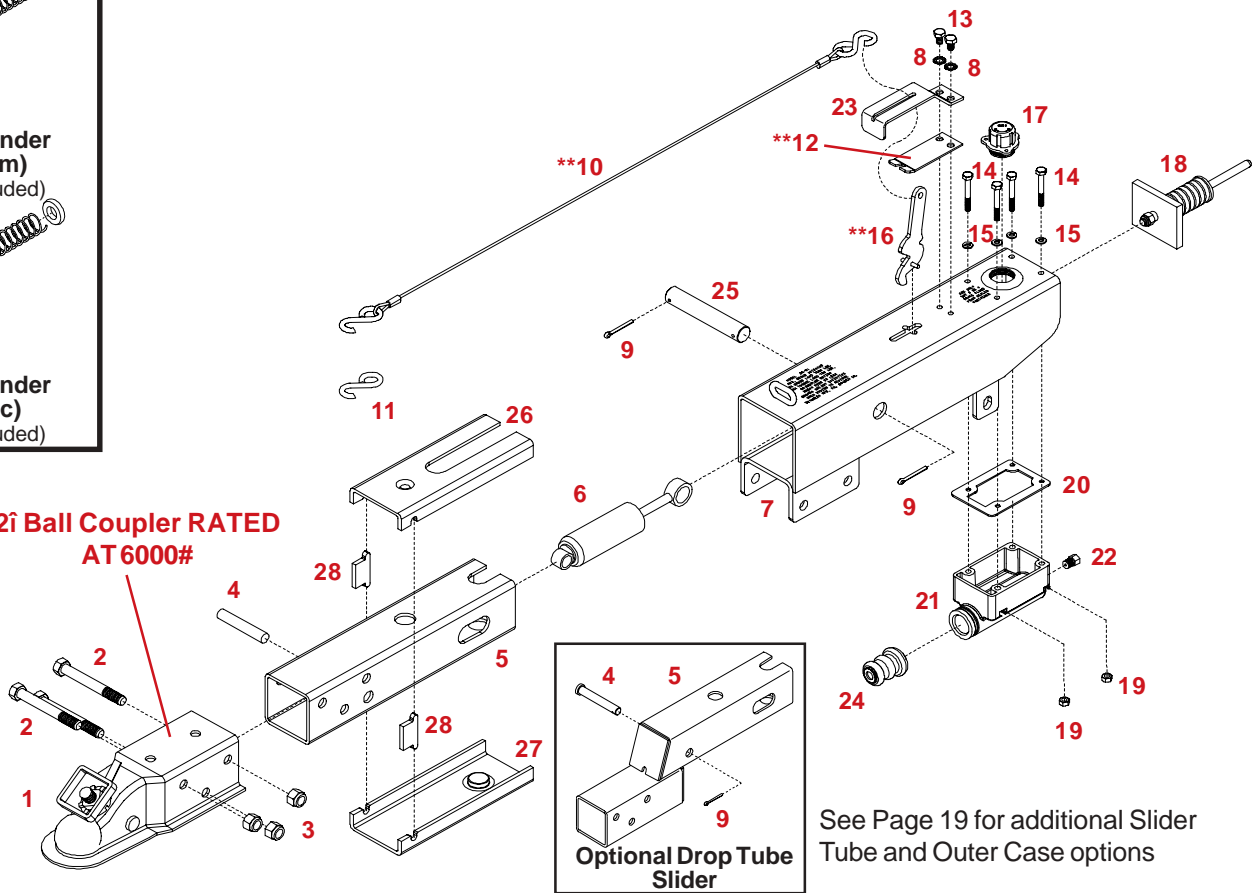
DISCLAIMER

No other express warranty has been made or will be made on behalf of warrantor with respect to Demco brake product or its instruction, operation, repair or replacement. Warrantor shall not be responsible for damage, loss or damage to personal property, whether direct or indirect, and whether arising in contract or tort.

ACTUATOR PARTS BREAKDOWN



2i Ball Coupler RATED AT 6000#

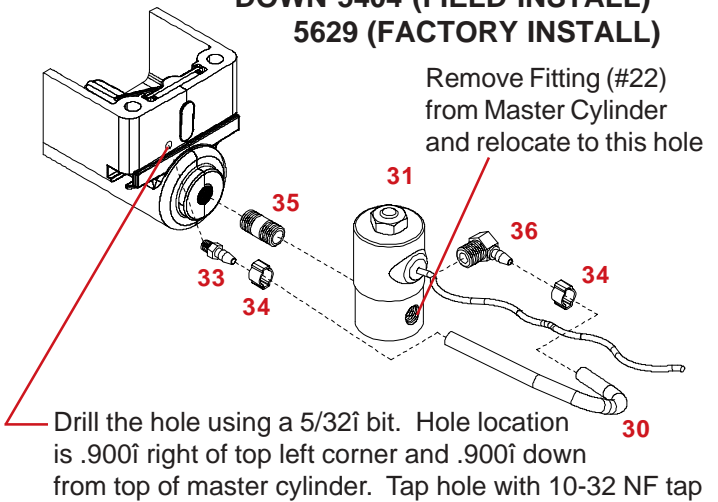


Model 91 ACTUATOR PARTS LIST

REF. NO.	PART NO.	QTY.	DESCRIPTION
1.	05432	1	6000# 2" Ball Coupler (zinc plated)
2.	01896	3	1/2"-13UNC x 4" Hex Head Bolt (gr.5)
3.	02178	3	1/2"-13UNC Nylon Insert Lock Nut
4.	05441-95	1	Front Shock Pin 5/8" dia x 3 (straight tube)
-	05426	1	Front Shock Pin (drop tube actuators)
5.	11078-??	1	Straight Tube Actuator Slider
-	11079-??	1	Drop Tube Actuator Slider
6.	SB12426	1	Damper/ Shock
7.	11164-??	1	3 Bolt Mount Outer Case
8.	05424	2	5/16" External Tooth Lock Washer
9.	02363	2	5/32" x 1 1/4 Cotter Pin(Qty 3 w/drop tube)
**10.	05408	1	3/32" Cable with hooks
11.	SB10555	-	Replacement S-Hooks ONLY
**12.	05693-??	1	Emergency Lever Spring
13.	05961	2	5/16"-18UNC x 5/8" Hex Head Bolt (gr.5)
14.	00618	4	1/4-20UNC x 2" Hex Head Bolt (gr.5)
15.	00057	4	1/4" Lock Washer
**16.	05951-??	1	Emergency Lever Assembly
17.	03876	1	Master Cylinder Cap w/ Diaphragm & O-ring
-	05849	1	O-Ring Only (not shown)
18.	05977	1	Push Rod Assembly
19.	00062	4	1/4"-20 UNC Hex Nut
20.	09153	-	Plastic Master Cyl. Gasket ONLY
21.	10616	1	Master Cylinder (drum brakes)
-	11190	1	Master Cylinder (discbrakes)
22.	SB12098	1	.018 Connector Orifice (Drum Brakes)
-	05679	1	Inverted Flare Adapter (Disc Brakes)
23.	03866-??	1	Lever Guide
24.	05687	1	Master Cylinder Protective Boot
25.	05986-??	1	Connecting Pin
26.	10965	1	Upper Slider
27.	10966	1	Lower Slider
28.	10967	2	Side Spacers

-	5401	-	Lever Replacement Kit (incl. items w/**)
-	5650	-	Master Cyl. Replacement Kit (drum)
-	5672	-	Master Cyl Replacement Kit (disc)
-	5221	-	Coupler Repair Kit
29.	02920	-	Thumb Lock ONLY

(OPTIONAL) FREE BACKING SOLENOID KIT PARTS BREAKDOWN 5404 (FIELD INSTALL) 5629 (FACTORY INSTALL)



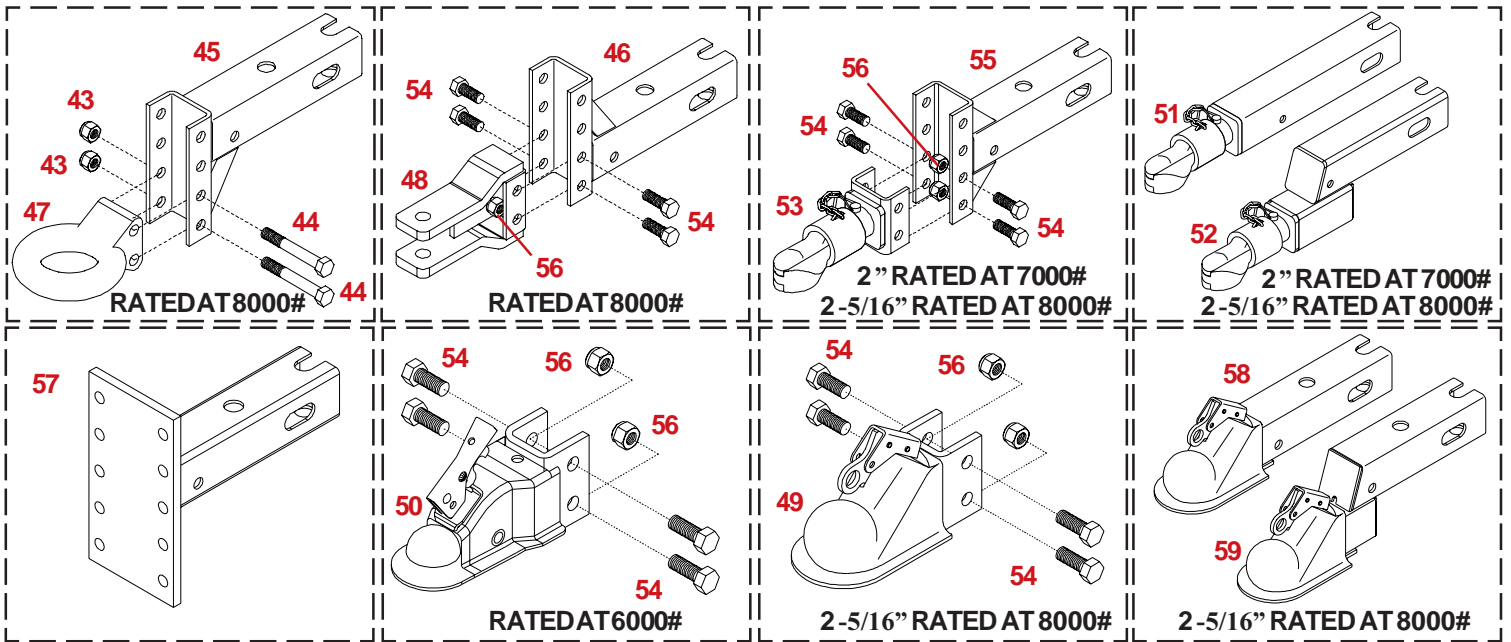
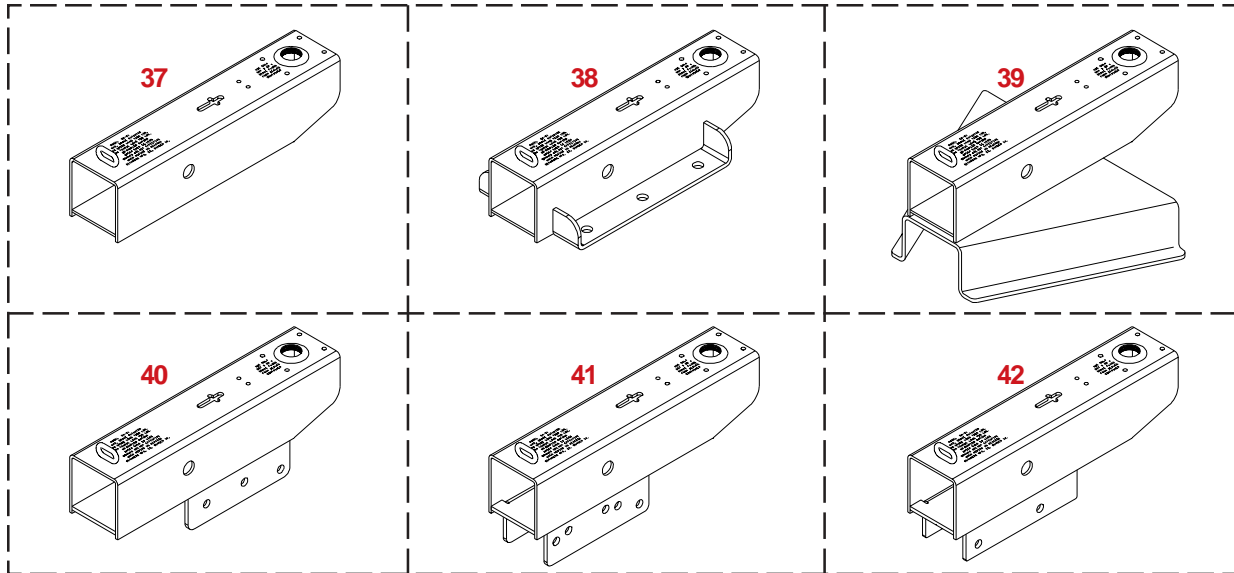
KIT #5404 PARTS LIST

REF. NO.	PART NO.	QTY.	DESCRIPTION
30.	04594	-	EPDM Black Tubing
31.	05561	1	Solenoid Valve
32.	09153	1	Master Cylinder Gasket (not shown)
33.	10373	1	Brass Fitting Str. .2 HB x 10-32 NF
34.	10374	2	Crimp Clamp
35.	10375	1	Straight Nipple 1/8" MPT x 1/8" MPT
36.	10376	1	Brass Elbow 1/8" MPT x .2 HB

Note: -?? = -30 Black -91 Yellow Chromate
 -95 Plated -97 Primed Red
 Indicate **color** when ordering parts

Please order replacement parts by **PART NO.** and **DESCRIPTION**

OUTER CASE OPTIONS AND AVAILABLE HITCH CONFIGURATIONS



WARNING: TO AVOID PERSONAL INJURY OR PROPERTY DAMAGE, OBSERVE THE FOLLOWING INSTRUCTIONS:

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(712) 725-2311
 (712) 725-2302
 1-800-543-3626
 FAX: 1-800-845-6420

Note: -?? = -30 Black -91 Yellow Chromate
 -95 Plated -97 Primed Red

Please order replacement parts by PART NO. and DESCRIPTION and COLOR.

PARTS LIST

REF. NO.	PART NO.	QTY.	DESCRIPTION
37.	11101-??	1	Outer Case w/ no mounts
38.	11171-??	1	Outer Case w/ plate
39.	11163-??	1	Outer Case w/ 50 mount
40.	11168-??	1	Outer Case w/ 3 hole mount
41.	11170-??	1	Outer Case w/ universal holes
42.	11169-??	1	Outer Case w/ 2 hole mount
43.	02587	2	5/8"-11UNC Nylon Insert Lock Nut
44.	02434	2	5/8"-11UNC x 4 1/2" Hex Head Bolt (Gr. 5)
45.	11076-??	1	Channel Down Slider
46.	11077-??	1	Channel Up Slider
47.	09557-??	1	Pintle Ring (10 Ton Capacity)
48.	05593-??	1	Clevis
49.	07678-??	1	2-5/16" Lever Lock Bolt-On Coupler
50.	09430-??	1	2" Lever Lock Coupler
51.	11070-??	1	2-5/16" Bulldog Coupler Welded to Straight Slider Tube
-	11071-??	1	2" Bulldog Coupler Welded to Straight Slider Tube
52.	11069-??	1	2-5/16" Bulldog Coupler Welded to Drop Slider Tube
-	11072-??	1	2" Bulldog Coupler Welded to Drop Slider Tube
53.	05557-??	1	2-5/16" Bulldog Coupler Welded to Clevis Channel
-	05823-??	1	2" Bulldog Coupler Welded to Clevis Channel
54.	04051	4	5/8"-11UNC x 1-1/2" Hex Head Bolt (Gr.5)
55.	11075-??	1	Channel Centered Slider
56.	03730	4	5/8" Stover Locknut
57.	11081-??	1	Slider w/ Flat Plate Mount
58.	11073-??	1	Straight Slider w/ 2" Coupler
59.	11074-??	1	Drop Tube Slider w/ 2-5/16" Coupler



DETHMERS MFG. COMPANY

P.O. BOX 189

4010 320th St., BOYDEN, IA. 51234

PH: (712) 725-2311 FAX: (712) 725-2380

TOLL FREE: 1-800-54DEMCO (1-800-543-3626)

www.demco-products.com