HTT

Harsco Track Technologies

Harsco

HR0307 SERIES A

UNIVERSAL HY-RAIL®
GUIDE WHEEL EQUIPMENT
MANUALLY OPERATED

OPERATOR'S SERVICE AND PARTS MANUAL

ISSUED 3 - 2007

BULLETIN 1192D

■ **THIS MANUAL CONTAINS VITAL INFORMATION FOR THE SAFE USE AND EFFICIENT OPERATION OF THE VEHICLE EQUIPPED WITH HY-RAIL® GUIDE WHEEL EQUIPMENT. CAREFULLY READ THIS OPERATOR'S MANUAL BEFORE USING THE VEHICLE. FAILURE TO ADHERE TO THE INSTRUCTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.**

When this manual is received, record the guide wheel unit serial numbers in the spaces provided in the General Information and Parts Sections for future reference, in case the serial number tags ever become unreadable. A Manual must remain with the vehicle. Additional or replacement manuals may be obtained by calling or writing Harsco Track Technologies, Harsco Corporation.

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. Harsco Track Technologies, Harsco Corporation reserves the right to make changes at any time without notice.

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SECTION 1 - GENERAL INFORMATION
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1.1 Safety Information

THIS SYMBOL MEANS: ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.

SAFETY IS A CRITICAL FACTOR IN THE DESIGN OF HARSCO TRACK TECHNOLOGIES EQUIPMENT. THE BEST SAFETY PROGRAM STARTS WITH A SAFETY CONSCIOUS OPERATOR. THE SAFETY INFORMATION HIGHLIGHTED IN THIS BULLETIN DESCRIBES SAFE OPERATING PRACTICES FOR THE BENEFIT OF THE WORKERS WHO WILL USE OUR EQUIPMENT IN THEIR DAILY JOBS.

1.1.1 Hazard Seriousness

Signal Words: **DANGER**, **WARNING** and **CAUTION** are used to identify levels of hazard seriousness.

DANGER

DANGER - Immediate hazards which WILL result in sever bodily injury or death.

WARNING

WARNING - Hazards or unsafe practices which COULD result in severe bodily injury or death.

CAUTION

CAUTION - Hazards or unsafe practices which COULD result in minor bodily injury and / or product or property damage.

1.1 Safety Information

- **APPLY THE VEHICLE PARKING BRAKE AND STOP THE ENGINE WHEN PERFORMING MAINTENANCE, MAKING ADJUSTMENTS, WORKING UNDER VEHICLE OR GUIDE WHEEL EQUIPMENT OR WHENEVER UNINTENDED MOVEMENT OF THE VEHICLE COULD OCCUR, UNLESS OTHERWISE INSTRUCTED IN THIS MANUAL.**
- **MAKE SURE ALL PERSONS ARE CLEAR OF VEHICLE BEFORE PERFORMING ANY OPERATING FUNCTIONS.**
- **KEEP ALL PARTS OF THE BODY AND LOOSE CLOTHING CLEAR OF ALL MOVING PARTS OF THE VEHICLE OR GUIDE WHEEL EQUIPMENT.**
- **UNDERSTAND EQUIPMENT OPERATION AND BE AWARE OF ALL PINCH POINTS BEFORE OPERATING OR MAKING ADJUSTMENTS TO GUIDE WHEEL EQUIPMENT.**
- **IF A DERAILMENT SHOULD OCCUR WHILE VEHICLE IS OPERATING IN ELECTRIFIED 3RD-RAIL TERRITORY, VEHICLE OR GUIDE WHEEL EQUIPMENT MIGHT BE IN ELECTRICAL CONTACT WITH ELECTRIFIED RAIL. DO NOT ATTEMPT TO EXIT FROM VEHICLE UNTIL ELECTRICAL POWER TO 3RD-RAIL HAS BEEN TURNED OFF.**
- **DO NOT EXCEED 45 MPH (72 km/h) WHEN OPERATING VEHICLE ON TRACK. RAILROAD RULES GOVERNING SPEEDS SHOULD BE OBSERVED AT ALL TIMES. REDUCE SPEED WHEN PROPELLING VEHICLE THROUGH SWITCHES, CROSSINGS, BRANCH LINES AND ANY SPECIAL TRACK WORKS. OPERATING VEHICLE AT UNSAFE SPEEDS COULD RESULT IN DERAILMENT OF VEHICLE.**
- **CHECK AND CORRECT GUIDE WHEEL EQUIPMENT ALIGNMENT PROMPTLY IF MISALIGNMENT IS INDICATED.**

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1.1 Safety Information

- **AT MAXIMUM LOADED GROSS VEHICLE WEIGHT ON TRACK (including driver, passengers, equipment, tools, payload, etc.) DO NOT EXCEED ANY OF THE FOLLOWING:**
  - **VEHICLE'S G.V.W.R. (Gross Vehicle Weight Rating).**
  - **VEHICLE'S FRONT G.A.W.R. (Gross Axle Weight Rating) OR THE SUM OF THE FRONT GUIDE WHEEL UNIT RATED LOAD CAPACITY PLUS (+) VEHICLE'S FRONT TIRE/WHEEL RATED LOAD CAPACITY, WHICHEVER IS LOWER.**
  - **VEHICLE'S REAR G.A.W.R. (Gross Axle Weight Rating) OR THE SUM OF REAR GUIDE WHEEL UNIT GUIDE WHEEL RATED LOAD CAPACITY PLUS (+) VEHICLE'S REAR TIRE/WHEEL RATED LOAD CAPACITY, WHICHEVER IS LOWER.**
  - **COMPONENTS RATED LOAD CAPACITY:**
    - **A. TIRE MANUFACTURER'S RATED LOAD CAPACITY**
    - **B. VEHICLE'S WHEEL RATED LOAD CAPACITY**
    - **C. GUIDE WHEEL UNIT RATED LOAD CAPACITY (700 lbs (318 kg) maximum per guide wheel)**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **KNOW THE POSITIONS AND FUNCTIONS OF ALL CONTROLS BEFORE ATTEMPTING TO OPERATE VEHICLE.**
- **THIS GUIDE WHEEL EQUIPMENT IS DESIGNED WITH YOUR SAFETY IN MIND. NEVER DISCONNECT AND/OR ATTEMPT TO OVERRIDE SAFETY FEATURES.**
- **SUPPLIED LIFT HANDLES ARE DESIGNED FOR OPERATING ONLY PROPERLY MAINTAINED GUIDE WHEEL EQUIPMENT. DO NOT USE THE LIFT HANDLE FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS DESIGNED. IF LIFT HANDLE IS DAMAGED (BENT, BROKEN, ETC.), IT MUST NOT BE REPAIRED (STRAIGHTENED, WELDED, ETC.), IT MUST BE REPLACED.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Note: To help ensure safe operation of this equipment, keep all safety decals clean and legible. Replace safety decals when necessary with new decals, listed in the Parts Section of this manual.

1.2 Identification View

FIGURE 1-1
HR0307 SERIES A HY-RAIL® EQUIPPED VEHICLE

1.3 Description

The FAIRMONT™ HR0307 Series A HY-RAIL® guide wheel equipment can be applied to various standard utility vehicles, cab chassis and pickup trucks. The vehicle's G.V.W.R. (gross vehicle weight rating) and/or G.A.W.R. (gross axle weight rating) must comply with specifications recommended by Harsco Track Technologies. For information regarding special applications, contact Harsco Track Technologies, Harsco Corporation, Fairmont, Minnesota.

The HY-RAIL® guide wheel equipment has front and rear guide wheel units which are manually operated and are mounted onto the vehicle frame. The weight of the units is carried on the vehicle frame, above the springs, when the units are in the "highway" position. Load bearing guide wheel assemblies guide the vehicle during on track operation.

The HY-RAIL® equipped vehicle uses the vehicle propulsion and braking system for propelling and braking on track.

1.4 Vehicle Orientation

Front - rear and left - right are determined from the vehicle operator's seat.

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1.5 Serial Numbers

When this bulletin is received, complete the following record from the serial number tag on both the front and rear guide wheel units. Always provide these factory serial numbers when calling or writing about the units. The serial number tags are located on the frame mounting assembly on both units.

FIGURE 1-2
FRONT GUIDE WHEEL UNIT SERIAL NUMBER TAG

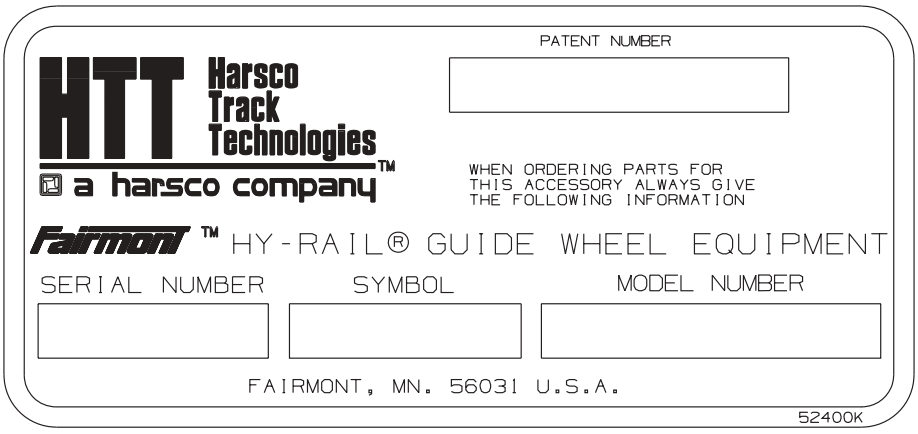
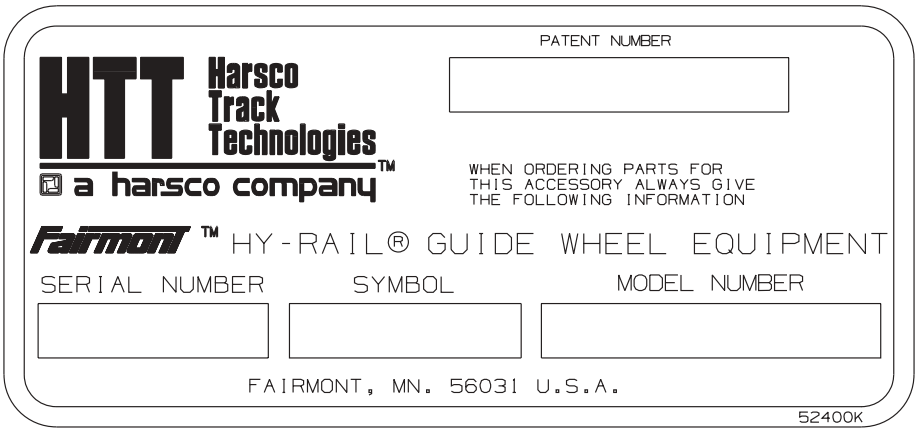


FIGURE 1-3
REAR GUIDE WHEEL UNIT SERIAL NUMBER TAG



1.6 Specifications

1.6.1 Vehicle

The vehicle's G.V.W.R. (gross vehicle weight rating) and/or G.A.W.R. (gross axle weight rating) must comply with specifications recommended by Harsco Track Technologies. For information regarding special applications, contact Harsco Track Technologies, Harsco Corporation, Fairmont, Minnesota.

1.6.2 Guide Wheel Units

Track Gauge	56-1/2 in	(1435 mm)
Guide Wheels - All Tread Types		
- Flange Diameter	12-1/4 in	(311 mm)
- Tread Diameter	10 in	(254 mm)
Weight - Front Unit	255 lbs	(116 kg)
- Rear Unit	255 lbs	(116 kg)
Recommend Load Per Guide Wheel - All Tread Types	350 - 400 lbs	(159 - 182 kg)
Maximum Load Per Guide Wheel - All Tread Types	700 lbs	(318 kg)

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SECTION 2 - OPERATION
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2.1 Speedometer

■ **WHEN WHEEL/TIRE MODIFICATIONS ARE APPLIED, CHECK AND CHANGE SPEEDOMETER DRIVE RATIO IF NECESSARY. THE SPEEDOMETER DRIVE RATIO WILL INFLUENCE THE OPERATION OF THE VEHICLE'S ANTI-LOCK BRAKE SYSTEMS, ELECTRONICALLY CONTROLLED TRANSMISSION SHIFT TIMING AND SPEEDOMETER DISPLAY OF THE TRUE VEHICLE SPEED. FAILURE TO MAINTAIN CORRECT SPEEDOMETER DRIVE RATIO COULD RESULT IN SEVERE BODILY INJURY.**

Some vehicles require special larger diameter wheels and/or wheel spacers to properly space the vehicle tires for on track operation. Use of these wheel modifications may effect the speedometer drive ratio calibration. The speedometer drive ratio will influence the operation of the vehicle's anti-lock brake systems, electronically controlled transmission shift timing and speedometer display of the true vehicle speed. The vehicle speedometer must be re-calibrated when wheel modifications are applied to the vehicle. See the vehicle manufacturer or dealer for speedometer calibration information.

2.2 Preparing Vehicle for Operation

Be sure the vehicle is in operating condition by checking the following:

a. Engine oil level.
b. Radiator fluid level.
c. Fuel tank level.
d. Brakes work properly.
e. Parking brake works properly.
f. Head, brake and signal lights work properly.
g. Tires properly inflated to the manufacturer's recommended maximum pressure printed on the sidewall of the tires, or the wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower.
h. Vehicle wheels: Lug nuts / bolts tightened to the proper torque, inspect vehicle wheels, lug bolts and lug nuts for wear or damage. For vehicle wheel, lug bolt and lug nut inspection information refer to the USER'S GUIDE TO WHEELS AND RIMS produced by THE MAINTENANCE COUNCIL. To obtain this guide, contact:

THE MAINTENANCE COUNCIL
AMERICAN TRUCKING ASSOCIATION
2200 MILL ROAD
ALEXANDRIA, VA. 22314
Phone: (703) 838-1763

I. Any other normal maintenance requirements.

2.3 Preparing Guide Wheel Equipment For Operation

Be sure the front and rear guide wheel units are in operating condition by checking the following:

a. Overall for damaged or worn parts.
b. Proper alignment and guide wheel loads.
c. Proper lubrication at recommended operating hourly intervals.

2.4 Misalignment Indicators

■ **BEFORE OPERATING A VEHICLE WITH NEWLY INSTALLED GUIDE WHEEL EQUIPMENT ON TRACK, VERIFY THAT THE GUIDE WHEEL EQUIPMENT ALIGNMENT PROCEDURE HAS BEEN COMPLETED. CHECK AND CORRECT ALIGNMENT PROMPTLY IF MISALIGNMENT IS INDICATED. MISALIGNMENT OF GUIDE WHEEL EQUIPMENT COULD RESULT IN DERAILMENT OF THE VEHICLE AND SEVERE BODILY INJURY.**

The following conditions may indicate that minor adjustments to the guide wheel equipment alignment are necessary. If any of these conditions occur during operation, perform the Track Test, see Adjustment Section - Vehicle Track Test and/or complete the Alignment Procedure, see Adjustment Section - Guide Wheel Equipment Alignment Procedure.

1. Excessive flange or tread wear on any of the rail guide wheels.

2. The vehicle pulls noticeably to the left or right during track operation.

3. Vibration felt throughout the vehicle at various speeds during track operation.

2.5 Placing Vehicle on Track

- **PLACE VEHICLE AUTOMATIC TRANSMISSION IN "PARK" OR MANUAL TRANSMISSION IN "NEUTRAL". APPLY THE PARKING BRAKE.**
- **UNDERSTAND EQUIPMENT OPERATION AND BE AWARE OF ALL PINCH POINTS BEFORE OPERATING OR MAKING ADJUSTMENTS TO GUIDE WHEEL EQUIPMENT.**
- **BEFORE PROPELLING THE VEHICLE ON THE TRACK, MAKE SURE:**
  - **ALL FOUR GUIDE WHEELS ARE LOWERED, LOCKED IN THE RAIL POSITION, AND SECURED WITH THE LOCK PIN.**
  - **ALL GUIDE WHEEL FLANGES ARE ENGAGED ON THE INSIDE OF THE RAIL.**
  - **THE FRONT WHEELS ARE POINTED STRAIGHT AHEAD AND THE STEERING WHEEL LOCK IS ENGAGED.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN DERAILMENT OF THE VEHICLE AND SEVERE BODILY INJURY.

- **THE SUPPLIED LIFT HANDLES ARE DESIGNED FOR OPERATING ONLY PROPERLY MAINTAINED GUIDE WHEEL EQUIPMENT. DO NOT USE THE LIFT HANDLE FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS DESIGNED. IF THE LIFT HANDLE IS DAMAGED (BENT, BROKEN, ETC.), IT MUST NOT BE REPAIRED (STRAIGHTENED, WELDED, ETC.), IT MUST BE REPLACED.**
- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **IF THE VEHICLE IS EQUIPPED WITH A STROBE LIGHT (BEACON) AND RAILROAD RULES AND REGULATIONS REQUIRE ITS USE, THE STROBE LIGHT (BEACON) MUST BE ILLUMINATED WHEN PLACING THE VEHICLE ON TRACK AND WHEN OPERATING THE VEHICLE ON TRACK.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.5 Placing Vehicle on Track

2.5.1 Lowering Guide Wheels - See Figure 2-1

1. Ensure that highway vehicles are not approaching the grade crossing while placing the vehicle on track. To ensure safety, flag the crossing per railroad rules and regulations.

2. At a road crossing, drive the vehicle about 25 feet (7.6 M) past the track. Back the vehicle onto the rails so that the rear vehicle wheels are centered on rails. It may be necessary to move the vehicle back and forth several times to get the wheels centered on the rail properly.

3. Place automatic transmission in "PARK" or manual transmission in "NEUTRAL". Apply the parking brake.

4. Lower and lock the rear guide wheels first. The rear guide wheels should be lowered first so the vehicle front tires can be maneuvered to align the front guide wheels with the rails.

5. Remove lock pin (1). Button in "T" end of the pin must be pressed in to remove the lock pin. Place the lock pin in a position so that it does not become entangled in the mechanical lock mechanism.

6. Insert the end of hand lever (5) with the long single bend (B) into socket (2). Maintain a firm grip on the hand lever to prevent the guide wheels from dropping suddenly when the mechanical lock is released.

7. Push the locking pawl handle (4) to release the mechanical lock. Use the hand lever (5) to lower the guide wheel to the rail.

8. Remove hand lever (5) from socket (2) and insert the opposite end with short single bend (A) into socket (3). Push down on the hand lever, forcing the guide wheel down until the locking mechanism fully locks, securing the guide wheel in the "rail" position.

9. Insert lock pin (1) to secure the locking pawl (4). Button in "T" end of the pin must be pressed in to insert the lock pin. Remove hand lever (5) from socket (3).

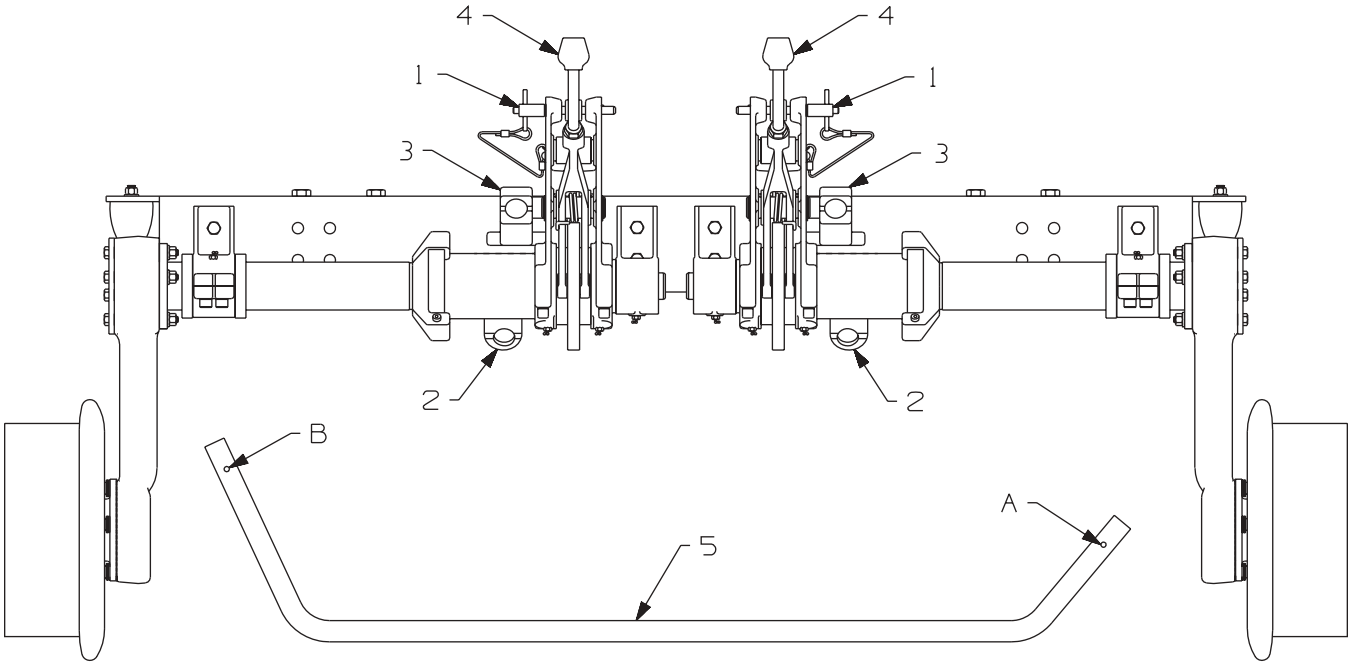
10. Repeat Steps 5 through 9 to lower and lock the other rear guide wheel in the "rail" position.

11. After the rear guide wheels are locked in the "rail" position, move the vehicle so that the vehicle front wheels are centered on the rail. Follow the same procedure to lock the front guide wheels in the "rail" position.

2.5 Placing Vehicle on Track

2.5.1 Lowering Guide Wheels

FIGURE 2-1
PLACING VEHICLE ON TRACK



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2.5 Placing Vehicle on Track

2.5.2 Steering Locks

1. See Figures 2-2, 2-3, 2-4 and 2-5. Turn the steering wheel to set the vehicle front wheels straight ahead. Secure the steering wheel in this position with the steering lock, located on the steering column. Steering locks may vary from vehicle to vehicle but will operate similarly.

Note: Do not place any pressure on the steering wheel after the steering lock is engaged.

FIGURE 2-2
STEERING LOCK IN UNLOCKED POSITION

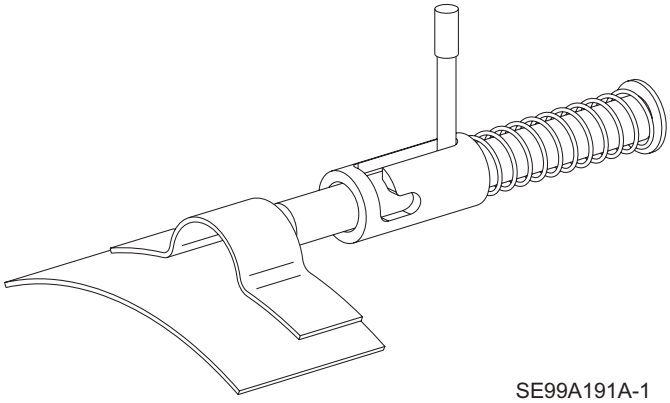

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FIGURE 2-3
STEERING LOCK IN LOCKED POSITION

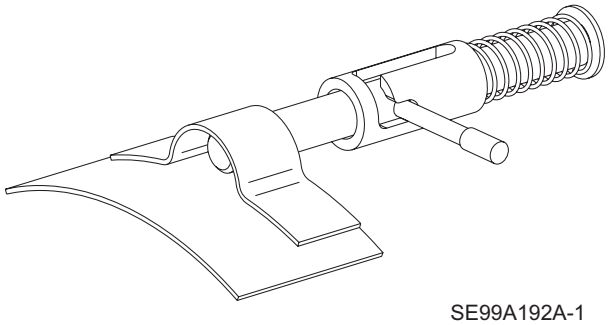

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FIGURE 2-4
VELCRO STEERING LOCK OFF

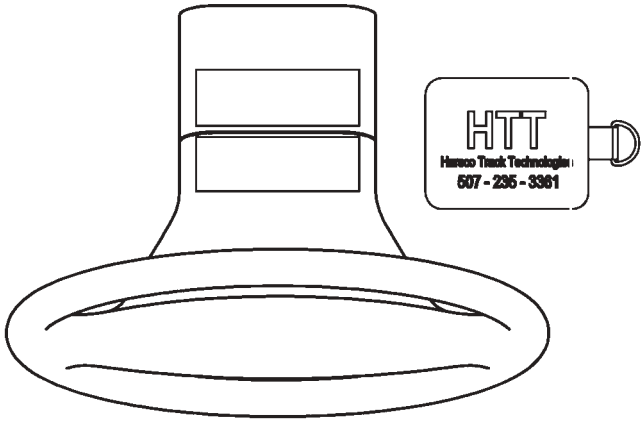
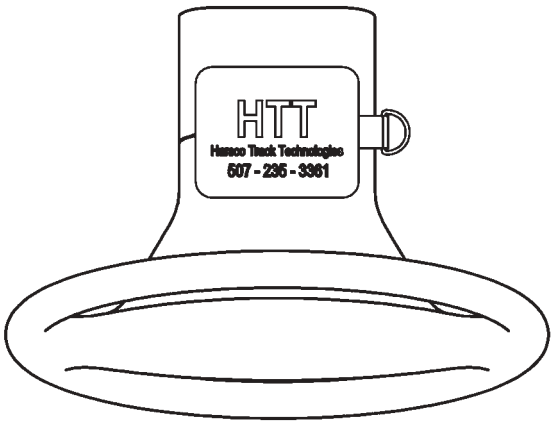


FIGURE 2-5
VELCRO STEERING LOCK ON



2.5 Placing Vehicle on Track

2.5.3 Rail Sweeps

1. The guide wheel units may be equipped with rail sweeps. The rail sweeps are positioned ahead of the front guide wheels and behind the rear guide wheels. The rail sweeps clear the rail of debris, lengthening the service life of the guide wheels.

   The rail sweeps are attached to the wheel arm and will lower when the guide wheels are lowered to the "rail" position and will raise when the guide wheels are raised to the "highway" position.

2.6 Guide Wheel Load on Track

- **IMPROPER LOADING OF THE GUIDE WHEEL EQUIPPED VEHICLE CAN CAUSE DERAILMENT OF THE VEHICLE.**
- **APPLY VEHICLE PARKING BRAKE AND STOP VEHICLE ENGINE BEFORE CHECKING GUIDE WHEEL LOAD.**
- **NEVER OPERATE THE VEHICLE ON THE "RAIL" WITH ONE OR MORE OF THE OVERLOAD SET SCREWS BOTTOMED OUT.**
- **ALWAYS CHECK THE GUIDE WHEEL LOAD BEFORE OPERATING THE VEHICLE ON TRACK. MINIMUM LOAD ON ANY GUIDE WHEEL MUST BE AT LEAST 350 LBS (159 kg). MAXIMUM LOAD ON ANY GUIDE WHEEL MUST NOT EXCEED 700 LBS (318 kg). NEVER OPERATE THE VEHICLE ON TRACK IF THE LOAD ON ANY GUIDE WHEEL IS NOT WITHIN THESE RANGES.**
- **DO NOT USE ANY OTHER JACK THEN THE HARSCO TRACK TECHNOLOGIES WHEEL WEIGHING JACK NO. 073527 TO CHECK THE GUIDE WHEEL LOAD. USE OF ANY OTHER JACK WILL RESULT IN INCORRECT GUIDE WHEEL LOAD INFORMATION.**
- **MISUSE OF THE WHEEL WEIGHING JACK MAY CAUSE GAUGE TO EXPLODE. READ ANSI B40.1 AND APPARATUS INSTALLATION / OPERATING INSTRUCTIONS BEFORE USE.**
- **DO NOT USE THE WHEEL WEIGHING JACK TO LIFT THE VEHICLE. EXCESSIVE WEIGHT MAY CAUSE THE JACK TO FAIL.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN DERAILMENT OF VEHICLE AND/OR SEVERE BODILY INJURY.

2.6.1 Checking Guide Wheel Load - See Figures 2-6 and 2-7

1. Lower and lock all guide wheels in the rail position. When the vehicle is at curb weight (with permanent attachments such as: spare tire, tool box less tools, utility box, crane, aerial lift boom, etc; and without passengers, baggage, load, etc.) there should be 3/8 inch (9.5 mm) clearance between the overload set screw and the stop on the casting. Check the overload set screws on each guide wheel whenever the vehicle is loaded or additional load is added to the existing vehicle load on "rail". If any of the overload set screws are bottomed out against the stop on the casting, the load must be redistributed or some of the load removed. Never operate the vehicle on "rail" with one or more of the overload set screws bottomed out.

2. Use the wheel weighing jack (Harsco Track Technologies part no. 073527) to check the guide wheel load if any of the overload set screws are bottomed out against the stop on the casting and/or to determine the load on the guide wheel. Do not use any other jack then the Harsco Track Technologies wheel weighing jack no. 073527 to check the guide wheel load. Use of any other jack will result in incorrect guide wheel load information.

2.6 Guide Wheel Load on Track

2.6.1 Checking Guide Wheel Load - See Figures 2-6 and 2-7

3. See Figure 2-5. Place the wheel weighing jack (073527) under the guide wheel arm directly below the wheel spindle. Jack the guide wheel up until the guide wheel just clears the top of the rail. Note the gauge reading. The gauge reading indicates the pounds of load on the guide wheel.

   Note: An easy way to tell when the guide wheel just clears the top of rail is to jack the wheel up approximately 1/4" (6.4 mm) above the top of the rail. Place a piece of paper between the rail and the guide wheel. Lower the guide wheel onto the paper. Slowly jack the guide wheel up while applying a steady pulling force on the paper until the paper can be pulled out. Note the gauge reading when the paper can be removed.

4. The recommended guide wheel load is 350 - 400 lbs (159 - 182 kg) @ specified guide wheel height. With the vehicle loaded, the maximum guide wheel load is 700 lbs (318 kg). The guide wheel load should be equal (+/- 25 lbs) on both the left and right sides of the unit.

5. If the measured load is less than the minimum guide wheel load of 350 lbs (159 kg) or exceeds the maximum guide wheel load of 700 lbs (318 kg) on any guide wheel, the guide wheel unit must be adjusted or the vehicle load must be redistributed or some of the load removed. Never operate the vehicle on track if the load on any guide wheel is not within these ranges. See the Adjustments Section - Guide Wheel Equipment Alignment Procedure.

FIGURE 2-6
GUIDE WHEEL OVERLOAD SET SCREWS

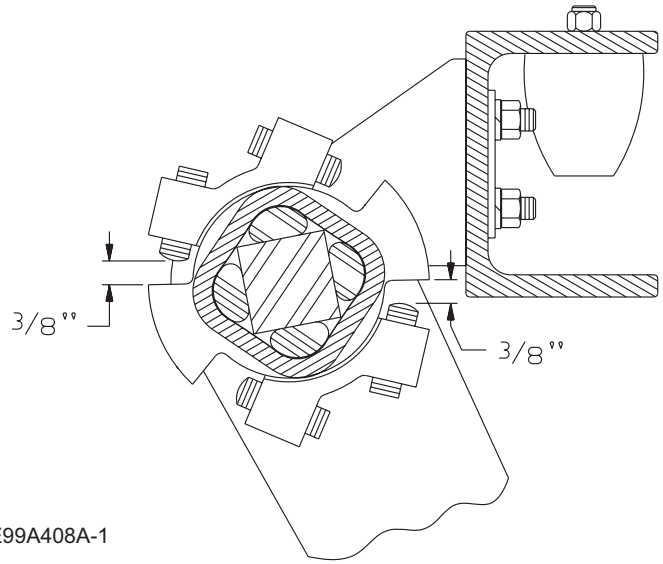


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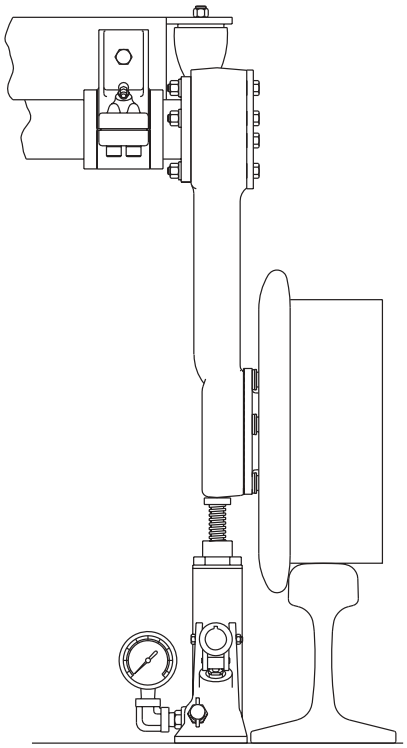
FIGURE 2-7
WHEEL WEIGHING JACK



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2.7 Propelling on Track

■ **IMPROPER LOADING OF THE GUIDE WHEEL EQUIPPED VEHICLE CAN CAUSE DERAILMENT OF THE VEHICLE.**

■ **ALWAYS CHECK THE GUIDE WHEEL LOAD BEFORE OPERATING THE VEHICLE ON TRACK. MINIMUM LOAD ON ANY GUIDE WHEEL MUST BE AT LEAST 350 LBS (159 kg). MAXIMUM LOAD ON ANY GUIDE WHEEL MUST NOT EXCEED 700 LBS (318 kg). NEVER OPERATE THE VEHICLE ON TRACK IF THE LOAD ON ANY GUIDE WHEEL IS NOT WITHIN THESE RANGES.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN DERAILMENT OF THE VEHICLE AND/OR SEVERE BODILY INJURY.

■ **BEFORE OR WHEN PROPELLING ON TRACK:**

- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **THE OPERATOR MUST LOOK ALL DIRECTIONS FOR PERSONS OR OBJECTS ON OR ADJACENT TO THE TRACK.**
- **DO NOT ACCELERATE SUDDENLY. TRACTION IS REDUCED ON TRACK, SPINNING VEHICLE TIRES COULD DAMAGE THEM.**
- **DO NOT EXCEED 45 MPH (72 km/h) WHEN OPERATING THE VEHICLE ON TRACK. RAILROAD RULES GOVERNING SPEEDS SHOULD BE OBSERVED AT ALL TIMES. REDUCE SPEED WHEN PROPELLING THE VEHICLE THROUGH SWITCHES, CROSSINGS, BRANCH LINES AND ANY SPECIAL TRACK WORKS. OPERATING THE VEHICLE AT UNSAFE SPEEDS COULD RESULT IN DERAILMENT OF THE VEHICLE.**
- **STEERING LOCK MUST BE ENGAGED AT ALL TIMES WHEN OPERATING THE VEHICLE ON TRACK.**

■ **IF THE VEHICLE IS EQUIPPED WITH A STROBE LIGHT (BEACON) AND RAILROAD RULES AND REGULATIONS REQUIRE ITS USE, THE STROBE LIGHT (BEACON) MUST BE ILLUMINATED WHEN OPERATING THE VEHICLE ON TRACK.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Vehicles equipped with HR0307 Series A HY-RAIL® Guide Wheel Equipment use the vehicle propulsion system. Do not accelerate suddenly. Traction is reduced on the track, and spinning the vehicle tires could damage them.

2.8 Braking on Track

- **PERSONS WHO OPERATE THE VEHICLE MUST BE FAMILIAR WITH TRACK AND WEATHER CONDITIONS THAT MAY AFFECT STOPPING DISTANCE. BE ALERT TO THESE CONDITIONS AND ALLOW ADEQUATE STOPPING DISTANCE.**

- **BE PREPARED TO BRAKE AT ALL HIGHWAY CROSSINGS. THIS VEHICLE WILL NOT OPERATE TRACK SIGNAL CIRCUITS, AND ONCOMING VEHICLES OR PEDESTRIANS MAY NOT YIELD THE RIGHT OF WAY.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Vehicles equipped with HR0307 Series A HY-RAIL® Guide Wheel Equipment use the vehicle brake system for braking on track. Stopping distance may be greater on track than on typical road surfaces. Apply the brakes gradually to avoid sliding the tires.

2.9 Removing Vehicle from Track

- **PLACE VEHICLE AUTOMATIC TRANSMISSION IN "PARK" OR MANUAL TRANSMISSION IN "NEUTRAL". APPLY THE PARKING BRAKE.**
- **UNDERSTAND EQUIPMENT OPERATION AND BE AWARE OF ALL PINCH POINTS BEFORE OPERATING OR MAKING ADJUSTMENTS TO GUIDE WHEEL EQUIPMENT.**
- **BEFORE PROPELLING THE VEHICLE OFF TRACK, MAKE SURE:**
  - **ALL FOUR GUIDE WHEELS ARE RAISED, LOCKED IN THE HIGHWAY POSITION, AND SECURED WITH THE LOCK PIN.**
  - **THE STEERING WHEEL LOCK IS DISENGAGED.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

- **THE SUPPLIED LIFT HANDLES ARE DESIGNED FOR OPERATING ONLY PROPERLY MAINTAINED GUIDE WHEEL EQUIPMENT. DO NOT USE THE LIFT HANDLE FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS DESIGNED. IF THE LIFT HANDLE IS DAMAGED (BENT, BROKEN, ETC.), IT MUST NOT BE REPAIRED (STRAIGHTENED, WELDED, ETC.), IT MUST BE REPLACED.**
- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **IF THE VEHICLE IS EQUIPPED WITH A STROBE LIGHT (BEACON) AND RAILROAD RULES AND REGULATIONS REQUIRE ITS USE, THE STROBE LIGHT (BEACON) MUST BE ILLUMINATED WHEN OPERATING THE VEHICLE ON TRACK AND WHEN REMOVING VEHICLE FROM TRACK.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.9.1 Raising Guide Wheels - See Figure 2-8

1. Ensure that highway vehicles are not approaching the grade crossing while removing vehicle from track. To ensure safety, flag the crossing per railroad rules and regulations.
2. Approach a road crossing and stop with the vehicle front wheels on the crossing.
3. Place automatic transmission in "PARK" or manual transmission in "NEUTRAL". Apply the parking brake.
4. Raise the front guide wheels first. Then the rear guide wheels.
5. Remove lock pin (1). Button in "T" end of the pin must be pressed in to remove the pin. Place the lock pin in a location so that it does not become entangled in the mechanical lock mechanism.

2.9 Removing Vehicle from Track

2.9.1 Raising Guide Wheels - See Figure 2-8

6. Insert the end of the hand lever (5) with short single bend (A) into socket (3). Push down to remove pressure from the locking pawl handle.

7. Push the locking pawl handle (4) to release the mechanical lock. Raise hand lever (5) to raise the guide wheel until it rests on the rail.

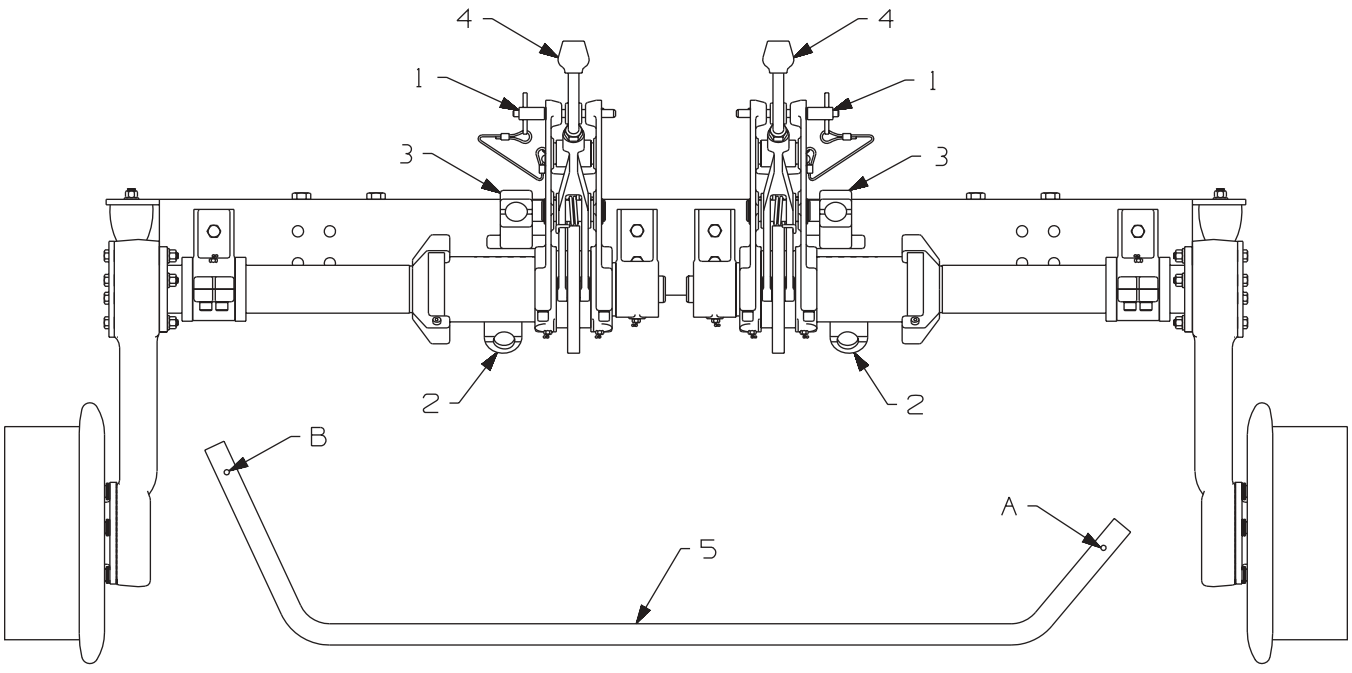
8. Remove the hand lever (5) from socket (3) and insert opposite end with long single bend (B) into socket (2). Push down on the hand lever, forcing the guide wheel up until the locking mechanism fully locks, securing the guide wheel in the "highway" position.

9. Insert lock pin (1) to secure the locking pawl (4). Button in "T" end of the pin must be pressed in to insert the lock pin. Remove hand lever (5) from socket (2).

10. Repeat Steps 5 through 9 to raise the other front guide wheel to the "highway" position.

11. After the front guide wheels are locked in the "highway" position, follow the same procedure to raise and lock the rear guide wheels in the "highway" position.

FIGURE 2-8
PLACING VEHICLE ON TRACK



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2.9 Removing Vehicle from Track

2.9.2 Steering Locks

1. See Figure 2-9, 2-10, 2-11 and 2-12. Disengage the steering lock. Steering locks may vary from vehicle to vehicle but will operate similarly.

FIGURE 2-9
STEERING LOCK IN UNLOCKED POSITION

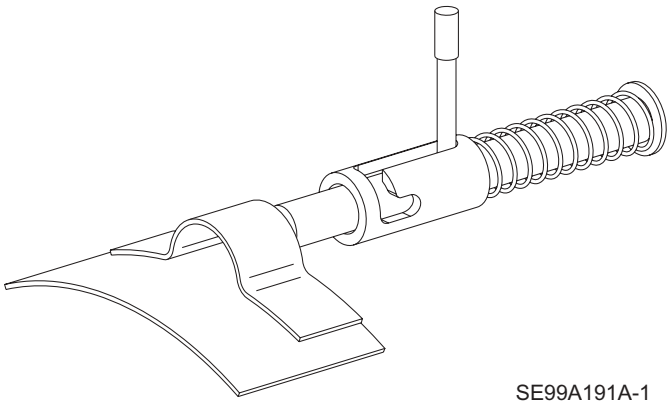

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FIGURE 2-10
STEERING LOCK IN LOCKED POSITION

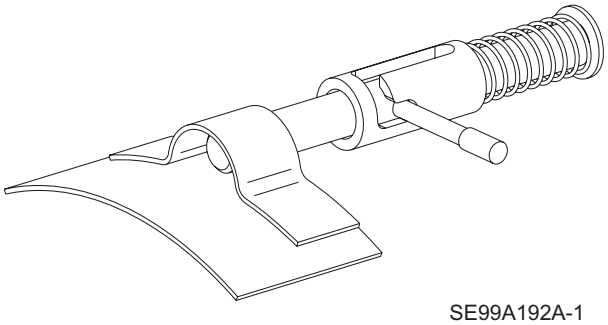

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FIGURE 2-11
VELCRO STEERING LOCK OFF

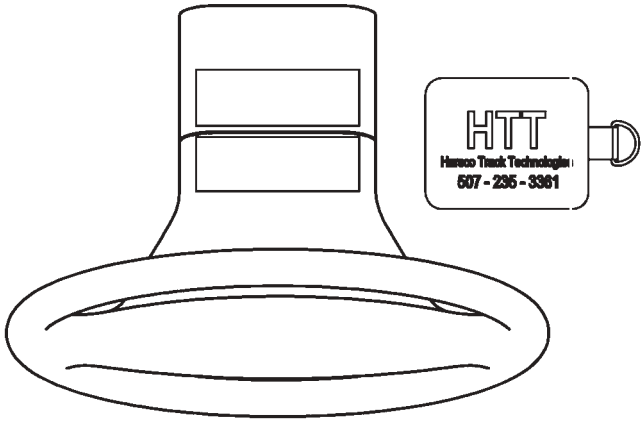
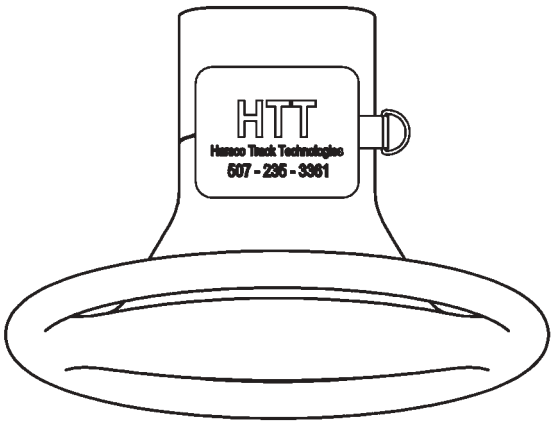


FIGURE 2-12
VELCRO STEERING LOCK ON



2.10 Highway Operation

■ **THIS MULTIPURPOSE VEHICLE HAS SPECIAL DESIGNS AND EQUIPMENT FEATURES FOR OFF-ROAD USE. IT HANDLES DIFFERENTLY FROM AN ORDINARY PASSENGER CAR IN DRIVING CONDITIONS THAT MAY OCCUR ON STREETS, HIGHWAYS AND OFF-ROAD. WEIGHT AND LOCATION OF AVAILABLE PAYLOAD MAY ALSO AFFECT THE HANDLING OF THIS VEHICLE. DRIVE WITH CARE AND WEAR SAFETY BELTS AT ALL TIMES. READ VEHICLE OWNER'S MANUAL FOR ADDITIONAL PRECAUTIONS.**

2.11 Towing Trailer / Equipment With The Vehicle On Track

- **THE VEHICLE USED FOR TOWING MUST BE RATED BY VEHICLE MANUFACTURER FOR WEIGHT OF TRAILER / EQUIPMENT TO BE TOWED. DO NOT EXCEED VEHICLE MANUFACTURER'S MAXIMUM RATED TOWING CAPACITY.**

- **THE TOWING VEHICLE MUST WEIGH AS MUCH OR MORE THAN TRAILER / EQUIPMENT BEING TOWED.**

- **THE VEHICLE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP THE TOWING VEHICLE AND THE TRAILER / EQUIPMENT BEING TOWED.**

- **TOWING TRAILER / EQUIPMENT LENGTHENS STOPPING DISTANCES. ALLOW ADEQUATE DISTANCE FOR STOPPING. ANTICIPATE STOPS SO YOU CAN BRAKE GRADUALLY.**

- **STOPPING DISTANCE IS GREATER ON TRACK THAN ON TYPICAL ROAD SURFACES. APPLY BRAKES GRADUALLY TO AVOID SLIDING VEHICLE TIRES AND GUIDE WHEELS.**

- **TOW TRAILER / EQUIPMENT AT A REASONABLE SPEED, 20 MPH (32 km/h) MAXIMUM, TAKING INTO ACCOUNT TRACK CONDITIONS, TRACK GRADE, WEATHER, VISIBILITY AND STOPPING DISTANCE TO ASSURE SAFE OPERATION. RAILROAD RULES GOVERNING SPEEDS AND RIGHT OF WAY SHOULD BE OBSERVED AT ALL TIMES.**

- **THE TRAILER / EQUIPMENT BEING TOWED MUST BE IN A SAFE, USABLE CONDITION TO BE TOWED.**

- **MAKE SURE THAT THE VEHICLE HAS:**
  - **THE FRONT AND REAR GUIDE WHEELS LOWERED AND LOCKED IN THE RAIL POSITION.**
  - **ALL FRONT AND REAR GUIDE WHEEL FLANGES ENGAGED ON THE INSIDE OF THE RAILS.**
  - **THE STEERING WHEEL LOCK ENGAGED WITH THE FRONT WHEELS STRAIGHT AHEAD.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

2.11 Towing Trailer / Equipment With The Vehicle On Track

- **CAREFULLY AND THOROUGHLY PREPARE THE VEHICLE FOR TOWING, MAKING SURE TO USE THE RIGHT TOWING EQUIPMENT AND TO ATTACH IT PROPERLY.**
- **THE TOWING EQUIPMENT (HITCHES, TOW BARS, ETC.) MUST BE ATTACHED TO THE VEHICLE FRAME. DO NOT MOUNT OR ATTACH THE TOWING EQUIPMENT TO THE GUIDE WHEEL UNITS.**
- **THE TOWING EQUIPMENT (HITCHES, TOW BARS, ETC.) MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE WEIGHT OF TRAILER / EQUIPMENT BEING TOWED.**
- **USE A RIGID TYPE TOW BAR WITH SAFETY LOCKING COUPLERS. DO NOT USE CHAIN, WIRE ROPE ETC.**
- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **DO NOT ACCELERATE SUDDENLY. TRACTION IS REDUCED ON TRACK, SPINNING THE VEHICLE TIRES COULD DAMAGE THEM.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.11 Towing Trailer / Equipment With The Vehicle On Track

1. See your vehicle operator's manual for towing information.

2. Use the vehicle manufacturer's recommendations to determine the maximum weight the towing vehicle can tow. Do not exceed the vehicle manufacturer's maximum rated towing capacity.

3. The towing vehicle must have an adequate brake system to safely decelerate and stop the towing vehicle and the trailer / equipment being towed. The towing vehicle must weigh as much or more than the trailer / equipment being towed.

4. Make sure that the vehicle has:
   a. The front and rear guide wheels lowered and locked in the rail position.
   b. All front and rear guide wheel flanges engaged on the inside of the rails.
   c. The front wheels set straight ahead and the steering wheel lock is engaged.

5. Make sure the towing vehicle and the trailer / equipment are in good working condition (tires, brakes, lights, etc.) and that current maintenance has been performed on the vehicle and trailer / equipment.

6. The towing equipment (hitches, tow bars, etc.) on the towing vehicle must have a rating equal to or greater than the weight of the trailer / equipment being towed.

7. The towing equipment (hitches, tow bars, etc.) must be attached to the towing vehicle frame. Do not mount or attach the towing equipment to the guide wheel units.

8. Observe and follow all railroad safety rules and regulations.

9. Do not accelerate suddenly. Traction is reduced on track. Spinning the vehicle tires could damage them.

10. Stopping distance is greater on track than on typical road surfaces. Apply the vehicle brakes gradually to avoid sliding the vehicle tires and the guide wheels. Towing trailer / equipment lengthens stopping distances. Allow adequate distance for stopping. Anticipate stops so that you can brake gradually.

11. Tow the trailer / equipment on the track at a reasonable speed, 20 MPH (32 km/h) maximum, taking into account track conditions, track grade, weather, visibility and stopping distance to assure safe operation. Railroad rules and regulations governing speed limits and right of way should be observed at all times.

12. Always chock the trailer wheels before unhooking the trailer from the towing vehicle.

2.12 Towing Trailer / Equipment With The Vehicle On Road

- **THE VEHICLE USED FOR TOWING MUST BE RATED BY THE VEHICLE MANUFACTURER FOR WEIGHT OF THE TRAILER / EQUIPMENT TO BE TOWED. DO NOT EXCEED THE VEHICLE MANUFACTURER'S MAXIMUM RATED TOWING CAPACITY.**

- **THE VEHICLE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP THE TOWING VEHICLE AND TRAILER / EQUIPMENT BEING TOWED.**

- **TOWING TRAILER / EQUIPMENT LENGTHENS STOPPING DISTANCES. ALLOW ADEQUATE DISTANCE FOR STOPPING. ANTICIPATE STOPS SO YOU CAN BRAKE GRADUALLY.**

- **TOW TRAILER / EQUIPMENT AT A REASONABLE SPEED TAKING INTO ACCOUNT ROAD CONDITIONS, ROAD GRADE, WEATHER, VISIBILITY AND STOPPING DISTANCE TO ASSURE SAFE OPERATION. POSTED SPEED LIMITS SHOULD BE OBSERVED AT ALL TIMES.**

- **THE TRAILER / EQUIPMENT BEING TOWED MUST BE IN A SAFE, USABLE CONDITION TO BE TOWED.**

- **MAKE SURE THAT THE VEHICLE HAS:**
  - **THE FRONT AND REAR GUIDE WHEEL UNITS RAISED AND LOCKED IN THE HIGHWAY POSITION.**
  - **THE STEERING WHEEL LOCK DISENGAGED.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

2.12 Towing Trailer / Equipment With The Vehicle On Road

- **THIS MULTIPURPOSE VEHICLE HAS SPECIAL DESIGNS AND EQUIPMENT FEATURES FOR OFF-ROAD USE. IT HANDLES DIFFERENTLY FROM AN ORDINARY PASSENGER CAR IN DRIVING CONDITIONS THAT MAY OCCUR ON STREETS, HIGHWAYS AND OFF-ROAD. WEIGHT AND LOCATION OF AVAILABLE PAYLOAD MAY ALSO AFFECT THE HANDLING OF THIS VEHICLE. DRIVE WITH CARE AND WEAR SAFETY BELTS AT ALL TIMES. READ VEHICLE OWNER'S MANUAL FOR ADDITIONAL PRECAUTIONS.**

- **OBSERVE AND FOLLOW ALL FEDERAL, STATE AND LOCAL DRIVING RULES AND REGULATIONS.**

- **STATE LAWS MAY REQUIRE TOWING VEHICLE AND TRAILER / EQUIPMENT BEING TOWED TO BE EQUIPPED WITH SPECIAL SAFETY EQUIPMENT (MIRRORS ON BOTH SIDES OF TOWING VEHICLE, TRAILER BRAKES, TRAILER LIGHTS, ETC.).**

- **CAREFULLY AND THOROUGHLY PREPARE YOUR VEHICLE FOR TOWING, MAKING SURE TO USE THE RIGHT TOWING EQUIPMENT AND TO ATTACH IT PROPERLY.**

- **THE TOWING EQUIPMENT (HITCHES, TOW BARS, ETC.) MUST BE ATTACHED TO THE VEHICLE FRAME. DO NOT MOUNT OR ATTACH TOWING EQUIPMENT TO THE GUIDE WHEEL UNITS.**

- **THE TOWING EQUIPMENT (HITCH, TOW BAR, ETC.) MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN WEIGHT OF THE TRAILER / EQUIPMENT BEING TOWED.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.12 Towing Trailer / Equipment With The Vehicle On Road

1. See your vehicle operator's manual for towing information.

2. Use the vehicle manufacturer's recommendations to determine the maximum weight the towing vehicle can tow. Do not exceed the vehicle manufacturer's maximum rated towing capacity.

3. The towing vehicle must have an adequate brake system to safely decelerate and stop the towing vehicle and the trailer / equipment being towed. Towing trailer / equipment lengthens stopping distances. Allow adequate distance for stopping. Anticipate stops so that you can brake gradually.

4. Make sure that the vehicle has:
   a. The front and rear guide wheel units raised and locked in the highway position.
   b. The steering wheel lock disengaged.

5. Make sure the towing vehicle and the trailer / equipment are in good working condition (tires, brakes, lights, etc.) and that current maintenance has been performed on the vehicle and trailer / equipment.

6. The towing equipment (hitches, tow bars, etc.) on the towing vehicle must have a rating equal to or greater than the weight of the trailer / equipment being towed.

7. The towing equipment (hitches, tow bars, etc.) must be attached to the towing vehicle frame. Do not mount or attach the towing equipment to the guide wheel units.

8. Observe and follow all federal, state and local driving rules, regulations and laws.

9. State laws may require the towing vehicle and/or the trailer / equipment being towed to be equipped with special safety equipment (mirrors on both sides of the towing vehicle, trailer brakes, trailer lights, etc.).

10. Tow the trailer / equipment on the road at a reasonable speed taking into account road conditions, road grade, weather, visibility and stopping distance to assure safe operation. Always observe posted speed limits.

11. Always chock the trailer wheels before unhooking the trailer from the towing vehicle.

2.13 Towing The Disabled Vehicle On Track

- **THE TOWING VEHICLE / MACHINE MUST WEIGH AS MUCH OR MORE THAN THE DISABLED VEHICLE BEING TOWED.**
- **THE VEHICLE / MACHINE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP THE TOWING VEHICLE / MACHINE AND THE DISABLED VEHICLE BEING TOWED.**
- **TOWING THE DISABLED VEHICLE LENGTHENS STOPPING DISTANCES. ALLOW ADEQUATE DISTANCE FOR STOPPING. ANTICIPATE STOPS SO YOU CAN BRAKE GRADUALLY.**
- **TOW THE DISABLED VEHICLE AT A REASONABLE SPEED, 10 MPH (16 km/h) MAXIMUM, TAKING INTO ACCOUNT TRACK CONDITIONS, TRACK GRADE, WEATHER, VISIBILITY AND STOPPING DISTANCE TO ASSURE SAFE OPERATION. RAILROAD RULES GOVERNING SPEED LIMITS AND RIGHT OF WAY SHOULD BE OBSERVED AT ALL TIMES.**
- **STOPPING DISTANCE IS GREATER ON TRACK THAN ON TYPICAL ROAD SURFACES. APPLY BRAKES GRADUALLY TO AVOID SLIDING THE TOWING VEHICLE / MACHINE WHEELS.**
- **MAKE SURE THAT THE DISABLED VEHICLE HAS:**
  - **THE FRONT AND REAR GUIDE WHEEL UNITS LOWERED AND LOCKED IN THE RAIL POSITION.**
  - **ALL FRONT AND REAR GUIDE WHEEL FLANGES ENGAGED ON THE INSIDE OF THE RAILS.**
  - **THE STEERING WHEEL LOCK ENGAGED WITH THE FRONT WHEELS STRAIGHT AHEAD.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

2.13 Towing The Disabled Vehicle On Track

- **THE TOW BAR MUST BE ATTACHED TO DISABLED VEHICLE FRAME. DO NOT MOUNT OR ATTACH THE TOW BAR TO THE DISABLED VEHICLE GUIDE WHEEL UNITS.**
- **THE TOW BAR MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN WEIGHT OF THE DISABLED VEHICLE BEING TOWED.**
- **USE A RIGID TYPE TOW BAR WITH SAFETY LOCKING COUPLERS. DO NOT USE CHAIN, WIRE ROPE ETC.**
- **OBSERVE AND FOLLOW ALL RAILROAD SAFETY RULES AND REGULATIONS.**
- **DO NOT ACCELERATE SUDDENLY. TRACTION IS REDUCED ON TRACK, SPINNING THE TOWING VEHICLE / MACHINE WHEELS COULD DAMAGE THEM.**
- **TOW THE DISABLED VEHICLE TO THE NEAREST ROAD CROSSING AND REMOVE IT FROM THE TRACK.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.13 Towing The Disabled Vehicle On Track

1. See your vehicle operator's manual for towing information.

2. The towing vehicle / machine must have an adequate brake system to safely decelerate and stop the towing vehicle / machine and the disabled vehicle being towed. The towing vehicle / machine must weigh as much or more than the disabled vehicle towed.

3. Make sure that the disabled vehicle has:
   a. The front and rear guide wheel units lowered and locked in the rail position.
   b. All front and rear guide wheel flanges engaged on the inside of the rails.
   c. The front wheels are set straight ahead and the steering wheel lock is engaged.

4. Make sure the towing vehicle / machine is in good working condition (tires, brakes, lights, etc.) and that current maintenance has been performed on the vehicle / machine.

5. The towing equipment (hitches, tow bars, etc.) on the towing vehicle / machine must have a rating equal to or greater than the weight of the disabled vehicle being towed.

6. The tow bar must be mounted or attached to the disabled vehicle's frame. Do not mount or attach the tow bar to the guide wheel units. Use a rigid type tow bar with safety locking couplers.

7. Observe and follow all railroad safety rules and regulations.

8. Do not accelerate suddenly. Traction is reduced on track. Spinning the towing vehicle tires / machine wheels could damage them.

9. Stopping distance is greater on track than on typical road surfaces. Apply the towing vehicle / machine brakes gradually to avoid sliding the vehicle tires / machine wheels. Towing disabled vehicle lengthens stopping distances. Allow adequate distance for stopping. Anticipate stops so that you can brake gradually.

10. Tow the disabled vehicle on the track at a reasonable speed, 10 MPH (16 km/h) maximum, taking into account track conditions, track grade, weather, visibility and stopping distance to assure safe operation. Railroad rules and regulations governing speed limits and right of way should be observed at all times.

11. Tow the disabled vehicle to the nearest road crossing and remove the vehicle from the track.

2.14 Towing The Disabled Vehicle On Road

- **TOW THE DISABLED VEHICLE PER THE VEHICLE MANUFACTURER'S TOWING SPECIFICATIONS LISTED IN YOUR VEHICLE'S OPERATORS MANUAL.**
- **THE VEHICLE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP TOWING VEHICLE AND DISABLED VEHICLE BEING TOWED.**
- **TOW THE DISABLED VEHICLE AT A REASONABLE SPEED TAKING INTO ACCOUNT ROAD CONDITIONS, ROAD GRADE, WEATHER, VISIBILITY AND STOPPING DISTANCE TO ASSURE SAFE OPERATION. POSTED SPEED LIMITS SHOULD BE OBSERVED AT ALL TIMES.**
- **MAKE SURE THE DISABLED VEHICLE HAS:**
  - **THE FRONT AND REAR GUIDE WHEEL UNITS RAISED AND LOCKED IN THE HIGHWAY POSITION.**
  - **THE STEERING WHEEL LOCK DISENGAGED.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

- **TOWING EQUIPMENT (TOW TRUCK, TOW BARS, ETC.) MUST BE ATTACHED TO THE DISABLED VEHICLE FRAME. DO NOT MOUNT OR ATTACH TOWING EQUIPMENT TO THE GUIDE WHEEL UNITS.**
- **THE TOWING EQUIPMENT (TOW TRUCK, TOW BARS, ETC.) MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN WEIGHT OF THE DISABLED VEHICLE BEING TOWED.**
- **OBSERVE AND FOLLOW ALL FEDERAL, STATE AND LOCAL DRIVING RULES AND REGULATIONS.**
- **STATE LAWS MAY REQUIRE TOWING VEHICLE AND DISABLED VEHICLE TO BE EQUIPPED WITH SPECIAL SAFETY EQUIPMENT (LIGHTS, ETC.).**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

2.14 Towing The Disabled Vehicle On Road

1. See your vehicle operator's manual for towing information.

2. The towing vehicle must have an adequate brake system to safely decelerate and stop the towing vehicle and the disabled vehicle being towed.

3. Make sure that the disabled vehicle has:
   a. The front and rear guide wheel units raised and locked in the highway position.
   b. The steering wheel lock is disengaged.

4. Make sure the towing vehicle is in good working condition (tires, brakes, lights, etc.) and that current maintenance has been performed on the vehicle.

5. The towing equipment (tow truck, tow bars, etc.) on the towing vehicle must have a rating equal to or greater than the weight of the disabled vehicle being towed.

6. The towing equipment (tow truck, tow bars, etc.) must be mounted or attached to the disabled vehicle frame. Do not mount or attach the towing equipment to the guide wheel units.

7. Observe and follow all federal, state and local driving rules, regulations and laws.

8. State laws may require the towing vehicle and the disabled vehicle being towed to be equipped with special safety equipment (lights, etc.).

9. Tow the disabled vehicle on the road at a reasonable speed taking into account road conditions, road grade, weather, visibility and stopping distance to assure safe operation. Always observe posted speed limits.

SECTION 3 - ADJUSTMENTS
TABLE OF CONTENTS

3.1 Guide Wheel Equipment Alignment Procedure

- **BEFORE PERFORMING ANY ADJUSTMENTS TO THE GUIDE WHEEL UNITS OR VEHICLE, ALWAYS PLACE THE AUTOMATIC TRANSMISSION IN "PARK" OR THE MANUAL TRANSMISSION IN "NEUTRAL". APPLY PARKING BRAKE.**

- **UNDERSTAND EQUIPMENT OPERATION AND BE AWARE OF ALL PINCH POINTS BEFORE OPERATING OR MAKING ADJUSTMENTS TO THE GUIDE WHEEL EQUIPMENT.**

FAILURE TO HEED THESE WARNINGS COULD RESULT IN SEVERE BODILY INJURY.

The Guide Wheel Alignment Procedure must be completed when the guide wheel equipment is applied to the vehicle, or when any of the misalignment indicators occur. See Operation Section -Misalignment Indicators

3.1.1 Vehicle Check

1. The vehicle must be at curb weight with permanent attachments: spare tire, tool box less tools, utility box, crane, aerial lift boom, etc. and without: passengers, baggage, load, etc.

2. Weigh the entire vehicle and record this weight. Weigh both the front and rear axles of the vehicle separately and record these weights. The weight of the vehicle should not exceed the GVWR (Gross Vehicle Weight Rating) and the weight on the front and rear axles should not exceed their respective GAWR (Gross Axle Weight Rating).

3. Permanent attachments to the vehicle such as a tool box, utility box, crane aerial lift boom, etc. which could cause uneven loading on the guide wheels should be compensated for by adjusting the vehicle suspension by adding leaf springs, coil springs, torsion bars, etc.

4. Tires must be inflated to the tire manufacturer's recommended maximum pressure printed on the sidewalls of the tires or the wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower.

5. Visually inspect the entire vehicle, especially the guide wheel equipment for loose or missing bolts and bent or damaged components. Tighten, repair or replace as necessary.

6. Verify that the vehicle that the guide wheel equipment is being mounted on is equipped correctly (springs, tires, wheels, etc.).

3.1 Guide Wheel Equipment Alignment Procedure

3.1.1 Vehicle Check

7. Check the following measurements on the vehicle that the guide wheel equipment is to be mounted on before applying the guide wheel equipment to the vehicle.

   a. Frame must be square. Diagonal measurements of frame should be equal within 1/8 inch (3.2 mm).

   b. Wheelbase (as measured on each side) must be equal within 1/16 inch (1.8 mm).

   c. Vehicle axles must be square with the frame within 1/64 inch per foot (.4 mm per 305 mm). Harsco Track Technologies, Harsco Corporation recommends that this be checked by a reputable alignment shop.

8. Follow the mounting instructions on the application drawing which is supplied with each Guide Wheel Equipment Group.

   Note: The applicator of the guide wheel equipment must make sure the application drawings remain with the vehicle for further reference. If the application drawings are not with the vehicle, contact Harsco Track Technologies, Fairmont Minnesota Facility to obtain these drawings.

9. After mounting the guide wheel equipment, have a four point alignment completed on the vehicle including checking the caster, camber, toe-in on the front wheels and thrust angle of the rear axle. The thrust angle of the rear axle should be set as close to zero as possible. If necessary, adjust to vehicle manufacturers' recommendations.

10. Have the headlight aim checked and adjusted, if necessary.

3.1.2 Placing Vehicle On Track

1. Place the vehicle on straight, level, tangent track or on an alignment rack constructed for guide wheel equipment alignment. If track or an alignment rack is not available, use 4 x 6 inch lumber, on a level floor, to simulate track. Space the lumber so it measures 57-1/2 inches between the inside edges. Using 4 x 6 inch lumber will allow the wheel weighing jack to fit underneath the wheel arm to weigh the guide wheel load when the guide wheels are in the "rail" position.

2. Place the automatic transmission in "Park" or manual transmission in "Neutral". Apply the parking brake. Lower and lock all four guide wheels in the "rail" position. See Operation Section -Placing Vehicle On Track.

3. Set the vehicle wheels straight ahead. Secure the steering wheel using the steering lock. Stop the engine.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.3 Guide Wheel Unit Back Flange Gauge - See Figure 3-1

1. Measure the back flange gauge of both the front and rear guide wheel units. Measure from the back of the left wheel flange, directly below the center line of the wheel spindle, to the same point on the right wheel flange. Back flange gauge must be 53-3/8 - 53-1/2 inches (1356 - 1359 mm) for both the front and rear guide wheel units. If not, see Adjustment.

3.1.3.1 Adjustment

1. Unlock both front and/or both rear guide wheels from the "rail" position. Let the guide wheels rest on the rail.

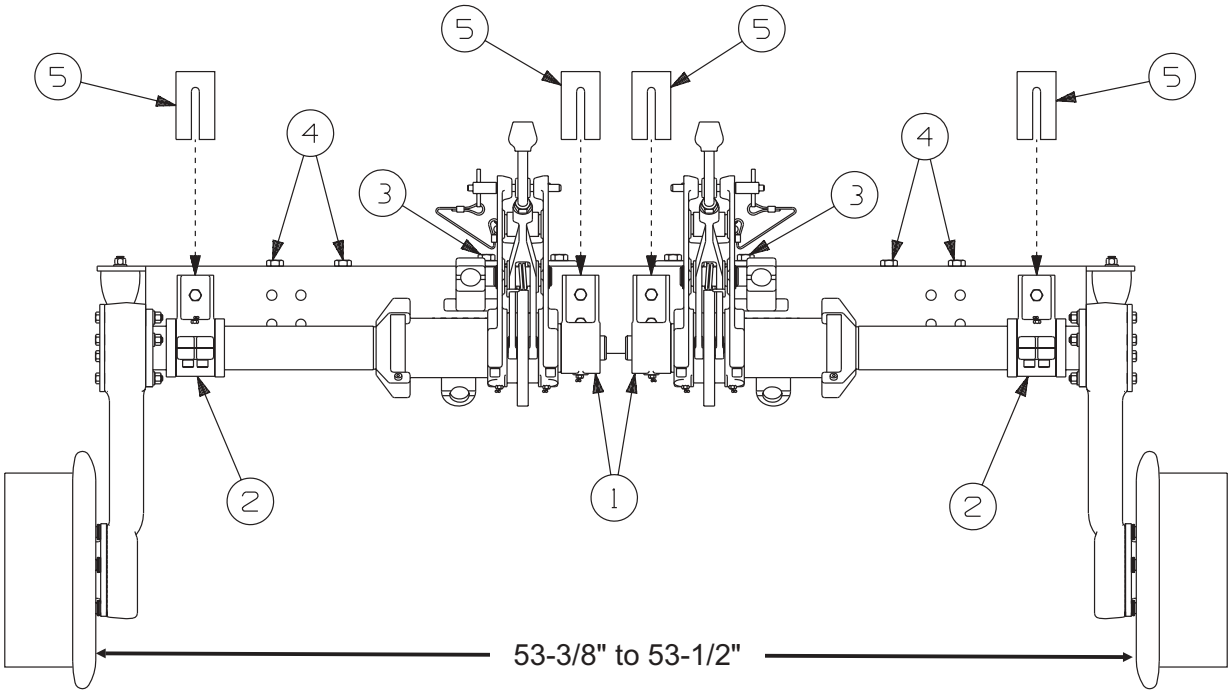
2. Loosen the inner (1) and outer (2) pivot bearings and trunnion nut bracket cap screws (3). Shift one or both of the guide wheel assemblies. Re-tighten the cap screws.

3. Lock all guide wheels in the "rail" position. Recheck the guide wheel unit back flange gauge.

4. Repeat the procedure until the guide wheel unit back flange gauge is correct.

5. Always check the guide wheel back flange gauge after performing any guide wheel alignment procedures to ensure the back flange gauge is within the allowable limits.

FIGURE 3-1
GUIDE WHEEL UNIT BACK FLANGE GAUGE



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3.1 Guide Wheel Equipment Alignment Procedure

3.1.4 Guide Wheel Arm Vertical Height - See Figures 3-2, 3-3 & 3-4

1. Figure 3-2 illustrates a side view of a typical HR0307 Series A HY-RAIL® Guide Wheel Equipment application. Guide wheel unit mounts may vary in detail, depending on the vehicle.

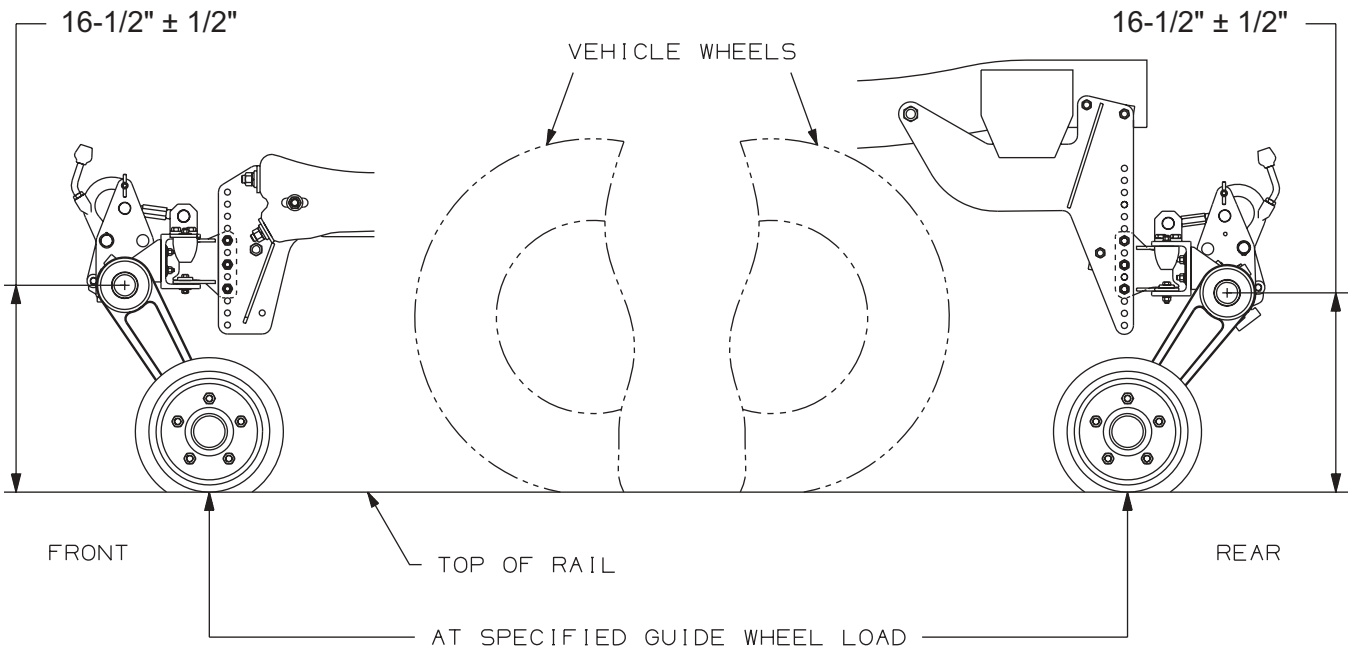
2. Lower and lock all four guide wheels in the "rail" position. Measure the vertical distance from the top of the rail to the pivot center of the wheel arm on all guide wheels.

   With the vehicle at curb weight, the recommended height is 16-1/2" ±1/2" (419 mm ±12.7 mm) @ specified guide wheel load.

   Note: For maximum load carrying capacity, set both rear wheel arms to the upper recommended height limit.

   If the vertical height is not correct on any of the wheel arms, see Adjustment.

FIGURE 3-2
GUIDE WHEEL UNIT WHEEL ARM VERTICAL HEIGHT



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3.1 Guide Wheel Equipment Alignment Procedure

3.1.4 Guide Wheel Arm Vertical Height - See Figures 3-2, 3-3 & 3-4

3.1.4.1 Adjustment

1. Unlock both front and/or both rear guide wheels from the "rail" position. Let the guide wheels rest on the rails.

2. Readjust only the wheel arm(s) that were initially not within the recommended height. The difference between the measured height and the recommended height is the approximate height that the wheel arms must be adjusted.

3. Figures 3-3 and 3-4 illustrate typical mounting bracket configurations used on the front and rear guide wheel units. Mounting brackets may vary in detail, depending on the vehicle.

4. The adjustments can be made in 1 inch or 1/2 inch increments. Either one or a combination of both can be used to achieve the recommended height. Before removing any bolts, securely block the guide wheel unit.

   1 inch (25.4 mm) increments:

   Remove cap screws (1) and relocate in a different set of holes in the mounting bracket (2). Reinstall and re-tighten the cap screws.

   1/2 inch (12.7 mm) increments:

   Remove cap screws (1). Remove cap screws (3) and adapter bracket (4). Reverse adapter bracket (4) (top to bottom) and reinstall.

   Note: It is acceptable to reverse only one of the adapter brackets (4) to compensate for differences in the vehicle frame but the adapter brackets (4) must be mounted in the same holes, left and right, on mounting brackets (2).

   As an example: if the top bolt of the left adapter bracket (4) is located five holes down from the top of mounting bracket (2), the top bolt of the right adapter bracket (4) must also be located five holes down from the top of mounting bracket (2).

   Be sure to reinstall the 1/32" and 1/16" shims (5) on the top or bottom of the adapter bracket (4). The adapter bracket (4) must fit snug inside of the cross channel (6). The shims are used as required. Reinstall and re-tighten the cap screws.

5. Lock all guide wheels in the "rail" position. Recheck the vertical height on all wheel arms.

   Note: Any wheel arm height adjustment made may change the guide wheel load. Recheck the guide wheel load. Wheel arm vertical height and guide wheel load must both be attained at the same time within the specified height dimensions and load limits. If the wheel arm vertical height and guide wheel load cannot be attained at the same time within the specified height dimensions and load limits, the rubber cords may need to be replaced.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.4 Guide Wheel Arm Vertical Height

FIGURE 3-3
GUIDE WHEEL ARM VERTICAL ADJUSTMENT
FRONT GUIDE WHEEL UNIT

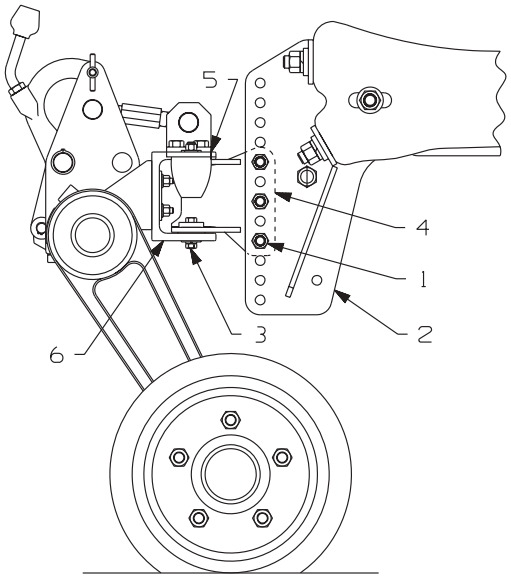

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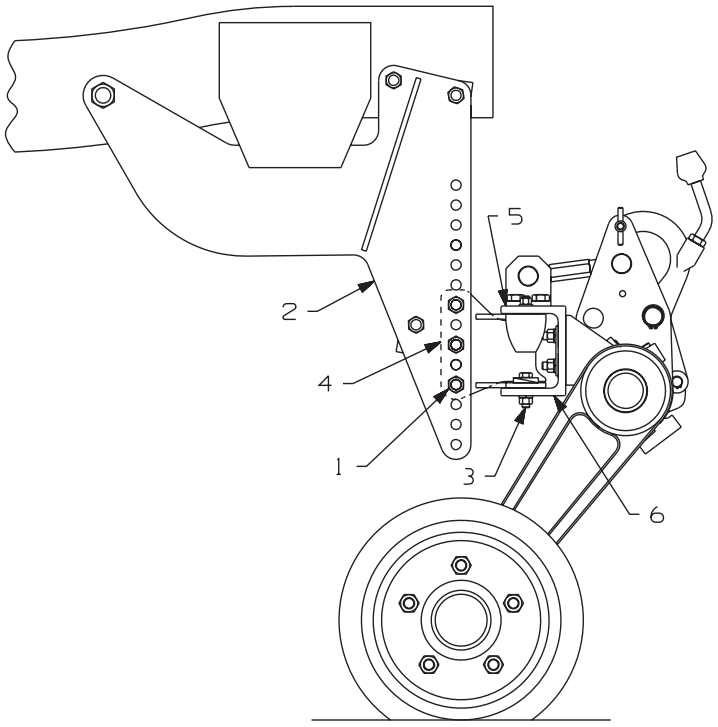
FIGURE 3-4
GUIDE WHEEL ARM VERTICAL ADJUSTMENT
REAR GUIDE WHEEL UNIT



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3.1.5 Guide Wheel Load

CAUTION

- **DO NOT USE ANY OTHER JACK THAN THE HARSCO TRACK TECHNOLOGIES WHEEL WEIGHING JACK NO. 073527 TO CHECK THE GUIDE WHEEL LOAD. USE OF ANY OTHER JACK WILL RESULT IN INCORRECT GUIDE WHEEL LOAD INFORMATION.**
- **DO NOT USE THE WHEEL WEIGHING JACK TO LIFT THE VEHICLE. EXCESSIVE WEIGHT MAY CAUSE JACK TO FAIL. MISUSE OF WHEEL WEIGHING JACK MAY CAUSE GAUGE TO EXPLODE. READ ANSI B40.1 AND APPARATUS INSTALLATION / OPERATING INSTRUCTIONS BEFORE USE.**

FAILURE TO HEED THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.5 Guide Wheel Load - See Figures 3-5 & 3-6

1. Lower and lock all guide wheels in the "rail" position. Do not use any other jack than the Harsco Track Technologies wheel weighing jack no. 073527 to check the guide wheel load. Use of any other jack will result in incorrect guide wheel load information.

2. Place the wheel weighing jack (part no. 073527) under the guide wheel arm directly below the wheel spindle, see Figure 3-5. Jack the guide wheel up until the guide wheel just clears the top of the rail. Note the gauge reading. The gauge reading indicates the pounds of load on the guide wheel.

Note: An easy way to tell when the guide wheel just clears the top of rail is to jack the wheel up approximately 1/4" (6.4 mm) above the top of the rail. Place a piece of paper between the rail and the guide wheel. Lower the guide wheel onto the paper. Slowly jack the guide wheel up while applying a steady pulling force on the paper until the paper can be pulled out. Note the gauge reading when the paper can be removed.

With the vehicle at curb weight, the recommended guide wheel load is 350 - 400 lbs (159 - 182 kg) @ specified guide wheel height

With the vehicle loaded, the maximum guide wheel load is 700 lbs (318 kg).

If the load is not correct on any guide wheel, see Adjustment.

Note: For maximum load carrying capacity, set both rear guide wheels to the lower recommended load limit.

3.1.5.1 Adjustment

1. Unlock both front and/or rear guide wheels from the "rail" position. Let the guide wheels rest on the rails.

2. Figure 3-6 illustrates the load adjustment stud on the front and rear units. Each guide wheel is adjusted independently of the other.

3. Loosen the jam nut (1) using the provided wrench (part no. 079792).

To Increase The Load:	Turn the adjusting stud (2) clockwise, shortening the distance between the trunnion nuts (3).
To Decrease The Load:	Turn the adjusting stud (2) counter-clockwise, lengthening the distance between the trunnion nuts (3).

4. Lock all guide wheels in the "rail" position. Recheck the guide wheel load on all guide wheels. When the load indicated is within the recommended weight, tighten jam nut (1) securely.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.5 Guide Wheel Load - See Figures 3-5 & 3-6

3.1.5.1 Adjustment

5. If the recommended guide wheel load cannot be achieved by turning the adjusting stud, the guide wheel arm vertical height must be adjusted lower.

   Note: Any guide wheel load adjustment made may change the guide wheel arm vertical height. Recheck the guide wheel arm vertical height. Guide wheel load and guide wheel arm vertical height must both be attained at the same time within the specified load limits and height dimensions.

6. The end of the load adjusting stud (2) should not extend more than 1/4 inch (6.4 mm) beyond and not more than 1/8 inch (3.2 mm) within the face of the trunnion nut (3).

   If adjusting stud extends more than 1/4 inch (6.4 mm) beyond the face of the trunnion nut, it may be necessary to replace the rubber cords in the torque coupling.

   If the end of the adjusting stud is within the face of the trunnion nut, there may be foreign material lodged in the torque coupling assembly. Disassemble and clean.

FIGURE 3-5
WHEEL WEIGHING JACK

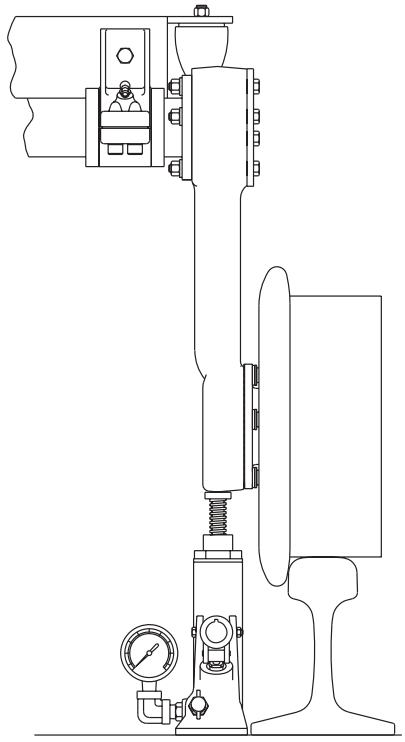

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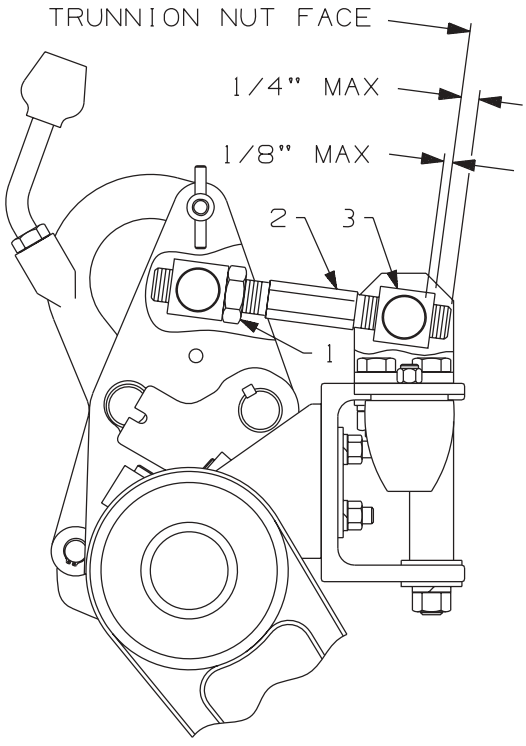
FIGURE 3-6
LOAD ADJUSTING STUD



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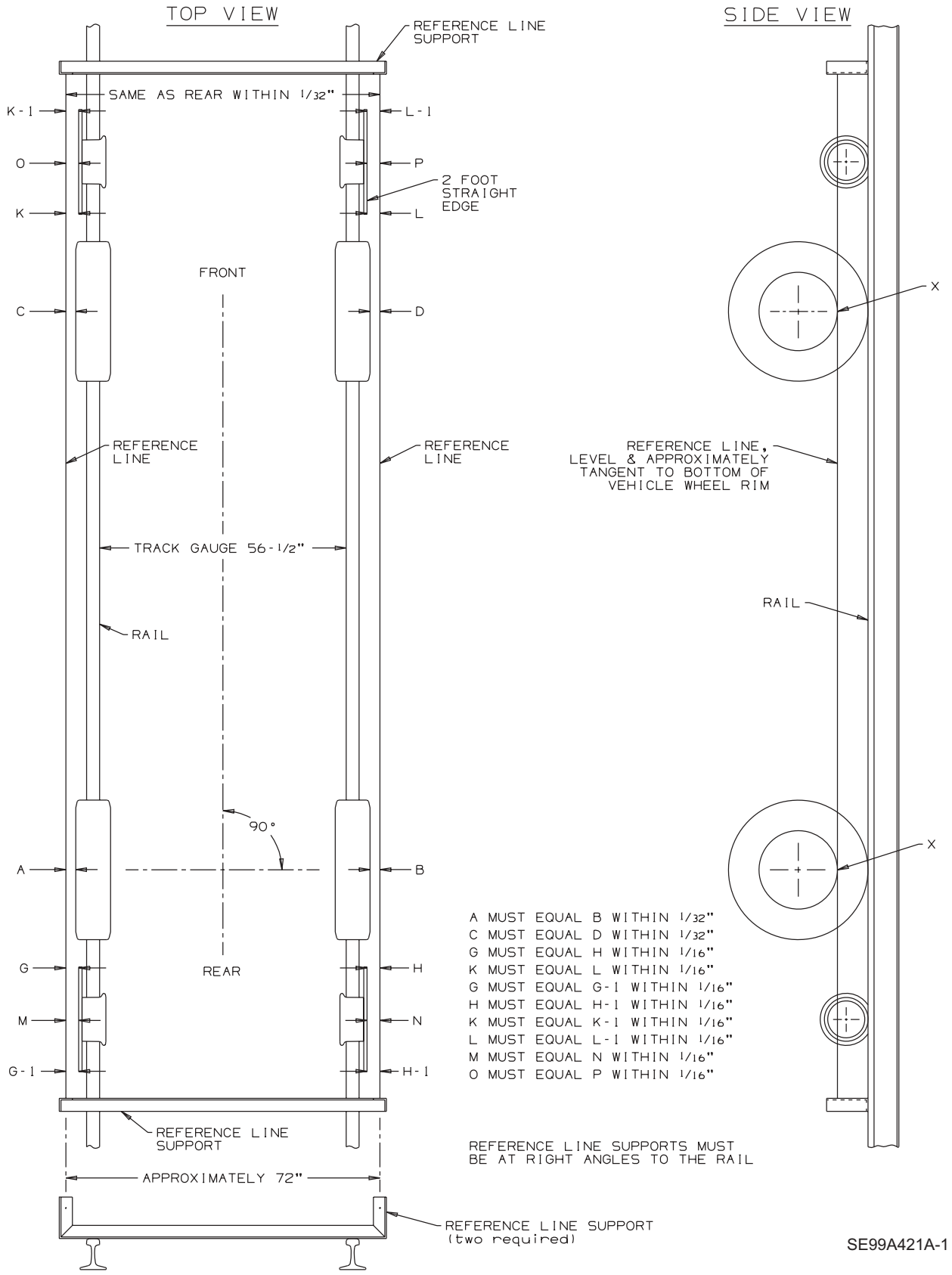
3.1 Guide Wheel Equipment Alignment Procedure

FIGURE 3-7
GUIDE WHEEL EQUIPMENT ALIGNMENT



3.1 Guide Wheel Equipment Alignment Procedure

3.1.6 String Lining Set-Up - See Figure 3-7

1. The string lining procedure is only a guide to check and make alignment adjustments to the guide wheel equipment. String lining the vehicle and guide wheel equipment will not guarantee that the guide wheel equipped vehicle will track properly. Harsco Track Technologies recommends that all HY-RAIL® equipped vehicles be track tested. The vehicle should be at its normal operating load for track testing. The vehicle should be track tested when:

    a. The guide wheel equipment is installed on the vehicle.
    b. Any adjustments are made to the guide wheel equipment.
    c. The load on the vehicle is changed.
    d. Periodically to ensure that the vehicle is tracking properly.

2. Establish parallel reference lines on each side of vehicle as shown in Figure 3-6.

3. Parallel reference lines can be established by building two supports or brackets. These can be built out of scrap angle iron or other material. The supports should be approximately 6 inches high, and a few inches longer than the width of the vehicle. Wires or cords stretched between the front and rear supports will be the reference lines. The wires or cords should be spaced approximately 72 inches apart. The distance between the wires or cords must be equal or within 1/32 inch at each support.

4. Clamp the supports to the rail in front of and behind the vehicle. The supports should be at right angles to the rail. Stretch the wires or cords between the supports, level with the bottom edge of the vehicle wheel rim (point X). The reference lines must be level.

5. Shift the supports on the rail until dimensions A = B and C = D are equal or within 1/32 inch. These measurements should be taken from the bead seat of the vehicle rim directly below the axle (point X) to the reference line. When shifting the supports, keep them at right angles to the rail so the reference lines stay level and parallel to each other.

6. After the reference lines have been established, measurements can be taken from these lines to the guide wheels to ensure correct alignment.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.7 Guide Wheel Unit Alignment - See Figures 3-7 and 3-8

3.1.7.1 Checking Guide Wheel Unit Alignment

1. Lower and lock all guide wheels in the "rail" position. Take measurements M, N, O & P. Measure from the outer edge of the guide wheels, directly below the center line of the wheel spindle, to the reference line. Measurements M, N, O & P must all be equal or within 1/16 inch. If not, see Adjustment.

3.1.7.2 Adjusting Guide Wheels

1. Unlock both front and/or both rear guide wheels from the "rail" position. Let the guide wheels rest on the rails.

2. Loosen the eight adapter bracket cap screws (4) on the top and bottom of the cross channel. Shift the entire guide wheel unit until measurements M, N, O & P are all equal. Re-tighten the cap screws.

3. Lock all guide wheels in the "rail" position. Recheck the guide wheel unit alignment.

4. Repeat the procedure until the guide wheel unit alignment is correct.

5. Lower and lock all guide wheels in the "rail" position. The guide wheels must track straight, not toed in or out. Hold a two foot long straight edge against the outer edge of the guide wheel with the straight edge centered on the guide wheel. Check that dimensions G = G-1, H = H-1, K = K-1 & L = L-1. These dimensions must be equal or within 1/16 inch. If not, see Adjustment.

   Note: When verifying whether the guide wheel is toed-in or toed-out, it may be helpful to visualize the traveling direction of the vehicle when in rail position.

   The guide wheel is toed-in if the front dimension of the straight edge to the reference line is larger than the rear dimension. (Example - Left Rear Guide Wheel: Dimension G is larger than dimension G-1).

   The guide wheel is toed-out if the front dimension of the straight edge to the reference line is smaller than the rear dimension. (Example - Left Rear Guide Wheel: Dimension G is smaller than dimension G-1).

6. Unlock both front and/or both rear guide wheels from the "rail" position. Let the guide wheels rest on the rails.

7. Loosen the appropriate inner (1) or outer (2) pivot bearing cap screws. Add or remove shims (5) (part no. 101818) between the pivot bearing and cross channel. Re-tighten the cap screws.

3.1 Guide Wheel Equipment Alignment Procedure

3.1.7 Guide Wheel Unit Alignment - See Figures 3-7 and 3-8

3.1.7.2 Adjusting Guide Wheels

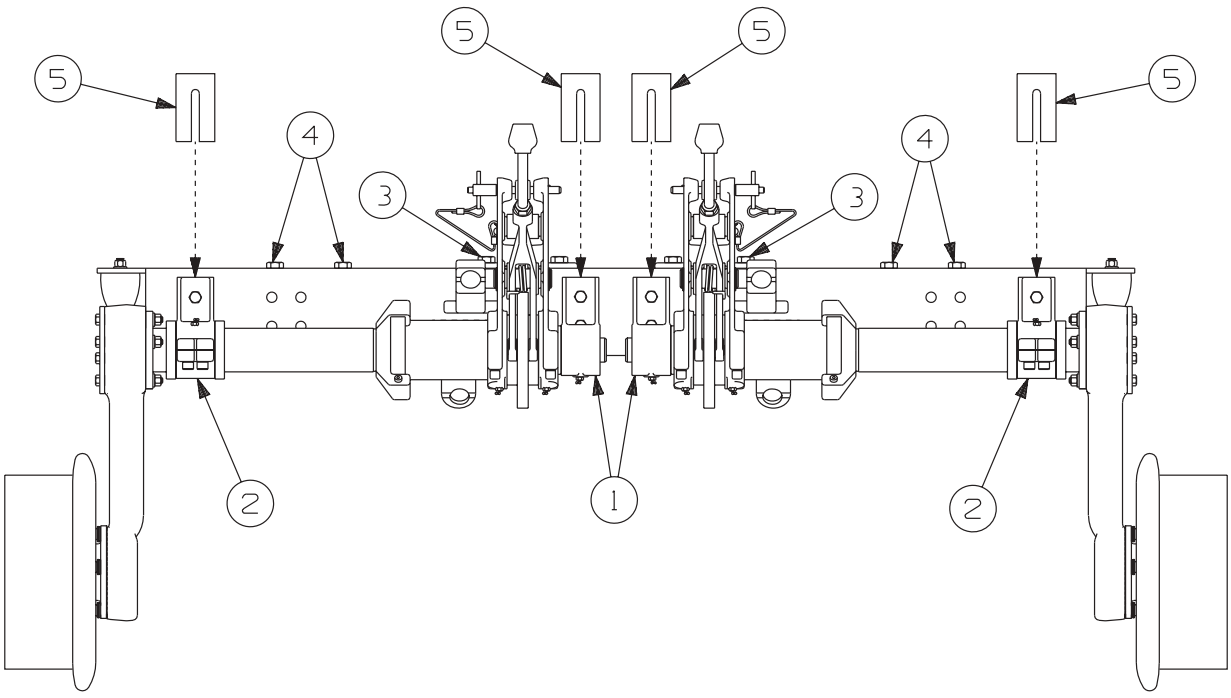
Note: Do not use more than two shims on any pivot bearing during the original application of the guide wheel units or three shims on any pivot bearing during field inspection and adjustment.

Front Guide Wheel Toed In:	Add shims to inner pivot bearing or remove shims from outer pivot bearing.
Front Guide Wheel Toed Out:	Add shims to outer pivot bearing or remove shims from inner pivot bearing.
Rear Guide Wheel Toed In:	Add shims to outer pivot bearing or remove shims from inner pivot bearing.
Rear Guide Wheel Toed Out:	Add shims to inner pivot bearing or remove shims from outer pivot bearing.

8. Lock all guide wheels in the "rail" position. Recheck the guide wheel unit alignment.

8. Repeat the procedure until the guide wheel unit alignment is correct.

FIGURE 3-8
GUIDE WHEEL UNIT



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3.1 Guide Wheel Equipment Alignment Procedure

3.1.8 Guide Wheel Overload Set Screws - See Figure 3-9

1. The "rail" overload set screws carry the load in case of an overload or a tire failure, instead of transferring the load through the rubber cords when the guide wheels are in the "rail" position. Each guide wheel has two overload set screws for a combined total of eight on the vehicle.

2. Lower and lock all guide wheels in the "rail" position. With the vehicle at curb weight, measure the distance between the set screw and the stop on the casting.

   The recommended dimension for all eight overload set screws is 3/8 inch (9.5 mm).

   Note: An easy way to check the dimension is to insert a 3/8 inch cap screw in the gap. If the cap screw slips in with little play, the overload dimension is correct. If the cap screw does not slip in or is sloppy, adjustment is necessary.

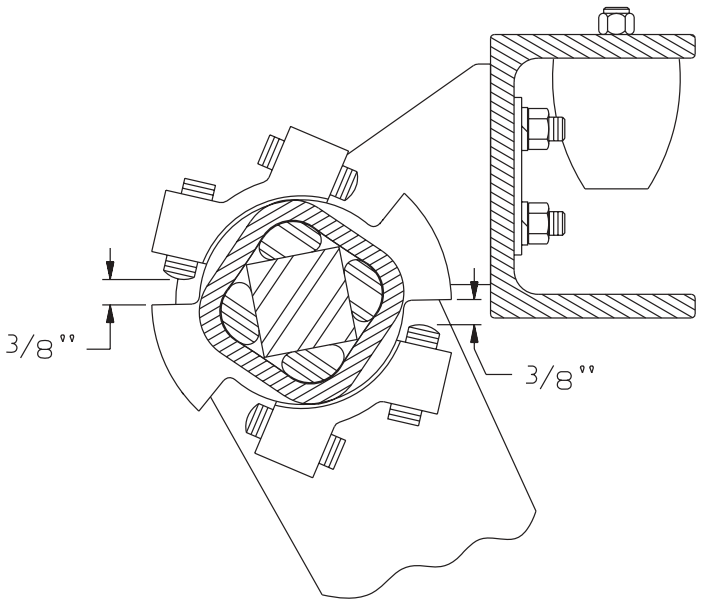
   If any of the eight overload set screws are not set correctly, see Adjustment.

3.1.8.1 Adjusting Guide Wheel Overload Set Screws - See Figure 3-9

1. Insert the 3/8 inch cap screw in the gap. Tighten or loosen the set screw until the cap screw is snug with little play.

2. Repeat the procedure to set all eight overload set screws.

FIGURE 3-9
GUIDE WHEEL OVERLOAD SET SCREWS



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3.1 Guide Wheel Equipment Alignment Procedure

3.1.9 Guide Wheel Highway Set Screws - See Figure 3-10

1. The highway set screws secure the guide wheel arms against the rubber bumpers on the cross frame when the guide wheel units are in the "highway" position. The rubber bumpers absorb the shocks encountered in highway driving instead of transferring the shocks through the rubber cords. Each guide wheel has two highway set screws for a combined total of eight on the vehicle.

2. Raise and lock all guide wheels in the "highway" position. The wheel arms should be solidly against the rubber bumpers. If any of the highway set screws are not set correctly, see adjustment.

3.1.9.1 Adjusting Guide Wheel Highway Set Screws - See Figure 3-10

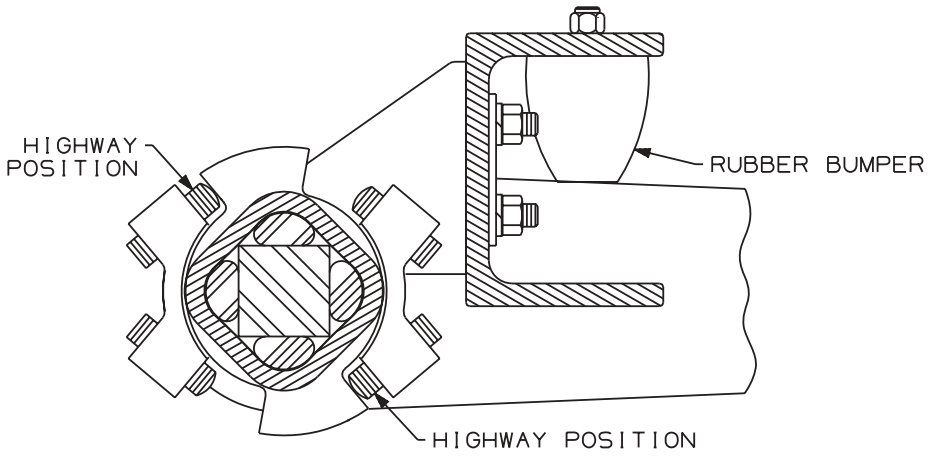
1. Unlock the guide wheel from the "highway" position. Let the guide wheel rest on the rails.

2. Turn both highway set screws to move the wheel arm up or down.

3. Lock the guide wheel in the "highway" position. Recheck the guide wheel arm.

4. Repeat the procedure until the guide wheel arm is solidly against the rubber bumper. If the rubber bumper is worn so the arm cannot be adjusted solidly against it, replace the bumper.

FIGURE 3-10
GUIDE WHEEL HIGHWAY SET SCREWS



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3.1 Guide Wheel Equipment Alignment Procedure

3.1.10 Vehicle Track Test

■ **CHECK AND CORRECT ALIGNMENT PROMPTLY IF MISALIGNMENT IS INDICATED. MISALIGNMENT OF GUIDE WHEEL EQUIPMENT COULD RESULT IN DERAILMENT OF THE VEHICLE AND SEVERE BODILY INJURY.**

1. Harsco Track Technologies recommends that all HY-RAIL® equipped vehicles be track tested. The vehicle should be at its normal operating load for track testing. The vehicle should be track tested when:
   a. The guide wheel equipment is installed on the vehicle.
   b. Any adjustments are made to the guide wheel equipment.
   c. The load on the vehicle is changed.
   d. Periodically to ensure that the vehicle is tracking properly.

2. The vehicle must be placed on straight, level, tangent track. See Operation Section - Placing Vehicle On Track.

3. Apply spray paint to the flanges an treads of all guide wheels.

4. Lower and lock all guide wheels in the "rail" position.

5. Operate the vehicle a minimum of 1/4 mile at a normal operating speed.

6. The paint should wear evenly around the flanges and treads of all guide wheels. If the paint is worn evenly on all guide wheels, the vehicle and guide wheel equipment is properly aligned.

7. If the paint did not wear evenly, note which guide wheels, flange and / or tread the paint is worn on.
   a. Repaint the flanges and treads on all guide wheels.
   b. Operate the vehicle in reverse for a short distance at a normal operating speed.
   c. Note which guide wheels, flange and / or tread the paint is worn on. If the paint wore off on the right front flange when traveling forward and then on the left rear flange when traveling in reverse, the vehicle is probably not aligned properly. Have the vehicle frame checked for proper alignment. See Vehicle Check.

8. See Figure 3-8. If the vehicle pulls noticeable to the right when traveling forward, add a shim (5) (part no. 101818) behind the right front outer bearing. Do not use more than two shims on any pivot bearing during the original application of the guide wheel units or three shims on any pivot bearing during field inspection and adjustment.

   If the vehicle pulls noticeable to the left when traveling forward, add a shim (5) (part no. 101818) behind the left front outer bearing. Do not use more than two shims on any pivot bearing during the original application of the guide wheel units or three shims on any pivot bearing during field inspection and adjustment.

9. If the vehicle continues to track improperly, repeat the String Lining and Guide Wheel Alignment Procedure.

3.2 Adjustments

3.2.1 Locking Mechanism - See Figure 3-11

The spring loaded locking mechanism should move freely so it engages itself when the guide wheel is raised or lowered. Periodically inspect this area for wear. When the vehicle is operated in mud or slush, foreign material may get into the locking mechanism, preventing the lock from operating correctly. Remove this foreign material, being careful not to damage the locking mechanism.

The locking mechanism is secured in the "rail" or "highway" position by a lock pin inserted through the pawl handle and the side plates of the locking mechanism. The lock pin must insert easily in either position. If not, re-align.

The button in the lock pin must bush in easily and also pop out when released. The locking balls in the end of the pin must work freely so the pin cannot be removed until the button in the lock pin is pushed in. If the lock pin does not operate properly, replace the pin.

1. Place the vehicle on straight, level track. Place the automatic transmission in "Park" or manual transmission in "Neutral". Apply the parking brake. Stop the engine.

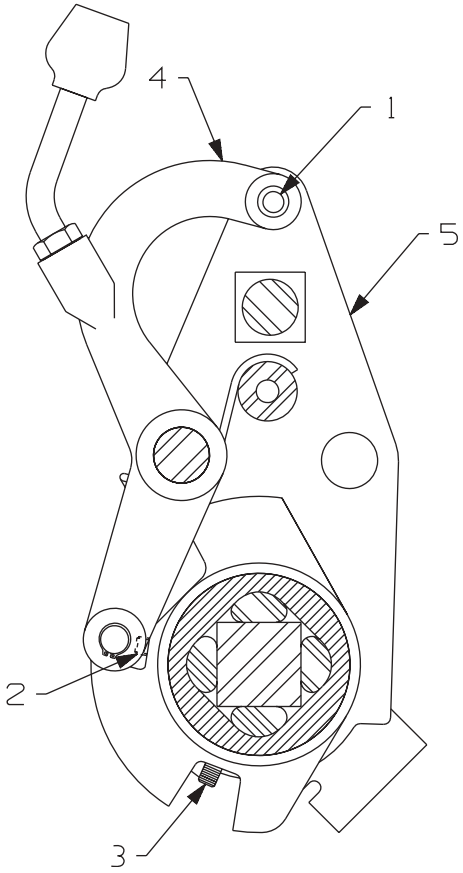
3.2.1.1 Rail Position Adjustment

1. Lower and lock all four guide wheels in the "rail" position.
2. If the lock pin (1) cannot be inserted or is hard to insert, re-align the locking pawl.
3. To re-align, adjust the set screw (2) so the hole in the pawl handle (4) aligns with the holes in the side plates (5). Turn the screw clockwise to move the hole in the pawl handle towards the vehicle. Turn the screw counter-clockwise to move the hole in the pawl handle away from the vehicle.

3.2.1.2 Highway Position Adjustment

1. Raise and lock all four guide wheels in the "highway" position.
2. If the lock pin (1) cannot be inserted or is hard to insert re-align the locking pawl.
3. To re-align, adjust the set screw (3) so the hole in the pawl handle (4) aligns with the holes in the side plates (5). Turn the screw clockwise to move the hole in the pawl handle towards the vehicle. Turn the screw counter-clockwise to move the hole in the pawl handle away from the vehicle.

FIGURE 3-11
LOCKING MECHANISM



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3.2 Adjustments

3.2.2 Rail Sweeps - See Figure 3-12

1. Place the vehicle on straight, level track. Place the automatic transmission in "Park" or manual transmission in "Neutral". Apply the parking brake. Stop the engine.

2. Lower and lock all four guide wheels in the "rail" position, the rail sweeps will lower to the rail position when the guide wheels are lowered.

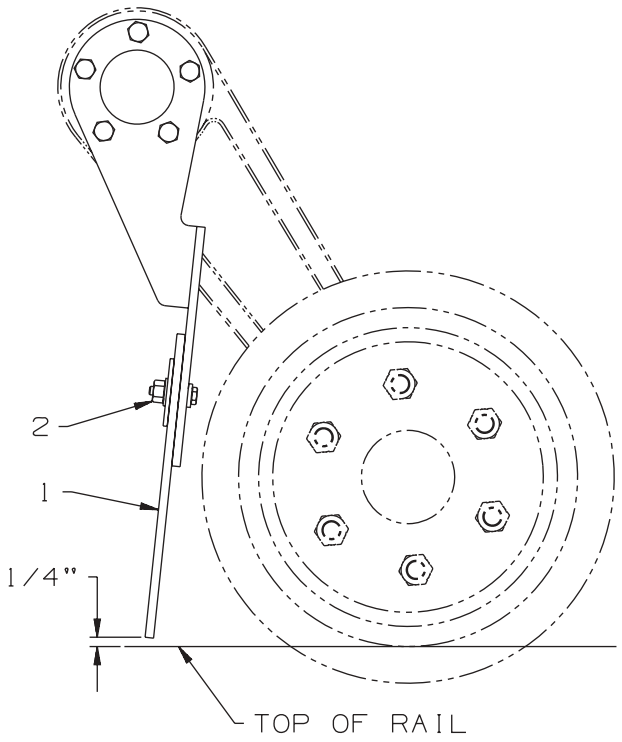
3. The rubber sweep pad (1) should clear the top of the rail by 1/4 inch (6.4 mm). If not, adjustment is necessary.

4. Loosen the two cap screws (2). Slide the rubber sweep (1) down until it clears the top of the rail by 1/4 inch (6.4 mm). Re-tighten the cap screws.

5. If the rubber sweep (1) can not be lowered, remove the two cap screws (2). Relocate the cap screws in the next upper set of holes in the rubber sweep (1). Then adjust the sweep. See Step 4.

6. If the rubber sweep (1) is in the last, upper set of holes and can not be adjusted, replace the rubber sweep.

FIGURE 3-12
RAIL SWEEP



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SECTION 4 - MAINTENANCE
TABLE OF CONTENTS

4.1 Maintenance Schedule

■ **RE-TORQUE VEHICLE WHEEL LUG NUTS, WHEEL SPACER LUG NUTS AND GUIDE WHEEL LUG NUTS AFTER FIRST 50 MILES OF OPERATION. THEREAFTER TORQUE WHEEL NUTS ACCORDING TO RECOMMENDED MAINTENANCE SCHEDULE. FAILURE TO HEED THIS WARNING COULD RESULT IN SEVERE BODILY INJURY.**

4.1.1 Daily:

1. Inspect both front and rear guide wheel units for damaged or missing parts.

2. Note the amount of effort required to lower and raise the guide wheels. Effort required should be about the same for each guide wheel. The rear guide wheels, which are locked in the rail position first, should be somewhat easier to lower.

3. Check the locking mechanism for ease of operation. The lock pins should never be able to be pulled out unless the button on the "T" end is pushed in. The button in the lock pin must push in easily and pop out when released. The locking balls in the end of the pin must work freely so the pin cannot be removed until the button in the lock pin is depressed. If the lock pin does not operate properly, replace the lock pin.

4. When the vehicle is operated on the track, listen for unusual noises. Unusual noises may indicate incorrectly lowered guide wheels, or damaged or missing parts. Pay attention to the quality of the ride. Check alignment if the vehicle crowds one side of the track instead of floating from side to side. See Adjustment - Guide Wheel Equipment Alignment Procedure.

4.1.2 Weekly:

1. Check guide wheel equipment alignment. See Adjustments Section, Guide Wheel Equipment Alignment Procedure - Vehicle Track Test.

2. Inspect guide wheel tread and flanges for wear or damage. See Maintenance - Guide Wheel Allowable Wear.

3. Spin each guide wheel by hand, checking for ease of rotation or excessive play. If the guide wheel does not rotate properly, the bearings and spindle may be damaged. Replace the bearing/spindle assembly if necessary.

4. Inspect vehicle wheels, studs, lug nuts and tires for wear, damage, cuts, etc.

5. Check vehicle tires for correct inflation pressure. Operate at the tire manufacturer's recommended maximum pressure printed on the sidewalls of the tires or the wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower.

6. Check guide wheel unit pivot bearings for tightness.

7. Check all bolts for tightness. See Appendices, Appendix A - Bolt Torque Requirements Chart.

4.1 Maintenance Schedule

4.1.3 At 50 Vehicle Miles (80 Vehicle km):

1. Torque wheel spacer lug nuts, vehicle wheel lug nuts and guide wheel lug nuts to the recommended specifications. See the decal attached to the vehicle wheel for the recommended wheel bolt torque specifications. Thereafter refer to the wheel manufacturer's wheel torque specifications.

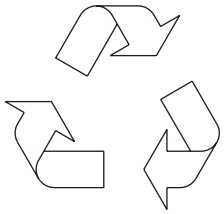
4.1.4 At 50 Track Miles (80 Vehicle km):

1. At 50 track miles (80 Km) after initial installation of the guide wheel unit, torque guide wheel lug nuts to the recommended specifications.

4.1.5 Every 2000 Track Miles (3200 Track km):

1. Lubricate guide wheel unit locations provided with grease fittings. See Lubrication.
2. Lubricate the locking mechanism and other pivot points with light oil or a lubricating spray.
3. Torque guide wheel lug nuts to 90 ft lbs (122 N-m).

4.2 Waste Disposal



Dispose of waste properly. Improper disposal of waste can threaten the environment. The operation and maintenance of Harsco Track Technologies equipment may involve the use of such items as hydraulic oil, engine oil, fuel, coolant, brake fluid, filters, batteries, etc.

Use leak proof containers when draining fluids. Do not pour waste onto the ground, down a drain, or into any water source. Inquire on the proper way to recycle or dispose of waste according to applicable Federal, State and/or local regulations.

4.3 Guide Wheel Unit Lubrication - See Figure 4-1

1. Lubricate the guide wheel equipment every 2000 track miles (3200 track km) maximum or each time the vehicle is serviced.

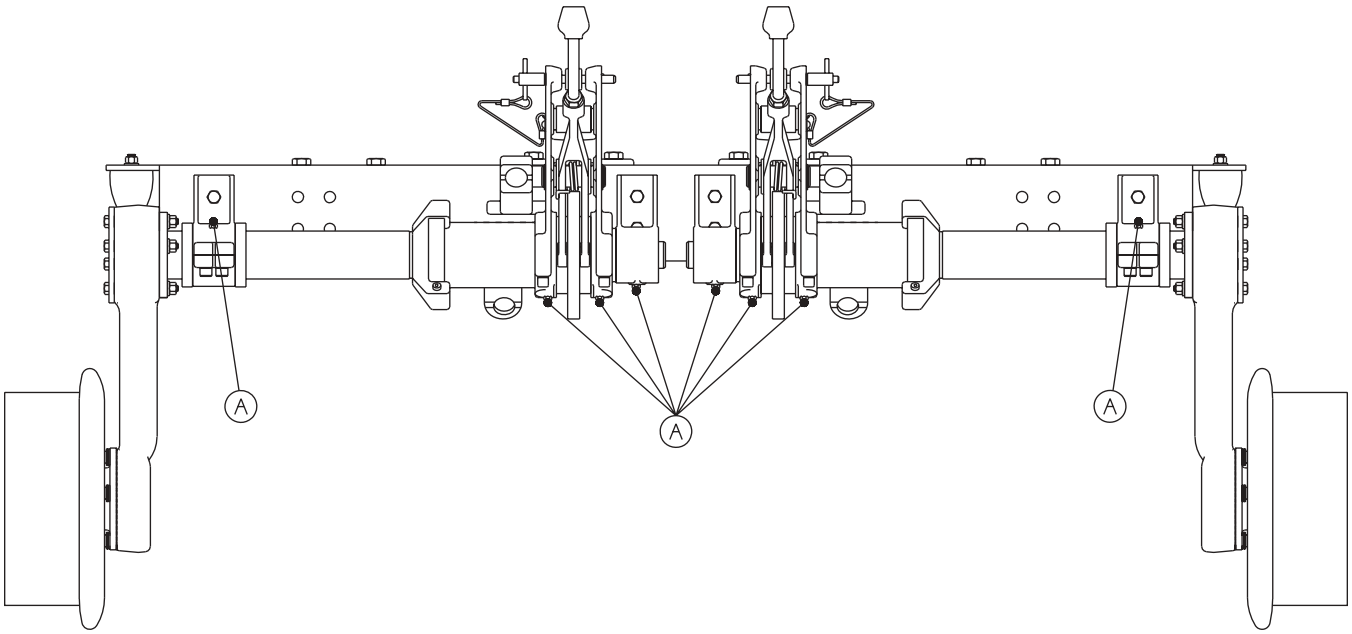
2. Apply the vehicle parking brake. Stop the engine.

3. Lubricate all grease fittings (A) using Mobil Special Moly, or equivalent.

4. Lubricate the locking mechanism and other pivot points with a light weight oil or a lubricating spray.

Note: HR0307 Series A guide wheel equipment utilizes sealed bearings in the guide wheels. Do not re-pack the guide wheel bearings. If the bearings are worn, replace the spindle, hub and bearing assembly.

FIGURE 4-1
GUIDE WHEEL UNIT LUBRICATION DIAGRAM



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4.4 Guide Wheels

4.4.1 Allowable Wear - 171768 Aluminum Wheel With Rubber Tread - See Figure 4-2

WARNING

■ **REPLACE ANY GUIDE WHEEL IMMEDIATELY WHICH SHOWS DAMAGE AND/OR HAS WORN MORE THAN THE ALLOWABLE LIMITS. FAILURE TO COMPLY COULD RESULT IN DERAILMENT OF THE VEHICLE, AND SEVERE BODILY INJURY.**

1. Tools needed: Harsco Track Technologies wheel caliper (M019889), or equivalent.

2. Measure the wheel flange at position "A" with the wheel caliper.

   The minimum allowable flange dimension is: Position "A".....1/4 inch (6.4 mm)

   If the wheel flange dimension is less than the allowable limit, replace the wheel immediately.

3. Measure the wheel tread at positions "B" and "C" with the wheel caliper.

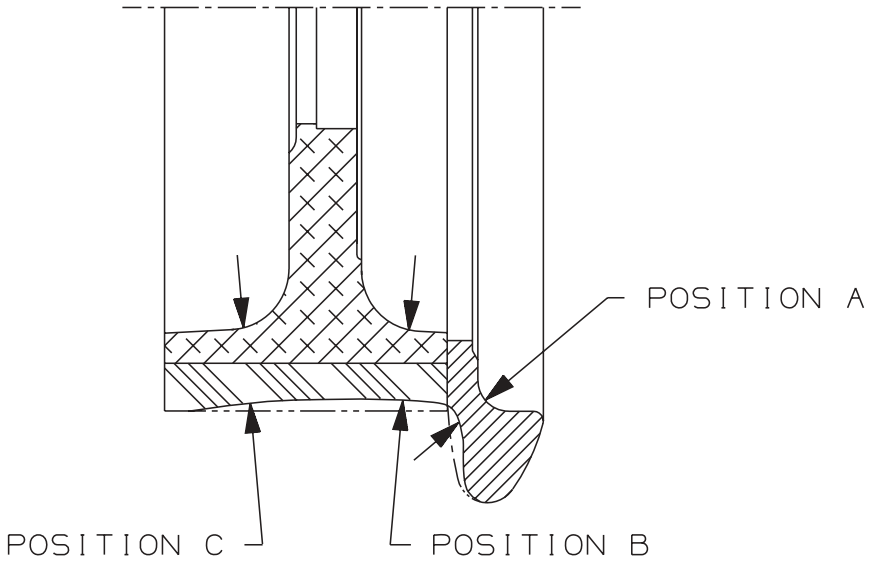
   The minimum allowable tread dimensions are: Position "B".....11/16 inch (17.5 mm)
   Position "C" .....11/16 inch (17.5 mm)

   If any of the guide wheel tread dimensions are less than the allowable limits, replace the wheel immediately.

4. The rubber tread must not have gouges. The aluminum wheel and/or flange must not have hairline cracks. If any of these are evident, replace the wheel immediately.

4

FIGURE 4-2
ALLOWABLE WEAR - 171768 ALUMINUM GUIDE WHEEL WITH RUBBER TREAD GROUP



4.4 Guide Wheels

4.4.2 Allowable Wear - 138113 Steel Guide Wheel - See Figure 4-3

WARNING

■ **REPLACE ANY GUIDE WHEEL IMMEDIATELY WHICH SHOWS DAMAGE AND/OR HAS WORN MORE THAN THE ALLOWABLE LIMITS. FAILURE TO COMPLY COULD RESULT IN DERAILMENT OF THE VEHICLE, AND SEVERE BODILY INJURY.**

1. Tools needed: Harsco Track Technologies wheel caliper (M019889), or equivalent.

2. Measure the wheel flange at position "A" with the wheel caliper.

   The minimum allowable flange dimension is: Position "A".....1/4 inch (6.4 mm)

   If the wheel flange dimension is less than the allowable limit, replace the wheel immediately.

4

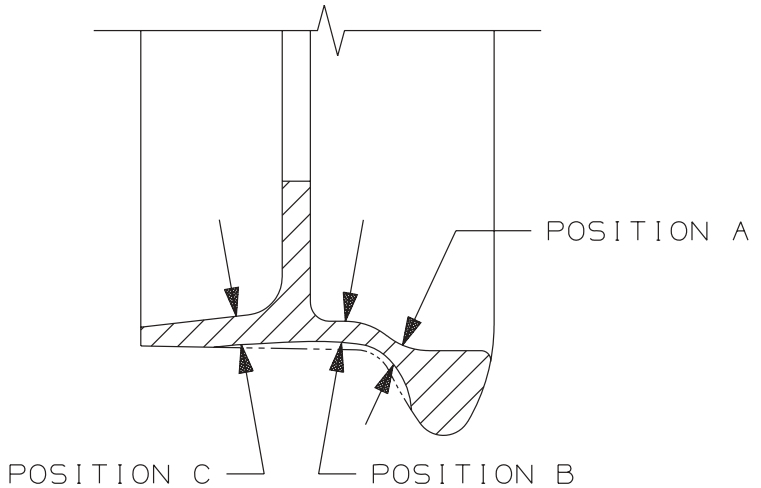
3. Measure the wheel tread at positions "B" and "C" with the wheel caliper.

   The minimum allowable tread dimensions are: Position "B".....1/4 inch (6.4 mm)
   Position "C" .....1/4 inch (6.4 mm)

   If any of the guide wheel tread dimensions are less than the allowable limits, replace the wheel immediately.

4. The entire wheel must not have any gouges or cracks. If any of these are evident, replace the wheel immediately.

FIGURE 4-3
ALLOWABLE WEAR - 138113 STEEL GUIDE WHEEL GROUP



4.4 Guide Wheels

4.4.3 Guide Wheel Check

Guide wheels which do not run true on the tread and flange will vibrate and give a rough ride. If the vehicle vibrates and gives a rough ride on track, there may be foreign matter (dirt, rust, paint, etc.) between the wheel and hub, the spindle bearings may be worn, or the tread and flange of the wheel may be worn or damaged, causing a wobbling sensation. On wheels with rubber tread, there may also be foreign matter lodged between the mating surfaces of the steel flange and the aluminum wheel, giving the same sensation.

1. Verify that the five lug nuts are torqued properly to 90 ft lbs (122 N-m). Tighten if necessary.

2. Rubber Guide Wheels Only: Verify that the six 3/8 inch hex flange head cap screws securing flange to the rubber tread wheel are torqued properly to 40 ft lbs (55 N-m).

3. Track test the vehicle to verify whether the vibrations were caused by loose guide wheels or flanges.

   If track testing shows that the vibrations persist, go on to the following steps.

4. Check the spindle bearing by grasping the guide wheel and working it from side to side. If there is excessive play in the spindle, remove the guide wheel and verify that the four 3/8 inch cap screws that secure the spindle to the wheel arm are properly torqued to 31 ft lbs (42 N-m). Re-tighten if necessary.

5. Recheck the spindle bearing by grasping the spindle and working it from side to side. If there is excessive play in the spindle bearing, the bearings are worn. Replace the spindle and hub assembly.

6. Check for foreign material on the mating surfaces of the guide wheel and the hub. Remove any foreign material on these surfaces.

7. Rubber Guide Wheels Only: Remove the flange from the guide wheel and check for foreign material on the mating surfaces of the flange and the guide wheel. Remove any foreign material on these surfaces. Reinstall the flange on the guide wheel and torque the fasteners to 40 ft lbs (55 N-m).

8. Reinstall the guide wheel onto the spindle and hub. Torque wheel nuts to 90 ft lbs (122 N-m).

9. Track test the vehicle to verify whether the vibrations were caused by worn spindle bearings or foreign material between guide wheel/flange mounting surfaces.

   If track testing shows that the vibrations persist, the wheel may be sprung or bent. Replace the wheel.

4.5 Locking Mechanism

The spring loaded locking mechanism should move freely so that it engages itself when the guide wheel is raised or lowered. Periodically inspect this area for worn or damaged parts. When the vehicle is operated in muddy or slushy conditions, foreign material may get into the locking mechanism, preventing the lock from operating correctly. Remove this foreign material, being careful not to damage the locking mechanism.

The locking mechanism is secured in the "rail" or "highway" position by a lock pin inserted through the pawl handle and side plates of the locking mechanism. The lock pin must insert easily in either position. If not, re-adjust. See Adjustment Section - Locking Mechanism. The button in the locking pin must push in easily and also pop out when released. The locking balls in the end of the pin must work freely so the pin cannot be removed until the button in the locking pin is pushed in. If the lock pin does not operate properly, replace the pin.

4.6 Pivot Bearings

The inner and outer pivot bearings on the guide wheel unit should be checked carefully at weekly intervals for wear. To check the bearings, apply the parking brake. The guide wheels must be raised to the "highway" position.

Insert a pry bar between the cross channel and the pivot. Check for looseness. The pivot bearings are non-adjustable. If the pivot bearings are worn, replace them.

4.7 Rubber Cord Replacement

See the Section 3, 3.1 Guide Wheel Equipment Alignment Procedure. The end of the load adjustment stud, behind the locking pawl mechanism, should not extend more than 1/4 inch (6.4 mm) beyond and not more than 1/8 inch (3.2 mm) within the face of the trunnion nut.

If the adjusting stud extends more than 1/4 inch (6.4 mm) beyond the face of the trunnion nut, it may be necessary to replace the rubber cords in the torque coupling. See Service Data Sheet no. 400

4.8 Vehicle Wheels

4.8.1 Wheel Replacement

■ **USE REPLACEMENT WHEEL(S) AS RECOMMENDED IN THE HARSCO TRACK TECHNOLOGIES HY-RAIL® VEHICLE SPECIFICATIONS MANUAL. FAILURE TO COMPLY COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.**

Use replacement wheel rim(s) as recommended by Harsco Track Technologies to ensure correct vehicle wheel spacing and accurate guide wheel load. The wheels and tires should be static balanced or balanced after installation on the vehicle for the best results. Torque vehicle wheel lug nuts to recommended specifications. See the decal attached to the vehicle wheel for the recommended wheel bolt torque specifications.

4.8.2 Tire Replacement

■ **USE REPLACEMENT TIRES WITH THE SAME ROLLING RADIUS, TREAD WIDTH, PLY RATING, AND LOAD RATING AS RECOMMENDED BY HARSCO TRACK TECHNOLOGIES. FAILURE TO COMPLY COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.**

Replacement tires must have the same rolling radius, tread width, ply rating, and load rating as recommended by Harsco Track Technologies. Using tires of equal diameter will help keep the speedometer reading and the guide wheel load accurate. Tires must have a minimum 5-1/2 inches of tread width. After installing new tire(s) on the vehicle, check guide wheel load. See the Adjustment Section - Guide Wheel Equipment Alignment Procedure.

Inflate tires to the tire manufacturer's recommended maximum pressure printed on the sidewalls of the tires or the wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower. The wheels and tires should be static balanced or balanced after installation on the vehicle for the best results. Torque vehicle wheel lug nuts to recommended specifications. See the decal attached to the vehicle wheel for the recommended wheel bolt torque specifications.

4.9 Bolt Torque Requirements

■ **CHECK ALL BOLTS AND NUTS PERIODICALLY, AND KEEP THEM TIGHTENED TO TORQUE SPECIFIED IN APPENDIX A. IF BOLT REPLACEMENT BECOMES NECESSARY, REPLACE WORN BOLT WITH EQUAL GRADE BOLT. FAILURE TO COMPLY COULD RESULT IN BODILY INJURY, AND/OR PROPERTY DAMAGE.**

See Appendix A, for bolt torque requirements table and grade identification markings used by manufacturers.

NOTES

SECTION 5 - TROUBLESHOOTING
TABLE OF CONTENTS

5.1 Troubleshooting Guide Wheel Equipment

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Extreme effort required to unlock and lower or raise guide wheels.	Components bent, broken, etc.	Replace components.
	Foreign material (mud, slush, dirt, etc;) in torque coupler.	Clean.
	Pivot bearings are dirty and/or not lubricated.	Disassemble and clean. Lubricate.
Extreme effort required to lock or unlock guide wheels in the "rail" position.	Vehicle incorrectly loaded or overloaded.	Redistribute or remove some of the load.
	Vehicle tires under-inflated.	Check pressure. Inflate if low. Do not exceed tire manufacturer's recommended maximum pressure printed on the sidewalls or wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower.
	Guide wheel unit wheel arm height and/or guide wheel load adjusted incorrectly.	Re-adjust. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.

5.1 Troubleshooting Guide Wheel Equipment

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Minimal effort required to lock or unlock guide wheels in the "rail" position.	Vehicle tires are over-inflated.	Check pressure. If too high, deflate to the tire manufacturer's recommended maximum pressure printed on the sidewalls or wheel manufacturer's recommended maximum pressure, stamped on the wheel, whichever is lower.
	Guide Wheel unit wheel arm height and/or guide wheel load adjusted incorrectly.	Re-adjust. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.
Vehicle pulls noticeably to the left or right when on track.	Vehicle loaded heavy on one side.	Move load to center of vehicle.
	Steering lock not engaged.	Engage the steering lock.
	Vehicle wheels not aligned with steering lock when engaged.	Re-align. See Adjustment Section - Guide Wheel Equipment Adjustment Procedure.
	Guide wheels are not aligned with vehicle.	Re-align. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.
	Vehicle front tires out of alignment.	Re-align front tires.
Vehicle derails.	Guide wheel units, vehicle axle(s), etc. not aligned with vehicle frame.	Check alignment. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.

5.1 Troubleshooting Guide Wheel Equipment

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Vibration felt in the vehicle when traveling on track.	Guide wheel unit mounting hardware loose.	Tighten all bolts to recommended torque.
	Guide wheel spindle bearings worn.	Replace bearing/spindle assembly.
	Guide wheel worn or damaged.	Replace guide wheel.
	Guide wheel unit pivot bearings worn.	Check inner and outer pivot bearings. See Maintenance Section - Pivot Bearings.
	Vehicle rim bent.	Replace rim. See Maintenance Section - Vehicle Wheels.
	Vehicle tires out of balance.	Balance tires. See Maintenance Section - Tire Replacement.
	Wheel spacer lug nuts and or vehicle lug nuts loose.	Torque wheel spacer lug nuts and vehicle lug nuts to recommended specifications. See maintenance Section.
Unusual or excessive noise when traveling on track.	Guide wheel spindle bearings worn.	Replace bearing/spindle assembly.
	Guide wheel unit flanging hard to the right or left.	Re-align. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.

5.1 Troubleshooting Guide Wheel Equipment

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Vibration felt in the vehicle when traveling on road.	Guide wheel unit mounting hardware loose.	Tighten all bolts to recommended torque.
	Guide wheels are not locked and secured in "highway" position.	STOP IMMEDIATELY. Make sure all four guide wheels are locked and secured in "highway" position.
	Guide wheel "highway" set screws are adjusted incorrectly.	Re-adjust. Wheel arms should be tight against rubber bumper on the cross tube. If rubber bumper is worn, replace.
	Vehicle wheel bent.	Replace wheel. See Maintenance Section - Vehicle Wheels.
	Vehicle tires out of balance.	Balance tires. See Maintenance Section - Tire Replacement/Balancing.
	Wheel spacer lug nuts and or vehicle lug nuts loose.	Torque wheel spacer lug nuts and vehicle lug nuts to recommended specifications. See maintenance Section.

5.1 Troubleshooting Guide Wheel Equipment

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Guide wheel "rail" overload set screws bottomed out.	Vehicle incorrectly loaded or overloaded.	Redistribute or remove some of the load.
	Vehicle tires under-inflated.	Check pressure. Inflate if low. Do not exceed tire manufacturer's recommended maximum pressure printed on the sidewalls or wheel manufacturer's recommended maximum pressure stamped on the wheel, whichever is lower.
	Guide wheel arm height and/or guide wheel load adjusted incorrectly.	Re-adjust. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.
	"Rail" overload set screws adjusted incorrectly.	Re-adjust. See Adjustment Section - Guide Wheel Equipment Alignment Procedure.
	Rubber cords in torque coupler worn.	Have rubber cords replaced.
	Foreign material (mud, slush, dirt, etc;) in torque coupler.	Clean.

SECTION 6 - PARTS
TABLE OF CONTENTS

Fastener Kits For Front And Rear Bracket Mounting

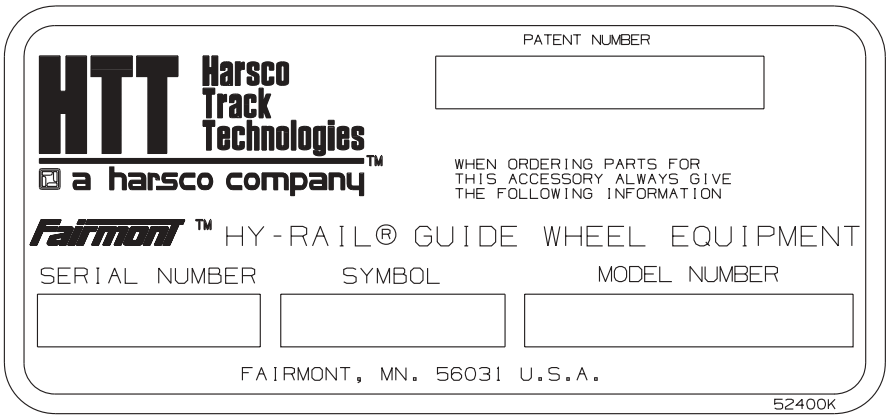
Mounting Bracket Groups

Wheel Modification Groups

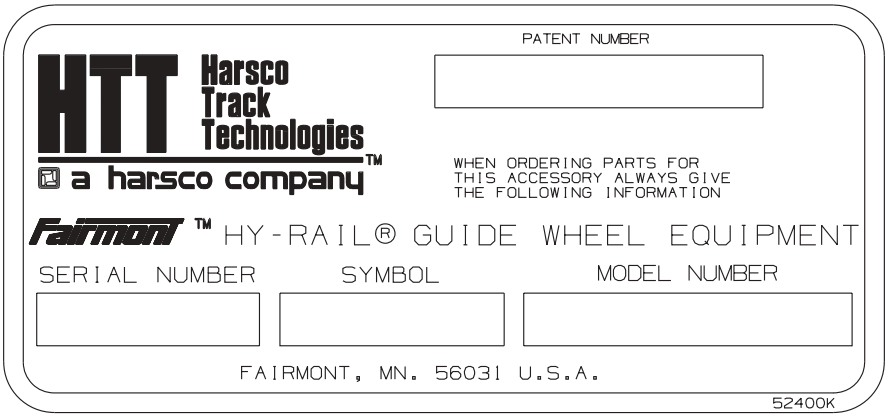
Serial Numbers

When this bulletin is received, fill in the spaces provided below using the information from the serial number tags on both the front and rear guide wheel units. Always provide these factory serial numbers when calling or writing about the units. The serial number tags are located on the cross channel on both units.

FRONT GUIDE WHEEL UNIT SERIAL NUMBER TAG



REAR RAIL GUIDE WHEEL UNIT SERIAL NUMBER TAG



Instructions For Ordering Parts

1. See Section 7 for the Vehicle Applications.

2. Find the make, model and year of the vehicle that the unit is mounted on.

3. Each application consists of required groups, optional groups required and accessory group options. These are the group numbers that were supplied with, or that were available for the unit.

4. Locate the appropriate group numbers in the Parts Section to find the individual parts required.

5. Front - rear and left - right are determined from the operator's position.

6. Assemblies: Items listed in CAPITALS are assemblies which include all parts listed immediately following and with the part description indented to the right. When assemblies can be used, always order them to save work of fitting separate parts.

7. For convenience in ordering, parts are listed by item number, part number, description, and quantity in each assembly or group. If in doubt as to any part wanted, send full description, sketch, or send the old part with the order.

8. To insure prompt and correct shipment of parts on orders, always give:

    1. Quantity of each part wanted.
    2. Part number of each part as shown in this book. Include any prefix and suffix letters.
    3. Description of each part as shown in this book.
    4. Factory serial numbers from the serial number tag.
    5. Purchase order number (if required).
    6. Preferred method of shipment.

9. All parts are shipped F.O.B. factory, transportation charges to be paid by customer. Terms to be determined by the Credit Department.

Limited Warranty

HARSCO TRACK TECHNOLOGIES warrants products of its manufacture to be free of defects in material and workmanship, under normal use and service for a period of six (6) months from date of delivery to the original user. The obligation of Harsco Track Technologies under this warranty is limited to repairing or replacing at its factories, or other location designated by it, any part or parts thereof which are returned within 30 days of the date when failure occurs or defect is noted, with transportation charges prepaid, and which upon examination appears to the satisfaction of Harsco Track Technologies to have been defective. Such free repair or replacement does not include transportation charges, or the cost of installing the new part or any other expense incident thereto. Harsco Track Technologies will not be liable for other loss, damage, or expense directly or indirectly arising from the use of its product, nor will Harsco Track Technologies be liable for special, incidental, or consequential damages.

Ordinary wear and tear, and damage from abuse, misuse, neglect or alteration are not covered by this warranty. Harsco Track Technologies assumes no liability for expense incurred or repairs made outside its factories except by written consent. This warranty is null and void if instructions and operating procedures are not followed.

Equipment and parts not manufactured by Harsco Track Technologies, but which are furnished in connection with Harsco Track Technologies products, are covered directly by the warranty of the manufacturer supplying them. However, Harsco Track Technologies will assist in obtaining adjustment on such equipment or parts when necessary.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED AND OF ANY OTHER OBLIGATION OR LIABILITY OF HARSCO TRACK TECHNOLOGIES. THE REMEDY SET FORTH ABOVE IS BUYER'S EXCLUSIVE REMEDY FOR A BREACH OF THE WARRANTY. UNDER NO CIRCUMSTANCES WILL HARSCO TRACK TECHNOLOGIES BE RESPONSIBLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL OR OTHER INDIRECT DAMAGES.

Indemnity

Buyer agrees to indemnify and hold Harsco Track Technologies harmless for all loss, cost including but not limited to legal and other cost of proceedings, and damages suffered by Buyer or claimed by third parties by or related to Buyer's use of Harsco Track Technologies' products.

Product Improvement Liability Disclaimer

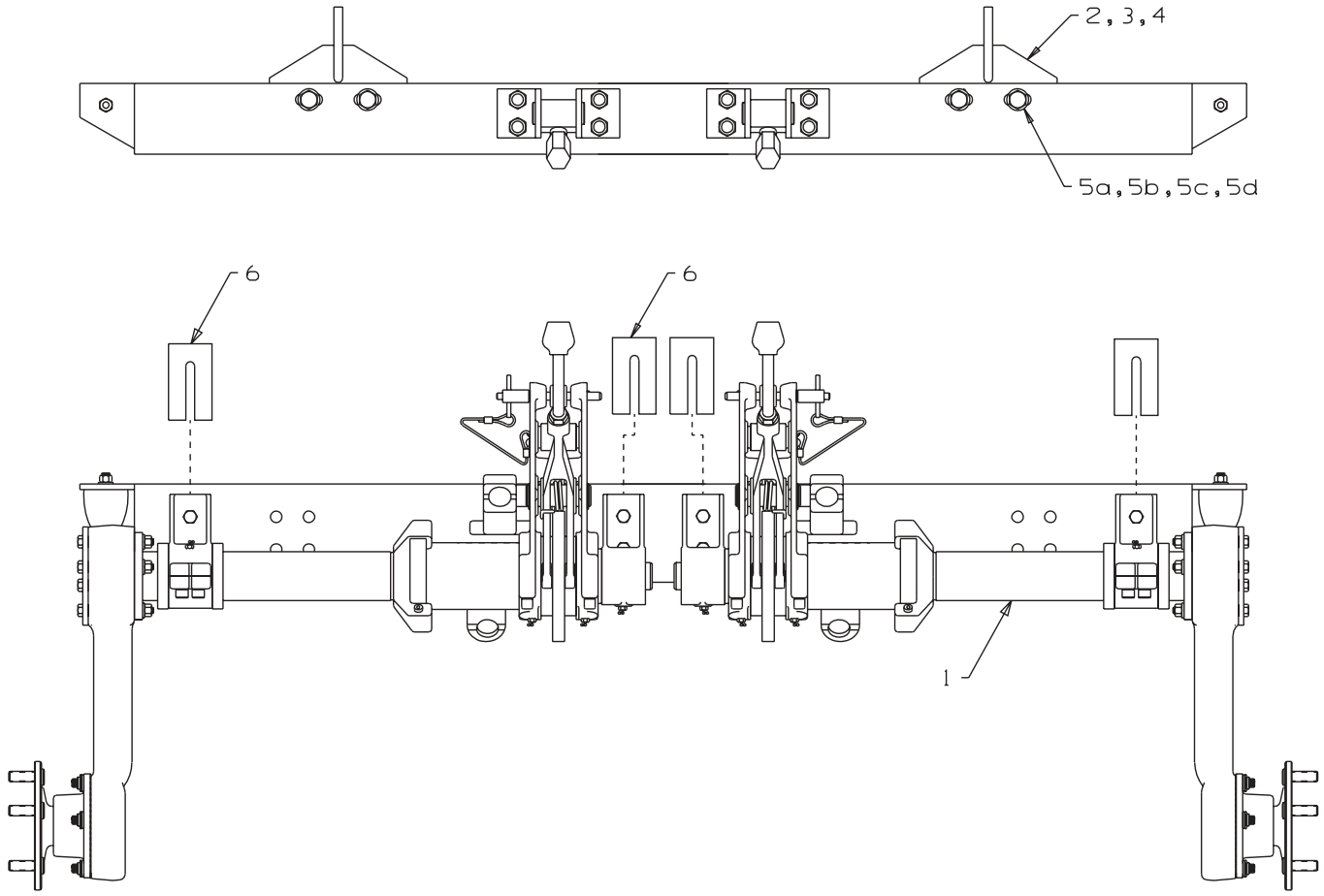
Harsco Track Technologies reserves the right to make any changes in or improvements to its products without incurring any liability or obligation whatsoever and without being required to make any corresponding changes or improvements to products previously manufactured or sold.

Hazardous Material Disclaimer

The parts/assemblies that are used in this Product are classified as "articles" according to 29 CFR 1910.1200 (C). They are formed to a specific shape or design during manufacture, have end use function dependent upon their shape or design, and do not release any hazardous chemical under normal conditions of use. Accordingly, we are not required to supply Material Safety Data Sheets (MSDS) or to label shipping containers for "articles". However, lubricants, liquids, gaseous chemicals and solids used in operation or maintenance of the product may require that user's take occupational protective measures. MSDS sheets for such materials will be supplied to your Purchasing Manager/Safety Director to be used in your employee safety training education and environmental health training.

NOTES

159322 GUIDE WHEEL UNIT



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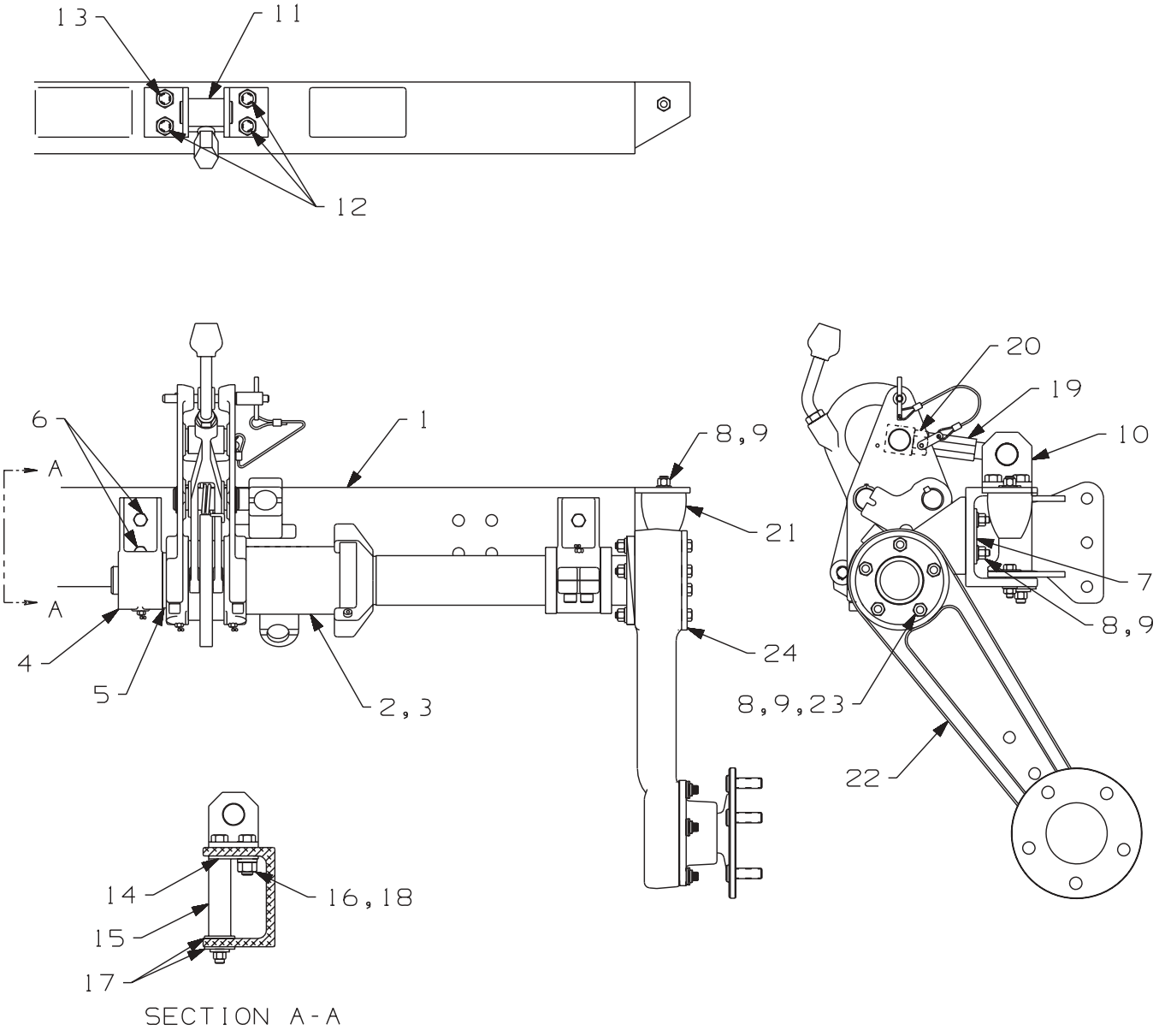
159322 GUIDE WHEEL UNIT

ITEM	PART NO	DESCRIPTION	QTY
1	159323	Guide Wheel Unit Assembly (see separate breakdown)	2
2	101813K	Side Bar Adapter	4
3	101816	Spacer, 1/16"	8
4	101817	Spacer, 1/32"	8
5	181463	FASTENER KIT	1
5a	F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	16
5b	F023111	Hardened Washer	16
5c	058528	Washer	16
5d	F015922	Elastic Stop Nut, 3/8"-16	16
6	101818K	Bearing Shim, 1/16" (use as required for wheel alignment)	10
	079792	Wrench, 1-1/8" Open End (not illustrated)	1
	135744	Lift Handle (not illustrated)	1
	140220	Decal, Warning - Do Not Operate This Machine Before...	1
	F018082	Decal, Safety Instructions - Lock Front Wheels...	1
	135742	Decal, Operating Instructions	1
	F018084	Decal, Operation	2
	155007	Decal, HY-RAIL® Vehicle Completed By...	1
	023351	Decal Application Drawing	1
	BUL1192	Operator's Service and Parts Manual	1
	V1-093	Instruction Video	1

159323 GUIDE WHEEL UNIT ASSEMBLY



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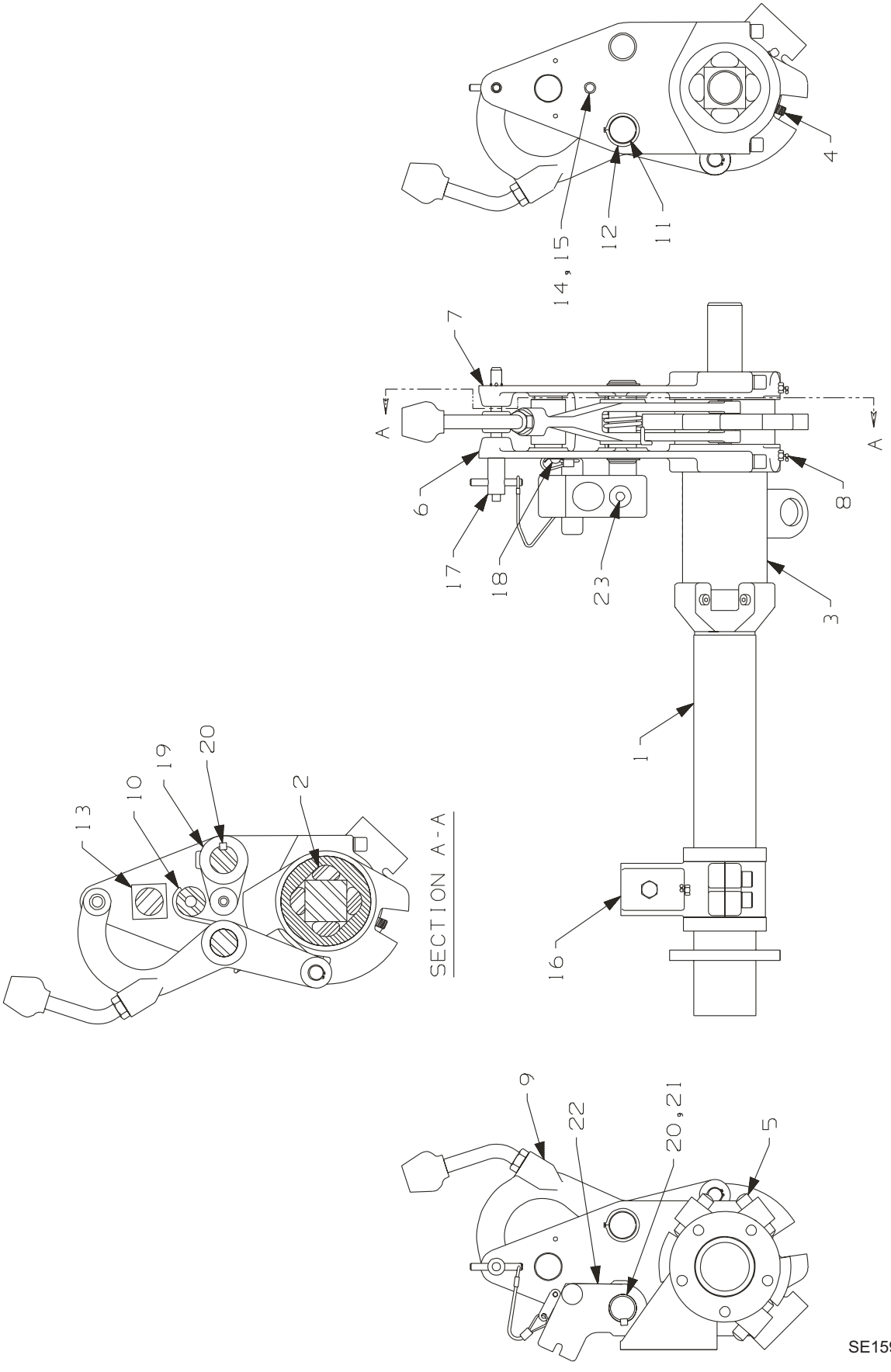
159323 GUIDE WHEEL UNIT ASSEMBLY

ITEM	PART NO	DESCRIPTION	QTY
1	162060	Cross Channel	1
2	159324	Coupling And Tube RF/LR (see separate breakdown)	1
3	159325	Coupling And Tube LF/RR (see separate breakdown)	1
4	083119	INNER PIVOT BEARING	2
4a	F014262	Grease Seal	2
4b	F008014	Grease Fitting	1
5	083121	Thrust Washer	2
6	F016365	Cap Screw, 3/8-24 x 1-1/2" Hex Hd GR 8	8
7	101799	Bolt Strip	4
8	F001025	SAE Lock Washer, 3/8"	20
9	F016820	Hex Nut, 3/8"-24	20
10	083122	Angle	4
11	083118	Trunnion Nut	2
12	F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	6
13	F001525	Cap Screw, 1/2-13 x 5-1/2" Hex Hd	2
14	101802	Bolt Strip	4
15	101803	Spacer	2
16	F001075	SAE Lock Washer, 1/2"	8
17	F001267	Wrought Washer, 1/2"	8
18	F003598	Hex Nut, 1/2"-13	8
19	083123	Adjusting Stud	2
20	F005170	Lock Nut, 3/4"-16	2
21	F011732	Rubber Bumper	2
22	158378	Wheel Arm Assembly (see separate breakdown)	2
23	F017427	Cap Screw, 3/8-24 x 3-1/4" Hex Hd	10
24	157642	Washer	2
25	162058	Decal, Warning, Supplied Lift Handles	2
	F016443	Anti-Seize Lubricant (apply to adjusting studs as needed)	
	200898	Rust Inhibitor (apply to set screws, pins, rollers, etc. as needed)	

159324 COUPLING AND TUBE ASSEMBLY - RIGHT FRONT / LEFT REAR



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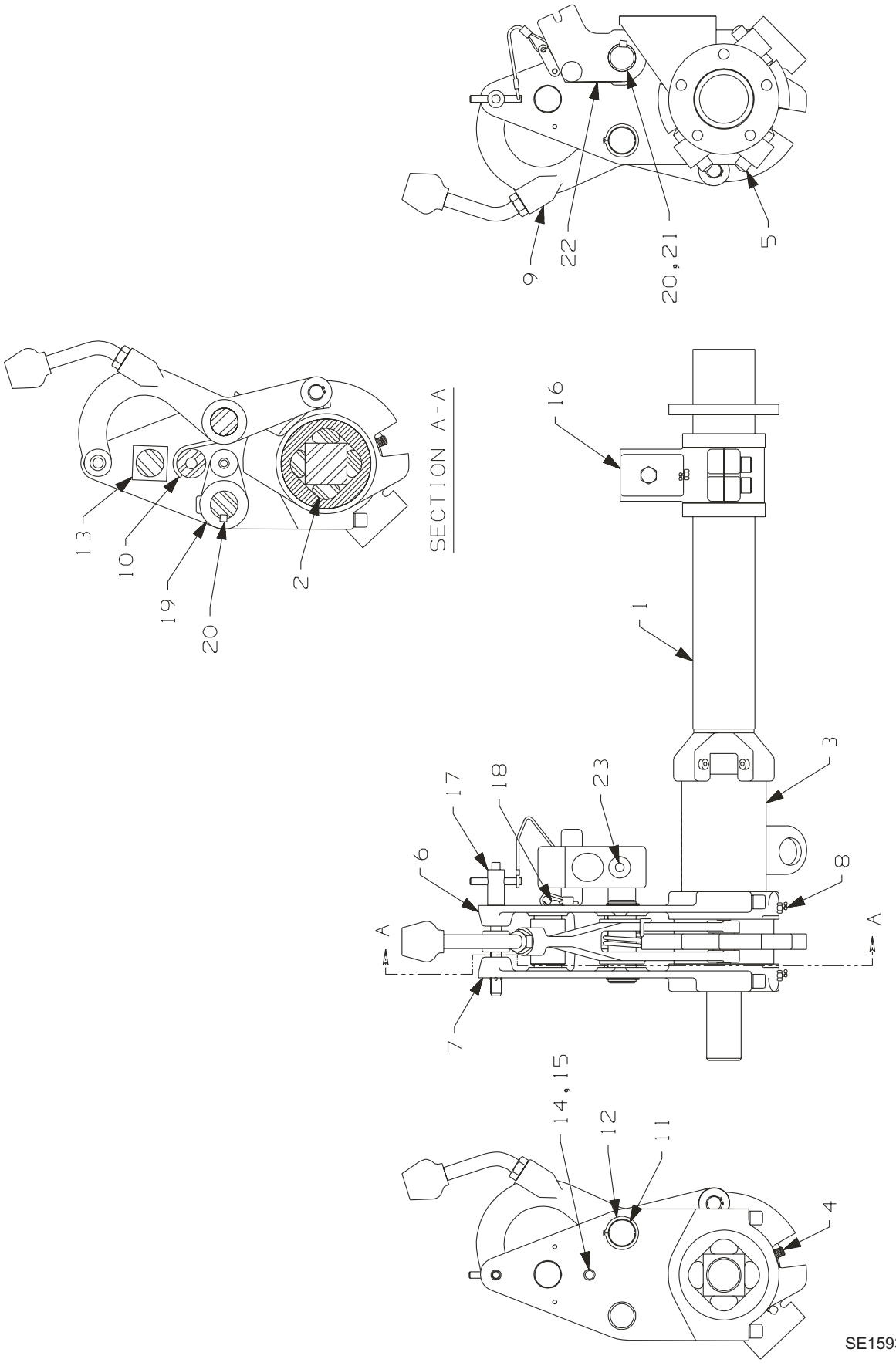
159324 COUPLING AND TUBE ASSEMBLY - RIGHT FRONT / LEFT REAR

ITEM	PART NO	DESCRIPTION	QTY
1	161655	Tube And Shaft	1
	F013313	Rubber Lubricant (use for rubber cord assembly)	
2	083085	Rubber Cord	4
3	118504	Torque Coupling	1
4	F018272	Set Screw, 5/16-18 x 3/4" Cup Point	2
5	F012772	Set Screw, 1/2-13 x 1-1/2" Oval Point	4
	171043	Coupling, Cords and Tube Assembly (Includes Items 1, 2, 3, 4 and 5)	1
6	083088	LOCK SUPPORT	1
6a	F012849	Cap Screw, 3/8-24 x 1-1/2" Soc Hd	2
6b	F011455	Lock Washer, 3/8"	2
7	083114	Lock Support	1
8	F008014	Grease Fitting, 1/4" Straight	2
9	083093K	LOCKING PAWL	1
9a	083095K	Sleeve	1
9b	084877	Stud, Handle	1
9c	F002737	Hex Jam Nut, 1/2"-13	1
9d	F014260K	Knob	1
9e	107533	Pin	1
9f	F009169K	Retaining Ring, 1/2" External	2
10	083097	Torsion Spring	1
11	130705	Pin	1
12	F011450	Retaining Ring, 1" External	2
13	083100	Trunnion Nut	1
14	F008549	Cap Screw, 3/8-24 x 1-1/2" Soc Hd	1
15	F011455	Lock Washer, 3/8" High Collar	1
16	083106	OUTER BEARING	1
16a	F013472	Dust Seal	1
16b	F010722	Grease Fitting, 1/4" 90°	1
17	083105K1	Lock Pin And Lanyard	1
18	F023158	Cap Screw, #10-24 x 3/8" Hex Flg Hd	1
19	085957	PIVOT ARM	1
19a	093467	Roller	1
19b	F011954	Roll Pin, 3/8 x 1-1/2"	1
19c	F012127	Set Screw, 3/8-16 x 1/2" Cup Point	1
20	M002310	Square Key, 1/4 x 1-1/2"	2
21	159452	Shaft	1
22	159451	Socket	1
23	F012127	Set Screw, 3/8-16 x 1/2" Cup Point	1

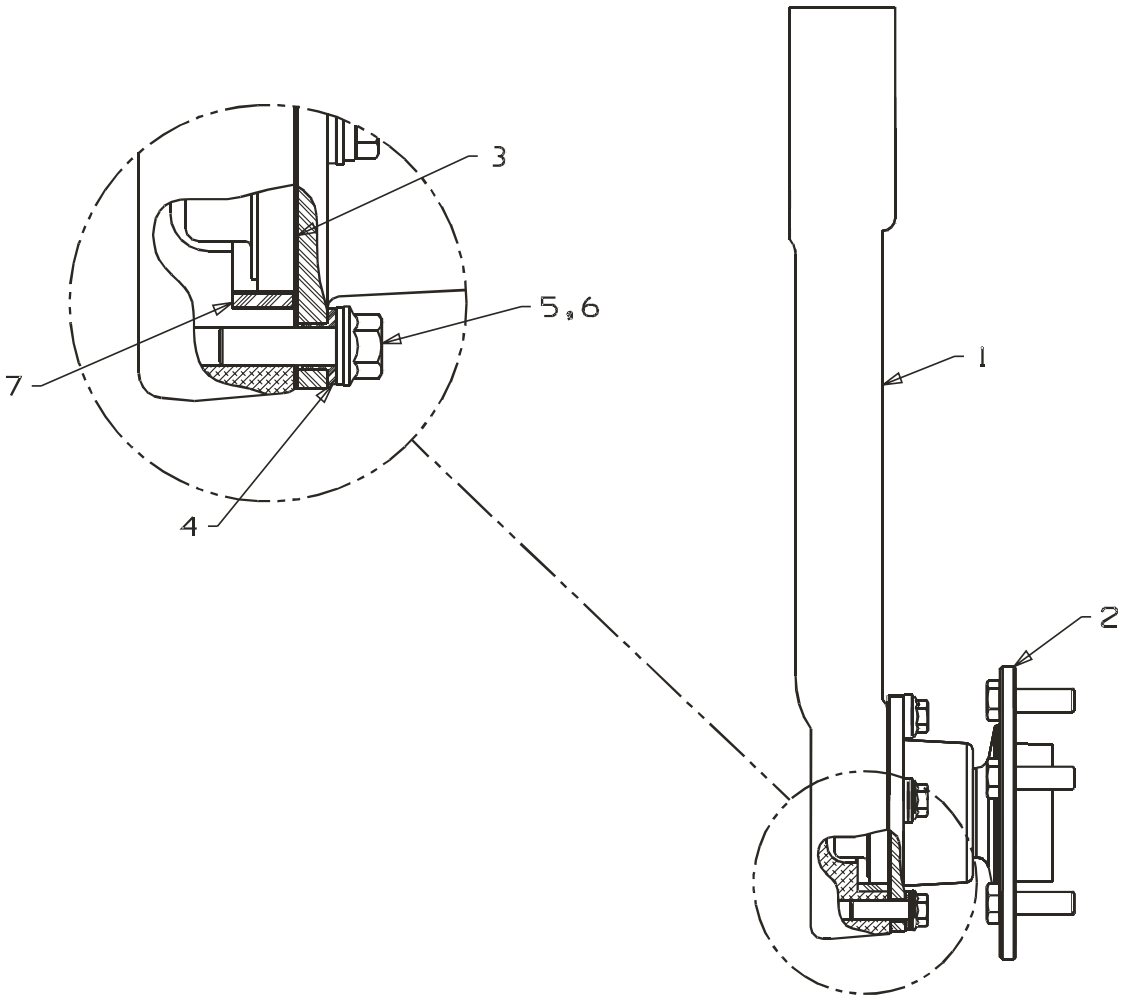
159325 COUPLING AND TUBE ASSEMBLY - LEFT FRONT / RIGHT REAR



159325 COUPLING AND TUBE ASSEMBLY - LEFT FRONT / RIGHT REAR

ITEM	PART NO	DESCRIPTION	QTY
1	161655	Tube And Shaft	1
	F013313	Rubber Lubricant (use for rubber cord assembly)	
2	083085	Rubber Cord	4
3	118503	Torque Coupling	1
4	F018272	Set Screw, 5/16-18 x 3/4" Cup Point	2
5	F012772	Set Screw, 1/2-13 x 1-1/2" Oval Point	4
	171044	Coupling, Cords and Tube Assembly (Includes Items 1, 2, 3, 4 and 5)	1
6	083088	LOCK SUPPORT	1
6a	F012849	Cap Screw, 3/8-24 x 1-1/2" Soc Hd	2
6b	F011455	Lock Washer, 3/8"	2
7	083114	Lock Support	1
8	F008014	Grease Fitting, 1/4" Straight	2
9	083093K	LOCKING PAWL	1
9a	083095K	Sleeve	1
9b	084877	Stud, Handle	1
9c	F002737	Hex Jam Nut, 1/2"-13	1
9d	F014260K	Knob	1
9e	107533	Pin	1
9f	F009169K	Retaining Ring, 1/2" External	2
10	083097	Torsion Spring	1
11	130705	Pin	1
12	F011450	Retaining Ring, 1" External	2
13	083100	Trunnion Nut	1
14	F008549	Cap Screw, 3/8-24 x 1-1/2" Soc Hd	1
15	F011455	Lock Washer, 3/8" High Collar	1
16	083106	OUTER BEARING	1
16a	F013472	Dust Seal	1
16b	F010722	Grease Fitting, 1/4" 90°	1
17	083105K1	Lock Pin And Lanyard	1
18	F023158	Cap Screw, #10-24 x 3/8" Hex Flg Hd	1
19	085957	PIVOT ARM	1
19a	093467	Roller	1
19b	F011954	Roll Pin, 3/8 x 1-1/2"	1
19c	F012127	Set Screw, 3/8-16 x 1/2" Cup Point	1
20	M002310	Square Key, 1/4 x 1-1/2"	2
21	159452	Shaft	1
22	159451	Socket	1
23	F012127	Set Screw, 3/8-16 x 1/2" Cup Point	1

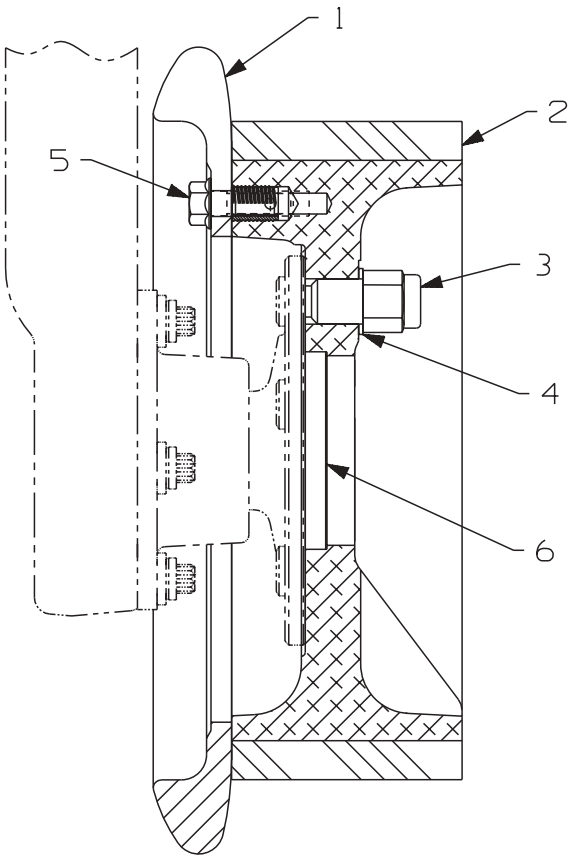
158378 WHEEL ARM ASSEMBLY



SE158378A-1

ITEM	PART NO	DESCRIPTION	QTY
	158378	WHEEL ARM ASSEMBLY	1
1	158352K	Wheel Arm	1
2	F023021	Integral Spindle	1
3	157640	Insulator	1
4	157639	Bushing	4
5	F001362	Wrought Washer, 5/16"	4
6	F023417	Cap Screw, 3/8-16 x 1-1/2" Hex Flg Hd	4
7	157641	Insulator	1

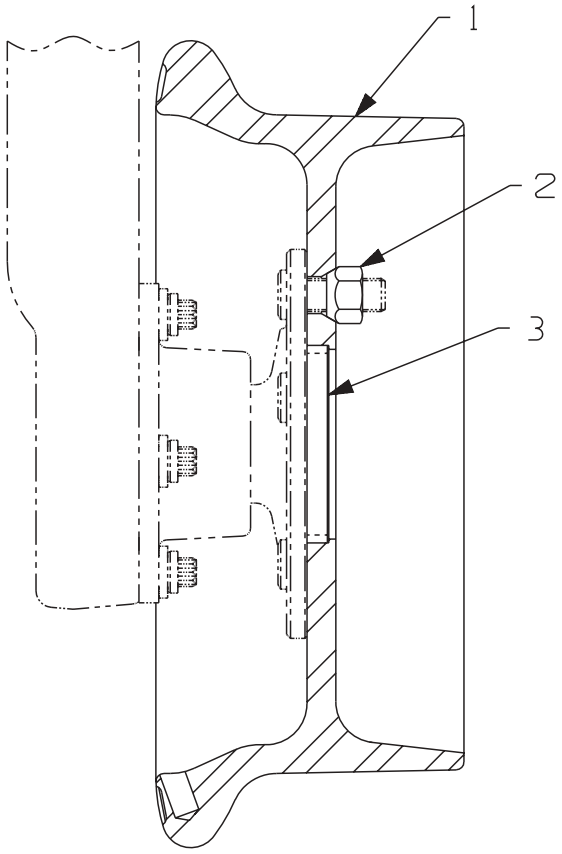
171768 RUBBER TREAD GROUP



SE020083A-1

ITEM	PART NO	DESCRIPTION	QTY
	171768	RUBBER TREAD GROUP	1
1	136133	Flange	1
2	3411039	Rubber Tread	1
3	F023472	Lug Nut, M12 x 1.5 - Torque to 90 lb-ft (122 N-m)	5
4	F023457	Washer, 11/16"	5
5	F023255	Cap Screw, 3/8-16 x 1" Hex Flg Hd - Torque to 40 lb-ft (54 N-m)	6
6	123795	Tube	1

138113 STEEL TREAD GROUP



SE020084A-1

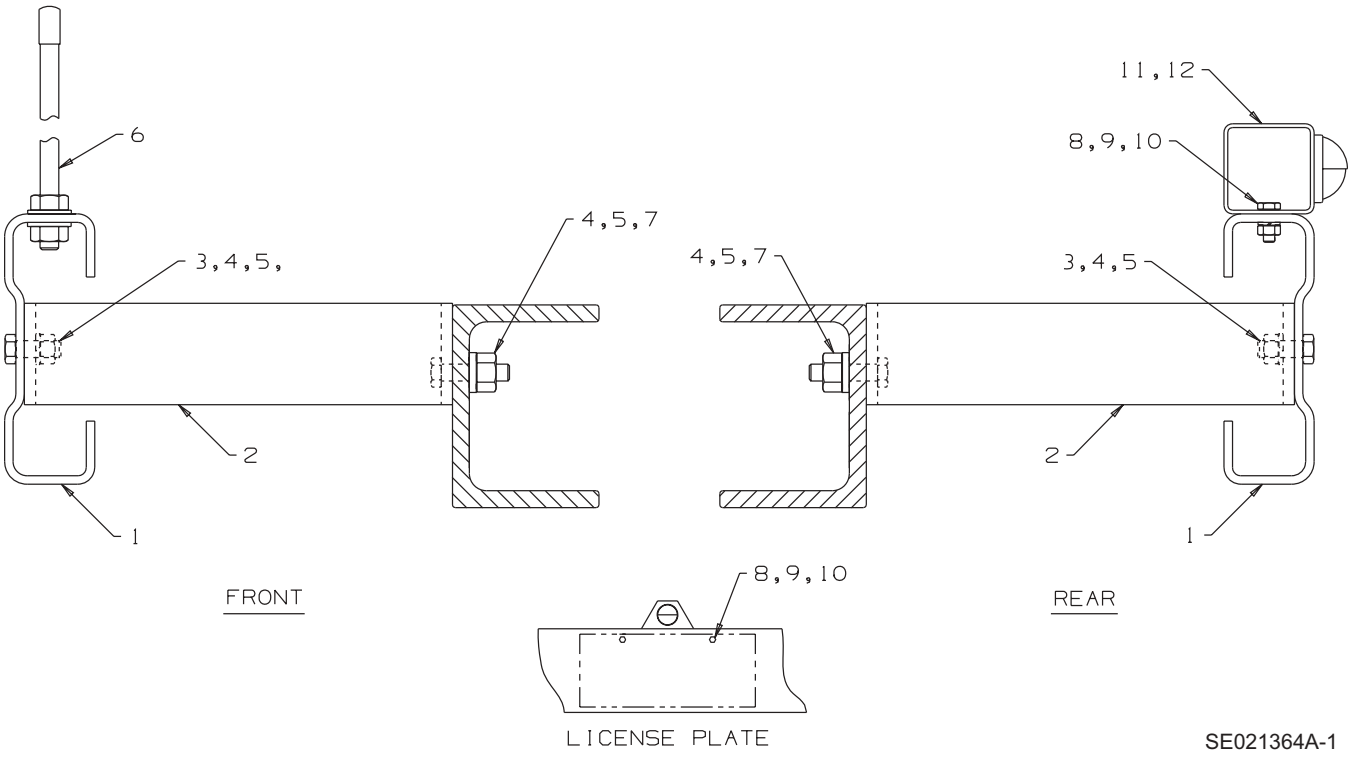
ITEM	PART NO	DESCRIPTION	QTY
	138113	STEEL TREAD GROUP	1
1	136297	Steel Tread	1
2	F019949K	Hex Cone Nut, M12 x 1.5 - Torque to 90 lb-ft (122 N-m)	5
3	123795	Tube	1

STEERING LOCK GROUPS

Individual steering lock components are not available as repair parts. Steering lock groups are sold as complete replacement groups only. See vehicle application charts to find the correct steering lock group applicable to your make, model and year of vehicle.

NOTES

166251 BUMPER GROUP - FRONT AND REAR
166253 BUMPER GROUP - FRONT ONLY
166252 BUMPER GROUP - REAR ONLY



6

166251 BUMPER GROUP - FRONT AND REAR

ITEM	PART NO	DESCRIPTION	QTY
	166251	BUMPER GROUP - FRONT AND REAR	1
1	164510	Bumper	2
2	083139K2	Bracket, Bumper	4
3	F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	8
4	F001075	Lock Washer, 1/2"	16
5	F003598	Hex Nut, 1/2"-13	16
6	130195	Sight Rod Kit, (includes two sight rods and mounting hardware)	1
7	F001095	Cap Screw, 1/2-13 x 1-3/4" Hex Hd	8
8	F002355	Cap Screw, 1/4-20 x 3/4" Hex Hd	6
9	F009535	Lock Washer, 1/4"	6
10	F007022	Hex Nut, 1/4"-20	6
11	107874	License Light Bracket	1
12	F015664	License Lamp	1

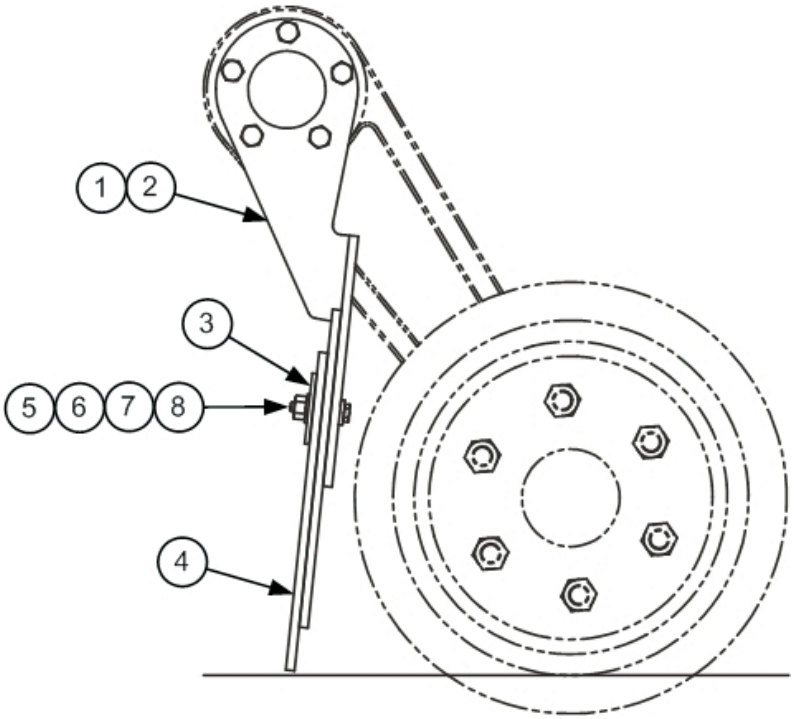
166253 BUMPER GROUP - FRONT ONLY

ITEM	PART NO	DESCRIPTION	QTY
	166253	BUMPER GROUP - FRONT ONLY	1
1	164510	Bumper	1
2	083139K2	Bracket, Bumper	2
3	F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	4
4	F001075	Lock Washer, 1/2"	8
5	F003598	Hex Nut, 1/2"-13	8
6	130195	Sight Rod Kit, (includes two sight rods and mounting hardware	1
7	F001095	Cap Screw, 1/2-13 x 1-3/4" Hex Hd	4
8	F002355	Cap Screw, 1/4-20 x 3/4" Hex Hd	2
9	F009535	Lock Washer, 1/4"	2
10	F007022	Hex Nut, 1/4"-20	2

166252 BUMPER GROUP - REAR ONLY

ITEM	PART NO	DESCRIPTION	QTY
	166252	BUMPER GROUP - REAR ONLY	1
1	164510	Bumper	1
2	083139K2	Bracket, Bumper	2
3	F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	4
4	F001075	Lock Washer, 1/2"	8
5	F003598	Hex Nut, 1/2"-13	8
6	Not Used		
7	F001095	Cap Screw, 1/2-13 x 1-3/4" Hex Hd	4
8	F002355	Cap Screw, 1/4-20 x 3/4" Hex Hd	4
9	F009535	Lock Washer, 1/4"	4
10	F007022	Hex Nut, 1/4"-20	4
11	107874	License Light Bracket	1
12	F015664	License Lamp	1

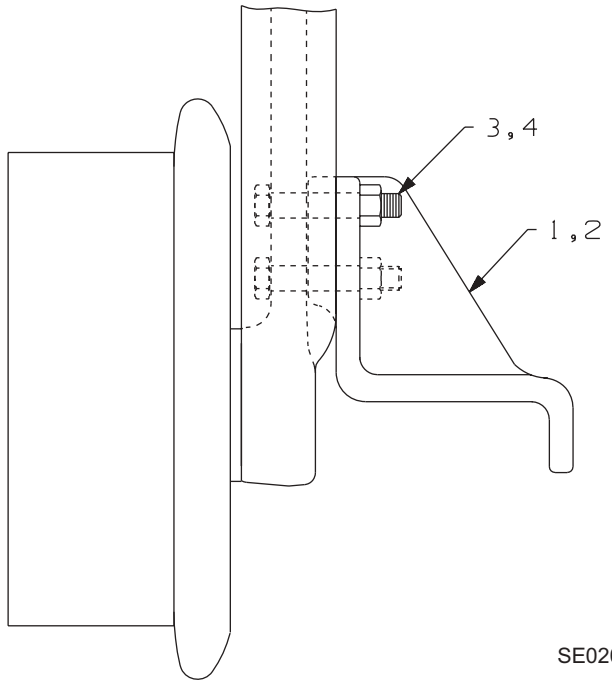
162321 RAIL SWEEP GROUP



SE020923A-1

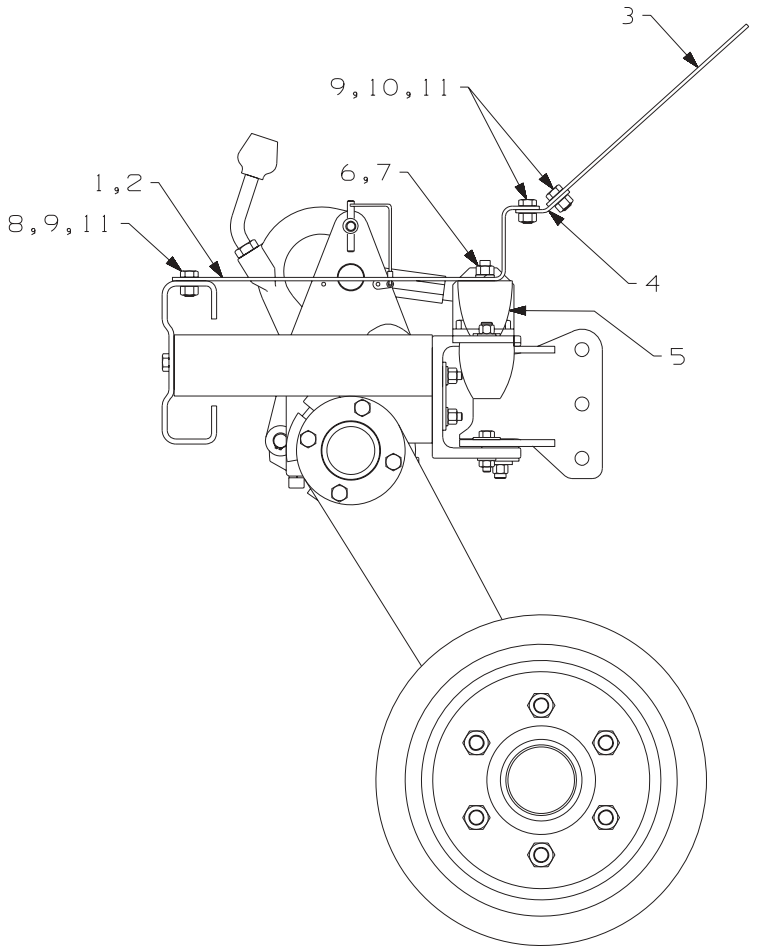
ITEM	PART NO	DESCRIPTION	QTY
	162321	RAIL SWEEP GROUP	1
1	158355K	Bracket - Left Front / Right Rear	1
2	158356K	Bracket - Right Front / Left Rear	1
3	088525	Link	2
4	200919	Rubber Sweep	4
5	F007020	Hex Nut, 3/8"-16	4
6	F001025	SAE Lock Washer, 3/8"	4
7	F001115	Wrought Washer, 3/8"	4
8	F001640	Cap Screw, 3/8-16 x 2" GR 5 Hex Hd	4

137682 DERAIL SKID GROUP



ITEM	PART NO	DESCRIPTION	QTY
	137682	DERAIL SKIDS	1
1	140100	Derail Skid - Left Front / Right Rear	1
2	139613	Derail Skid - Right Front / Left Rear	1
3	F003095	Cap Screw, 1/2-13 x 2-3/4" Hex Hd	4
4	F013500	Hex Elastic Stop Nut, 1/2"-13	4

171077 ALUMINUM STEP PLATE GROUP - FRONT

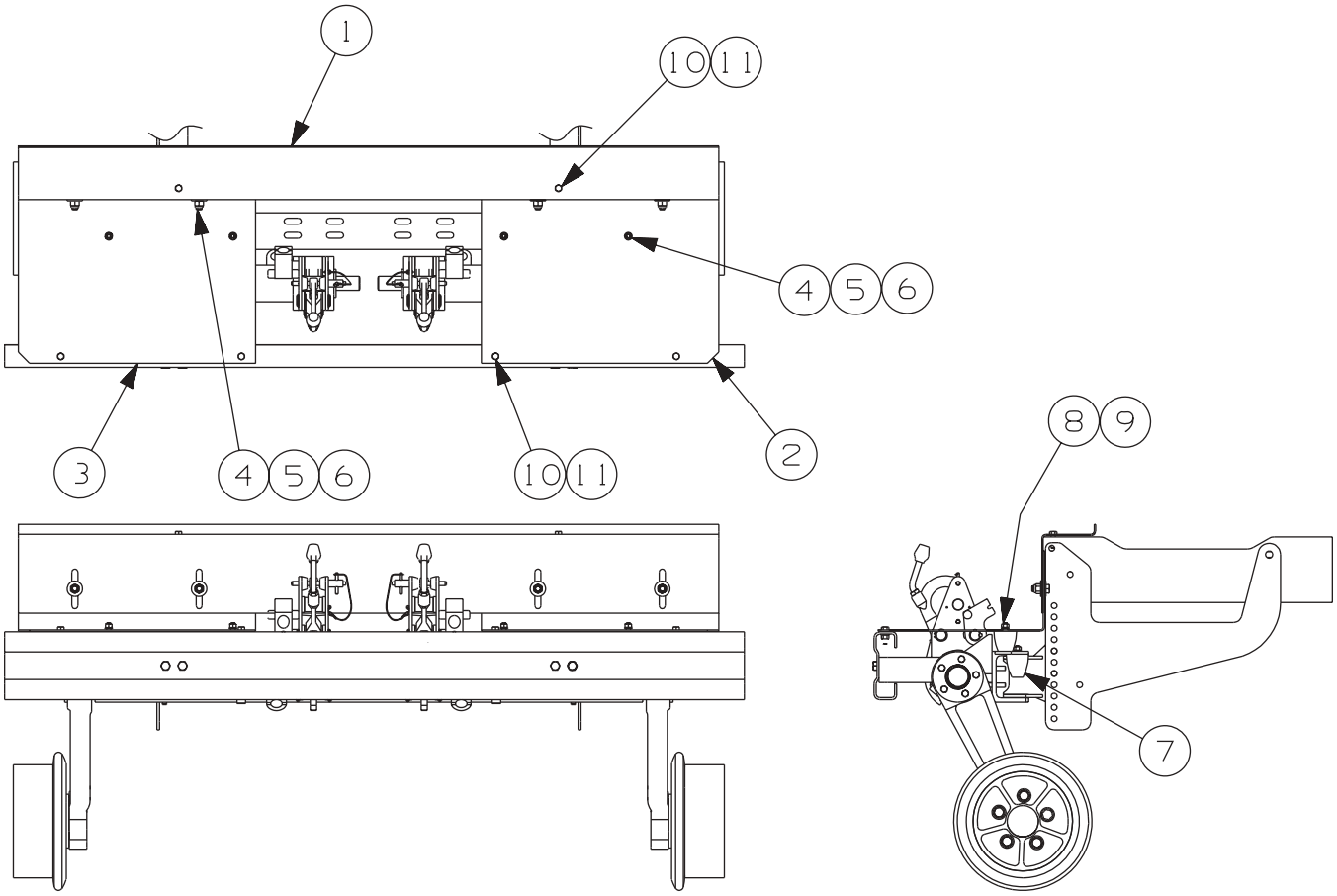


SE022002A-1

6

ITEM	PART NO	DESCRIPTION	QTY
	171077	ALUMINUM STEP PLATE GROUP - FRONT	1
1	171062	Step Plate - Right Front	1
2	171076	Step Plate - Left Front	1
3	171063	Plate	2
4	171061	Bracket	2
5	F011732	Rubber Bumper	4
6	F016820	Hex, Nut, 3/8"-24	4
7	F001025	SAE Lock Washer, 3/8"	4
8	F001125	Cap Screw, 3/8-16 x 1-1/4" Hex Hd	4
9	F015922	Elastic Stop Nut, 3/8"-16	16
10	F001007	Cap Screw, 3/8-16 x 1" Hex Hd	12
11	F009681	SAE Washer, 3/8"	16

179483 STEP PLATE GROUP - REAR

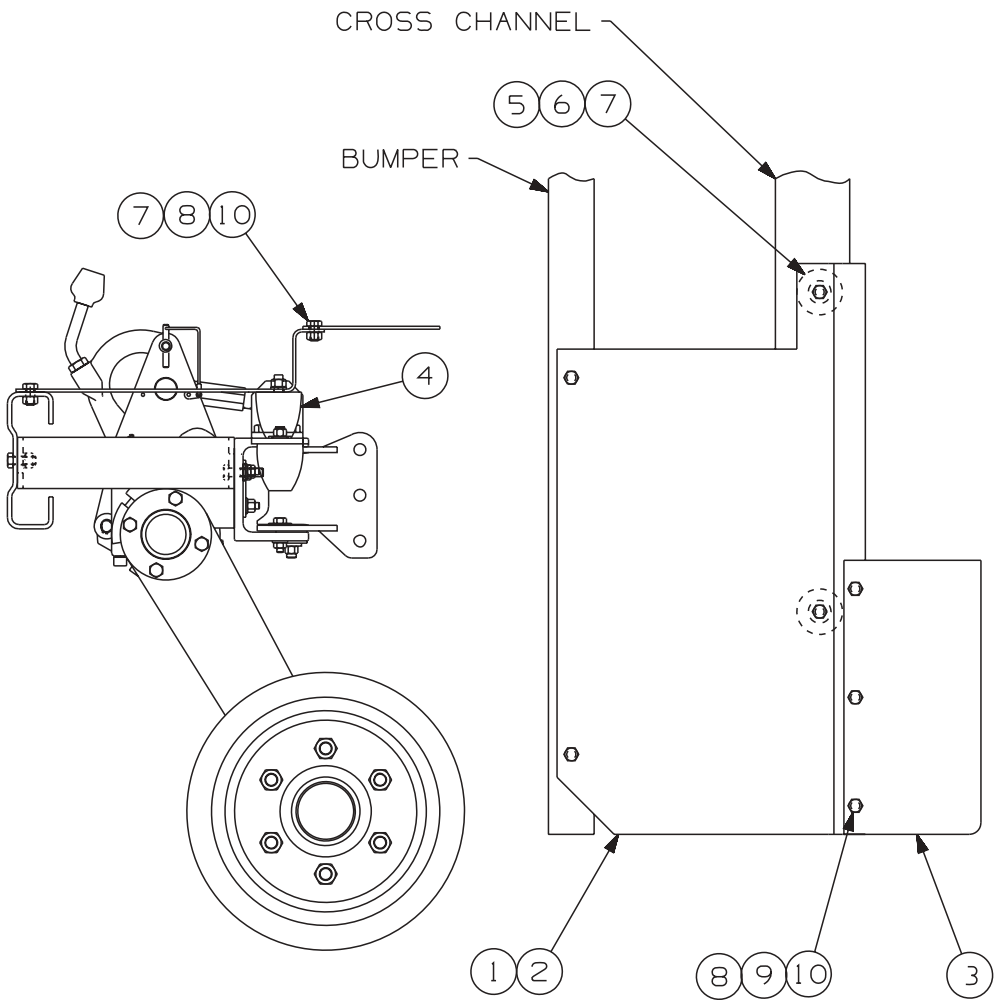


SE022721A-1

6

ITEM	PART NO	DESCRIPTION	QTY
	179483	STEP PLATE GROUP - REAR	1
1	179484	Plate	1
2	179481	Step Plate, Right	1
3	179482	Step Plate, Left	1
4	F001267	Wrought Washer, 1/2"	16
5	F001539	Cap Screw, 1/2-13 x 1-1/4" GR 5 Hex Hd	8
6	F013500	Elastic Stop Nut	8
7	F011732	Rubber Bumper	4
8	F001025	SAE Lock Washer, 3/8"	4
9	F016820	Hex Nut, 3/8"-24	4
10	F002837	Cap Screw, 3/8-16 x 1-3/8" GR 5 Hex Hd	6
11	F015922	Elastic Stop Nut, 3/8"-16	6

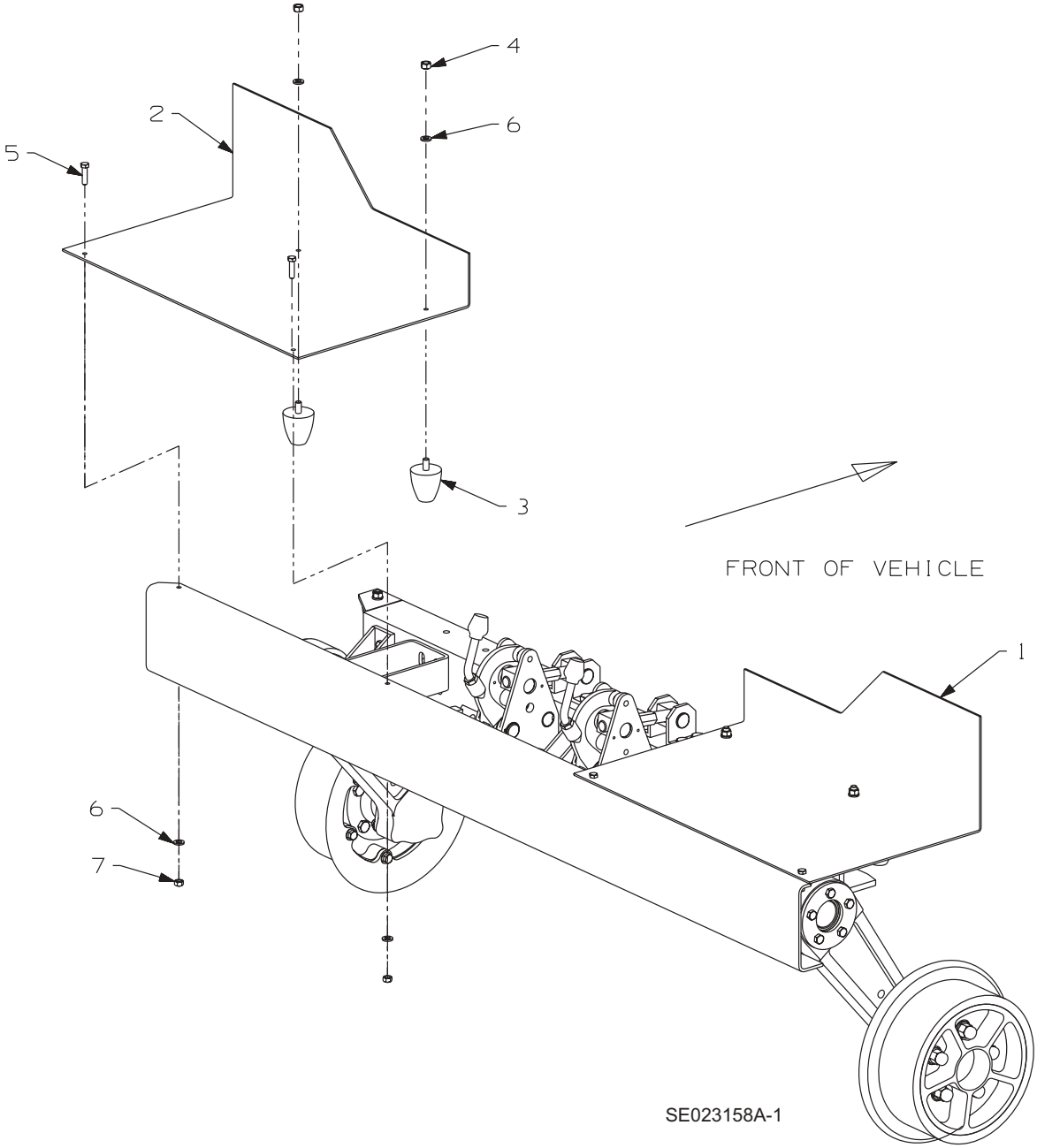
179529 STEP PLATE GROUP - FRONT



SE022567A-1

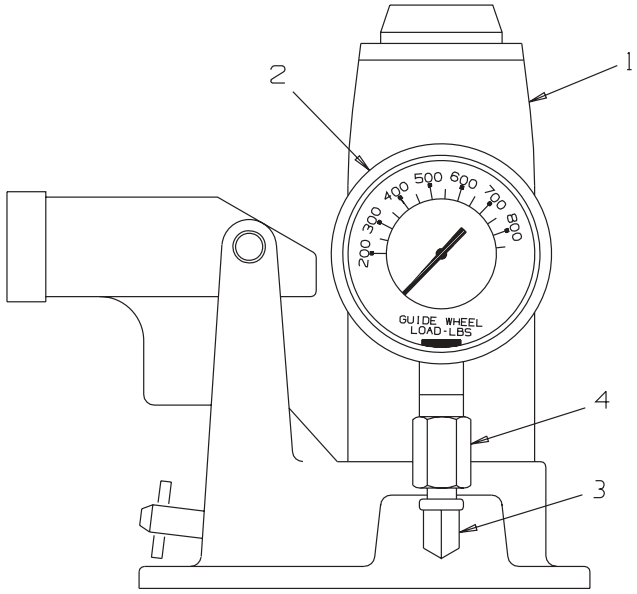
ITEM	PART NO	DESCRIPTION	QTY
	179529	STEP PLATE GROUP - FRONT	1
1	171062	Step Plate, Right	1
2	171076	Step Plate, Left	1
3	179530	Plate	2
4	F011732	Rubber Bumper	4
5	F016820	Hex Nut, 3/8"-24	4
6	F001025	SAE Lock Washer, 3/8"	4
7	F001125	Cap Screw, 3/8-16 x 1-1/4" GR 5 Hex Hd	4
8	F015922	Elastic Stop Nut, 3/8"-16	10
9	F001007	Cap Screw, 3/8-16 x 1" GR 5 Hex Hd	6
10	F009681	SAE Washer, 3/8"	10

186109 ALUMINUM STEP PLATE GROUP - REAR



ITEM	PART NO	DESCRIPTION	QTY
	186109	ALUMINUM STEP PLATE GROUP - REAR	1
1	186110	Step Plate, Right	1
2	186111	Step Plate, Left	1
3	F011732	Rubber Bumper	4
4	F016820	Hex Nut, 3/8"-24	4
5	F001125	Cap Screw, 3/8-16 x 1-1/4" Hex Hd	4
6	F001025	SAE Lock Washer, 3/8"	8
7	F007020	Hex Nut, 3/8"-16	4

073527 WHEEL WEIGHING JACK



SE073527A-1

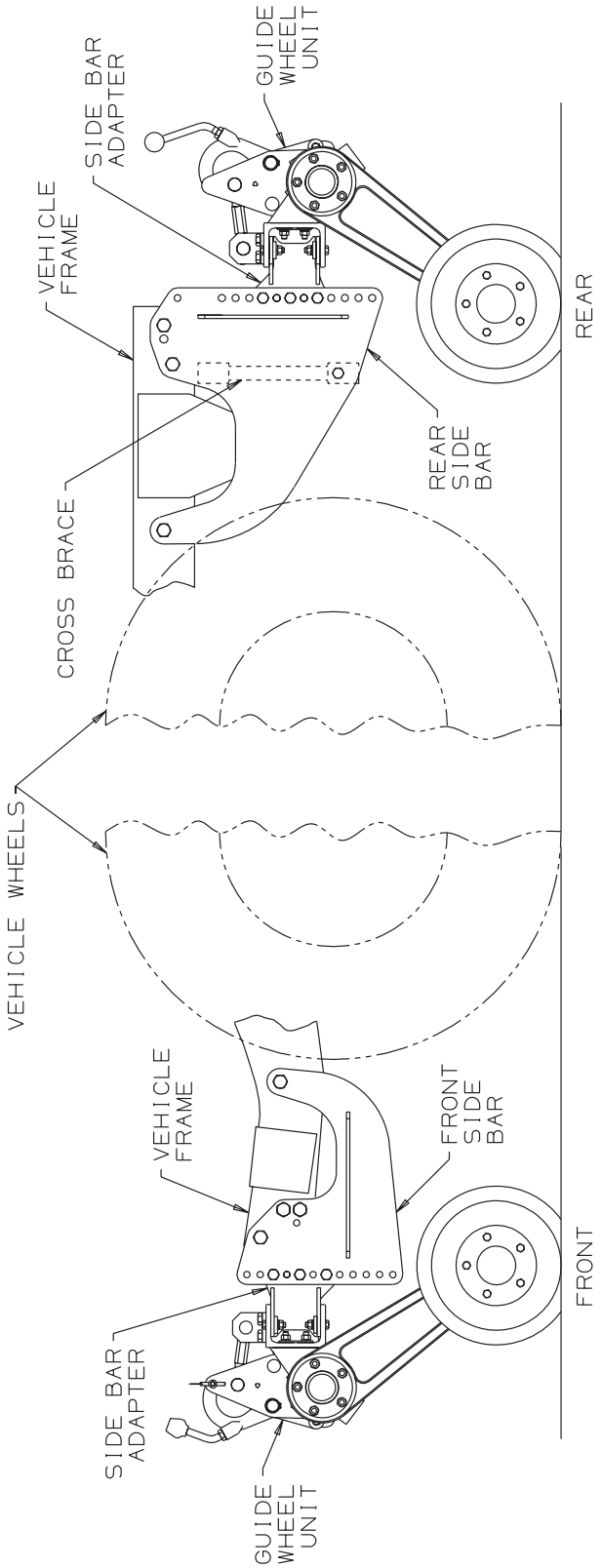
ITEM	PART NO	DESCRIPTION	QTY
	073527	JACK ASSEMBLY	1
1	F025513	Hydraulic Jack	1
2	154381	Gauge With Decals	1
3	146353	90° Elbow, 1/8 M NPT x 1/8 F NPT	1
4	F023088	Adapter, 1/8 M NPT x 1/4 F NPT	1

163638 DECAL SERVICE GROUP

PART NO	DESCRIPTION	QTY
163638	DECAL SERVICE GROUP	1
F018082	Decal, Safety Instructions - Lock Front Wheels...	1
F018084	Decal, Operation	2
162058	Decal, Harsco Track Technologies Supplied Lift Handles...	4
140220	Decal, Warning - Do Not Operate This Machine Before...	3
135742	Decal, Operating Instructions	1
155007	Decal, HY-RAIL ® Vehicle Completed By....	1
BUL1192	Operator's Service and Parts Manual.	1
020504	Decal Application	1

TYPICAL MOUNTING BRACKETS

This illustration shows typical mounting brackets that are common in most groups and guide wheel units, mounted on a vehicle. Mounting brackets and applications will vary from vehicle to vehicle. See Section 7, Vehicle Applications, to find the correct mounting bracket group applicable to your make, model and year of vehicle.



SE93A129A-1

FASTENER KITS FOR FRONT AND REAR UNIT MOUNTING

PART NO	DESCRIPTION	QTY
181460	FASTENER KIT	1
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	8
F018861	Cap Screw, 1/2-13 x 2-1/4" Hex Hd	10
F019762	Cap Screw, 5/8-11 x 1-1/2" Hex Hd	4
F040637	Cap Screw, 3/4-10 x 1-3/4" Hex Hd	2
F020672	Cap Screw, 3/4-10 x 5" Hex Hd	4
F013500	Elastic Stop Nut, 1/2"-13	18
F012452	Elastic Stop Nut, 5/8"-11	4
F013633	Elastic Stop Nut, 3/4"-10	6
F001267	Wrought Washer, 1/2"	18
181461	FASTENER KIT	1
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	18
F019501	Cap Screw, 5/8-11 x 1-3/4" Hex Hd	4
F013500	Elastic Stop Nut, 1/2"-13	18
F012452	Elastic Stop Nut, 5/8"-11	4
F001267	Wrought Washer, 1/2"	18
F023012	Hardened Washer	4
181462	FASTENER KIT	1
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	8
F018861	Cap Screw, 1/2-13 x 2-1/4" Hex Hd	4
F019762	Cap Screw, 5/8-11 x 1-1/2" Hex Hd	4
F023743	Cap Screw, 5/8-11 x 5-1/2" Hex Hd	2
F040637	Cap Screw, 3/4-10 x 1-3/4" Hex Hd	4
F013500	Elastic Stop Nut, 1/2"-13	12
F012452	Elastic Stop Nut, 5/8"-11	6
F013633	Elastic Stop Nut, 3/4"-10	4
F001267	Wrought Washer, 1/2"	12
F023012	Hardened Washer	6
F021137	Hardened Washer	4
187178	FASTENER KIT	1
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	24
F020460	Cap Screw, 5/8-11 x 2" GR 8 Hex Hd	4
F022173	Cap Screw, 3/4-10 x 2" GR 8 Hex Hd	8
700564300	Cap Screw, 1/2-13 x 3" GR 8 Hex Hd	6
F013500	Elastic Stop Nut	24
F013633	Elastic Stop Nut, 3/4"-10	8
F017188	Hex Elastic Stop Nut, 5/8"-11	4
F026081	Hex Flg Nut 1/2"-13 GR 8	4
F024047	Washer	18
F023012	Harden Washer	8
F021137	Hardened Washer	4

163169 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
163169	MOUNTING BRACKET GROUP	1
181461	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

159638	Side Bar, Right	1
159642	Side Bar, Left	1
055954	Shim, .060"	12
163634	Brace End	1
163636	Brace End	1
021305	Front Unit Application Drawing	

Parts For Rear Unit Mounting

137674	Side Bar - Left	1
137675	Side Bar - Right	1
163634	Brace End	2
163635	Brace End	2
021301	Rear Unit Application Drawing	

169032 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
169032	MOUNTING BRACKET GROUP	1
181461	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

168269	Side Bar, Right	1
168268	Side Bar, Left	1
055954	Spacer (use as required)	12
163634	Brace End	1
163636	Brace End	1
021837	Front Unit Application Drawing	

Parts For Rear Unit Mounting

137674	Side Bar - Left	1
137675	Side Bar - Right	1
163634	Brace End	1
163635	Brace End	1
021301	Rear Unit Application Drawing	

174348 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
174348	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

159638	Side Bar, Right	1
159642	Side Bar, Left	1
055954	Spacer (use as required)	12
163634	Brace End	2
163636	Brace End	2
F022036	Cap Screw, 1/2-13 x 1-1/4" Hex Flg Hd	12
F022037	Hex Flg Nut, 1/2"-13	12
F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	8
F001075	SAE Lock Washer, 1/2"	6
F003598	Hex Nut, 1/2"-13	6
F024047	Washer	4
021305	Front Unit Application Drawing	
021347	Front Unit Application Drawing	

180717 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
180717	MOUNTING BRACKET GROUP	1
181462	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

184495	Side Bar, Left & Right	2
163636	Brace End	2
163634	Brace End	2
022637	Front Unit Application Drawing	

Parts For Rear Unit Mounting

180748	Side Bar, Right	1
180749	Side Bar, Left	1
163635	Brace End	2
163634	Brace End	2
022657	Rear Unit Application Drawing	

181687 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
181687	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

168269	Side Bar, Right	1
168268	Side Bar, Left	1
163634	Brace End	1
163636	Brace End	1
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	18
F013500	Elastic Stop Nut	12
F001267	Wrought Washer, 1/2"	18
055954	Bar	12
021837	Rear Unit Application Drawing	

181717 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
181717	MOUNTING BRACKET GROUP	1
181462	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

181692	Side Bar, Left	1
181691	Side Bar, Right	1
181718	Tube	2
163636	Brace End	1
163634	Brace End	1
F023743	Cap Screw, 5/8-11 x 5-1/2" GR 8 Hex Hd	2
700566225	Cap Screw, 5/8-11 x 2-1/4" GR 8 Hex Hd	4
F023012	Harden Washer	8
F012452	Elastic Stop Nut, 5/8"	6
022966	Front Unit Application Drawing	

Parts For Rear Unit Mounting

181695	Side Bar Right	1
181696	Side Bar Left	1
181725	Spacer	2
181724	Spacer	2
175841	Hex Head Cap Screw	2
F016378	Cap Screw, 5/8-11 x 3-1/2" GR 8 Hex Hd	2
F012452	Elastic Stop Nut, 5/8"	4
181697	Plate	2
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	8
F024602	Hardened Washer	8
F014487	Elastic Stop Nut, 1/2"-13	8
F023012	Harden Washer	8
163634	Brace End	1
163635	Brace End	1
022967	Rear Unit Application Drawing	

184085 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184085	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

184095 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184095	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023037	Front Unit Application Drawing	

184096 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184096	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

184098 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184098	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

184433 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
184433	MOUNTING BRACKET GROUP	1
181462	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

184398	Side Bar, Left	1
184399	Side Bar, Right	1
184472	Bracket, Right	1
184473	Bracket, Left	1
023037	Front Unit Application Drawing	

Parts For Rear Unit Mounting

184421	Side Bar, Right	1
184422	Side Bar, Left	1
163635	Brace End	2
163634	Brace End	2
023038	Rear Unit Application Drawing	

184459 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
184459	MOUNTING BRACKET GROUP	1
181460	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184486	Bracket, Right	1
184487	Bracket, Left	1
184480	Bar	4
023046	Front Unit Application Drawing	

Parts For Rear Unit Mounting

184474	Side Bar, Right	1
184475	Side Bar, Left	1
163635	Brace End	2
163634	Brace End	2
023047	Rear Unit Application Drawing	

184492 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184492	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

184493 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184493	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

184522 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
184522	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184477	Side Bar, Left	1
184469	Side Bar, Right	1
184487	Bracket, Left	1
184486	Bracket, Right	1
184480	Bar	4
184491	Shim	4
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	12
F026081	Hex Flg Nut, 1/2"-13	4
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	12
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
023046	Front Unit Application Drawing	

186145 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
186145	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184398	Side Bar, Left	1
184399	Side Bar, Right	1
184472	Bracket, Right	1
184473	Bracket, Left	1
F041212	Hex Elastic Stop Nut, M12 x 1.75 mm	6
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	10
F013500	Elastic Stop Nut	6
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	6
F017188	Hex Elastic Stop Nut, 5/8"-11	2
F009425	SAE Washer, 5/8"	2
023037	Front Unit Application Drawing	

186147 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
186147	MOUNTING BRACKET GROUP	1
Parts For Front Unit Mounting		
184398	Side Bar, Left	1
184399	Side Bar, Right	1
184472	Bracket, Right	1
184473	Bracket, Left	1
F041212	Hex Elastic Stop Nut, M12 x 1.75 mm	6
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	18
F013500	Elastic Stop Nut	14
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F001267	Wrought Washer, 1/2"	18
F017188	Hex Elastic Stop Nut, 5/8"-11	2
F009425	SAE Washer, 5/8"	2
023037	Front Unit Application Drawing	

186149 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
186149	MOUNTING BRACKET GROUP	1
Parts For Front Unit Mounting		
184398	Side Bar, Left	1
184399	Side Bar, Right	1
184472	Bracket, Right	1
184473	Bracket, Left	1
F041212	Hex Elastic Stop Nut, M12 x 1.75 mm	6
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	10
F013500	Elastic Stop Nut	6
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
F009425	SAE Washer, 5/8"	2
023037	Front Unit Application Drawing	

186150 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
186150	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

184398	Side Bar, Left	1
184399	Side Bar, Right	1
184472	Bracket, Right	1
184473	Bracket, Left	1
184480	Bar	4
F041212	Hex Elastic Stop Nut, M12 x 1.75 mm	6
F018650	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	18
F013500	Elastic Stop Nut	14
F020460	Cap Screw, 5/8-11 x 2" Hex Hd	6
F017188	Hex Elastic Stop Nut, 5/8"-11	2
F009425	SAE Washer, 5/8"	2
023037	Front Unit Application Drawing	

186268 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
186268	MOUNTING BRACKET GROUP	1
187178	Fastener Kit (for front and rear unit mounting)	1

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Parts For Front Unit Mounting

184398	Side Bar, Left	1
184399	Side Bar, Right	1
184390	Bar	2
023037	Front Unit Application Drawing	

Parts For Rear Unit Mounting

186244	Side Bar, Left	1
186245	Side Bar, Right	1
163634	Brace End	2
163635	Brace End	2
023206	Rear Unit Application Drawing	

188603 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
188603	MOUNTING BRACKET GROUP	1
181461	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

188498	Side Bar	2
187197	Bar	2
187202	Link	2
188602	Bar	2
F024602	Hardened Washer	16
700564300	Cap Screw, 1/2-13 x 3" GR 8 Hex Hd	6
F022037	Hex Flg Nut, 1/2"-13 GR 5	2
F021924	Hex Flg Nut, 5/8"-11 GR 5	2
023437	Front Unit Application Drawing	

Parts For Rear Unit Mounting

187294	Side Bar Assembly Left	1
187295	Side Bar Assembly Right	1
163635	Brace End	2
163634	Brace End	2
F019501	Cap Screw, 5/8-11 x 1-3/4" Hex Hd	6
F012452	Elastic Stop Nut, 5/8"	6
F023012	Harden Washer	12
023439	Rear Unit Application Drawing	

188627 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
188627	MOUNTING BRACKET GROUP	1
181461	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

188625	Side Bar, Left	1
188624	Side Bar, Right	1
187197	Bar	2
187202	Link	2
187198	Bar	2
163635	Brace End	2
163634	Brace End	2
700564300	Cap Screw, 1/2-13 x 3" GR 8 Hex Hd	6
F022037	Hex Flg Nut, 1/2"-13 GR 5	2
F021924	Hex Flg Nut, 5/8"-11 GR 5	2
F024602	Hardened Washer	16
023274	Front Unit Application Drawing	

Parts For Rear Unit Mounting

187294	Side Bar, Left	1
187295	Side Bar, Right	1
F019501	Cap Screw, 5/8"-11 x 1-3/4" Hex Hd	6
F012452	Elastic Stop Nut, 5/8"	6
163635	Brace End	2
163634	Brace End	2
023439	Rear Unit Application Drawing	

202504 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
202504	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

163634	Brace End	1
202308	Shim	2
163636	Brace End	1
F018861	Cap Screw, 1/2-13 x 2-1/4" GR 8 Hex Hd	12
188498	Side Bar, Left or Right	2
F018811	Cap Screw, 1/2-13 x 2-1/2" GR 8 Hex Hd	4
F024602	Hardened Washer	14
F014487	Elastic Stop Nut, 1/2"-13	10
202307	Shim	2
F012452	Elastic Stop Nut, 5/8"	2
F023012	Hardened Washer	2
F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F023111	Hardened Washer	8
F015922	Elastic Stop Nut, 3/8"-16	8
058528	Washer	8
700566225	Cap Screw, 5/8-11 x 2-1/4" GR 8 Hex Hd	2
023772	Front Unit Application Drawing	

Parts For Rear Unit Mounting

163634	Brace End	2
163636	Brace End	2
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
F024602	Hardened Washer	24
202505	Side Bar, Left	1
202506	Side Bar, Right	1
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	4
F014487	Elastic Stop Nut, 1/2"-13	10
F023012	Hardened Washer	4
F020460	Cap Screw, 5/8-11 x 2" GR 8 Hex Hd	2
F012452	Elastic Stop Nut, 5/8"	2
F023111	Hardened Washer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
101817	Spacer, 1/32"	2
101816	Spacer, 1/16"	4
058528	Washer	8
024550	Rear Unit Application Drawing	

203464 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
203464	MOUNTING BRACKET GROUP	1
187178	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F023111	Hardened Washer	8
058528	Washer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F013500	Elastic Stop Nut	16
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	10
184477	Side Bar, Left	1
184469	Side Bar, Right	1
184480	Bar	4
203264	Bracket, Left	1
203265	Bracket, Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd	4
F024047	Washer	22
202063	Washer, Hardened, 1/2"	14
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
024627	Front Unit Application Drawing	

Parts For Rear Unit Mounting

F022173	Cap Screw, 3/4-10 x 2" Hex Hd	10
F013633	Elastic Stop Nut, 3/4"-10	8
F013500	Elastic Stop Nut	12
F023111	Hardened Washer	8
058528	Washer	8
F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F015922	Elastic Stop Nut, 3/8"-16	8
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	10
186177	Side Bar, Left	1
186178	Side Bar, Right	1
F024047	Washer	24
202069	Washer, Hardened, 3/4"	10
F002929	SAE Washer, 3/4"	10
163634	Brace End	2
163635	Brace End	2
101816	Spacer, 1/16"	2
101817	Spacer, 1/32"	2
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
023047	Rear Unit Application Drawing	

203474 MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
203474	MOUNTING BRACKET GROUP	1
187178	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

184399	Side Bar, Right	1
184398	Side Bar, Left	1
F019742	Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd	8
F023111	Washer, 3/8"	8
058528	Spacer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F013500	Elastic Stop Nut	14
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	8
F020460	Cap Screw, 5/8-11 x 2" GR 8 Hex Hd	2
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
184480	Bar	4
203264	Bracket, Left	1
203265	Bracket, Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd	4
F024047	Washer	20
202063	Hardened Washer, 1/2"	8
202067	Washer	2
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
024631	Front Unit Application Drawing	

Parts For Rear Unit Mounting

F022173	Cap Screw, 3/4-10 x 2" Hex Hd	10
F013633	Elastic Stop Nut, 3/4"-10	10
F013500	Elastic Stop Nut	12
F023111	Washer	8
058528	Spacer	8
F019742	Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd	8
F015922	Elastic Stop Nut, 3/8"-16	8
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	6
186177	Side Bar, Left	1
186178	Side Bar, Right	1
F024047	Washer	24
202069	Hardened Washer, 3/4"	10
F002929	SAE Washer, 3/4"	10
163634	Brace End	2
163635	Brace End	2
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
023047	Rear Unit Application Drawing	

203510 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
203510	MOUNTING BRACKET GROUP	1
187178	Fastener Kit (for front and rear unit mounting)	1

Parts For Front Unit Mounting

F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F023111	Hardened Washer	8
058528	Washer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F013500	Elastic Stop Nut, 1/2"-13	16
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	10
184477	Side Bar, Left	1
184469	Side Bar, Right	1
184480	Bar	4
203264	Bracket, Left	1
203265	Bracket, Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd	4
F024047	Washer	12
202063	Hardened Washer, 1/2"	14
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	16
024627	Front Unit Application Drawing	

203646 MOUNTING BRACKET GROUP FOR HR0307A FRONT ONLY

PART NO	DESCRIPTION	QTY
203646	MOUNTING BRACKET GROUP	1

Parts For Front Unit Mounting

F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F023111	Hardened Washer	8
058528	Washer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F013500	Elastic Stop Nut, 1/2"-13	16
F018650	Cap Screw, 1/2-13 x 1-1/2 GR 8 Hex Hd	10
184477	Side Bar, Left	1
184469	Side Bar, Right	1
184480	Bar	4
203264	Bracket Left	1
203265	Bracket Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x1-3/4" GR 8 Hex Hd	4
F024047	Washer	22
202063	Hardened Washer, 1/2"	14
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6
024627	Front Unit Application Drawing	

203794 REAR MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
203794	REAR MOUNTING BRACKET GROUP	1
149966	Cap Screw, 5/8-11 x 2-1/2" GR 8 Hex Hd	4
200396	Brace End	2
200397	Brace End	2
201584	Washer	4
203800	Side Bar, Left	1
203801	Side Bar, Right	1
700666075	Hex Locknut, 3/4"-10	2
F013500	Elastic Stop Nut, 1/2"-13	8
F017188	Hex Elastic Stop Nut, 5/8-11	4
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	8
F020458	Cap Screw, 3/4-10 x 2-1/2" GR 8 Hex Hd	2
F021137	Hardened Washer	4
F023012	Hardened Washer	4

203798 FRONT MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
203798	FRONT MOUNTING BRACKET GROUP	1
184399	Side Bar, Right	1
184398	Side Bar, Left	1
F013500	Elastic Stop Nut, 1/2"	14
F018650	Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd	8
F020460	Cap Screw, 5/8-11 x 2" GR 8 Hex Hd	2
F009425	SAE Washer, 5/8"	2
F017188	Hex Elastic Stop Nut, 5/8"-11	2
184480	Bar	4
203264	Bracket, Left	1
203265	Bracket, Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd	4
F024047	Washer	20
202063	Hardened Washer, 1/2"	8
202067	Washer	2
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6

203825 FRONT MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
203825	FRONT MOUNTING BRACKET GROUP	1
F019742	Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd	8
F023111	Washer	8
058528	Spacer	8
F015922	Elastic Stop Nut, 3/8"-16	8
F013500	Elastic Stop Nut, 1/2"-13	16
F018650	Cap Screw, 1/2-13 x 1-1/2"GR 8 Hex Hd	10
184477	Side Bar, Left	1
184469	Side Bar, Right	1
184480	Bar	4
203264	Bracket, Left	1
203265	Bracket, Right	1
203462	Plate	2
F023674	Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd	4
F024047	Washer	22
202063	Hardened Washer, 1/2"	14
700564200	Cap Screw, 1/2-13 x 2" GR 8 Hex Hd	6

3410723 FRONT MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
3410723	FRONT MOUNTING BRACKET GROUP	1
058528	Washer	8
101816	Spacer, 1/16"	8
101817	Spacer, 1/32"	8
163634	Brace End	2
163636	Brace End	2
188624	Side Bar, Right	1
188625	Side Bar, Left	1
F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	9
F001095	Cap Screw, 1/2-13 x 1-3/4" Hex Hd	4
F001121	Washer	2
F002965	SAE Washer, 1/2	2
F005192	Cap Screw, 5/8-11 x 1-3/4" Hex Hd	2
F013500	Elastic Stop Nut, 1/2"	14
F015922	Elastic Stop Nut, 3/8"-16	8
F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F021924	Hex Flg Nut, 5/8"-11 GR 5	2
F023111	Hardened Washer	8

3410724 REAR MOUNTING BRACKET GROUP

PART NO	DESCRIPTION	QTY
3410724	REAR MOUNTING BRACKET GROUP	1
058528	Washer	8
101816	Spacer, 1/16"	8
101817	Spacer, 1/32"	8
163634	Brace End	2
163636	Brace End	2
3410628	Side Bar, Right	1
3410629	Side Bar, Left	1
700666075	Hex Locknut, 3/4"-10	2
F001090	Cap Screw, 1/2-13 x 1-1/2" Hex Hd	8
F001753	Wrought Washer, 3/4"	2
F002480	Cap Screw, 5/8-11 x 4" GR 5 Hex Hd	4
F013239	Hex Lock Nut, 5/8"-18	4
F013500	Elastic Stop Nut, 1/2"-13	8
F015134	Cap Screw, 3/4-10 x 1-3/4" Hex Hd	2
F015922	Elastic Stop Nut, 3/8"-16	8
F019742	Cap Screw, 3/8-16 x 1-3/4" Hex Hd	8
F023111	Hardened Washer	8

159849 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
159849	WHEEL MODIFICATION GROUP	1
137670	WHEEL, 19-1/2 x 6-3/4" RIM	5
137671	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
133600	Spacer, 7/16" Front Wheel	2
137882	Wheel Stop, Left	1
137881	Wheel Stop, Right	1
159920	Bar	2
164036	Wheel Stud, Front Wheels	16
F016365	Cap Screw, 3/8-24 x 1-1/2" Hex Hd	4
F001025	SAE Lock Washer, 3/8"	4
F015839	Hex Lock Nut, 3/8"-24	4
F001115	Wrought Washer, 3/8"	4
021102	Wheel Modification Application Drawing	

168072 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
168072	WHEEL MODIFICATION GROUP	1
137670	WHEEL, 19-1/2 x 6"	5
137671	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
133600	Spacer, 7/16" Front Wheel	2
164036	Wheel Stud, Front Wheels	16
137881	Wheel Stop, Right	1
137882	Wheel Stop, Left	1
159920	Bar	2
F016365	Cap Screw, 3/8-24 x 1-1/2" Hex Hd	4
F001025	SAE Lock Washer, 3/8"	4
F015839	Hex Lock Nut, 3/8"-24	4
F001115	Wrought Washer, 3/8"	4
021504	Wheel Modification Application Drawing	

169031 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
169031	WHEEL MODIFICATION GROUP	1
133242	WHEEL, 19-1/2 x 6"	5
133243	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire	1
169329	Decal, This Vehicle Is Equipped With...	2
201752	Disk-Lock Nut, M14 x 1.5	32
F025796	Wheel Nut, 60° Cone, Rear Spacer	16
171054	WHEEL SPACER, REAR	2
F026230	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum...	1
171051	Wheel Spacer, Front	2
F025952	Shock Absorber	2
169037	Bushing	4
169036	Tube	2
F002929	SAE Washer, 3/4"	16
044564	Bar	2
116904	Bar	2
021758	Wheel Modification Application Drawing	
021810	Steering Stop Application Drawing	

180718 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
180718	WHEEL MODIFICATION GROUP	1
180780	WHEEL, 19-1/2 x 6"	5
181490	Decal, Ratings Represent...	1
162065	Decal, Wheel Nut Torque 250 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
181491	Stud	20
F025919	Hex Flange Nut	20
022714	Wheel Modification Application Drawing	

184448 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
184448	WHEEL MODIFICATION GROUP	1
3408668	WHEEL, 19-1/2 x 6"	5
3410469	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
186130	Spacer	2
201753	Disk-Lock Nut, 14 mm x 2.0	32
188359	Wheel Stop Assembly	2
F014801	Hose Clamp	3
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	3
F013588	Elastic Stop Nut, 1/4"-20	3
188359	Wheel Stop	2
187092	Bar	1
F019742	Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd	2
F011998	Elastic Stop Nut, 38-16	2
F006471	Cap Screw, 1/4-20 x 1-3/4" GR5 Hex Hd	2
192408	Clamp	2
F001213	Cap Screw, 1/4-20 x 1-1/4" Hex Hd	4
137349	Spring	2
F001106	Wrought Washer, 1/4"	8
023214	Wheel Modification Application Drawing	
023412	Steering Stop Application Drawing	

187299 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
187299	WHEEL MODIFICATION GROUP	1
187191	WHEEL, 19-1/2 x 6"	5
187194	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
201752	Disk-Lock Nut, M14 x 1.5	32
116904	Bar	2
188431	Wheel Spacer	2
188432	Wheel Stud	16
188433	Tube	2
023275	Wheel Modification Application Drawing	
023428	Steering Stop Application Drawing	

188439 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
188439	WHEEL MODIFICATION GROUP	1
3408668	WHEEL, 19-1/2 x 6"	5
3410469	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
186130	Spacer	2
184550	Hex Flange Nut	32
188436	Wheel Stop Assembly	1
188437	Wheel Stop Assembly	1
F014801	Hose Clamp	3
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	3
F013588	Elastic Stop Nut, 1/4"-20	3
187091	Bar	2
187092	Bar	1
F019742	Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd	4
F011998	Elastic Stop Nut, 3/8"-16	4
023414	Wheel Modification Application Drawing	
023413	Steering Stop Application Drawing	

188604 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
188604	WHEEL MODIFICATION GROUP	1
3408669	WHEEL, 19-1/2 x 6"	5
3410467	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
188490	Wheel Spacer	4
188600	Wheel Stop	1
188601	Wheel Stop	1
188432	Wheel Stud	18
188532	Wheel Stud	18
184106	Hex Flange Nut	34
188608	Bar	2
188609	Bar	4
023438	Wheel Modification Application Drawing	

193871 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
193871	WHEEL MODIFICATION GROUP	1
188432	Wheel Stud	16
188490	Wheel Spacer	2
193872	WHEEL SPACER ASSEMBLY	2
F026230	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum	1
200453	Angle	2
200455	Wheel Stop, Left	1
200456	Wheel Stop, Right	1
201752	Disk-Lock Nut, M14 x 1.5	32
3408669	WHEEL, 19-1/2 x 6"	5
3410467	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
F025796	Wheel Nut	16
3409821	Wheel Modification Application Drawing	

203237 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
203237	WHEEL MODIFICATION GROUP	1
201756	Disk Lock Nut, 3/4"-16	32
203181	WHEEL SPACER	4
201255	Wheel Stud	8
203221	Wheel, Accuride, 19-1/2 x 6"	5
203229	Block	2
203239	Decal, Wheel Nut Torque, 300 Lb-Ft	5
F013588	Elastic Stop Nut, 1/4"-20	2
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	2
F001106	Wrought Washer, 1/4"	4
F019582	P-Clamp, 3/8"	2
F019242	P-Clamp, 11/16"	2
024628	Wheel Modification Application Drawing	

203476 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
203476	WHEEL MODIFICATION GROUP	1
137908	Wheel Stop, Left	1
137909	Wheel Stop, Right	1
201756	Disk Lock Nut, 3/4"-16	32
203181	WHEEL SPACER	4
201255	Wheel Stud	8
203221	Wheel, Accuride, 19-1/2 x 6"	5
203239	Decal, Wheel Nut Torque, 300 Lb-Ft	5
3410536	Eye Bolt, 5/16-18 x 4"	2
3410537	Fender Washer, 5/16"	4
F007021	Hex Nut, 5/16"-18 GR 5	4
F014800	P-Clamp	2
F009667	Cap Screw, 1/4-20 x 1-1/2 Hex Hd	2
F001106	Wrought Washer, 1/4"	4
F013588	Elastic Stop Nut, 1/4"-20	2
024633	Wheel Modification Application Drawing	

203688 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
203688	WHEEL MODIFICATION GROUP	1
203229	Block (wheel stop, weld on)	2
203651	WHEEL ASSEMBLY	5
161453	Decal, Warning: When Wheel/Tire...	1
202560	Decal, Ratings Represent...	1
3409270	Decal, Torque Wheel Nuts to OEM...	1
F019242	P-Clamp, 11/16"	2
F019582	P-Clamp, 3/8"	2
F001106	Wrought Washer, 1/4"	4
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	2
F013588	Elastic Stop Nut, 1/4"-20	2

203712 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
203712	WHEEL MODIFICATION GROUP	1
161453	Decal, Warning: When Wheel/Tire...	5
170774	Decal, Wheel Nut Torque 140 Foot Pounds	5
201751	Two Piece Cap Nut, 9/16"-18	32
203229	Block (wheel stop, weld on)	2
203659	WHEEL SPACER ASSEMBLY	4
186228	Wheel Stud	8
203660	Wheel	5
203729	Spacer	32
203732	Wheel Guard	4
F001106	Wrought Washer, 1/4"	4
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	2
F013588	Elastic Stop Nut, 1/4"-20	2
F019242	P-Clamp, 11/16"	2
F019582	P-Clamp, 3/8"	2

203738 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
203738	WHEEL MODIFICATION GROUP	1
161453	Decal, Warning: When Wheel/Tire...	5
170774	Decal, Wheel Nut Torque 140 Foot Pounds	5
201751	Disk-Lock Nut - 9/16	32
203229	Block (wheel stop, weld on)	2
203221	Wheel, Accuride 19-1/2 x 6"	5
203628	WHEEL SPACE ASSEMBLY	4
178170	Wheel Stud	8
203576	Spacer Bushing	2
F001106	Wrought Washer, 1/4"	4
F002355	Cap Screw, 1/4-20 x 3/4" GR 5 Hex Hd	2
F013588	Elastic Stop Nut, 1/4"-20	2
F019242	P-Clamp, 11/16"	2
F019582	P-Clamp, 3/8"	2

204018 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
204018	WHEEL MODIFICATION GROUP	1
137908	Wheel Stop, Left	1
137909	Wheel Stop, Right	1
161453	Decal, Warning: When Wheel/Tire...	5
170774	Decal, Wheel Nut Torque 140 Foot Pounds	5
201751	Two Piece Cap Nut, 9/16"-18	32
203221	Wheel, Accuride 19-1/2 x 6"	5
203628	WHEEL SPACE ASSEMBLY	4
178170	Wheel Stud	8
203576	Spacer Bushing	2
3410536	Eye Bolt, 5/16-18 x 4"	2
3410537	Fender Washer, 5/16"	4
F007021	Hex Nut, 5/16"-18 GR 5	4
F014800	P-Clamp	2
F009667	Cap Screw, 1/4-20 x 1-1/2 Hex Hd	2
F001106	Wrought Washer, 1/4"	4
F013588	Elastic Stop Nut, 1/4"-20	2

3408610 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
3408610	WHEEL MODIFICATION GROUP	1
200453	Angle	2
200455	Wheel Stop, Left	1
200456	Wheel Stop, Right	1
201276	WHEEL SPACER ASSEMBLY	2
201222	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum...	1
201277	WHEEL SPACER ASSEMBLY	2
201222	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum...	1
201751	Two Piece Cap Nut, 9/16"-18	32
203132	Pressure Transmitter Valve	5
203134	Nut	5
203176	Grommet	5
203219	WHEEL ASSEMBLY	5
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
F025796	Wheel Nut, M14 x 1.5	32

3409054 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
3409054	WHEEL MODIFICATION GROUP	1
200453	Angle	2
200455	Wheel Stop, Left	1
200456	Wheel Stop, Right	1
201328	WHEEL ASSEMBLY	5
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
3410767	Decal, Spacer Nut Torque 145 Pound Feet	1
201353	WHEEL SPACER ASSEMBLY	2
201222	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum...	1
201354	WHEEL SPACER ASSEMBLY	2
201222	Wheel Stud	8
162432	Decal, Warning: Studs In This Brake Drum...	1
201751	Two Piece Cap Nut, 9/16"-18	32
203132	Pressure Transmitter Valve	5
203134	Nut	5
203158	Rubber Grommet	5
F025796	Wheel Nut, M14 x 1.5	32

3409780 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
3409780	WHEEL MODIFICATION GROUP	1
188432	Wheel Stud	16
188490	Wheel Spacer	2
193872	WHEEL SPACER ASSEMBLY	2
162432	Decal, Warning: Studs In This Brake Drum...	1
F026230	Wheel Stud	8
200453	Angle	2
200455	Wheel Stop, Left	1
200456	Wheel Stop, Right	1
201752	Disk-Lock Nut, M14 x 1.5	32
203132	Pressure Transmitter Valve	5
203134	Nut	5
203158	Rubber Grommet	5
3408669	WHEEL, 19-1/2 x 6"	5
3410467	Decal, Ratings Represent...	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire...	1
F025796	Wheel Nut, M14 x 1.5	16

3409821 WHEEL MODIFICATION GROUP

PART NO	DESCRIPTION	QTY
3409821	WHEEL MODIFICATION GROUP	1
188432	Wheel Stud	16
188490	Wheel Spacer	2
193872	WHEEL SPACER ASSEMBLY	2
162432	Decal, Warning: Studs In This Brake Drum	1
F026230	Wheel Stud	8
200453	Angle	2
200455	Wheel Stop, Left	1
200456	Wheel Stop, Right	1
201752	Disk-Lock Nut, M14 x 1.5	32
3408669	WHEEL, 19-1/2 x 6"	5
3410467	Decal, Ratings Represent	1
170774	Decal, Wheel Nut Torque 140 Foot Pounds	1
161453	Decal, Warning: When Wheel/Tire	1
F025796	Wheel Nut, M14 x 1.5	16

SECTION 7 - VEHICLE APPLICATIONS
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	2000-2004 CHEV/GMC K15706 4 X 4 TAHOE / YUKON 4 DOOR 6,800 GVWR	2000-2004 CHEV/GMC C25753 4 X 2 EXTENDED CAB PICKUP WITH 6-1/2' BOX 7,200 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	———	187211
Rail Pilot Unit - Front or Rear	———	159323
Mounting Brackets	———	188627
Steering Lock	———	169632
Wheel Modification	———	187299
Application Drawing - Front	———	023247
Application Drawing - Rear	———	023439
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Step Plates - Front	179529	———
Step Plates - Rear	179483	———
Aluminum Step Plates - Front	———	171077
Aluminum Step Plates - Rear	———	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC C25903 4 X 2 REGULAR CAB WITH 8' BOX 7,200 GVWR	2000-2004 CHEV/GMC C25903 4 X 2 REGULAR CAB WITH 8' BOX 8,600 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	187211	187211
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	188627	188627
Steering Lock	169632	169632
Wheel Modification	187299	187299
Application Drawing - Front	023274	023274
Application Drawing - Rear	023249	023249
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC K25753 4 X 4 EXTENDED CAB WITH 6-1/2' BOX 8,600 GVWR	2000-2004 CHEV/GMC K25903 4 X 4 REGULAR AND EXTENDED CAB WITH 8' BOX 8,600 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	188612	188612
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	188603	188603
Steering Lock	169632	169632
Wheel Modification	188604	188604
Application Drawing - Front	023437	023437
Application Drawing - Rear	023439	023439
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC C25953 4 X 2 EXTENDED CAB WITH 8' BOX 8,600 GVWR	2000-2004 CHEV/GMC K25953 4 X 4 EXTENDED CAB WITH 8' BOX 8,600 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	187211	187211
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	188627	188627
Steering Lock	169632	169632
Wheel Modification	187299	187299
Application Drawing - Front	023274	023274
Application Drawing - Rear	023439	023439
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC C25953 4 X 2 REGULAR CAB WITH 8' BOX 8,600 GVWR	2000-2004 CHEV/GMC C30903 4 X 2 CHASSIS CAB WITH SRW 9,000 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	187211	170693
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	188627	163169
Steering Lock	169632	169632
Wheel Modification	187299	168072
Application Drawing - Front	023274	021305
Application Drawing - Rear	023439	021301
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC K30903 4 X 4 CHASSIS CAB WITH SRW 9,200 GVWR	2000-2004 CHEV/GMC K30903 4 X 4 CHASSIS CAB WITH SRW 9,200 GVWR HR0307A1 FRONT HR2000A3 REAR
REQUIRED GROUPS		
HY-RAIL® Application	171038	181688
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	169032	181687
Steering Lock	169632	169632
Wheel Modification	169031	169031
Application Drawing - Front	021837	021837
Application Drawing - Rear	021301	022910
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC C30943 4 X 2 CREW CAB WITH SRW 9,000 GVWR	2000-2004 CHEV/GMC C30903 4 X 2 6 MAN CREW AND CHASSIS CAB 9,000 / 9,200 / 10,000 GVWR HR0307A1 FRONT 0813 REAR
REQUIRED GROUPS		
HY-RAIL® Application	170696	174345
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	163169	174348
Steering Lock	169632	169632
Wheel Modification	159849	159849
Application Drawing - Front	021305	021347
Application Drawing - Rear	021301	022221
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 CHEV/GMC C30903 4 X 2 6 MAN CREW AND CHASSIS CAB 9,000 / 9,200 / 10,000 GVWR HR0307A1 FRONT HR2000A3 REAR	2005 CHEV/GMC 4 X 4 REGULAR CAB WITH SRW 9,200 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	175218	202503
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	174348	202504
Steering Lock	169632	158687
Wheel Modification	159849	———
Wheel Modification - Silverstone	———	193871
Wheel Modification - GKN	———	3409821
Application Drawing - Front	021305	023772
Application Drawing - Rear	021418	024550
Drill Drawing - Front & Rear	———	193837
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	———
Front Only With Sight Rods	166253	166253
Rear Only	———	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

2007 CHEVROLET
4 X 4
SUBURBAN
8,600 GVWR

REQUIRED GROUPS

HY-RAIL® Application	3410722
Rail Pilot Unit - Front or Rear	159323
Mounting Brackets - Front	3410723
Mounting Brackets - Rear	3410724
Steering Lock - Standard	169632
Steering Lock - Velcro	201711
Wheel Modification - Steel GKN	3409780
Wheel Modification - Steel Accuride	3409054
Wheel Modification - Aluminum Accuride	3408610
Drill Drawing - Front	179126
Drill Drawing - Rear	3410725

GUIDE WHEEL OPTIONS

Steel Tread	138113
Rubber Tread	171768

BUMPER GROUPS

Front and Rear With Sight Rods	166251
Front Only With Sight Rods	166253
Rear Only	166252

ACCESSORY GROUP OPTIONS

*	Rail Sweeps	162321
*	Derail Skids	137682
	Aluminum Step Plates - Front	171077
	Aluminum Step Plates - Rear	186109
	Wheel Weighing Jack	073527

* Recommended Safety Option

	2000-2004 FORD EXPEDITION 4 X 4 7,200 GVWR	2000-2004 FORD F150 4 X 2 REGULAR CAB STYLESIDE 6,000 / 6,600 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	180719	181761
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	180717	181717
Steering Lock	181548	181548
Wheel Modification	180718	180718
Application Drawing - Front	022637	022966
Application Drawing - Rear	022657	022967
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F250 HD 4 X 2 REGULAR, SUPER & CREW CAB PICKUP 8,800 GVWR	2000-2004 FORD F250 HD 4 X 4 REGULAR, SUPER & CREW CAB PICKUP 8,800 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	184432	184458
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	184433	184459
Steering Lock	181548	181548
Wheel Modification	184448	188439
Application Drawing - Front	023037	023046
Application Drawing - Rear	023038	023038
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A3 REAR
REQUIRED GROUPS		
HY-RAIL® Application	184432	186148
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	184433	186149
Steering Lock	181548	181548
Wheel Modification	184448	184448
Application Drawing - Front	023037	023037
Application Drawing - Rear	023038	023062
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000B1 REAR	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT 0813 REAR
REQUIRED GROUPS		
HY-RAIL® Application	186144	186146
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	186145	186147
Steering Lock	181548	181548
Wheel Modification	184448	184448
Application Drawing - Front	023037	023037
Application Drawing - Rear	023053	023051
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	———
Front Only With Sight Rods	166253	166253
Rear Only	———	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	———
Wheel Weighing Jack	073527	073527

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* Recommended Safety Option

	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A3 REAR
REQUIRED GROUPS		
HY-RAIL® Application	184458	184523
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	184459	184522
Steering Lock	181548	181548
Wheel Modification	188439	188439
Application Drawing - Front	023046	023046
Application Drawing - Rear	023047	023062
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000B1 REAR	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CAB PICKUP WITH SRW 9,900 GVWR HR0307A1 FRONT 0813 REAR
REQUIRED GROUPS		
HY-RAIL® Application	184524	184525
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	184493	184492
Steering Lock	181548	181548
Wheel Modification	188439	188439
Application Drawing - Front	023046	023046
Application Drawing - Rear	023053	023051
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	———
Front Only With Sight Rods	166253	166253
Rear Only	———	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	———
Wheel Weighing Jack	073527	073527

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* Recommended Safety Option

	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000B1 REAR
REQUIRED GROUPS		
HY-RAIL® Application	186273	186153
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	186268	186150
Steering Lock	181548	181548
Wheel Modification	184448	184448
Application Drawing - Front	023037	023037
Application Drawing - Rear	023206	023077
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT 0813 REAR	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A2 REAR
REQUIRED GROUPS		
HY-RAIL® Application	186152	186151
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	184095	184095
Steering Lock	181548	181548
Wheel Modification	184448	184448
Application Drawing - Front	023037	023037
Application Drawing - Rear	023097	023095
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	———
Front Only With Sight Rods	166253	166253
Rear Only	166252	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 2 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A3 REAR	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	184103	186273
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	184095	186268
Steering Lock	181548	181548
Wheel Modification	184448	184448
Application Drawing - Front	023037	023037
Application Drawing - Rear	023094	023206
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	166251
Front Only With Sight Rods	166253	166253
Rear Only	———	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000B1 REAR	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT 0813 REAR
REQUIRED GROUPS		
HY-RAIL® Application	184089	184102
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	184085	184096
Steering Lock	181548	181548
Wheel Modification	188439	188439
Application Drawing - Front	023046	023046
Application Drawing - Rear	023077	023097
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	———
Front Only With Sight Rods	166253	166253
Rear Only	———	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	———
Wheel Weighing Jack	073527	073527

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* Recommended Safety Option

	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A2 REAR	2000-2004 FORD F350 4 X 4 REGULAR, SUPER & CREW CHASSIS CAB WITH SRW 9,900 GVWR HR0307A1 FRONT HR2000A3 REAR
REQUIRED GROUPS		
HY-RAIL® Application	184104	186154
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	184098	184098
Steering Lock	181548	181548
Wheel Modification	188439	188439
Application Drawing - Front	023046	023046
Application Drawing - Rear	023095	023094
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	———	———
Front Only With Sight Rods	166253	166253
Rear Only	———	———
ACCESSORY GROUP OPTIONS		
* Rail Sweeps - Front	162321	162321
* Derail Skids - Front	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	———	———
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F250 4 X 2 CREW CAB PICKUP 9,200 GVWR	2005 FORD F250 4 X 2 CREW CAB PICKUP 9,200 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	203475	204019
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	203474	203474
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification (with 3/4" stud)	203476	———
Wheel Modification (with 9/16" stud)	———	204018
Application Drawing - Front	024631	024631
Application Drawing - Rear	023047	023047
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F250 4 X 4 CREW CAB PICKUP WITH SRW 9,600 GVWR	2005 FORD F250 4 X 4 CREW CAB PICKUP WITH SRW 9,600 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	203478	204121
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	203464	203464
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification	203237	203738
Application Drawing - Front	024627	024627
Application Drawing - Rear	023047	023047
Drill Drawing - Front	184425	184425
Drill Drawing - Rear	184426	184426
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F350 4 X 2 CHASSIS CAB WITH SRW 10,000 GVWR	2005 FORD F350 4 X 2 CHASSIS CAB WITH SRW 10,000 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	203799	204099
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets - Front	203798	203798
Mounting Brackets - Rear	203794	203794
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification (with 3/4" stud)	203476	———
Wheel Modification (with 9/16" stud)	———	204018
Drill Drawing - Front	184425	184425
Drill Drawing - Rear	173148	173148
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

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* Recommended Safety Option

	2005 FORD F350 4 X 4 CHASSIS CAB WITH SRW 10,400 GVWR	2005 FORD F350 4 X 4 CHASSIS CAB WITH SRW 10,400 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	203829	204100
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets - Front	203825	203825
Mounting Brackets - Rear	203794	203794
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification (with 3/4" stud)	203476	———
Wheel Modification (with 9/16" stud)	———	203738
Drill Drawing - Front	184425	184425
Drill Drawing - Rear	173148	173148
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Aluminum Step Plates - Front	171077	171077
Aluminum Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F350 4 X 4 CREW CAB PICKUP WITH SRW 11,200 GVWR HR0307A1 FRONT HR1500B2 REAR	2005 FORD F350 4 X 4 CREW CAB PICKUP 11,200 GVWR HR0307A1 FRONT HR1500B2 REAR
REQUIRED GROUPS		
HY-RAIL® Application	204127	203509
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	203510	203510
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification	203738	203237
Application Drawing - Front	024627	024627
Application Drawing - Rear	023957	023957
Drill Drawing - Front	184425	184425
GUIDE WHEEL OPTIONS (Front Only)		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front Only With Sight Rods	166253	166253
ACCESSORY GROUP OPTIONS (Front Only)		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Step Plates	171077	171077
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F350 4 X 4 CREW CAB PICKUP WITH SRW 11,200 GVWR HR0307A1 FRONT HR2000B3-1 REAR	2005 FORD F350 4 X 4 CREW CAB PICKUP 11,200 GVWR HR0307A1 FRONT HR2000B3-1 REAR
REQUIRED GROUPS		
HY-RAIL® Application	204126	203644
Rail Pilot Unit - Front	159323	159323
Mounting Brackets	203646	203646
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification	203738	203237
Application Drawing - Front	024627	024627
Application Drawing - Rear	024694	024694
Drill Drawing - Front	184425	184425
GUIDE WHEEL OPTIONS (Front Only)		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front Only With Sight Rods	166253	166253
ACCESSORY GROUP OPTIONS (Front Only)		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Step Plates	171077	171077
Wheel Weighing Jack	073527	073527

* Recommended Safety Option

	2005 FORD F350 4 X 4 CHASSIS CAB 11,200 GVWR	2006 FORD F350 4 X 4 CREW CAB PICKUP 11,200 GVWR
REQUIRED GROUPS		
HY-RAIL® Application	203465	204120
Rail Pilot Unit - Front or Rear	159323	159323
Mounting Brackets	203464	203464
Steering Lock - Standard	181548	181548
Steering Lock - Velcro	201711	201711
Wheel Modification - Steel GKN	———	203688
Wheel Modification - Steel Accuride	203237	203738
Wheel Modification - Aluminum Accuride	———	203712
Application Drawing - Front	024627	024627
Application Drawing - Rear	023047	023047
Drill Drawing - Front	184425	184425
Drill Drawing - Rear	184426	184426
GUIDE WHEEL OPTIONS		
Steel Tread	138113	138113
Rubber Tread	171768	171768
BUMPER GROUPS		
Front and Rear With Sight Rods	166251	166251
Front Only With Sight Rods	166253	166253
Rear Only	166252	166252
ACCESSORY GROUP OPTIONS		
* Rail Sweeps	162321	162321
* Derail Skids	137682	137682
Step Plates - Front	171077	171077
Step Plates - Rear	186109	186109
Wheel Weighing Jack	073527	073527

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* Recommended Safety Option

APPENDIX A - CONVERSION TABLES
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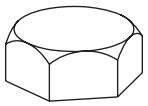
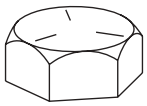
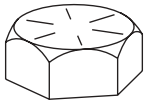
Appendix A

FIGURE A-1
STANDARD BOLT TORQUE REQUIREMENTS TABLE
STANDARD TYPE FASTENERS

The torque values listed below are for standard-type fasteners only. The torque values listed are based on wet and (lubricated) dry conditions. The torque values for 1/4 and 5/16 inch size fasteners are listed in lb-in and N-m torque equivalents. The torque values for all other size fasteners are listed lb-ft and N-m torque equivalents. Use lower grade torque values if bolt and nut have different SAE grades. Manufacturer's SAE grade markings may vary.

STANDARD MARKINGS AND TORQUE SPECIFICATIONS

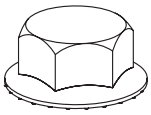
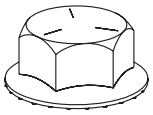
SAE Grade	1 or 2				5				8			
Fastener Standard SAE Grade Markings												
Fastener Body Size Inch-Thread	**Torque**				**Torque**				**Torque**			
	Wet		**Dry**		**Wet**		**Dry**		**Wet**		**Dry**	
	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m	lb-in	N-m
1/4 - 20	49	5.5	65	7.3	75	8.5	100	11.3	107	12.0	142	16.0
1/4 - 28	56	6.5	74	8.3	86	9.7	114	12.8	122	13.8	162	18.3
5/16 - 18	103	11.6	137	15.5	157	17.7	208	23.5	220	24.8	293	33.1
5/16 - 24	113	12.7	150	16.9	173	19.5	230	25.9	244	27.5	325	36.7
Fastener Body Size Inch-Thread	**Torque**				**Torque**				**Torque**			
	Wet		**Dry**		**Wet**		**Dry**		**Wet**		**Dry**	
	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
3/8 - 16	15	20	20	27	23	31	31	42	32	43	43	58
3/8 - 24	17	23	23	31	26	35	35	47	37	50	49	66
7/16 - 14	24	32	32	43	37	50	49	66	52	70	69	93
7/16 - 20	27	36	36	49	42	57	56	76	58	78	77	104
1/2 - 13	39	53	52	70	57	77	76	103	80	108	106	144
1/2 - 20	41	55	55	74	64	87	85	115	90	122	120	163
9/16 - 12	53	72	71	96	82	111	109	148	115	156	153	207
9/16 - 18	59	80	78	106	91	123	121	164	129	175	172	233
5/8 - 11	73	99	97	131	113	155	150	203	160	217	213	289
5/8 - 18	83	112	110	149	128	173	170	230	180	244	239	324
3/4 - 10	129	175	172	233	200	271	266	361	282	382	375	508
3/4 - 16	144	195	192	260	223	302	297	403	315	427	419	568
7/8 - 9	124	168	165	224	323	438	430	583	454	615	604	819
7/8 - 14	138	187	184	249	355	481	472	640	501	679	666	903
1 - 8	188	255	250	339	483	655	642	870	681	923	906	1228
1 - 14	210	285	279	378	541	733	720	976	764	1036	1016	1377
1-1/8 - 7	266	361	354	480	596	808	793	1075	966	1310	1285	1742
1-1/8 - 12	297	403	395	535	668	906	888	1204	1083	1468	1440	1952
1-1/4 - 7	375	508	499	676	841	1140	1119	1517	1363	1848	1813	2458
1-1/4 - 12	415	563	552	748	930	1261	1237	1677	1509	2046	2007	2721
1-3/8 - 6	492	667	654	887	1102	1494	1466	1988	1787	2423	2377	3223
1-3/8 - 12	560	759	745	1010	1255	1701	1670	2264	2034	2758	2705	3667
1-1/2 - 6	653	885	868	1177	1463	1983	1946	2638	2371	3215	3153	4275
1-1/2 - 12	734	995	976	1323	1645	2230	2188	2966	2668	3617	3548	4810

Appendix A

FIGURE A-2
STANDARD BOLT TORQUE REQUIREMENTS TABLE
SERRATED TYPE FLANGE FASTENERS

The torque values listed below are for serrated-type flange fasteners only. The torque values listed are based on wet (lubricated) and dry conditions. The torque values for all other size fasteners are listed in lb-ft and N-m torque equivalents. Use lower grade torque values if bolt and nut have different SAE grades. Manufacturer's SAE grade markings may vary.

STANDARD MARKINGS AND TORQUE SPECIFICATIONS

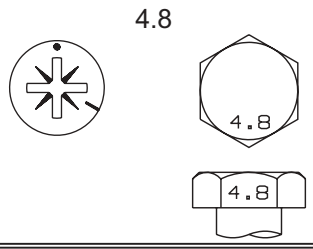
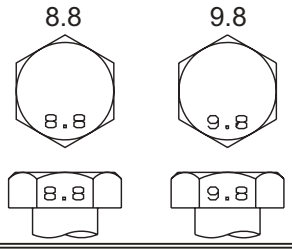
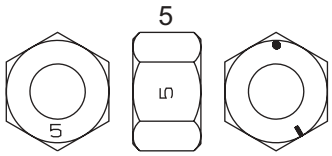
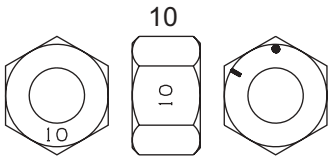
SAE Grade	**1 or 2**				5			
Fastener Standard SAE Grade Markings								
Fastener Body Size Inch-Thread	**Torque**				**Torque**			
	Wet		**Dry**		**Wet**		**Dry**	
	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
1/4 - 20	8	10.8	11	14.9	11	14.9	15	20.3
1/4 - 28	9	12.2	12	16.3	12	16.3	16	21.7
5/16 - 18	13	17.6	17	23.0	20	27.1	27	36.6
5/16 - 24	13	17.6	17	23.0	32	43.3	43	58.3
3/8 - 16	23	31	31	42	40	54	53	72
3/8 - 24	25	34	33	45	43	58	57	77
7/16 - 14	38	51	51	69	55	74	73	99
7/16 - 20	40	54	53	72	60	81	80	108
1/2 - 13	60	81	80	108	95	129	127	172
1/2 - 20	65	88	87	118	100	135	133	180
9/16 - 12	78	106	104	141	140	190	187	253
9/16 - 18	85	115	113	153	150	203	200	271
5/8 - 11	125	169	167	226	190	258	253	343
5/8 - 18	135	183	180	244	220	298	293	397
3/4 - 10	225	305	300	407	350	474	467	633
3/4 - 16	250	339	333	451	400	542	533	723
7/8 - 9	350	474	467	633	550	746	733	994
7/8 - 14	375	508	500	678	600	813	800	1085
1 - 8	480	651	640	868	750	1017	1000	1356
1 - 14	500	678	666	903	800	1085	1066	1445

Appendix A

FIGURE A-3
BOLT TORQUE REQUIREMENTS TABLE
METRIC TYPE FASTENERS

Do not use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically. Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original. Make sure fastener's threads are clean and that thread engagement is properly started. This will help prevent them from failing when tightening.

*Lubricated means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. Dry means plain or zinc plated without any lubrication.

Property Class and Head Markings		
Property Class and Head Markings		

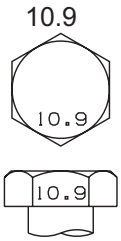
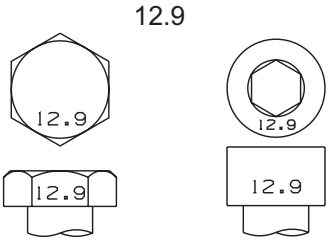
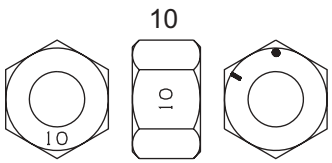
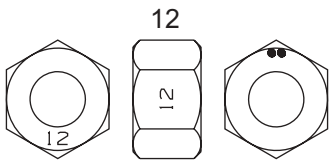
Size	Class 4.8				Class 8.8 or 9.8			
	* Lubricated		* Dry		* Lubricated		* Dry	
	N - m	lb - ft	N - m	lb - ft	N - m	lb - ft	N - m	lb - ft
M 6	4.8	3.5	6	4.5	9	6.5	11	8.5
M 8	12	8.5	15	11	22	16	28	20
M10	23	17	29	21	43	32	55	40
M12	40	29	50	37	75	55	95	70
M14	63	47	80	60	120	88	150	110
M16	100	73	125	92	190	140	240	175
M18	135	100	175	125	260	195	330	250
M20	190	140	240	180	375	275	475	350
M22	260	190	330	250	510	375	650	475
M24	330	250	425	310	650	475	825	600
M27	490	360	625	450	950	700	1200	875
M30	675	490	850	625	1300	950	1650	1200
M33	900	675	1150	850	1750	1300	2200	1650
M36	1150	850	1450	1075	2250	1650	2850	2100

Appendix A

FIGURE A-4
BOLT TORQUE REQUIREMENTS TABLE
METRIC TYPE FASTENERS

Do not use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically. Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original. Make sure fastener's threads are clean and that thread engagement is properly started. This will help prevent them from failing when tightening.

*Lubricated means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. Dry means plain or zinc plated without any lubrication.

Property Class and Head Markings								
Property Class and Head Markings								
Size	Class 10.9				Class 12.9			
	* Lubricated		* Dry		* Lubricated		* Dry	
	N - m	lb - ft	N - m	lb - ft	N - m	lb - ft	N - m	lb - ft
M 6	13	9.5	17	12	15	11.5	19	14.5
M 8	32	24	40	30	37	28	47	35
M10	63	47	80	60	75	55	95	70
M12	110	80	140	105	130	95	165	120
M14	175	130	225	165	205	150	260	190
M16	275	200	350	255	320	240	400	300
M18	375	275	475	350	440	325	560	410
M20	530	400	675	500	625	460	800	580
M22	725	540	925	675	850	625	1075	800
M24	925	675	1150	850	1075	800	1350	1000
M27	1350	1000	1700	1250	1600	1150	2000	1500
M30	1850	1350	2300	1700	2150	1600	2700	2000
M33	2500	1850	3150	2350	2900	2150	3700	2750
M36	3200	2350	4050	3000	3750	2750	4750	3500

Appendix A

FIGURE A-5
INCH TO MILLIMETER CONVERSION TABLE
1 INCH = 25.4 MILLIMETERS

FRACTIONS	DECIMALS	MILLIMETERS	FRACTIONS	DECIMALS	MILLIMETERS
1/64	.016	0.397	33/64	.516	13.097
1/32	.031	0.794	17/32	.531	13.494
3/64	.047	1.191	35/64	.547	13.891
1/16	.063	1.588	9/16	.563	14.288
5/64	.078	1.984	37/64	.578	14.684
3/32	.094	2.381	19/32	.594	15.081
7/64	.109	2.778	39/64	.609	15.478
1/8	.125	3.175	5/8	.625	15.875
9/64	.141	3.572	41/64	.641	16.272
5/32	.156	3.969	21/32	.656	16.669
11/64	.172	4.366	43/64	.672	17.066
3/16	.188	4.763	11/16	.688	17.463
13/64	.203	5.159	45/64	.703	17.859
7/32	.219	5.556	23/32	.719	18.256
15/64	.234	5.953	47/64	.734	18.653
1/4	.250	6.350	3/4	.750	19.050
17/64	.266	6.747	49/64	.766	19.447
9/32	.281	7.144	25/32	.781	19.844
19/64	.297	7.541	51/64	.797	20.241
5/16	.313	7.938	13/16	.813	20.638
21/64	.328	8.334	53/64	.828	21.034
11/32	.344	8.731	27/32	.844	21.431
23/64	.359	9.128	55/64	.859	21.828
3/8	.375	9.525	7/8	.875	22.225
25/64	.391	9.922	57/64	.891	22.622
13/32	.406	10.319	29/32	.906	23.019
27/64	.422	10.716	59/64	.922	23.416
7/16	.438	11.113	15/16	.938	23.813
29/64	.453	11.509	61/64	.953	24.209
15/32	.469	11.906	31/32	.969	24.606
31/64	.484	12.303	63/64	.984	25.003
1/2	.500	12.700	1	1.000	25.400

A

FIGURE A-6
FEET TO METERS CONVERSION TABLE
1 FOOT = 0.3048 METER

FEET	METERS	FEET	METERS	FEET	METERS	FEET	METERS	FEET	METERS
100	30.480	10	3.048	1	0.305	0.1	0.030	0.01	0.003
200	60.960	20	6.096	2	0.610	0.2	0.061	0.02	0.006
300	91.440	30	9.144	3	0.914	0.3	0.091	0.03	0.009
400	121.920	40	12.192	4	1.219	0.4	0.122	0.04	0.012
500	152.400	50	15.240	5	1.524	0.5	0.152	0.05	0.015
600	182.880	60	18.288	6	1.829	0.6	0.183	0.06	0.018
700	213.360	70	21.336	7	2.134	0.7	0.213	0.07	0.021
800	243.840	80	24.384	8	2.438	0.8	0.244	0.08	0.024
900	274.320	90	27.432	9	2.743	0.9	0.274	0.09	0.027
1,000	304.800	100	30.480	10	3.048	1.0	0.305	0.10	0.030

Appendix A

FIGURE A-7
POUNDS TO KILOGRAMS CONVERSION TABLE
1 POUND = 0.4536 KILOGRAM

LB	KG	LB	KG	LB	KG	LB	KG	LB	KG
1,000	453.59	100	45.36	10	4.54	1	0.45	0.1	0.05
2,000	907.18	200	90.72	20	9.07	2	0.91	0.2	0.09
3,000	1,360.78	300	136.08	30	13.61	3	1.36	0.3	0.14
4,000	1,814.37	400	181.44	40	18.14	4	1.81	0.4	0.18
5,000	2,267.96	500	226.80	50	22.68	5	2.27	0.5	0.23
6,000	2,721.55	600	272.16	60	27.22	6	2.72	0.6	0.27
7,000	3,175.15	700	317.51	70	31.75	7	3.18	0.7	0.32
8,000	3,628.74	800	362.87	80	36.29	8	3.63	0.8	0.36
9,000	4,082.33	900	408.23	90	40.82	9	4.08	0.9	0.41
10,000	4,535.92	1,000	453.59	100	45.36	10	4.54	1.0	0.45

FIGURE A-8
POUNDS PER SQUARE INCH TO BAR CONVERSION TABLE
1 PSI = 0.06895 BAR

PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
1,000	68.95	100	6.90	10	0.69	1	0.07
2,000	137.90	200	13.79	20	1.38	2	0.14
3,000	206.84	300	20.68	30	2.07	3	0.21
4,000	275.80	400	27.58	40	2.76	4	0.28
5,000	344.70	500	34.47	50	3.45	5	0.35
6,000	413.64	600	41.36	60	4.14	6	0.41
7,000	482.58	700	48.26	70	4.83	7	0.48
8,000	551.52	800	55.15	80	5.52	8	0.55
9,000	620.46	900	62.05	90	6.21	9	0.62
10,000	689.48	1,000	68.95	100	6.90	10	0.69

FIGURE A-9
POUNDS PER SQUARE INCH TO KILOPASCALS CONVERSION TABLE
1 PSI = 6.895 kPa

PSI	kPa	PSI	kPa
10	68.95	1	6.90
20	137.90	2	13.79
30	206.84	3	20.68
40	275.80	4	27.58
50	344.70	5	34.47
60	413.64	6	41.36
70	482.58	7	48.26
80	551.52	8	55.15
90	620.46	9	62.05
100	689.48	10	68.95

Appendix A

FIGURE A-10
FAHRENHEIT TO CELSIUS (Centigrade) CONVERSION TABLE
(DEGREES F - 32°) ÷ 1.8 = DEGREES C

deg F	deg C	deg F	deg C	deg F	deg C	deg F	deg C
1	-17.2	51	10.6	101	38.3	151	66.1
2	-16.7	52	11.1	102	38.9	152	66.7
3	-16.1	53	11.7	103	39.4	153	67.2
4	-15.6	54	12.2	104	40.0	154	67.8
5	-15.0	55	12.8	105	40.6	155	68.3
6	-14.4	56	13.3	106	41.1	156	68.9
7	-13.9	57	13.9	107	41.7	157	69.4
8	-13.3	58	14.4	108	42.2	158	70.0
9	-12.8	59	15.0	109	42.8	159	70.6
10	-12.2	60	15.6	110	43.3	160	71.1
11	-11.7	61	16.1	111	43.9	161	71.7
12	-11.1	62	16.7	112	44.4	162	72.2
13	-10.6	63	17.2	113	45.0	163	72.8
14	-10.0	64	17.8	114	45.6	164	73.3
15	-9.4	65	18.3	115	46.1	165	73.9
16	-8.9	66	18.9	116	46.7	166	74.4
17	-8.3	67	19.4	117	47.2	167	75.0
18	-7.8	68	20.0	118	47.8	168	75.6
19	-7.2	69	20.6	119	48.3	169	76.1
20	-6.7	70	21.1	120	48.9	170	76.7
21	-6.1	71	21.7	121	49.4	171	77.2
22	-5.6	72	22.2	122	50.0	172	77.8
23	-5.0	73	22.8	123	50.6	173	78.3
24	-4.4	74	23.3	124	51.1	174	78.9
25	-3.9	75	23.9	125	51.7	175	79.4
26	-3.3	76	24.4	126	52.2	176	80.0
27	-2.8	77	25.0	127	52.8	177	80.6
28	-2.2	78	25.6	128	53.3	178	81.1
29	-1.7	79	26.1	129	53.9	179	81.7
30	-1.1	80	26.7	130	54.4	180	82.2
31	-0.6	81	27.2	131	55.0	181	82.8
32	0.0	82	27.8	132	55.6	182	83.3
33	0.6	83	28.3	133	56.1	183	83.9
34	1.1	84	28.9	134	56.7	184	84.4
35	1.7	85	29.4	135	57.2	185	85.0
36	2.2	86	30.0	136	57.8	186	85.6
37	2.7	87	30.6	137	58.3	187	86.1
38	3.3	88	31.1	138	58.9	188	86.7
39	3.9	89	31.7	139	59.4	189	87.2
40	4.4	90	32.2	140	60.0	190	87.8
41	5.0	91	32.8	141	60.6	191	88.3
42	5.6	92	33.3	142	61.1	192	88.9
43	6.1	93	33.9	143	61.7	193	89.4
44	6.7	94	34.4	144	62.2	194	90.0
45	7.2	95	35.0	145	62.8	195	90.6
46	7.8	96	35.6	146	63.3	196	91.1
47	8.3	97	36.1	147	63.9	197	91.7
48	8.9	98	36.7	148	64.4	198	92.2
49	9.4	99	37.2	149	65.0	199	92.8
50	10.0	100	37.8	150	65.5	200	93.3

Appendix A

FIGURE A-11
MILES PER HOUR TO KILOMETERS
PER HOUR CONVERSION TABLE
1 MPH = 1.609 KM/H

MPH	KM/H	MPH	KM/H	MPH	KM/H
10	16.09	1	1.61	0.1	0.16
20	32.19	2	3.22	0.2	0.32
30	48.28	3	4.83	.03	0.48
40	64.37	4	6.44	0.4	0.64
50	80.47	5	8.05	0.5	0.80
60	96.56	6	9.66	0.6	0.97
70	112.65	7	11.27	0.7	1.13
80	128.75	8	12.87	0.8	1.29
90	144.84	9	14.48	0.9	1.45
100	160.93	10	16.09	1.0	1.61

FIGURE A-12
U.S. GALLONS TO LITERS CONVERSION TABLE
1 U.S. GALLON = 3.785 LITERS

GAL	LITER	GAL	LITER	GAL	LITER	GAL	LITER
100	378.54	10	37.85	1	3.79	0.1	0.38
200	757.08	20	75.71	2	7.57	0.2	0.76
300	1,135.62	30	113.56	3	11.36	0.3	1.14
400	1,514.16	40	151.42	4	15.14	0.4	1.51
500	1,892.71	50	189.27	5	18.93	0.5	1.89
600	2,271.25	60	227.12	6	22.71	0.6	2.27
700	2,649.79	70	264.98	7	26.50	0.7	2.65
800	3,028.33	80	302.83	8	30.28	0.8	3.03
900	3,406.87	90	340.69	9	34.07	0.9	3.41
1,000	3,785.41	100	378.54	10	37.85	1.0	3.79

NOTES

Limited Warranty

HARSCO TRACK TECHNOLOGIES warrants products of its manufacture to be free of defects in material and workmanship, under normal use and service for a period of six (6) months from date of delivery to the original user. The obligation of Harsco Track Technologies under this warranty is limited to repairing or replacing at its factories, or other location designated by it, any part or parts thereof which are returned within 30 days of the date when failure occurs or defect is noted, with transportation charges prepaid, and which upon examination appears to the satisfaction of Harsco Track Technologies to have been defective. Such free repair or replacement does not include transportation charges, or the cost of installing the new part or any other expense incident thereto. Harsco Track Technologies will not be liable for other loss, damage, or expense directly or indirectly arising from the use of its product, nor will Harsco Track Technologies be liable for special, incidental, or consequential damages.

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