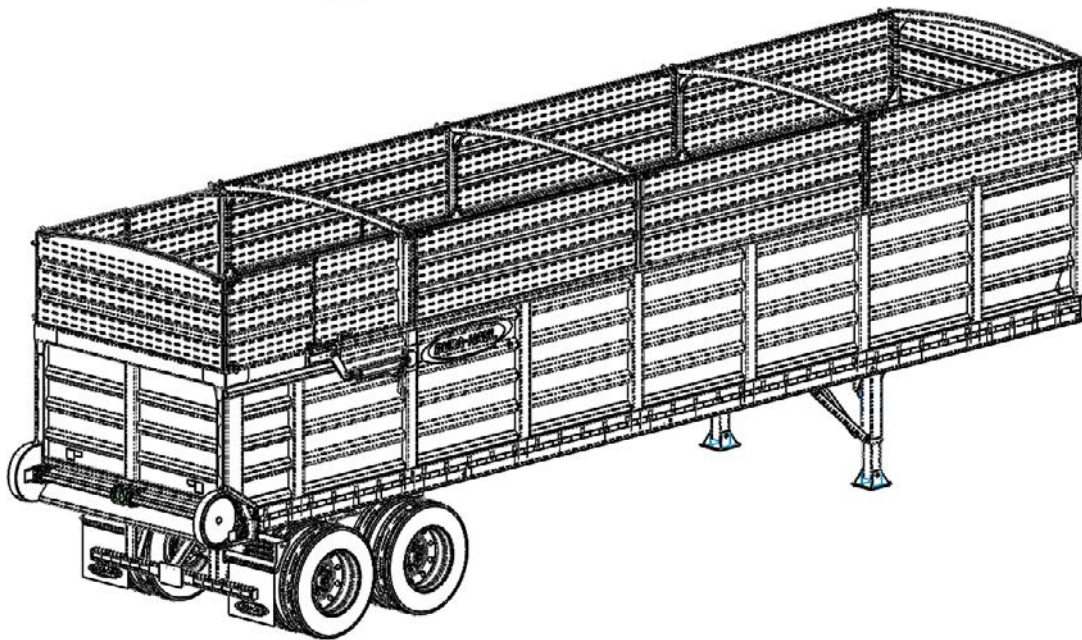




2019 CHAIN TRAILER

Owner's Manual



ALWAYS MOVING FORWARD

movingforward@durahaul.com
US toll free 877-523-5355

WWW.DURHAUL.COM



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Important Safety Information

Before attempting to operate, load, unload, or do anything with or to the trailer, YOU MUST READ THIS MANUAL and become completely familiar with all of its operation instructions and safety precautions. To avoid serious injury or death, ALWAYS FOLLOW THESE PRECAUTIONS:

1. Do not allow unqualified, untrained, or careless personnel to operate the trailer. Do not use the trailer for a purpose for which it was not intended.
2. Each person at the user's facility who may be involved with installing, operating, servicing, inspecting, maintaining, or repairing the trailer must read the complete operating instructions and carefully study and understand the safety instructions. All actual and potential operators should confirm their having done so in writing.
3. The trailer must be serviced and maintained only by authorized and properly trained personnel. Such personnel must have undergone training by a factory-trained representative concerning the proper and safe operation of the trailer. Only the manufacturer or factory-trained technicians should carry out more than minor repairs.
4. Do not allow anyone who is not physically fit or mentally alert near the trailer or its operating area. Be constantly alert to possible hazards on or around the trailer.
5. Keep a safe distance at all times from any moving parts, including the conveyor.
6. When unloading the trailer:
 - a. Long hair must be protected by headgear.
 - b. Do not wear loose apparel such as ties, scarves, etc.
 - c. Remove all wristwatches and jewelry.
 - d. Wear only approved industrial grade eye protection or a face guard to protect against flying debris.
7. Do not allow tools or other loose objects to be placed on top of or around the trailer.
8. At the very first sign of any problem and before attempting any troubleshooting or maintenance, the conveyor must be stopped.
9. Safety features must not be removed, dismantled, altered, put out of operation or relocated. All guards and safety devices are to be re-fitted and in place after changeovers, servicing, or making repairs and before the trailer is used. All safety devices must be checked at regular intervals for correct operation.
10. Do not remove safety signs or warning decals from the trailer. Product safety signs should be periodically inspected and cleaned as necessary. Product safety signs should be replaced when they are no longer legible at a normal viewing distance. Replacements are available from Dura-Haul, LLC.
11. Follow all workplace safety and accident prevention regulations applicable to the operation of the trailer. Comply with local, state, and/or federal environment regulations, including those governing airborne dust particles.
12. Designate a person to be responsible at any given time for installation, commissioning, operating and repair of the trailer so the responsibility for safety will not be lost.
13. The trailer has been designed and built with original Dura-Haul parts only. Only original Dura-Haul parts must be used for maintenance or repair. Use of other parts will void your warranty.
14. Do not perform modifications to or reconstruction of the trailer without first getting written approval from Dura-Haul.
15. The cleanliness and tidiness of the trailer and its surrounding area must be ensured through appropriate instructions, routine inspections, and cleaning.



Inspection, Service, and Maintenance

It is important that your Chain Trailer be inspected and serviced on a regular basis to keep it in safe and functional condition. Regular maintenance will also save you money in costly repairs over time.

Daily Inspection

A daily inspection of the following items should be performed before using the trailer:

Trailer:

- Hopper
- Kingpin area
- Fifth wheel plate
- Framework
- Bolts and fasteners
- Ladder
- Mud flaps

Suspension & Axles:

- Axle alignment
- Hub oil level
- Brake adjustments
- Brake pad thickness
- Wheels
- Tires

Conveyor System:

- Hydraulic hoses
- Hydraulic motor
- Chain sprockets
- Chain tension

Floor:

- Steel floor
- Plastic liner

Tarps

- Tarp hardware
- Tarps



Preventative Maintenance Schedule

We recommend that you follow the general preventative maintenance schedule below. The intervals given are for nominal operating conditions; service more frequently if the trailer is used in an overly humid or dusty condition.

After the first 50 to 100 miles

- Check torque of cap nuts or flange nuts on each wheel

After the first 1,000 miles

- Check torque of suspension hardware
- Check alignment of suspension

Every 5,000 miles or once a month (whichever comes first)

- Wash trailer thoroughly with a mild detergent and water
- Check general structural condition for corrosion or cracks
- Inspect kingpin area
- Check clearances and torque of air-ride suspension system
- Visually check alignment of suspension
- Check condition of lights
- Check wiring harness for cracking or chafing
- Check hydraulic and pneumatic lines for signs of leakage or wear
- Check hinges on rear door(s) for signs of damage
- Lubricate hinges, latches, and bearings (if applicable) on rear door(s)
- Inspect brake components for proper adjustment and for any sign of damage
- Check tires for excessive wear and proper inflation
- Check wheel nuts for proper torque
- Check wheel seals for leaks
- Check level of oil in axles
- Check conveyor system for excessive wear or damage
- Check condition of tarp system, if installed
- Check condition and security of mud flaps

Fifth Wheel Area Inspection

The fifth wheel area must be kept clean and free of dirt and foreign materials. This includes the area between the kingpin plate and the body of the trailer where the conveyor chains travel. Buildup materials can cause binding or other serious damage if allowed to remain in this area. Any binding can place excess stress on the front shaft, which can result in any of the following:

- The shaft to bend or break
- The bearings or adjustment mechanisms to be damaged
- The chain to stretch excessively, resulting in premature failure

Daily inspect the kingpin and kingpin plate for the following:

- Wear, cracks, or other damage
- Damaged or missing parts



Adjusting and Lubricating the Conveyor System

Conveyor Chain

The conveyor chain must be inspected regularly and lubricated. Check chain tension to make sure its not to loose. Adjust conveyor chain by tightening the bolts located at the front of the trailer shown in the picture below.

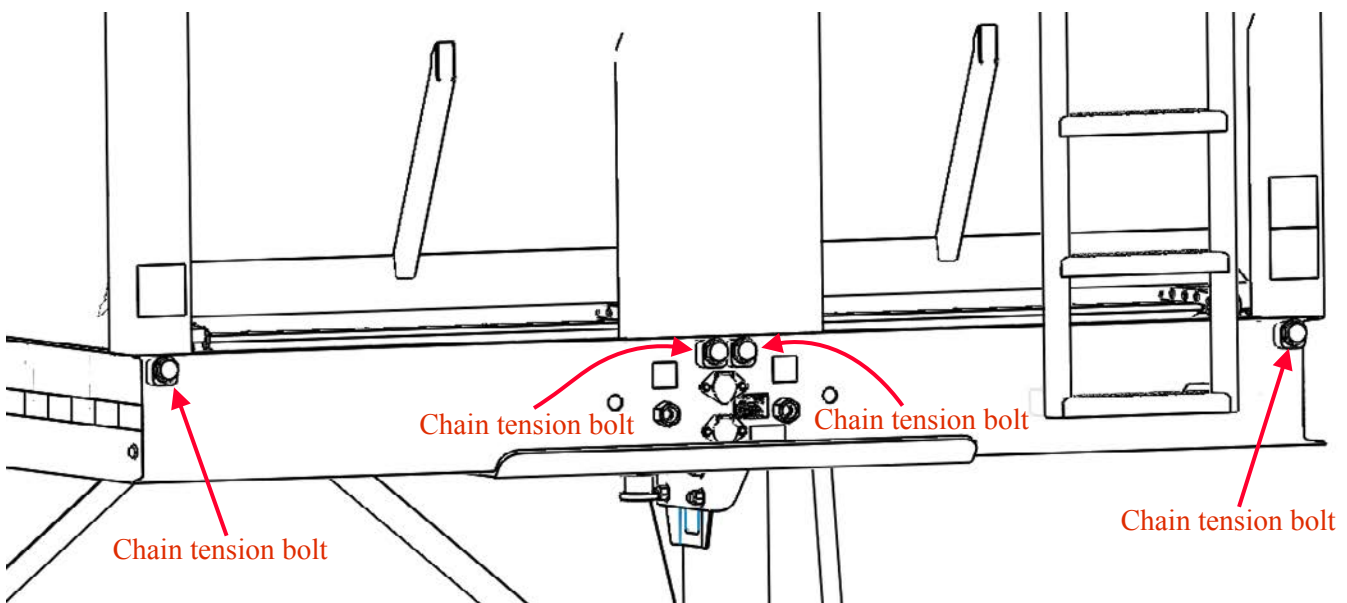
WARNING Attempting to lubricate the chains while they are in motion can result in serious bodily injury or death. Stay clear of the chains while they are in motion. Position the chains and completely disable the hydraulic system before doing any maintenance.

Bushings and Sprockets

The bearings on the front and rear conveyor shafts must be inspected and lubricated at regular intervals using an NLGI Grade 2 general-purpose grease. As with chain lubrication, the amount of lubrication is dependent upon the amount of use.

- Under daily use, daily inspection is required. Lubricate as needed.
- Under all other uses, weekly inspection should be sufficient. Lubricate as needed.
- Inspect sprockets for excessive wear or damage.

WARNING Attempting to lubricate the bearings while the shaft is rotating can result in serious bodily injury or death. Stay clear of the bearings while they are rotating. Completely disable the hydraulic system before doing any maintenance on the bearings.





Gear Box

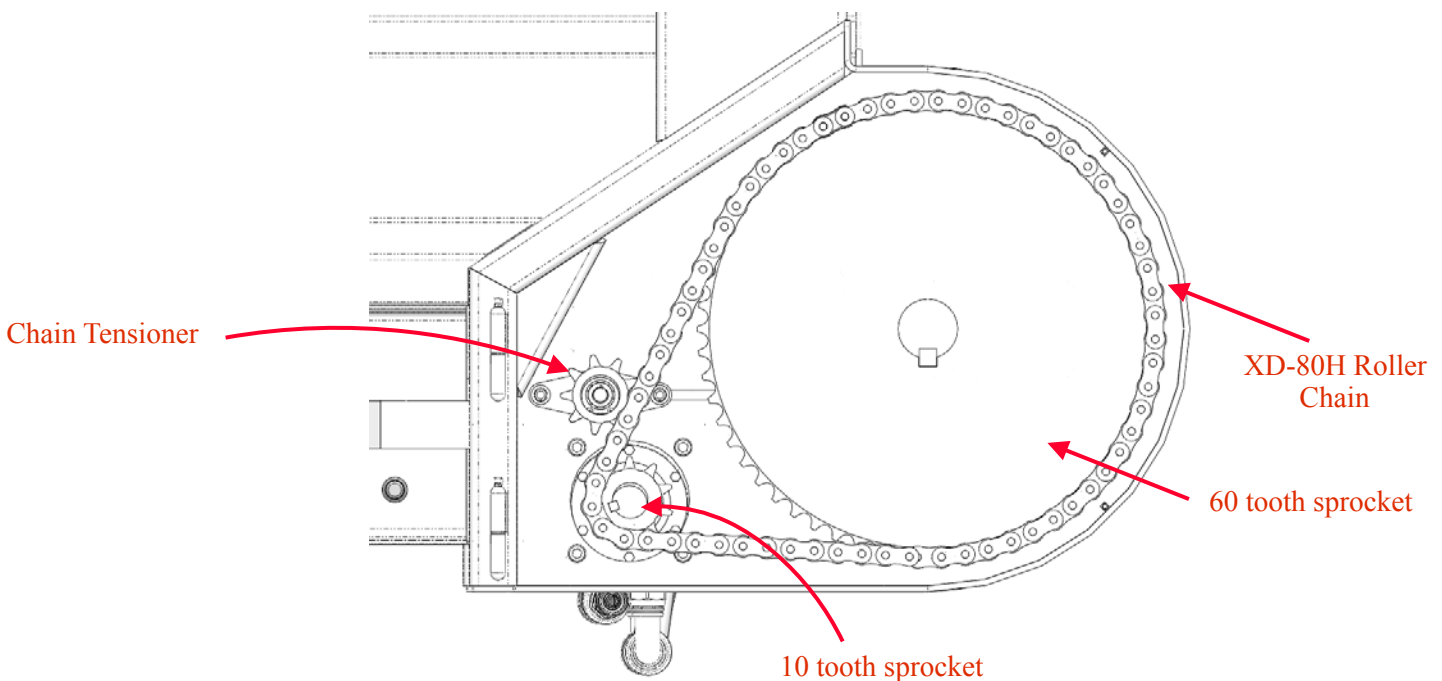
Gear box

Trailer comes with a 60 tooth sprocket on the rear chain shaft and a 10 tooth sprocket on the drive shaft. 6 to 1 ratio. Prior to changing out any components in the gear box contact the manufacturer.

Tension adjustment

If necessary tighten the roller chain by loosen the bolts on the tensioner and readjust the chain tension as necessary. After tensioning the roller chain tighten the bolts to 55 ft lbs.

WARNING Do not open the gear box while they are in motion it can result in serious bodily injury or death. Stay clear of the sprockets while they are in motion. Completely disable the hydraulic system before doing any maintenance.





Conveyor Chain

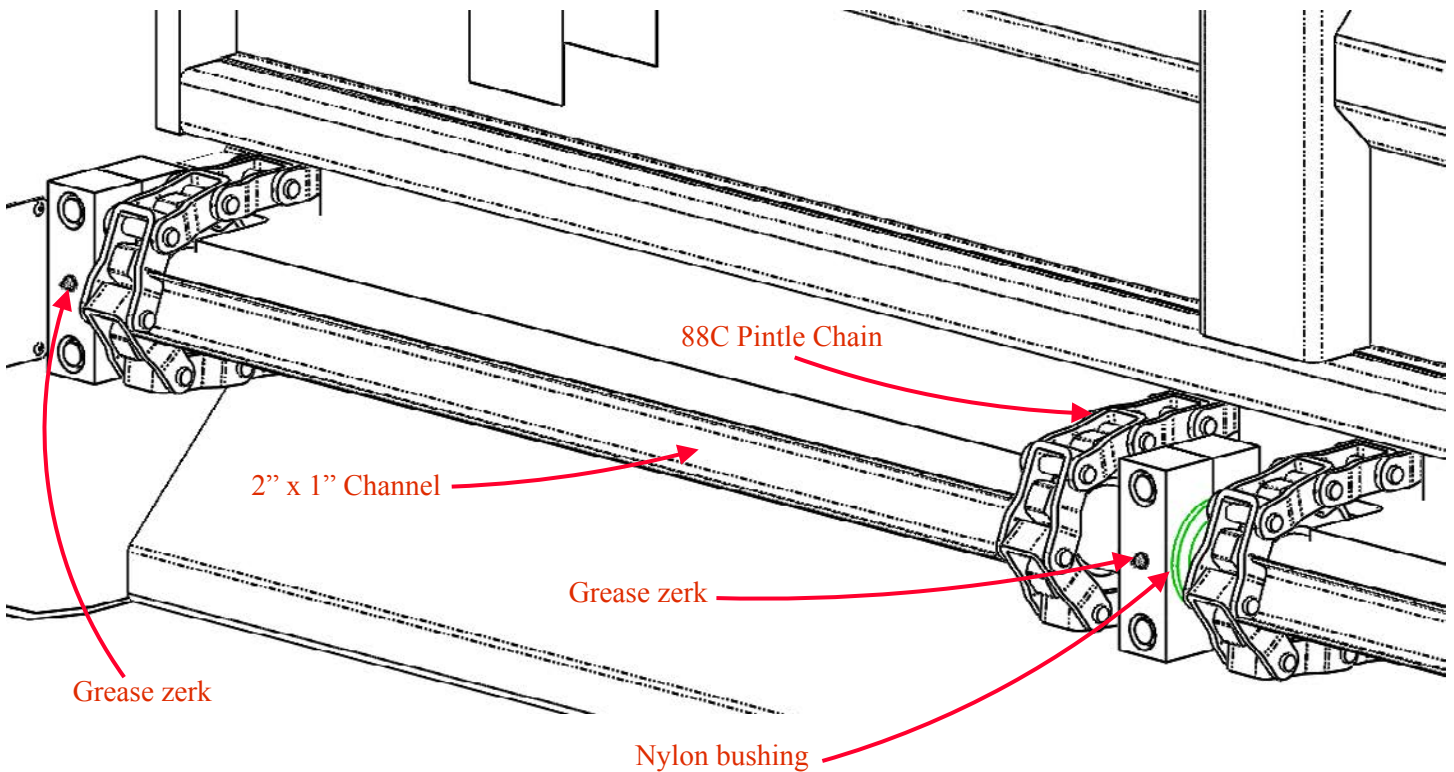
Chains

Your trailer comes with a 88C pintle chain for the chain system. 2" x 1" 3/16" C Channel for the cross members of each chain assembly.

Bushings

Check nylon bushing regularly. If any wear is visible replace them with new bushings.

WARNING Do not operate if one of the channels is bent or damaged in any way. Doing so may cause serious damage to the trailer and/or hydraulic components.





Rear Lift Gate

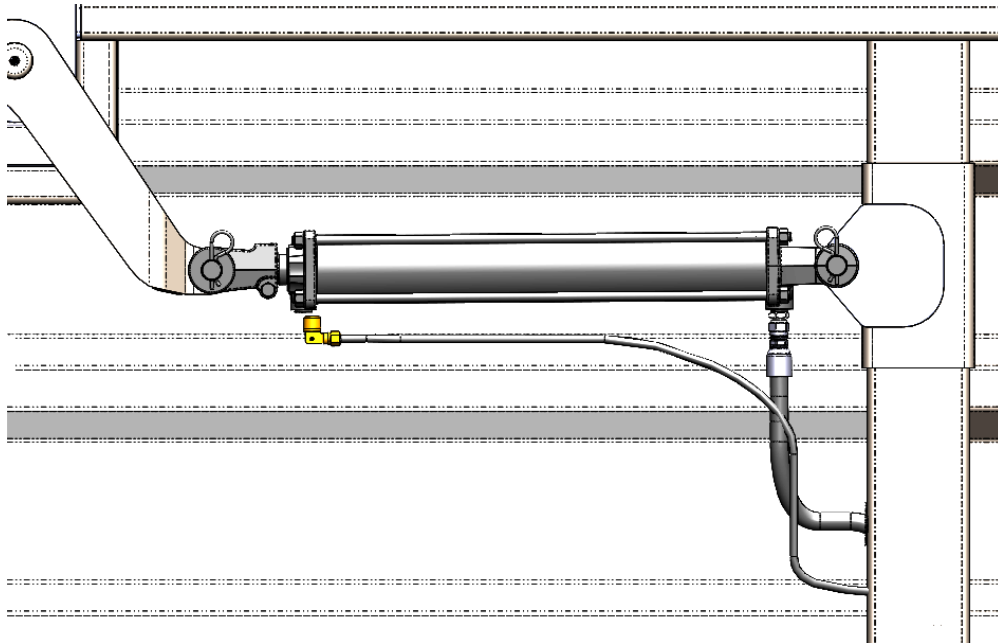
Lubrication of the Door(s)

Door hinges and bearings must be lubricated regularly, especially if the trailer has been operating or stored for an extended period of time in a humid or wet environment. Corrosion can lead to the failure of door hinges if they are not maintained properly. As a general rule with the rear doors, as with the entire trailer, “if it moves, lubricate it.” Use a NLGI Grade 2 general purpose grease on all shafts and grease zerks.

Rear Gate Cylinders

Rear lift gate cylinders

Your trailer comes with two hydraulic/Pneumatic cylinders. One installed on each side. The hydraulics lines are connected to the same hydraulic lines as the motors, therefore, when engaging the hydraulic system your rear gate will lift automatically. Once PTO is disengaged the door will slowly start closing. The return line is connected directly to the air reservoir. This will prevent the gate from rattling or opening when driving on rough terrain.

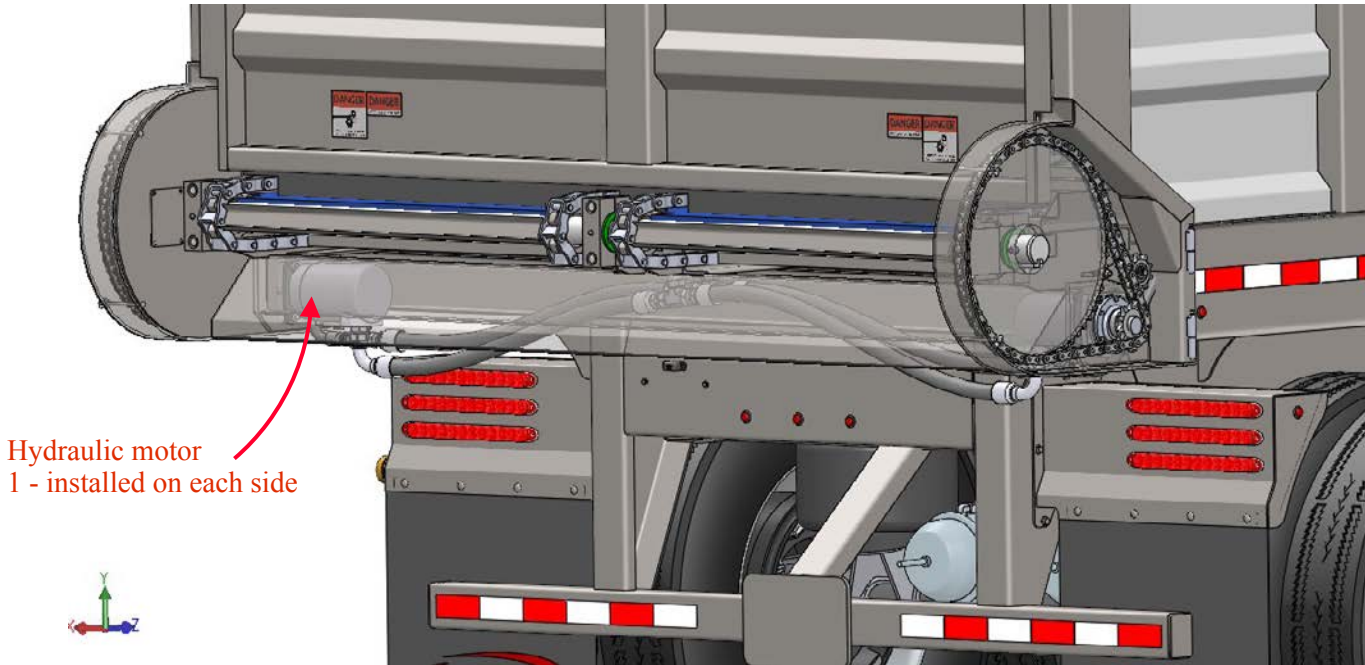




Hydraulic System

Hydraulic motors

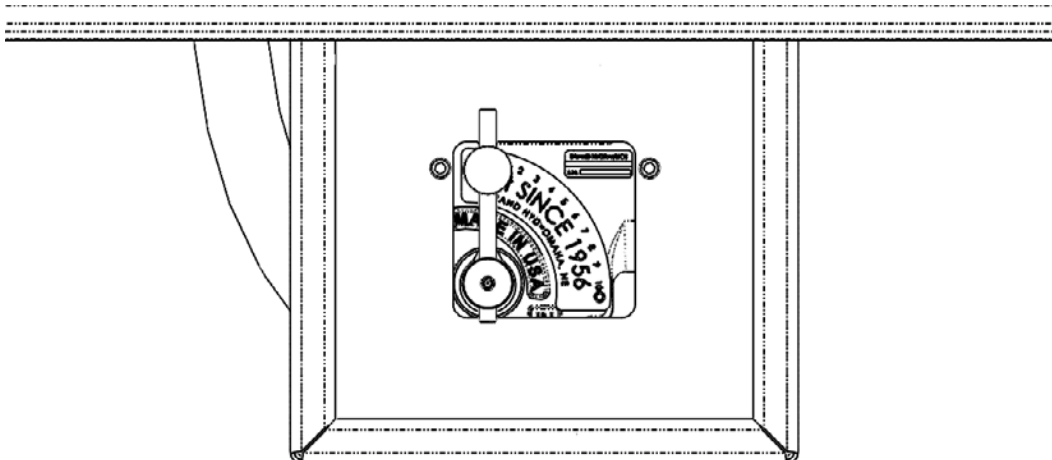
Your trailer comes with 2 - hydraulic driven motors installed at the rear of the trailer. See motor locations in picture below.



Conveyor Speed Control

Flow control Valve

There is a flow control valve located on the roadside of the trailer just in front of the axles. This allows you to control the speed of the chain at all times. By having the handle at its vertical position the chain will come to a total stop.

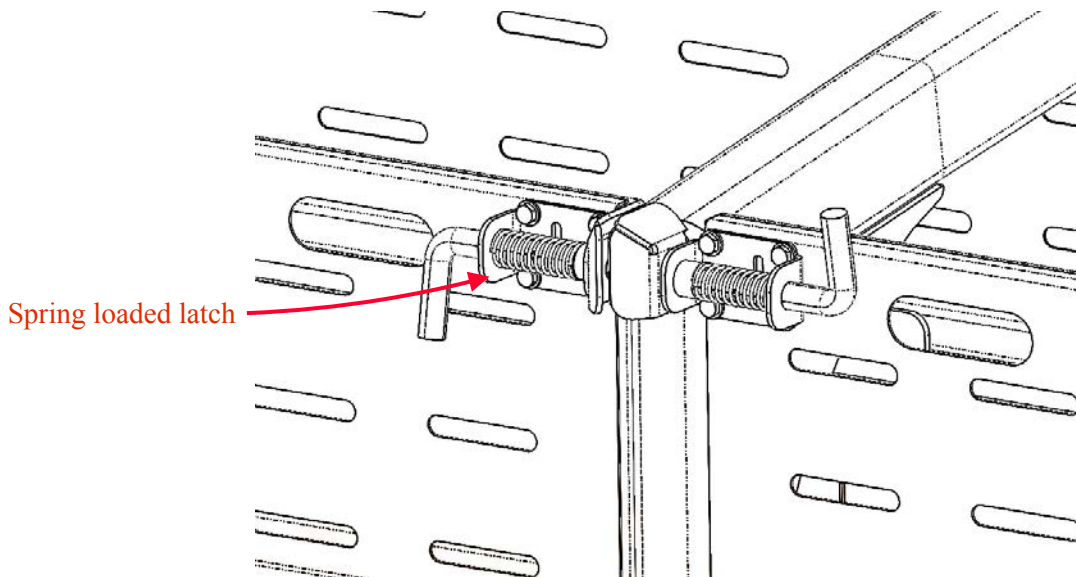




Removable Extensions

Remove extensions

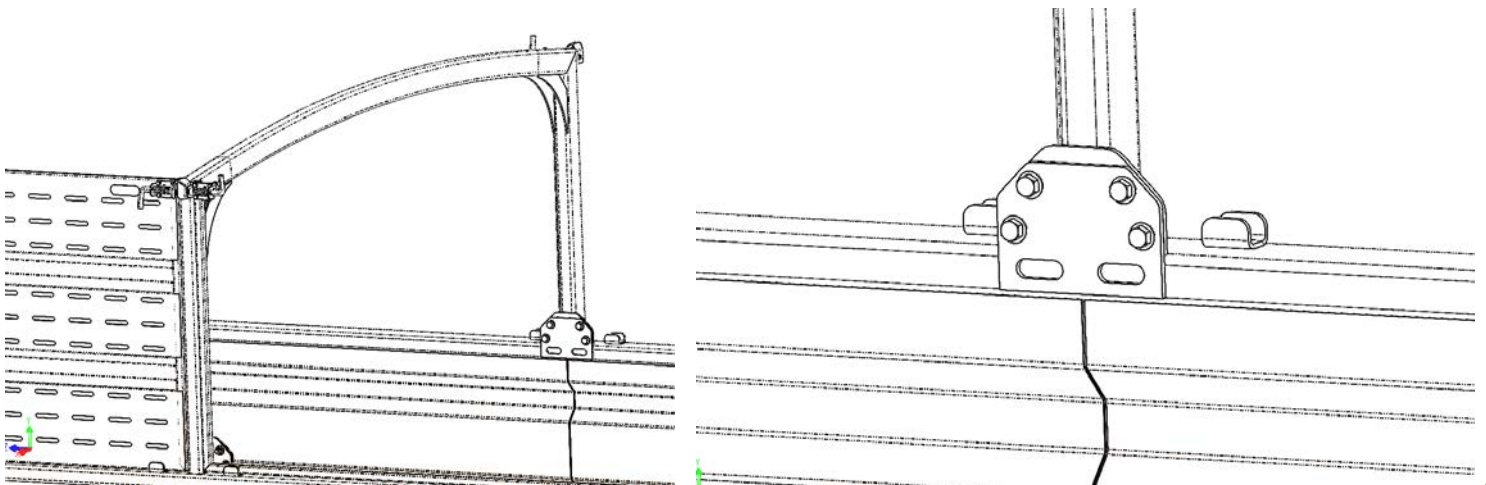
As shown in the picture below your trailer comes with removable extensions. To remove the extensions simply pull on the spring loaded latches and lock them to their open position. This will allow you to freely remove the extensions one by one.



Removable Bows

Remove bows

As shown in the picture below you can also completely remove all bows. To take off the bows simply remove the 4 bolts on each side. You can now freely remove the bow.





Hydraulic System Requirements

Tractor Hydraulic System Requirements

Gear pump requirements (volume) 25-50 GPM (gallons per minute)

Reservoir capacity: Minimum 10-25 gallons

Hyd. pressure requirements/bypass settings: 2700/3400 PSI

Tractor hydraulic oil must be maintained at all times. Neglect of the trailer oil will result in premature hydraulic component failure

Care of the Steel or Plastic Floor

Steel Floor

The steel floor under the chain must be inspected for damage and wear. Replace the the floor if it is worn through at any spot. If any foreign material should become lodged between the steel and the body of the trailer, remove it by blowing or vacuuming it out.

High Molecular Weight (HWM) and Ultra-High Molecular Weight (UHMW) Liner

The plastic liner under the chain must be inspected for damage and wear. Replace the liner if it is worn through at any spot. If any foreign material should become lodged between the liner and the body of the trailer, remove it by blowing or vacuuming it out.

Paint Care and Corrosion Prevention

Paint Care

Your Dura-Haul Chain trailer is coated with a 5 step powder coating Process. This paint is built to give a longer lasting corrosion resistance and higher quality finish.

The best way to preserve the finish on your trailer and help prevent corrosion is to wash it regularly, especially after it has been used around road salt or other ice, road oil or tar, or any other potentially corrosive material. Hauling corrosive products such as salts and fertilizers will void the paint warranty.

Small nicks or chips in the paint can occur with normal use. Any chips or scratches in the finish should be repaired with matching touch-up paint. This is especially important for carbon steel trailers; as even small areas of bare metal can corrode quickly. The cost of repairing any chips is the responsibility of the owner.



®

Safety Labels

WARNING

TO PREVENT POSSIBLE INJURY OR DEATH

- DO NOT GO UNDER THE TRAILER OR NEAR THE CONVEYOR SYSTEM WHILE THE CONVEYOR SYSTEM IS IN OPERATION.
- DO NOT STAND IN OR MOVE THROUGH THE AREA WHERE THE TRAILER OPERATES. ALWAYS BE AWARE OF YOUR POSITION RELATIVE TO THE TRAILER.
- REMAIN AT CONVEYOR CONTROLS DURING UNLOADING OPERATIONS. DO NOT LEAVE UNATTENDED.
- ALWAYS DISENGAGE POWER TAKE-OFF AND POWER SOURCE WHEN TRAILER IS NOT IN USE OR WHEN MOVING TRAILER.

WARNING



BRAKE SYSTEM COMPONENTS ARE SPRING LOADED. SERVICING BY AN UNTRAINED PERSON CAN RESULT IN SERIOUS INJURY OR DEATH. HAVE BRAKES SERVICED BY A TRAINED TECHNICIAN ONLY. CAGE OR DEACTIVATE BRAKES BEFORE SERVICING.

WARNING

TO PREVENT POSSIBLE INJURY OR DEATH

- DO NOT GO UNDER THE TRAILER OR NEAR THE CONVEYOR SYSTEM WHILE THE CONVEYOR SYSTEM IS IN OPERATION.
- DO NOT STAND IN OR MOVE THROUGH THE AREA WHERE THE TRAILER OPERATES. ALWAYS BE AWARE OF YOUR POSITION RELATIVE TO THE TRAILER.
- REMAIN AT CONVEYOR CONTROLS DURING UNLOADING OPERATIONS. DO NOT LEAVE UNATTENDED.
- ALWAYS DISENGAGE POWER TAKE-OFF AND POWER SOURCE WHEN TRAILER IS NOT IN USE OR WHEN MOVING TRAILER.

WARNING

USE OF IMPROPERLY SIZED OR MISMATCHED TIRES, STUDS, LUG NUTS, OR OTHER WHEEL HARDWARE COULD RESULT IN THE WHEEL HARDWARE OR COMPLETE WHEELS COMING OFF OF THE TRAILER WHILE TOWING. THIS COULD CAUSE DAMAGE TO OR LOSS OF PROPERTY, SERIOUS INJURY OR DEATH. CONSULT A QUALIFIED TIRE TECHNICIAN BEFORE CHANGING HARDWARE.

WARNING



DO NOT STAND IN FRONT OF HYDRAULIC VALVES WHILE OPERATING. LEAKS CAN OCCUR AND CAUSE HIGH PRESSURE, HIGH HEAT HYDRAULIC FLUID TO CONTACT YOU, CAUSING SERIOUS INJURY OR DEATH. ALWAYS WEAR EYE PROTECTION WHILE USING HYDRAULIC VALVES.

WARNING



IT IS THE OWNER'S AND/OR OPERATOR'S RESPONSIBILITY TO BE AWARE OF PROPER LADDER USAGE AND CURRENT SAFETY REGULATIONS.

WARNING



UNEVEN OR OVER LOADING CAN CAUSE THE TRAILER TO COLLAPSE OR BECOME UNCONTROLLABLE WHILE DRIVING, LEADING TO A LOSS OF PROPERTY, SERIOUS INJURY OR DEATH. LOAD THE TRAILER EVENLY FROM THE REAR TO THE FRONT. DO NOT HEAP THE LOAD IN THE MIDDLE.

WARNING

THE ANTI-LOCK BRAKE SYSTEM ON THIS TRAILER MUST BE SERVICED BY A QUALIFIED TECHNICIAN ONLY. WORK PERFORMED BY UNTRAINED A PERSON CAN RESULT IN LOSS OF PROPERTY, SERIOUS INJURY OR DEATH.

WARNING

THE ALIGNMENT OF THE SUSPENSION MUST BE INSPECTED AND ADJUSTED BY A QUALIFIED TECHNICIAN IN ACCORDANCE WITH DURA-HAUL'S OWNER'S MANUAL. ADJUSTMENTS MADE BY AN UNTRAINED PERSON COULD RESULT IN LOSS OF PROPERTY, SERIOUS INJURY OR DEATH.

NOTICE

IF THE ABS INDICATOR LAMP COMES ON AND STAYS ON WHEN YOU APPLY BRAKES TO A MOVING VEHICLE, THE TRAILER ABS IS NOT WORKING PROPERLY. THE ABS MUST BE SERVICED AS SOON AS POSSIBLE UPON COMPLETION OF YOUR TRIP TO ENSURE FULL ANTI-LOCK BREAKING CAPABILITY.

WARNING



KEEP OFF OF AND OUT OF THE TRAILER WHILE IT IS IN MOTION. YOU COULD FALL AND BE SERIOUSLY INJURED.

NOTICE

CHECK YOUR TRACTOR:

- FMVSS-121 REGULATIONS MANDATE HIGHER AIR PRESSURE IN THE SUPPLY LINE. BRAKE PERFORMANCE ON THIS TRAILER WILL BE IMPAIRED IF THE TRAILER COMPRESSIONS ADJUSTMENT IS TOO LOW.
- COMPRESSOR CUT-IN PRESSURE: ADJUST TO 105 PSI ON THE GOVERNOR.
- COMPRESSOR CUT-OUT PRESSURE: ADJUST TO A MINIMUM OF 120 PSI ON THE GOVERNOR.

NOTE: The use of additives in the air brake system is NOT recommended.



Safety Labels

WARNING



MOVING CONVEYOR PARTS CAN CRUSH, CUT AND CAUSE SERIOUS INJURY OR DEATH. KEEP AWAY FROM ALL MOVING PARTS WHILE THEY ARE IN MOTION.

WARNING



SLIPPING ON, OR FALLING FROM LADDERS CAN LEAD TO SERIOUS INJURY OR DEATH. USE CAUTION WHEN CLIMBING ON TO THE TRAILER TO REDUCE THE RISK OF FALLING.

WARNING

CONSIDER BEFORE EACH USE

- USE LADDER ONLY AS DEFINED IN THE OWNER'S MANUAL.
- DO NOT USE IN POOR HEALTH, UNDER THE INFLUENCE OF DRUGS OR ALCOHOL, OR PHYSICALLY IMPAIRED IN ANY WAY.
- SHOES OR BOOTS MUST BE WORN WHILE USING LADDER, MUST BE CLEAN AND IN GOOD CONDITION.
- LEATHER SOLES SHOULD NOT BE WORN, AS THEY CAN CAUSE YOU TO SLIP.
- USE LADDER AT YOUR OWN RISK.

WARNING

PROPER SETUP AND USE

- LADDER IS DESIGNED FOR PERSONS OVER 5 FEET TALL AND WEIGHING 250 LBS OR LESS.
- ALWAYS FACE LADDER DURING USE, MAINTAINING A FIRM GRIP. USE BOTH HANDS WHEN CLIMBING OR DESCENDING.
- ALWAYS ATTACH FALL PROTECTION.
- ALWAYS MAINTAIN THREE POINTS OF CONTACT WITH THE LADDER.
- KEEP BODY CENTRED BETWEEN SIDE RAILS. DO NOT OVERREACH.

WARNING



GETTING INSIDE THE TRAILER WITH DOOR(S) CLOSED OR THE HYDRAULIC SYSTEM ENABLED CAN RESULT IN INJURY OR DEATH. OPEN DOOR(S) AND DISABLE ALL HYDRAULIC SYSTEMS BEFORE ENTERING THE TRAILER.

WARNING

PRIOR TO COUPLING TRAILER TO TRACTOR:

- INSPECT FIFTH WHEEL AND KING PIN FOR DAMAGE. DO NOT OPERATE TRAILER IF ANY DAMAGE IS FOUND.
- VERIFY THAT THE FIFTH WHEEL IS CLEAN AND LUBRICATED (CONSULT THE DURA-HAUL OWNER'S MANUAL FOR INSPECTION AND LUBRICATION).
- PRIOR TO TOWING THE TRAILER, ENSURE THE KING PIN IS SECURELY ENGAGED IN THE FIFTH WHEEL.
- FAILURE TO FOLLOW THESE STEPS CAN RESULT IN THE TRAILER DISCONNECTING FROM THE TRACTOR WHILE TOWING, WHICH COULD RESULT IN LOSS OF PROPERTY, INJURY OR DEATH.

WARNING



DOOR(S) CAN OPEN UNDER THE WEIGHT OF THE LOAD CAUSING LOSS OF PROPERTY, SERIOUS INJURY OR DEATH. MAKE SURE DOOR(S) ARE SECURELY CLOSED AND LATCHED BEFORE GETTING BEHIND THE TRAILER OR BEFORE LOADING OR TOWING THE TRAILER.

WARNING



DO NOT GET BEHIND A LOADED TRAILER WITH DOOR(S) OPEN. THE TRAILER'S CONTENTS COULD SPILL ON YOU CAUSING SERIOUS INJURY OR DEATH.

WARNING

TO PREVENT POSSIBLE INJURY OR DEATH

- DO NOT GO UNDER THE TRAILER OR NEAR THE CONVEYOR SYSTEM WHILE THE CONVEYOR SYSTEM IS IN OPERATION.
- DO NOT STAND IN OR MOVE THROUGH THE AREA WHERE THE TRAILER OPERATES. ALWAYS BE AWARE OF YOUR POSITION RELATIVE TO THE TRAILER.
- REMAIN AT CONVEYOR CONTROLS DURING UNLOADING OPERATIONS. DO NOT LEAVE UNATTENDED.
- ALWAYS DISENGAGE POWER TAKE-OFF AND POWER SOURCE WHEN TRAILER IS NOT IN USE OR WHEN MOVING TRAILER.

WARNING

DO NOT OPERATE THE CONVEYOR WITH THE DOOR(S) CLOSED. THE CONVEYOR SYSTEM COULD BE DAMAGED OR BREAK ALONG WITH THE DOOR(S). SERIOUS INJURY OR DEATH COULD OCCUR.

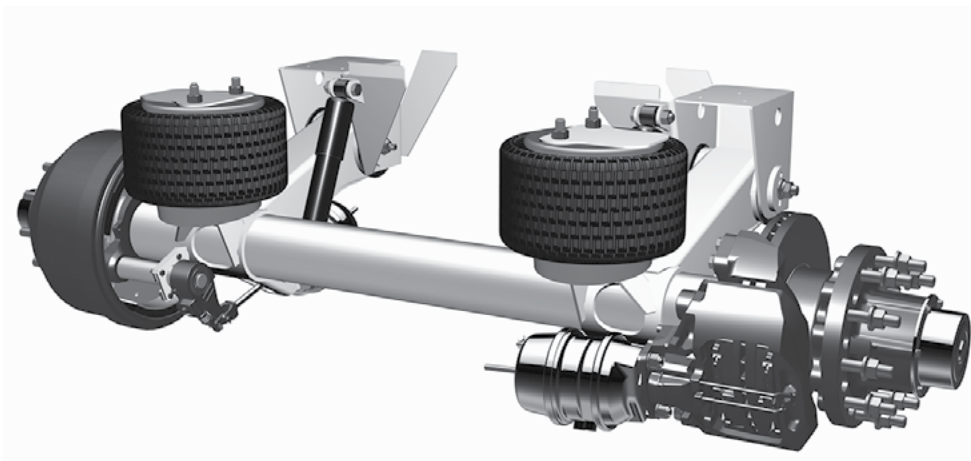
CAUTION

INSPECT BEFORE EACH USE

- INSPECT THOROUGHLY FOR MISSING OR DAMAGED COMPONENTS.
- INSPECT THOROUGHLY FOR LOOSE FASTENERS AND ENSURE THAT ALL LADDER HARDWARE IS IN WORKING ORDER.
- ENSURE LADDER IS FREE OF FOREIGN DEBRIS.
- REPLACE LADDER AND/OR HARDWARE IF DAMAGED OR WORN.

RAR-266

Large Diameter Axle (LDA) – Air-Ride Suspension



Installation and Service Manual

Suspension Identification 2

Suspension System/Axle Serial Tag

Installation 3

Prior to Installation

Suspension Mounting

Troubleshooting HCV Installation

Maintenance 6

Recommended Service Intervals

Parts Illustration

23K - Overslung Suspension

23K/25K - Overslung Suspension

25K - Low Mount Suspension

Bushing Replacement Kit

Bushing Replacement Procedure

Wide Bushing/Narrow Bushing

Appendix 13

266-Overslung Torque Specifications

266-Low Mount Torque Specifications

Axle Alignment

Warranty 16



Part No.: 9710103

Doc.: 266-Trailer-ISM-RevA-06-20-16

SUSPENSION IDENTIFICATION

Introduction

It's important that the proper suspension model be chosen for the application in which it is to be used. The Ridewell Air Ride (RAR) 266 Trailer Suspension is a fully integrated Large Diameter Axle (LDA) suspension system that can be used in a range of applications. The suspension can also be configured with a standard five-inch axle.

Refer to the engineering drawing for detailed information on the suspension system components and operating parameters.

Read through the entire Installation and Service Manual (ISM) before performing any installation or maintenance procedures.

Identification Tag

Ridewell suspension systems and axles can be identified by the Part and Serial Number listed on the serial identification tags.

Suspension Serial Tag

The Suspension Serial Tag provides information on the suspension model (Figure 1).

The **Part Number (266xxxxxx)** refers to the individual model of the suspension system.

The nine-digit **Serial Number (1xxxxxxx)** refers to the date and order of manufacture of the suspension.

Please refer to both the part number and serial number when contacting Ridewell for customer service, replacement parts and warranty information.

Axle Body - Serial Tag

Ridewell-branded axles will have a tag attached to the axle tube listing the **Part Number (165xxxx)** and **Serial Number** of the axle body (Figure 2).

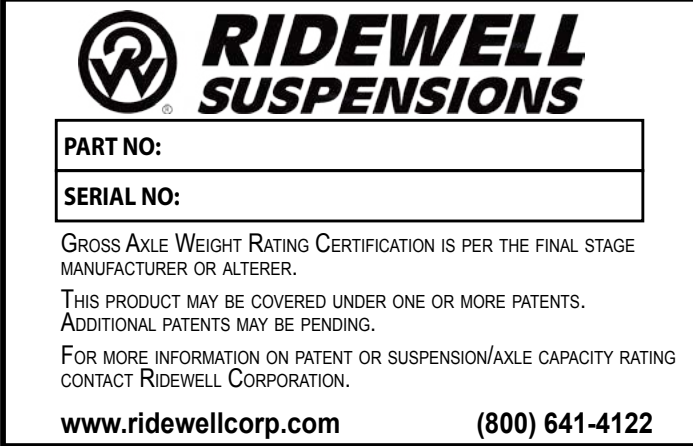
Notes and Cautions

All work should be performed by a properly trained technician using the proper/special tools and safe work procedures.

The ISM uses two types of service notes to provide important safety guidelines, prevent equipment damage and make sure that the suspension system operates correctly. The service notes are defined as:

“NOTE”: Provides additional instructions or procedures to complete tasks and make sure that the suspension functions properly.

CAUTION Indicates a hazardous situation or unsafe practice that, if not avoided, could result in equipment damage and serious injury.



RIDEWELL SUSPENSIONS

PART NO: _____

SERIAL NO: _____

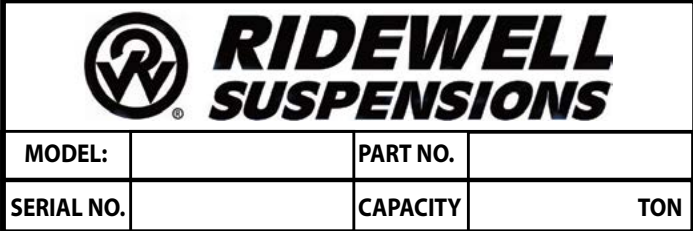
GROSS AXLE WEIGHT RATING CERTIFICATION IS PER THE FINAL STAGE MANUFACTURER OR ALTERER.

THIS PRODUCT MAY BE COVERED UNDER ONE OR MORE PATENTS. ADDITIONAL PATENTS MAY BE PENDING.

FOR MORE INFORMATION ON PATENT OR SUSPENSION/AXLE CAPACITY RATING CONTACT RIDEWELL CORPORATION.

www.ridewellcorp.com (800) 641-4122

Figure 1. The Suspension Serial Tag is located on the left-hand (driver's side) suspension hanger.



RIDEWELL SUSPENSIONS

| | | | |
|------------|--|----------|-----|
| MODEL: | | PART NO. | |
| SERIAL NO. | | CAPACITY | TON |

Figure 2. Ridewell axles have a serial identification tag listing the Part Number (165xxxx) and Serial Number of the axle body.

Prior to Installation

Refer to the engineering drawing to confirm dimensional requirements and the range of ride heights available.

Installations can vary and procedures should be adapted for different vehicles, as needed.

- The Gross Axle Weight Rating (GAWR) is determined by the system component with the lowest load rating. Please consult with tire, wheel, axle and brake manufacturers before installation to determine the GAWR.
- If vehicle chassis modifications are required, consult with the vehicle manufacturer to ensure that such changes are permitted.
- Welding or altering suspension components is not permitted without the express written permission of Ridewell Suspensions.

Installer Responsibilities

The installer of the suspension has the sole responsibility for proper attachment of the suspension system to the vehicle chassis.

- The installer is responsible for locating the suspension system on the vehicle to provide the proper load distribution.
- The installer must verify that vehicle crossmembers are positioned to support the suspension at the installing location.
- It is the installer's responsibility to determine that axle spacing conforms to any applicable federal and local bridge laws.
- The installer must verify that air reservoir volume requirements are met after suspension installation. Consult the vehicle manufacturer or Federal Motor Vehicle Safety Standards (FMVSS) 121 for more information.
- The installer must verify there is sufficient clearance for proper functioning of the suspension, air springs, brake chambers, axle and tires.

Mounting the suspension to the frame

Refer to the engineering drawing for the range of ride heights available, torque values, spacing and clearance requirements of the suspension.

Recommended locations of customer-furnished filler plates and supporting crossmembers for the suspension hangers and air spring mounting plates are shown on the engineering drawing.

The suspension installer has the final responsibility of attaching the suspension to the vehicle frame.

Weld-On Installation Procedure

CAUTION Welding method must use a minimum weld tensile strength of 70,000 psi, per AWS specifications.

1. Mark the desired location of the hangers and filler plates on the vehicle frame. Hangers must be installed parallel to each other for proper axle alignment.
2. Mark the desired location of the air spring mounting plates and filler plates on the frame.
3. Install filler plates for the hangers and air spring mounting plates on the frame. Weld filler plates to crossmembers with ¼" fillet welds down the length of the crossmember.
4. Weld the hangers to the frame/filler plates with 1/4" fillet welds completely around the hangers. Stop the welds 1/2" from the corners and edges.
 - 4.1 For hangers with wing gussets, the wing gussets must be welded to a crossmember or other supporting structure.
 - 4.2 A length of 1 1/2"-diameter pipe can be placed through the holes in the two hangers to help with stabilization and alignment.
5. Weld the air spring mounting plates to the frame/filler plates with 3/16" fillet welds.
6. Attach a crossmember or diagonal brace to the front of the hangers with 1/4" fillet welds.

Bolt-On Installation

Before installation, check to make sure that wires, hoses or other components will not be affected by drilling into the frame rail.

- Bolts/nuts for attaching the suspension to the vehicle are supplied by the installer. Grade 8 bolts and flanged lock nuts or lock nuts with hardened washers are recommended.
- Bolt holes are not provided in the air spring mounting plates. Clamp mounting plates and filler plates (if necessary) in place before drilling.

Final Assembly and Inspection

- Verify the welds of the hanger and air spring mounting plates.
- Check the location for sufficient clearances of suspension components.
- Attach beam and axle assemblies to hangers. Note: Do not fully torque pivot hardware until axle alignment is completed.
- Complete assembly and installation of air springs as shown on the engineering drawing. Torque to specifications (Appendix).
- Install shock absorbers. NOTE: If the suspension is painted after shocks are installed, make sure paint overspray does not get under the shock absorber dust covers.
- Install/connect the height control valve (HCV), if applicable (Page 5). Check the air system tubing and fittings after installation for leaks.
- Verify the suspension ride height is adjusted within the range shown on the engineering drawing and complete axle alignment procedure (Appendix).

CAUTION Failure to torque bolts/nuts of suspension components to specifications can result in failure of the suspension and void the warranty.

Install the height control valve

The Ridewell Extreme Air® Height Control Kit (HCK) automatically adds and exhausts air from the air suspension to maintain the vehicle ride height as loads increase and decrease. The (HCK) assembly consists of a lever arm connected to the height control valve (HCV) and a vertical rod arm (vertical linkage) connected to the suspension/axle (Figure 3).

Refer to the Extreme Air® installation guide for installation procedures. Be sure to check the air system after installation for leakage. **CAUTION** The installer is responsible for making sure that air system requirements comply with the appropriate Federal Motor Vehicle Safety Standards.

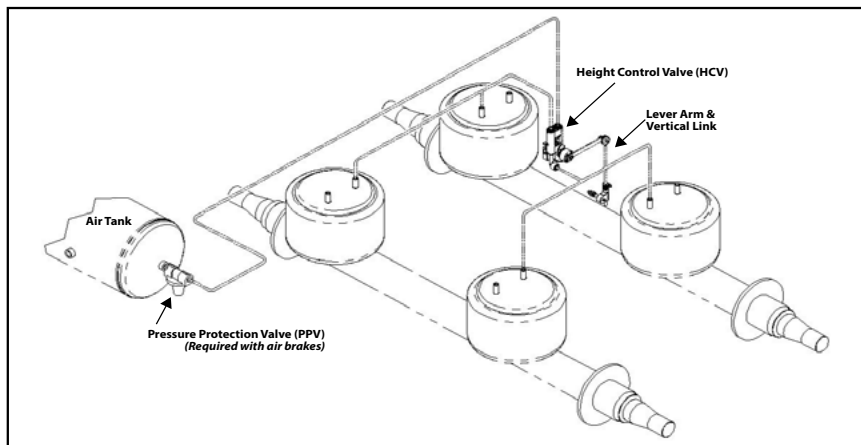
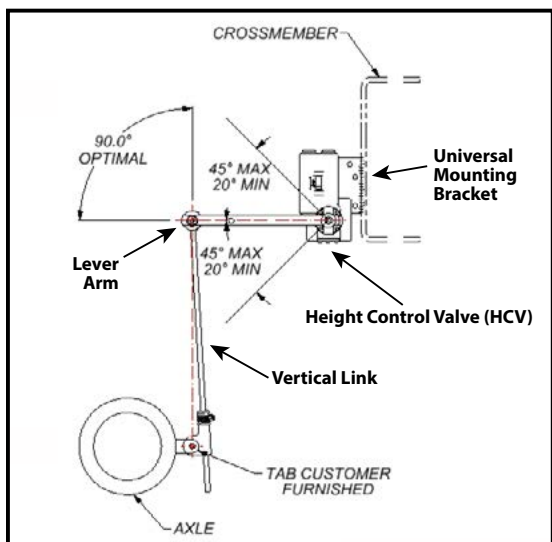


Figure 3. Example of single Height Control Valve (HCV) installation on vehicle frame with linkage attached to the axle.

Troubleshooting – Height Control Valve Installation

| Problem | Possible Cause | Corrective Action |
|--|--|---|
| HCV is not receiving air/ HCV is not delivering air to the air springs. | <ul style="list-style-type: none"> Blocked air supply line. Air tank is not filling/reaching set pressure. Pressure Protection Valve (PPV) not working correctly. Pilot port is not plumbed or is plumbed incorrectly. | <ul style="list-style-type: none"> Verify air lines are pressurized by removing supply line at HCV. Check for pinched lines. Verify air tank pressure with manual/in-line pressure gauge. Check PPV operation by making sure that valve opens when system reaches the desired pressure setpoint (<i>usually greater than 70 psi</i>). Check configuration – Non-Dump; Pressure-Dump (Normally Open); Zero-Pressure Dump (Normally Closed). Reinstall, if necessary. |
| Air springs fill but do not exhaust. | <ul style="list-style-type: none"> Obstructed air line. HCV installed backwards. Supply line installed in suspension port | <ul style="list-style-type: none"> Disconnect linkage and rotate actuating lever to down position (exhaust). If springs remain inflated, check for pinched/blocked lines. Check installation. Reinstall, if necessary. Move air supply line to HCV supply port. |
| Air system leaks down in a short period of time. | <ul style="list-style-type: none"> HCV installed backwards. Leak in air system beyond accepted standards. | <ul style="list-style-type: none"> Disconnect HCV linkage and rotate actuating lever to the up position (fill). If air springs do not inflate, reinstall HCV. To find leak in the HCV area, pressurize system and spray soapy water solution onto the valve and lines. Check for bubbles (leaks): No leak found – Do not remove valve, check the rest of the system for leaks. Check that tubing cuts are straight and smooth. Re-cut and reassemble if necessary. |

MAINTENANCE

A visual inspection of the suspension structure should be performed during each pre-trip/safety inspection. Ridewell Suspensions recommends the following minimum service intervals for standard duty, on-highway usage applications. More frequent intervals are recommended for heavier duty applications.

Daily/Pre-Trip Inspections

- ___ Check tires for proper inflation, damage or excessive wear.
- ___ Check wheel-ends for obvious signs of lubricant leakage. Check for missing components.
- ___ Check axle assemblies for damage or loose components.
- ___ Visually inspect suspension structure for signs of damage or excessive wear.
- ___ Check for loose or missing bolts/nuts. Check for irregular movement in suspension components.
- ___ Make sure air controls are operating properly. Drain all moisture from air reservoirs.

First 6,000 miles of use

- ___ Torque all suspension component bolts/nuts to specifications (see Torque Specifications chart on page 3 or refer to engineering drawing).
- ___ Verify that the suspension is operating at the installed ride height.

Every 12,000 miles of use

- ___ Inspect air springs for any damage or excessive wear. Torque air spring bolts/nuts to specifications (see Torque Specifications chart on page 3 or refer to engineering drawing).
- ___ Check air lines and connections for leaks.

Every 50,000 miles of use

- ___ Torque all suspension component bolts/nuts to specifications (see Torque Specifications chart on page 3 or refer to engineering drawing).

Annually/100,000 miles of use

- ___ Inspect pivot connection for worn pivot bushing and wear washers. Replace components, if necessary. Torque all suspension component bolts/nuts to specifications (see Torque Specifications chart or engineering drawing).
- ___ Check arm beam-to-axle connection welds.
- ___ Check air lines and connections for leaks.
- ___ Test air control system pressure protection valve (PPV), if equipped.
- ___ Check height control valve (HCV) adjustment.
- ___ Verify that the suspension is operating at the installed ride height.

CAUTION Failure to torque the bolts/nuts of suspension components to specifications can result in failure of the suspension and voiding of the warranty.

Ridewell suggests the following Technology & Maintenance Council (TMC) publications for additional maintenance information.

| | |
|-------------|---|
| TMC RP 609C | Self-Adjusting and Manual Brake Adjuster Removal, Installation and Maintenance |
| TMC RP 619B | Air System Inspection Procedure |
| TMC RP 631B | Recommendations for Wheel End Lubrication |
| TMC RP 634A | Ride Height Concerns and Adjustment Procedures for Truck/Tractor Air Ride Suspensions |
| TMC RP 643 | Air Ride Suspension Maintenance Guidelines |
| TMC RP 728A | Trailer Axle Maintenance |

Pivot Bushing Inspection Procedure

Park the unloaded trailer on a level surface. Set the brakes and chock the tires so vehicle cannot move during inspection.

Insert the flat end of a pry-bar between one side of the hanger sidewall and the wear washers. Move the pry-bar back-and-forth and look for excessive movement of the beam (NOTE: A small amount of beam

movement because of the rubber flexing is normal). Inspect the wear washers for excessive wear/damage.

Repeat the pry-bar process and wear washer inspection on the other side of the hanger. If any large/easy movement or damaged wear washers is observed, drop the beams for further inspection. Replace components as necessary.

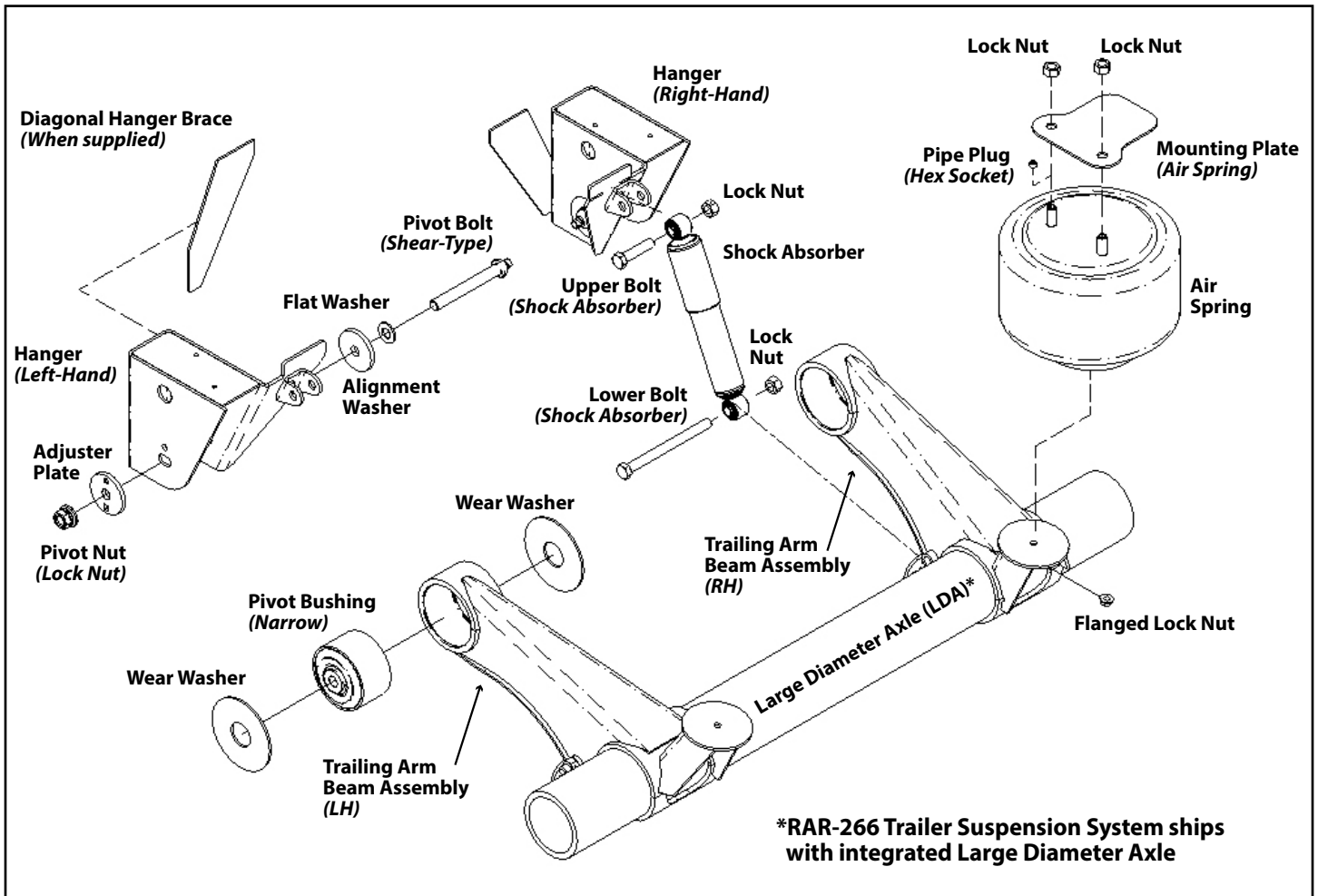


Figure 4.
RAR-266 - 23K Trailer Suspension System
Overslung – Narrow Bushing and integrated Large Diameter Axle (LDA).
 Refer to the engineering drawing for the individual component part number.

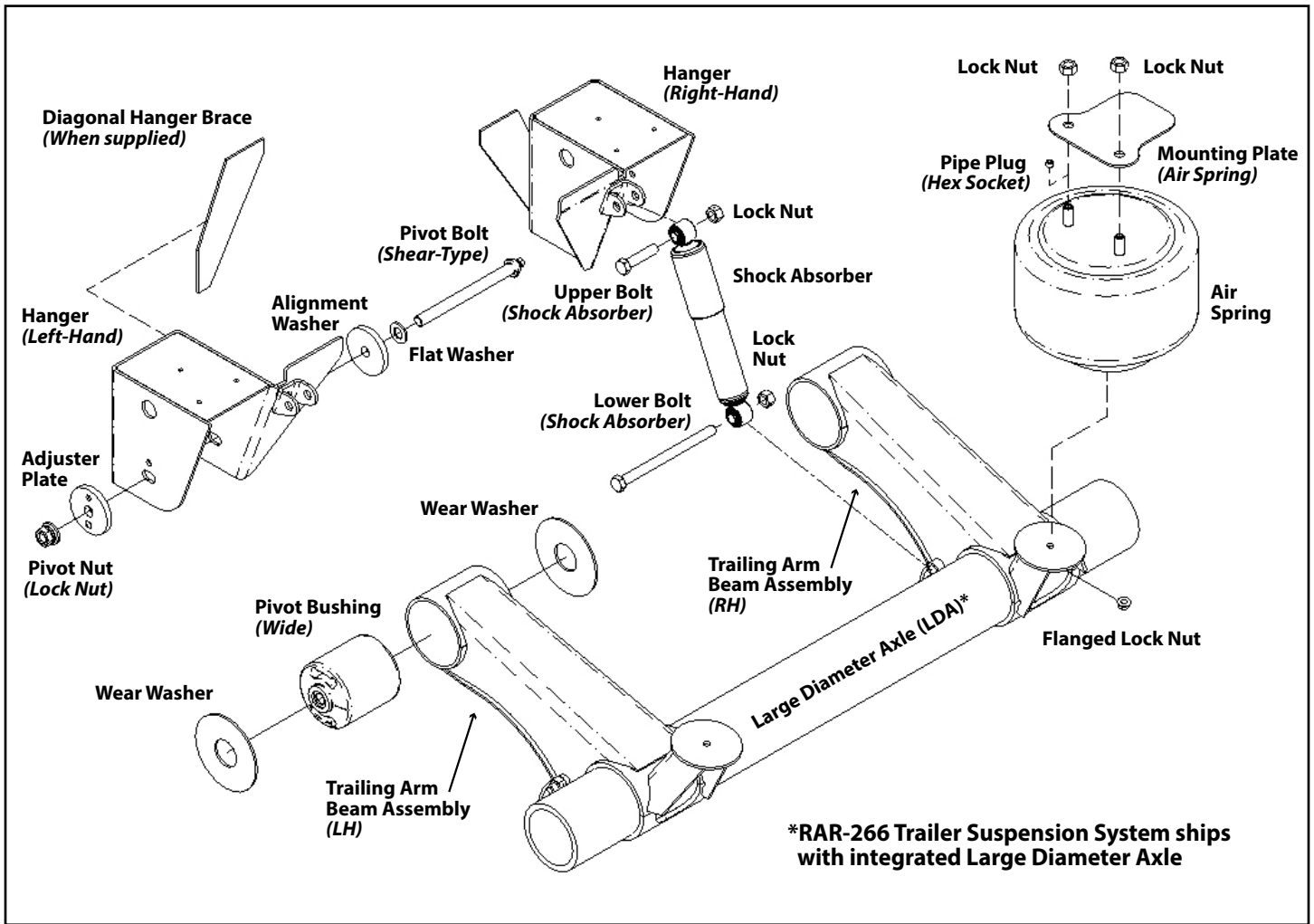


Figure 5.
RAR-266 - 23K/25K Trailer Suspension System
Overslung – Wide Bushing and Integrated Large Diameter Axle (LDA).
 Refer to the engineering drawing for the individual component part number.

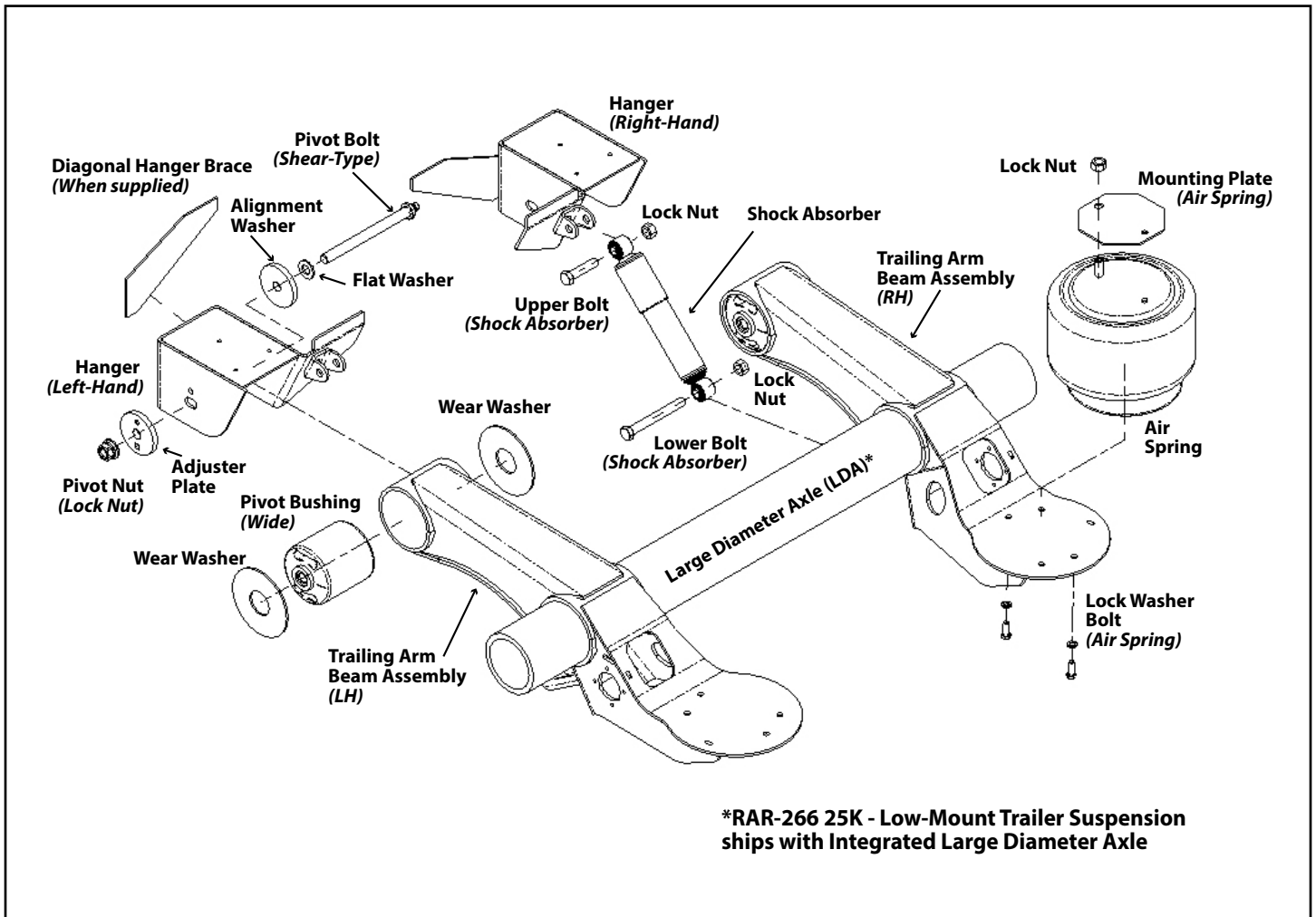


Figure 6.
RAR-266 - 25K Trailer Suspension System
Low Mount – Wide Bushing and integrated Large Diameter Axle (LDA)
 Refer to the engineering drawing for the individual component part number.

RAR-266 Trailer Suspension – Bushing Replacement Kit

| Suspension Type | Replacement Kit Part No. | Replacement Tool Part No. | Pivot Hardware | Torque Specifications |
|-------------------------------------|--------------------------|---------------------------|---|--|
| 23K/25K Capacity; Wide Bushing | 6040098 | 6100051 | Pivot Bolt (Shear-Type) Pivot Nut (Lock Nut) | Use a 1" drive impact wrench to tighten pivot bolt until Torx head is sheared off. |
| 20K/23K Capacity; Narrow Bushing | 6040128 | 6100044 | Pivot Bolt (Shear-Type) Pivot Nut (Lock Nut) | |

CAUTION Failure to install and maintain pivot hardware at torque specification could result in suspension failure and void the warranty. Refer to the engineering drawing for torque values.

Bushing Replacement Procedure

Park the vehicle on a level surface. Chock wheels to keep vehicle from moving. Raise vehicle to height that removes load from suspension and support with jack stands. Disconnect the linkage from the height control valve(s), if necessary, and exhaust all air from the air springs.

CAUTION Failure to properly chock wheels, exhaust the air system and raise and safely support the vehicle could allow vehicle/suspension movement that could result in serious injury.

Disassemble suspension

Remove wheels and tires, if necessary. Remove the shock absorbers. Disassemble the pivot connections. Remove and inspect adjuster plates and alignment washers. Replace, if necessary. Discard pivot hardware (new pivot hardware and wear washers included in bushing replacement kit).

Rotate trailing arm beams down and out of hangers. Inspect pivot bolt holes and hanger surfaces for wear or damage. Repair or replace components, as needed.

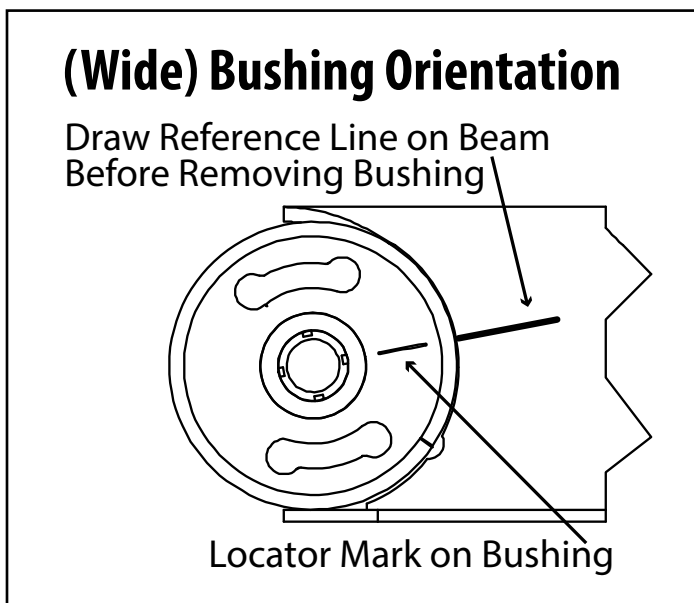


Figure 7.
The locator mark on the bushing provides the correct bushing orientation during installation.

Wide Bushing Replacement Tool 6100051 (266 - 25K Low-Mount and 266 - 23K/25K O/S)

Bushing Removal

- Using locator mark on old bushing as a reference, draw a line on the beam (Figure 7). The line will be used to orient the new bushing during installation.
- Lubricate threads of threaded rod assembly, inside the plunger, and the end cap bearing with grease.
- Assemble the bushing replacement tool and place on the eye of the beam (Figure 8). NOTE: Cone is tapered inside to smaller opening on one end.
 - Place the end cap on the hex nut-threaded rod assembly. The end cap should be seated on the flange of the hex nut. Place the larger opening of the cone against the end cap.
 - Insert threaded rod through bushing sleeve and center tapered end on the beam eye.
 - Thread the plunger onto the threaded rod. Rotate the plunger until the plate is seated snugly against the bushing.
- Use a 3/4" drive impact wrench on the hex nut to rotate the assembly and press the bushing out of the beam eye into the cone. NOTE: A small amount of heat may be needed to break the bond between bushing and beam eye. Do not overheat. Allow beam to cool before installing new bushing.
- Disassemble the bushing replacement tool. Remove old bushing from the cone and discard.

New Bushing Installation

1. Use a wire brush to clean any foreign debris and any corrosion out of the beam eye.
2. Coat the inside of the beam eye, the outside of the bushing and the inside of the cone with S.G. Type "M" Rubber Assembly Oil. NOTE: Do not substitute (S.G. Type "M" Rubber Assembly Oil included in bushing replacement kit).
3. The cone is tapered inside to a smaller opening on one end. Insert the new bushing into the larger end of the cone with the locator mark of the new bushing on the outside.
4. Assemble the bushing replacement tool and place on the eye of the beam (Figure 8).
 - 4.1 Place the end cap on the hex nut-threaded rod assembly. The end cap should rest on the flange of the hex nut.
 - 4.2 Insert the threaded rod/end cap assembly through the beam eye. Place the tapered end of the cone onto the threaded rod and center the cone on the beam eye. Line up locator mark on new bushing with line drawn on beam during bushing removal (Figure 7).
 - 4.3 Thread the plunger onto the threaded rod. Rotate the plunger until the plate is seated snugly against the bushing.
5. Use a 3/4" drive impact wrench on the hex nut to rotate the threaded rod and press the bushing into the beam eye. NOTE: Hold plunger with an open end wrench to prevent the cone from rotating.
6. Disassemble and remove the bushing replacement tool. Check the placement of the bushing to make sure it is centered in the beam eye.

Reassemble suspension

Rotate trailing arm beams into hangers. Install adjuster plate and alignment washer(s). Install new wear washers and pivot hardware (do not reuse shear-type pivot bolt). NOTE: Do not apply final torque.

Install shock absorbers. Connect height control valve linkage (if disconnected) and inflate air springs. Install wheels and tires (if removed). Raise vehicle and remove support stands. Lower vehicle to ground.

Check axle alignment and realign, if necessary. Tighten pivot bolt with a 1" drive impact wrench and E-20 Torx® socket (Ridewell tool 6100054) until the Torx® head is sheared off.

CAUTION Failure to torque pivot hardware to specifications can result in failure of the suspension and void the warranty.

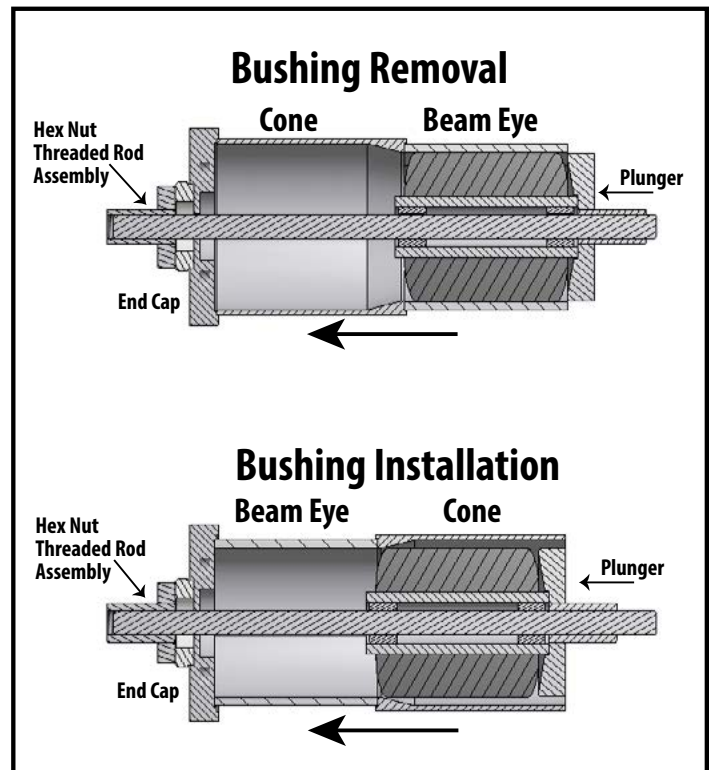


Figure 8. Bushing Tool 6100051 is used with RAR-266 suspensions that have wide bushings. The tapered cone allows the rubber bushing to expand during removal and compresses the bushing for installation into the beam eye.

Narrow Bushing Replacement Tool 6100041 (266 - 20K Low-Mount and 266 - 23K O/S)

Disassemble suspension

Remove wheels and tires, if necessary. Remove the shock absorbers. Disassemble the pivot connections. Remove and inspect adjuster plates and alignment washers. Replace, if necessary. Discard pivot hardware (new pivot hardware and wear washers included in bushing replacement kit).

Rotate trailing arm beams down and out of hangers. Inspect pivot bolt holes and hanger surfaces for wear or damage. Repair or replace components, as needed.

Bushing Removal

1. Lubricate the threads of the hex nut-threaded rod assembly, the inside threads of the plunger, and the end cap bearing with grease.
2. Assemble the bushing replacement tool and place on the eye of the beam (Figure 9). NOTE: Cone is tapered inside to a smaller opening on one end.
 - 2.1 Place the end cap on the hex nut-threaded rod assembly. The end cap should be seated on the flange of the hex nut. Place the larger opening of the cone against the end cap.
 - 2.2 Insert the threaded rod through the bushing sleeve and center the tapered end of the cone on the beam eye.
 - 2.3 Thread the plunger onto the threaded rod. Rotate the plunger until the plate is seated snugly against the bushing.
3. Use a 3/4" drive impact wrench on the hex nut to rotate the threaded rod and press the bushing out of the beam eye. NOTE: A small amount of heat may be required to break the bond between the bushing and the beam eye. Do not overheat. Allow beam to cool before installing the new bushing.
4. Disassemble the bushing replacement tool. Remove old bushing from the cone and discard.

New Bushing Installation

1. Use a wire brush to clean any foreign debris and any corrosion out of the beam eye.
2. Liberally apply P80[®] lubricant or soap solution to the inside of the beam eye, the outside of the bushing and the inside of the cone.
3. The cone is tapered inside to a smaller opening on one end. Insert the new bushing into the larger opening of the cone.
4. Assemble the bushing replacement tool and place on the eye of the beam (Figure 9).
 - 4.1 Place the end cap on the hex nut-threaded rod assembly. The end cap should rest on the flange of the hex nut.

- 4.2 Insert the threaded rod/end cap assembly through the beam eye. Place the tapered end of the cone onto the threaded rod and center the cone on the beam eye.
 - 4.3 Thread the plunger onto the threaded rod. Rotate the plunger until the plate is seated snugly against the bushing.
5. Use a 3/4" drive impact wrench to rotate the threaded rod and press the bushing into the beam eye. NOTE: Hold the plunger with an open end wrench to prevent the cone from rotating.
 6. Disassemble and remove the bushing replacement tool. Check the placement of the bushing to make sure it is centered in the beam eye.

Reassemble suspension

Rotate trailing arm beams into hangers. Install adjuster plates and alignment washers. Install new wear washers and pivot hardware (do not reuse shear-type pivot bolt). NOTE: Do not apply final torque.

Install shock absorbers. Connect height control valve linkage (if disconnected) and inflate air springs.

Install wheels and tires (if removed). Raise vehicle and remove support stands. Lower vehicle to ground. Check axle alignment and realign per axle alignment procedure (Appendix). Tighten pivot bolt with a 1" drive impact wrench and E-20 Torx[®] socket (Ridewell tool #6100054) until the Torx[®] head is sheared off.

CAUTION Failure to properly torque pivot hardware can result in suspension failure and void warranty.

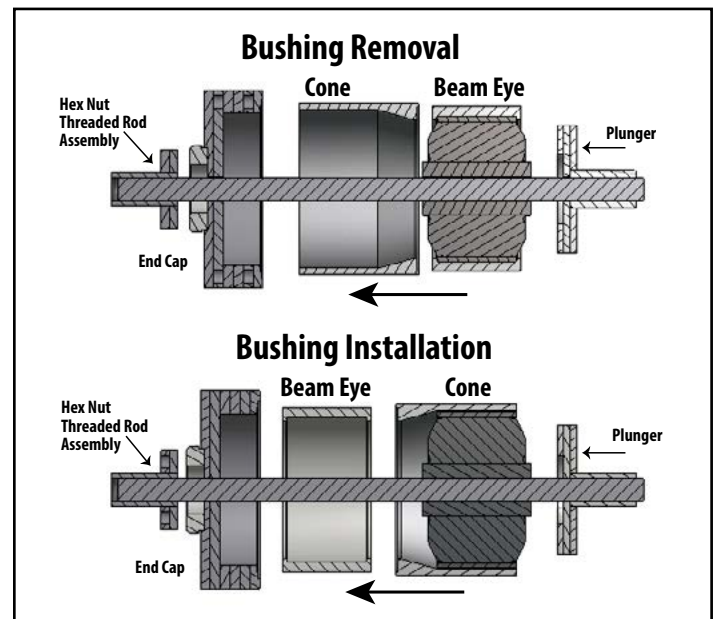


Figure 9. Bushing Replacement Tool 6100041 is for RAR-266 suspensions with narrow bushing.

RAR-266 23K/25K - Overslung Trailer Suspension - Torque Specifications

| Fastener Type | Size | Torque Values | |
|---|--------------|---|--------------|
| | | foot-pound | Newton-meter |
| Pivot Bolt - (Shear-Type) Pivot Nut - (Lock Nut) <i>Requires E-20 Torx® socket (RW #6100054)</i> | 7/8" - 9NC | Use a 1" drive impact wrench to tighten the pivot bolt until the Torx® head is sheared off. | |
| Pivot Bolt - (Eccentric Bolt) Pivot Nut - (Lock Nut) | 1 1/4" - 7NC | 1000 ft-lb | 1356 N-m |
| Lock Nut - (Shock Absorber) | 3/4" - 10NC | 200-230 ft-lb | 271-312 N-m |
| Lock Nut - (Air Spring) | 3/4" - 16NF | 45-50 ft-lb | 61-68 N-m |
| Lock Nut - (Air Spring) | 1/2" - 13NC | 45-50 ft-lb | 61-68 N-m |
| <p><i>Torque values reflect a lubricated thread condition (Nuts are pre-lubed). Do not overtorque.</i></p> <p>⚠ CAUTION <i>Suspension is shipped with minimal torque applied to fasteners. It is the installer's responsibility to apply the proper torque values. All fasteners, except shear-type pivot bolt, must be re-torqued after the first 6,000 miles of operation. Failure to install and maintain suspension component fasteners at torque specifications could result in suspension failure and void the warranty.</i></p> | | | |

RAR-266 20K/25K - Low Mount Trailer Suspension – Torque Specifications

| Fastener Type | Size | Torque Values | |
|---|------------|---|--------------|
| | | foot-pound | Newton-meter |
| Pivot Bolt - (Shear-Type) Pivot Nut - (Lock Nut) <i>Requires E-20 Torx® socket (RW #6100054)</i> | 7/8" - 9NC | Use a 1" drive impact wrench to tighten the pivot bolt until the Torx® head is sheared off. | |
| Lock Nut - (Shock Absorber) | 3/4"-10NC | 200-230 ft-lb | 271-312 N-m |
| Lock Nut - (Air Spring) | 3/4"-16NF | 45-50 ft-lb | 61-68 N-m |
| Bolt - (Air Spring) | 1/2"-13NC | 20-25 ft-lb | 27-34 N-m |
| <p><i>Torque values reflect a lubricated thread condition (Nuts are pre-lubed). Do not overtorque.</i></p> <p>⚠ CAUTION <i>Suspension is shipped with minimal torque applied to fasteners. It is the installer's responsibility to apply the proper torque values. All fasteners, except for shear-type pivot bolt, MUST be re-torqued after the first 6,000 miles of operation. Failure to install and maintain suspension component fasteners at torque specifications could result in suspension failure and void the warranty.</i></p> | | | |

Axle Alignment

Alignment should be performed on a level surface with the suspension at the desired ride height. Refer to the engineering drawing for the designed ride heights of the suspension model.

Align the suspension per TMC or SAE recommended standards. On a multiple-axle vehicle, the forward axle is moved into the proper alignment, then the remaining axles are positioned so that they are parallel to the forward axle. A maximum tolerance of 1/8-inch difference from side-to-side of the forward axle and 1/16-inch difference from side-to-side for the aft axles is acceptable (Figure 8).

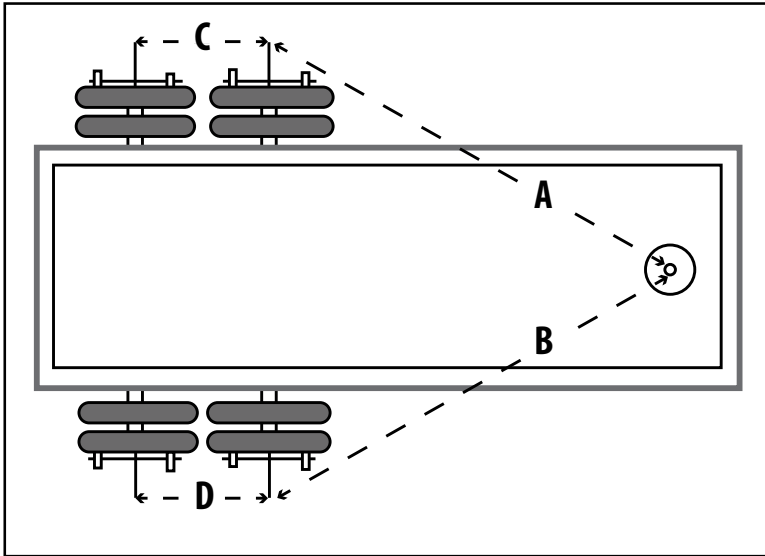


Figure 10.
Kingpin measurement for axle alignment.

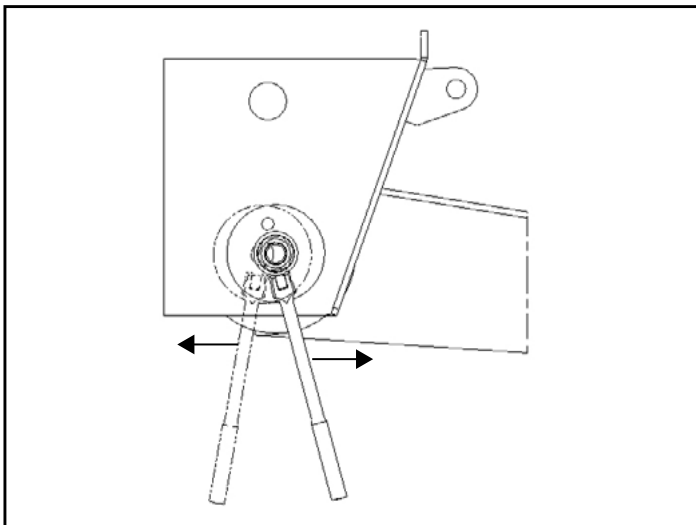
Check the forward axle alignment by measuring from the kingpin to both ends of the axle centers. If the difference between the “A” measurement and the “B” measurement is greater than 1/8-inch, the forward axle needs to be aligned. If the difference between the “C” measurement and the “D” measurement is greater than 1/16-inch, the aft axle needs adjustment.

Speed Set® Alignment

The RAR-266 Trailer Suspension is equipped with the Ridewell Speed Set® alignment feature for simple, manual alignment of the axle.

Axle alignment procedure

1. Loosen the pivot nut enough for beam to move.
2. Locate the adjuster plate at the pivot connection. Insert a 1/2”-shank breaker bar into the square hole of the adjuster plate. Move the arm beam forward or backward until the axle reaches alignment (Figure 13). NOTE: Check to make sure that the pivot bushing is not wedged sideways during



beam movement. The adjuster plate and alignment washer on the two sides of the hanger should move in unison with the beam.

3. Tighten the pivot nut so that beam can no longer move. Re-check alignment measurements and adjust, if necessary.
NOTE: Check to make sure that both the adjuster plate and alignment washer are flat against the hanger before final torque is applied.
4. Use a 1” drive impact wrench with an E-20 Torx® socket to tighten the pivot bolt until the Torx head is sheared off.

CAUTION Failure to properly torque pivot hardware could result in catastrophic suspension failure and void the warranty

Figure 11.
Move beam back-and-forth using adjuster plate until axle reaches desired position.

WARRANTY

Terms and coverage in this warranty apply only to the United States and Canada.

Ridewell Suspensions warrants the suspension systems manufactured by it to be free of defects in material and workmanship. Warranty coverage applies only to suspensions that have been properly installed, maintained and operated within the rated capacity and recommended application of the suspension. The responsibility for warranty coverage is limited to the repair/replacement of suspension parts. The liability for coverage of purchased components is limited to the original warranty coverage extended by the manufacturer of the purchased part.

All work under warranty must have prior written approval from the Ridewell warranty department. Ridewell has the sole discretion and authority to approve or deny a claim and authorize the repair or replacement of suspension parts. All parts must be held until the warranty claim is closed.

Parts that need to be returned for warranty evaluation will be issued a Returned Materials Authorization (RMA). Parts must be returned to Ridewell with the transportation charges prepaid. The transportation charges will be reimbursed if the warranty claim is approved.

This non-transferable warranty is in lieu of all other expressed or implied warranties or representations, including any implied warranties of merchantability or fitness or any obligations on the part of Ridewell. Ridewell will not be liable for any business interruptions, loss of profits, personal injury, any costs of travel delays or for any other special, indirect, incidental or consequential losses, costs or damages caused by Ridewell.

Contact the Ridewell Warranty Dept. at 417.833.4565 - Ext. 135, for complete warranty information.



9700



Trailer Suspension Series

Configurations & Parts Identification



Advancing the Practical Application of Suspension Technology

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Application

The 9700 Series suspension is an indirect result of Hutchens' Rocker Bushing Improvement Program. It can be utilized anywhere a 7700 Series suspension can, and almost all of the suspension components are interchangeable. However, the 9700 Series suspension offers several options that were previously unavailable with the 7700 Series, as well as numerous improvements.

Capacity

Like our 7700 Series, the 9700 Series suspension has a Gross Axle Weight Rating (G.A.W.R.) of 22,400 lbs. when equipped with single leaf, two leaf, standard three leaf and seven leaf springs. Heavy-duty three leaf and eight leaf springs raise the G.A.W.R. to 25,000 lbs.

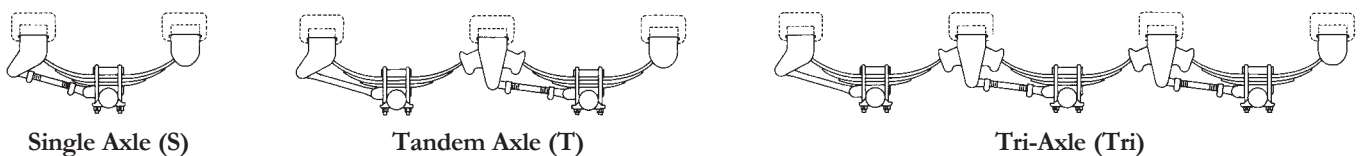
Features

- ▶ A Huck "lockbolt" fastening system for the rocker/rocker hanger assembly that is virtually maintenance free.
- ▶ Lightweight, fabricated hangers and equalizers with 1/2" wear pads to reduce wear at all spring contact points.
- ▶ Cast steel hangers and equalizers with increased wall thickness at spring contact points...eliminating the need for additional wear pads.
- ▶ The industry's finest rocker bushing...combining a new rubber compound and improved bushing installation techniques, coupled with dimensional changes in the bushing and fasteners.
- ▶ An improved spring seat design that more efficiently transfers forces from the axle to the springs.
- ▶ A redesigned top plate that is lighter and offers greater stability under U-bolt clamp loads.
- ▶ Wrapped fabricated torque arm eye ends that utilize a single 5/8" bolt and a higher clamp load to prevent separation under extreme conditions.
- ▶ Torque arm screws that are coated with "NEVER-SEEZ"®, and then painted to resist corrosion while allowing easy adjustment for suspension alignment.

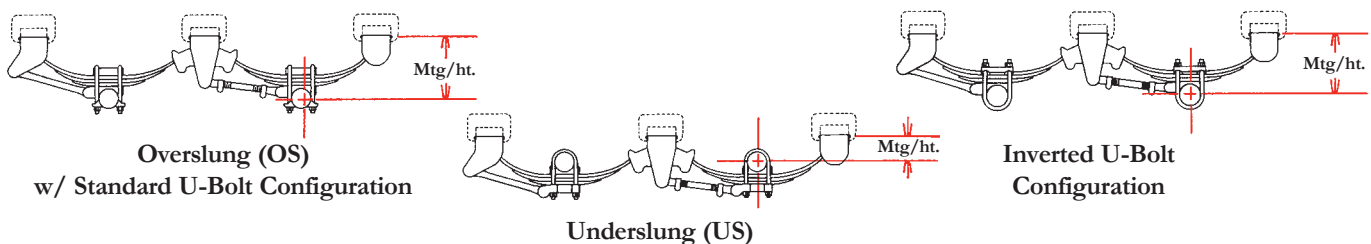
Except for the rockers and rocker hangers, the component parts of all 7700 and 9700 Series suspensions are completely interchangeable.

Options

The 9700 Series suspensions are available in single, tandem and multi-axle configurations.

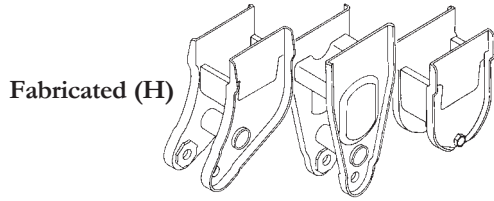


In addition to the standard overslung configuration, an underslung configuration is available for reduced mounting heights. Mounting height (Mtg/ht) is the distance from the center line of the axle to the top of the spring hangers.



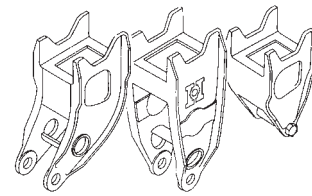
The standard 9700 Series suspensions have U-bolts that point downward (threads and nuts below the axle). However, a model is available with inverted U-bolts (threads and nuts above the axle).

All 9700 Series suspensions are available with either fabricated or cast steel hangers and rockers. These hangers come in various styles.



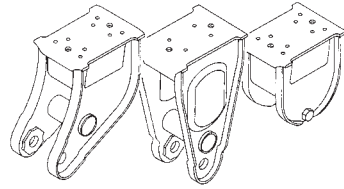
Fabricated (H)

Straddle Mount (Str/mt)
Straddle Mount Hangers are for use with box type frames. Each hanger straddles the frame and is welded to both sides of the frame. This is our strongest hanger mounting.

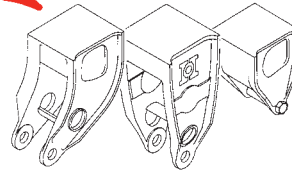


Cast (CH)

Under Mount (Un/mt)
Under Mount hangers are welded flush to the bottom of the frame. For an added weight savings in I-beam applications special fabricated front and rear hangers without top plates are available.



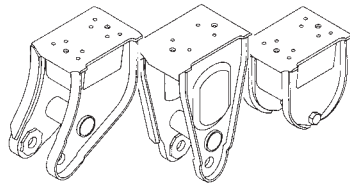
Fabricated (H)



Cast (CH)

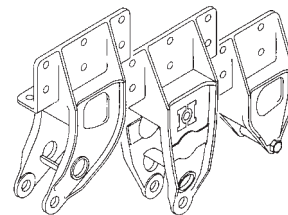
Under Mount Weld-on (Un/mt/wo) and Side Mount Weld-on (Si/mt/wo)
These versatile Weld-on hangers can be used for either under mount or side mount applications.

Side Mount (Si/mt)
Side Mount Hangers are welded to the side of the frame. They are useful on flatbed sliders and "maximum cube" vans.



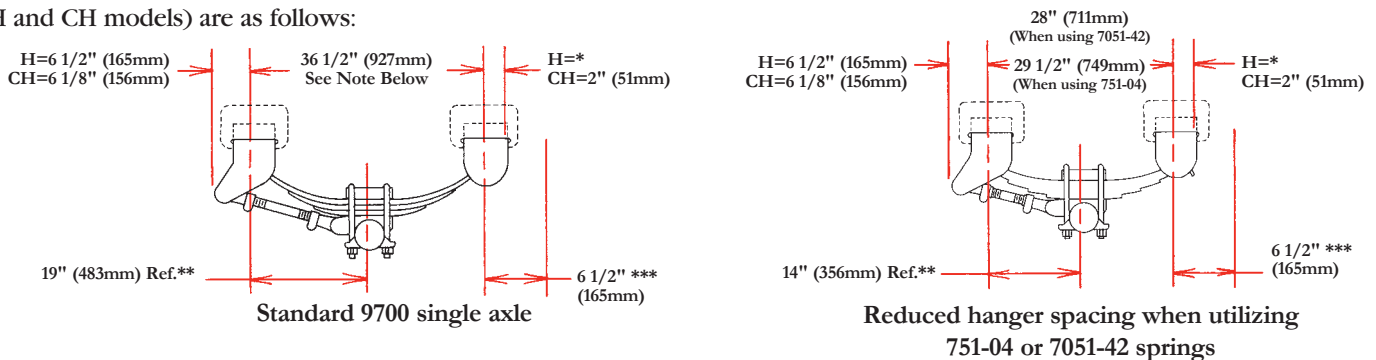
Fabricated (H)

Flange Mount (Fl/mt)
Flange Mount hangers are available with or without bolt holes. Hangers may be bolted (Fl/mt/bo) or welded (Fl/mt/wo) to the frame, or a combination of bolting and welding may be used.

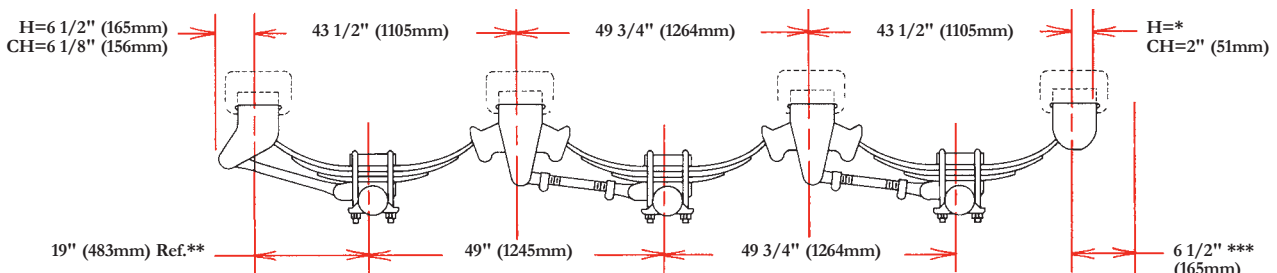


Cast (CH)

Axle spacings of 42 1/2", 44" and 49" will be covered in this publication. Axle spacings greater than 49" will be covered in the widespread section. Unless otherwise specified, axle centers are assumed to be 49". Hanger spacings for single axle units (H and CH models) are as follows:

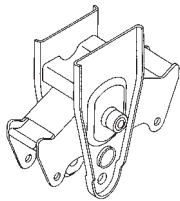


Hanger spacings for tandem axle units with 42 1/2" and 44" axle centers (H and CH models) are covered on pages 17 and 18 of this publication. Hanger spacings for tandem axle units with 49" axle centers (H and CH models) are covered with their appropriate illustration. Hanger spacings for tri-axle units with 49" axle centers (H and CH models) are as follows:

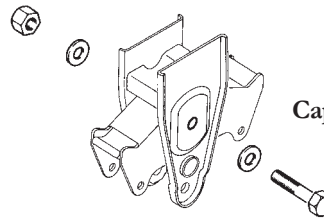


Note: When using 751-06, 752-01, 752-06 and 16316-01 springs, this hanger spacing should be 38" (965mm).
 * Str/mt = 3 1/2" (89mm), Un/mt & Si/mt = 3 7/8" (99mm), Fl/mt = 5 1/2" (140mm). ** Ref: This dimension may vary with changes in springs, spring seat heights, etc. *** Recommended spring clearance.

As an option to the Huck fastener, a single cap screw fastener is available for the rocker and center rocker hanger. This system is also offered as a replacement for the Huck fastener should that become necessary.



Huck Fastener (Std.)



Cap Screw (Opt.)

Spring seats and U-bolts to fit 5" round axles (shown below) are standard. These spring seats range in height from 3/4" to 4 3/4". Heavy duty spring seats as well as spring seats and U-bolts for special axle shapes are available as an option.



No-Hop Attach Fitting
Rear Axle Only

A no-hop feature is available for rear axle application on overslung H and CH 9700's with the standard U-bolt configuration. This feature is designed to prevent rear axle rotation and the resulting "chatter" or "hop" that sometimes occurs when an empty trailer brakes hard. All overslung H and CH 9700 Series suspensions are available with optional 3/4" U-bolts in lieu of the standard 7/8" U-bolts. These model variations are standard catalog items. Many more combinations are possible. If your particular need is not covered in this publication, please contact Hutchens for assistance.

How To Order Your 9700 Series Suspension System

With so many options available on the 9700 Series suspensions, the basis of any order must begin with a complete description of the unit. The following procedure will provide the descriptive information required:

1. Determine the number of axles required and the spacing of these axles. Unless otherwise specified, tandem axles with 49" axle centers are assumed.
2. Select the style of hangers required to mount the suspension on your particular frame or subframe. Specify whether these hangers are to be fabricated (H) or cast (CH) steel.
3. Determine the mounting height (Mtg/ht) your application requires. For your convenience, a Mounting Height Chart may be found on Page 4 of this booklet. From this chart please note that mounting height is dependent upon:
 - a) Suspension configuration - Overslung or Underslung. Unless otherwise specified, suspension configuration is assumed to be overslung.
 - b) Axle size - 5" Round or other. (Hutchens does not manufacture or sell axles.)
 - c) Spring seat height - 3/4" to 4 3/4" in 1/2" increments.
 - d) Spring type - Standard or Heavy-Duty, number of leaves and spring arch. Hutchens is not a spring manufacturer. As a service to our customers we will supply springs upon request. Whether or not we provide you with springs, we will need to know what springs you intend to use to assure we furnish the appropriate U-bolt for the spring and spring seat combination you've ordered.
4. Choose which U-bolt size you would like (either the standard 7/8" or the optional 3/4" size).

Note: In many instances more than one combination will result in the same mounting height. Therefore, all of the aforementioned factors should be taken into consideration when ordering.

Example: A tandem axle (T) 9700 Series suspension requiring a mounting height of 16" and fabricated (H) undermount hangers (Un/mt) for use with 3/4" U-bolts and 5" round axles with 354-00 springs would be ordered as follows:

| Quantity | Fabricated Steel | Series No. | Tandem Axle | Undermount Hangers | For use with 3/4" U-bolts | 5" Round Axles | See Mtg/hr Chart | With 354-00 Spings |
|----------|------------------|------------|-------------|--------------------|---------------------------|----------------|------------------|--------------------|
| 1 ea. | H | 9700 | T | Un/mt | 3/4" U-bolts | 5" rd. | 3/4" seat | w/354-00 sprgs. |

1 ea. H9700T - Un/mt - 3/4" U-bolts - 5" rd. - 3/4" seat - w/ 354-00 springs

Mounting Height Chart: Nominal Values For No-Load Conditions

5" (127mm) Round Axles With 3/4" (19mm) Spring Seats

| Spring Part No. | Description | G.A.W.R. (lbs.) | Overslung Configuration | | | | Underslung Configuration | | | |
|-----------------|---------------------------|-----------------|---------------------------|----------------|----------------------------|----------------|---------------------------|---------------|----------------------------|---------------|
| | | | Tandem Axle | | Single Axle | | Tandem Axle | | Single Axle | |
| | | | 49" (1245mm) Axle Centers | | 36.5" (927mm) Hgr. Spacing | | 49" (1245mm) Axle Centers | | 36.5" (927mm) Hgr. Spacing | |
| | | | Fabricated | Cast | Fabricated | Cast | Fabricated | Cast | Fabricated | Cast |
| 32401 | Hi-arch, 2-leaf | 22,400 | 16.00" (406mm) | 15.73" (400mm) | 15.50" (394mm) | 14.92" (379mm) | 7.50" (191mm) | 7.12" (181mm) | 7.00" (178mm) | 6.31" (160mm) |
| 32501 | Med-arch, 2-leaf | 22,400 | 14.50 (368) | 14.21 (361) | 13.75 (349) | 13.34 (339) | 6.00 (152) | 5.60 (142) | 5.25 (133) | 4.74 (120) |
| 32601 | Low-arch, 2-leaf | 22,400 | 13.75 (349) | 13.36 (339) | 13.25 (337) | 12.49 (317) | 5.25 (133) | 4.74 (120) | 4.75 (121) | 3.88 (99) |
| 35400 | Hi-arch, 3-leaf | 22,400 | 16.00 (406) | 15.80 (401) | 15.75 (400) | 14.98 (380) | 7.00 (178) | 6.65 (169) | 6.75 (172) | 5.84 (148) |
| 35500 | Med-arch, 3-leaf | 22,400 | 14.50 (368) | 14.15 (359) | 14.00 (356) | 13.26 (337) | 5.50 (140) | 5.00 (127) | 5.00 (127) | 4.12 (105) |
| 35600 | Low-arch, 3-leaf | 22,400 | 13.75 (349) | 13.43 (341) | 13.25 (337) | 12.56 (319) | 4.50 (114) | 4.28 (109) | 4.00 (102) | 3.41 (87) |
| 36300 | Low-arch, 1-leaf | 22,400 | 13.75 (349) | 13.38 (340) | 13.25 (337) | 12.49 (317) | 5.75 (146) | 5.32 (135) | 5.25 (133) | 4.44 (113) |
| 36500 | Hi-arch, 3-leaf H.D. | 25,000 | 16.00 (406) | 15.77 (401) | 15.75 (400) | 14.95 (380) | 6.50 (165) | 6.17 (157) | 6.25 (159) | 5.36 (136) |
| 36501 | Low-arch, 3-leaf H.D. | 25,000 | 13.75 (349) | 13.52 (343) | 13.25 (337) | 12.66 (322) | 4.25 (108) | 3.92 (100) | 3.75 (95) | 3.07 (78) |
| 75101 | Low-arch, 7-leaf | 22,400 | 13.75 (349) | 13.66 (347) | 13.25 (337) | 12.83 (326) | 3.75 (95) | 3.54 (90) | 3.25 (83) | 2.70 (69) |
| 75105 | Hi-arch, 7-leaf | 22,400 | 16.00 (406) | 15.70 (399) | 15.50 (394) | 14.88 (378) | 6.00 (152) | 5.57 (141) | 5.50 (140) | 4.77 (121) |
| 75106 | Hi-arch, 7-leaf | 22,400 | NR | NR | 16.50 (419)* | 15.52 (394)* | NR | NR | 6.50 (165)* | 5.39 (137)* |
| 75201 | Low-arch, 8-leaf H.D. | 25,000 | 14.25 (362) | 14.12 (359) | 13.75 (349) | 13.28 (337) | 3.75 (95) | 3.49 (89) | 3.25 (83) | 2.66 (68) |
| 75205 | Hi-arch, 8-leaf H.D. | 25,000 | 16.50 (419) | 16.22 (412) | 16.25 (413) | 15.41 (391) | 6.00 (152) | 5.58 (142) | 5.75 (146) | 4.79 (122) |
| 75206 | Hi-arch, 8-leaf H.D. | 25,000 | NR | NR | 16.75 (426)* | 16.03 (407)* | NR | NR | 6.25 (159)* | 5.41 (137)* |
| 1631601 | Low-arch, FRP H.D.** | 24,000 | 14.50 (368) | 13.87 (352) | 14.25 (362)* | 13.26 (337)* | 4.50 (114) | 4.41 (112) | 4.25 (108)* | 3.80 (97)* |
| 1671001 | Med-arch, 2-leaf, 2 stage | 22,400 | 14.75 (375) | 14.48 (368) | 14.25 (362) | 13.60 (345) | 5.25 (133) | 5.17 (131) | 4.75 (121) | 4.29 (109) |
| 1788201 | Med-arch, 2-leaf, 2 stage | 22,400 | NR | NR | NR | NR | NR | NR | NR | NR |
| 2478401 | Hi-arch, 3-leaf L.D. | 15,000 | 16.00 (406) | 15.80 (401) | 15.75 (400) | 14.98 (380) | 7.00 (178) | 6.65 (169) | 6.75 (172) | 5.84 (148) |

* In single axle applications use 38" (965mm) hanger spacings only.

** FRP mounting heights include additional 1/4" (6mm) for reinforced seats.

Notes

1. Mounting heights given are for units with 5" (127mm) round axles and 3/4" (19mm) spring seats. Add 1/2" (13mm) to the mounting height shown for each 1/2" (13mm) increase in spring seat height.
2. The mounting heights for 5" x 5" (127mm x 127mm) square axles are the same as those for 5" (127mm) round axles. To obtain the mounting heights for overslung 4" x 6" (102mm x 152mm) rectangular axles add 1/2" (13mm) to the appropriate 5" (127mm) round mounting height.
3. Mounting heights shown are for Undermount, Sidemount and Flangemount hangers. Subtract 1/4" (6mm) for Straddlemount hangers. For Series 10 mounting heights subtract 1 1/4" (32mm). Refer to the Series 10 catalog section for additional considerations when using the Series 10.
4. Mounting heights must not exceed 17 1/4" (438mm) on No-Hop suspensions. For best performance, do not exceed 17 1/4" (438mm) mounting heights on any suspension.
5. For single axle units with 38" (965mm) hanger spacings add approximately 1/4" (6mm) to the 36 1/2" (927mm) mounting height.
6. It is recommended that a minimum of 4 1/2" (114mm) vertical clearance be maintained above the tires with trailer or chassis in an unloaded condition. Also, a minimum of 4" (102 mm) is required between the axle and the frame. When using mounting heights less than 6 1/2" (165 mm) it may be necessary to modify the trailer or chassis frame to achieve the required clearances.

H-9700 and CH-9700 (Overslung)

Bill of Materials

| Item | Part No. | Quantity | | Description |
|------|-------------------------|---------------------------------|-------------|---|
| | | Single Axle | Tandem Axle | |
| 1 | See Chart A, Below | 2 | 2 | Front Spring Hanger |
| 2 | See Chart A, Below | 0 | 2 | Center Rocker/Rocker Hanger Assembly |
| 3 | See Chart A, Below | 2 | 2 | Rear Spring Hanger Assembly |
| 4 | 71902 | 4 | 8 | Radius Rod Bolt - Hex Bolt - 1 - 14 UNS x 5" |
| 5 | 16398-04 | 1 | 2 | Radius Rod w/ Bushing - 19.25 LG |
| 6 | 10562-00 | 4 | 8 | Flange Locknut - 1 - 14 UNS, GRF, Phosphate & Oil |
| 7 | See Chart C, Page 8 | 4 | 8 | U-Bolt - Standard 7/8" U-Bolt (Shown) |
| 8 | 16868-01 | 2 | 4 | Top Plate |
| 9 | 17350-02 | 2 | 4 | Galvanized Liner ① |
| 10 | See Spring Appendix | 2 | 4 | Spring Assembly - Standard 3-Leaf (Shown) |
| 11 | See Chart B, Below | 2 | 4 | Spring Seat - 5" Round (Shown) |
| 12 | See Chart D, Page 8 | 2 | 4 | Bottom Plate - 5" Round (Shown) |
| 13 | 35-00 or 817-00 | 8 8 | 16 16 | Washer - PL, 15/16 ID x 1 3/4 OD (For Std. 7/8" U-Bolt Shown) Washer - 1/8" x 13/16 ID x 1 1/2 OD (For Optional 3/4" U-Bolt) |
| 14 | 3404 or 16303-01 | 8 8 | 16 16 | Hex Nut - 7/8" - 14 UNF (For Std. 7/8" U-Bolt Shown) Hex Nut - 3/4" - 16 UNF (For Optional 3/4" U-Bolt) |
| 15 | 715-00 | 1 | 2 | Non-Adj. Radius Rod w/ Rubber Bushing |
| 16 | See Chart E, Page 8 | 0 | 2 | Spring Seat - Replaces Rear Spring Seat Only |
| 17 | See Chart E, Page 8 | 0 | 2 | Attach Fitting - Replaces Rear Bottom Plate Only |
| 18 | See Chart E, Page 8 | 0 | 2 | Adj. Radius Rod w/ Bushing - Replaces 1 Adj. and 1 Non-Adj. Radius Rod on Rear Axle Only |
| 19 | 7717-01 | 2 per Hanger | | Washer Bushing - Replaces Sideplate Washer 10561-00 on Fabricated (H) Front and Center Hangers Only |
| 20 | 722-00 | 2 per Rad. Rod | | Radius Rod Bushing Only - 3" LG |
| 21 | 37-03 | 2 per Rocker 1 per Rear Hgr. | | Hex Lock Nut - 5/8" - 18 UNF, GRB (Shipped loose, not part of center rocker & hanger Assy. However it is part of the rear hanger Assy.) |
| 22 | 756-00 | 2 per Rocker 1 per Rear Hgr. | | Sleeve Spacer - 3/4 OD x 18 GA x 3 1/4 LG (Shipped loose, not part of center rocker & hanger Assy. However it is part of the rear hanger Assy.) |
| 23 | 759-00 | 2 per Rocker 1 per Rear Hgr. | | Hex Bolt - 5/8" - 18 UNF x 4 1/2 LG, GR2 (Shipped loose, not part of center rocker & hanger Assy. However it is part of the rear hanger Assy.) |
| 24 | 11154-00 | 1 per Rocker | | Hex Lock Nut - 1 1/8" - 7 UNC, GR5 |
| 25 | 837-00 | 2 per Rocker | | Washer - 1/8" x 1 1/4 ID x 2 1/4 OD |
| 26 | 16158-01 or 17784-01 | 0 0 | 2 2 | Fabricated Rocker Assembly w/ Rubber Bushing (Shown) Cast Rocker Assembly w/ Rubber Bushing (Not Shown) |
| 27 | 18723-01 | 1 per Rocker | | Rocker Bushing Only - Rubber |
| 28 | 16150-01 | 1 per Rocker | | Hex Cap Screw - 1 1/8" - 7 UNC x 6.62" LG, GR5 |
| 29 | 16353-01 | 1 per Rocker | | Rocker Replacement Bolt Kit Consisting of 1 ea. 16150-01, 2 ea. 837-00, 1 ea. 11154-00, 2 ea. 759-00, 2 ea. 756-00 and 2 ea. 37-03 |

Chart A - Hanger: Fabricated (H) and Cast (CH) Hangers

| Description | Part No. | Hanger Configuration | | | | | | |
|--------------------------------|----------|----------------------|--------------------------|----------------|--------------------------|----------------------|----------------------|--|
| | | Str/mt | Un/mt | Un/mt (I-beam) | Si/mt | Fl/mt/wo | Fl/mt/bo | |
| Front Hgr., Fab. (H) | 7701- | -01 | 20728-01 | 16481-01 | L 20729-01 R 20730-01 | L-05 R-06 | L-07 R-08 | |
| Front Hgr., Cast (CH) | | 702-01 | L 16291-03 R 16291-04 | NA | L 16291-03 R 16291-04 | L 702-09 R 702-10 | L 702-11 R 702-12 | |
| Rocker & Hgr. Assy., Fab. (H) | 16319- | -01 | -02 | -02 | -04 | -08 | -07 | |
| Rocker & Hgr. Assy., Cast (CH) | 16319- | -51 | -52 | -52 | -52 | -58 | -57 | |
| Rocker Hgr. Only, Fab. (H) | | 16169-01 | 16171-01 | 16171-01 | 16175-01 | 16179-01 | 16178-01 | |
| Rocker Hgr. Only, Cast (CH) | | 16196-03 | 16197-03 | 16197-03 | 16197-03 | 16199-05 | 16199-03 | |
| Rear Hgr. Assy., Fab. (H) | 7703- | -01 | 20732-01 | 16483-01 | L 20733-01 R 20734-01 | L-05 R-06 | L-07 R-08 | |
| Rear Hgr. Assy., Cast (CH) | | 712-01 | L 16293-01 R 16293-02 | NA | L 16293-01 R 16293-02 | L 712-09 R 712-10 | L 712-11 R 712-12 | |

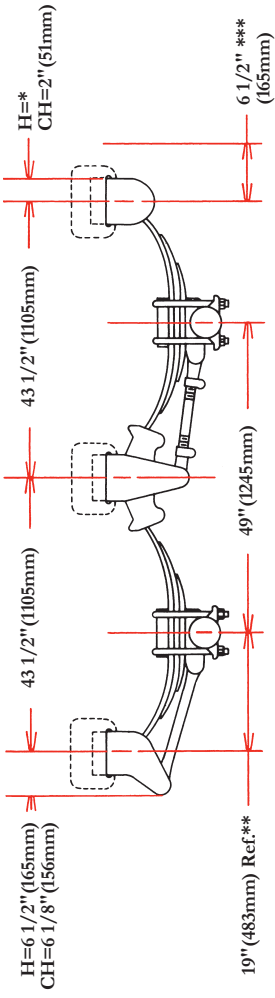
Chart B - Spring Seat

| Seat Height | 3/4" | 1 1/4" | 1 3/4" | 2 1/4" | 2 3/4" | 3 1/4" | 3 3/4" | 4 1/4" | 4 3/4" | |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|
| 5" Round | 19360- | -01 | -02 | -03 | -04 | -05 | -06 | -07 | -08 | -09 |
| 5" x 5" Square | 19365- | -01 | -02 | -03 | -04 | -05 | -06 | -07 | -08 | -09 |
| 4" x 6" Rect. | 19364- | -01 | -02 | -03 | -04 | -05 | -06 | -07 | -08 | -09 |

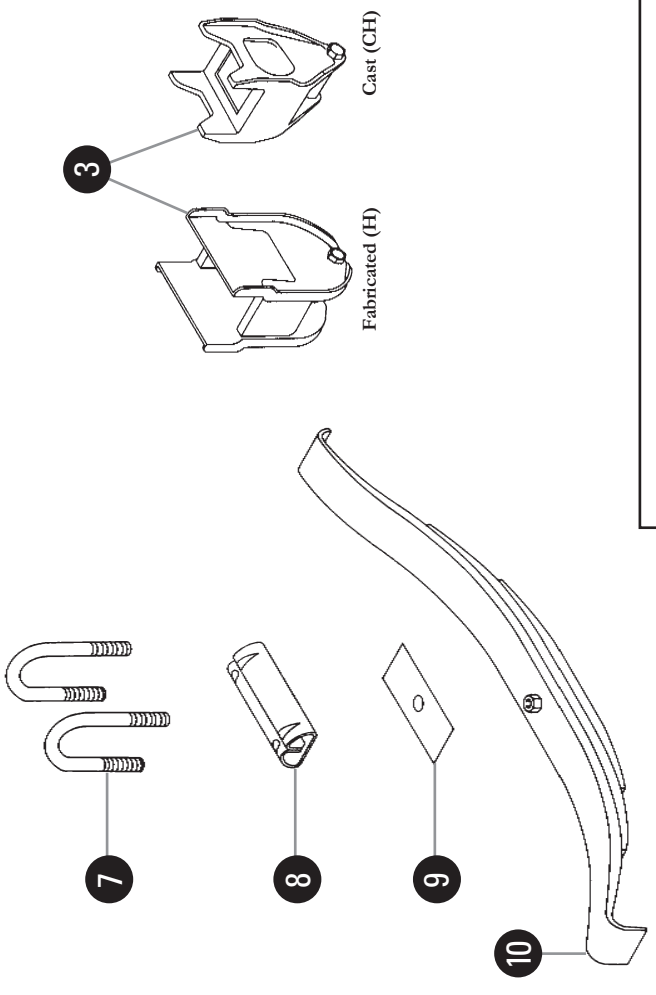
① Galvanized liners are required on the tension (top) side of each plate when taper (i.e., single, two and three leaf) springs are utilized. One spring liner per spring (for top leaf) will be shipped loose from Hutchens or spring vendor. Liners are not required on flat plate (seven or eight leaf) springs.



H-9700/CH-9700



* Str/mt = 3 1/2" (89mm), Un/mt & Si/mt = 3 7/8" (99mm), F/mt = 5 1/2" (140mm)
 ** Ref: This dimension may vary with changes in springs, spring seat heights, etc.
 *** Recommended spring clearance



Cast (CH)

Fabricated (H)

Cast (CH)

Fabricated (H)

No-Hop Option
(See Chart E)

Rear Axle Only

Replacement Parts

Parts available as a kit
See Item 29 Pg. 5

H-9700 and CH-9700

Chart C - U-Bolt

| 5" Round Axle | | | | | | | | | | | |
|---|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| 16300 - See Below, Opt. 3/4 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -06 | 9 3/4 | -07 | 10 1/4 | -08 | 10 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | |
| 1 1/4 | -07 | 10 1/4 | -08 | 10 3/4 | -09 | 11 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | |
| 1 3/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | |
| 2 1/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | |
| 2 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | |
| 3 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | |
| 3 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | |
| 4 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | -15 | 14 1/4 | -17 | 15 1/4 | -18 | 15 3/4 | |
| 4 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | -16 | 14 3/4 | -18 | 15 3/4 | -19 | 16 1/4 | |

| 5" x 5" Square Axle | | | | | | | | | | | |
|--|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | |
| 1 1/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | |
| 1 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | |
| 2 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | |
| 2 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | |
| 3 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | -15 | 14 1/4 | -17 | 15 1/4 | -18 | 15 3/4 | |
| 3 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | -16 | 14 3/4 | -18 | 15 3/4 | -19 | 16 1/4 | |
| 4 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | -17 | 15 1/4 | -19 | 16 1/4 | -20 | 16 3/4 | |
| 4 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | -18 | 15 3/4 | -20 | 16 3/4 | -21 | 17 1/4 | |

| 4" x 6" Rectangle Axle | | | | | | | | | | | |
|--|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | |
| 1 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | |
| 1 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | |
| 2 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | -15 | 14 1/4 | -17 | 15 1/4 | -18 | 15 3/4 | |
| 2 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | -16 | 14 3/4 | -18 | 15 3/4 | -19 | 16 1/4 | |
| 3 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | -17 | 15 1/4 | -19 | 16 1/4 | -20 | 16 3/4 | |
| 3 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | -18 | 15 3/4 | -20 | 16 3/4 | -21 | 17 1/4 | |
| 4 1/4 | -17 | 15 1/4 | -18 | 15 3/4 | -19 | 16 1/4 | -21 | 17 1/4 | -22 | 17 3/4 | |
| 4 3/4 | -18 | 15 3/4 | -19 | 16 1/4 | -20 | 16 3/4 | -22 | 17 3/4 | -23 | 18 1/4 | |

Chart D - Bottom Plate

| Axle Size | Part No. |
|-----------------------------|----------|
| 5" Rd. w/ 7/8" Dia. U-Bolts | 71000 |
| 5" Rd. w/ 3/4" Dia. U-Bolts | 16297-01 |
| 5" x 5" Square | 7747-01 |
| 4" x 6" Rect. | 7746-00 |

Chart E - No-Hop Option

| 5" Round Axle | | | | | | | | | | | |
|---|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| 16300 - See Below, Opt. 3/4 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -06 | 9 3/4 | -07 | 10 1/4 | -08 | 10 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | |
| 1 1/4 | -07 | 10 1/4 | -08 | 10 3/4 | -09 | 11 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | |
| 1 3/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | |
| 2 1/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | |

| Axle Group | | | | |
|------------|----------------------------|----------------------------|----------|----------|
| Seat | Radius Rod | Attach Fitting | | |
| Height | (w/ Std. 7/8 Dia. U-Bolts) | (w/ Opt. 3/4 Dia. U-Bolts) | Seat | |
| 3/4 | 16398-06 | 10775-00 | 16308-01 | 22215-01 |
| 1 1/4 | 16398-06 | 10775-00 | 16308-01 | 22215-02 |
| 1 3/4 | 16398-06 | 10775-00 | 16308-01 | 22215-03 |
| 2 1/4 | 16398-06 | 10775-00 | 16308-01 | 22215-04 |

| 5" x 5" Square Axle | | | | | | | | | | | |
|--|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | |
| 1 1/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | |
| 1 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | |
| 2 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | |

| Axle Group | | | |
|-------------|------------|----------------|----------|
| Seat Height | Radius Rod | Attach Fitting | Seat |
| 3/4 | 16398-04 | 7738-01 | 22226-01 |
| 1 1/4 | 16398-04 | 7738-01 | 22226-02 |
| 1 3/4 | 16398-04 | 7738-01 | 22226-03 |
| 2 1/4 | 16398-04 | 7738-01 | 22226-04 |

| 4" x 6" Rectangle Axle | | | | | | | | | | | |
|--|-------------|--------|----------|--------|------------|--------|------------|--------|------------|--------|--|
| U-Bolts | | | | | | | | | | | |
| 7040 - See Below, Std. 7/8 Dia. x 3 Rd. x See Length Below | | | | | | | | | | | |
| Seat | Single Leaf | | Two Leaf | | Three Leaf | | Seven Leaf | | Eight Leaf | | |
| Height | Spring | Length | Spring* | Length | Spring** | Length | Spring | Length | Spring | Length | |
| 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 | |
| 1 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 | |
| 1 3/4 | -12 | 12 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -16 | 14 3/4 | -17 | 15 1/4 | |
| 2 1/4 | -13 | 13 1/4 | -14 | 13 3/4 | -15 | 14 1/4 | -17 | 15 1/4 | -18 | 15 3/4 | |

| Axle Group | | | |
|-------------|------------|----------------|----------|
| Seat Height | Radius Rod | Attach Fitting | Seat |
| 3/4 | 16398-04 | 7738-00 | 22228-01 |
| 1 1/4 | 16398-04 | 7738-00 | 22228-02 |
| 1 3/4 | 16398-04 | 7738-00 | 22228-03 |
| 2 1/4 | 16398-04 | 7738-00 | 22228-04 |

* When using the 16710 -01 2-stage spring, use the same length U-bolt as used with 365-00 and 365-01 springs.

** When using 365-00, 365-01 springs or 34-00 Hi-nuts, use 1/2" longer U-bolts.

H-9700 and CH-9700 US (Underslung)

Bill of Materials

| Item | Part No. | Quantity | | Description |
|------|-------------------------|---------------------------------|-------------|---|
| | | Single Axle | Tandem Axle | |
| 1 | See Chart A, Below | 2 | 2 | Front Spring Hanger |
| 2 | See Chart A, Below | 0 | 2 | Center Rocker/Rocker Hanger Assembly |
| 3 | See Chart A, Below | 2 | 2 | Rear Spring Hanger Assembly |
| 4 | 719-02 | 4 | 8 | Radius Rod Bolt - Hex Bolt - 1 - 14 UNS x 5" |
| 5 | 16398-04 | 1 | 2 | Radius Rod w/ Bushing - 19.25 LG |
| 6 | 10562-00 | 4 | 8 | Flange Locknut - 1 - 14 UNS, GRF, Phosphate & Oil |
| 7 | See Chart F, Page 12 | 4 | 8 | U-Bolt - Standard 7/8" U-Bolt |
| 8 | See Chart G, Page 12 | 2 | 4 | Spring Seat - 5" Round (Shown) |
| 9 | 17350-02 | 2 | 4 | Galvanized Liner ❶ |
| 10 | See Spring Appendix | 2 | 4 | Spring Assembly - Standard 3-Leaf (Shown) |
| 11 | 706-01 | 2 | 4 | Bottom Plate Att. - Cast |
| 12 | 35-00 | 8 | 16 | Washer - PL, 15/16 ID x 1 3/4 OD (For Std. 7/8" U-Bolt) |
| 13 | 3404 | 8 | 16 | Hex Nut - 7/8" - 14 UNF (For Std. 7/8" U-Bolt) |
| 14 | 715-00 | 1 | 2 | Non-Adj. Radius Rod w/ Rubber Bushing |
| 15 | 7717-01 | 2 per Hanger | | Washer Bushing - Replaces Sideplate Washer 10561-00 on Fabricated (H) Front and Center Hangers Only |
| 16 | 722-00 | 2 per Rad. Rod | | Radius Rod Bushing Only - 3" LG |
| 17 | 37-03 | 2 per Rocker 1 per Rear Hgr. | | Hex Lock Nut - 5/8" - 18 UNF, GRB (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 18 | 756-00 | 2 per Rocker 1 per Rear Hgr. | | Sleeve Spacer - 3/4 OD x 18 GA x 3 1/4 LG (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 19 | 759-00 | 2 per Rocker 1 per Rear Hgr. | | Hex Bolt - 5/8" - 18 UNF x 4 1/2 LG, GR2 (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 20 | 11154-00 | 1 per Rocker | | Hex Lock Nut - 1 1/8" - 7 UNC, GR5 |
| 21 | 837-00 | 2 per Rocker | | Washer - 1/8" x 1 1/4 ID x 2 1/4 OD |
| 22 | 16158-01 or 17784-01 | 0 | 2 | Fabricated Rocker Assembly w/ Rubber Bushing (Shown) |
| | | 0 | 2 | Cast Rocker Assembly w/ Rubber Bushing (Not Shown) |
| 23 | 18723-01 | 1 per Rocker | | Rocker Bushing Only - Rubber |
| 24 | 16150-01 | 1 per Rocker | | Hex Cap Screw - 1 1/8" - 7 UNC x 6.62" LG, GR5 |
| 25 | 16353-01 | 1 per Rocker | | Rocker Replacement Bolt Kit Consisting of 1 ea. 16150-01, 2 ea. 837-00, 1 ea. 11154-00, 2 ea. 759-00, 2 ea. 756-00 and 2 ea. 37-03 |

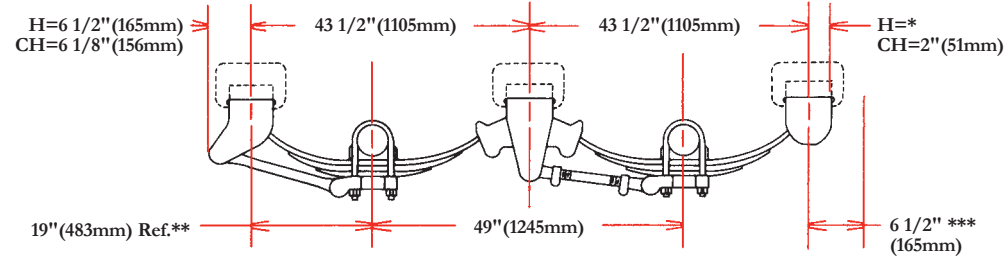
Chart A - Hanger: Fabricated (H) and Cast (CH) Hangers

| Description | Part No. | Hanger Configuration | | | | | | |
|--------------------------------|----------|----------------------|--------------------------|----------------|--------------------------|----------------------|----------------------|--|
| | | Str/mt | Un/mt | Un/mt (I-beam) | Si/mt | Fl/mt/wo | Fl/mt/bo | |
| Front Hgr., Fab. (H) | 7701- | -01 | 20728-01 | 16481-01 | L 20729-01 R 20730-01 | L-05 R-06 | L-07 R-08 | |
| Front Hgr., Cast (CH) | | 702-01 | L 16291-03 R 16291-04 | NA | L 16291-03 R 16291-04 | L 702-09 R 702-10 | L 702-11 R 702-12 | |
| Rocker & Hgr. Assy., Fab. (H) | 16319- | -01 | -02 | -02 | -04 | -08 | -07 | |
| Rocker & Hgr. Assy., Cast (CH) | 16319- | -51 | -52 | -52 | -52 | -58 | -57 | |
| Rocker Hgr. Only, Fab. (H) | | 16169-01 | 16171-01 | 16171-01 | 16175-01 | 16179-01 | 16178-01 | |
| Rocker Hgr. Only, Cast (CH) | | 16196-03 | 16197-03 | 16197-03 | 16197-03 | 16199-05 | 16199-03 | |
| Rear Hgr. Assy., Fab. (H) | 7703- | -01 | 20732-01 | 16483-01 | L 20733-01 R 20734-01 | L-05 R-06 | L-07 R-08 | |
| Rear Hgr. Assy., Cast (CH) | | 712-01 | L 16293-01 R 16293-02 | NA | L 16293-01 R 16293-02 | L 712-09 R 712-10 | L 712-11 R 712-12 | |

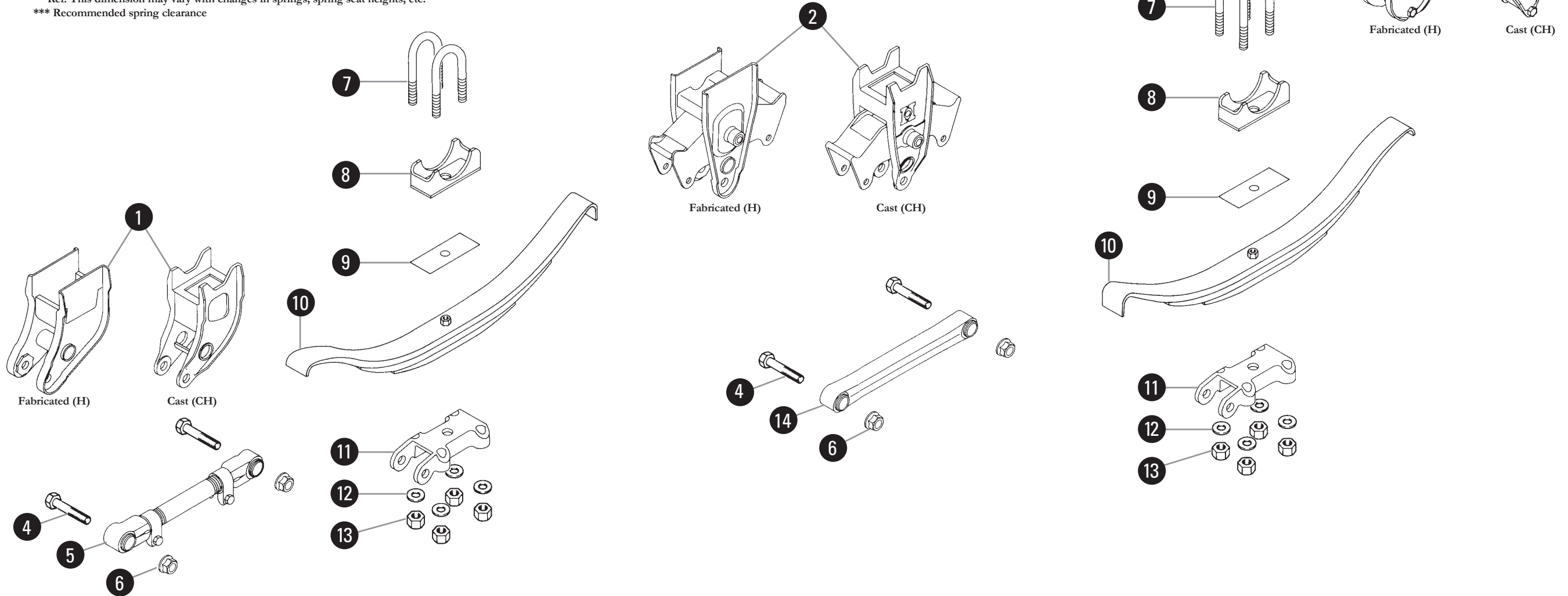
❶ Galvanized liners are required on the tension (top) side of each plate when taper (i.e., single, two and three leaf) springs are utilized. One spring liner per spring (for top leaf) will be shipped loose from Hutchens or spring vendor. Liners are not required on flat plate (seven or eight leaf) springs.



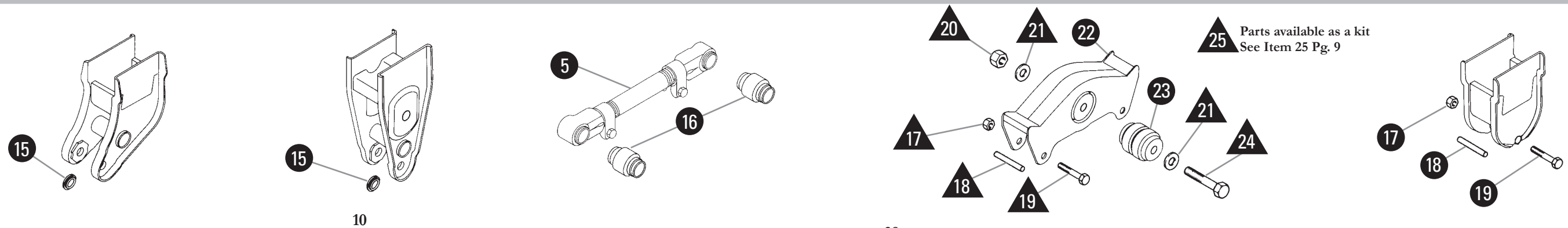
H-9700/CH-9700 US



* Str/mt = $3\frac{1}{2}'' (89\text{mm})$, Un/mt & Si/mt = $3\frac{7}{8}'' (99\text{mm})$, Fl/mt = $5\frac{1}{2}'' (140\text{mm})$
 ** Ref: This dimension may vary with changes in springs, spring seat heights, etc.
 *** Recommended spring clearance



Replacement Parts



H-9700 and CH-9700 US

Chart F - U-Bolt

| 5" Round Axle | | | | | | | | | | |
|--|--------------------|--------|------------------|--------|---------------------|--------|-------------------|--------|-------------------|--------|
| U-Bolts | | | | | | | | | | |
| 7816 – See Below, Std. 7/8 Dia. x 5 Rd. x See Length Below | | | | | | | | | | |
| Seat Height | Single Leaf Spring | Length | Two Leaf Spring* | Length | Three Leaf Spring** | Length | Seven Leaf Spring | Length | Eight Leaf Spring | Length |
| 3/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 |
| 1 1/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 |
| 1 3/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 |
| 2 1/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 |

| 5" x 5" Square Axle | | | | | | | | | | |
|--|--------------------|--------|------------------|--------|---------------------|--------|-------------------|--------|-------------------|--------|
| U-Bolts | | | | | | | | | | |
| 7840 – See Below, Std. 7/8 Dia. x 5 Sq. x See Length Below | | | | | | | | | | |
| Seat Height | Single Leaf Spring | Length | Two Leaf Spring* | Length | Three Leaf Spring** | Length | Seven Leaf Spring | Length | Eight Leaf Spring | Length |
| 3/4 | -04 | 10 3/4 | -05 | 11 1/4 | -06 | 11 3/4 | -08 | 12 3/4 | -09 | 13 1/4 |
| 1 1/4 | -05 | 11 1/4 | -06 | 11 3/4 | -07 | 12 1/4 | -09 | 13 1/4 | -10 | 13 3/4 |
| 1 3/4 | -06 | 11 3/4 | -07 | 12 1/4 | -08 | 12 3/4 | -10 | 13 3/4 | -11 | 14 1/4 |
| 2 1/4 | -07 | 12 1/4 | -08 | 12 3/4 | -09 | 13 1/4 | -11 | 14 1/4 | -12 | 14 3/4 |

Chart G - Spring Seat

| Seat Height | | 3/4" | 1 1/4" | 1 3/4" | 2 1/4" | 2 3/4" | 3 1/4" | 3 3/4" | 4 1/4" | 4 3/4" |
|----------------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|
| 5" Round | 22215- | -01 | -02 | -03 | -04 | NR | — | — | — | — |
| 5" x 5" Square | 22226- | -01 | -02 | -03 | -04 | NR | — | — | — | — |

* When using the 16710-01 2-stage spring, use the same length U-bolt as used with 365-00 and 365-01 springs.

** When using 365-00, 365-01 springs or 34-00 Hi-nuts, use 1/2" longer U-bolts.

H-9700 and CH-9700 w/ Inv. U-Bolts

Bill of Materials

| Item | Part No. | Quantity | | Description |
|------|-------------------------|---------------------------------|-------------|---|
| | | Single Axle | Tandem Axle | |
| 1 | See Chart A, Below | 2 | 2 | Front Spring Hanger |
| 2 | See Chart A, Below | 0 | 2 | Center Rocker/Rocker Hanger Assembly |
| 3 | See Chart A, Below | 2 | 2 | Rear Spring Hanger Assembly |
| 4 | 719-02 | 4 | 8 | Radius Rod Bolt - Hex Bolt - 1 - 14 UNS x 5" |
| 5 | 16398-04 | 1 | 2 | Radius Rod w/ Bushing - 19.25 LG |
| 6 | 10562-00 | 4 | 8 | Flange Locknut - 1 - 14 UNS, GRF, Phosphate & Oil |
| 7 | 34-04 or 16303-01 | 8 8 | 16 16 | Hex Nut - 7/8" - 14 UNF (For Std. 7/8" U-Bolt Shown) Hex Nut - 3/4" - 16 UNF (For Optional 3/4" U-Bolt) |
| 8 | 35-00 or 817-00 | 8 8 | 16 16 | Washer - PL, 15/16 ID x 1 3/4 OD (For Std. 7/8" U-Bolt Shown) Washer - 1/8" x 13/16 ID x 1 1/2 OD (For Optional 3/4" U-Bolt) |
| 9 | See Chart H, Page 16 | 2 | 4 | Top Plate |
| 10 | 17350-02 | 2 | 4 | Galvanized Liner ❶ |
| 11 | See Spring Appendix | 2 | 4 | Spring Assembly - Standard 3-Leaf (Shown) |
| 12 | See Chart B, Page 16 | 2 | 4 | Spring Seat - 5" Round (Shown) |
| 13 | See Chart J, Page 16 | 4 | 8 | U-Bolt - Standard 7/8" U-Bolt (Shown) |
| 14 | 715-00 | 1 | 2 | Non-Adj. Radius Rod w/ Rubber Bushing |
| 15 | 7717-01 | 2 per Hanger | | Washer Bushing - Replaces Sideplate Washer 10561-00 on Fabricated (H) Front and Center Hangers Only |
| 16 | 722-00 | 2 per Rad. Rod | | Radius Rod Bushing Only - 3" LG |
| 17 | 37-03 | 2 per Rocker 1 per Rear Hgr. | | Hex Lock Nut - 5/8" - 18 UNF, GRB (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 18 | 756-00 | 2 per Rocker 1 per Rear Hgr. | | Sleeve Spacer - 3/4 OD x 18 GA x 3 1/4 LG (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 19 | 759-00 | 2 per Rocker 1 per Rear Hgr. | | Hex Bolt - 5/8" - 18 UNF x 4 1/2 LG, GR2 (Shipped loose, not part of center rocker & hanger assy. However it is part of the rear hanger assy.) |
| 20 | 11154-00 | 1 per Rocker | | Hex Lock Nut - 1 1/8" - 7 UNC, GR5 |
| 21 | 837-00 | 2 per Rocker | | Washer - 1/8" x 1 1/4 ID x 2 1/4 OD |
| 22 | 16158-01 or 17784-01 | 0 0 | 2 2 | Fabricated Rocker Assembly w/ Rubber Bushing (Shown) Cast Rocker Assembly w/ Rubber Bushing (Not Shown) |
| 23 | 18723-01 | 1 per Rocker | | Rocker Bushing Only - Rubber |
| 24 | 16150-01 | 1 per Rocker | | Hex Cap Screw - 1 1/8" - 7 UNC x 6.62" LG, GR5 |
| 25 | 16353-01 | 1 per Rocker | | Rocker Replacement Bolt Kit Consisting of 1 ea. 16150-01, 2 ea. 837-00, 1 ea. 11154-00, 2 ea. 759-00, 2 ea. 756-00 and 2 ea. 37-03 |

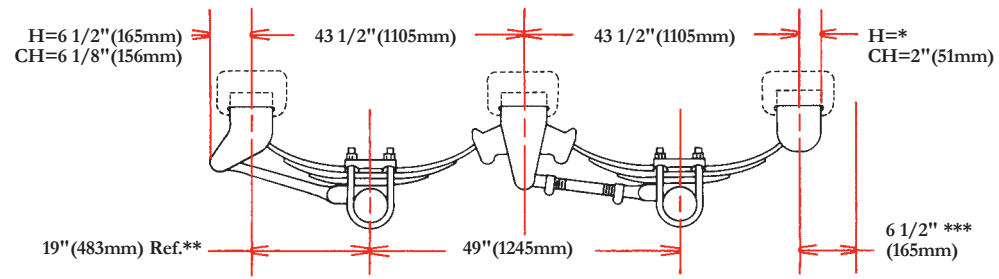
Chart A - Hanger: Fabricated (H) and Cast (CH) Hangers

| Description | Part No. | Hanger Configuration | | | | | | |
|--------------------------------|----------|----------------------|--------------------------|----------------|--------------------------|----------------------|----------------------|--|
| | | Str/mt | Un/mt | Un/mt (I-beam) | Si/mt | Fl/mt/wo | Fl/mt/bo | |
| Front Hgr., Fab. (H) | 7701- | -01 | 20728-01 | 16481-01 | L 20729-01 R 20730-01 | L-05 R-06 | L-07 R-08 | |
| Front Hgr., Cast (CH) | | 702-01 | L 16291-03 R 16291-04 | NA | L 16291-03 R 16291-04 | L 702-09 R 702-10 | L 702-11 R 702-12 | |
| Rocker & Hgr. Assy., Fab. (H) | 16319- | -01 | -02 | -02 | -04 | -08 | -07 | |
| Rocker & Hgr. Assy., Cast (CH) | 16319- | -51 | -52 | -52 | -52 | -58 | -57 | |
| Rocker Hgr. Only, Fab. (H) | | 16169-01 | 16171-01 | 16171-01 | 16175-01 | 16179-01 | 16178-01 | |
| Rocker Hgr. Only, Cast (CH) | | 16196-03 | 16197-03 | 16197-03 | 16197-03 | 16199-05 | 16199-03 | |
| Rear Hgr. Assy., Fab. (H) | 7703- | -01 | 20732-01 | 16483-01 | L 20733-01 R 20734-01 | L-05 R-06 | L-07 R-08 | |
| Rear Hgr. Assy., Cast (CH) | | 712-01 | L 16293-01 R 16293-02 | NA | L 16293-01 R 16293-02 | L 712-09 R 712-10 | L 712-11 R 712-12 | |

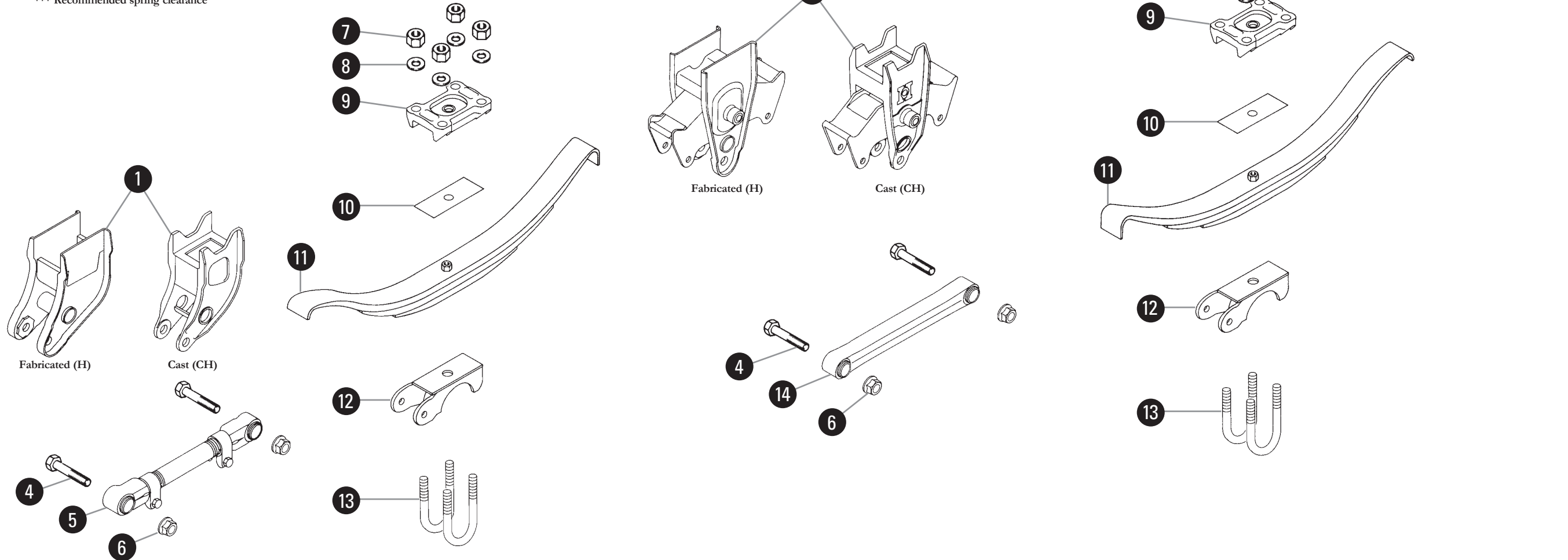
❶ Galvanized liners are required on the tension (top) side of each plate when taper (i.e., single, two and three leaf) springs are utilized. One spring liner per spring (for top leaf) will be shipped loose from Hutchens or spring vendor. Liners are not required on flat plate (seven or eight leaf) springs.



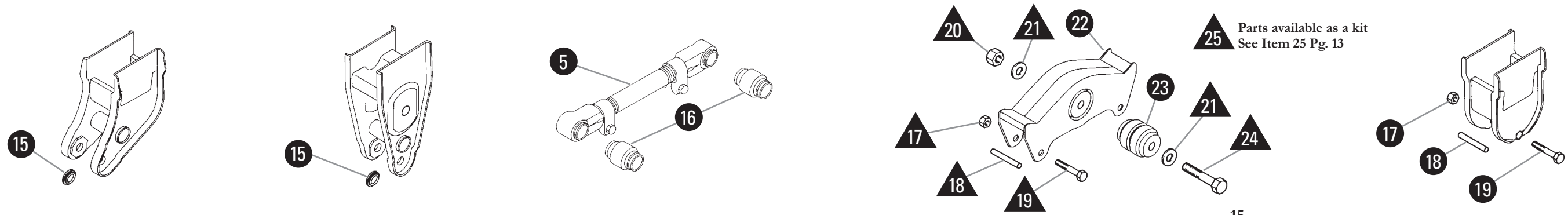
H-9700/CH-9700 w/ Inv. U-Bolts



* Str/mt = 3 1/2" (89mm), Un/mt & Si/mt = 3 7/8" (99mm), Fl/mt = 5 1/2" (140mm)
 ** Ref: This dimension may vary with changes in springs, spring seat heights, etc.
 *** Recommended spring clearance



Replacement Parts



H-9700 and CH-9700 w/ Inv. U-Bolts

Chart B - Spring Seat

| Seat Height | | 3/4" | 1 1/4" | 1 3/4" | 2 1/4" | 2 3/4" | 3 1/4" | 3 3/4" | 4 1/4" | 4 3/4" |
|----------------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|
| 5" Round | 19360- | -01 | -02 | -03 | -04 | -05 | -06 | -07 | -08 | -09 |
| 5" x 5" Square | 19365- | -01 | -02 | -03 | -04 | -05 | -06 | -07 | -08 | -09 |

Chart H - Top Plate

| Axle Size | Part No. |
|----------------|----------|
| 5" Round | 9202-00 |
| 5" x 5" Square | 9202-00 |

Chart J - U-Bolt

| 5" Round Axle | | | | | | | | | | |
|--|--------------------|--------|------------------|--------|---------------------|--------|-------------------|--------|-------------------|--------|
| U-Bolts | | | | | | | | | | |
| 7816 – See Below, Std. 7/8 Dia. x 5 Rd. x See Length Below | | | | | | | | | | |
| Seat Height | Single Leaf Spring | Length | Two Leaf Spring* | Length | Three Leaf Spring** | Length | Seven Leaf Spring | Length | Eight Leaf Spring | Length |
| 3/4 | -05 | 9 1/4 | -06 | 9 3/4 | -07 | 10 1/4 | -09 | 11 1/4 | -10 | 11 3/4 |
| 1 1/4 | -06 | 9 3/4 | -07 | 10 1/4 | -08 | 10 3/4 | -10 | 11 3/4 | -11 | 12 1/4 |
| 1 3/4 | -07 | 10 1/4 | -08 | 10 3/4 | -09 | 11 1/4 | -11 | 12 1/4 | -12 | 12 3/4 |
| 2 1/4 | -08 | 10 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -12 | 12 3/4 | -13 | 13 1/4 |
| 2 3/4 | -09 | 11 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -13 | 13 1/4 | -14 | 13 3/4 |
| 3 1/4 | -10 | 11 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -14 | 13 3/4 | -15 | 14 1/4 |
| 3 3/4 | -11 | 12 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -15 | 14 1/4 | -16 | 14 3/4 |
| 4 1/4 | -12 | 12 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -16 | 14 3/4 | -17 | 15 1/4 |
| 4 3/4 | -13 | 13 1/4 | -14 | 13 3/4 | -15 | 14 1/4 | -17 | 15 1/4 | -18 | 15 3/4 |

| 5" x 5" Square Axle | | | | | | | | | | |
|--|--------------------|--------|------------------|--------|---------------------|--------|-------------------|--------|-------------------|--------|
| U-Bolts | | | | | | | | | | |
| 7840 – See Below, Std. 7/8 Dia. x 5 Sq. x See Length Below | | | | | | | | | | |
| Seat Height | Single Leaf Spring | Length | Two Leaf Spring* | Length | Three Leaf Spring** | Length | Seven Leaf Spring | Length | Eight Leaf Spring | Length |
| 3/4 | -01 | 9 1/4 | -02 | 9 3/4 | -03 | 10 1/4 | -05 | 11 1/4 | -06 | 11 3/4 |
| 1 1/4 | -02 | 9 3/4 | -03 | 10 1/4 | -04 | 10 3/4 | -06 | 11 3/4 | -07 | 12 1/4 |
| 1 3/4 | -03 | 10 1/4 | -04 | 10 3/4 | -05 | 11 1/4 | -07 | 12 1/4 | -08 | 12 3/4 |
| 2 1/4 | -04 | 10 3/4 | -05 | 11 1/4 | -06 | 11 3/4 | -08 | 12 3/4 | -09 | 13 1/4 |
| 2 3/4 | -05 | 11 1/4 | -06 | 11 3/4 | -07 | 12 1/4 | -09 | 13 1/4 | -10 | 13 3/4 |
| 3 1/4 | -06 | 11 3/4 | -07 | 12 1/4 | -08 | 12 3/4 | -10 | 13 3/4 | -11 | 14 1/4 |
| 3 3/4 | -07 | 12 1/4 | -08 | 12 3/4 | -09 | 13 1/4 | -11 | 14 1/4 | -12 | 14 3/4 |
| 4 1/4 | -08 | 12 3/4 | -09 | 13 1/4 | -10 | 13 3/4 | -12 | 14 3/4 | -13 | 15 1/4 |
| 4 3/4 | -09 | 13 1/4 | -10 | 13 3/4 | -11 | 14 1/4 | -13 | 15 1/4 | -14 | 15 3/4 |

* When using the 16710-01 2-stage spring, use the same length U-bolt as used with 365-00 and 365-01 springs.

** When using 365-00, 365-01 springs or 34-00 Hi-nuts, use 1/2" longer U-bolts.

Optional 42 1/2" and 44" Axle Centers

42 1/2" (1080mm) Axle Centers (A/C)

On the Overslung, Underslung and Inverted U-Bolts, H and CH 9700 Series suspensions with 42 1/2" A/C, the only parts not interchangeable with the standard 49" A/C models are as follows:

Bill of Materials

| Item | Part No. | Quantity | | Description |
|------|----------------------|----------|--|---------------------------------------|
| | | Tandem | | |
| 1 | 16398-01 | 2 | | Adj. Radius Rod w/ Bushing - 14.00 LG |
| 2 | See Following Charts | 8 | | U-Bolt |
| 3 | See Following Charts | 4 | | Spring Assembly |
| 5 | 16398-02 | 2 | | Adj. Radius Rod w/ Bushing - 16.00 LG |

Note: On the 42 1/2" A/C models all radius rods are adjustable.

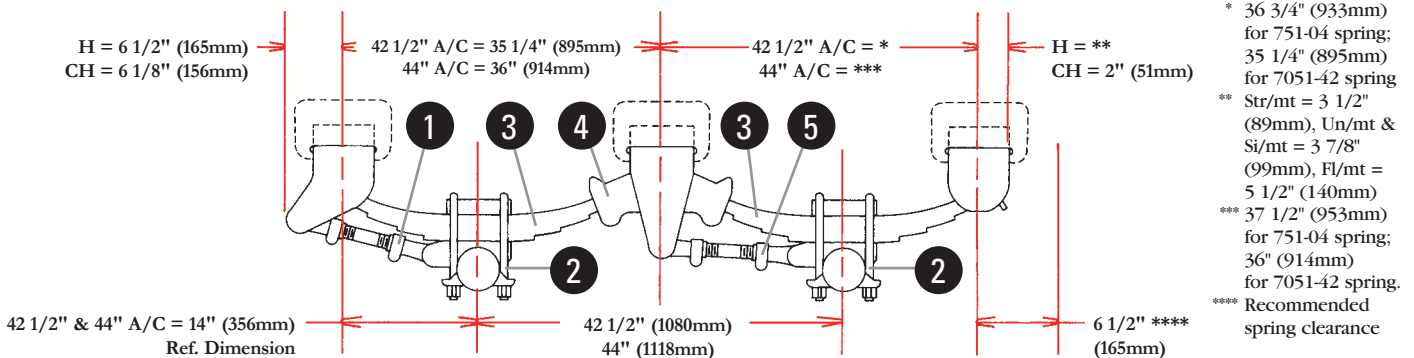
44" (1118mm) Axle Centers (A/C)

On the Overslung, Underslung and Inverted U-Bolts, H and CH 9700 Series suspensions with 44" A/C, the only parts not interchangeable with the standard 49" A/C models are as follows:

Bill of Materials

| Item | Part No. | Quantity | | Description |
|------|----------------------|----------|--|---------------------------------------|
| | | Tandem | | |
| 1 | 16398-01 | 2 | | Adj. Radius Rod w/ Bushing - 14.00 LG |
| 2 | See Following Charts | 8 | | U-Bolt |
| 3 | See Following Charts | 4 | | Spring Assembly |
| 4 | 24711-01 | 2 | | Rocker w/ Rubber Bushing, Fabricated |
| 5 | 16398-03 | 2 | | Adj. Radius Rod w/ Bushing - 16.62 LG |

9700 Overslung (42 1/2" (1080mm) & 44" (1118mm))

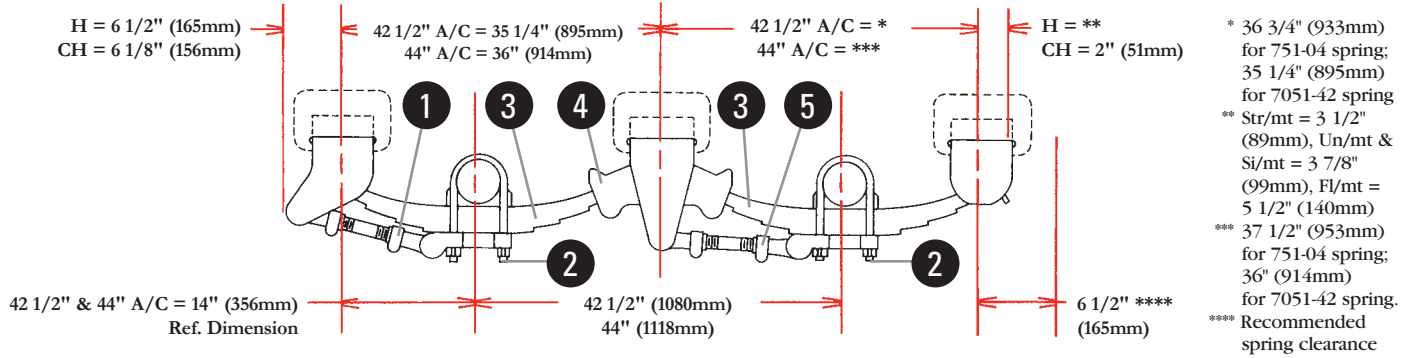


| Mounting Height (See ①) (Inches (mm)) | Axle Size | Spring Assembly | Spring Seat Height (inches) | | | | | | | | |
|--|-----------------------------|------------------------------|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | 3/4 | 1 1/4 | 1 3/4 | 2 1/4 | 2 3/4 | 3 1/4 | 3 3/4 | 4 1/4 | 4 3/4 |
| U-Bolt Part No. (See ②) 7040 - See Chart, (Std. 7/8" Dia. U-Bolt) 16300 - See Chart, (Opt. 3/4" Dia. U-Bolt) | 5" | 751-04 (6 leaf) | 14 1/8 (359) | 14 5/8 (372) | 15 1/8 (384) | 15 5/8 (397) | 16 1/8 (410) | 16 5/8 (422) | 17 1/8 (435) | 17 5/8 (448) | 18 1/8 (461) |
| | | Round 7051-42 (single leaf) | -09 | -10 | -11 | -12 | -13 | -14 | -15 | -16 | -17 |
| | 5" x 5" | 751-04 (6 leaf) | 13 1/4 (337) | 13 3/4 (349) | 14 1/4 (362) | 14 3/4 (375) | 15 1/4 (387) | 15 3/4 (400) | 16 1/4 (413) | 16 3/4 (425) | 17 1/4 (438) |
| | | Square 7051-42 (single leaf) | -06 | -07 | -08 | -09 | -10 | -11 | -12 | -13 | -14 |
| 4" x 6" | 5" x 5" | 751-04 (6 leaf) | 14 1/8 (359) | 14 5/8 (372) | 15 1/8 (384) | 15 5/8 (397) | 16 1/8 (410) | 16 5/8 (422) | 17 1/8 (435) | 17 5/8 (448) | 18 1/8 (461) |
| | | Square 7051-42 (single leaf) | -11 | -12 | -13 | -14 | -15 | -16 | -17 | -18 | -19 |
| | Rect. 7051-42 (single leaf) | 751-04 (6 leaf) | 13 1/4 (337) | 13 3/4 (349) | 14 1/4 (362) | 14 3/4 (375) | 15 1/4 (387) | 15 3/4 (400) | 16 1/4 (413) | 16 3/4 (425) | 17 1/4 (438) |
| | | 751-04 (6 leaf) | 14 5/8 (372) | 15 1/8 (384) | 15 5/8 (397) | 16 1/8 (410) | 16 5/8 (422) | 17 1/8 (435) | 17 5/8 (448) | 18 1/8 (461) | 18 5/8 (473) |
| | | | 13 3/4 (349) | 14 1/4 (362) | 14 3/4 (375) | 15 1/4 (387) | 15 3/4 (400) | 16 1/4 (413) | 16 3/4 (425) | 17 1/4 (438) | 17 3/4 (451) |
| | | | -10 | -11 | -12 | -13 | -14 | -15 | -16 | -17 | -18 |

① For correct mounting height on the 44" A/C models, subtract 1/4" (6mm) from the mounting height shown. All other chart material remains the same.

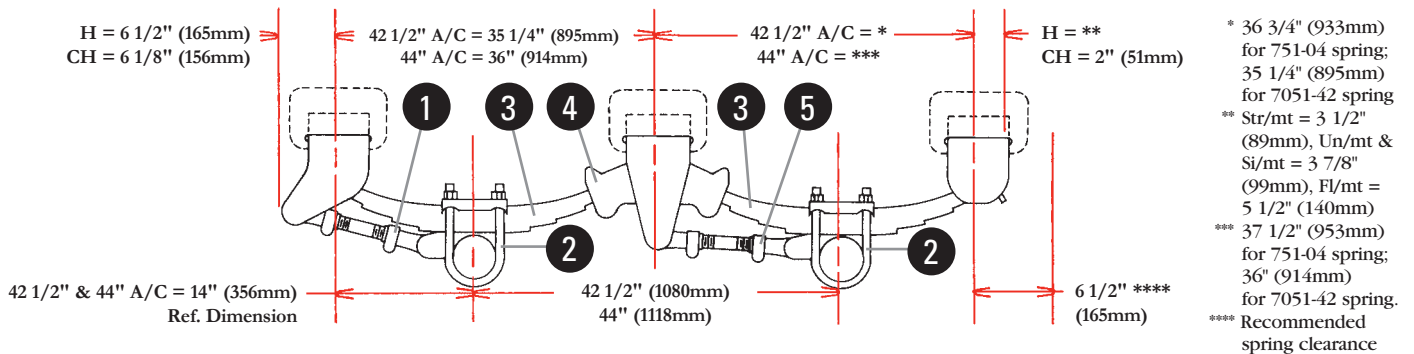
② Whichever U-bolt you choose (the Std. 7/8" or the Opt. 3/4" Dia.) be sure that you are using the correct size U-bolt nuts, washers and bottom plates.

9700 Underslung (42 1/2" (1080mm) & 44" (1118mm))



| Mounting Height (See ①) (Inches (mm)) | Axle Size | Spring Assembly | Spring Seat Height (inches) | | | |
|---------------------------------------|-----------|-----------------|-----------------------------|-------------|-------------|------------|
| | | | 3/4 | 1 1/4 | 1 3/4 | 2 1/4 |
| U-Bolt Part No. | 5" | 751-04 | 4 1/2 (108) | 4 (102) | 3 1/2 (89) | 3 (76) |
| | | (6 leaf) | 7816-11 | 7816-12 | 7816-13 | 7816-14 |
| | Round | 7051-42 | 5 1/4 (133) | 4 3/4 (121) | 4 1/4 (108) | 3 3/4 (95) |
| | | (single leaf) | 7816-08 | 7816-09 | 7816-10 | 7816-11 |
| | 5" x 5" | 751-04 | 4 1/2 (108) | 4 (102) | 3 1/2 (89) | 3 (76) |
| | | (6 leaf) | 7840-07 | 7840-08 | 7840-09 | 7840-10 |
| | Square | 7051-42 | 5 1/4 (133) | 4 3/4 (121) | 4 1/4 (108) | 3 3/4 (95) |
| | | (single leaf) | 7840-04 | 7840-05 | 7840-06 | 7840-07 |

9700 w/ Inv. U-Bolts (42 1/2" (1080mm) & 44" (1118mm))



| Mounting Height (See ①) (Inches (mm)) | Axle Size | Spring Assembly | Spring Seat Height (inches) | | | | | | | | |
|---------------------------------------|-----------|-----------------|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | 3/4 | 1 1/4 | 1 3/4 | 2 1/4 | 2 3/4 | 3 1/4 | 3 3/4 | 4 1/4 | 4 3/4 |
| U-Bolt Part No. | 5" | 751-04 | 14 1/8 (359) | 14 5/8 (372) | 15 1/8 (384) | 15 5/8 (397) | 16 1/8 (410) | 16 5/8 (422) | 17 1/8 (435) | 17 5/8 (448) | 18 1/8 (461) |
| | | (6 leaf) | 7816-08 | 7816-09 | 7816-10 | 7816-11 | 7816-12 | 7816-13 | 7816-14 | 7816-15 | 7816-16 |
| | Round | 7051-42 | 13 1/4 (337) | 13 3/4 (349) | 14 1/4 (362) | 14 3/4 (375) | 15 1/4 (387) | 15 3/4 (400) | 16 1/4 (413) | 16 3/4 (425) | 17 1/4 (438) |
| | | (single leaf) | 7816-05 | 7816-06 | 7816-07 | 7816-08 | 7816-09 | 7816-10 | 7816-11 | 7816-12 | 7816-13 |
| | 5" x 5" | 751-04 | 14 1/8 (359) | 14 5/8 (372) | 15 1/8 (384) | 15 5/8 (397) | 16 1/8 (410) | 16 5/8 (422) | 17 1/8 (435) | 17 5/8 (448) | 18 1/8 (461) |
| | | (6 leaf) | 7840-04 | 7840-05 | 7840-06 | 7840-07 | 7840-08 | 7840-09 | 7840-10 | 7840-11 | 7840-12 |
| | Square | 7051-42 | 13 1/4 (337) | 13 3/4 (349) | 14 1/4 (362) | 14 3/4 (375) | 15 1/4 (387) | 15 3/4 (400) | 16 1/4 (413) | 16 3/4 (425) | 17 1/4 (438) |
| | | (single leaf) | 7840-01 | 7840-02 | 7840-03 | 7840-04 | 7840-05 | 7840-06 | 7840-07 | 7840-08 | 7840-09 |

① For correct mounting height on the 44" A/C models, subtract 1/4" (6mm) from the mounting height shown. All other chart material remains the same.

Numerical Listing of Parts

| Part No. | Description | Pg. # | Part No. | Description | Pg. # |
|----------|---|-------------------------|----------|---|--------------------|
| 34-00 | Hex Nut - Hi, 7/8" - 14 UNF | 8, 12, 16 | 7816-05 | U-Bolt - 7/8 Dia. x 5" Round x 9 1/4 LG | 16, 18 |
| 34-04 | Hex Nut - 7/8" - 14 UNF | 5, 9, 13 | 7816-06 | U-Bolt - 7/8 Dia. x 5" Round x 9 3/4 LG | 16, 18 |
| 35-00 | Washer - PL, 15/16 ID x 1 3/4 OD | 5, 9, 13 | 7816-07 | U-Bolt - 7/8 Dia. x 5" Round x 10 1/4 LG | 16, 18 |
| 37-03 | Hex Locknut - 5/8" - 18 UNF | 5, 9, 13 | 7816-08 | U-Bolt - 7/8 Dia. x 5" Round x 10 3/4 LG | 12, 16, 18 |
| 324-01 | Spring Assembly - 2 Leaf, High Arch | 4, Spring Appendix | 7816-09 | U-Bolt - 7/8 Dia. x 5" Round x 11 1/4 LG | 12, 16, 18 |
| 325-01 | Spring Assembly - 2 Leaf, Medium Arch | 4, Spring Appendix | 7816-10 | U-Bolt - 7/8 Dia. x 5" Round x 11 3/4 LG | 12, 16, 18 |
| 326-01 | Spring Assembly - 2 Leaf, Low Arch | 4, Spring Appendix | 7816-11 | U-Bolt - 7/8 Dia. x 5" Round x 12 1/4 LG | 12, 16, 18 |
| 354-00 | Spring Assembly - 3 Leaf, High Arch | 4, Spring Appendix | 7816-12 | U-Bolt - 7/8 Dia. x 5" Round x 12 3/4 LG | 12, 16, 18 |
| 355-00 | Spring Assembly - 3 Leaf, Medium Arch | 4, Spring Appendix | 7816-13 | U-Bolt - 7/8 Dia. x 5" Round x 13 1/4 LG | 12, 16, 18 |
| 356-00 | Spring Assembly - 3 Leaf, Low Arch | 4, Spring Appendix | 7816-14 | U-Bolt - 7/8 Dia. x 5" Round x 13 3/4 LG | 12, 16, 18 |
| 363-00 | Spring Assembly - 1 Leaf, Low Arch | 4, Spring Appendix | 7816-15 | U-Bolt - 7/8 Dia. x 5" Round x 14 1/4 LG | 12, 16, 18 |
| 365-00 | Spring Assembly - 3 Leaf, High Arch H.D. | 4, Spring Appendix | 7816-16 | U-Bolt - 7/8 Dia. x 5" Round x 14 3/4 LG | 12, 16, 18 |
| 365-01 | Spring Assembly - 3 Leaf, Low Arch H.D. | 4, Spring Appendix | 7816-17 | U-Bolt - 7/8 Dia. x 5" Round x 15 1/4 LG | 16 |
| 702-01 | Front Spring Hanger - Cast, Str/mt | 5, 9, 13 | 7816-18 | U-Bolt - 7/8 Dia. x 5" Round x 15 3/4 LG | 16 |
| 702-09 | Front Spring Hanger - Cast, Fl/mt/wo, Left | 5, 9, 13 | 7840-01 | U-Bolt - 7/8 Dia. x 5" Square x 9 1/4 LG | 16, 18 |
| 702-10 | Front Spring Hanger - Cast, Fl/mt/wo, Right | 5, 9, 13 | 7840-02 | U-Bolt - 7/8 Dia. x 5" Square x 9 3/4 LG | 16, 18 |
| 702-11 | Front Spring Hanger - Cast, Fl/mt/bo, Left | 5, 9, 13 | 7840-03 | U-Bolt - 7/8 Dia. x 5" Square x 10 1/4 LG | 16, 18 |
| 702-12 | Front Spring Hanger - Cast, Fl/mt/bo, Right | 5, 9, 13 | 7840-04 | U-Bolt - 7/8 Dia. x 5" Square x 10 3/4 LG | 12, 16, 18 |
| 706-01 | Bottom Plate - Att., Cast | 9 | 7840-05 | U-Bolt - 7/8 Dia. x 5" Square x 11 1/4 LG | 12, 16, 18 |
| 710-00 | Bottom Plate - U-Bolt, 5" Round | 8 | 7840-06 | U-Bolt - 7/8 Dia. x 5" Square x 11 3/4 LG | 12, 16, 18 |
| 712-01 | Rear Spring Hanger - Cast, Str/mt | 5, 9, 13 | 7840-07 | U-Bolt - 7/8 Dia. x 5" Square x 12 1/4 LG | 12, 16, 18 |
| 712-09 | Rear Spring Hanger - Cast, Fl/mt/wo, Left | 5, 9, 13 | 7840-08 | U-Bolt - 7/8 Dia. x 5" Square x 12 3/4 LG | 12, 16, 18 |
| 712-10 | Rear Spring Hanger - Cast, Fl/mt/wo, Right | 5, 9, 13 | 7840-09 | U-Bolt - 7/8 Dia. x 5" Square x 13 1/4 LG | 12, 16, 18 |
| 712-11 | Rear Spring Hanger - Cast, Fl/mt/bo, Left | 5, 9, 13 | 7840-10 | U-Bolt - 7/8 Dia. x 5" Square x 13 3/4 LG | 12, 16, 18 |
| 712-12 | Rear Spring Hanger - Cast, Fl/mt/bo, Right | 5, 9, 13 | 7840-11 | U-Bolt - 7/8 Dia. x 5" Square x 14 1/4 LG | 12, 16, 18 |
| 715-00 | Non-Adj. Radius Rod w/ Bushing - 19 1/4 LG | 5, 9, 13 | 7840-12 | U-Bolt - 7/8 Dia. x 5" Square x 14 3/4 LG | 12, 16, 18 |
| 719-02 | Radius Rod Bolt - Hex Bolt - 1 - 14 UNS x 5" | 5, 9, 13 | 7840-13 | U-Bolt - 7/8 Dia. x 5" Square x 15 1/4 LG | 16 |
| 722-00 | Radius Rod Bushing - 3 LG | 5, 9, 13 | 7840-14 | U-Bolt - 7/8 Dia. x 5" Square x 15 3/4 LG | 16 |
| 751-01 | Spring Assembly - 7 Leaf, Low Arch | 4, Spring Appendix | 9202-00 | Top Plate - U-Bolt, 5" Round & 5" x 5" Square | 16 |
| 751-04 | Spring Assembly - 6 Leaf, Low Arch, 42 1/2 A/C | 17, 18, Spring Appendix | 10562-00 | Flange Locknut - 1 - 14 UNS, GRF, Phosphate & Oil | 5, 9, 13 |
| 751-05 | Spring Assembly - 7 Leaf, High Arch | 4, Spring Appendix | 10775-00 | Att., Assembly - Radius Rod, 5" Round | 8 |
| 751-06 | Spring Assembly - 7 Leaf, High Arch, Single Axle | 4, Spring Appendix | 11154-00 | Hex Locknut - 1 1/8 - 7 UNC, GR5 | 5, 9, 13 |
| 752-01 | Spring Assembly - 8 Leaf, Low Arch H.D. | 4, Spring Appendix | 16150-01 | Hex Cap Screw - 1 1/8 x 7 x 6.62 LG, GR5 | 5, 9, 13 |
| 752-05 | Spring Assembly - 8 Leaf, High Arch H.D. | 4, Spring Appendix | 16158-01 | Rocker Assy. - Fabricated w/ Rubber Bushing | 5, 9, 13 |
| 752-06 | Spring Assembly - 8 Leaf, High Arch H.D. Single Axle & Widespread | 4, Spring Appendix | 16169-01 | Center Rocker Hanger - Str/mt | 5, 9, 13 |
| 756-00 | Sleeve Spacer - 3/4 OD x 18 GA x 3 1/4" | 5, 9, 13 | 16171-01 | Center Rocker Hanger - Un/mt | 5, 9, 13 |
| 759-00 | Hex Bolt - 5/8" - 18 UNF x 4 1/2", GR2 | 5, 9, 13 | 16175-01 | Center Rocker Hanger - Si/mt | 5, 9, 13 |
| 817-00 | Washer - 1/8" x 13/16 ID x 1 1/2 OD | 5, 13 | 16178-01 | Center Rocker Hanger - Fl/mt/bo | 5, 9, 13 |
| 837-00 | Washer - 1/8" x 1 1/4 ID x 2 1/4 OD | 5, 9, 13 | 16179-01 | Center Rocker Hanger - Fl/mt/wo | 5, 9, 13 |
| 7040-06 | U-Bolt - 7/8 Dia. x 3" Round x 9 3/4 LG | 8, 17 | 16196-03 | Center Rocker Hanger - Cast, Str/mt | 5, 9, 13 |
| 7040-07 | U-Bolt - 7/8 Dia. x 3" Round x 10 1/4 LG | 8, 17 | 16197-03 | Center Rocker Hanger - Cast, Un/mt & Si/mt | 5, 9, 13 |
| 7040-08 | U-Bolt - 7/8 Dia. x 3" Round x 10 3/4 LG | 8, 17 | 16199-03 | Center Rocker Hanger - Cast, Fl/mt/bo | 5, 9, 13 |
| 7040-09 | U-Bolt - 7/8 Dia. x 3" Round x 11 1/4 LG | 8, 17 | 16199-05 | Center Rocker Hanger - Cast, Fl/mt/wo | 5, 9, 13 |
| 7040-10 | U-Bolt - 7/8 Dia. x 3" Round x 11 3/4 LG | 8, 17 | 16291-03 | Front Spring Hanger - Cast, Un/mt & Si/mt, Left | 5, 9, 13 |
| 7040-11 | U-Bolt - 7/8 Dia. x 3" Round x 12 1/4 LG | 8, 17 | 16291-04 | Front Spring Hanger - Cast, Un/mt & Si/mt, Right | 5, 9, 13 |
| 7040-12 | U-Bolt - 7/8 Dia. x 3" Round x 12 3/4 LG | 8, 17 | 16293-01 | Rear Spring Hanger - Cast, Un/mt & Si/mt, Left | 5, 9, 13 |
| 7040-13 | U-Bolt - 7/8 Dia. x 3" Round x 13 1/4 LG | 8, 17 | 16293-02 | Rear Spring Hanger - Cast, Un/mt & Si/mt, Right | 5, 9, 13 |
| 7040-14 | U-Bolt - 7/8 Dia. x 3" Round x 13 3/4 LG | 8, 17 | 16297-01 | Bottom Plate - 5" Round, 3/4 Dia. U-Bolt | 8 |
| 7040-15 | U-Bolt - 7/8 Dia. x 3" Round x 14 1/4 LG | 8, 17 | 16300-06 | U-Bolt - 3/4 Dia. x 3" Round x 9 3/4 LG | 8, 17 |
| 7040-16 | U-Bolt - 7/8 Dia. x 3" Round x 14 3/4 LG | 8, 17 | 16300-07 | U-Bolt - 3/4 Dia. x 3" Round x 10 1/4 LG | 8, 17 |
| 7040-17 | U-Bolt - 7/8 Dia. x 3" Round x 15 1/4 LG | 8, 17 | 16300-08 | U-Bolt - 3/4 Dia. x 3" Round x 10 3/4 LG | 8, 17 |
| 7040-18 | U-Bolt - 7/8 Dia. x 3" Round x 15 3/4 LG | 8, 17 | 16300-09 | U-Bolt - 3/4 Dia. x 3" Round x 11 1/4 LG | 8, 17 |
| 7040-19 | U-Bolt - 7/8 Dia. x 3" Round x 16 1/4 LG | 8, 17 | 16300-10 | U-Bolt - 3/4 Dia. x 3" Round x 11 3/4 LG | 8, 17 |
| 7040-20 | U-Bolt - 7/8 Dia. x 3" Round x 16 3/4 LG | 8, 17 | 16300-11 | U-Bolt - 3/4 Dia. x 3" Round x 12 1/4 LG | 8, 17 |
| 7040-21 | U-Bolt - 7/8 Dia. x 3" Round x 17 1/4 LG | 8, 17 | 16300-12 | U-Bolt - 3/4 Dia. x 3" Round x 12 3/4 LG | 8, 17 |
| 7040-22 | U-Bolt - 7/8 Dia. x 3" Round x 17 3/4 LG | 8 | 16300-13 | U-Bolt - 3/4 Dia. x 3" Round x 13 1/4 LG | 8, 17 |
| 7040-23 | U-Bolt - 7/8 Dia. x 3" Round x 18 1/4 LG | 8 | 16300-14 | U-Bolt - 3/4 Dia. x 3" Round x 13 3/4 LG | 8, 17 |
| 7051-42 | Spring Assembly - 1 Leaf, Low Arch, 42 1/2 A/C | 17, 18, Spring Appendix | 16300-15 | U-Bolt - 3/4 Dia. x 3" Round x 14 1/4 LG | 8, 17 |
| 7701-01 | Front Spring Hanger - Str/mt | 5, 9, 13 | 16300-16 | U-Bolt - 3/4 Dia. x 3" Round x 14 3/4 LG | 8, 17 |
| 7701-05 | Front Spring Hanger - Fl/mt/wo, Left | 5, 9, 13 | 16300-17 | U-Bolt - 3/4 Dia. x 3" Round x 15 1/4 LG | 8, 17 |
| 7701-06 | Front Spring Hanger - Fl/mt/wo, Right | 5, 9, 13 | 16300-18 | U-Bolt - 3/4 Dia. x 3" Round x 15 3/4 LG | 8, 17 |
| 7701-07 | Front Spring Hanger - Fl/mt/bo, Left | 5, 9, 13 | 16300-19 | U-Bolt - 3/4 Dia. x 3" Round x 16 1/4 LG | 8, 17 |
| 7701-08 | Front Spring Hanger - Fl/mt/bo, Right | 5, 9, 13 | 16300-20 | U-Bolt - 3/4 Dia. x 3" Round x 16 3/4 LG | 17 |
| 7703-01 | Rear Spring Hanger - Str/mt | 5, 9, 13 | 16300-21 | U-Bolt - 3/4 Dia. x 3" Round x 17 1/4 LG | 17 |
| 7703-05 | Rear Spring Hanger - Fl/mt/wo, Left | 5, 9, 13 | 16303-01 | Hex Nut - 3/4 - 16 UNF, GR8 | 5, 13 |
| 7703-06 | Rear Spring Hanger - Fl/mt/wo, Right | 5, 9, 13 | 16308-01 | No-Hop Att. Assy. - 5" Round, 3/4 Dia. U-Bolt | 8 |
| 7703-07 | Rear Spring Hanger - Fl/mt/bo, Left | 5, 9, 13 | 16316-01 | Spring Assembly - FRP, Low Arch H.D. | 4, Spring Appendix |
| 7703-08 | Rear Spring Hanger - Fl/mt/bo, Right | 5, 9, 13 | 16319-01 | Center Rocker & Hanger Assembly - Str/mt | 5, 9, 13 |
| 7717-01 | Washer Bushing | 5, 9, 13 | 16319-02 | Center Rocker & Hanger Assembly - Un/mt | 5, 9, 13 |
| 7738-00 | Att. Fitting - Radius Rod, 4" x 6" Rect. | 8 | 16319-04 | Center Rocker & Hanger Assembly - Si/mt | 5, 9, 13 |
| 7738-01 | Att. Fitting - Radius Rod, 5" x 5" Square | 8 | 16319-07 | Center Rocker & Hanger Assembly - Fl/mt/bo | 5, 9, 13 |
| 7746-00 | Bottom Plate - 4" x 6" Rect. | 8 | 16319-08 | Center Rocker & Hanger Assembly - Fl/mt/wo | 5, 9, 13 |
| 7747-01 | Bottom Plate - 5" x 5" Square | 8 | 16319-51 | Center Rocker & Hanger Assembly - Cast, Str/mt | 5, 9, 13 |

| Part No. | Description | Pg. # |
|-----------------|---|--------------------|
| 16319-52 | Center Rocker & Hanger Assembly - Cast, Un/mt & Si/mt | 5, 9, 13 |
| 16319-57 | Center Rocker & Hanger Assembly - Cast, Fl/mt/bo | 5, 9, 13 |
| 16319-58 | Center Rocker & Hanger Assembly - Cast, Fl/mt/wo | 5, 9, 13 |
| 16353-01 | Rocker Replacement Bolt Kit | 5, 9, 13 |
| 16398-01 | Adj. Radius Rod w/ Bushing & NEVER-SEEZ - 14 LG | 17 |
| 16398-02 | Adj. Radius Rod w/ Bushing & NEVER-SEEZ - 16 LG | 17 |
| 16398-03 | Adj. Radius Rod w/ Bushing & NEVER-SEEZ - 16 5/8 LG | 17 |
| 16398-04 | Adj. Radius Rod w/ Bushing & NEVER-SEEZ - 19 1/4 LG | 5, 8, 9, 13 |
| 16398-06 | Adj. Radius Rod w/ Bushing & NEVER-SEEZ - 21 1/2 LG | 8 |
| 16481-01 | Front Spring Hanger - Un/mt, Topless | 5, 9, 13 |
| 16483-01 | Rear Spring Hanger - Un/mt, Topless | 5, 9, 13 |
| 16710-01 | Spring Assembly - 2 Leaf, 2 Stage, Medium Arch | 4, Spring Appendix |
| 16868-01 | Top Plate - Roll Formed | 5 |
| 17350-02 | Galvanized Liner - 3 x 7 1/2 w/ Hole | 5, 9, 13 |
| 17784-01 | Rocker Assembly w/ Rubber Bushing, Cast | 5, 9, 13 |
| 17882-01 | Spring Assembly - 2 Leaf, 2 Stage, Medium Arch | 4, Spring Appendix |
| 18723-01 | Rocker Bushing Assembly - Rubber | 5, 9, 13 |
| 19360-01 | Spring Seat - Att., 5" Round, 3/4 High | 5, 16 |
| 19360-02 | Spring Seat - Att., 5" Round, 1 1/4 High | 5, 16 |
| 19360-03 | Spring Seat - Att., 5" Round, 1 3/4 High | 5, 16 |
| 19360-04 | Spring Seat - Att., 5" Round, 2 1/4 High | 5, 16 |
| 19360-05 | Spring Seat - Att., 5" Round, 2 3/4 High | 5, 16 |
| 19360-06 | Spring Seat - Att., 5" Round, 3 1/4 High | 5, 16 |
| 19360-07 | Spring Seat - Att., 5" Round, 3 3/4 High | 5, 16 |
| 19360-08 | Spring Seat - Att., 5" Round, 4 1/4 High | 5, 16 |
| 19360-09 | Spring Seat - Att., 5" Round, 4 3/4 High | 5, 16 |
| 19364-01 | Spring Seat - Att., 4" x 6" Rect., 3/4 High | 5 |
| 19364-02 | Spring Seat - Att., 4" x 6" Rect., 1 1/4 High | 5 |
| 19364-03 | Spring Seat - Att., 4" x 6" Rect., 1 3/4 High | 5 |
| 19364-04 | Spring Seat - Att., 4" x 6" Rect., 2 1/4 High | 5 |
| 19364-05 | Spring Seat - Att., 4" x 6" Rect., 2 3/4 High | 5 |
| 19364-06 | Spring Seat - Att., 4" x 6" Rect., 3 1/4 High | 5 |
| 19364-07 | Spring Seat - Att., 4" x 6" Rect., 3 3/4 High | 5 |
| 19364-08 | Spring Seat - Att., 4" x 6" Rect., 4 1/4 High | 5 |
| 19364-09 | Spring Seat - Att., 4" x 6" Rect., 4 3/4 High | 5 |
| 19365-01 | Spring Seat - Att., 5" x 5" Square, 3/4 High | 5, 16 |
| 19365-02 | Spring Seat - Att., 5" x 5" Square, 1 1/4 High | 5, 16 |
| 19365-03 | Spring Seat - Att., 5" x 5" Square, 1 3/4 High | 5, 16 |
| 19365-04 | Spring Seat - Att., 5" x 5" Square, 2 1/4 High | 5, 16 |
| 19365-05 | Spring Seat - Att., 5" x 5" Square, 2 3/4 High | 5, 16 |
| 19365-06 | Spring Seat - Att., 5" x 5" Square, 3 1/4 High | 5, 16 |
| 19365-07 | Spring Seat - Att., 5" x 5" Square, 3 3/4 High | 5, 16 |
| 19365-08 | Spring Seat - Att., 5" x 5" Square, 4 1/4 High | 5, 16 |
| 19365-09 | Spring Seat - Att., 5" x 5" Square, 4 3/4 High | 5, 16 |
| 20728-01 | Front Spring Hanger - Un/mt | 5, 9, 13 |
| 20729-01 | Front Spring Hanger - Si/mt, Left | 5, 9, 13 |
| 20730-01 | Front Spring Hanger - Si/mt, Right | 5, 9, 13 |
| 20732-01 | Rear Spring Hanger - Un/mt | 5, 9, 13 |
| 20733-01 | Rear Spring Hanger - Si/mt, Left | 5, 9, 13 |
| 20734-01 | Rear Spring Hanger - Si/mt, Right | 5, 9, 13 |
| 22215-01 | Spring Seat - 5" Round, 3/4 High | 8, 12 |
| 22215-02 | Spring Seat - 5" Round, 1 1/4 High | 8, 12 |
| 22215-03 | Spring Seat - 5" Round, 1 3/4 High | 8, 12 |
| 22215-04 | Spring Seat - 5" Round, 2 1/4 High | 8, 12 |
| 22226-01 | Spring Seat - 5" x 5" Square, 3/4 High | 8, 12 |
| 22226-02 | Spring Seat - 5" x 5" Square, 1 1/4 High | 8, 12 |
| 22226-03 | Spring Seat - 5" x 5" Square, 1 3/4 High | 8, 12 |
| 22226-04 | Spring Seat - 5" x 5" Square, 2 1/4 High | 8, 12 |
| 22228-01 | Spring Seat - 4" x 6" Rect., 3/4 High | 8 |
| 22228-02 | Spring Seat - 4" x 6" Rect., 1 1/4 High | 8 |
| 22228-03 | Spring Seat - 4" x 6" Rect., 1 3/4 High | 8 |
| 22228-04 | Spring Seat - 4" x 6" Rect., 2 1/4 High | 8 |
| 24711-01 | Rocker Assy. - Fabricated w/ Rubber Bushing, 44"/50"/51" A/C | 17 |



Advancing the Practical Application of Suspension Technology

Springfield, MO ■ (800) 654-8824 ■ (417) 862-5012
Fax (417) 862-2317 ■ www.hutchensindustries.com

OMT
 Versions

| Mounting flange | Shaft | Port size | European version | US version | Drain connection | Check valve | Low pressure release | High pressure release | Main type designation |
|-----------------|--------------------|--------------|------------------|------------|------------------|-------------|----------------------|-----------------------|-----------------------|
| Standard flange | Cyl. 40 mm | G 3/4 | ● | | Yes | Yes | | | OMT |
| | Cyl. 1.5 in | 1 1/16-12 UN | | ● | Yes | Yes | | | OMT |
| | Splined 1.5 in | G 3/4 | ● | | Yes | Yes | | | OMT |
| | | 1 1/16-12 UN | | ● | Yes | Yes | | | OMT |
| | Tapered 45 mm | G 3/4 | ● | | Yes | Yes | | | OMT |
| | Tapered 1.75 in | 1 1/16-12 UN | | ● | Yes | Yes | | | OMT |
| P.t.o. | G 3/4 | ● | | Yes | Yes | | | OMT | |
| Wheel | Cyl. 40 mm | G 3/4 | ● | | Yes | Yes | | | OMTW |
| | Tapered 45 mm | G 3/4 | ● | | Yes | Yes | | | OMTW |
| | Tapered 1.75 in | 1 1/16-12 UN | | ● | Yes | Yes | | | OMTW |
| Brake-wheel | Wheel bolt flange | G 3/4 | ● | | Yes | No | ● | | OMT FX |
| | Thread hole flange | G 3/4 | ● | | Yes | No | ● | | OMT FX |
| Brake-standard | Cyl. 40 mm | G 3/4 | ● | | Yes | No | ● | | OMT FL |
| | Splined 1.5 in | G 3/4 | ● | | Yes | No | ● | | OMT FL |
| | Cyl. 40 mm | G 3/4 | ● | | Yes | No | | ● | OMT FH |
| | Splined 1.5 in | G 3/4 | ● | | Yes | No | | ● | OMT FH |
| Short | No output shaft | G 3/4 | ● | | Yes | Yes | | | OMTS |

Function diagram - see page: →

Features available (options) :

- Speed sensor
- Motor with tacho connection
- Viton shaft seal
- Painted
- Ultra short

Code Numbers

| Code Numbers | Displacement [cm ³] | | | | | | Technical data – Page | Shaft loads – Page | Dimensions – Page |
|--------------|---------------------------------|------|------|------|------|------|-----------------------|--------------------|-------------------|
| | 160 | 200 | 250 | 315 | 400 | 500 | | | |
| 151B | 3000 | 3001 | 3002 | 3003 | 3004 | 3005 | 36 | 40 | 49 |
| 151B | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 36 | 40 | 50 |
| 151B | 3006 | 3007 | 3008 | 3009 | 3010 | 3011 | 36 | 40 | 49 |
| 151B | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 36 | 40 | 50 |
| 151B | 3012 | 3013 | 3014 | 3015 | 3016 | 3017 | 36 | 40 | 49 |
| 151B | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 36 | 40 | 50 |
| 151B | 3018 | 3019 | 3020 | 3021 | 3022 | 3023 | 36 | 40 | 49 |
| 151B | 3024 | 3025 | 3026 | 3027 | 3028 | 3029 | 36 | 40 | 51 |
| 151B | 3030 | 3031 | 3032 | 3033 | 3034 | 3035 | 36 | 40 | 51 |
| 151B | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 36 | 40 | 52 |
| 151B | 3207 | 3208 | 3209 | 3210 | 3211 | 3212 | 36 | 41 | 53 |
| 151B | 3200 | 3201 | 3202 | 3203 | 3204 | 3205 | 36 | 41 | 53 |
| 151B | 4000 | 4001 | 4002 | 4003 | 4004 | 4005 | 36 | 41 | 54 |
| 151B | 4007 | 4008 | 4009 | 4010 | 4011 | 4012 | 36 | 41 | 54 |
| 151B | 4021 | 4022 | 4023 | 4024 | 4025 | 4026 | 36 | 41 | 54 |
| 151B | 4028 | 4029 | 4030 | 4031 | 4032 | 4033 | 36 | 41 | 54 |
| 151B | 3036 | 3037 | 3038 | 3039 | 3040 | 3041 | 36 | - | 55 |
| | 42 | 42 | 43 | 43 | 44 | 44 | | | |

Ordering

Add the four digit prefix “151B” to the four digit numbers from the chart for complete code number.

Example:

151B3002 for an OMT 250 with standard flange, cyl. 40 mm shaft and port size G 3/4.

Orders will not be accepted without the four digit prefix.

**Technical data
for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH**

| Type | | OMT OMTW OMTS OMT FX OMT FL OMT FH | OMT OMTW OMTS OMT FX OMT FL OMT FH | OMT OMTW OMTS OMT FX OMT FL OMT FH | OMT OMTW OMTS OMT FX OMT FL OMT FH | OMT OMTW OMTS OMT FX OMT FL OMT FH | OMT OMTW OMTS OMT FX OMT FL OMT FH | |
|---|--|---|---|---|---|---|---|-----------------|
| Motor size | | 160 | 200 | 250 | 315 | 400 | 500 | |
| Geometric displacement | cm ³ [in ³] | 161.1 [9.83] | 201.4 [12.29] | 251.8 [15.37] | 326.3 [19.91] | 410.9 [25.07] | 523.6 [31.95] | |
| Max. speed | min-1 [rpm] | cont. | 625 | 625 | 500 | 380 | 305 | 240 |
| | | int. ¹⁾ | 780 | 750 | 600 | 460 | 365 | 285 |
| Max. torque | Nm [lbf-in] | cont. | 470 [4160] | 590 [5220] | 730 [6460] | 950 [8410] | 1080 [9560] | 1220 [10800] |
| | | int. ¹⁾ | 560 [4960] | 710 [6280] | 880 [7790] | 1140 [10090] | 1260 [11150] | 1370 [12130] |
| Max. output | kW [hp] | cont. | 26.5 [35.5] | 33.5 [44.9] | 33.5 [44.9] | 33.5 [44.9] | 30.0 [40.2] | 26.5 [35.5] |
| | | int. ¹⁾ | 32.0 [42.9] | 40.0 [53.6] | 40.0 [53.6] | 40.0 [53.6] | 35.0 [46.9] | 30.0 [40.2] |
| Max. pressure drop | bar [psi] | cont. | 200 [2900] | 200 [2900] | 200 [2900] | 200 [2900] | 180 [2610] | 160 [2320] |
| | | int. ¹⁾ | 240 [3480] | 240 [3480] | 240 [3480] | 240 [3480] | 210 [3050] | 180 [2610] |
| | | peak ²⁾ | 280 [4060] | 280 [4060] | 280 [4060] | 280 [4060] | 240 [3480] | 210 [3050] |
| Max. oil flow | l/min [USgal/min] | cont. | 100 [26.4] | 125 [33.0] | 125 [33.0] | 125 [33.0] | 125 [33.0] | 125 [33.0] |
| | | int. ¹⁾ | 125 [33.0] | 150 [39.6] | 150 [39.6] | 150 [39.6] | 150 [39.6] | 150 [39.6] |
| Max. starting pressure with unloaded shaft | bar [psi] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | |
| Min. starting torque | at max. press. drop cont. | 340 [3010] | 430 [3810] | 530 [4690] | 740 [6550] | 840 [7430] | 950 [8410] | |
| | at max. press. drop int. ¹⁾ | 410 [3630] | 520 [4600] | 630 [5580] | 890 [7880] | 970 [8590] | 1060 [9380] | |

1) Intermittent operation: the permissible values may occur for max. 10% of every minute.

2) Peak load: the permissible values may occur for max. 1% of every minute.

For max. permissible combination of flow and pressure, see function diagram for actual motor.

**Technical data
 for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH**

| Type | | | Max. inlet pressure | Max. return pressure with drain line |
|---|--------------|--------------------|---------------------|--------------------------------------|
| OMT, OMTW, OMTS, OMT FX, OMT FL, OMT FH | bar [psi] | cont. | 210 [3050] | 140 [2030] |
| | bar [psi] | int. ¹⁾ | 250 [3630] | 175 [2540] |
| | bar [psi] | peak ²⁾ | 300 [4350] | 210 [3050] |

Brake motors

| Type | Max. pressure in drain line ³⁾ | Holding torque ⁴⁾ | Brake-release pressure ³⁾ | Max pressure in brake line |
|-------------------|---|------------------------------|--------------------------------------|----------------------------|
| OMT FX, OMT FL | 5 bar [70 psi] | 1200 Nm [10620 lbf·in] | 12 bar [170 psi] | 30 bar [440 psi] |
| OMT FH | 5 bar [70 psi] | 1200 Nm [10620 lbf·in] | 30 bar [440 psi] | 280 bar [4060 psi] |

1) Intermittent operation: the permissible values may occur for max. 10% of every minute.

2) Peak load: The permissible values may occur for max. 1% of every minute.

3) Brake motors must always have a drain line. The brake-release pressure is the difference between the pressure in the brake line and the pressure in the drain line.

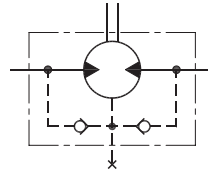
4) For the supply of motors with holding torques higher than those stated, please contact the Sauer-Danfoss Sales Organization.

For max. permissible combination of flow and pressure, see function diagram for actual motor.

Max. Permissible Shaft Seal Pressure

OMT with check valves and without use of drain connection:

The pressure on the shaft seal never exceeds the pressure in the return line



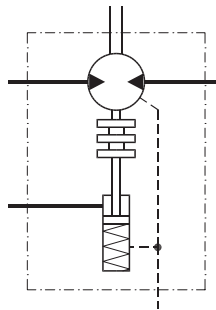
151-320.10

OMT with check valves and with drain connection:

The shaft seal pressure equals the pressure on the drain line.

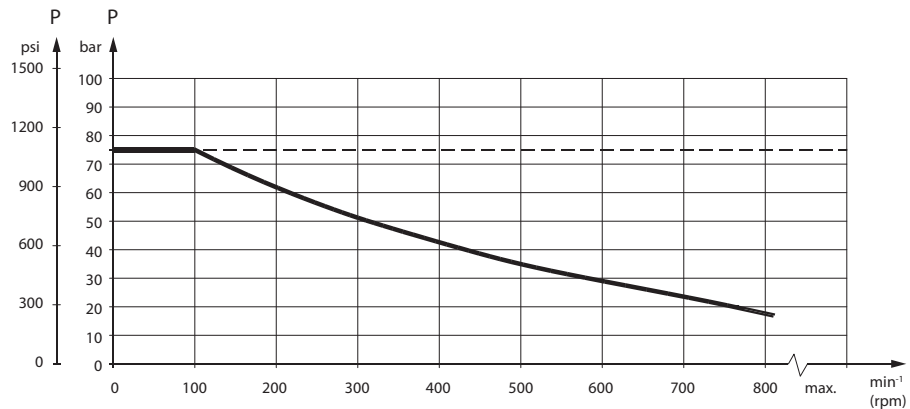
OMT FX, OMT FL and OMT FH must always be fitted with drain line.

Max. pressure in drain line is 5 bar [75 psi]



151-1405.10

Max. return pressure without drain line or max. pressure in the drain line

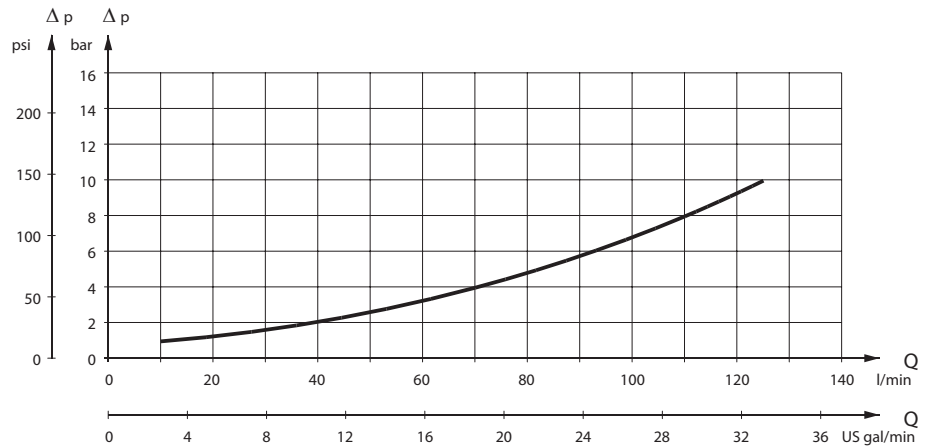


151-1674.10

----- Intermittent operation: the permissible values may occur for max. 10% of every minute.

———— Continuous operation

Pressure Drop in Motor



151-1409.10

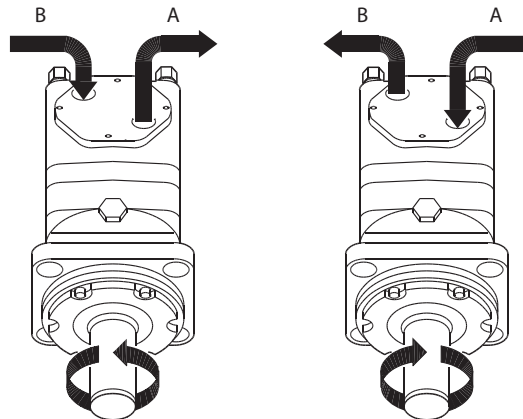
The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm²/s [165 SUS]

Oil Flow in Drain Line

The table shows the max. oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi].

| Pressure drop bar [psi] | Viscosity mm ² /s [SUS] | Oil flow in drain line l/min [US gal/min] |
|-------------------------------|--|---|
| 140 [2030] | 20 [100] | 2.5 [0.66] |
| | 35 [165] | 1.5 [0.40] |
| 210 [3050] | 20 [100] | 5.0 [1.32] |
| | 35 [165] | 3.0 [0.79] |

Direction of Shaft Rotation

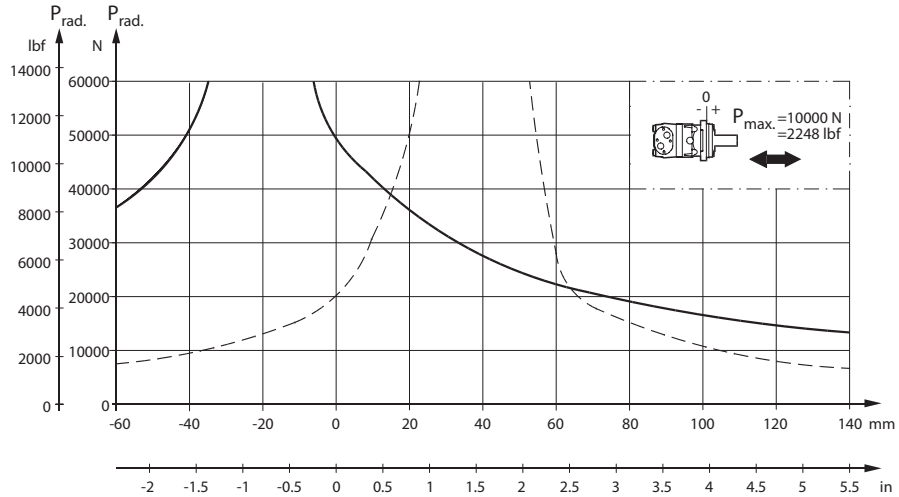


151-1050.10

**Permissible Shaft Loads
 for OMT**

Mounting flange:
 Standard

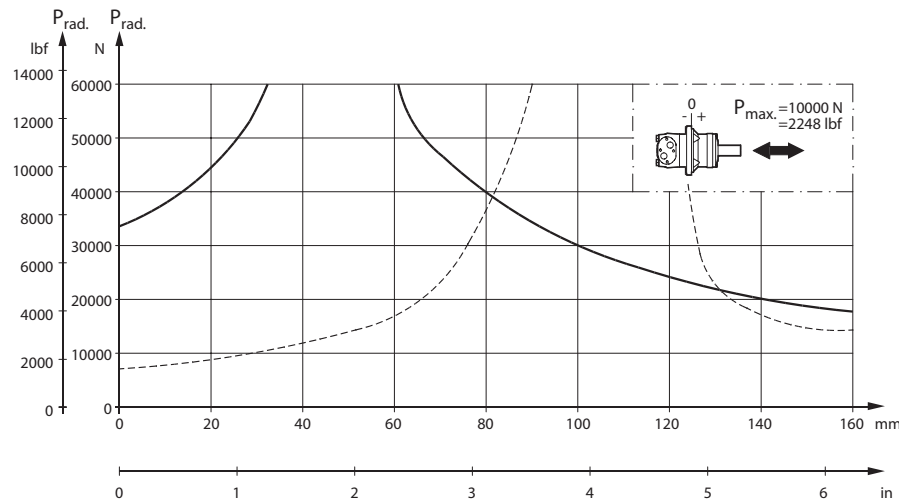
Shaft:
 All shaft types



151-1967.10

Mounting flange:
 Wheel

Shaft:
 All shaft types



151-1970.10

The output shaft runs in tapered roller bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

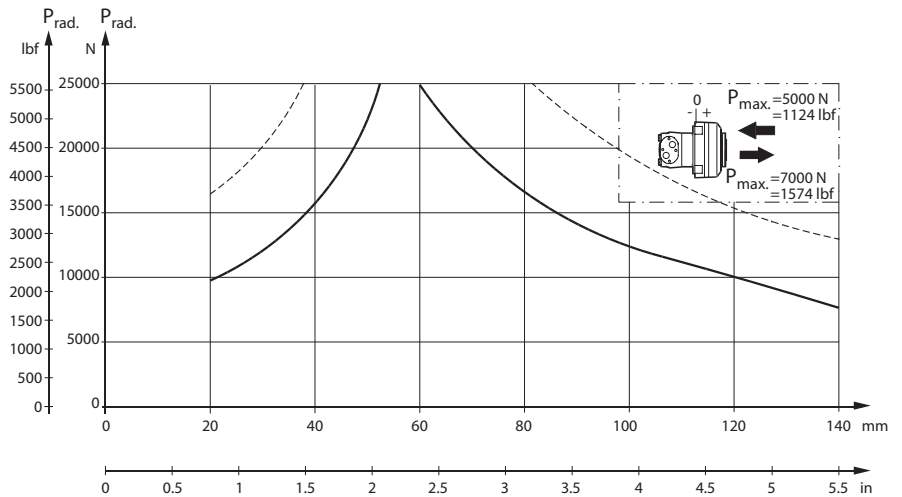
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

**Permissible Shaft Loads
 for OMT**

**Mounting flange:
 Brake-wheel**

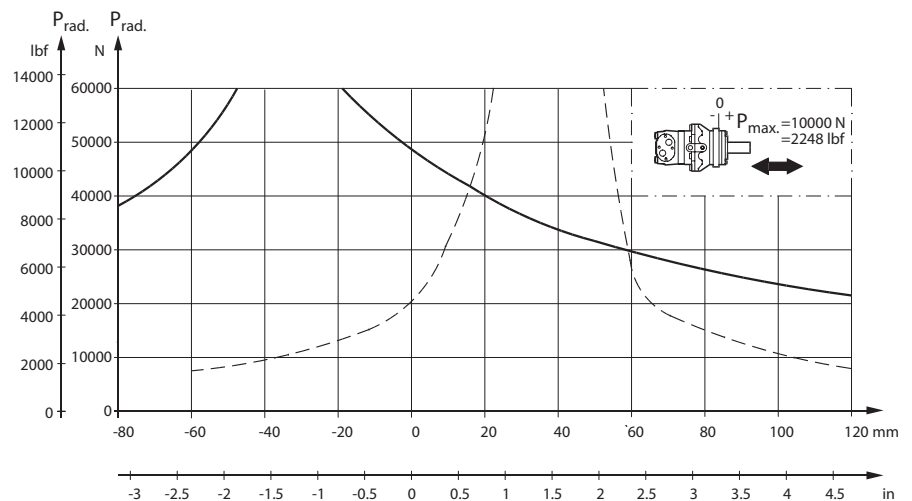
**Shaft:
 All shaft types**



151-1966.10

**Mounting flange:
 Brake-standard**

**Shaft:
 All shaft types**



151-1968.10

The output shaft runs in tapered roller bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

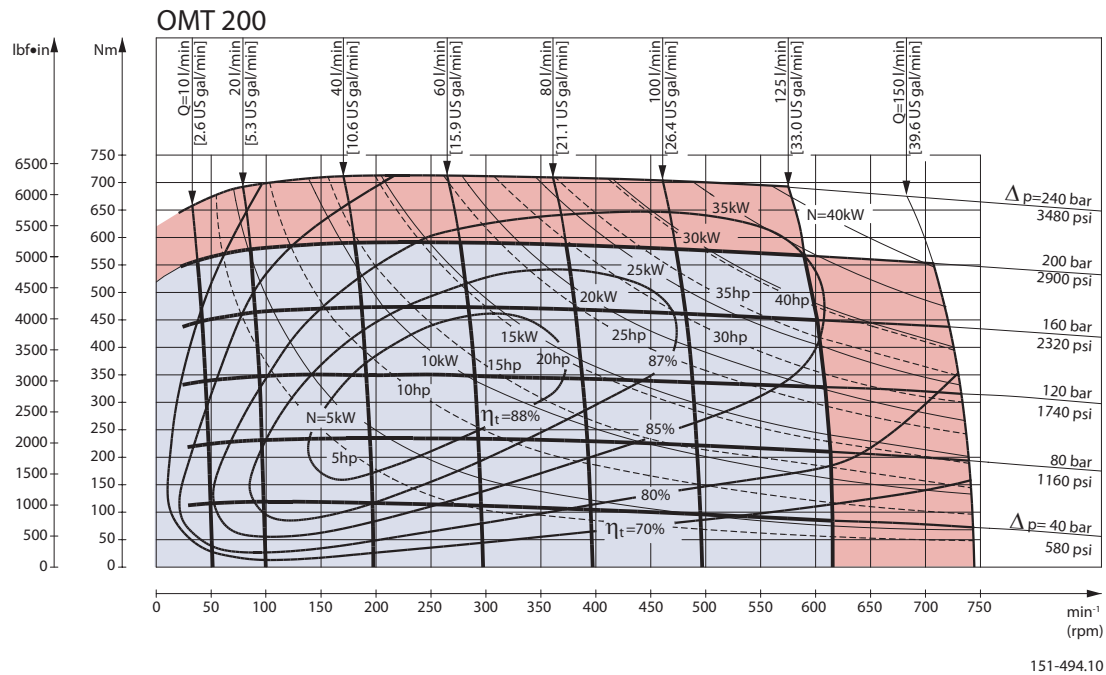
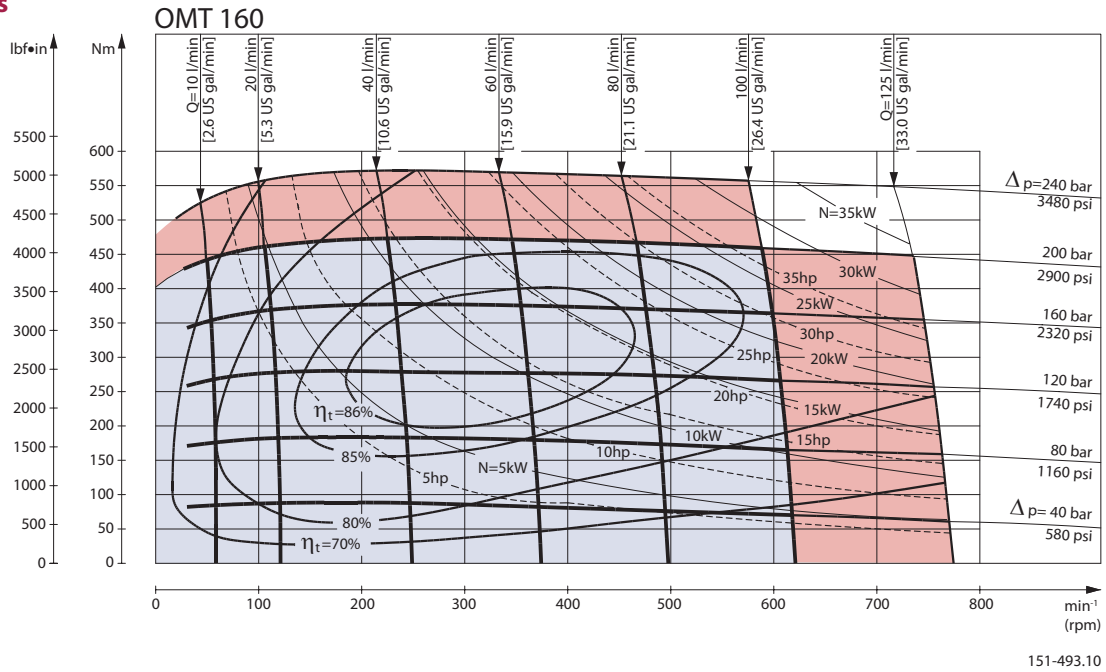
The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

Function Diagrams

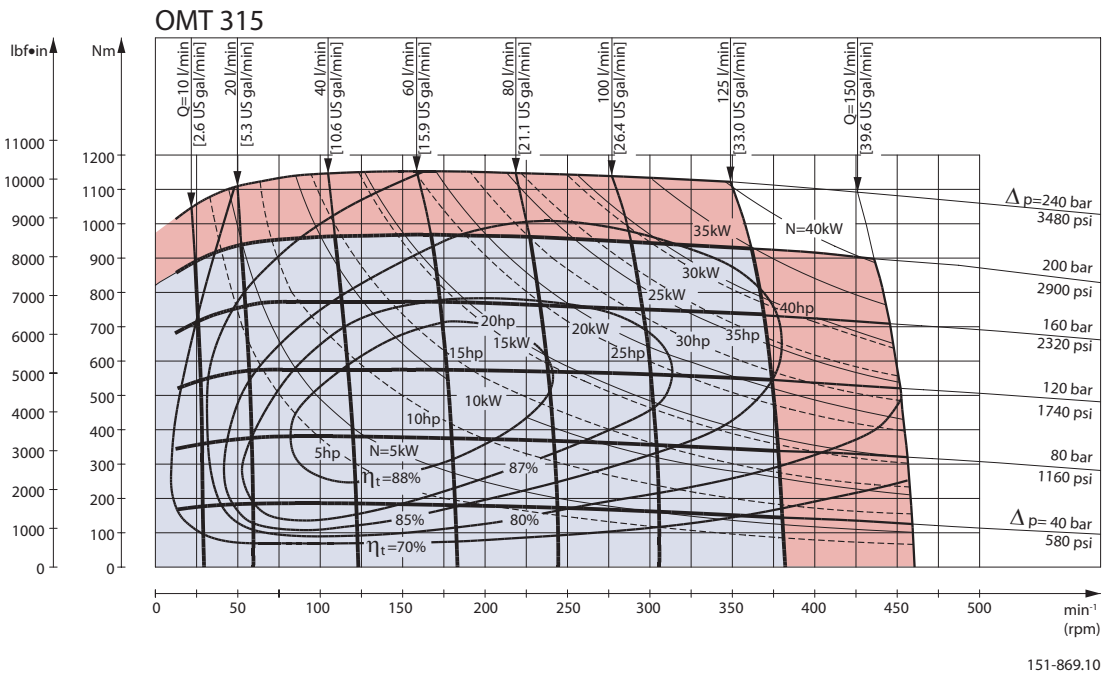
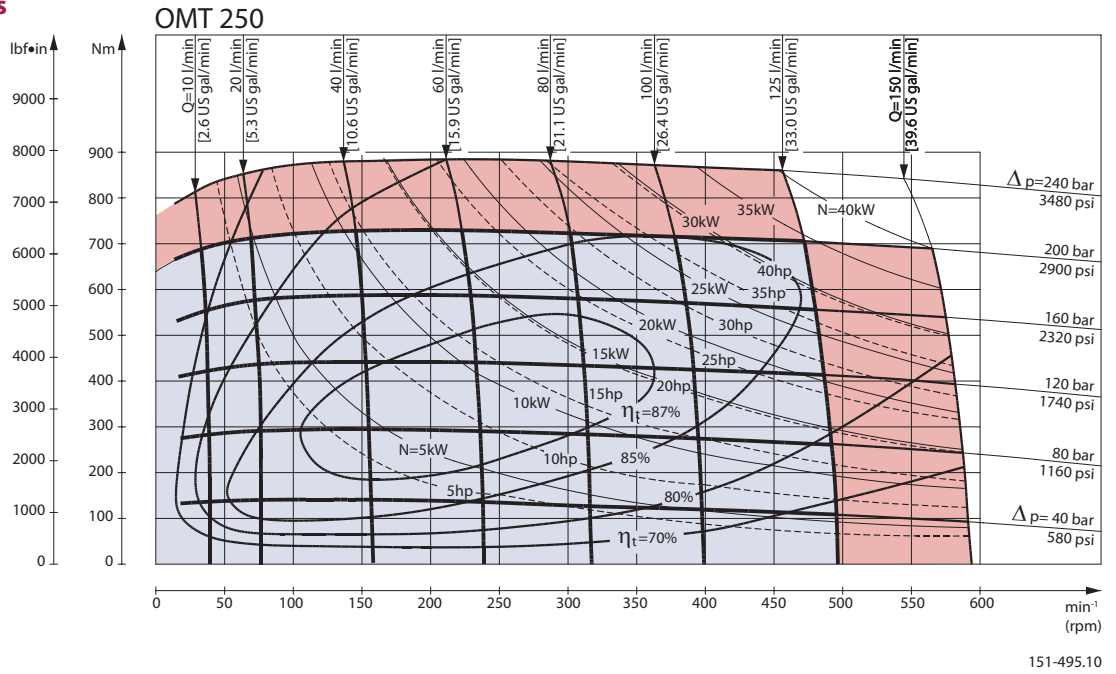


Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

Intermittent pressure drop and oil flow must not occur simultaneously.

Function Diagrams

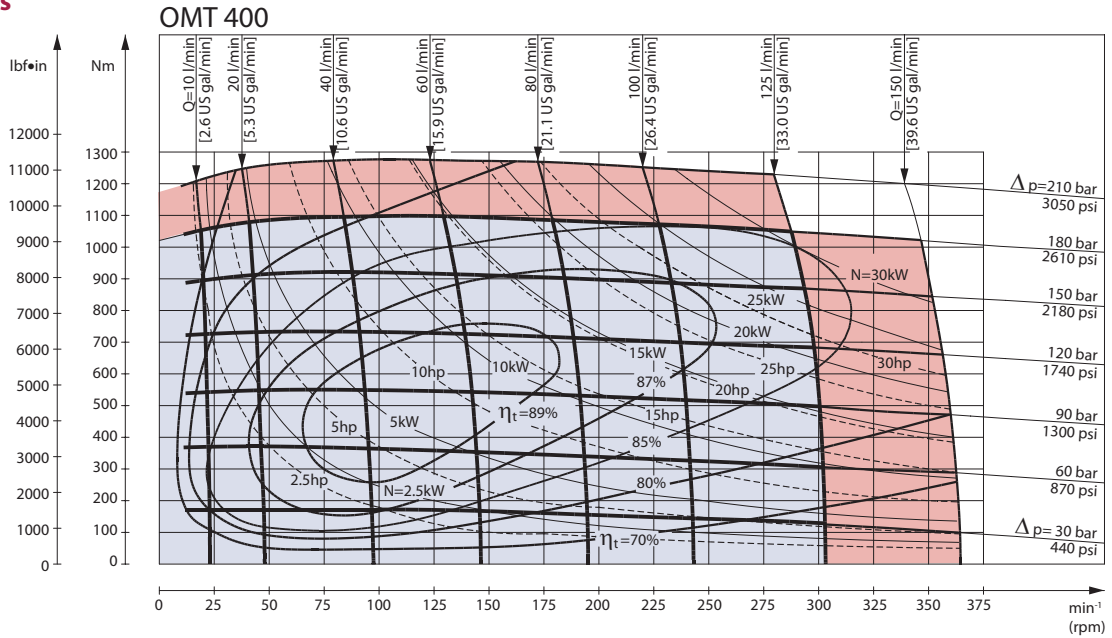


Explanation of function diagram use, basis and conditions can be found on page 5.

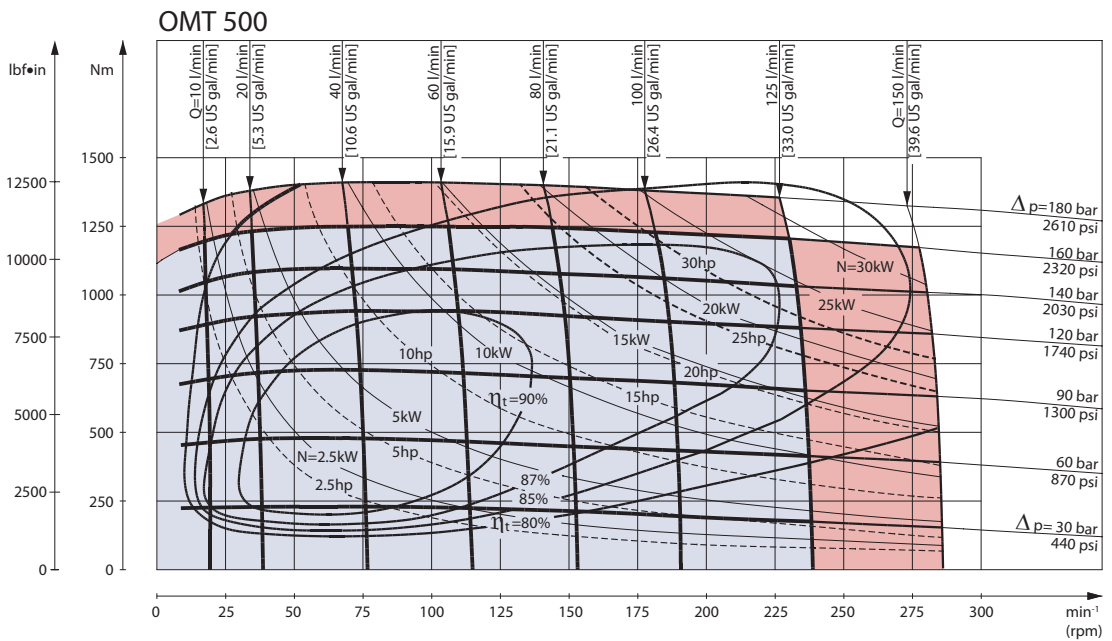
- Continuous range
- Intermittent range (max. 10% operation every minute)

Intermittent pressure drop and oil flow must not occur simultaneously.

Function Diagrams



151-1058.10



151-1116.10

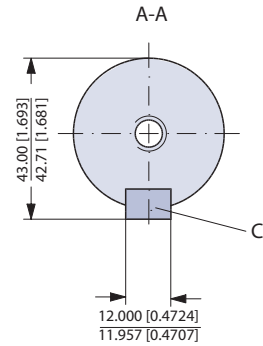
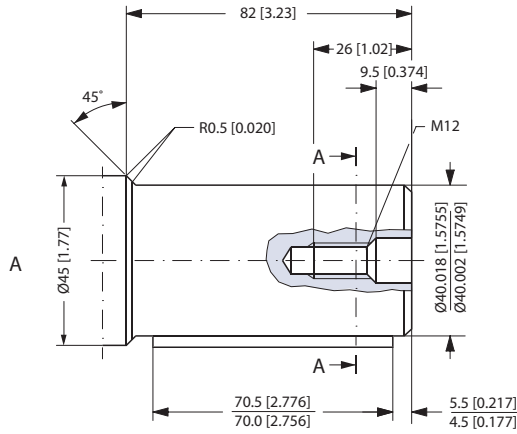
Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

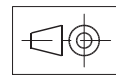
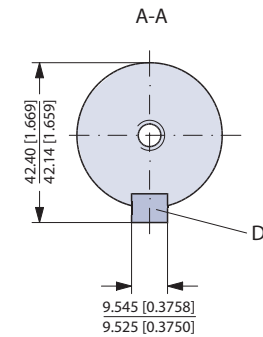
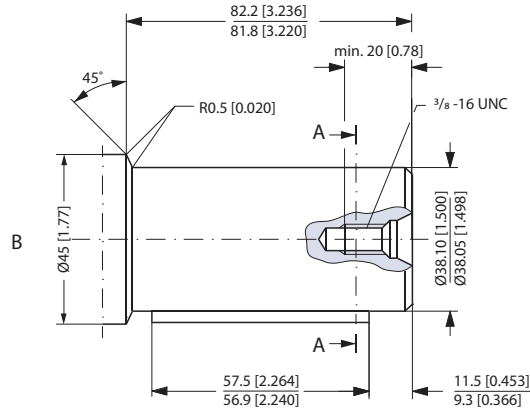
Intermittent pressure drop and oil flow must not occur simultaneously.

Shaft Version

A: Cylindrical 40 mm shaft
 C: Parallel key
 A12 × 8 × 70
 DIN 6885
 Keyway deviates from standard



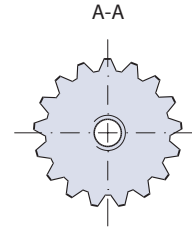
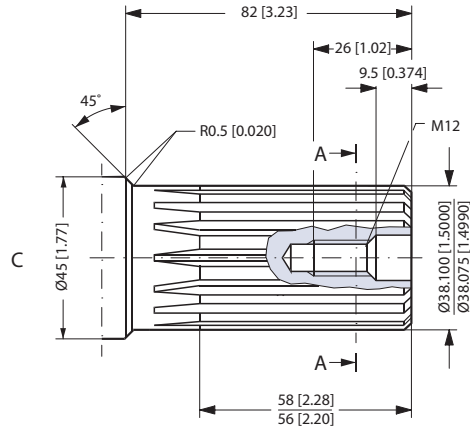
B: Cylindrical 1.5 in shaft
 D: Parallel key
 $\frac{3}{8} \times \frac{3}{8} \times 2\frac{1}{4}$ in
 B.S. 46
 Keyway deviates from standard



151-1032.10

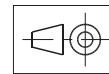
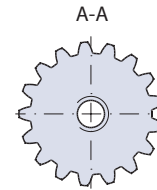
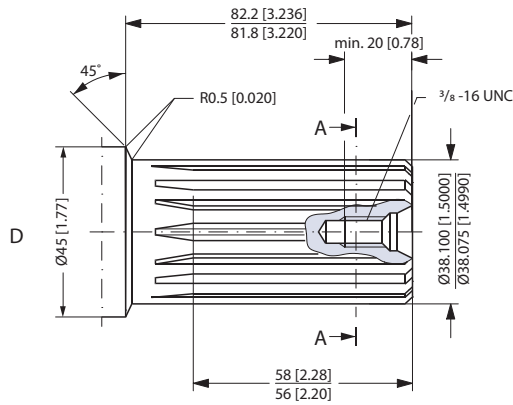
Shaft Version

- C. Involute splined shaft
- ANS B92.1 - 1970 standard
- Flat root side fit
- Pitch 12/24
- Teeth 17
- Major dia. 1.50 in
- Pressure angle 30°



US version

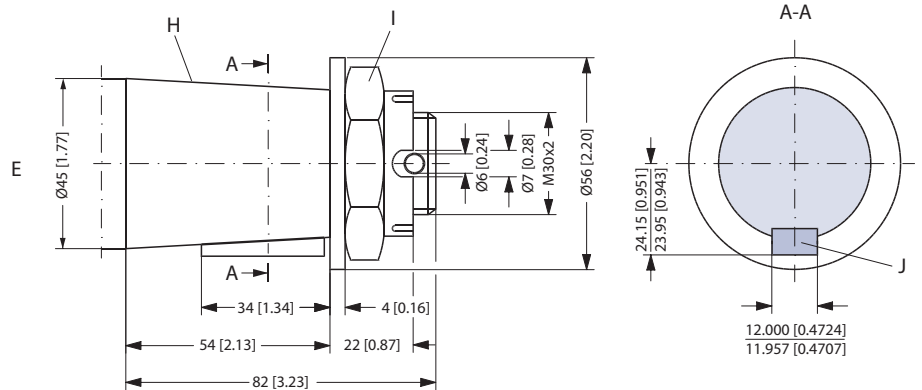
- D. Involute splined shaft
- ANS B92.1 - 1970 standard
- Flat root side fit
- Pitch 12/24
- Teeth 17
- Major dia. 1.50 in
- Pressure angle 30°



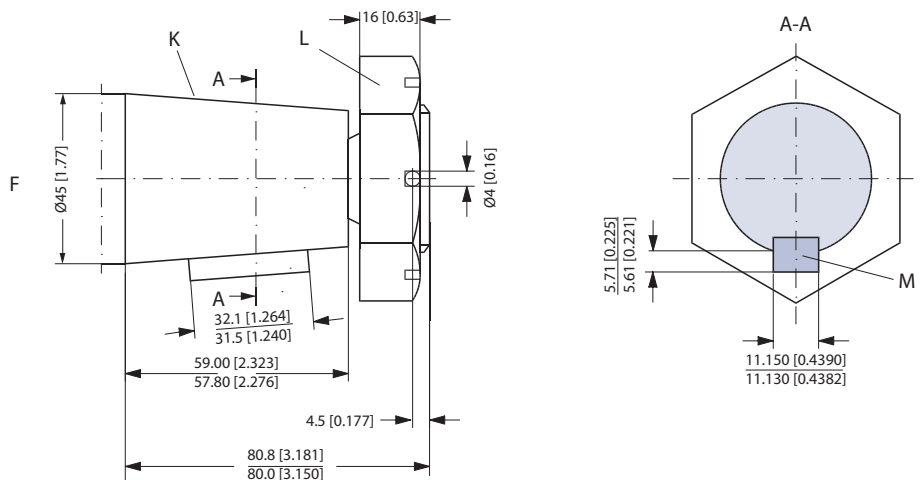
151-1916.10

Shaft Version

- E: Tapered 45 mm shaft (ISO/R775)
- I: DIN 937
 Across flats: 46 mm
 Tightening torque:
 500 ± 30 Nm [4430 ± 270 lbf-in]
- H: Taper 1:10
- J: Parallel key
 B12 × 8 × 28
 DIN 6885
 Keyway deviates from standard

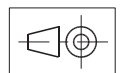
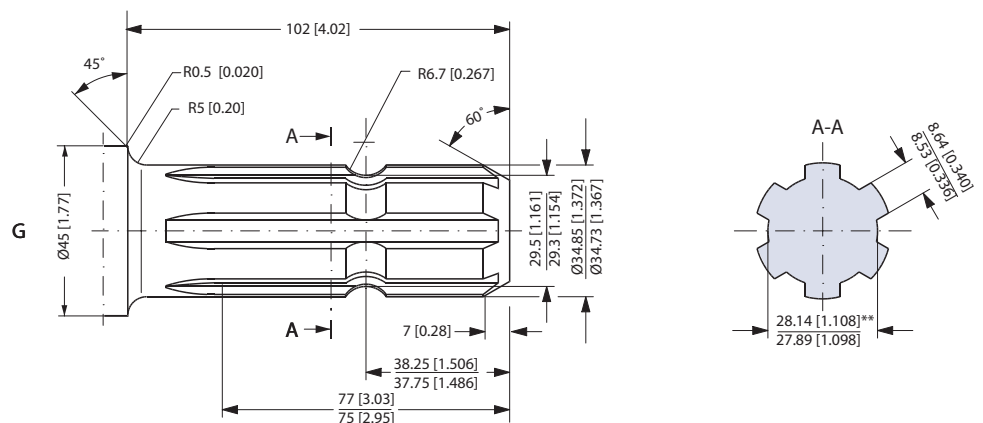


- F: Tapered 1.75 in shaft
- K: Cone 1:8
 SAE J501
- L: 1 1/4 - 18 UNEF
 Across flats 2 3/16 in
 Tightening torque:
 500 ± 10 Nm (4425 ± 90 lbf-in)
- M: Parallel key
 7/16 × 7/16 × 1 1/4
 B.S. 46
 Keyway deviates from standard



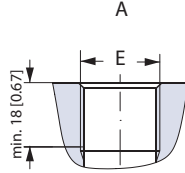
- G. Pt.o shaft
 DIN 9611 Form 1
 (ISO/R500 without pin hole)

** Deviates from DIN 9611

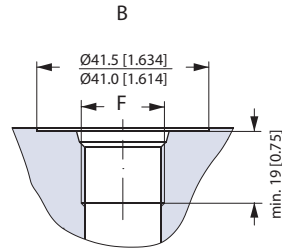


151-1917.10

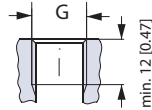
Port Thread Versions



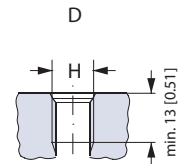
A: G main ports
E: ISO 228/1 - G³/4
O-ring boss port



B: UN main ports
F: 1 1/16 - 12 UN



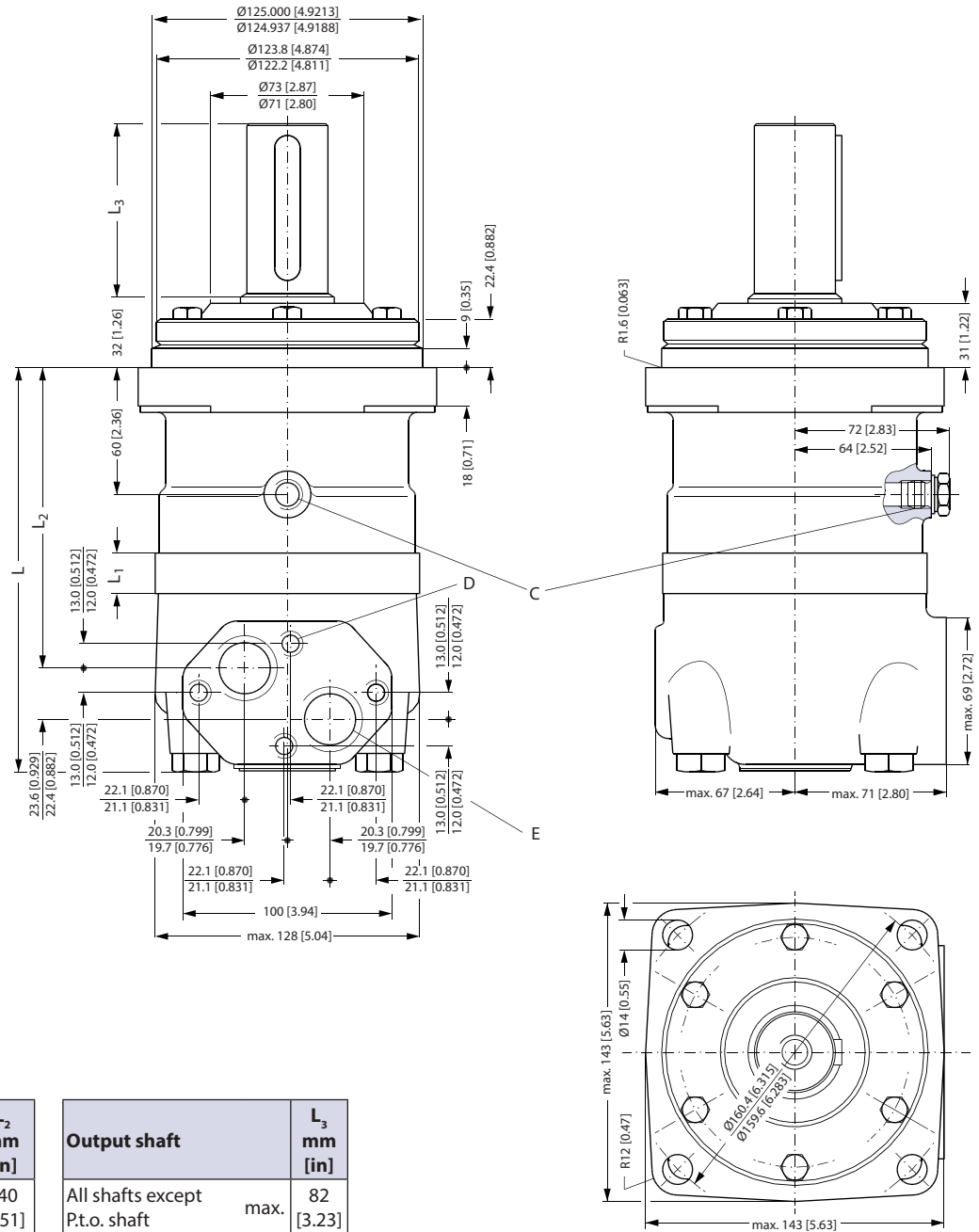
C: G drain port
G: ISO 228/1 - G¹/4
O-ring boss port



D: UNF drain port
H: 9/16 - 18 UNF

151-1977.11

**Dimensions
 Standard Flange**

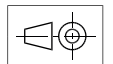
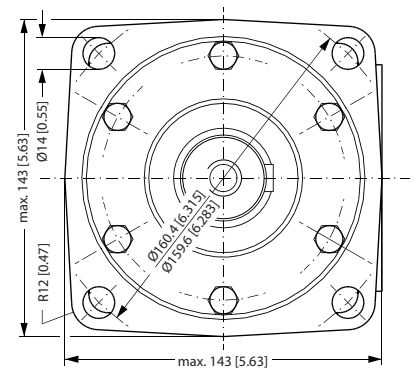


| Type | L _{max} mm [in] | L ₁ * mm [in] | L ₂ mm [in] |
|---------|--------------------------------|--------------------------------|------------------------------|
| OMT 160 | 190 [7.48] | 16.5 [0.650] | 140 [5.51] |
| OMT 200 | 195 [7.68] | 21.5 [0.846] | 145 [5.71] |
| OMT 250 | 201 [7.91] | 27.8 [1.094] | 151 [5.94] |
| OMT 315 | 211 [8.31] | 37.0 [1.457] | 161 [6.34] |
| OMT 400 | 221 [8.70] | 47.5 [1.870] | 171 [6.73] |
| OMT 500 | 235 [9.25] | 61.5 [2.421] | 185 [7.28] |

| Output shaft | L ₃ mm [in] |
|-----------------------------------|------------------------------|
| All shafts except P.t.o. shaft | max. 82 [3.23] |
| P.t.o. shaft | max. 102 [4.02] |

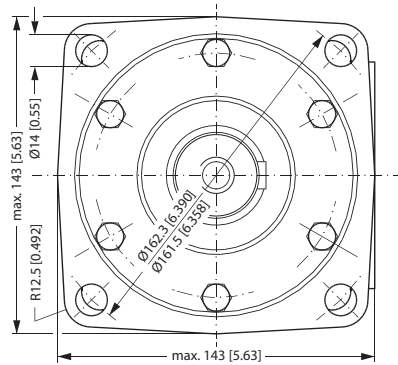
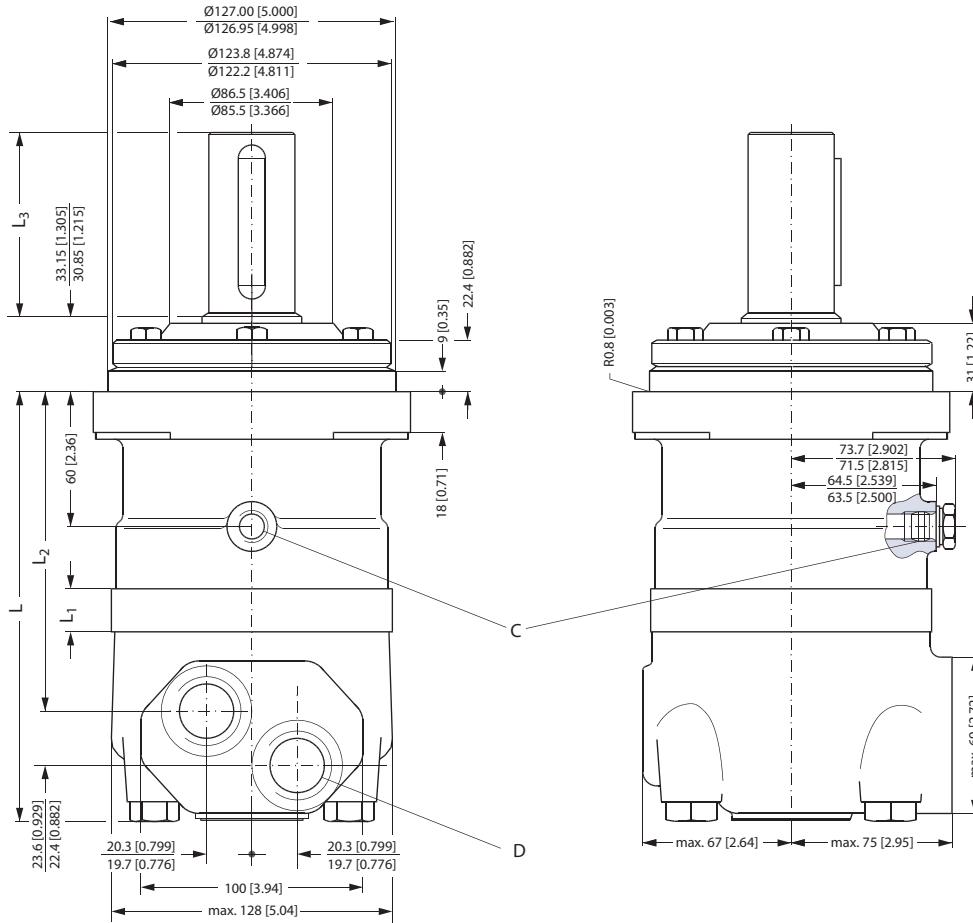
- C: Drain connection
G 1/4; 12 mm [0.47 in] deep
- D: M10; 10 mm [0.39 in] deep
- E: G 3/4; 17 mm [0.67 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions



151-889.11

Standard Flange

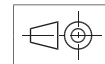


| Type | L _{max} mm [in] | L ₁ mm [in] | L ₂ mm [in] |
|---------|--------------------------------|------------------------------|------------------------------|
| OMT 160 | 190 [7.48] | 16.5 [0.650] | 140 [5.51] |
| OMT 200 | 195 [7.68] | 21.5 [0.846] | 145 [5.71] |
| OMT 250 | 201 [7.91] | 27.8 [1.094] | 151 [5.94] |
| OMT 315 | 211 [8.31] | 37.0 [1.457] | 161 [6.34] |
| OMT 400 | 221 [8.70] | 47.5 [1.870] | 171 [6.73] |
| OMT 500 | 235 [9.25] | 61.5 [2.421] | 185 [7.28] |

| Output shaft | L ₃ mm [in] |
|-----------------|------------------------------|
| Cyl. 1.5 in | 82 [3.23] |
| Splined 1.5 in | |
| Tapered 1.75 in | 80.4 [3.17] |

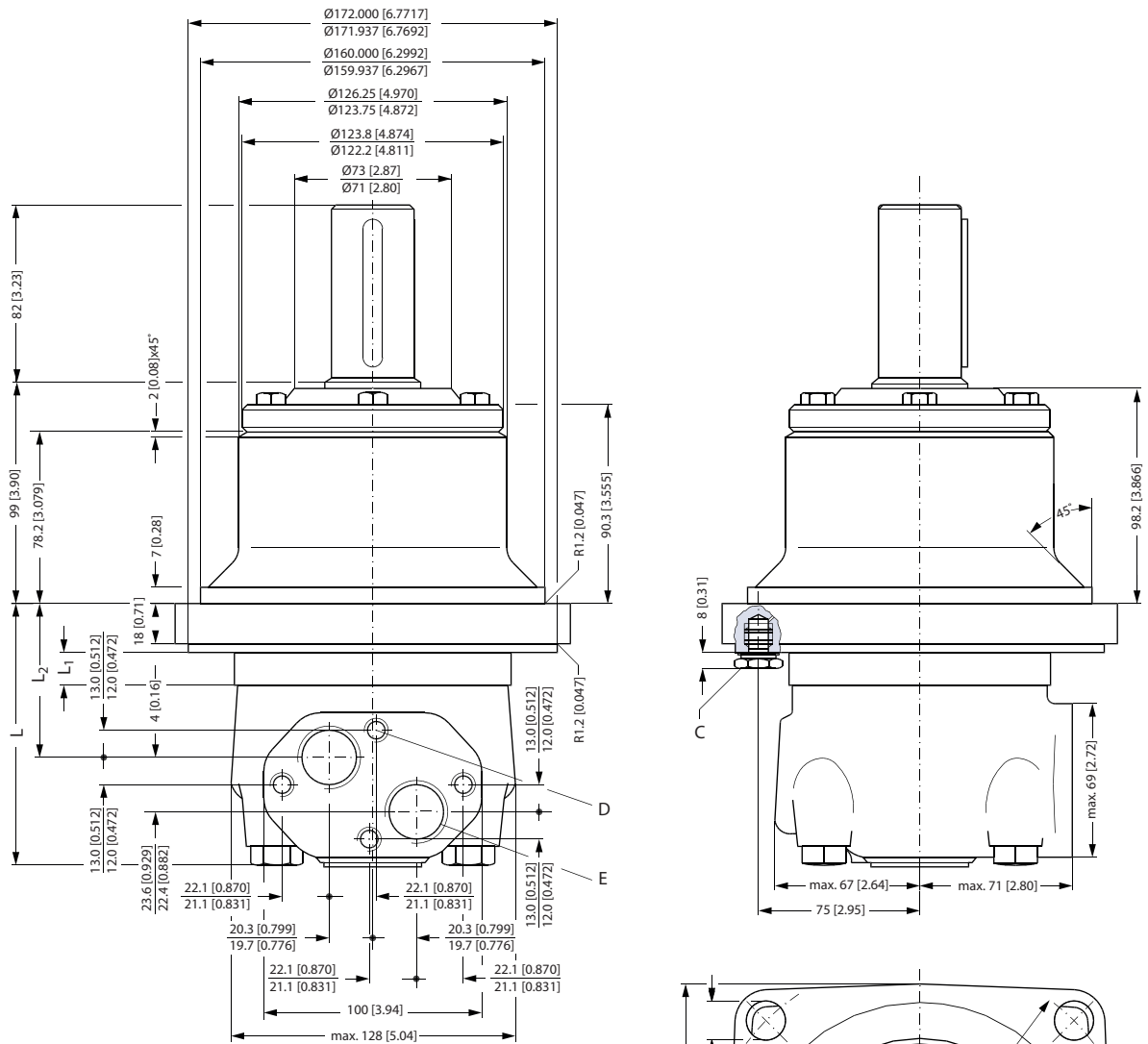
C: Drain connection 9/16 - 18 UNF; 13 mm [0.51 in] deep O-ring boss port
 D: 1 1/16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L₁ dimensions



151-889.11.22

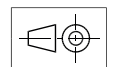
Wheel



| Type | L _{max} mm [in] | L ₁ [*] mm [in] | L ₂ mm [in] |
|----------|--------------------------------|---|------------------------------|
| OMTW 160 | 123 [4.84] | 16.5 [0.650] | 73 [2.87] |
| OMTW 200 | 128 [5.04] | 21.5 [0.846] | 78 [3.07] |
| OMTW 250 | 134 [5.28] | 27.8 [1.094] | 84 [3.31] |
| OMTW 315 | 144 [5.67] | 37.0 [1.457] | 94 [3.70] |
| OMTW 400 | 154 [6.06] | 47.5 [1.870] | 104 [4.09] |
| OMTW 500 | 168 [6.61] | 61.5 [2.421] | 118 [4.65] |

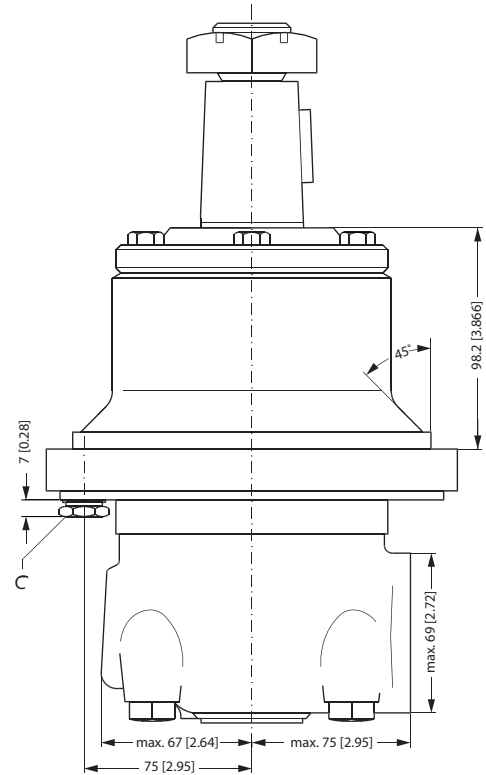
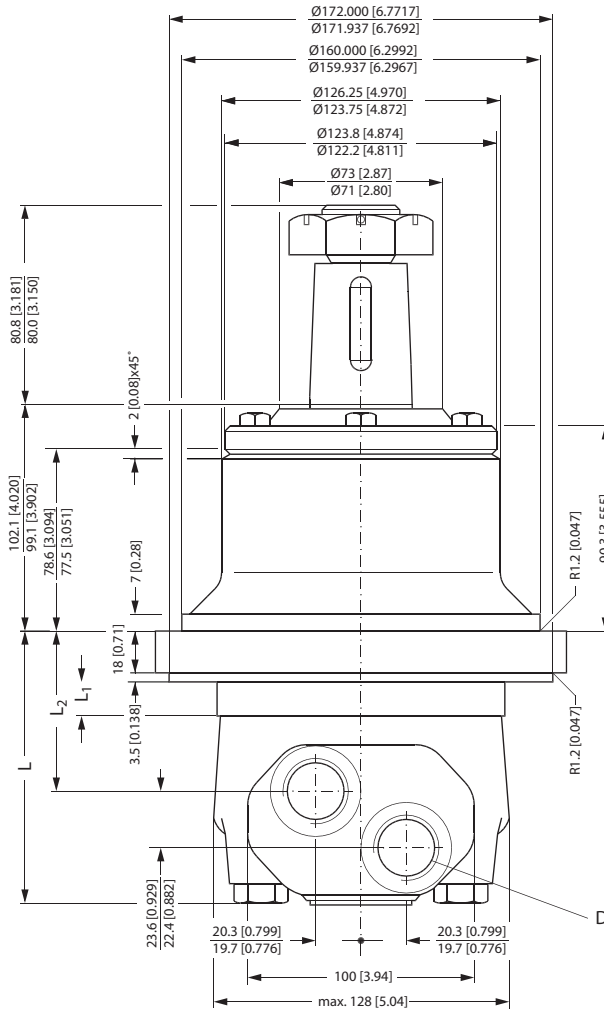
- C: Drain connection
G 1/4; 12 mm [0.47 in] deep
- D: M10; 10 mm [0.39 in] deep
- E: G 3/4; 17 mm [0.67 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions



151-897.12

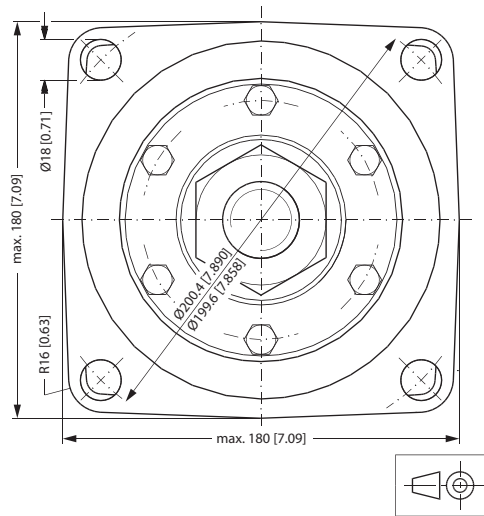
Wheel



| Type | L _{max} mm [in] | L ₁ mm [in] | L ₂ mm [in] |
|-------------|--------------------------------|------------------------------|------------------------------|
| OMTW 160 | 123 [4.84] | 16.5 [0.650] | 73 [2.87] |
| OMTW 200 | 128 [5.04] | 21.5 [0.846] | 78 [3.07] |
| OMTW 250 | 134 [5.28] | 27.8 [1.094] | 84 [3.31] |
| OMTW 315 | 144 [5.67] | 37.0 [1.457] | 94 [3.70] |
| OMTW 400 | 154 [6.06] | 47.5 [1.870] | 104 [4.09] |
| OMTW 500 | 168 [6.61] | 61.5 [2.421] | 118 [4.65] |

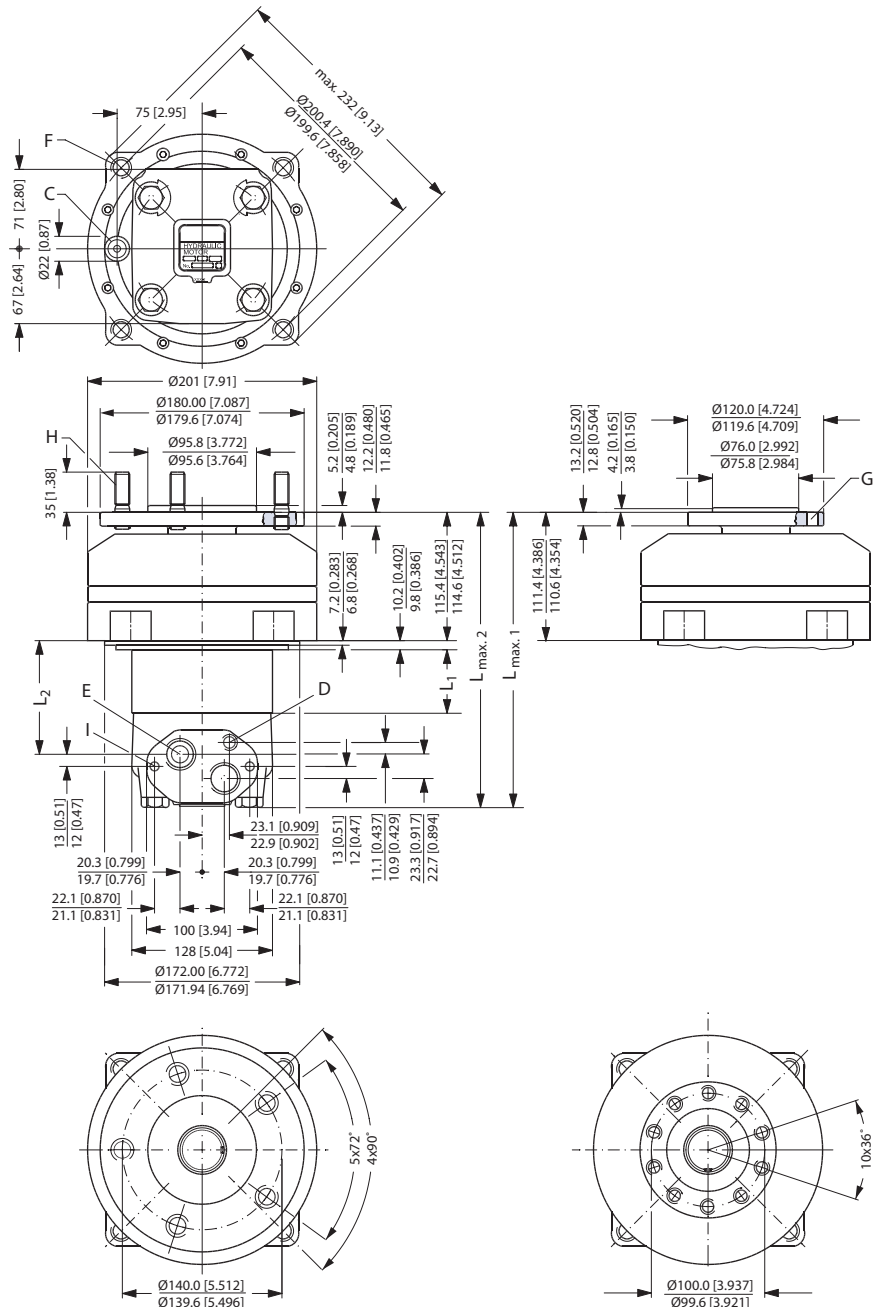
- C: Drain connection
 916 - 18 UNF;
 13 mm [0.51 in] deep
 O-ring boss port
- D: 1 1/16 - 12 UN;
 19 mm [0.75 in] deep
 O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions



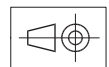
151-897.11.22

Brake-Wheel



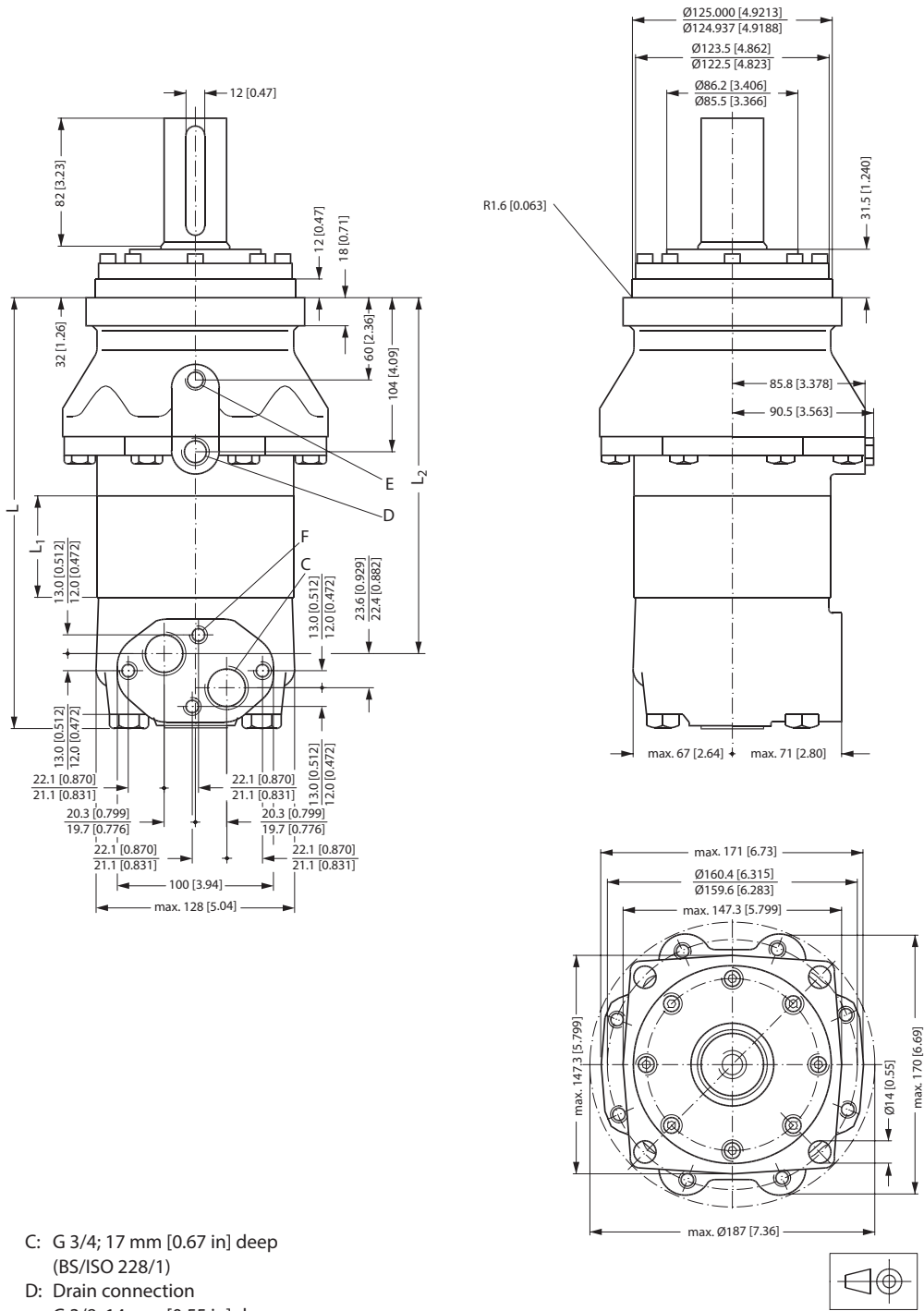
| Type | L _{max 1} mm [in] | L _{max 2} mm [in] | L ₁₊ mm [in] | L ₂ mm [in] |
|---------------|----------------------------------|----------------------------------|-------------------------------|------------------------------|
| OMT 160 FX | 223 [8.78] | 227 [8.94] | 16.5 [0.650] | 62 [2.45] |
| OMT 200 FX | 228 [8.98] | 232 [9.13] | 21.5 [0.846] | 67 [2.65] |
| OMT 250 FX | 234 [9.21] | 238 [9.37] | 27.8 [1.094] | 74 [2.89] |
| OMT 315 FX | 243 [9.57] | 247 [9.72] | 37.0 [1.457] | 83 [3.26] |
| OMT 400 FX | 254 [10.00] | 258 [10.16] | 47.5 [1.870] | 93 [3.67] |
| OMT 500 FX | 268 [10.55] | 272 [10.71] | 61.5 [2.421] | 107 [4.22] |

- C: Brake-release port G 1/4;
12 mm [0.47 in] deep (BS/ISO 228/1)
- D: Drain connection G 1/4;
12 mm [0.47 in] deep
- E: G 3/4; 17 mm [0.67 in] deep
- F: 4 × M12; 27 mm [1.06 in] deep
- G: 10 × M12
- H: Wheel bolts 5 × M14 × 1.5
- I: M10; 10 mm [0.39 in] deep
- *) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions



151-1443.11

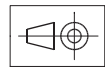
Brake-Standard



| Type | L _{max} mm [in] | L ₁ mm [in] | L ₂ mm [in] |
|------------------|--------------------------------|------------------------------|------------------------------|
| OMT 160 FL/FH | 228 [8.98] | 16.5 [0.650] | 178 [7.01] |
| OMT 200 FL/FH | 233 [9.17] | 21.5 [0.846] | 183 [7.20] |
| OMT 250 FL/FH | 239 [9.41] | 27.8 [1.094] | 189 [7.44] |
| OMT 315 FL/FH | 248 [9.76] | 37.0 [1.457] | 199 [7.83] |
| OMT 400 FL/FH | 259 [10.20] | 47.5 [1.870] | 209 [8.23] |
| OMT 500 FL/FH | 273 [10.75] | 61.5 [2.421] | 223 [8.78] |

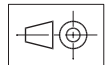
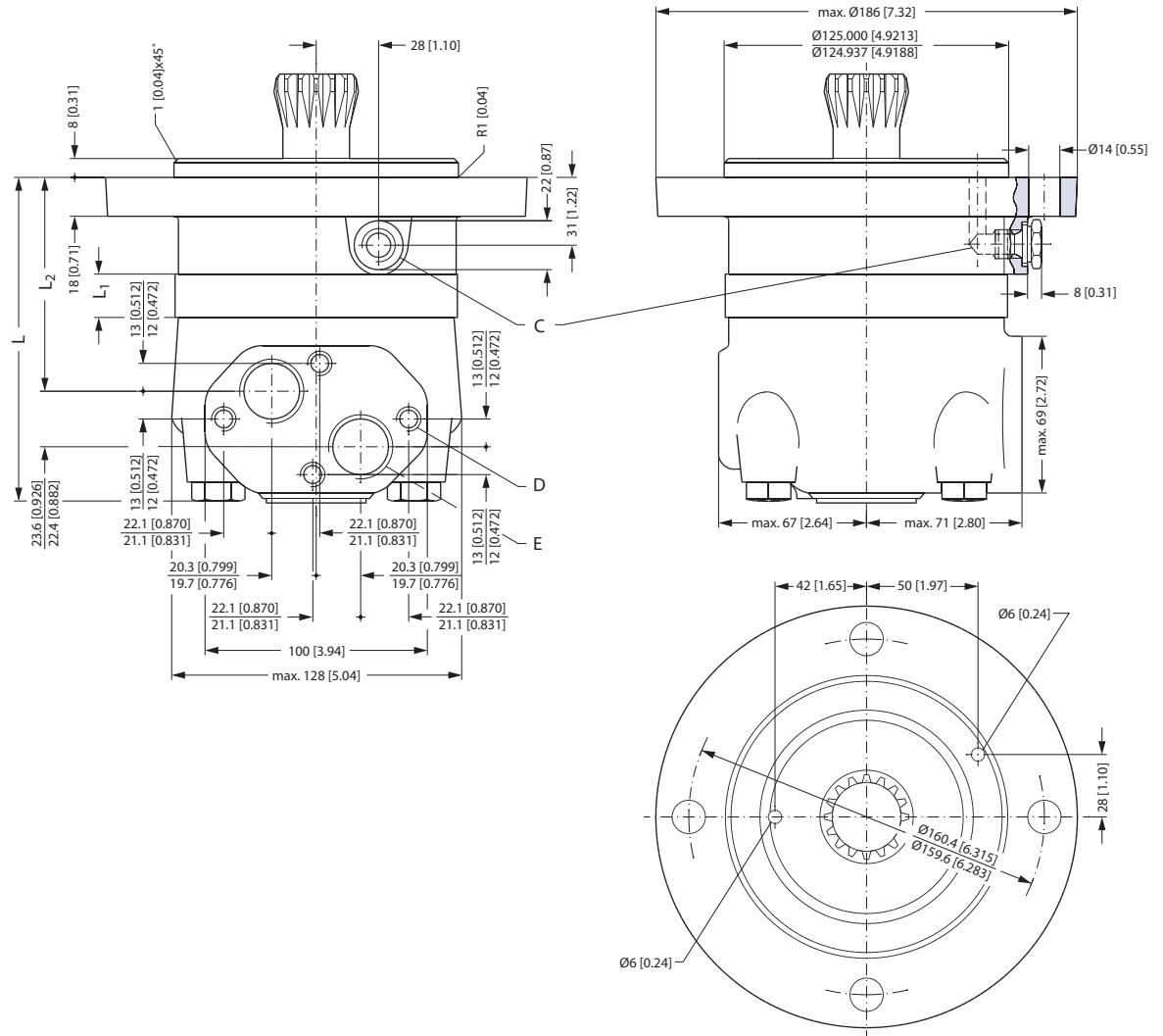
- C: G 3/4; 17 mm [0.67 in] deep (BS/ISO 228/1)
- D: Drain connection
- E: Brake-release port G 1/4; 12 mm [0.47 in] deep
- F: M10; 10 mm [0.39 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions



151-1453.10

Short



151-898.11

| Type | L _{max} mm [in] | L ₁ [*] mm [in] | L ₂ mm [in] |
|-------------|--------------------------------|---|------------------------------|
| OMTS 160 | 146 [5.75] | 16.5 [0.650] | 96 [3.78] |
| OMTS 200 | 151 [5.94] | 21.5 [0.846] | 101 [3.98] |
| OMTS 250 | 157 [6.18] | 27.8 [1.094] | 107 [4.21] |
| OMTS 315 | 166 [6.54] | 37.0 [1.457] | 116 [4.57] |
| OMTS 400 | 177 [6.97] | 47.5 [1.870] | 127 [5.00] |
| OMTS 500 | 191 [7.52] | 61.5 [2.421] | 142 [5.59] |

C: Drain connection
 G 1/4; 12 mm [0.47 in] deep
 D: M10; 10 mm [0.39 in] deep E:
 G 3/4; 17 mm [0.67 in] deep

*) The gearwheel set is 3.5 mm
 [0.138 in] wider across the
 rollers than the L1 dimensions

Installing the OMTS

The cardan shaft of the OMTS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output.

Internal oil leakage from the motor will therefore flow into the attached component.

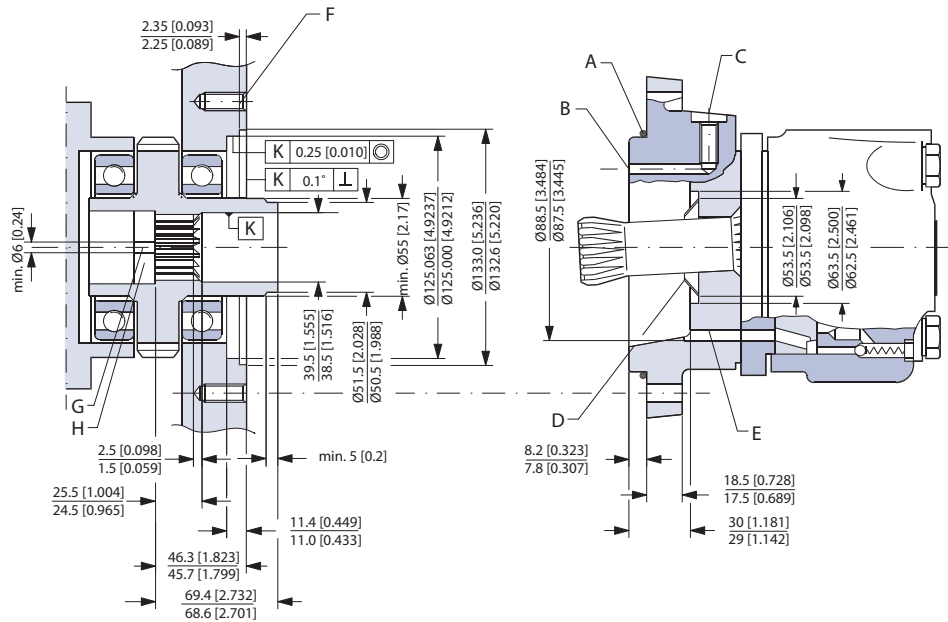
During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMT.

The conical sealing ring (code. no. 633B9022) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. below).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151B1040) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

**OMTS
 Dimensions of the
 Attached Component**



151-452.10

- A: O-ring: 125 × 3 mm
- B: External drain channel
- C: Drain connection
- G 1/4; 12 mm [0.47 in] deep
- D: Conical seal ring

- E: Internal drain channel
- F: M12; min. 18 mm [0.71 in] deep
- G: Oil circulation hole
- H: Hardened stop plate

Internal Spline Data for the Component to be Attached

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

Material:

Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (900 N/mm²) or SAE 8620.

Hardening specification:

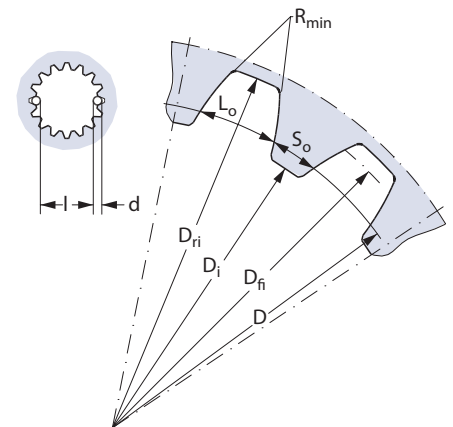
- On the surface: HV = 750 ± 50
- 0.7 ± 0.2 mm under the surface: HV = 560

Internal involute spline data

Standard ANS B92.1-1970, class 5 (corrected $m \cdot X = 1$; $m = 2.1166$)

| Flat root side fit | | mm | in |
|--------------------------------|-----------|---------------------|------------------------|
| Number of teeth | z | 16 | 16 |
| Pitch | DP | 12/24 | 12/24 |
| Pressure angle | | 30° | 30° |
| Pitch dia. | D | 33.8656 | 1.3333 |
| Major dia. | D_{ri} | $38.4_0^{+0.4}$ | $1.5118_0^{+0.0157}$ |
| Form dia. (min.) | D_{fi} | 37.6 | 1.4803 |
| Minor dia. | D_i | $32.150_0^{+0.04}$ | $1.2657_0^{+0.00157}$ |
| Space width (circular) | L_o | $4.516_{\pm 0.037}$ | $0.1777_{\pm 0.0014}$ |
| Tooth thickness (circular) | S_o | 2.170 | 0.0854 |
| Fillet radius | R_{min} | 0.5 | 0.02 |
| Max. measurement between pins* | l | $26.9_0^{+0.1}$ | $1.059_0^{+0.004}$ |
| Pin dia. | d | $4.834_{\pm 0.001}$ | $0.1903_{\pm 0.00004}$ |

* Finished dimensions (when hardened)



151-455.10

Drain Connection on OMTS or Attached Component

A drain line ought to be used when pressure in the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:

- 1) at the motor drain connection
- 2) at the drain connection of the attached component.

If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.

The maximum pressure in the drain line is limited by the attached component and its shaft seal.