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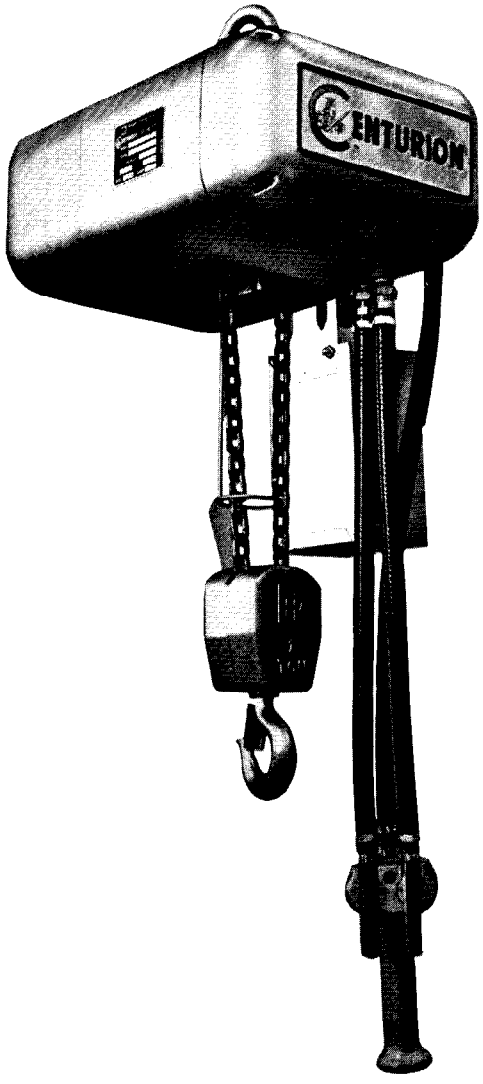
CENTURION®

AIR OPERATED CHAIN HOISTS



Operator and Maintenance Manual

STANDARD HOISTS
Series CA110
½-Ton Capacity
Single Line

Series CA120
1-Ton Capacity
Double Line

SPARK RESISTANT HOISTS
Series CAR105
¼-Ton Capacity
Single Line

Series CAR110
½-Ton Capacity
Double Line

WARNING

These Hoists are not to be used for lifting or lowering people

ALWAYS OPERATE, INSPECT AND MAINTAIN THIS HOIST IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE SAFETY STANDARDS B30.16

Refer All Communications to the Nearest Ingersoll-Rand Office or Distributor.

Printed in U.S.A.

Ingersoll-Rand®

CONTENTS

HOW TO ORDER REPAIR PARTS FOR YOUR CENTURION HOIST

Your Centurion Hoist is designed and constructed to give you long, trouble-free service. In time it may become necessary to order and install new parts to replace those that have been subjected to wear. For prompt service and genuine Ingersoll-Rand parts, place orders with your nearest Ingersoll-Rand Distributor. The use of other than genuine Ingersoll-Rand replacement parts may result in decreased Hoist performance, and may, at the Company's option, invalidate all warranties.

When ordering parts, give your Distributor the following data:

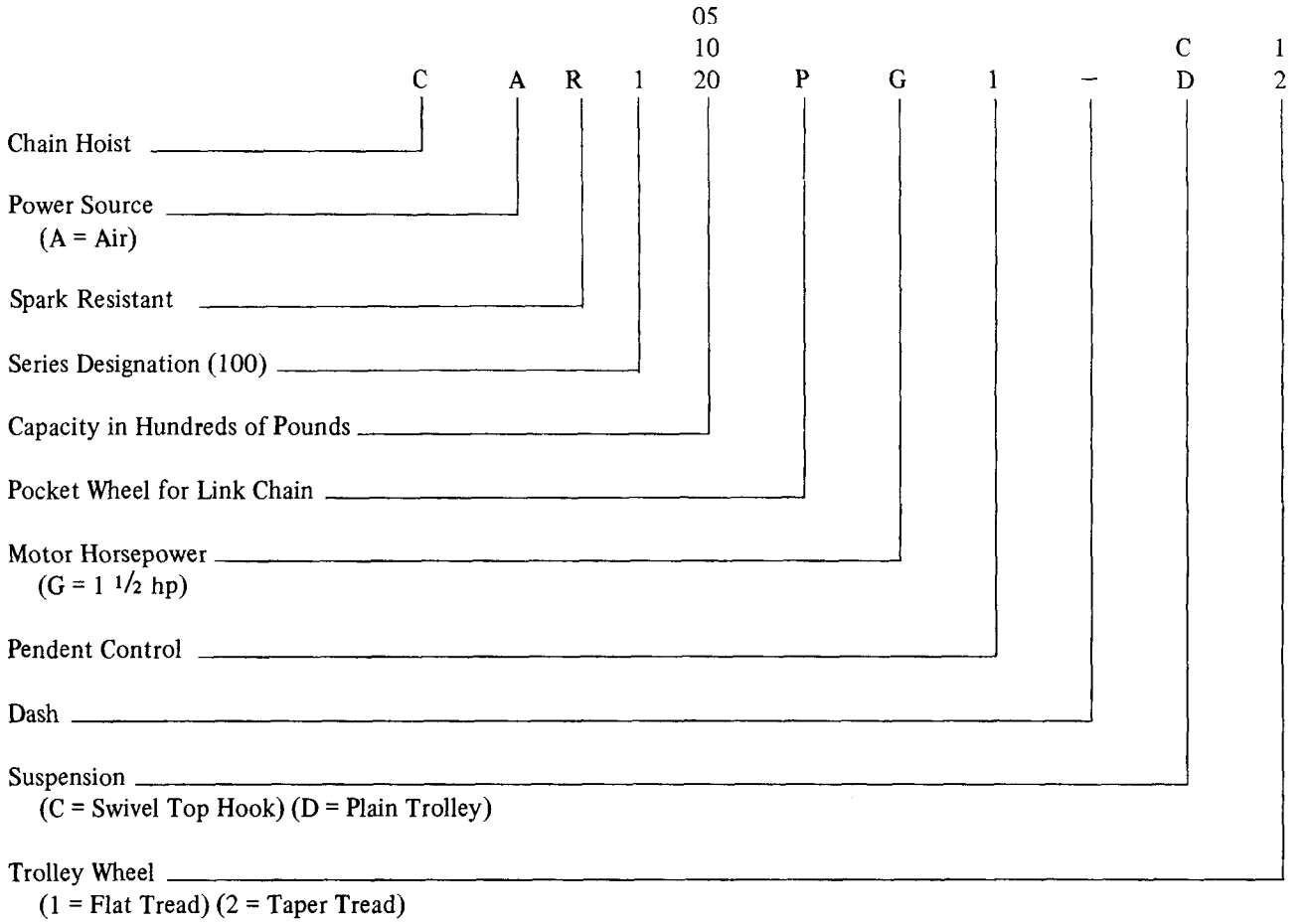
1. Complete model number of the Hoist as it appears on the name plate.
2. Complete part number, part description and quantity needed as shown on the pages of this manual. For Spark Resistant Hoists, refer to the ordering instructions on page 5.

If it becomes necessary to return the complete Hoist or certain parts to the factory, contact the Distributor from whom you purchased the Hoist, or the nearest Ingersoll-Rand Distributor in your locality.

MODEL NUMBER EXPLANATION

The model number of your Centurion Hoist is coded to provide information pertinent to that particular Hoist. Your understanding of this model coding may help you in making a more positive identification when placing orders for replacement parts.

The model code is as follows:



Example: CA110PG1-D1 Chain Hoist; Series 100; 1000 pound capacity; pocket wheel for link chain; 1 1/2 horsepower motor, pendent control, plain trolley with flat tread wheels.

Always Use Genuine Ingersoll-Rand Replacement Parts.

GENERAL DESCRIPTION

Your Centurion Chain Hoist is designed and constructed to provide many hours of trouble-free service. Naturally, the service you get from this Hoist is dependent, to some degree, upon the care and preventative maintenance program you establish. Obviously, improper or lack of lubrication and/or severe misuse is detrimental to any product regardless of design and make. Since good preventative maintenance is usually 90% common sense and 10% effort, we strongly urge you to establish and follow a good, realistic maintenance program.

Series 100 Centurion Chain Hoists are furnished with a 10 ft. lift as standard in two different capacity sizes—1/2-ton single line Hoist and 1-ton double line Hoist. The 1/2-ton single line Hoist has a rate of lift with rated load of 30 ft. per minute and the 1-ton double line Hoist has a rate of lift with rated load of 15 ft. per minute.

The air motor is a 7-vane motor of approximately 1 1/2 horsepower. It has a 1/2" pipe tap air inlet and requires a 3/4" diameter, or larger, air supply hose. The use of a smaller hose and/or pipe reducers will reduce the performance of the Hoist an appreciable amount. The air motor is designed for operation on 90 psi (6.3 kg/cm^2) air pressure.

All Series 100 Centurion Hoists are furnished with pendent control and limit valves to prevent raising the load into the Hoist or pulling the chain from the Hoist in the lowering direction. The limit valves are for safety purposes only, and **should not** be used for automatically stopping the Hoist in either direction.

Centurion Chain Hoists are available equipped with swivel-type top hook or a plain 4-wheel Trolley having either flat-tread wheels or taper-tread wheels. The Trolley can be adjusted to accommodate beams having flanges 3.00" to 5.00" wide.

An air released, spring applied load brake is furnished on every Centurion Hoist. This brake will hold a suspended rated load, and is automatically applied whenever the pendent control is released, or whenever there is air power failure.

Weight of the Centurion Chain Hoist with Swivel Top Hook is as follows:

Series CA110 and CAR105 . . . . . 69 lbs.
Series CA120 and CAR110 . . . . . 78 1/2 lbs.

SPARK RESISTANT MODELS

Spark Resistant Models CAR105 and CAR110 are basically the same as Standard Models CA110 and CA120 but certain parts are produced from spark-resistant materials. To maintain the high safety factory required by Ingersoll-Rand Standards, the rated capacity of each Spark Resistant Model is reduced 50% from the comparable Hoist with standard parts.

Model CAR105 is the Spark Resistant counterpart of No. CA110 Single Line 1/2-Ton Hoist, **but the capacity of CAR105 is 1/4-Ton.**

Model CAR110 is the Spark Resistant counterpart of No. CA120 Double Line 1-Ton Hoist, **but the capacity of CAR110 is 1/2-Ton.**

HOW TO ORDER PARTS FOR SPARK RESISTANT HOISTS MODEL CAR105 or CAR110

All parts listed on the illustrations are for **Standard Hoists.** Parts for **Spark Resistant Hoists** are the same unless there there is an encircled Reference Number (1), (6), (8) etc. after the Part Name, in which case the Spark Resistant counterpart is listed on page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.

SAFE OPERATING PRACTICES

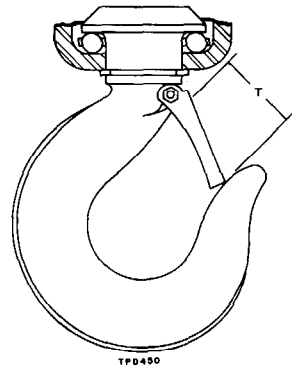
The two most important aspects of safe Hoist operation are: (1) Allow only qualified people to operate a Hoist, and (2) Subject each Hoist to a regular inspection and maintenance procedure.

A qualified operator must be physically competent. He must have no health condition which might affect his ability to react, and he must have good hearing, vision and depth perception. The qualified Hoist operator must be carefully instructed in his duties and must understand the operation of the Hoist, including a study of the manufacturer's literature. He must thoroughly understand proper methods of hitching loads. He should have a good attitude regarding safety and should refuse to operate under unsafe conditions.

Regular inspection procedures should be set up, rigidly adhered to and recorded by or under the direction of a qualified person. On Hoists in continuous service, inspection should be made at the beginning of each shift. The items to be checked include, but are not limited to:

a. Lubrication according to manufacturer's instructions.
b. **Brakes**: Visually check for proper adjustment (see illustration on page 34). Lift a capacity or near capacity load a few inches off the floor and check ability of braking system to stop and hold the load and without excessive drift.
c. **Chain and Hooks**: Visually inspect the load chain for cleanliness and lubrication as well as wear or other damage. **Note**: Excessive wear may not be apparent upon casual observation. The only positive check is to gauge it according to manufacturer's instructions. Refer to **CHAIN REPLACEMENT** on page 8. Never operate a Hoist with dry, dirty, worn, damaged or kinked chain.

Hooks should be checked for wear, increase in throat opening, and bending. (**Note**: Increased throat opening or a bent hook indicates overloading or abuse.) Replace hooks having a 15% increase in throat or 10% bend. If the safety latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support bearings for lubrication or damage. See that they swivel easily and smoothly.



Note: "T" is throat opening without latch.

Hoist Size	"T" Throat Opening	
	New Hook	Discard Hook
CA110 (1/2-ton Hoist)	1 1/16	1 7/32
CA120 (1-ton Hoist)	1 3/32	1 9/32
CAR105 (1/4-ton Hoist) or CAR110 (1/2-ton Hoist)	1 7/32	1 3/8

Observe the action of Chain feeding through the Hoist. Do not operate a Hoist unless the Chain feeds through the Hoist and Hook Block smoothly and without audible clicking or other evidence of binding or malfunctioning.

d. **Controls**: See that the controls function properly and return to neutral when released. Check the functioning of up and down stops by running the empty hook slowly to both extremes of travel. If the hook does not stop in its normal position, do not operate the Hoist until the cause of the trouble is located and corrected.
e. **General**: Check to see that suspension fastenings are secure, unworn and undamaged. On trolley-mounted Hoists, check that trolley wheels track the rail properly and that wheels and rail are not excessively worn. Be alert for unusual visual or audible signs which could indicate a defect. Do not operate the Hoist until the defect has been determined and corrected.

Always Use Genuine Ingersoll-Rand Replacement Parts.

Periodically, depending upon severity of service, the following items should also be inspected. These are in addition to those previously listed.

a. Check all load-supporting members, including Chain, Pocket Wheel and Chain Guides, for excessive wear or damage.
b. Inspect top and bottom hooks with a magnetic particle or other suitable crack detector.
c. Hook retaining nuts or collars along with their locking members and support bearings should be inspected. Proper inspection will require disassembly.
d. Check the brake discs for excessive wear or other deficiencies. The discs should be square across the faces. If either disc is worn to 1/4" or less, replace both discs. New discs measure 5/16"
e. The Hoist should be disassembled and checked for worn gearing, bearings, and shafts. Parts should be cleaned, lubricated and reassembled with all worn parts discarded and replaced.
f. Check all Trolleys for smoothness of operation and wear on supporting members.
g. Check all trolley wheel nuts and suspension bolts for tightness.

OPERATING INSTRUCTIONS

1. Read the manufacturer's instructions before operating the Hoist.
2. Never lift a load greater than the rated capacity of the Hoist.
3. Never use the load chain as a sling.
4. Always stand clear of the load.
5. Never use the Hoist for lifting or lowering people, and never stand on a suspended load.
6. Never carry loads over people.
7. Before each shift, check the Hoist for wear or damage. Check brakes, limit stops, etc.
8. Periodically inspect the Hoist thoroughly and replace worn or damaged parts.
9. Follow the lubrication instructions.
10. Do not attempt to repair load chain or hooks. Replace them when worn or damaged.
11. Never operate a Hoist when the load is not centered under the hook. Do not "side pull" or "yard".
12. Always rig the Hoist properly and carefully.
13. Never operate a Hoist with twisted, kinked or damaged chain.
14. Ease the slack out of the load chain when starting a lift. Do not jerk the Hoist.
15. Keep the load chain clean and well lubricated. Do not drag the load chain or hook on the floor.
16. Be certain there are no objects in the way of a load or hook when moving the Hoist.
17. Be certain the air supply is shut off before performing maintenance work on the Hoist.
18. Avoid swinging the load when moving the Hoist.
19. Keep the load block overhead when not in use.
20. Properly secure an outdoor Hoist before leaving it unattended.
21. Be certain the load is properly seated in the saddle of the hook. Do not tip-load the hook as this leads to spreading and eventual failure of the hook.
22. Do not allow unqualified personnel to operate a Hoist.
23. Avoid collision or bumping of Hoists. Do not swing a suspended load.
24. Do not operate a Hoist if you are not physically fit to do so.
25. Do not do anything you believe may be unsafe.
26. Do not use load chains as a ground for welding. Do not attach a welding electrode to a Hoist or sling chain.

Always Use Genuine Ingersoll-Rand Replacement Parts.

27. Do not divert your attention from the load while operating a Hoist.

28. Do not use up and down stops as a means of stopping a Hoist–these are emergency devices only.

29. Do not leave a load suspended for any extended period.

30. Never splice a hoist chain by inserting a bolt between links, or by any other means.

31. Do not force a chain or hook into place by hammering. Do not insert the point of the hook into a chain link.

32. Do not expose the chain to freezing temperatures, and do not apply sudden loads to a cold chain.

CHAIN CARE

Keep the Chain well lubricated as instructed in the section, **CHAIN LUBRICATION.** Never operate a Hoist when the Chain does not flow freely and smoothly into and out of the Pocket Wheel, or when it makes noises indicative of binding or other malfunctions. Under certain circumstances, particularly when worn or gummy, slack Chain can become tangled and jammed, causing the Chain to break. Chain can also fail to feed properly with an undersize or improperly mounted Chain Bucket.

Periodically (at the beginning of each shift for Hoists in continuous high duty cycle service), the Chain should be examined for cleanliness, lubrication, wear or other damage, and proper and smooth feeding through the Hoist. If the Hoist is deficient in any of these respects, it must not be operated until the deficiency is corrected.

CHAIN LUBRICATION

The load chain and chain attachment pins must be kept clean and lubricated at all times. Unlubricated Chain will wear out in a very few capacity lifts. Failure to maintain clean lubricated Chain will void the Manufacturer's Warranty and cause chain wear which will make operation of the Hoist hazardous. Where the Hoist is being used in clean areas, an open chain lubricant or any good EP gear oil may be used. Several excellent types of open chain lubricants are available and can be purchased in convenient aerosol cans. In areas where airborne grit and grime is present, a dry lubricant should be used, since grit trapped in the chain lubricant also causes rapid chain wear. These lubricants contain graphite or molydisulfide in a volatile carrier.

The top and bottom hooks are supported by thrust bearings. These bearings must be packed with grease at regular intervals. Neglect of proper lubrication will lead to bearing failure.

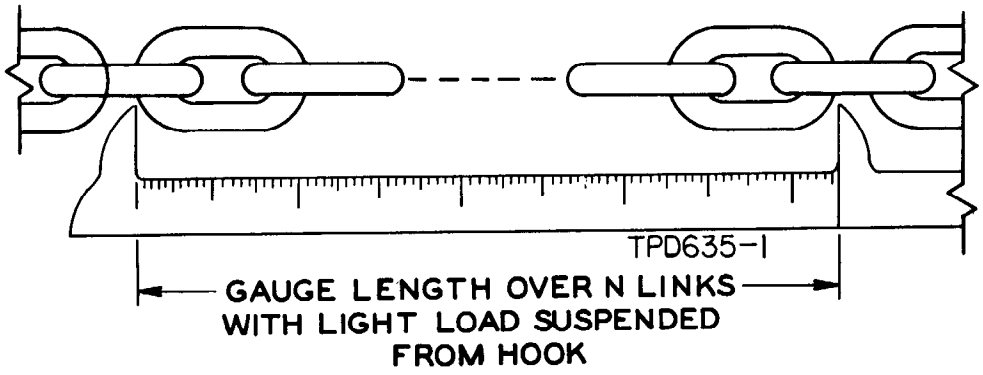
CHAIN REPLACEMENT

Excessive chain wear cannot be detected by casual observation. The chain is case hardened to a depth of .010" to .012", and once this case is worn through, wear will progress rapidly and the strength of the chain will be considerably reduced. Further, the Chain will no longer fit the Pocket Wheel properly, greatly increasing the chance of malfunction and chain breakage.

Periodically, as experience dictates, examine the Chain for wear. Be certain to inspect that portion of the Chain which regularly passes over the Pocket Wheel, since this is the portion that suffers the greatest wear. Check the individual links for striation–that is, minute parallel lines indicating excessive stress or wear.

Suspend a light load (50 to 100 pounds) from the Hoist and measure the Chain over the outside of the specified number of links.

The Chain must be measured over its entire working length–that is, over that portion of Chain which continuously passes over the Pocket Wheel. When any number of links in the working length reaches or exceeds the discard length, replace the entire Chain. **Always use a genuine Ingersoll-Rand replacement Chain. Never use any other Chain.**



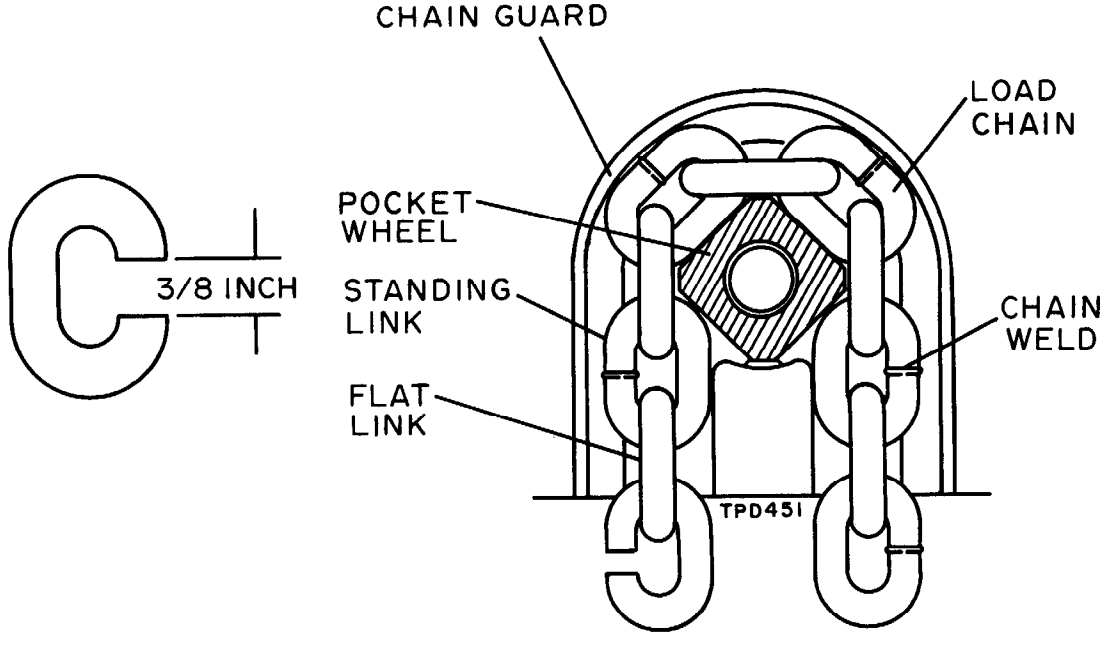
DIMENSIONS OF LINK - INCHES				MATERIAL	N NUMBER OF LINKS	DISCARD LENGTH OVER N LINKS, INCHES
A NOMINAL WIRE DIA.	B PITCH	C INSIDE WIDTH	D OUTSIDE WIDTH			
1/4	.767	.298	.823	Alloy Steel Carburized	7	5.89
1/4	.767	.298	.823	Stainless Steel	7	

One Pocket Wheel will outlast several Chains if the Chain is replaced as recommended, whereas the use of a worn Chain will cause the Pocket Wheel to wear rapidly.

If the Chain is visibly damaged, examine the Pocket Wheel and Chain Guard. Install a new Pocket Wheel if the old one is visibly worn; install a new Guard if the old one is broken or distorted.

Install a new load Chain as follows:

1. On single line Hoists, disconnect the load end of the Chain from the hook block. On double line Hoists, disconnect the load end of the Chain from the chain yoke and withdraw it from the sheave block. Do not remove the Chain from the Hoist.
2. Using an abrasive wheel, cut a section from the last standing link as shown in the following illustration. **Caution:** Do not distort the link in any manner. It must be able to pass over the Pocket Wheel without binding.



Always Use Genuine Ingersoll-Rand Replacement Parts.

3. Connect the new Chain to the old Chain by hooking the end of the new Chain onto the cutaway link. Make certain the welds on the standing links–links perpendicular to the Pocket Wheel–face away from the Pocket Wheel.

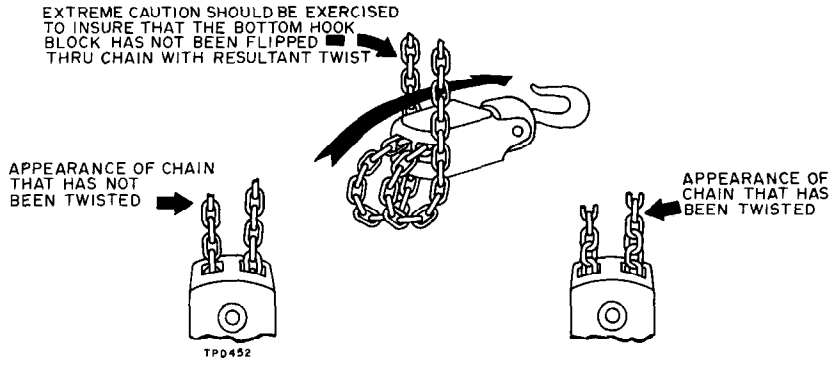
4. Carefully energize the Hoist in the raise direction, running off the old Chain and reeving the new Chain over the Pocket Wheel. The first link of new Chain over the Pocket Wheel must be a flat link.

5. After the new Chain is installed, secure the dead end of the Chain to the side of the Hoist. Make certain there is no twist in the dead end of the Chain between the Pocket Wheel and the end link. A twisted Chain can jam as it passes over the Pocket Wheel, possibly resulting in damage to the Hoist or even breaking the Chain and injuring personnel.

6. On single line Hoists, install the sliding Stop Ring followed by the Spring and stationary Stop Ring, on the second link from the load end of the Chain, and attach the Hook Block Assembly. On Hoists having a Chain Bucket, attach the Stop Ring so that the load does not hit the Chain Bucket.

7. On double line Hoists, reeve the load end of the new Chain around the Pocket Wheel in the Sheave Block Assembly, making certain the Chain is not twisted between the Hoist and the Sheave Block.

8. Keeping the load end of the Chain straight, attach the end link to the Chain Anchor Yoke.



9. Lubricate the Chain as instructed in the section **CHAIN LUBRICATION.**

10. Run the hook up and down several times under power with no load to make certain the Chain is running smoothly over the Pocket Wheel. There must be no apparent binding or evidence of malfunctioning.

INSTALLING THE HOIST

Make certain your Centurion Hoist is properly installed. A little extra time and effort in so doing can contribute a lot toward preventing accidents and helping you get the best service possible.

Always make certain the supporting member from which the Hoist is suspended is strong enough to support the weight of the Hoist plus the weight of a maximum rated load **plus** a generous safety factor of at least 500% of the combined weights.

On Hoists equipped with a Chain Bucket, relocate the "up" stop ring to prevent raising the load into the Chain Bucket. Since double line Hoists are not furnished with an "up" stop ring, the proper up stop parts will have to be installed on Hoists using a Chain Bucket. Refer to illustrations on pages 18 and 19, and **CHAIN BUCKET KITS** on page 41.

The Centurion Hoists are furnished with either a swivel-type Top Hook or a 4-wheel Plain Trolley that can be adjusted to accommodate beams having flanges 3.00" to 5.00" wide.

If the Hoist is suspended by a Top Hook, the supporting member should rest completely within the saddle of the Hook and be centered directly above the hook shank. Do not use a supporting member that cants the Hoist to one side or the other.

Always Use Genuine Ingersoll-Rand Replacement Parts.

All Ingersoll-Rand Trolleys shipped with a new Centurion Hoist are adjusted at the factory to fit a beam with a 3.00" flange width. When disassembling the Trolley for installation on the beam, note the exact arrangement of spacers so that the Trolley can be correctly reassembled.

For installation on a beam flange other than that for which the Trolley is pre-adjusted, measure the beam flange and temporarily install the Trolley on the Hoist to determine the exact distribution and arrangement of the spacers.

The distance between the wheel flanges should be 3/16" greater than the width of the beam flange for straight runway beams, and 3/16" to 1/4" greater in a runway system that includes sharp curves. The number of spacers between the Trolley side plate and the mounting lug on the Hoist should be the same in all four locations in order to keep the Hoist centered under the beam. The remaining spacers must be equally distributed on the outside of the Side Plate.

When installing the Hoist and Trolley on the beam, make certain the side plates are parallel and vertical. After installation, operate the Trolley over the entire length of beam with a capacity load suspended a few inches off the floor to make certain that adjustment and operation are satisfactory.

Always use an air line filter and lubricator unit with any Centurion air motor Hoist. Use a unit having at least 3/4" NPT inlet and outlet, and install it as close to the Hoist as practical. It should never be more than 15 feet from the Hoist inlet connection. Adjust the unit to feed 3 or 4 drops per minute while the Hoist is operating at full speed. For best results, we recommend using the Ingersoll-Rand No. NFLU-12 Filter-Lubricator Unit.

LUBRICATION

Centurion Hoists are constructed with a completely sealed gear chamber so that all gears and bearings within that chamber operate in an oil bath. Bearings located outside the gear chamber are permanently lubricated and sealed, and do not require any further lubrication. **Caution:** Never wash or clean any permanently lubricated bearing in kerosene or other solvent as this will break down or contaminate the lubricant and probably cause the bearing to fail.

Centurion Hoists are shipped from the factory lubricated and ready to install.

At the beginning of each 8 hour shift, or more often if required, fill the Filter-Lubricator Unit with Ingersoll-Rand Pneu-Lube Medium Oil No. 50 or a good SAE 20 or 20W motor oil.

After each 40 hours of operation, or as experience indicates, remove the Oil Level Plug from the side of the Gear Case, and if necessary, add a sufficient amount of Ingersoll-Rand No. 62 Gear Lubricant, Texaco Meropa 3* AGMA Mild 5EP** or equivalent oil to bring the oil level to the plug opening.

Whenever the Hoist is disassembled, refill the gear chamber with new oil. 12 ounces of oil are required for an initial filling.

After each 160 hours of operation, or as experience indicates, inject 3 to 6 strokes of Ingersoll-Rand Lubricant No. 28 into the Grease Fittings on the Trolley Wheel Shafts.

Check the load Chain for lubrication. Wash it in clean kerosene or other solvent and lubricate it as instructed in the section **CHAIN LUBRICATION.**

The Top Hook and Bottom Hook are both supported on thrust bearings. At each 160 hour check-up, work some Ingersoll-Rand Lubricant No. 28 into each of these bearings. Failure to lubricate these bearings could eventually cause bearing failure. Both Hooks should swivel freely with a rated load.

Disassemble the Sheave Block on double line Hoists and work some grease into the Sheave Block Pocket Wheel Bearings.

Always Use Genuine Ingersoll-Rand Replacement Parts.

* Trademark of Texaco Oil Company
** Trademark of Mobil Oil Company

TROUBLESHOOTING

I. **Hoist will not operate in either direction.**

A. Check the air line pressure. This should be at least 85 psi at the Hoist.
B. Check to be certain that all air line valves are open.
C. Remove the Motor and Brake Covers and check for broken, pinched or disconnected control hoses.
D. Depress either pendent throttle lever and observe the operation of the brake assembly as follows:
(1) If the brake does not release, check for a small leakage around the brake piston.
(2) If there is no air flow, shut off the air supply and check the Brake Shuttle (CA110-62) in the Limit Valve Assembly for freedom of movement. If the Shuttle is sluggish or "frozen", clean the bushing and Shuttle with clean kerosene or similar solvent.
(3) If the brake does not operate when the pendent throttle lever is depressed, shut off the air supply and remove the Shuttle Caps (CA110-A338) from the Motor Assembly. Check for a broken Shuttle Spring (CA110-250) or gummy bushings.
(4) If steps 1, 2 and 3 do not correct the trouble, disassemble the Motor and check for a broken Vane. If a Vane is broken or worn, install a complete new set of Vanes. Do not use new and old Vanes in combination.

II. **Hoist will operate in only one direction.**

A. Check the Stop Lever to see that it is free to move in either direction.
B. Remove the Motor and Brake Covers and check for broken, pinched or disconnected control hoses.
C. Shut off the air supply and remove the Shuttle Caps (CA110-A338) from the Motor Assembly. Check for a broken Shuttle Spring (CA110-250) or gummy bushings.
D. Shut off the air supply and check the Brake Shuttle (CA110-62) in the Limit Valve Assembly for freedom of movement. If the Shuttle is sluggish or "frozen" clean the bushing and Shuttle with clean kerosene or similar solvent.

III. **Hoist operation is sluggish.**

A. Check the air line lubrication system. Refer to **LUBRICATION.**
B. Shut off the air supply and remove the Shuttle Caps (CA110-A338) from the Motor Assembly. Check for a broken Shuttle Spring (CA110-250) or gummy bushings.

IV. **Chain is noisy.**

A. Examine the Chain as instructed in **CHAIN CARE** on page 8. If necessary, install a new Chain as instructed in **CHAIN REPLACEMENT. Warning: Always use genuine Ingersoll-Rand replacement Chain. Never use any other Chain.**
B. Examine the Pocket Wheel and Chain Guide. If either part is damaged in any respect, replace it.

DISASSEMBLY OF THE HOIST

The Centurion Hoist is designed and constructed so that it can be serviced from either end without completely disassembling the Hoist. The following components are accessible from the motor end of the Hoist:

- Air Motor
- Limit Valve Assembly
- Stop Lever Assembly
- Pocket Wheel Assembly
- Chain Guide

The following components are accessible from the brake end of the Hoist:

- Air Brake
- Gearing

Do not disassemble a Hoist any further than necessary to replace or repair a specific part.

Motor End Disassembly Procedure

1. Shut off the air supply to the Hoist.
2. Unscrew the four Motor Cover Screws (CE110-302) and remove the Motor Cover.
3. **If only the Motor Assembly is going to be serviced:**
(a) Disconnect the tubing at the Motor fittings.
(b) Unscrew the four Motor Mounting Screws (CE110-354) and withdraw the Motor.

Always Use Genuine Ingersoll-Rand Replacement Parts.

4. **If only the Limit Valve is going to be serviced:**
   (a) Disconnect the tubing at the Limit Valve.
   (b) Unscrew the two Hose Unions (MR-129) at the bottom of the Hoist.
   (c) Unscrew the Limit Valve Mounting Screws (CE110-31) and withdraw the Limit Valve Assembly.
5. **If neither the Motor nor the Limit Valve Assembly is going to be serviced:**
   (a) Disconnect the Brake Tube (CA110-401) from the top front fitting of the Limit Valve Assembly.
   (b) Unscrew the two Hose Unions (MR-129) at the bottom of the Hoist.
   (c) Unscrew the Motor Mounting Screws (CE110-354) and Limit Valve Mounting Screws (CE110-31) and lift out both assemblies.
6. Before any further disassembly, drain the oil from the Gear Case.
7. Unscrew the four Socket Head Cap Screws (CE110-638), and pull the Motor Housing from the Gear Case.
8. Grasp the Pocket Wheel (CE110-A740) and pull it, along with the Chain Guide (CE110-741) from the Gear Case.
9. Withdraw the Stop Lever Assembly (CA110-A254) from the Gear Case.

Brake End Disassembly Procedure

1. Unscrew the four Brake Cover Screws and remove the Brake Cover.
2. Disconnect the Brake Control Hose from the Brake Cylinder.
3. Unscrew the three Brake Assembly Mounting Screws and remove the Brake Assembly. **Warning: Do not use any solvent that attacks organics on the Brake Discs (CE110-855), Brake Plates (CE110-834) or on any adjacent part.**
4. Remove the Brake Spline Retaining Ring (G57-729) and withdraw the Brake Spline (CE110-842).
5. Before any further disassembly, drain the oil from the Gear Case.
6. Unscrew and remove the ten Gear Case Screws (CE110-354).
7. Grasp the Gear Case half (CA110-A352) adjacent to the brake, and withdraw it to expose the gearing.
8. Withdraw the Gear 1 Assembly (CE110-A319) until its bearing is clear of the bearing recess. Then tilt it away from the Gear 4-5 Assembly (CA110-A357).
9. In the order named, withdraw the Gear 4-5 Assembly, Gear 2-3 Assembly (CA110-A364), Gear 1 Assembly and Gear 6 (CE110-368).

ASSEMBLY OF THE HOIST

Motor End Assembly Procedure

1. If possible, obtain a short length of hoist chain containing 17 links.
2. Place the Chain Guide (CE110-741) over the Pocket Wheel Assembly (CE110-A740) so that it is centered over the chain pockets.
3. Feed the short length of Chain through the assembly flat link first, with the weld on the standing link facing away from the Pocket Wheel. Refer to the illustration on page 9. **Note:** If a short length of Chain is not used, feed the load Chain, flat link first, over the Pocket Wheel. Observe the weld orientation shown in the illustration on page 9.
4. Insert the splined end of the Pocket Wheel into the Gear Case so that it engages the internal splines of Gear 6 (CE110-368).
5. Insert the three Pins (CE110-15) through the holes in the Chain Guide and into the holes in the Gear Case.
6. Insert the short end of the Stop Lever Shaft (CA110-254) into the Needle Bearing in the Gear Case.
7. Install the Alignment Pin (CE110-347) in the Gear Case. Place Motor Housing Gaskets (CA110-739 and CA110-283) on the face of the Gear Case.
8. Smear a small quantity of grease in the Pocket Wheel Bearing recess of the Motor Housing. Place the Wave Spring Washer in the Bearing recess.
9. Place the Motor Housing against the Gear Case, making certain that all pins and shafts properly engage the Housing. The Housing should seat against the Gear Case without using any force.
10. Secure the Motor Housing with the four Socket Head Cap Screws (CE110-638). Tighten the Screws to 25 ft-lbs torque.
11. Align the flats on the Sector Gear (CE110-519) in the Limit Valve Assembly (CA110-B545) with the flats on the Stop Lever Shaft, and slide the Limit Valve Assembly onto the Shaft until it seats against the Motor Housing.
12. Align the 3/8" pipe tapped holes in the bottom of the Limit Valve Assembly with the holes in the Motor Housing, and place the Valve Housing Seals between the Valve Housing (CA110-A545) and the Motor Housing. While maintaining this alignment, install the three mounting screws (CE110-31) and tighten them to 35 in-lbs torque.
13. Slide the Air Motor Assembly (CA110-A40) into place, engaging the Motor Coupling (CE110-317) with Gear 1 (CE110-A319).

Always Use Genuine Ingersoll-Rand Replacement Parts.

14. Install the Motor Mounting Screws (CE110-354) and tighten them to 40 in-lbs torque.
15. Reconnect all tubing as shown in the illustration on page 20.
16. Place the Motor Housing Cover Gasket (CA110-592) on the face of the Motor Housing, and install the Motor Housing Cover.
17. Reconnect the Hose Unions at the bottom of the Hoist.

Brake End Assembly Procedure

1. Dampen the long hub of Gear 6 (CE110-368) with the recommended gear oil (refer to **LUBRICATION**), and slide the Gear onto the splined hub of the Pocket Wheel carefully working it through the lip of the Seal (CE110-614).
2. In the order named, place a Thrust Washer (CE110-296), Thrust Bearing (CE110-295) and a second Thrust Washer on the short hub of Gear 6.
3. Place the Spring Washer (M0V003AA-278) in the bearing recess for Gear 1.
4. Dampen Gear 1 with the recommended gear oil (refer to **LUBRICATION**) and slip either end of Gear 1 through the Seal (CE110-103). **Do not seat the bearing in the bearing recess.**
5. Place a bronze washer (CE110-332) against the face of the two Needle Bearings (CE110-316).
6. While tilting the Gear 1 to one side, install Gear 2-3 (CA110-A364) large gear end first.
7. Install Gear 4-5 (CA110-A357) small gear end first.
8. Straighten Gear 1 and seat its bearing in the bearing recess. Place a bronze washer on Gear 2-3 and Gear 4-5.
9. Install the two Alignment Pins (CE110-347) followed by the Gear Case Gasket (CE110-931) on the face of the Gear Box (CE110-A353).
10. Carefully place the other Gear Box (CA110-A352) against the assembled unit, making certain that all Shafts and Pins enter their respective bores. The Gear Box should easily slide into place against the Gasket. **DO NOT FORCE IT.**
11. Install the ten Gear Case Screws (CE110-354) and tighten them to 40 in-lbs.
12. Slide the Brake Spline (CE110-842) flat side first on the protruding end of Gear 1, and retain it with the Brake Spline Snap Ring (G57-729).
13. Engage the Brake Discs with the Brake Spline and slide the Air Brake Assembly (CA110-A830) into place. Retain it with the three Mounting Screws tightened to 35 in-lbs torque.
14. Reconnect the Brake Hose to the Fitting (AF120-339) on the side of the Brake Cylinder.
15. Install the Brake Cover Gasket and Brake Cover.

DISASSEMBLY OF THE MOTOR

1. Remove the Air Motor Assembly as described under **Motor End Disassembly Procedure.**
2. Using a gear puller, remove the Coupling (CE110-317), Coupling Key (CE110-70) and Shaft Collar (CA110-113) from the Rotor Shaft (CA110-52).
3. Remove the Snap Rings (G57-729) from both ends of the Rotor Shaft.
4. Remove the six hexagon Nuts (D02-428), Lock Washers (T11-58) and Bolts (R55H-312B), and withdraw the End Plates.
5. Slide the Vanes from the vane slots in the Rotor.
6. Slide the Rotor (CA110-53A) from the Rotor Shaft.
7. Unscrew the Shuttle Valve Caps (CA110-A338) and withdraw the Shuttle Valves and Springs.
8. Wash all parts in clean kerosene or some other suitable solvent. Make certain to clean the vane slots, shuttle valves and shuttle bushings of any gummed oil or dirt. Examine the Vanes for nicks, cracks or wear, and discard the entire set of Vanes if any of them show any defects. Examine the bore of the Cylinder (CA110-A3) and replace the Cylinder if the bore is wavy or rough. Check the Bearings for looseness or roughness, and replace them if necessary.

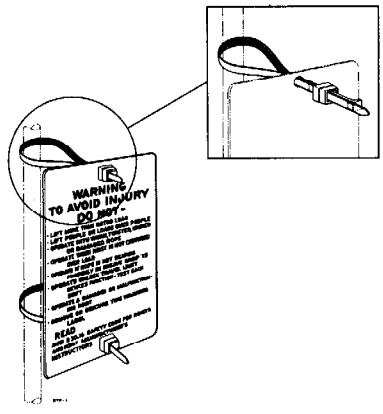
ASSEMBLY OF THE MOTOR

1. Dampen all parts with a thin film of light oil. Work some Ingersoll-Rand No. 28 Grease or any good quality No. 2 cup grease into the bearing races of the two Rotor Bearings.
2. Insert the key slot end of the Rotor Shaft (CA110-52) through the bore in the Front End Plate (CA110-11) so that the key slot protrudes from the bearing side of the End Plate.
3. Slide one of the Rotor Bearings over the key slot end of the Shaft until it seats against the shoulder. Place a Snap Ring (G57-729) in the groove adjacent to the Bearing.
4. Seat the Bearing into the bearing recess in the Front End Plate.

Always Use Genuine Ingersoll-Rand Replacement Parts.

5. Position the End Plate and Shaft Assembly upright, grasping the key slot end of the Shaft in copper-covered vise jaws.
6. Slide the Rotor down over the Rotor Shaft and against the End Plate.
7. Slip a Vane in each vane slot.
8. Place the Cylinder down over the Rotor and against the Front End Plate so that the two Tube Fittings (AF120-339) on the Shuttle Valve bosses face the Rear End Plate. Align the bolt holes in the Cylinder with those in the End Plate.
9. Place the Rear End Plate (CA110-12), flat side first, down over the Rotor Shaft and against the Cylinder. Orient the Rear End Plate so that the Tube Fittings (CA110-146 and CA110-471) face the Shuttle Valve bosses at right angles.
10. Install the six Bolts (R55H-312B), Lock Washers (T11-58) and Nuts (D02-428), but do not tighten the Nuts.
11. Slide the rear Rotor Bearing (T06-24) onto the Rotor Shaft and into the bearing recess in the Rear End Plate. Install the Snap Ring (G57-729) in the groove adjacent to the Bearing.
12. Alternately tighten each of the Motor Bolt Nuts a little at a time to 10 to 12 ft-lbs torque.
13. With the Rotor Shaft still clamped in copper-covered vise jaws, rotate the motor around the Shaft until the Shuttle Valve bosses are facing you.
14. Insert Shuttle Valve No. CA110-A248 (identified by a short stem on one end) stem end first into the shuttle valve bore at the left side of the Motor. Insert Shuttle Valve No. CA110-A246 (identified by a long stem on one end) stem end first into the shuttle valve bore at the right side of the Motor. **Warning:** Make certain these Shuttle Valves are properly installed. Refer to the illustration of the Air Motor Assembly on page 26.
15. Install the Shuttle Valve Springs and Shuttle Caps.
16. Remove the Motor from the vise and press the Rotor Shaft Collar (CA110-113) onto the Rotor Shaft (CA110-52) until it seats. Place the Shaft Key (CE110-70) in the key slot and press the Coupling (CE110-317) onto the Shaft until it seats against the Collar.
17. Replace the Air Motor in the Hoist as instructed under **Motor End Assembly Procedure.**

INSTALLATION OF NO. CA110-K598 HOIST SAFETY INSTRUCTION LABEL

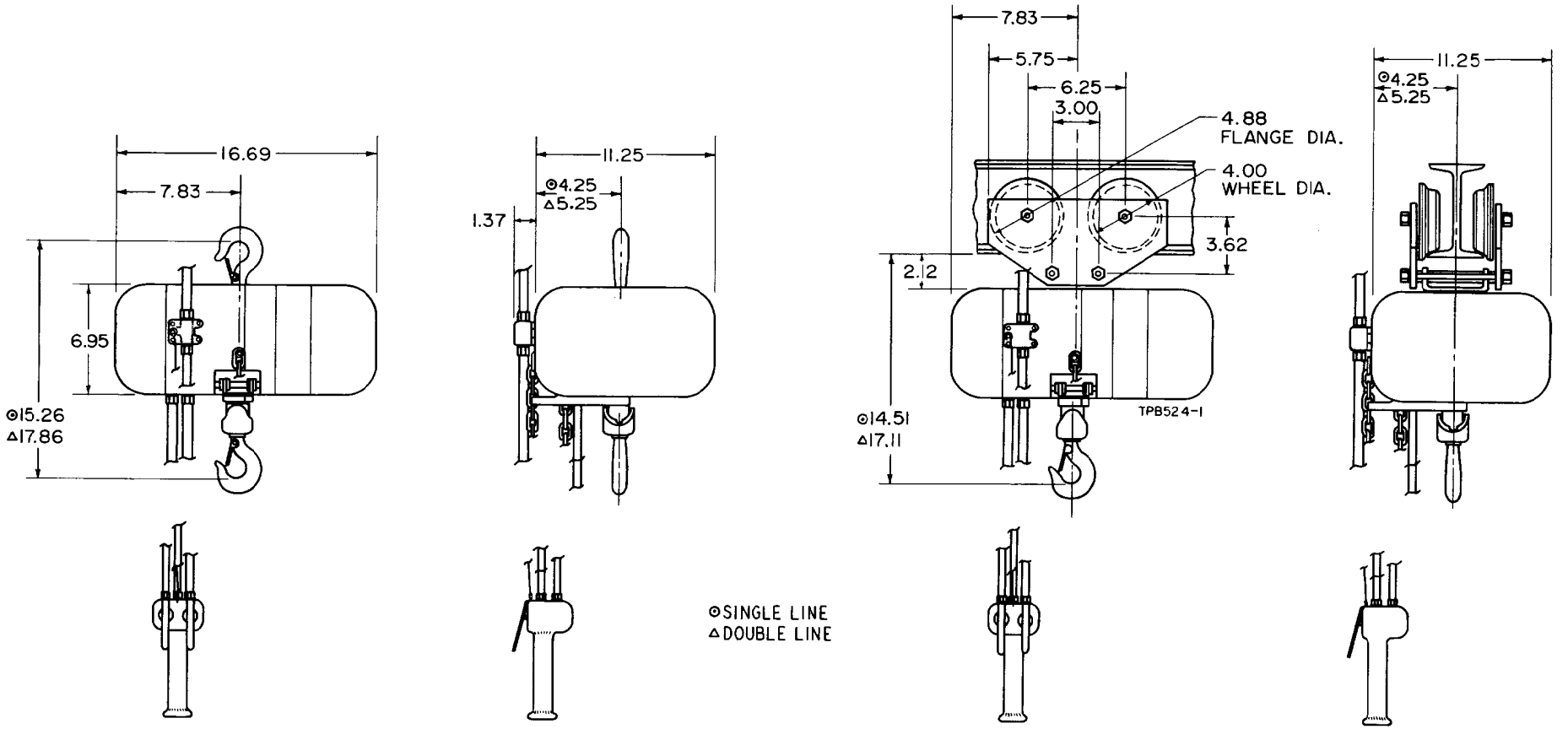


In accordance with ANSI B30.16 Safety Code for Hoists, a Hoist Safety Instruction Label is to be attached to all Hoists. Attach the Safety Instruction Label to the live air hose directly above the control assembly.

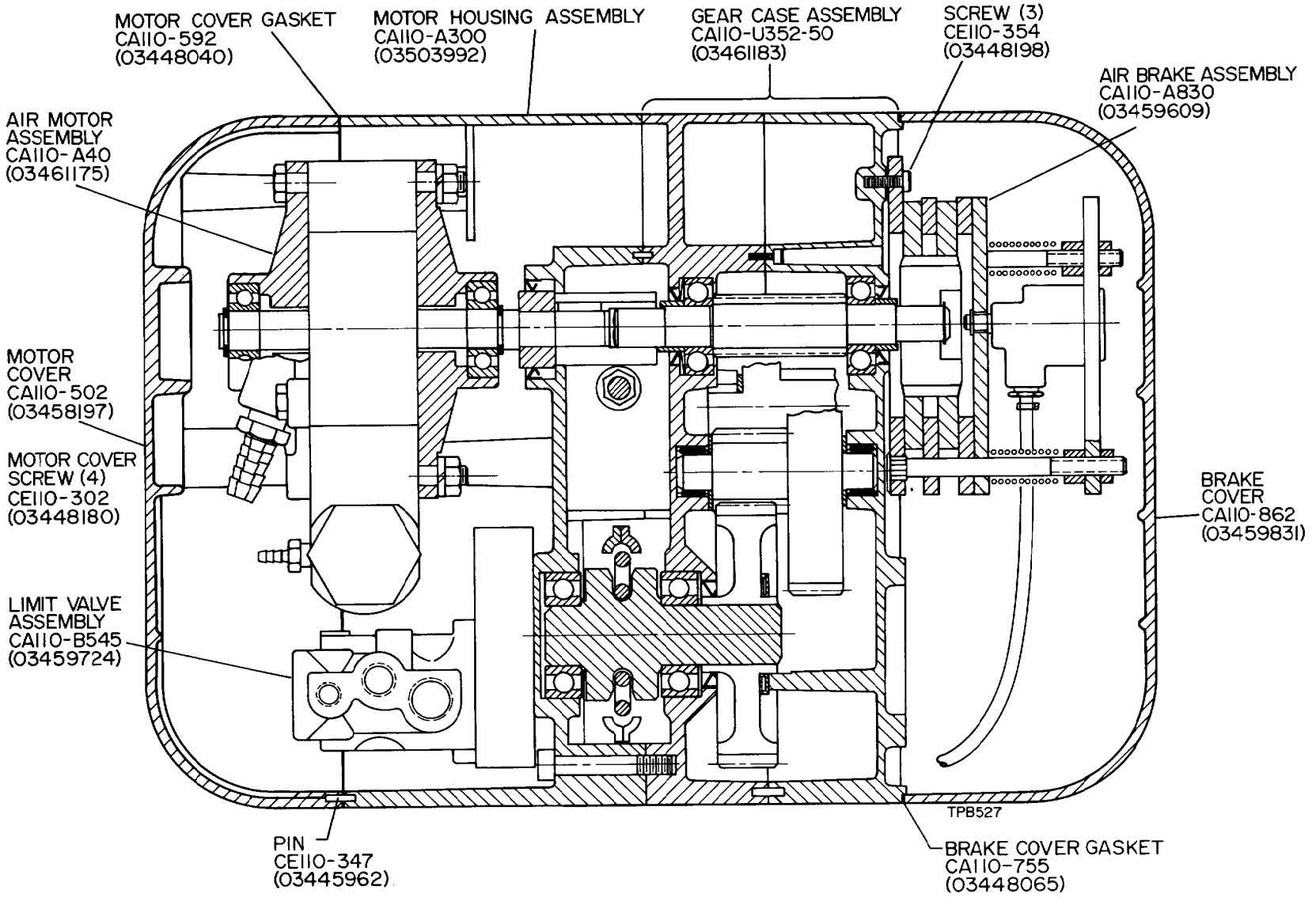
Attach the label as follows:

1. Note that there are two plastic fasteners included in the kit, one for each end of the Label.
2. Run the end of one fastener through the top hole in the Label, around the live air hose and back through the hole in the Label.
3. After bringing the end of the fastener back through the Label, run it through the square collar as shown in the upper right-hand illustration.
4. Pull the end of the fastener through the collar until the loop is snug against the live air hose.
5. Lock the fastener in the tightened position by pressing the square head of the fastener into the square collar as shown in the left-hand illustration.

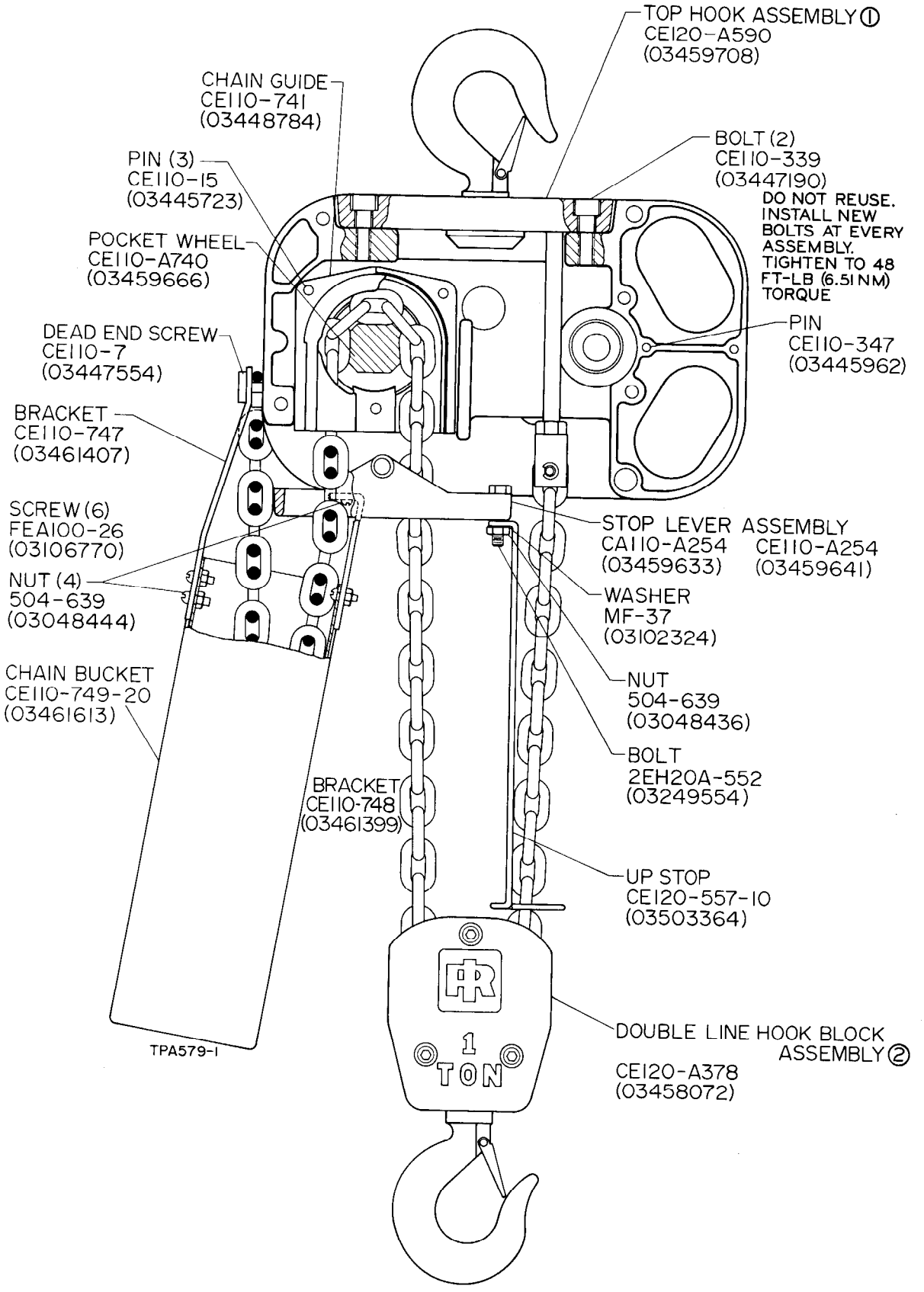
Always Use Genuine Ingersoll-Rand Replacement Parts.



Dimensions of Air-Operated Centurion Hoists

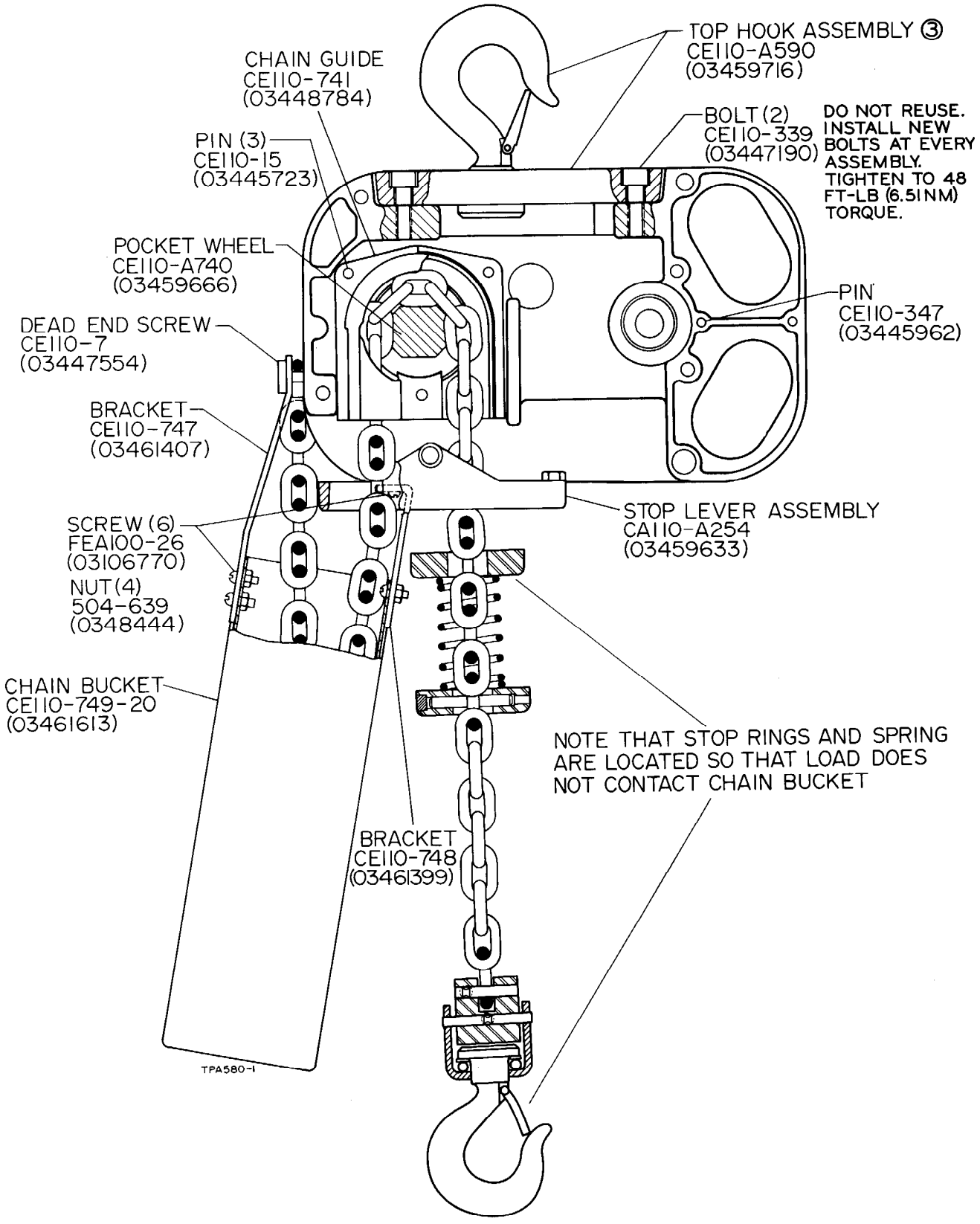


Horizontal Cross Section of Air-Operated Centurion Hoists



Vertical Cross Section of Double Line Centurion Hoists
For Spark Resistant parts ① and ②, refer to page 44.

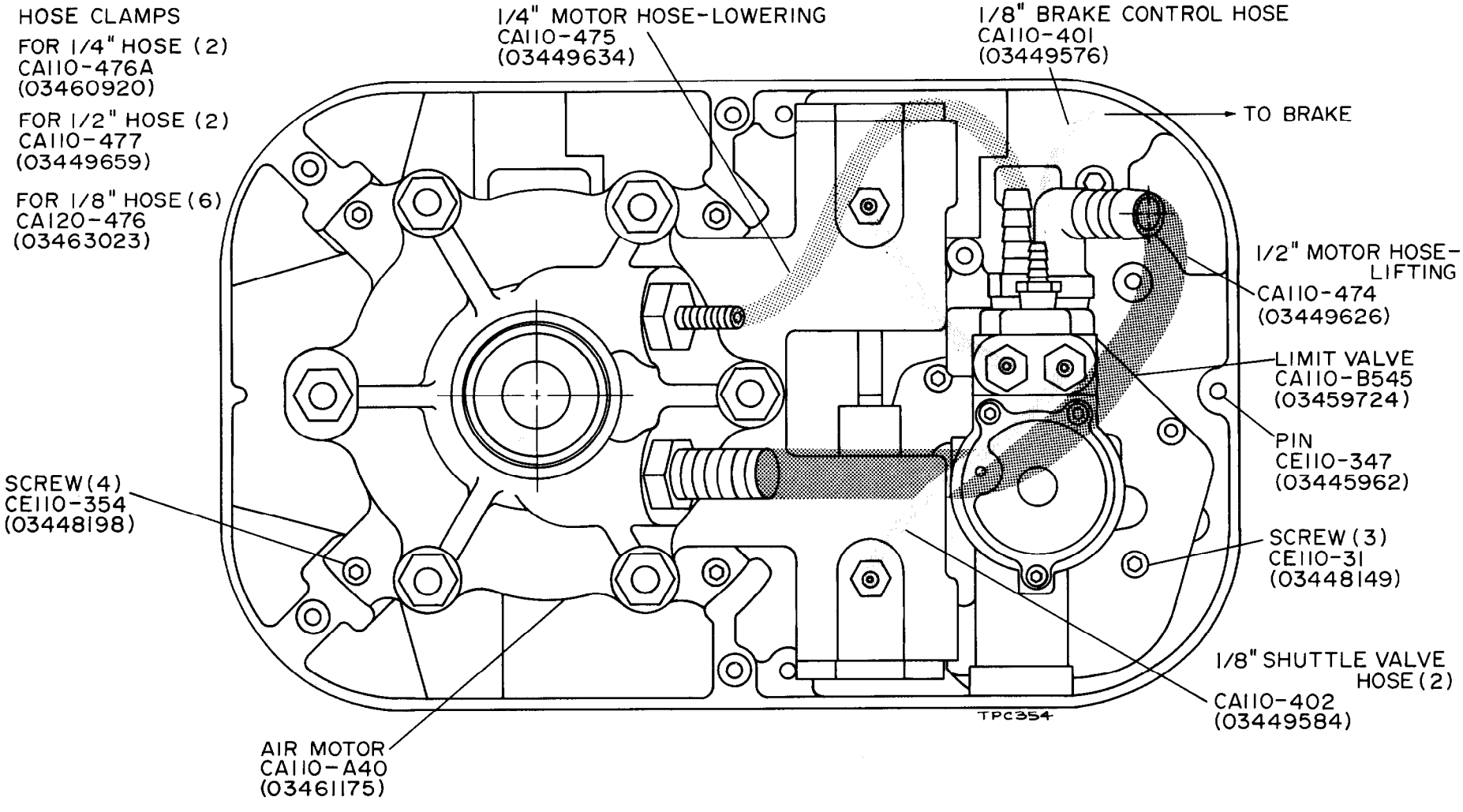
Always Use Genuine Ingersoll-Rand Replacement Parts.



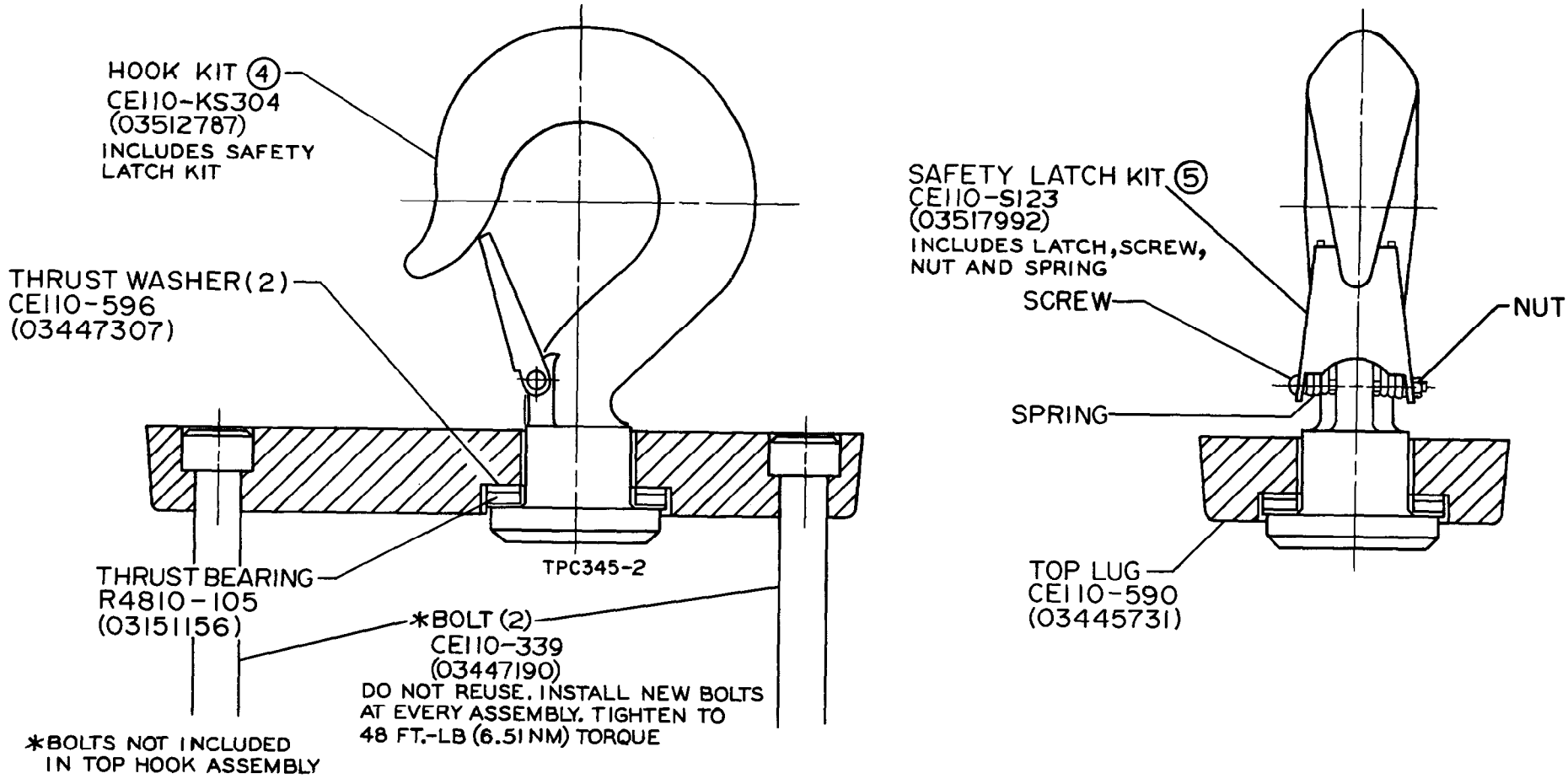
Vertical Cross Section of Single Line Centurion Hoist

For Spark Resistant part ③ , refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.

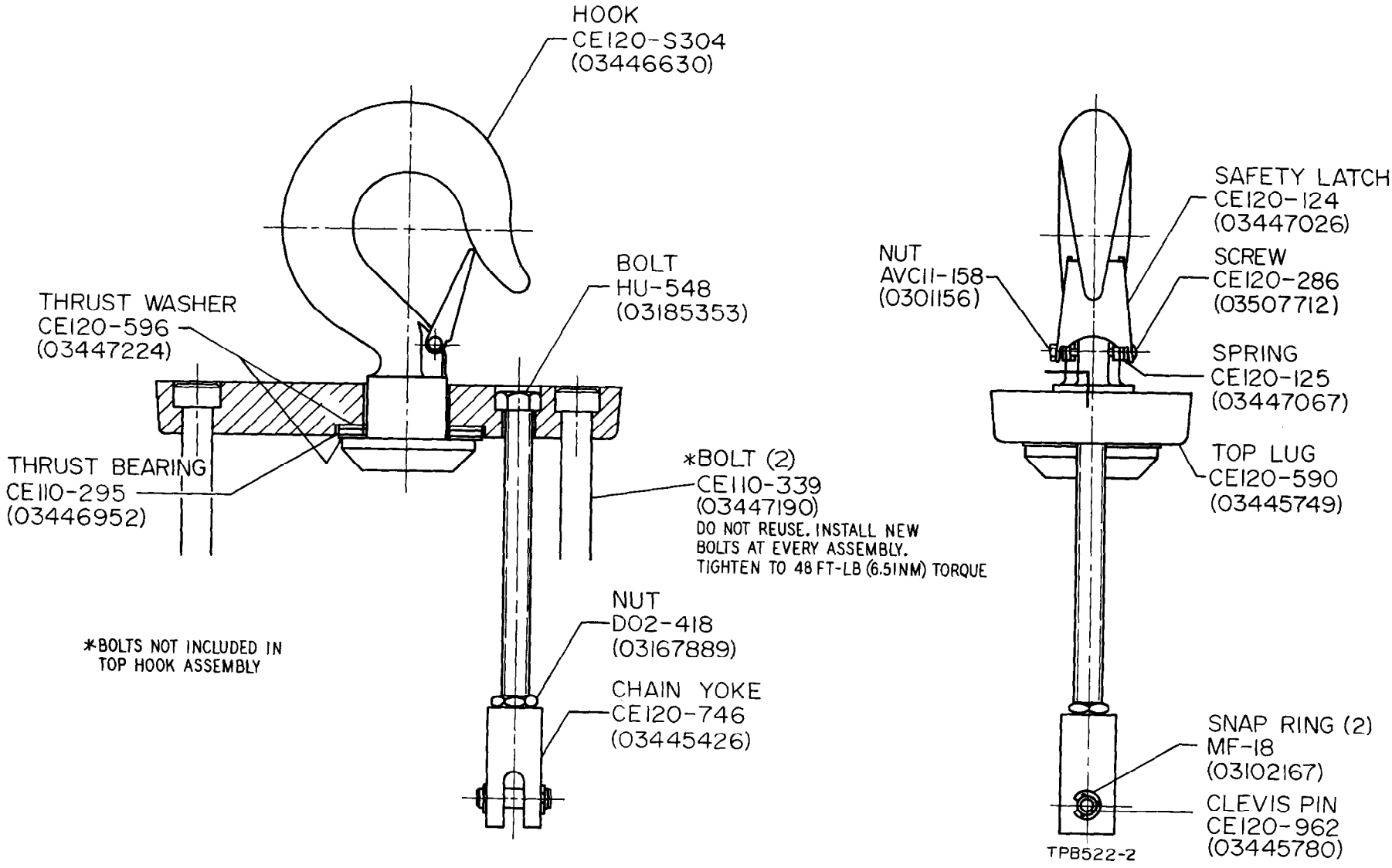


Motor End View of Air-Operated Centurion Hoist



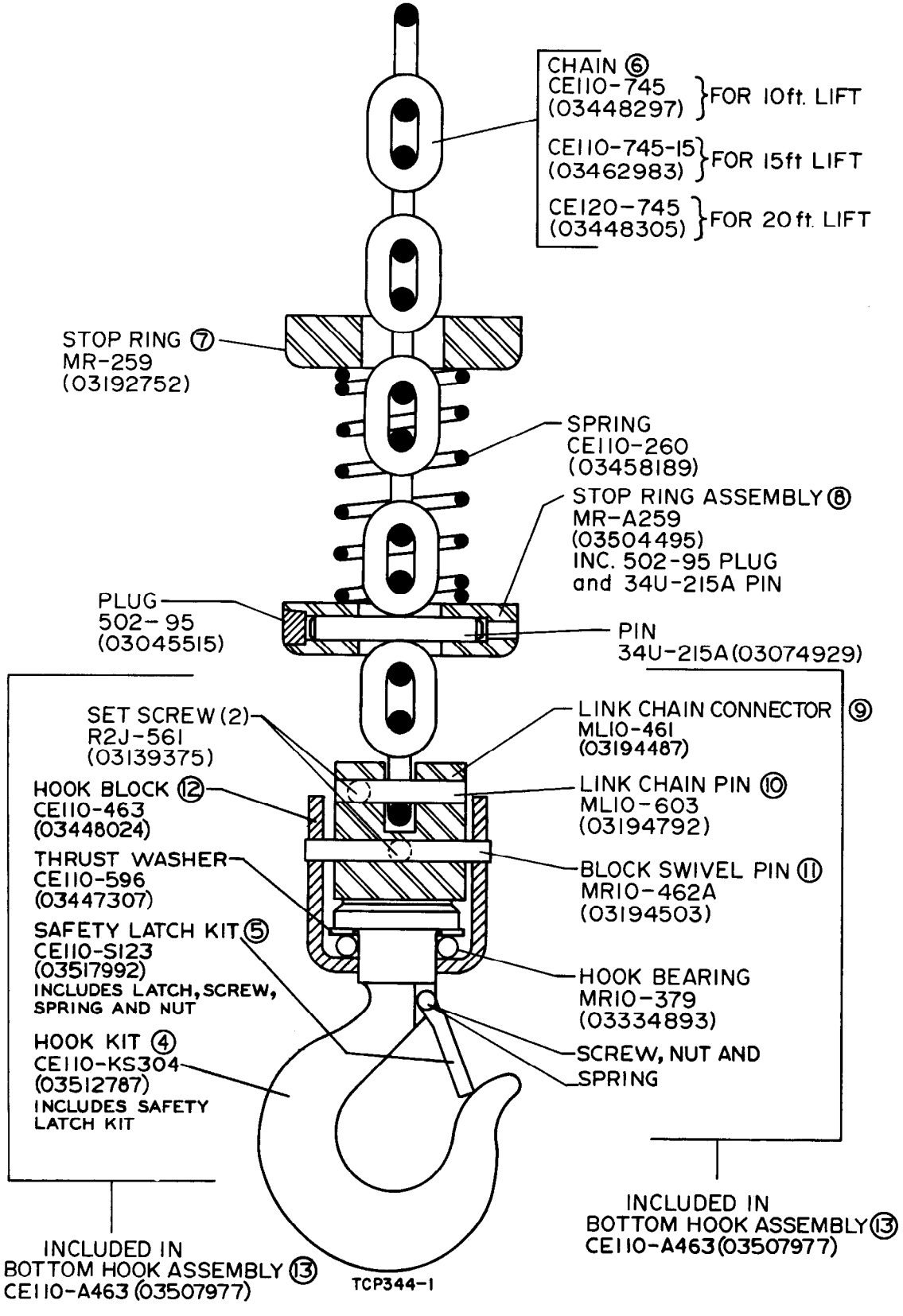
No. CE110-A590 (03459716) Top Hook Assembly (3)
(For Use on Single Line Hoist)

For Spark Resistant parts (3), (4) and (5), refer to page 44.



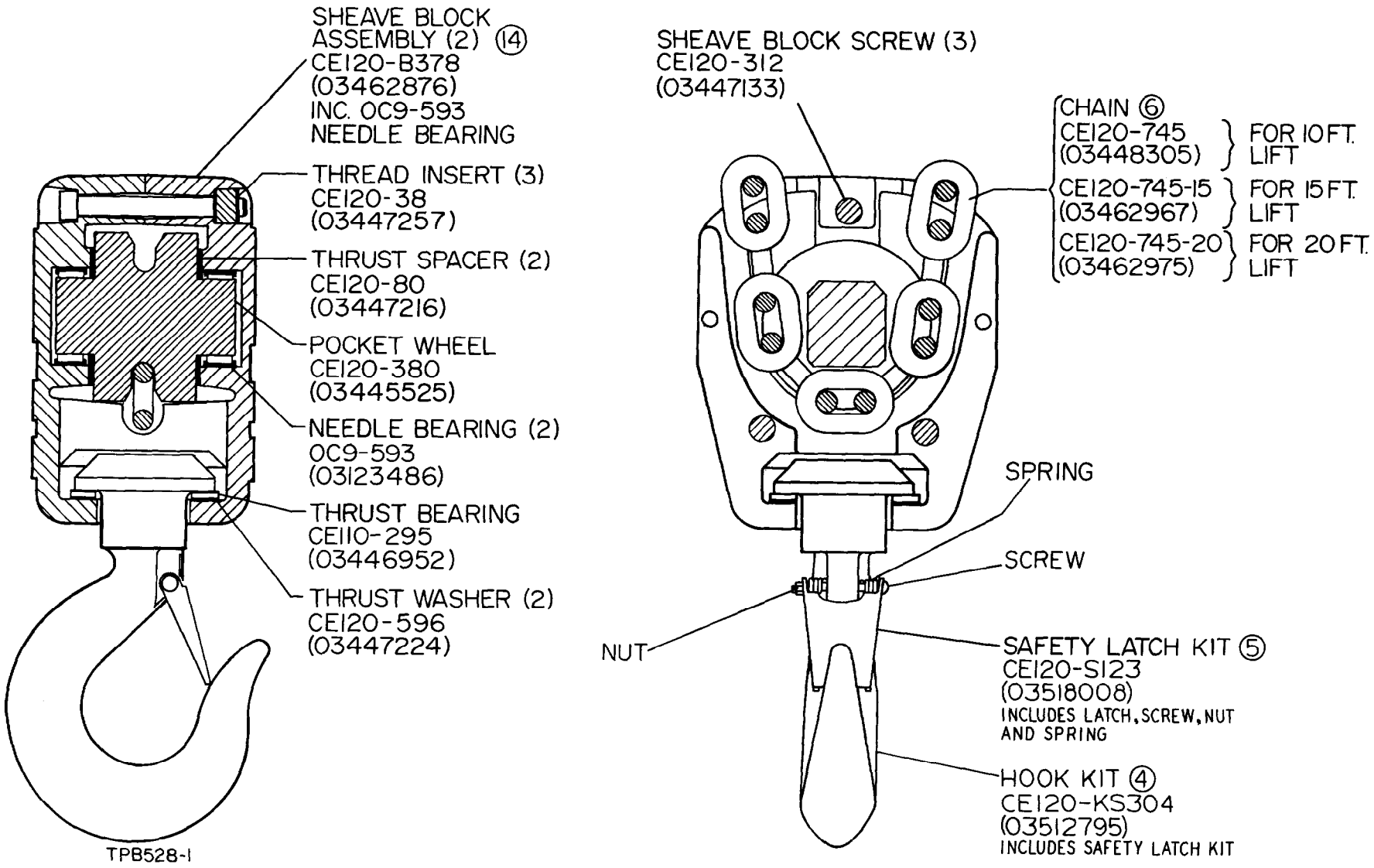
No. CE120-A590 (03459708) Top Hook Assembly ①
(For use on Double Line Hoist)
For Spark Resistant parts ①, ④ and ⑤, refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.



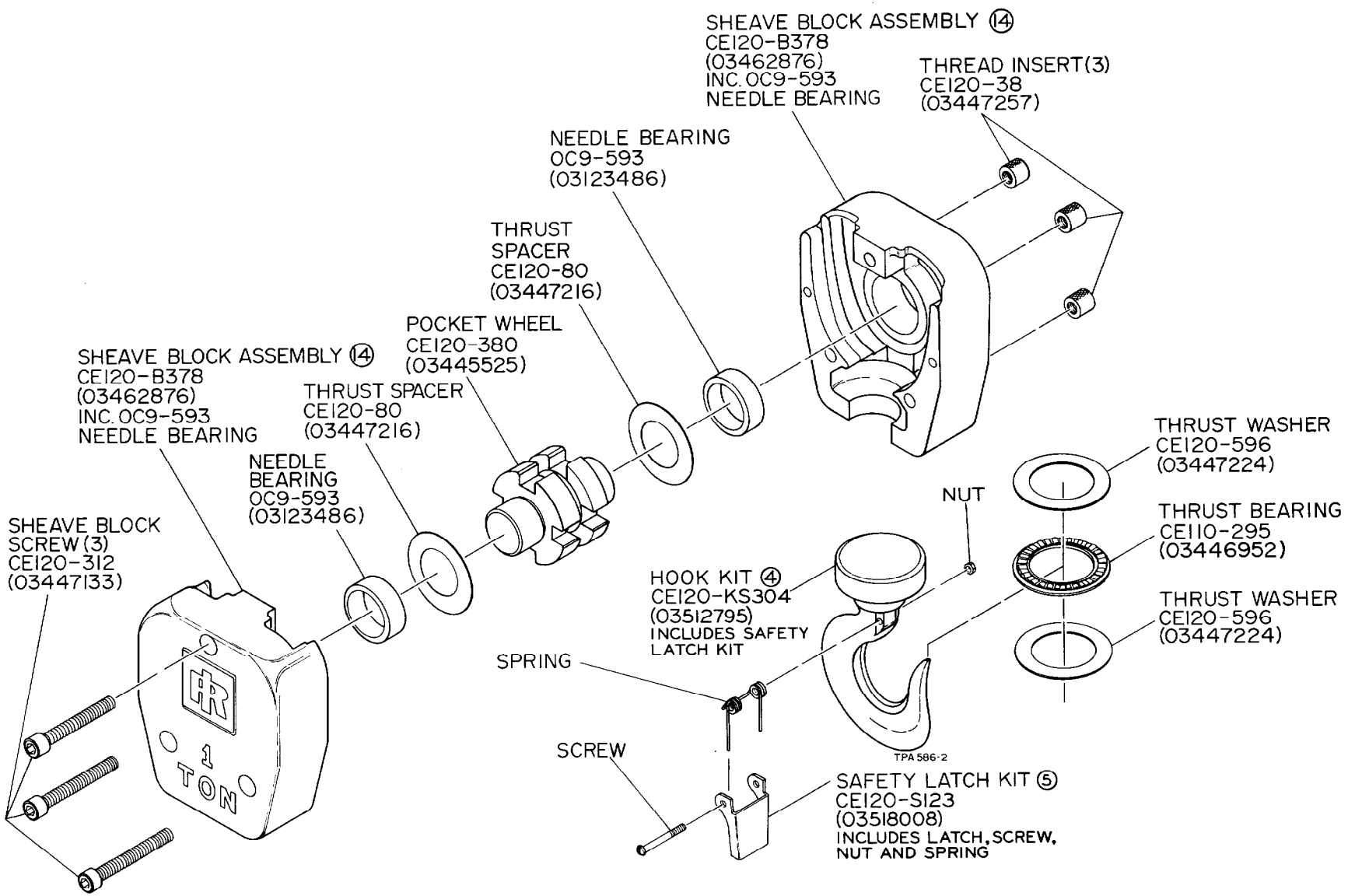
Bottom Hook, Stop Ring and Chain Parts
(For use on Single Line Centurion Air Hoists)
For Spark Resistant parts ④ thru ⑬, refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.



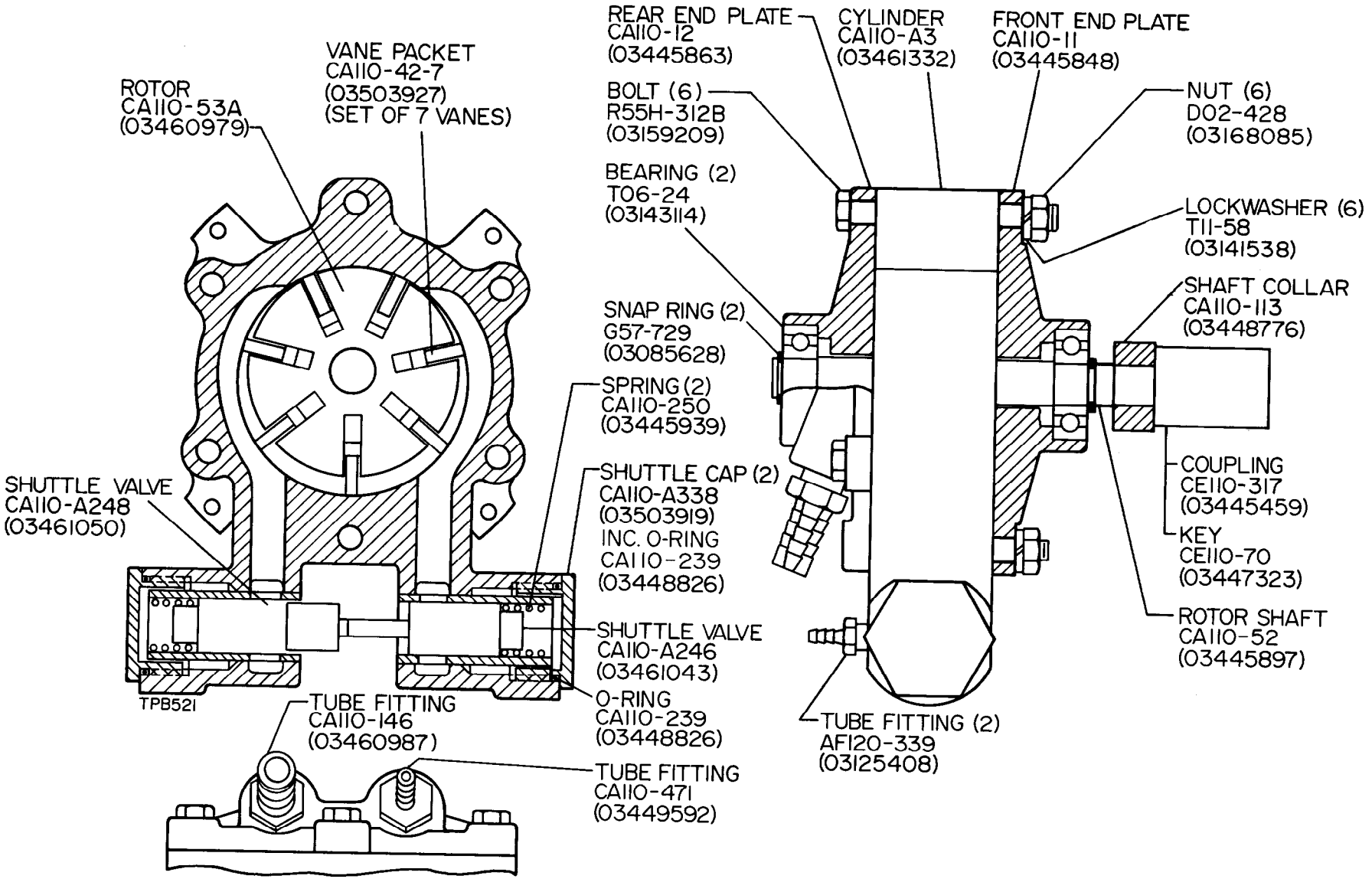
No. CE120-A378 (03458072) Double Line Hook Block Assembly ② And Chain
(Hook Block Assembly includes all parts shown except Chain)
For Spark Resistant parts ②, ④, ⑤, ⑥ and ⑭, refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.



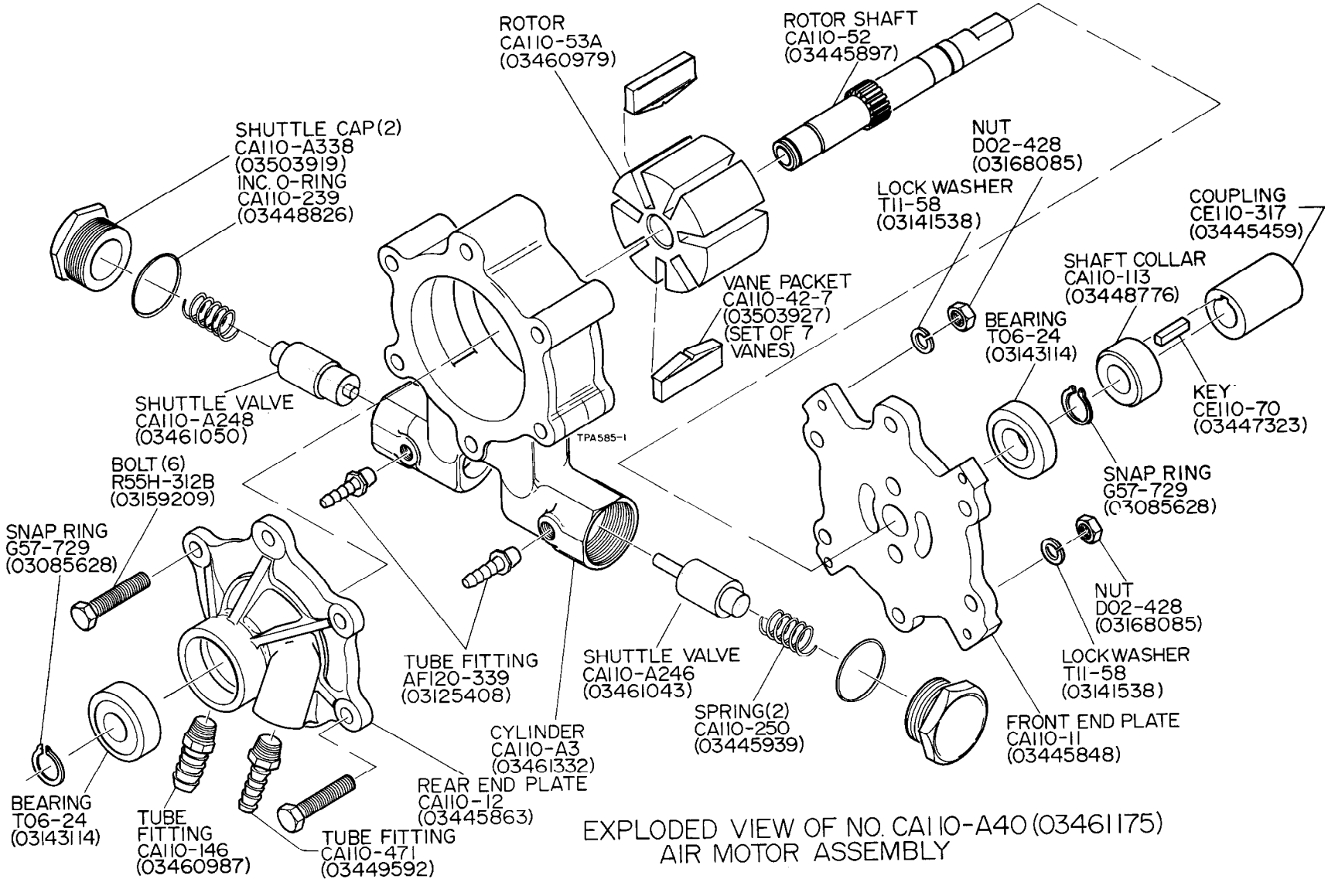
Exploded View of No. CE120-A378 (03458072) Double Line Hook Block Assembly ②

For Spark Resistant parts ②, ④, ⑤ and ⑭, refer to page 44.

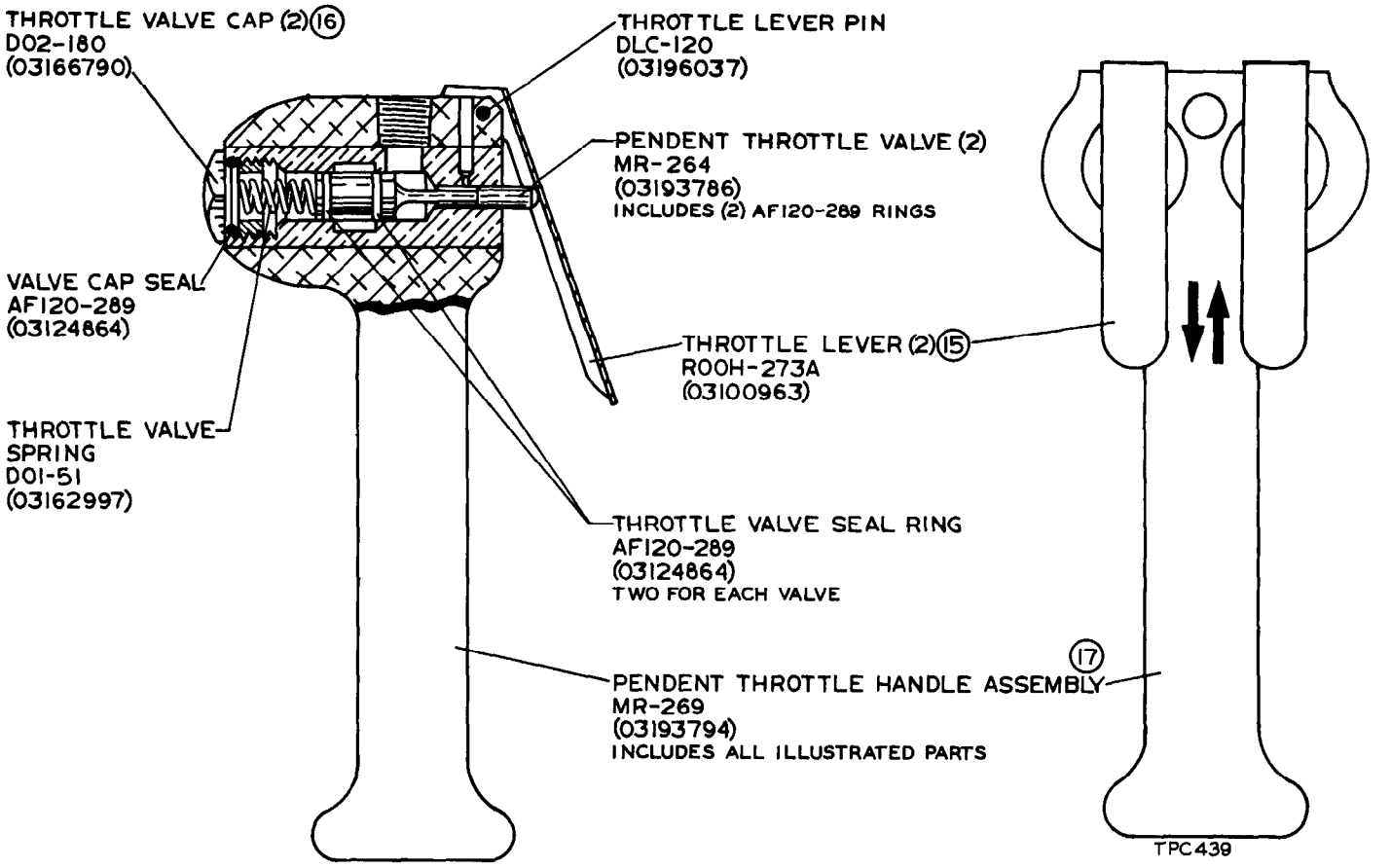


No. CA110-A40 (03461175) Air Motor Assembly

Always Use Genuine Ingersoll-Rand Replacement Parts.

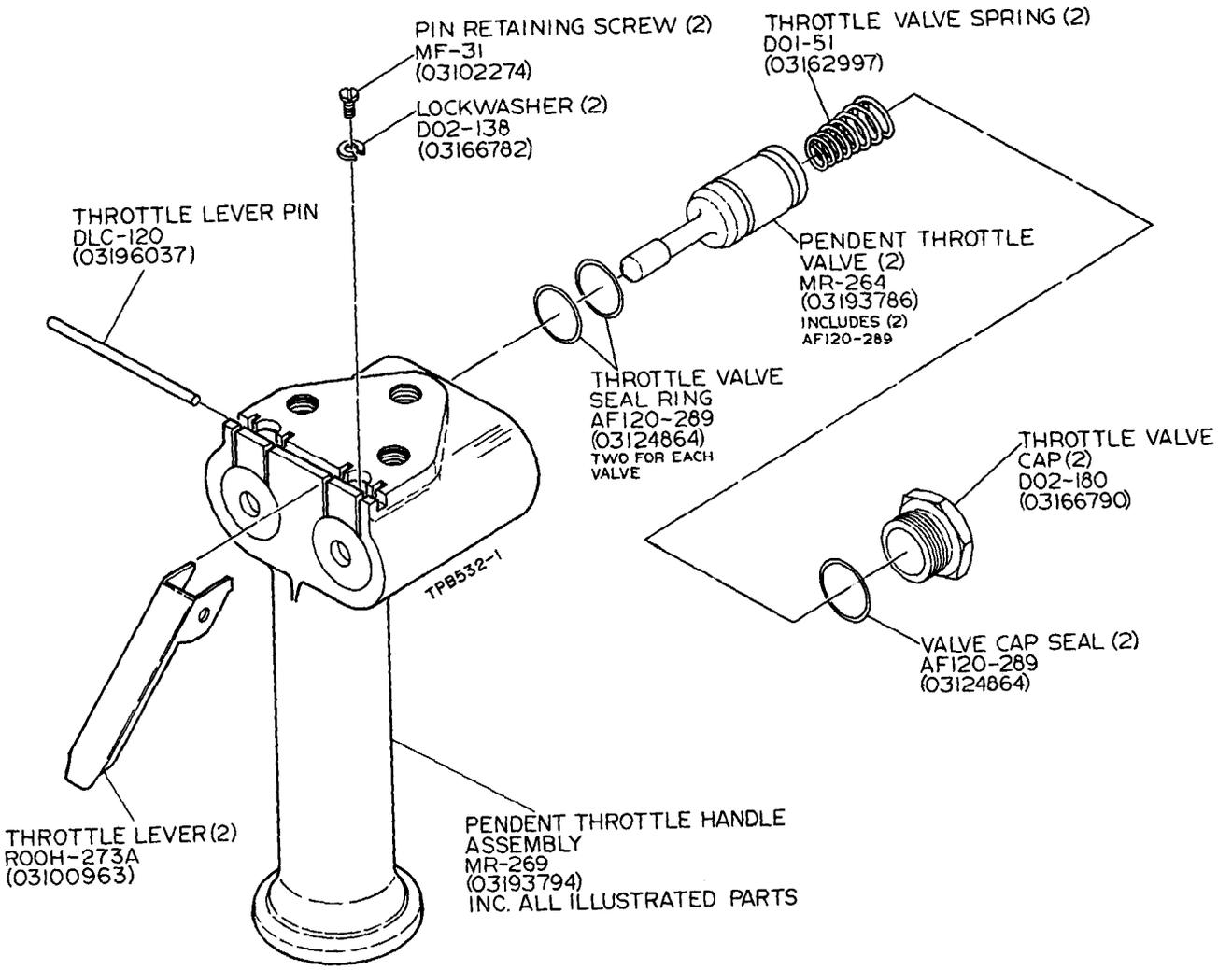


Exploded View of No. CA110-A40 (03461175) Air Motor Assembly



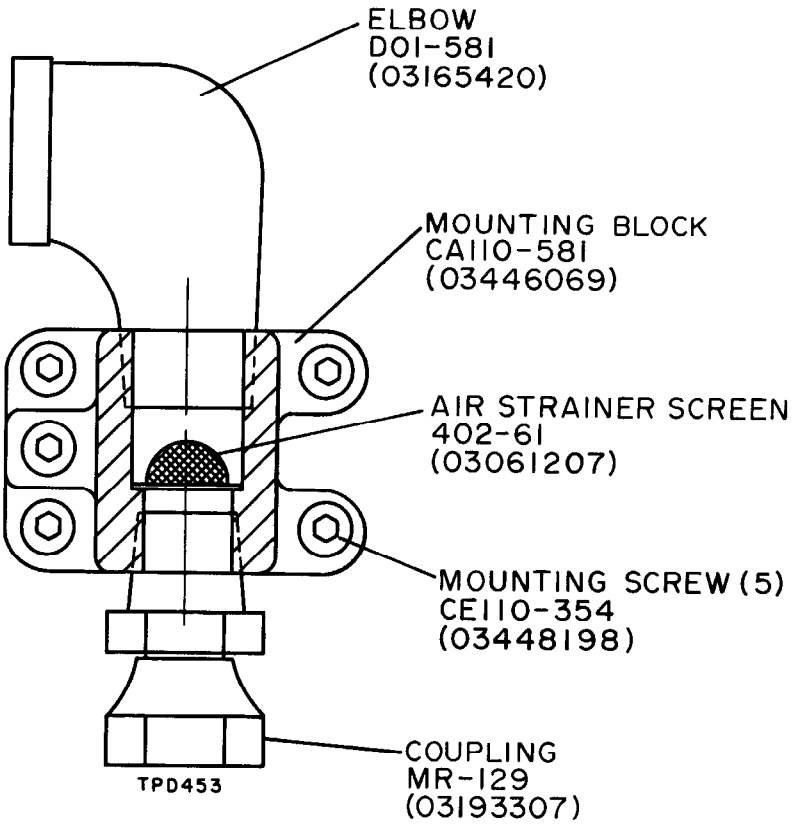
No. MR-269 (03193794) Pendent Throttle Handle (17)
For Spark Resistant parts (15), (16) and (17), refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.

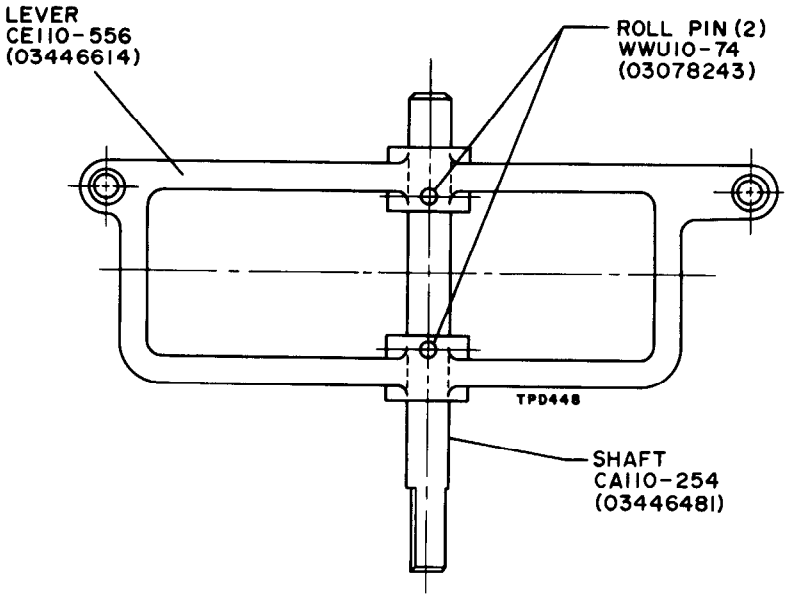


Exploded View of No. MR-269 (03193794) Pendent Throttle Handle ⑰
For Spark Resistant parts ⑮ , ⑯ and ⑰ , refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.

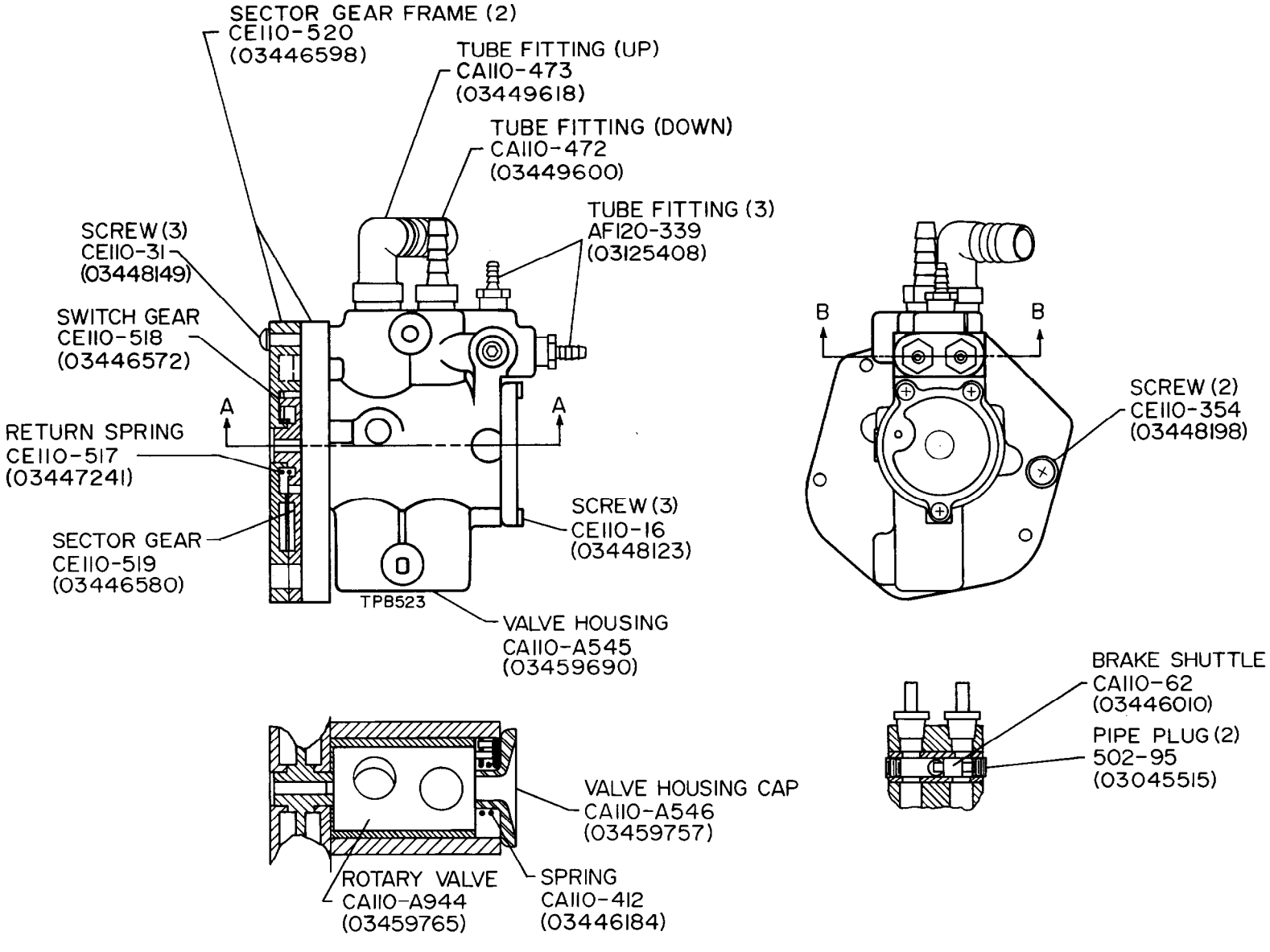


Air Inlet Connecting Parts

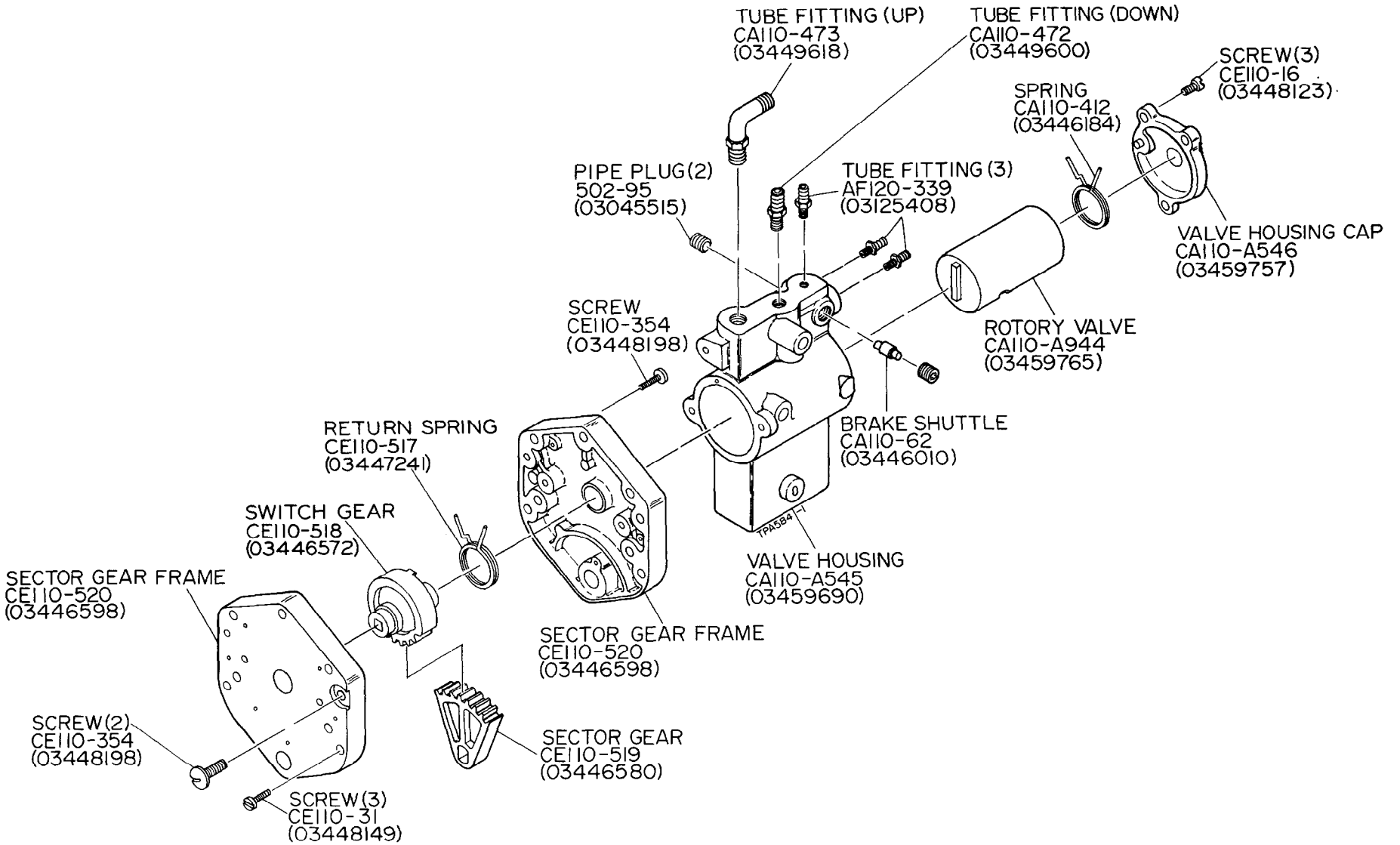


No. CA110-A254 (03459633) Stop Lever Assembly

Always Use Genuine Ingersoll-Rand Replacement Parts.

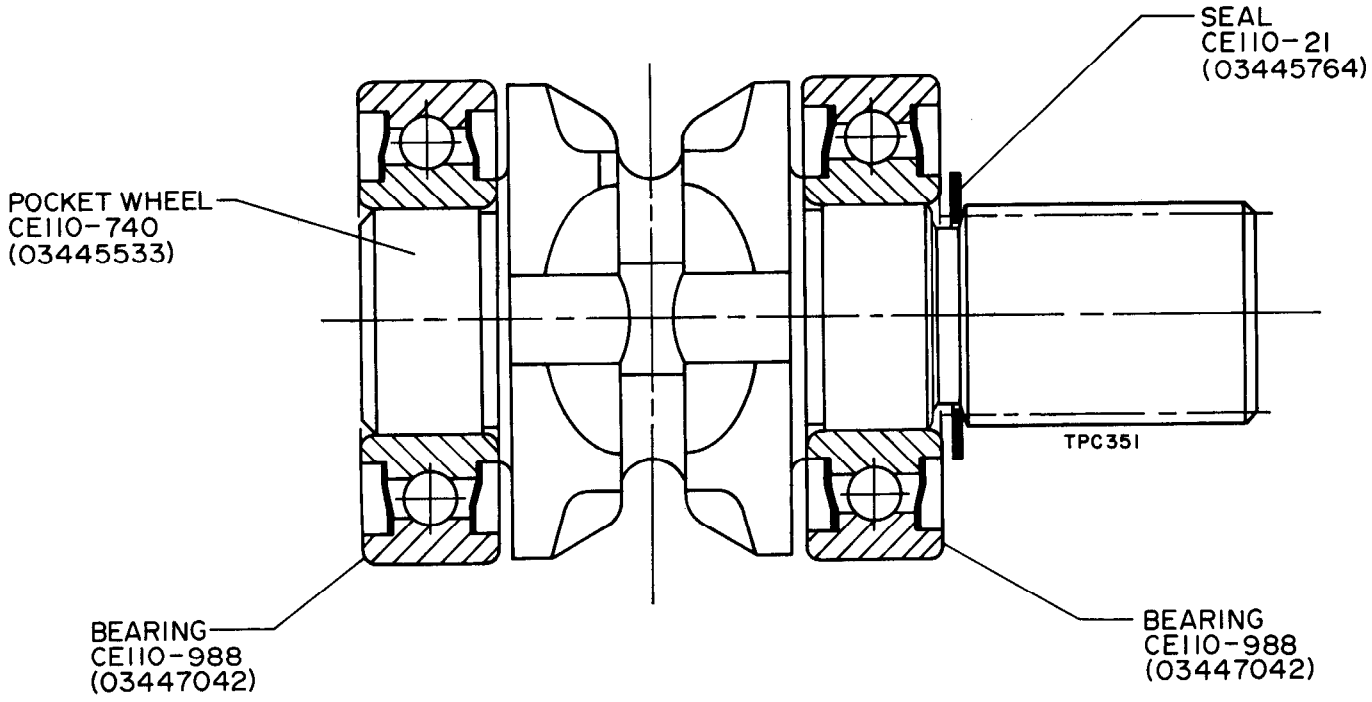


No. CA110-B545 (03459724) Limit Valve Assembly

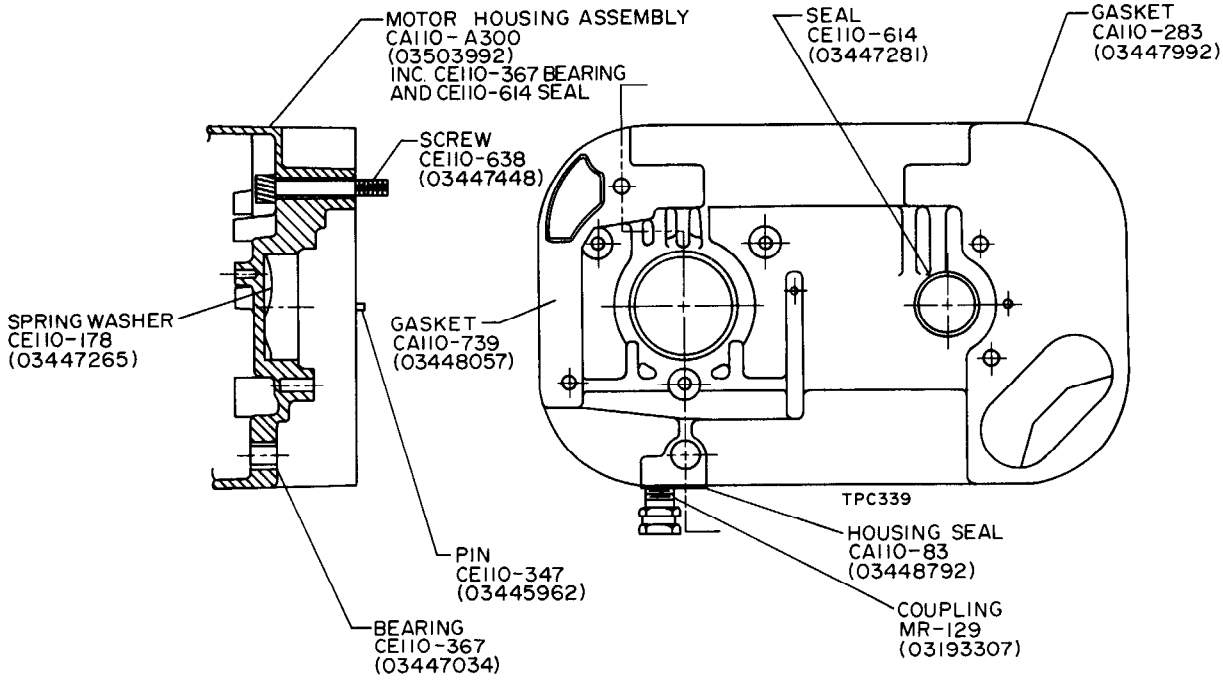


Exploded View of No. CA110-B545 (03459724) Limit Valve Assembly

Always Use Genuine Ingersoll-Rand Replacement Parts.

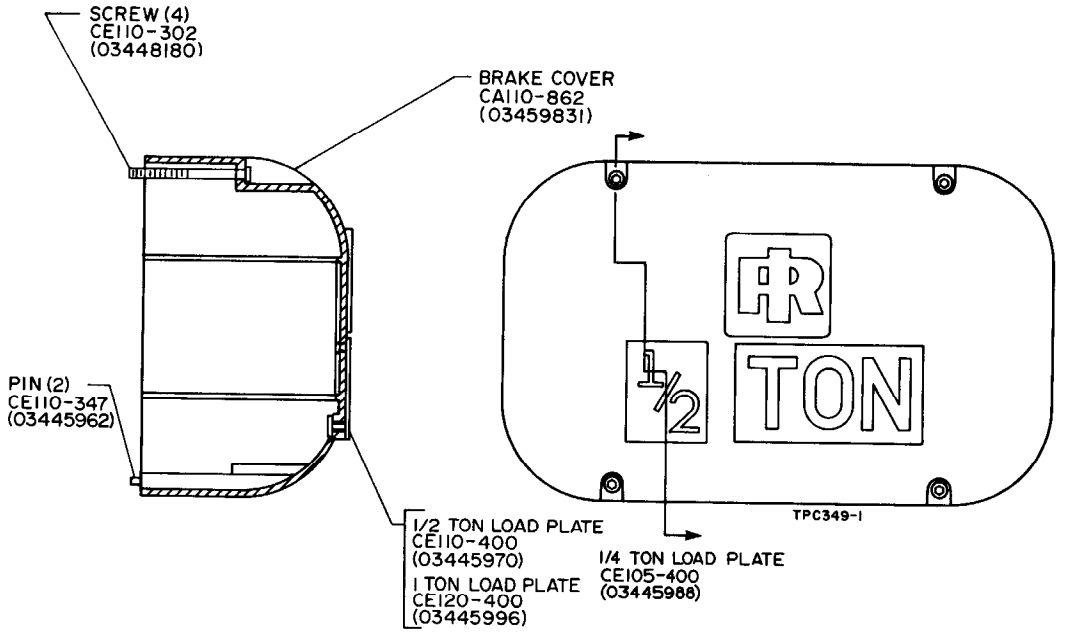


No. CE110-A740 (03459666) Pocket Wheel Assembly

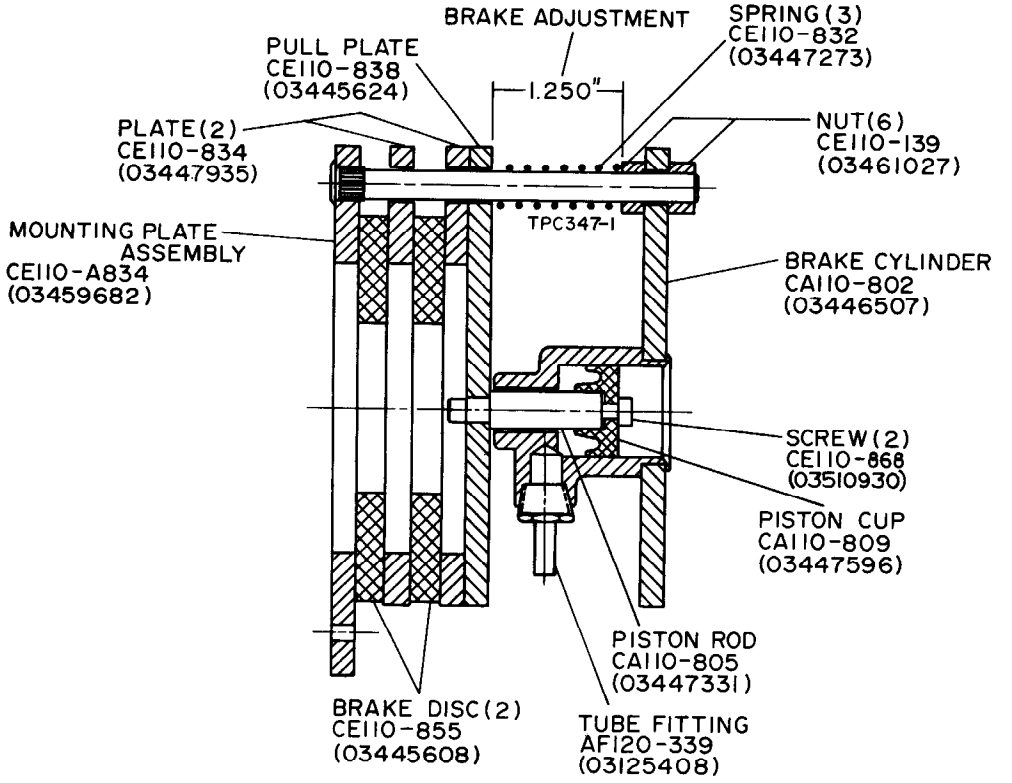


Motor Housing Parts

Always Use Genuine Ingersoll-Rand Replacement Parts.

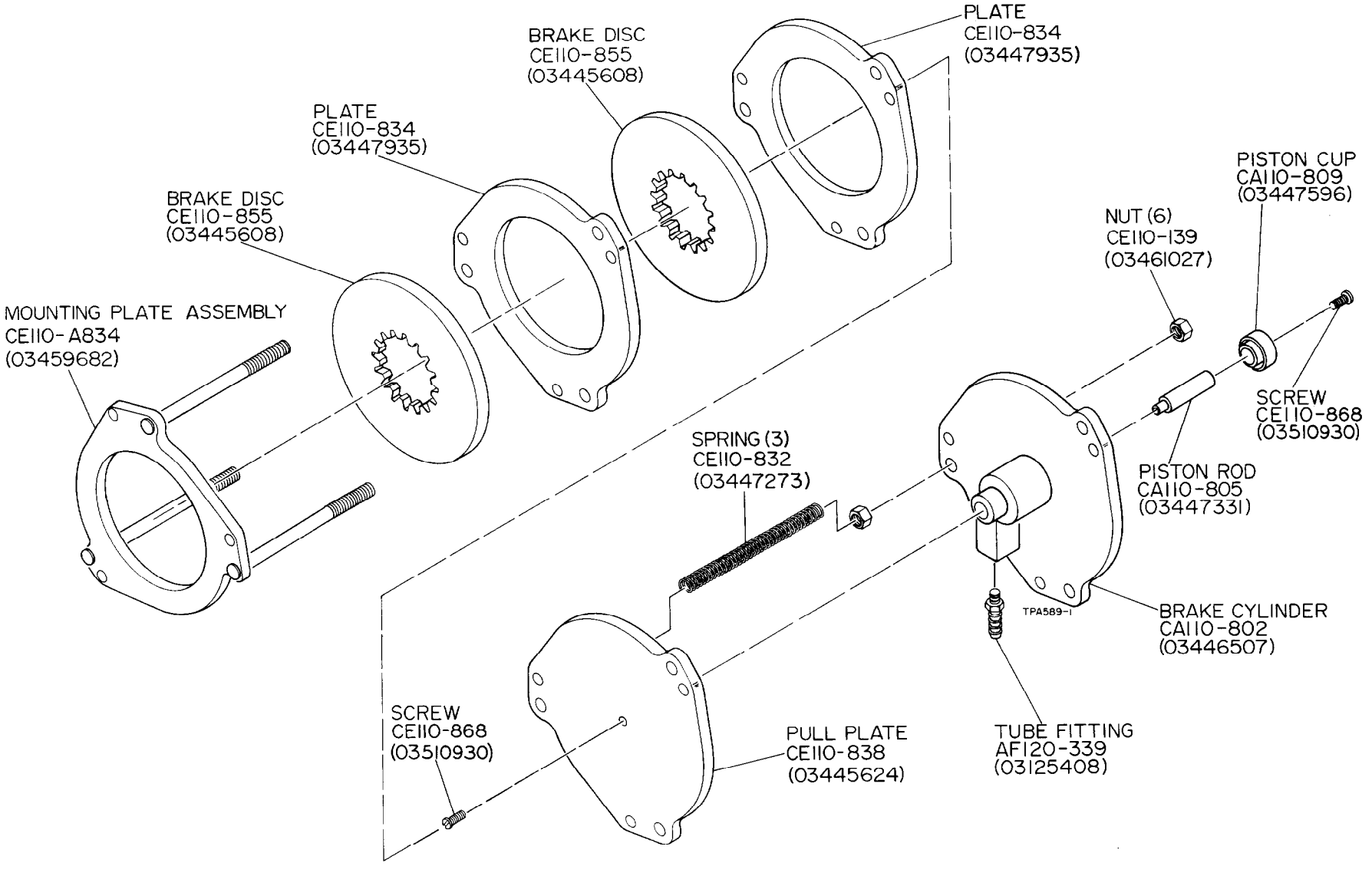


Brake Cover Parts

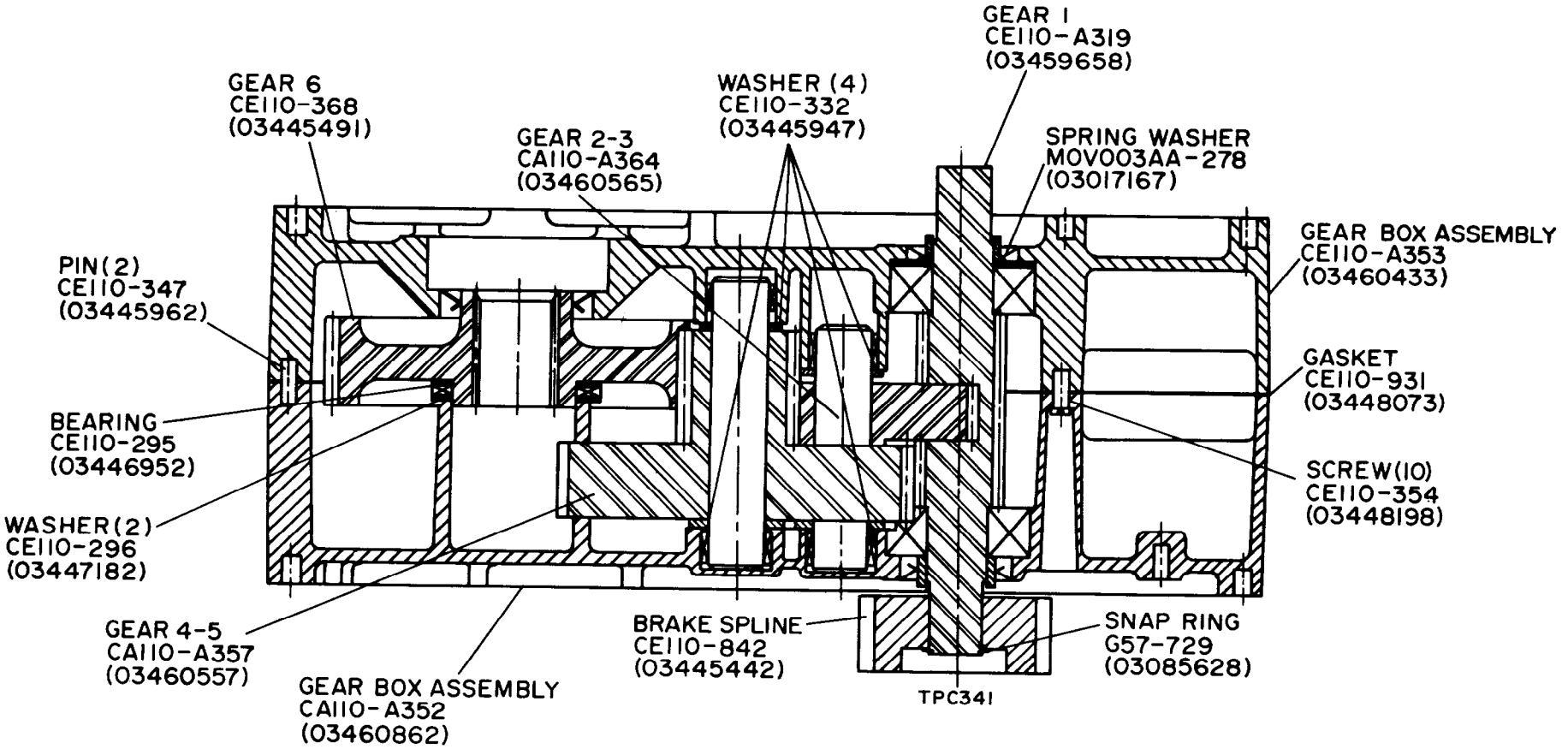


No. CA110-A830 (03459609) Air Brake Assembly

Always Use Genuine Ingersoll-Rand Replacement Parts.

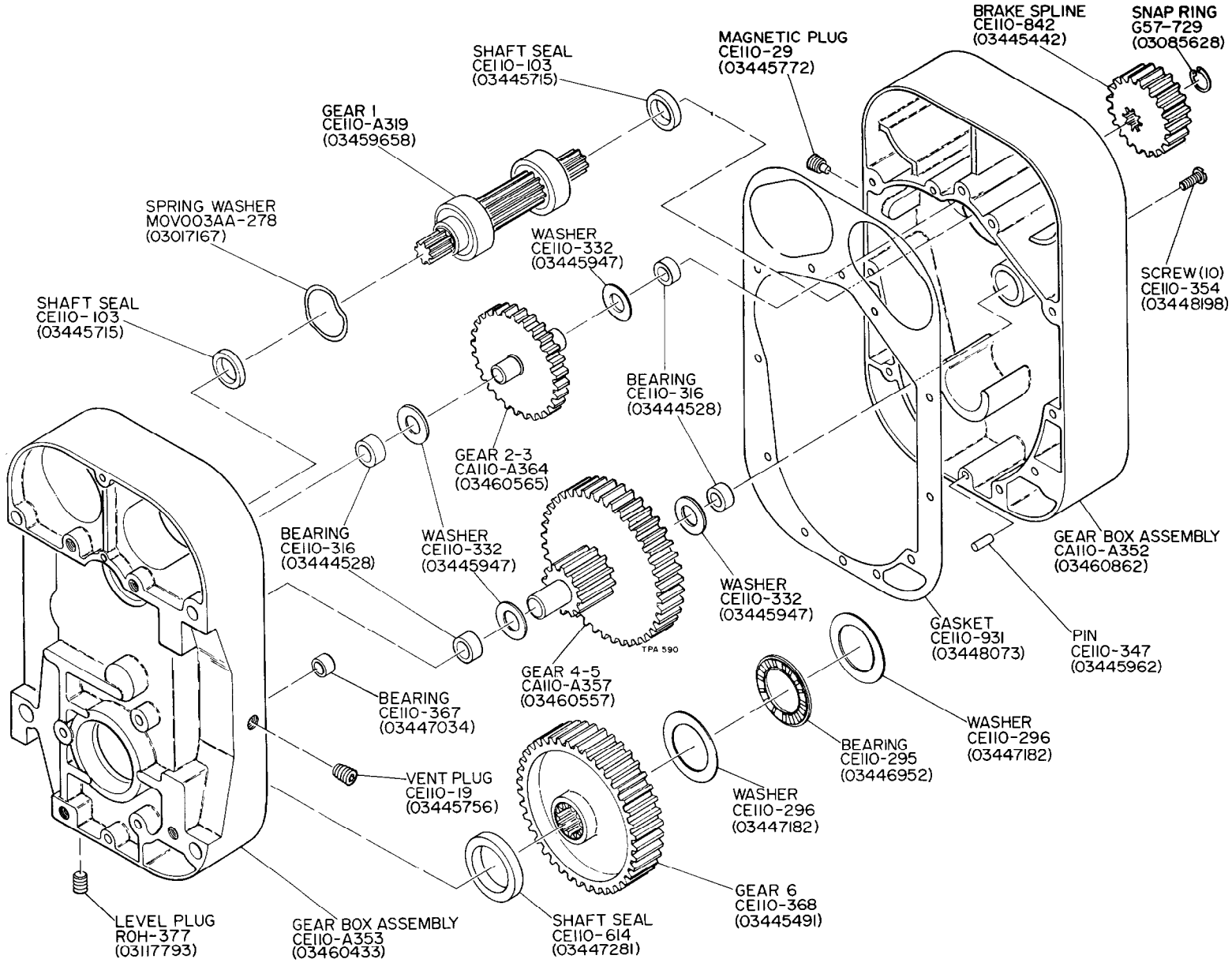


Exploded View of No. CA110-A830 (03459609) Air Brake Assembly

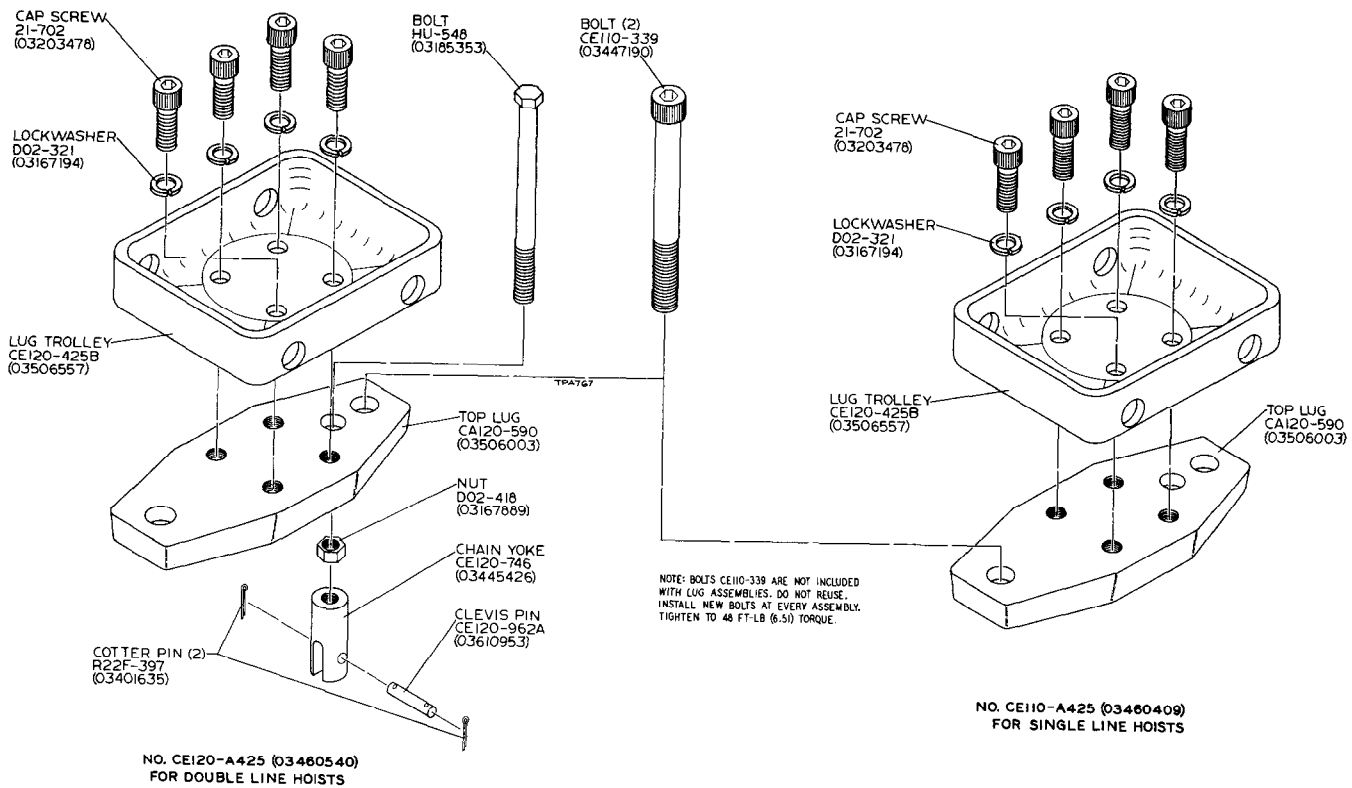


No. CA110-U352-50 (03461183) Gear Case Assembly
(Parts not numbered are included in either CA110-A352 or CE110-A353.
For part numbers of components, see exploded view on next page.)

Always Use Genuine Ingersoll-Rand Replacement Parts.

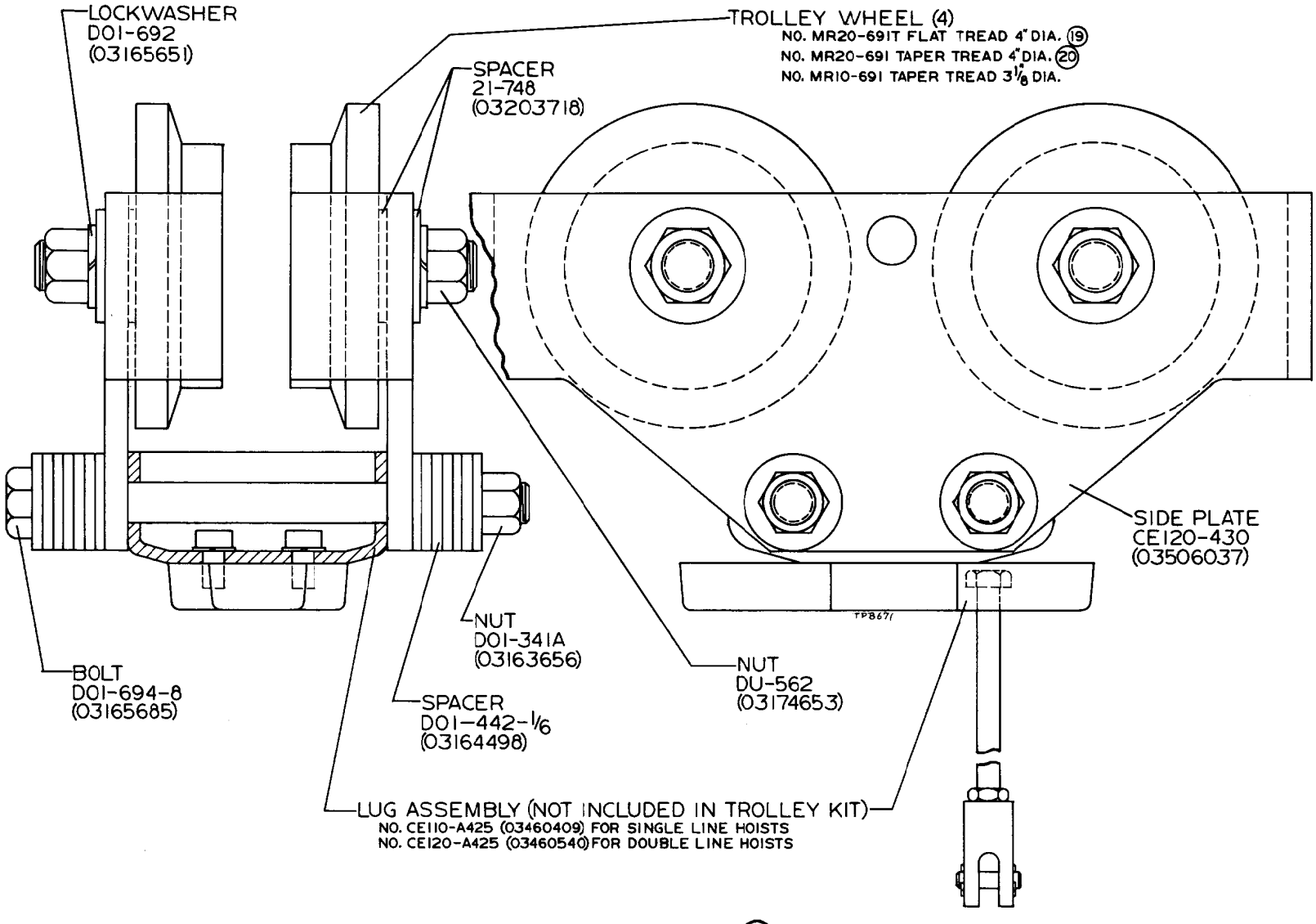


Exploded View of No. CA110-U352-50 (03461183) Gear Case Assembly



Lug Assemblies

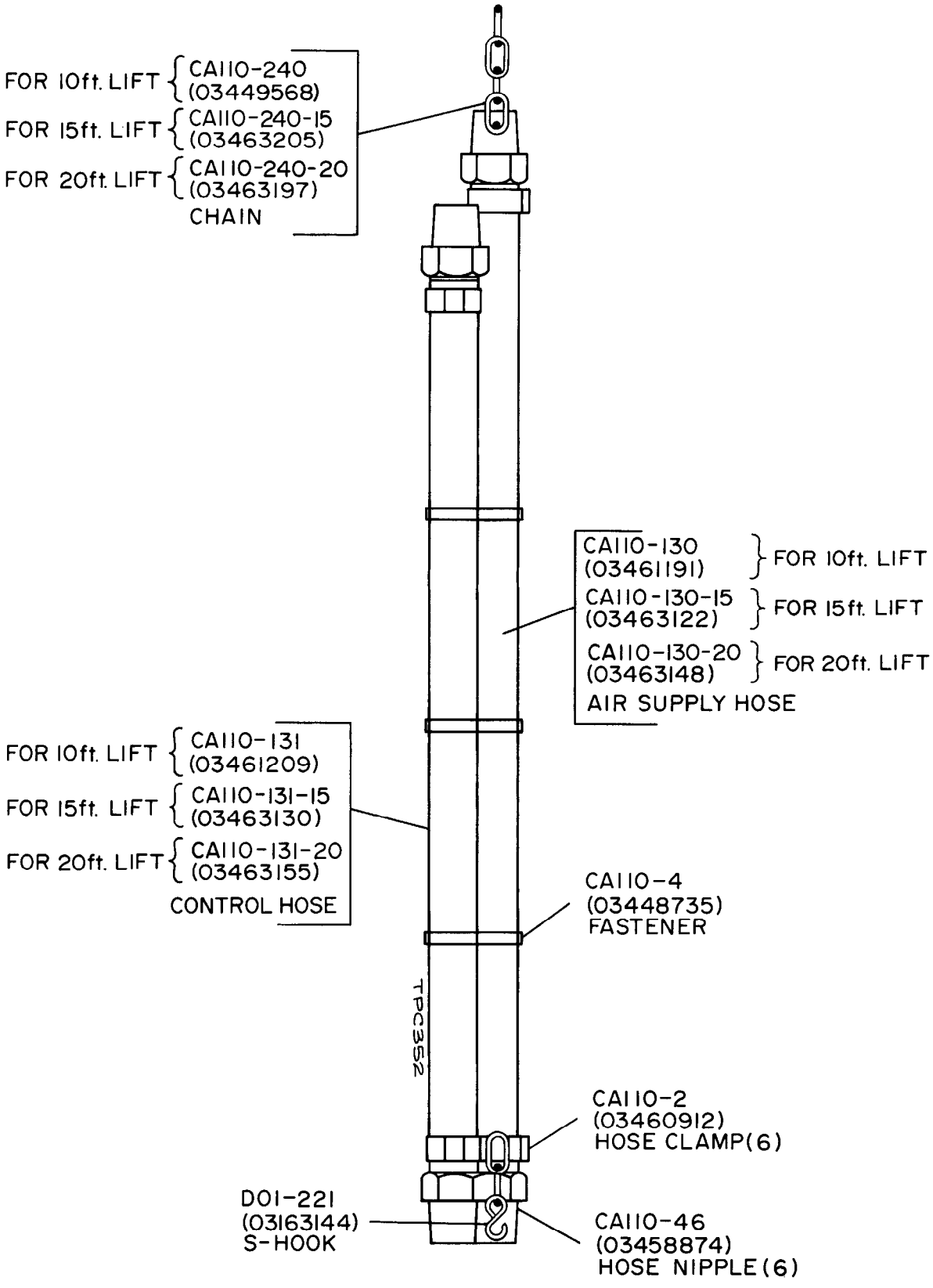
Always Use Genuine Ingersoll-Rand Replacement Parts.



Trolley Kits (18)

No. CE120-K430T (03510443) (4" dia. Flat Tread Wheels) (3.00" to 5.00" Flange Width)
No. CE120-K430 (03510435) (4" dia. Taper Tread Wheels) (3.00" to 5.00" Flange Width)
No. MLK-K430 (03611035) (3-1/8" dia. Taper Tread Wheels) (2.66" to 5.00" Flange Width)
For Spark Resistant parts (18), (19) and (20), refer to page 44.

Always Use Genuine Ingersoll-Rand Replacement Parts.



Pendent Control Hose

Always Use Genuine Ingersoll-Rand Replacement Parts.

ACCESSORIES

Chain Bucket Kit— Includes chain bucket, brackets, up stop and all hardware necessary for attachment to Hoist:

No. CE110-K749-20 (03461654) for use on Single Line Hoist with 10, 15 or 20 ft. lift, or for use on Double Line Hoist with 10 ft. lift.

No. CE120-K749-20 (03461662) for use on Double Line Hoist with 15 ft. or 20 ft. lift.

Fabric Chain Container Kit – Includes fabric chain container and all hardware necessary for attachment to Hoist:

No. CE120-K749-17 (03608197) for use on Single Line Hoist having up to 17 ft. lift, or Double Line Hoist having up to 9 ft. lift.

No. CE120-K749-45 (03608205) for use on Single Line Hoist having up to 45 ft. lift or Double Line Hoist having up to a 23 ft. lift.

Conversion Kit – Includes load plate, nameplate, bottom hook assembly and stop ring (when required). Chain and Hoist suspension members must be ordered separately.

No. CA110-K745 (03503638) for converting CA120 to CA110.

No. CA120-K745 (03503513) for converting CA110 to CA120.

★Lug Mount Assembly – Includes parts required to convert from Top Hook to Lug Mount. Also required for use with Trolley.

No. CE110-A425 (03460409) for Single Line Hoist.

No. CE120-A425 (03460540) for Double Line Hoist.

★Top Hook Assembly – Includes part required for converting from Lug Mount or Trolley to Top Hook.

No. CE110-A590 (03459716) for Single Line Standard Hoist.

No. CA105-AR590 (03611282) for Single Line Spark Resistant Hoist.

No. CE120-A590 (03459708) for Double Line Standard Hoist.

No. CA110-AR590 (03611290) for Double Line Spark Resistant Hoist.

Pendent Control Hose Assembly Package – Includes hoses, nipples, hose clamps, pendent chain, S-hook, warning tag and hose fasteners.

No. CA110-AP130-15 (03463056) for use on Hoists with 15 ft. lift.

No. CA110-AP130-20 (03463049) for use on Hoists with 20 ft. lift.

Multiple Motor Pendent Throttle Handles

No. MR-A122 (03266350) Two-Motor Pendent Throttle Handle for controlling the operation of the Hoist and one additional air motor (Trolley-Tractor, Crane Bridge, etc.) from a single console handle.

No. MR-A132 (03391489) Three-Motor Pendent Throttle Handle for controlling the operation of the Hoist and two additional air motors.

Drawbar Yoke Kit

No. CE120-K1 (03604915) – Includes all parts required for connecting Tractors to Centurion Hoist with Rigid Trolley.

Up Stop Kit

No. CE120-K557-10 (03503653) – Includes Up Stop and all necessary hardware for attachment to 10 ft. lift Centurion Hoists.

No. CE120-K557-20 (03461662) – Includes Up Stop and all necessary hardware for attachment to 15 ft. lift Centurion Hoists.

Bullard-Burnham Hook Kit

★ No. CE110-KBB377 (03504537) – Includes Bullard-Burnham Hook, Nut and Pin for use on CA110 Centurion Hoists.

★ No. CE120-KBB377 (03504545) – Includes Bullard-Burnham Hook, Nut and Pin for use on CA120 Centurion Hoists.

No. ML10-BB377 (03194024) – Includes Bottom Hook Block Assembly with Bullard-Burnham Hook for use on CA110 Centurion Hoists.

No. CE120-ABB378 (03503323) – Includes Sheave Block Assembly with Bullard-Burnham Hook for use on CA120 Centurion Hoists.

Always Use Genuine Ingersoll-Rand Replacement Parts.

★ No. CE110-ABB590 (03503331) – Includes Top Lug with Bullard-Burnham Hook for use on CA110 Centurion Hoists.

★ No. CE120-ABB590 (03503315) – Includes Top Lug with Bullard-Burnham Hook for use on CA120 Centurion Hoists.

★ When ordering any Lug Mount Assembly, Top Hook Assembly or a (★) designated Bullard-Burnham Hook Kit, also order two No. CE110-339 (03447190) Bolts because these Bolts must **not** be reused. New ones are required at every assembly. See page 21, 22 or 38 for torque required for proper tightness.

RIGID TROLLEY KIT

Includes two (2) side plates assembled with wheels along with required spacers, bolts and nuts for attaching it to hoist lug. Requires use of Lug Mount Assembly.

FLAT TREAD WHEELS FOR USE ON WIDE FLANGE OR MONORAIL:

No. CE120-K430T (03510443)	4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.
No. CE120-KR430T (03617495)	Spark Resistant. 4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.

TAPER TREAD WHEELS FOR USE ON I-BEAM:

No. CE120-K430 (03510435)	4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.
No. MLK-K430 (03611019)	3-1/8" dia. wheel, 2.66 - 5.00 flange width. Maximum capacity: half (1/2) ton.
No. MLK-KR430 (03611035)	Spark Resistant. 3-1/8" dia. wheel, 2.66 - 5.00 flange width. Maximum capacity: half (1/2) ton.

HOOK-ON TROLLEY KIT

Includes all trolley parts included with rigid trolley kit plus parts needed to suspend a hoist equipped with top hook from a beam.

FLAT TREAD WHEELS FOR USE ON WIDE FLANGE OR MONORAIL:

No. CE120-K426T (03511037)	4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.
No. CE120-KR426T (03617487)	Spark Resistant. 4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.

TAPER TREAD WHEELS FOR USE ON I-BEAM:

No. CE120-K426 (03511029)	4" diameter wheel, 3.00 - 5.00 flange width. Maximum capacity: one (1) ton.
No. CE110-K426 (03617511)	3-1/8" dia. wheel, 2.66 - 5.00 flange width. Maximum capacity: half (1/2) ton.
No. CE110-KR426 (03617479)	Spark Resistant. 3-1/8" dia. wheel, 2.66 - 5.00 flange width. Maximum capacity: half (1/2) ton.

RECOMMENDED SPARE PARTS TO SERVICE HOIST

To keep costly downtime to a minimum, it is desirable to have on hand certain repair parts. To guide you in the stocking of repair parts, we have listed below the parts and quantities we recommend you stock. This listing is based on medium duty service. If the Hoist is being used in remote geographical areas, or is subject to unusually severe service, the items and quantities should be increased. Contact your distributor or the nearest Ingersoll-Rand Office for recommendations.

★ One repair part (or set) for each Hoist in service.

● One repair part (or set) for every four Hoists in service.

Stock Code	Part Number	Description	Quantity per Hoist
★	CE110-339	Bolt	2
★	CA110-42-7	Vane Packet (set of 7 Vanes)	1
●	CA110-239	Shuttle Cap O-ring	2
●	CA110-250	Shuttle Spring	2
●	402-61	Strainer Screen	1
★	CA110-283	Housing Gasket	1
★	CA110-739	Housing Gasket	1
●	CE110-614	Housing Seal	1
●	CA110-83	Valve Housing Seal	1
●	CE110-103	Shaft Seal	2
★	CE110-931	Gear Case Gasket	1
★	CA110-755	Brake Cover Gasket	1
★	CA110-592	Motor Cover Gasket	1
●	CA110-809	Piston Cup	1
●	MR-942A	Throttle Valve Spring	2
★	R2F-167	Valve Stem Seal	2
★	R00BR-210	Valve Seal	2
★	C321-606	Valve Cap Seal	2
★	CE110-21	Pocket Wheel Seal	1

Always Use Genuine Ingersoll-Rand Replacement Parts.

SPARK RESISTANT PARTS
For
Models CAR105 (1/4 Ton) and CAR110 (1/2 Ton) Hoists

REF. NO.	PART NAME	PART NUMBER FOR ORDERING		COMM. NO.
		Model CAR105	Model CAR110	
①	Top Hook Assembly	– – –	CA110-AR590	03611290
②	Double Line Hook Block Assembly	– – –	CA110-AR378	03611241
③	Top Hook Assembly	CA105-AR590	– – –	03611282
④	Hook Kit (includes Nut, Pin and Latch Kit)	CA105-KSR304	– – –	03617453
④	Hook Kit (includes Nut, Pin and Latch Kit)	– – –	CA110-KSR304	03617461
⑤	Latch Kit	D02-S4055	D02-S4055	03170933
⑥	Chain (for 10 ft. lift)	CA105-R745-10	– – –	03611100
⑥	Chain (for 10 ft. lift)	– – –	CA110-R745-10	03611274
⑦	Stop Ring	MR-R259	– – –	03370434
⑧	Stop Ring Assembly	MR-AR259	– – –	03512506
⑨	Link Chain Connector	CA105-R461	– – –	03611167
⑩	Link Chain Pin	CA105-R603	– – –	03611142
⑪	Block Swivel Pin	CA105-R462	– – –	03611159
⑫	Hook Block	MR10-R463A	– – –	03370475
⑬	Bottom Hook Assembly	CA105-AR463	– – –	03611266
⑭	Sheave Block Assembly (includes Bearing) (2)	– – –	CA110-BR378	03611258
⑮	Pendent Throttle Lever	MLK-R273	MLK-R273	03611340
⑯	Pendent Throttle Valve Cap	D02-1180	D02-1180	03170487
⑰	Pendent Throttle Handle	MR-AR269	MR-AR269	03448289
⑱	Trolley Kit (Rigid Mount)			
	with Flat Tread Wheels	MR-KR430T	MR-KR430T	03508629
	with Taper Tread Wheels	MLK-KR430	MLK-KR430	03611035
⑲	Flat Tread Trolley Wheel	HRA20A-R691T	HRA20A-R691T	03370566
⑳	Taper Tread Trolley Wheel	MR20-1691	MR20-1691	03195971

Always Use Genuine Ingersoll-Rand Replacement Parts.

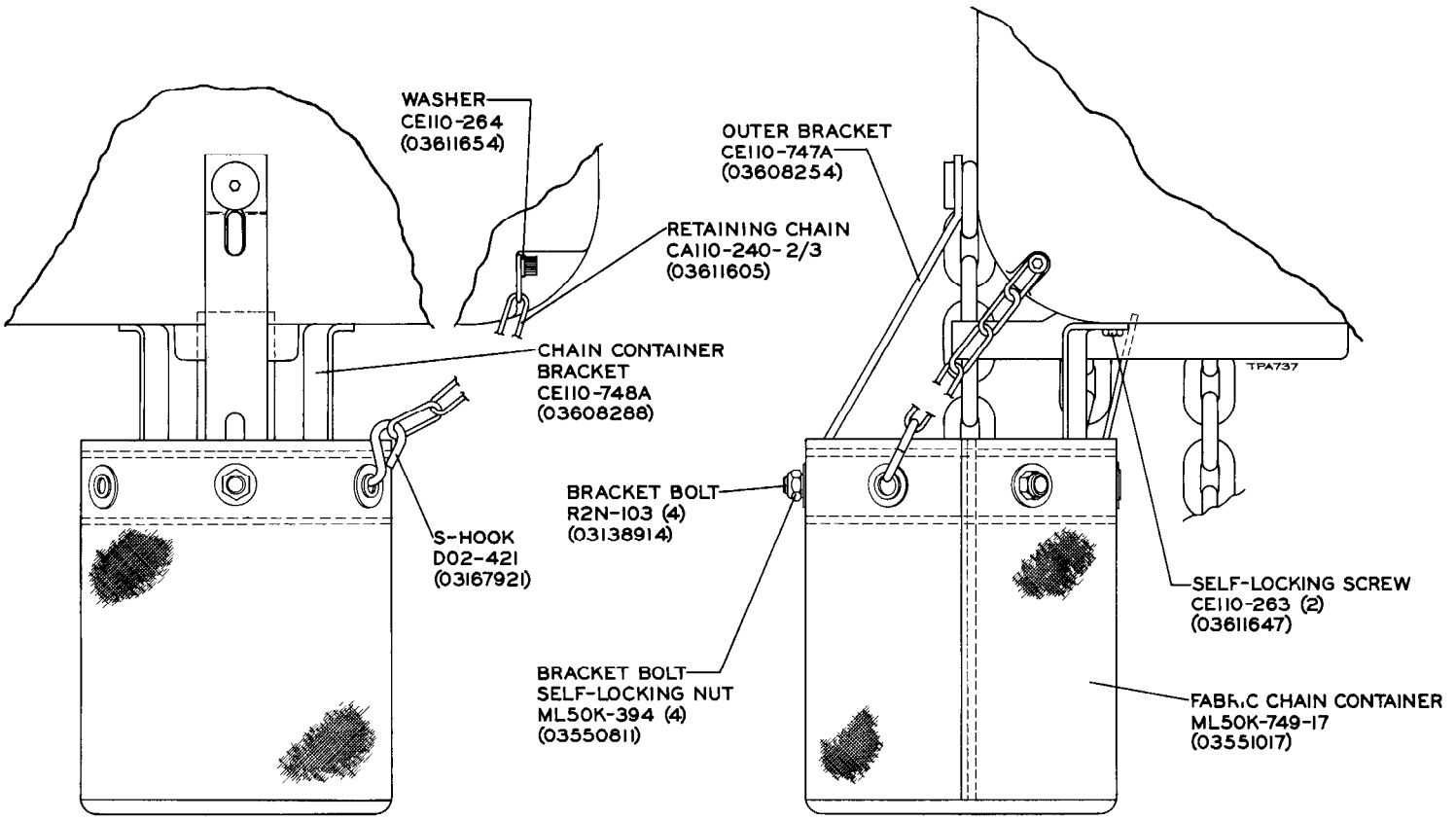
INSTALLATION INSTRUCTIONS FOR FABRIC CHAIN CONTAINER KITS

WARNING

DISCONNECT THE AIR SUPPLY LINE FROM THE HOIST BEFORE INSTALLING A CHAIN CONTAINER KIT.

NEVER USE A CHAIN CONTAINER WITHOUT THE RETAINING CHAIN.

ALWAYS USE SELF-LOCKING STOP NUTS TO SECURE THE BOLTS REQUIRED.



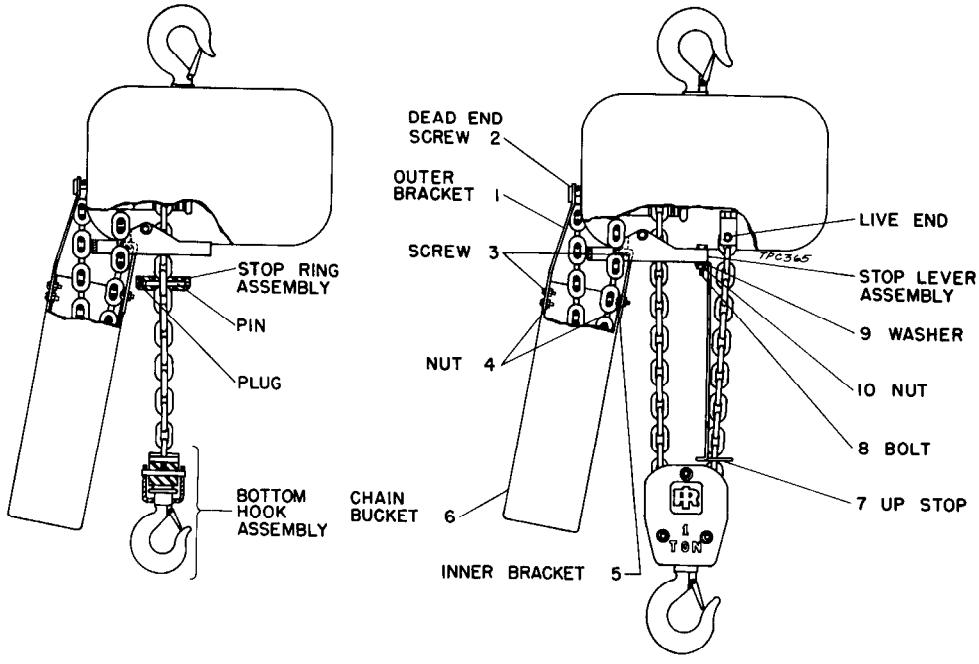
Attach the CE110-747A Outer Bracket under the Dead End Screw and the CE110-748A Chain Container Bracket to the bottom of the Hoist with the two CE110-263 Self-locking Screws. Attach the Chain Container with the four R2N-103 Bracket Bolts and ML50K-394 Self-locking Nuts.

Secure one end of the Retaining Chain under the lower Brake Cover Screw and attach the other end to the Container with the D02-421 S-Hook. Crimp the S-Hook into the grommet on the Chain Container as shown.

CHAIN BUCKET INSTALLATION

WARNING

DISCONNECT THE AIR SUPPLY LINE FROM THE HOIST BEFORE INSTALLING A CHAIN BUCKET.



For Double Line Hoists

1. Attach the Outer Bracket (1) to the side of the Motor Housing with the 1/4"-20 x 23/32" long Dead End Screw (2). Attach one prong of the Inner Bracket (5) to the Gear Box and the other prong to the Motor Housing on each side of the Stop Lever with No. 10-32 x 1/2" long Screws (3).
2. Install the Chain Bucket (6) to these two brackets with four No. 10-32 Screws (3) and Nuts (4).
3. Fasten the Up Stop (7) to the Stop Lever with the Bolt (8), Washer (9) and Nut (10). **Do not tighten the Nut.** Spread the loop on the Up Stop enough to pass the live end of the Chain through, and attach the Chain to the Chain Anchor, making certain the Chain is not twisted between the Sheave Block and the Chain Anchor. Tighten the up stop bolt so that the Chain passes through the Up Stop with no interference.

For Single Line Hoists

1. Follow 1 and 2 above.
2. Remove the plug and pin from the Stop Ring Assembly and lower the Chain until the saddle of the Bottom Hook is below the bottom of the Chain Bucket. Move the Stop Ring up until it contacts the Stop Lever. Replace the plug and pin.

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