# HR0307 SERIES B
## ElectroLift™
### UNIVERSAL HY-RAIL®
### GUIDE WHEEL EQUIPMENT
### ELECTRICALLY OPERATED


# OPERATOR'S SERVICE AND PARTS MANUAL

ISSUED 5 - 2000

BULLETIN 1214A


■ **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 rail pilot 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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**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.

## HAZARD SERIOUSNESS

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


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


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


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

## Safety Information


- **APPLY THE VEHICLE PARKING BRAKE AND STOP THE ENGINE WHEN PERFORMING MAINTENANCE, MAKING ADJUSTMENTS, WORKING UNDER THE 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 THE 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 THE GUIDE WHEEL EQUIPMENT.**

- **IF A DERAILMENT SHOULD OCCUR WHILE THE VEHICLE IS OPERATING IN ELECTRIFIED 3RD-RAIL TERRITORY, THE VEHICLE OR GUIDE WHEEL EQUIPMENT MIGHT BE IN ELECTRICAL CONTACT WITH THE ELECTRIFIED RAIL. DO NOT ATTEMPT TO EXIT FROM THE VEHICLE UNTIL THE ELECTRICAL POWER TO THE 3RD-RAIL HAS BEEN TURNED OFF.**

- **DO NOT EXCEED 45 MPH WHEN OPERATING 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 VEHICLE.**

- **CHECK AND CORRECT GUIDE WHEEL EQUIPMENT ALIGNMENT PROMPTLY IF MISALIGNMENT IS INDICATED.**

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## 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 RAIL PILOT UNIT GUIDE WHEEL 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 THE REAR RAIL PILOT 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. RAIL PILOT UNIT RATED LOAD CAPACITY (575 lbs (261 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 THE VEHICLE.**

- **THIS GUIDE WHEEL EQUIPMENT IS DESIGNED WITH YOUR SAFETY IN MIND. NEVER DISCONNECT AND/OR ATTEMPT TO OVERRIDE SAFETY FEATURES.**

**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.*

## Description



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

The FAIRMONT™ HR0307 Series B ElectroLift™ HY-RAIL® guide wheel equipment can be applied to various standard utility vehicles, cab chassis and pickup trucks. The vehicles G.V.W.R. (gross vehicle weight rating) and/or G.A.W.R. (gross axle weight rating) must comply with the specified limits listed in the Harsco Track Technologies Vehicle Specifications manual.

The HY-RAIL® guide wheel equipment has front and rear rail pilot units which are lowered and raised using the vehicle's electrical system. The electrical system powers an electric motor on the rail pilot unit which is coupled to a planetary gear drive and bell crank configuration. The bell crank design provides positive over-center mechanical locking of the guide wheels in both the "highway" and "rail" positions.

The rail pilot units are mounted to the vehicle's frame. All of the weight of the rail pilot units is carried on the vehicle frame, above the springs, when the rail pilot 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 systems for propelling and braking on the track.

## Vehicle Orientation

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

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## Serial Numbers

When this bulletin is received, complete the following record from the serial number tags on both the front and rear rail pilot units. Always provide these factory serial numbers when calling or writing about the units. The serial number tags are located on the right side of the channel assembly on both units.

FIGURE 1-2
FRONT RAIL PILOT UNIT SERIAL NUMBER TAG

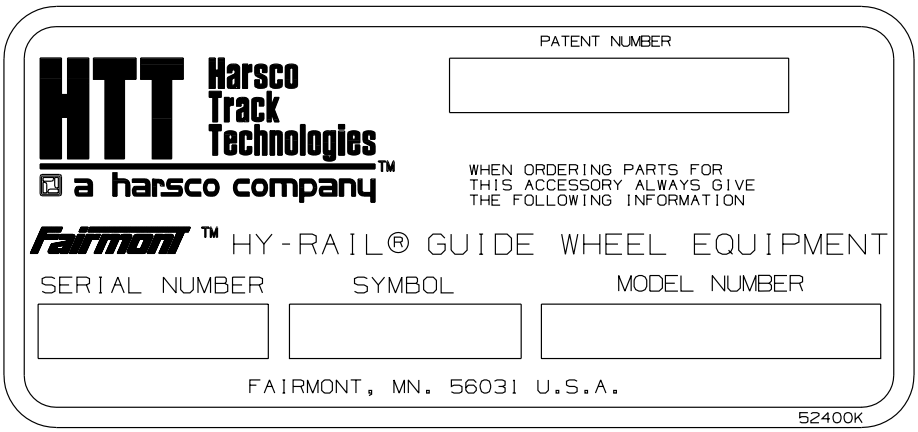
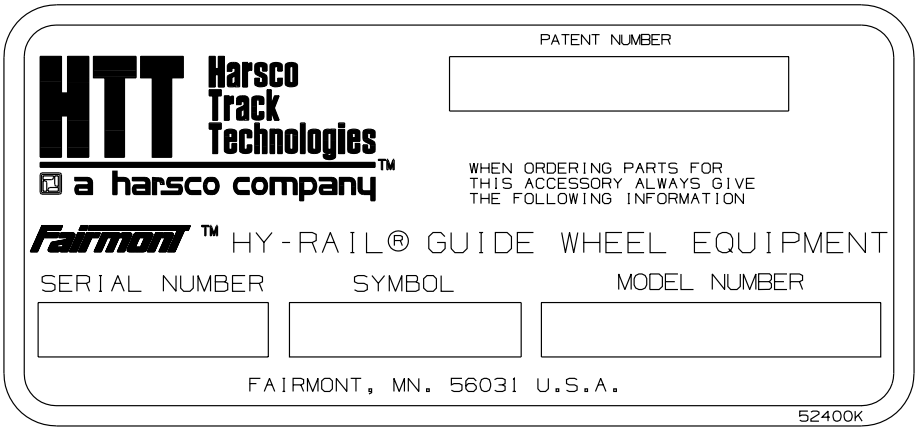



FIGURE 1-3
REAR RAIL PILOT UNIT SERIAL NUMBER TAG



## Specifications

### VEHICLE

See the Harsco Track Technologies HY-RAIL® Vehicle Specifications Manual for vehicle specifications. For information regarding special applications not listed in the Harsco Track Technologies Vehicle Specifications Manual, contact Harsco Track Technologies, Harsco Corporation, Fairmont, Minnesota.

### RAIL PILOT UNIT

| | | |
|---|---|---|
| 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 | 267 lbs | (121 kg) |
| - Rear Unit | 267 lbs | (121 kg) |
| Recommended Load Per Guide Wheel - All Tread Types (with vehicle at curb weight) | 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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## Towing

## 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.

## Preparing for Operation

### VEHICLE

Be sure 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 tire manufacturer's recommended maximum pressure, printed on the sidewalls of the tires or 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.

## Preparing for Operation

### GUIDE WHEEL EQUIPMENT

Be sure the guide wheel equipment is 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.

## Misalignment Indicators


■ **BEFORE OPERATING A VEHICLE WITH NEWLY INSTALLED GUIDE WHEEL EQUIPMENT ON TRACK, VERIFY THAT 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 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 Alignment Procedure.

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

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

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

## 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 AND LOCKED IN THE RAIL POSITION.**
  - **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.**


- **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.**

## Placing Vehicle on Track

### LOWERING GUIDE WHEELS



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

2. At a road crossing, drive the vehicle about 25 feet (7.6 m) past the track. Back the vehicle onto the track so that the vehicle rear 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. See Figure 2-1. With the rear guide wheels centered over the rails, move and hold switch (1) towards the "rail" position. As the guide wheels lower, ensure that the flanges of the guide wheels are on the gauge side (inside) of the rails.

6. Continue to hold switch (1) in the "rail" position to fully lower and lock the guide wheels in the "rail" position. As the guide wheels lower, the bell crank (2) rotates "over-center" and stops when it comes to rest on the cross channel frame.

7. To ensure that the guide wheels are locked in the "rail" position, the bell crank (2) must be "over-center" and resting on the cross channel frame as shown in Figure 2-2.

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

## Placing Vehicle on Track

FIGURE 2-1
PLACING VEHICLE ON TRACK



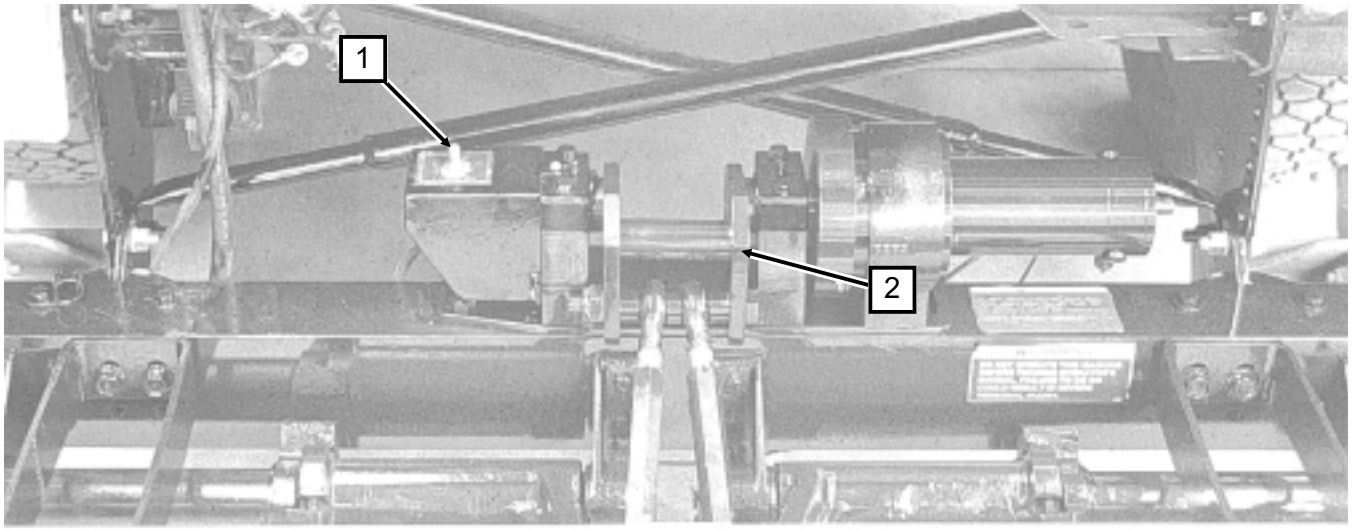


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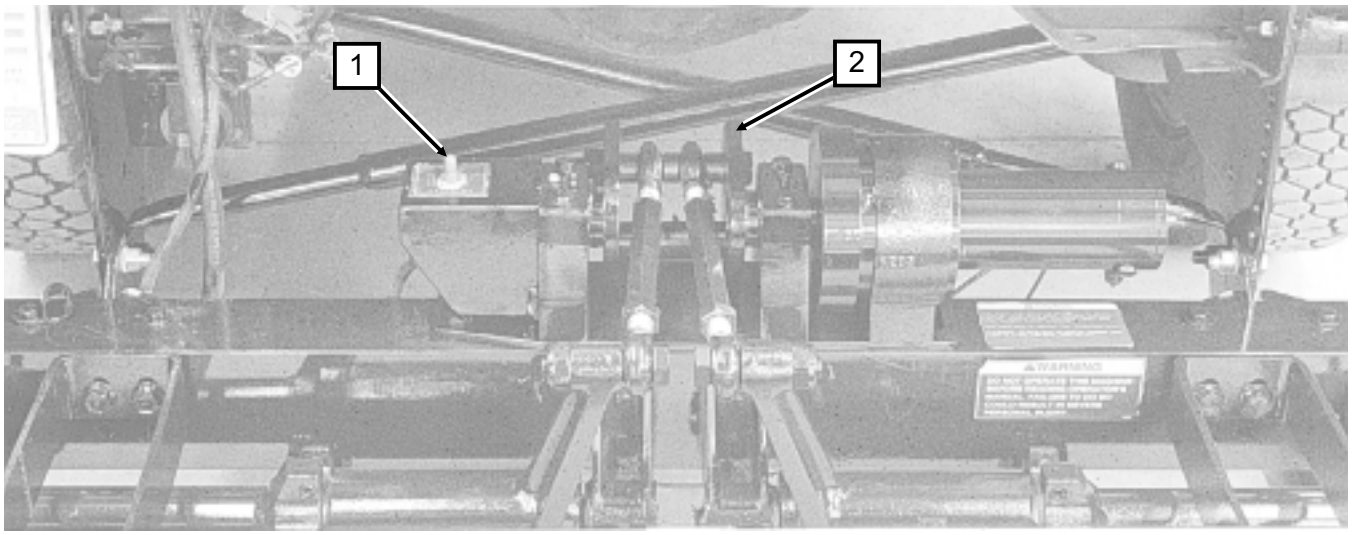
FIGURE 2-2
PLACING VEHICLE ON TRACK

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## Placing Vehicle on Track

### STEERING LOCK



9. See Figures 2-3 and 2-4. 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 2-3
STEERING LOCK IN UNLOCKED POSITION

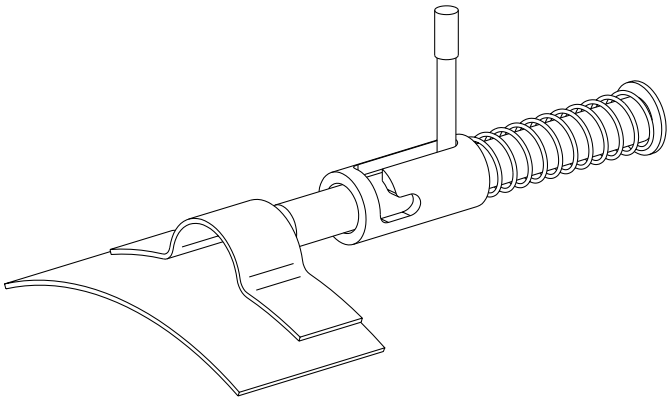

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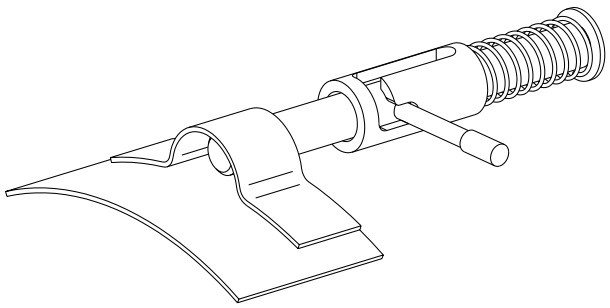
FIGURE 2-4
STEERING LOCK IN LOCKED POSITION



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## Placing Vehicle on Track

### RAIL SWEEPS

10. The rail pilot 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.

**Guide Wheel Load on Track**


- **IMPROPER LOADING OF HY-RAIL® EQUIPPED VEHICLE CAN CAUSE DERAILMENT OF VEHICLE.**
- **APPLY VEHICLE PARKING BRAKE AND STOP VEHICLE ENGINE BEFORE CHECKING GUIDE WHEEL LOAD.**
- **NEVER OPERATE THE VEHICLE ON THE TRACK 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 LOAD ON ANY GUIDE WHEEL IS NOT WITHIN THESE RANGES.**
- **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.**
- **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 JACK TO FAIL.**

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

1. See Figure 2-5. 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 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.

## Guide Wheel Load on Track

3. See Figure 2-6. 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. With the vehicle at curb weight, the recommended guide wheel load is 350 - 400 lbs (159 - 182 kg) @ the specified guide wheel height. With the vehicle loaded, the maximum guide wheel load is 700 Lbs (318 kg).

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 Adjustment Section - Guide Wheel Equipment Alignment Procedure.

FIGURE 2-5
GUIDE WHEEL OVERLOAD SET SCREWS

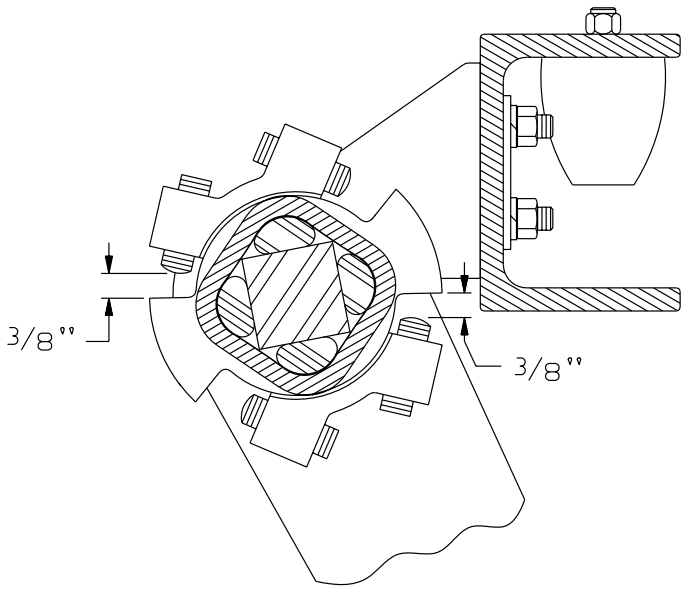


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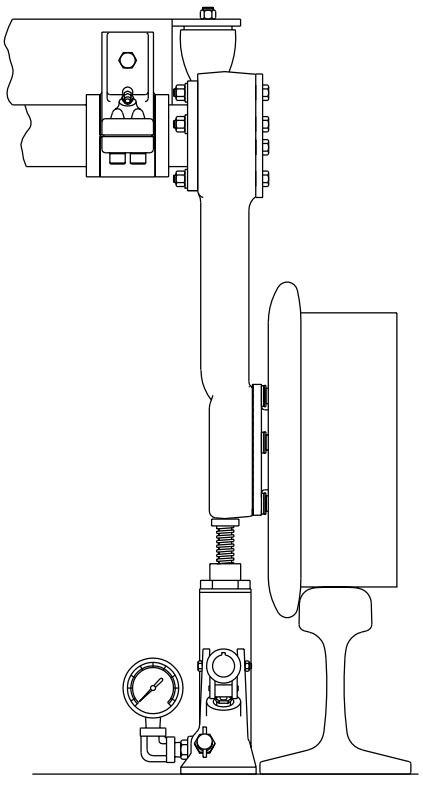
FIGURE 2-6
WHEEL WEIGHING JACK



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## Propelling on Track


- **IMPROPER LOADING OF HY-RAIL® EQUIPPED VEHICLE CAN CAUSE DERAILMENT OF 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.**
  - **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 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 VEHICLE AT UNSAFE SPEEDS COULD RESULT IN DERAILMENT OF THE VEHICLE.**
  - **STEERING LOCK MUST BE ENGAGED AT ALL TIMES WHEN OPERATING VEHICLE ON THE 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 B HY-RAIL® Guide Wheel Equipment use the vehicle propulsion system for propelling on track. Do not accelerate suddenly. Traction is reduced on the track, and spinning the vehicle tires could damage them.

## 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 B 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.

## Removing Vehicle from Track


- **PLACE VEHICLE AUTOMATIC TRANSMISSION IN "PARK" OR 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.**
- **BEFORE PROPELLING VEHICLE OFF TRACK, MAKE SURE:**
  - **ALL FOUR GUIDE WHEELS ARE RAISED, LOCKED IN HIGHWAY POSITION, AND SECURED WITH LOCK PIN.**
  - **STEERING WHEEL LOCK IS DISENGAGED.**

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


- **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.**

### RAISING GUIDE WHEELS

1. Ensure that highway vehicles are not approaching grade crossing while removing vehicle from track. To ensure safety, flag the crossing to 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. See Figures 2-3 and 2-4. Disengage the steering lock. Steering locks may vary from vehicle to vehicle but will operate similarly.

5. Raise the front guide wheels first. Then the rear guide wheels.

6. See Figures 2-1 and 2-2. Move and hold switch (1) towards the HIGHWAY position to raise the guide wheels.

7. Continue to hold switch (1) in the HIGHWAY position to fully raise and lock the guide wheels in the "highway" position. As the guide wheels raise, the bell crank (2) rotates "over-center" and stops when it comes to rest on the cross channel frame.

## Removing Vehicle from Track

### RAISING GUIDE WHEELS

8. To ensure that the guide wheels are locked in the "highway" position, the bell crank (2) must be "over-center" and resting on the cross channel frame as shown in Figure 2-1.

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

## Using The Hand Crank

1. A hand crank is provided to manually raise and / or lower the guide wheels should a problem occur with the electrical supply to the unit's motor. Check circuit breaker(s), wiring connections, amperage to the electrical motor, etc. If the electrical circuit and the unit's motor is operable but will not lower or raise the guide wheels, the rail pilot unit is probably adjusted incorrectly or overloaded. Do not use the hand crank to lower the guide wheels on a rail pilot unit that is adjusted incorrectly or overloaded.



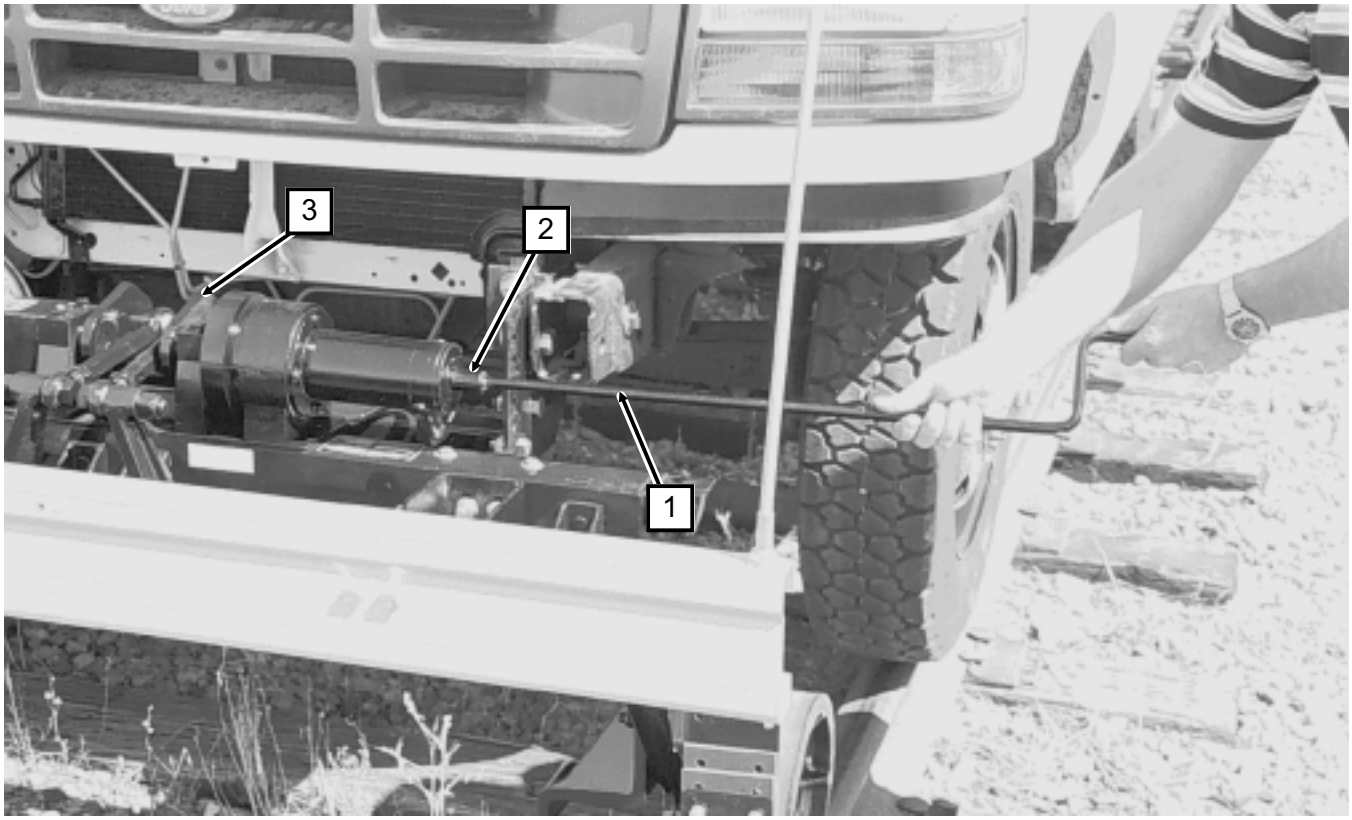
2. See Figure 2-7. Place the socket of the hand crank (1) over the shaft (2) on the unit's motor.

3. To lower the guide wheels, rotate the hand crank clockwise. Continue to turn the hand crank until the bell crank is "over-center" and resting on the cross channel frame. The bell crank (3) must be "over-center" and resting on the cross channel frame, as shown in Figure 2-2, to ensure that the guide wheels are locked in the "rail" position. Stop cranking once the bell crank is resting on the cross channel frame. Damage to the motor or planetary drive could occur if cranking is continued.

4. To raise the guide wheels, rotate the hand crank counter-clockwise. Continue to turn the hand crank until the bell crank is "over-center" and resting on the cross channel frame. The bell crank (3) must be "over-center" and resting on the cross channel frame, as shown in Figure 2-1, to ensure that the guide wheels are locked in the "highway" position. Stop cranking once the bell crank is resting on the cross channel frame. Damage to the motor or planetary drive could occur if cranking is continued.

## Using The Hand Crank

FIGURE 2-7
HAND CRANK OPERATION

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## Highway Operation

CAUTION

■ **THIS MULTIPURPOSE VEHICLE HAS SPECIAL DESIGN AND EQUIPMENT FEATURES FOR OFF-ROAD USE. IT HANDLES DIFFERENTLY FROM AN ORDINARY PASSENGER CAR IN DRIVING CONDITIONS WHICH 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.**

## Towing Trailer / Equipment With Vehicle On Track




- **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.**

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

- **VEHICLE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP 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.**

- **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.**

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

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

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

## Towing Trailer / Equipment With Vehicle On Track


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

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

- **TOWING EQUIPMENT (HITCHES, TOW BARS, ETC.) MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN 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 RAIL, SPINNING VEHICLE TIRES COULD DAMAGE THEM.**

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

## Towing Trailer / Equipment With 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. 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. Front wheels are set straight ahead and the steering wheel lock is engaged on the steering column.

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 rail pilot 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.

## Towing Trailer / Equipment With Vehicle On Road


- **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.**

- **VEHICLE USED FOR TOWING MUST HAVE AN ADEQUATE BRAKE SYSTEM TO SAFELY DECELERATE AND STOP 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.**

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

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

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

## Towing Trailer / Equipment With Vehicle On Road




- **THIS MULTIPURPOSE VEHICLE HAS SPECIAL DESIGN AND EQUIPMENT FEATURES FOR OFF-ROAD USE. IT HANDLES DIFFERENTLY FROM AN ORDINARY PASSENGER CAR IN DRIVING CONDITIONS WHICH 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.**

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

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

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

## Towing Trailer / Equipment With 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. Front and rear rail pilot units raised and locked in the highway position.
   b. Steering wheel lock is disengaged on the steering column.

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 rail pilot 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.

## Towing Disabled Vehicle On Track




- **TOWING VEHICLE / MACHINE MUST WEIGH AS MUCH OR MORE THAN DISABLED VEHICLE BEING TOWED.**

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

- **TOWING DISABLED VEHICLE LENGTHENS STOPPING DISTANCES. ALLOW ADEQUATE DISTANCE FOR STOPPING. ANTICIPATE STOPS SO YOU CAN BRAKE GRADUALLY.**

- **TOW 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 TOWING VEHICLE / MACHINE WHEELS.**

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

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

## Towing Disabled Vehicle On Track


- **TOW BAR MUST BE ATTACHED TO DISABLED VEHICLE FRAME. DO NOT MOUNT OR ATTACH TOW BAR TO DISABLED VEHICLE TRACK PILOT UNITS.**
- **TOW BAR MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN WEIGHT OF 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 TOWING VEHICLE / MACHINE WHEELS COULD DAMAGE THEM.**
- **TOW DISABLED VEHICLE TO NEAREST ROAD CROSSING AND REMOVE FROM TRACK.**

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

## Towing 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. Front and rear rail pilot units lowered and locked in the rail position.
   b. All front and rear guide wheel flanges engaged on the inside of the rails.
   c. Front wheels are set straight ahead and the steering wheel lock is engaged on the steering column.

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 disabled vehicle rail pilot 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.

## Towing Disabled Vehicle On Road


- **TOW DISABLED VEHICLE PER VEHICLE MANUFACTURER'S TOWING SPECIFICATIONS LISTED IN YOUR VEHICLE'S OPERATORS MANUAL.**

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

- **TOW 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 DISABLED VEHICLE HAS:**
  - **FRONT AND REAR RAIL PILOT UNITS RAISED AND LOCKED IN HIGHWAY POSITION.**
  - **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 DISABLED VEHICLE FRAME. DO NOT MOUNT OR ATTACH TOWING EQUIPMENT TO DISABLED VEHICLE RAIL PILOT UNITS.**

- **TOWING EQUIPMENT (TOW TRUCK, TOW BARS, ETC.) MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN WEIGHT OF 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.**

## Towing 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's:
   a. Front and rear rail pilot units are raised and locked in the highway position.
   b. Vehicle steering wheel lock is disengaged on the steering column.

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 disabled vehicle rail pilot units.

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

8. State laws may require the towing vehicle and 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

## Guide Wheel Equipment Alignment Procedure



## Adjustments

## Guide Wheel Equipment Alignment Procedure


- **BEFORE PERFORMING ANY ADJUSTMENTS TO THE RAIL PILOT UNITS OR VEHICLE, ALWAYS PLACE THE AUTOMATIC TRANSMISSION IN "PARK" OR THE MANUAL TRANSMISSION IN "NEUTRAL". APPLY THE 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.

### 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. 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.

3. 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.

4. 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.

5. Verify that the vehicle that the guide wheel equipment is being mounted on is equipped correctly (springs, tires, wheels, etc.). See the Harsco Track Technologies HY-RAIL® Vehicle Specifications Manual.

6. 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.

## Guide Wheel Equipment Alignment Procedure

### VEHICLE CHECK

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

8. After mounting the guide wheel equipment, have the front wheels of the vehicle checked for caster, camber, and toe-in. If necessary, adjust to vehicle manufacturer's recommendations.



### PLACING VEHICLE ON TRACK

9. Place the vehicle on straight, level, tangent track or on an alignment rack constructed for guide wheel equipment alignment. Place the automatic transmission in "Park" or manual transmission in "Neutral". Apply the parking brake. Stop the engine. Lower and lock the guide wheels in the "rail" position. See Operation Section -Placing Vehicle On Track.

   If track or an alignment rack is not available, use 6 x 6 inch lumber, on a level floor, to simulate track. Space the lumber so it measures 56-1/2 inches between the inside edges. Using 6 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.

10. Set the vehicle wheels straight ahead. Secure the steering wheel using the steering lock.

## Guide Wheel Equipment Alignment Procedure

**RAIL PILOT UNIT TRACK GAUGE** - See Figures 3-1 and 3-7

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

**Adjustment**



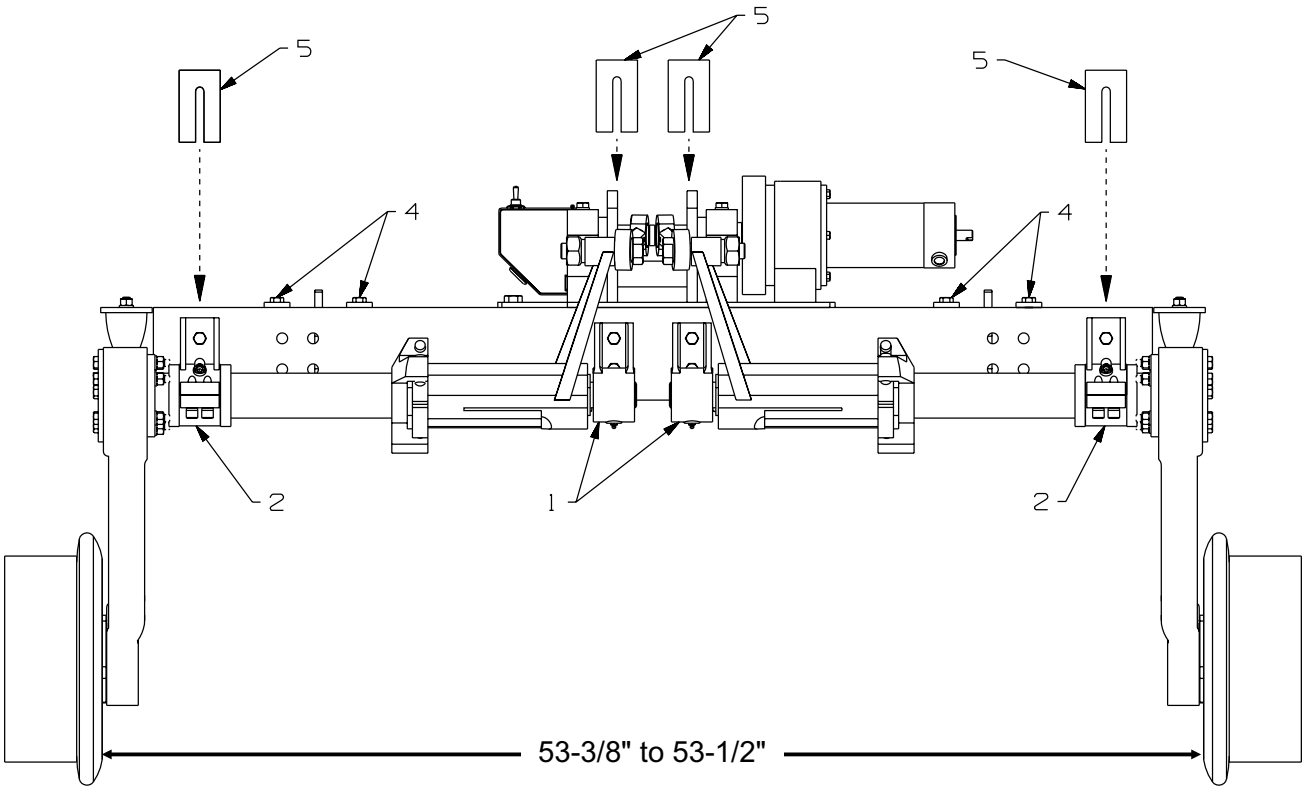
a. Raise the front and the rear guide wheels from the "rail" position. Let the guide wheels rest on the rail.

b. Loosen the inner (1) and outer (2) pivot bearing cap screws. Shift one or both of the guide wheel assemblies. Re-tighten the cap screws.

c. Lower and lock the guide wheels in the "rail" position. Re-check the rail pilot unit track gauge.

d. Repeat the procedure until the rail pilot unit track gauge is correct.

FIGURE 3-1
RAIL PILOT UNIT

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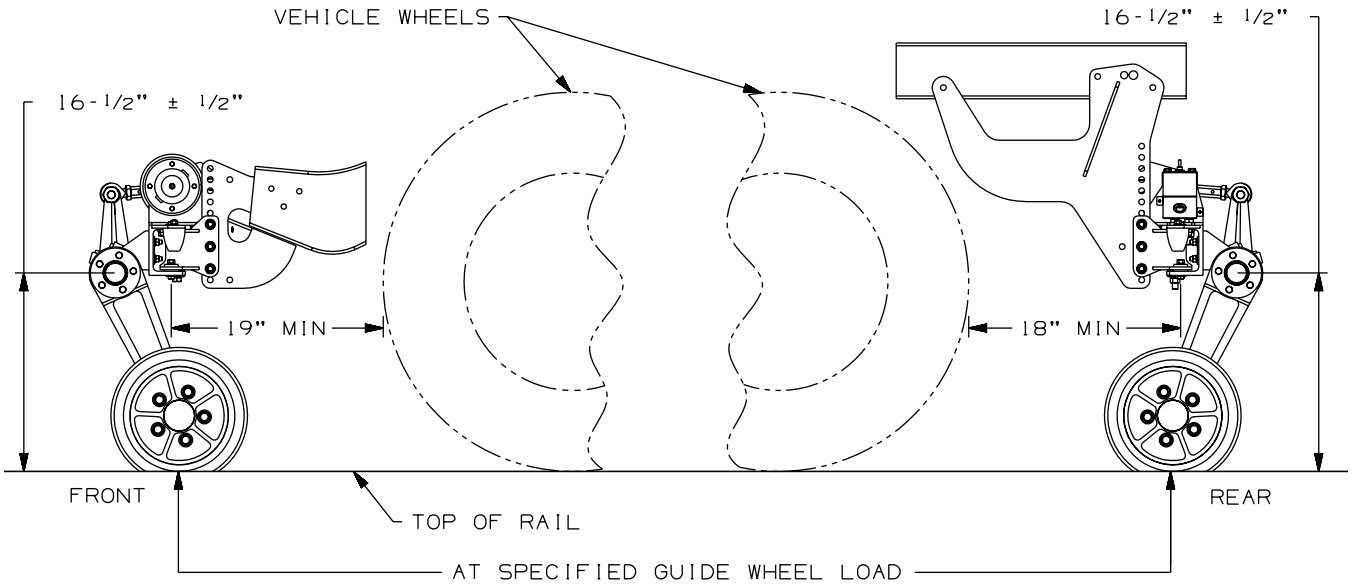
## Guide Wheel Equipment Alignment Procedure

FIGURE 3-2
RAIL PILOT UNIT WHEEL ARM VERTICAL HEIGHT

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**GUIDE WHEEL ARM VERTICAL HEIGHT** - See Figures 3-2, 3-3 and 3-4

12. Figure 3-2 illustrates a side view of a typical HR0307 Series A HY-RAIL® Guide Wheel Equipment application. Rail pilot unit mounting will vary depending on the vehicle application.

13. 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" (406 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.

## Guide Wheel Equipment Alignment Procedure

**GUIDE WHEEL ARM VERTICAL HEIGHT** - See Figures 3-2, 3-3 and 3-4

### Adjustment

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

b. Re-adjust 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.



c. Figures 3-3 and 3-4 illustrate typical mounting bracket configurations used on the front and rear rail pilot units. Mounting brackets may vary depending on the vehicle application.

d. 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 rail pilot unit.

| | |
|---|---|
| 1 inch (25.4 mm) increments: | Remove cap screws (1) and relocate in a different set of holes in the mounting plate (2). Reinstall and re-tighten the cap screws. |
| 1/2 inch (12.7 mm) increments: | Remove cap screws (3) and mounting bracket (4). Reverse the mounting bracket (4) (top to bottom) and reinstall. Be sure to reinstall the 1/32" and 1/16" shims (5) on the top or bottom of the mounting bracket (4). The mounting bracket (4) must fit snug inside of the cross channel (6). The shims are used as required. Reinstall and re-tighten the cap screws. |

e. 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 can not be attained at the same time within the specified height dimensions and load limits, the rubber cords may need to be replaced.*

## Guide Wheel Equipment Alignment Procedure

### GUIDE WHEEL ARM VERTICAL HEIGHT

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

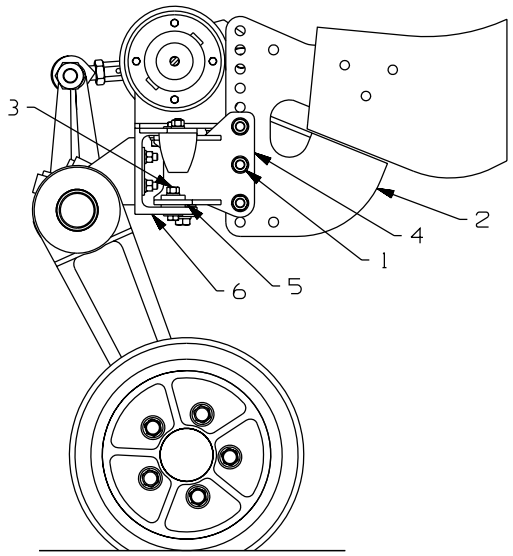


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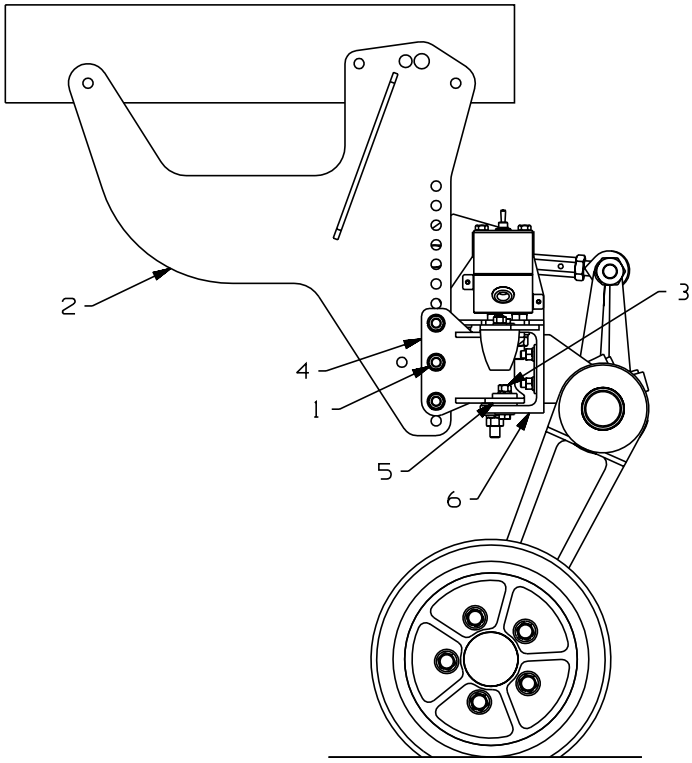
FIGURE 3-4
GUIDE WHEEL ARM VERTICAL ADJUSTMENT
REAR RAIL PILOT UNIT

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### 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.**

## Guide Wheel Equipment Alignment Procedure

**GUIDE WHEEL LOAD** - See Figures 3-5 and 3-6

14. 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. 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 pulled out.*

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

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

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.

**Adjustment**

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

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

c. Loosen the jam nut (1).

| | |
|---|---|
| To Increase The Load: | Turn the adjusting link (2) clockwise, shortening the link length. |
| To Decrease The Load: | Turn the adjusting link (2) counter-clockwise, lengthening the link length. |

## Guide Wheel Equipment Alignment Procedure

**GUIDE WHEEL LOAD** - continued

d. 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.

e. If the recommended guide wheel load cannot be achieved by turning the adjusting link, 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.*



15. Dimension "A" of the adjusting link (2) should not exceed 9-3/8 inches (238 mm) or be less than 8-5/8 inches (219 mm).

If dimension "A" is greater than 9-3/8 inches (238 mm), it may be necessary to replace the rubber cords in the torque coupling.

If dimension "A" is less than 8-5/8 inches (219 mm), there may be foreign material lodged in the torque coupling assembly. Disassemble and clean.

*Note: Adjusting link (2) must not be extended so that the threaded ends of either eye bolts (3) are screwed out past the indicator holes (4).*

FIGURE 3-5
WHEEL WEIGHING JACK

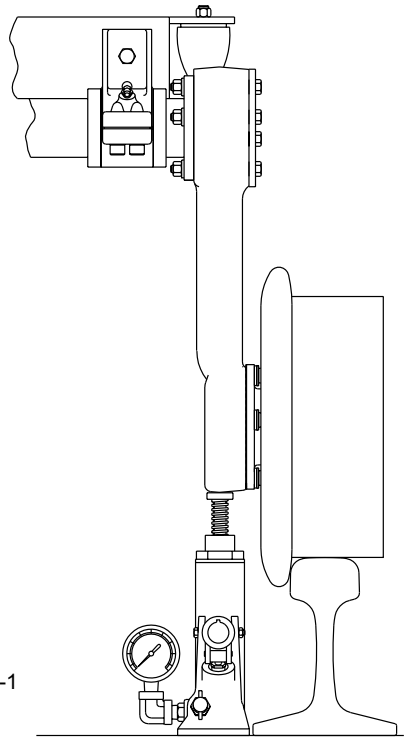

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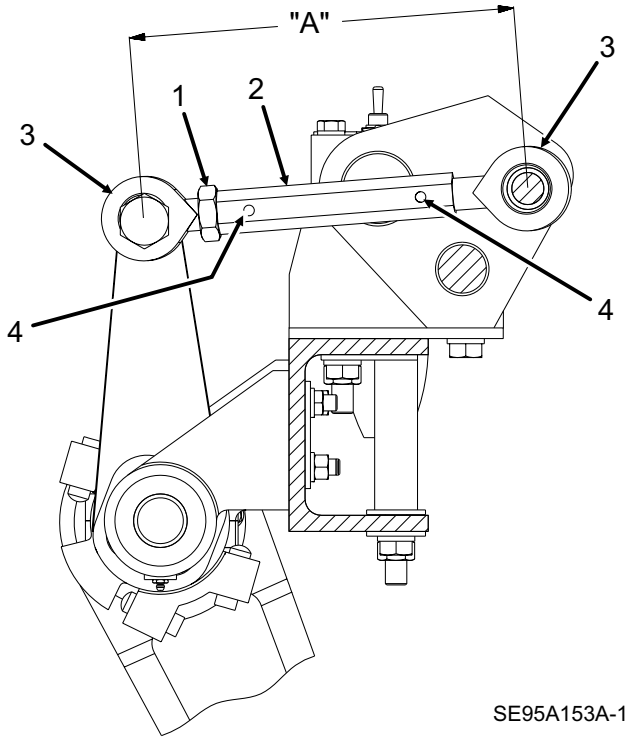
FIGURE 3-6
LOAD ADJUSTING LINK

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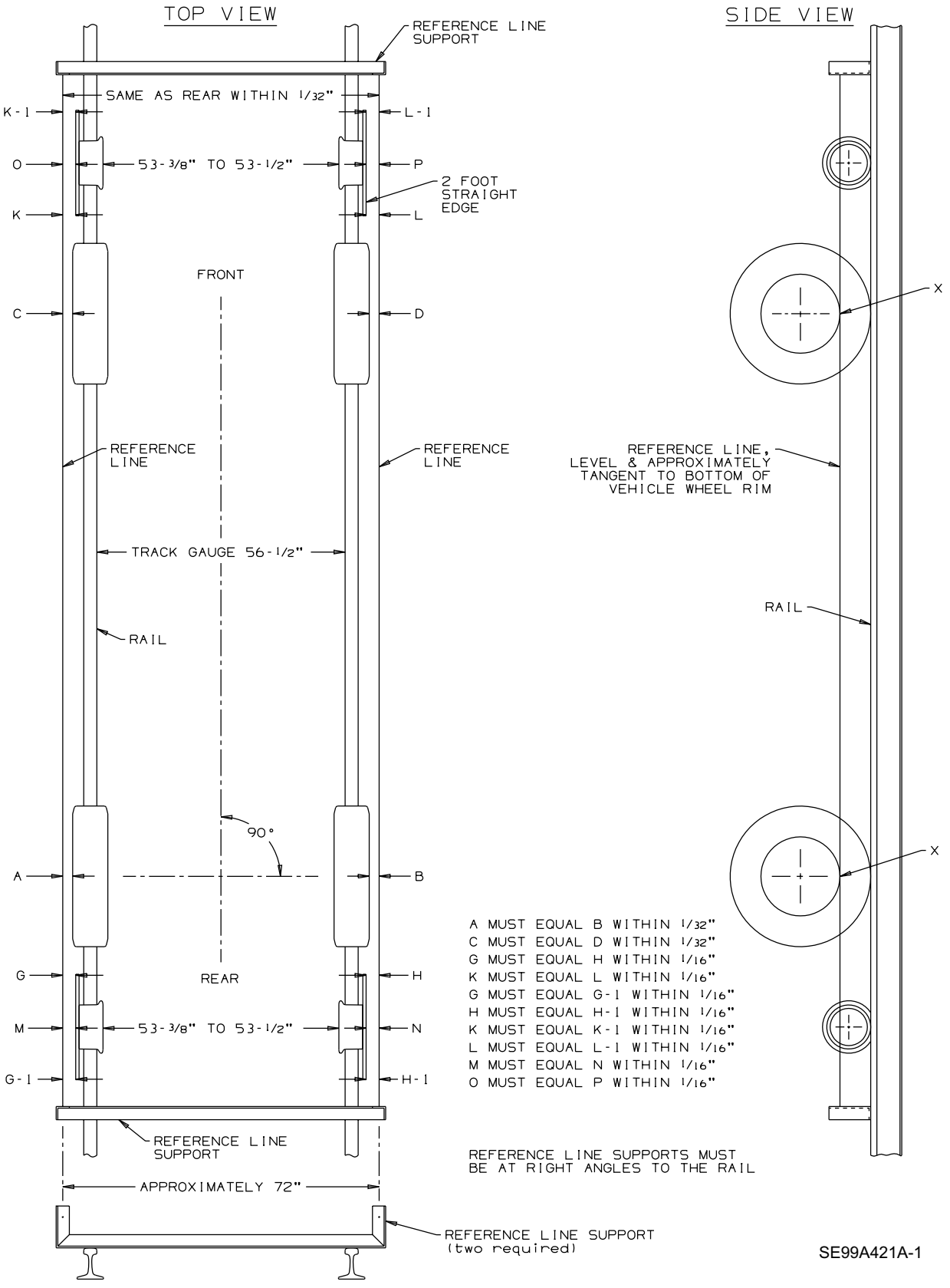
## Guide Wheel Equipment Alignment Procedure

FIGURE 3-7
GUIDE WHEEL EQUIPMENT ALIGNMENT



## Guide Wheel Equipment Alignment Procedure

**STRING LINING SET-UP** - See Figure 3-7

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.



16. Establish parallel reference lines on each side of vehicle as shown in Figure 3-7.

17. 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.

18. 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.

19. 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 edge 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. Rotate the vehicle wheels 180 degrees and recheck the measurements. If the measurements change, set the reference lines at the average of the two measurements.

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

## Guide Wheel Equipment Alignment Procedure

**RAIL PILOT UNIT ALIGNMENT** - See Figures 3-7 and 3-8

21. 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.

**Adjustment**



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

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

c. Lock all guide wheels in the "rail" position. Recheck the rail pilot unit alignment.

d. Repeat the procedure until the rail pilot unit alignment is correct.

22. 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).*

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

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

## Guide Wheel Equipment Alignment Procedure

**RAIL PILOT UNIT ALIGNMENT** - continued

### Adjustment

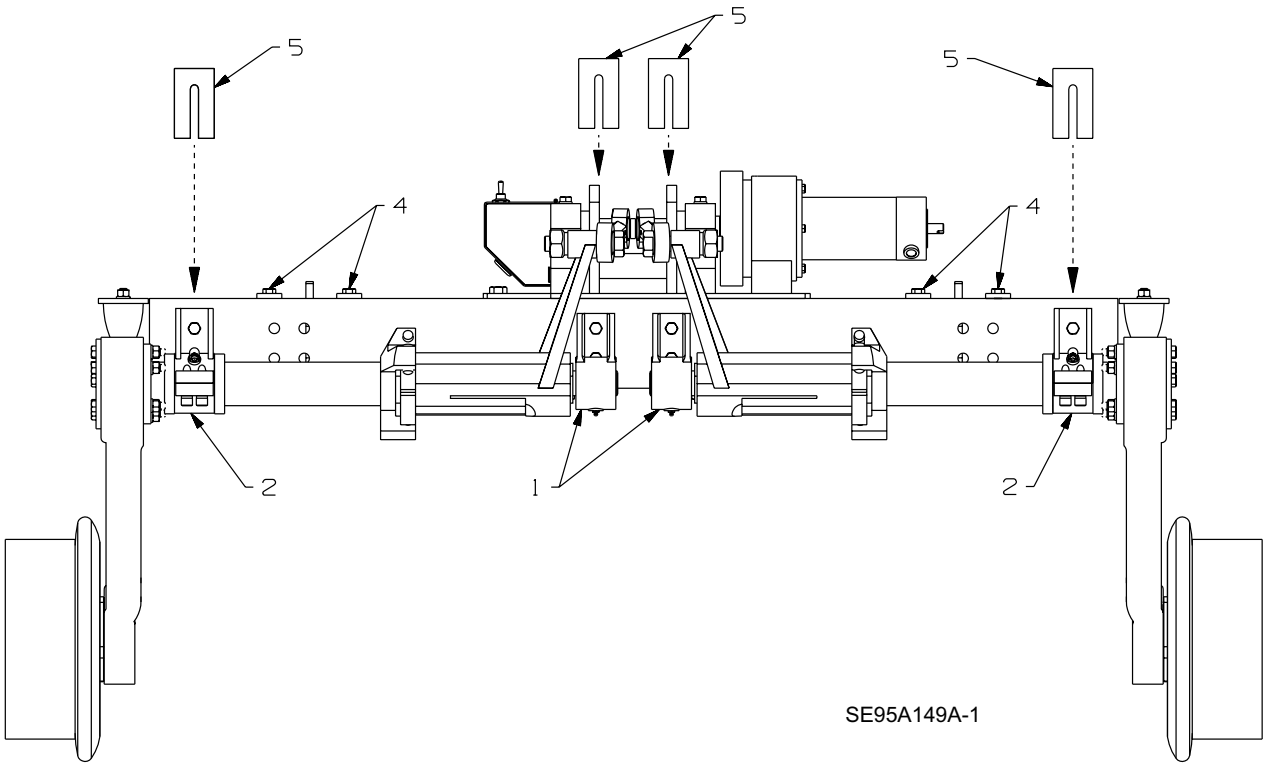
*Note: Do not use more than two shims on any pivot bearing during the original application of the guide wheel units or three shims on any pivot bearing during field inspection and adjustment.*

| | |
|---|---|
| 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. |

c. Lock all guide wheels in the "rail" position. Recheck the rail pilot unit alignment.

d. Repeat the procedure until the rail pilot unit alignment is correct.

FIGURE 3-8
RAIL PILOT UNIT



## Guide Wheel Equipment Alignment Procedure

**GUIDE WHEEL OVERLOAD SET SCREWS** - See Figure 3-9

23. 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.

24. 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.*

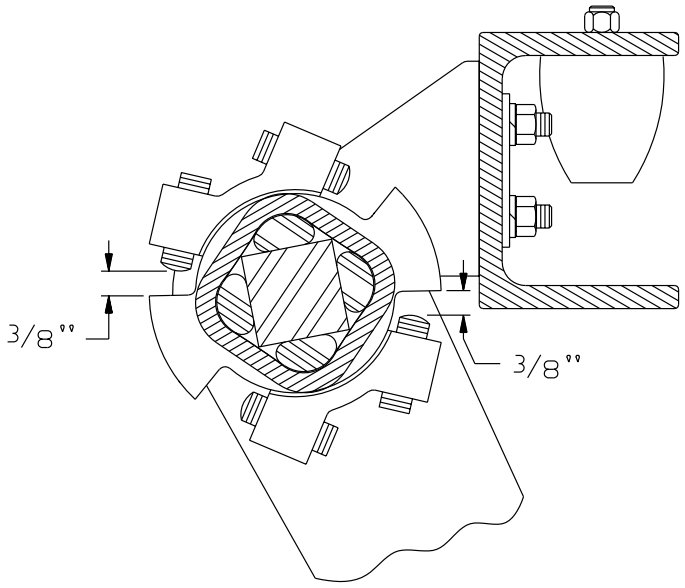
If any of the eight overload set screws are not set correctly, see Adjustment.

### Adjustment

a. 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.

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

FIGURE 3-9
GUIDE WHEEL OVERLOAD ADJUSTMENT

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## Guide Wheel Equipment Alignment Procedure

**GUIDE WHEEL HIGHWAY SET SCREWS** - See Figure 3-10

25. The highway set screws secure the guide wheel arms against the rubber bumpers on the cross frame when the rail pilot 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.

26. 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.



### Adjustment

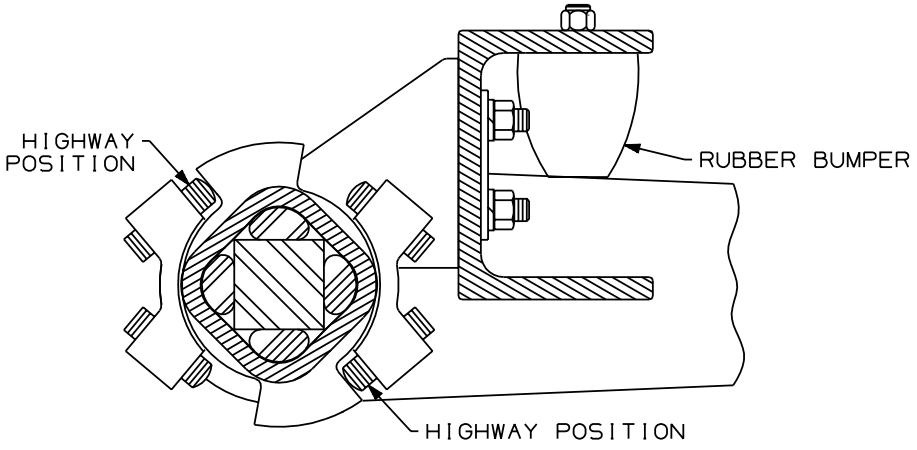
a. Unlock the guide wheel from the "highway" position. Let the guide wheel rest on the rails.

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

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

d. 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 ADJUSTMENT

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## Guide Wheel Equipment Alignment Procedure

### 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.**



27. 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.

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

29. Apply spray paint to the flanges and treads of all guide wheels.

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

31. Operate the vehicle for a short distance at a normal operating speed.

32. 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.

33. 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.

34. See Figure 3-8. If the vehicle pulls noticeable to the right when traveling forward, add a shim (5) (part no. 101818K) 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. 101818K) 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.

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

## Guide Wheel Equipment Adjustment

**RAIL SWEEP** - See Figure 3-11

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 are attached to the wheel arm and will lower to the rail when the guide wheels are lowered.

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

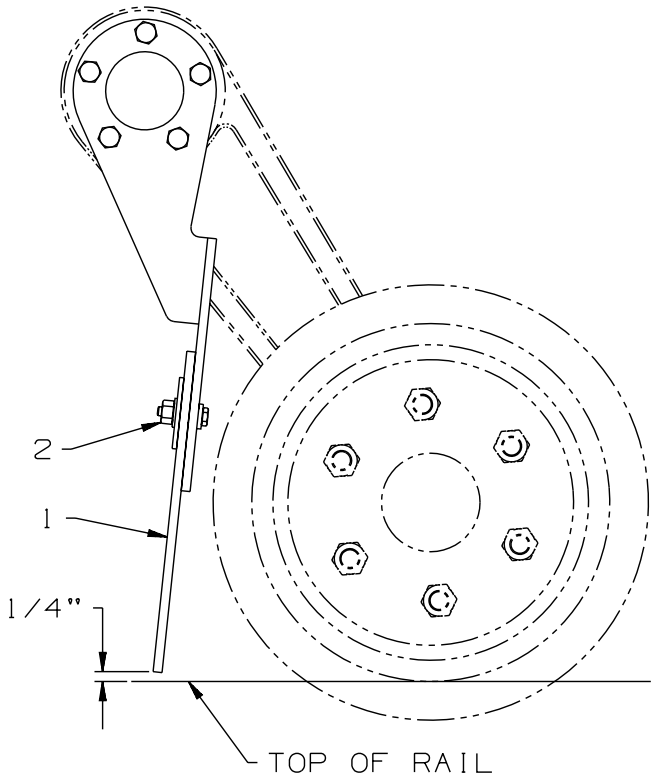
4. Loosen the two cap screws (2). Move the rail sweep (1) until the sweep clears the top of the rail by 1/4 inch (6.4 mm). Re-tighten the cap screws.

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



FIGURE 3-11
RAIL SWEEP

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# SECTION 4 - MAINTENANCE
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## 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.**

**Daily:**

1. Inspect both front and rear rail pilot 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.

**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 rail pilot unit pivot bearings for tightness.

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

## Maintenance Schedule

**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.

**Every 2000 Track Miles (3200 Track km):**

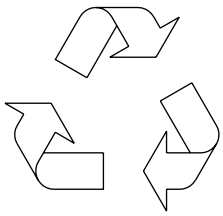
1. Lubricate rail pilot unit locations provided with grease fittings. See Lubrication.

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).



## 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.

## Rail Pilot Unit Lubrication

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

**RAIL PILOT UNIT LUBRICATION** - See Figure 4-1

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

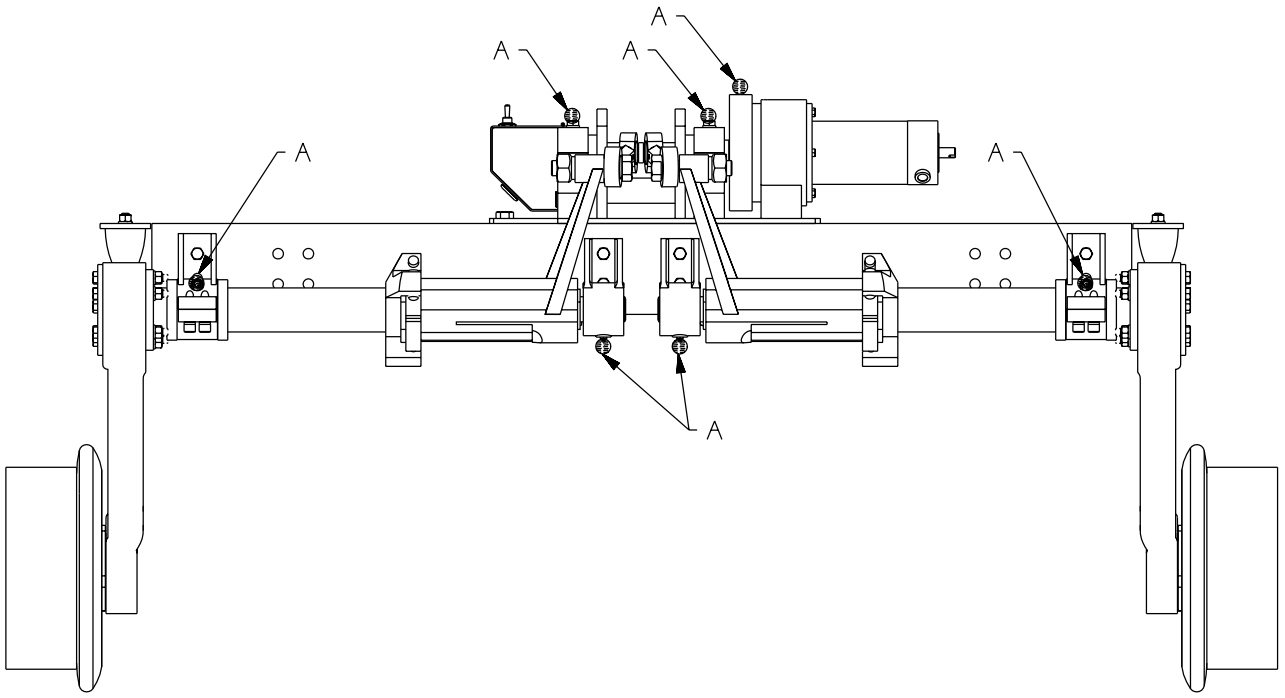
2. Lubricate all grease fittings (A) using Mobil Special Moly, or equivalent.

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

*Note: HR0307 Series B 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
RAIL PILOT UNIT LUBRICATION DIAGRAM

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## Vehicle Wheels

### 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 in the Harsco Track Technologies HY-RAIL® Vehicle Specifications Manual 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.

### TIRE REPLACEMENT


- **USE REPLACEMENT TIRES WITH THE SAME ROLLING RADIUS, TREAD WIDTH, PLY RATING, AND LOAD RATING AS RECOMMENDED IN THE HARSCO TRACK TECHNOLOGIES'S HY-RAIL® VEHICLE SPECIFICATIONS MANUAL. FAILURE TO COMPLY COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.**



Bias ply tires are the recommended tire for use on vehicles equipped with guide wheel equipment. Radial tires may influence vehicle tracking. Performance of vehicles equipped with radial tires is the responsibility of the end user.

Replacement tires must have the same rolling radius, tread width, ply rating, and load rating as recommended in the Harsco Track Technologies HY-RAIL® Vehicle Specifications Manual. 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.

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.

After installing new tire(s) on the vehicle, check rail pilot unit wheel arm vertical height and guide wheel load. See the Adjustment Section - Guide Wheel Equipment Alignment Procedure.

## Guide Wheels

### ALLOWABLE WEAR - 138093 ALUMINUM WHEEL WITH RUBBER TREAD

**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. See Figure 4-2. 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

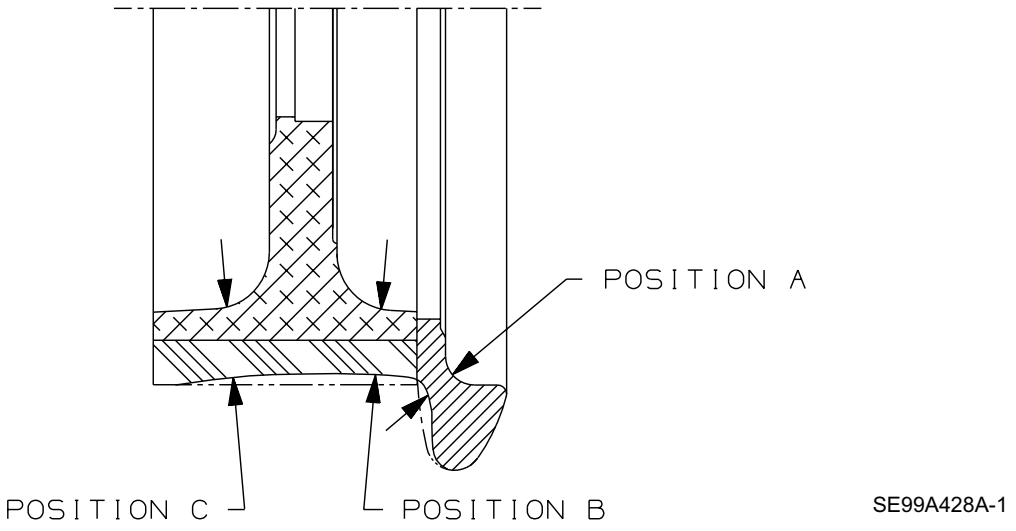
3. See Figure 4-2. Measure the wheel tread at positions "B" and "C" with the wheel caliper.

   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.

FIGURE 4-2
ALLOWABLE WEAR - 138093 ALUMINUM GUIDE WHEEL WITH RUBBER TREAD



## Guide Wheels

### ALLOWABLE WEAR - 138113 STEEL GUIDE WHEEL

**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. See Figure 4-3. 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.

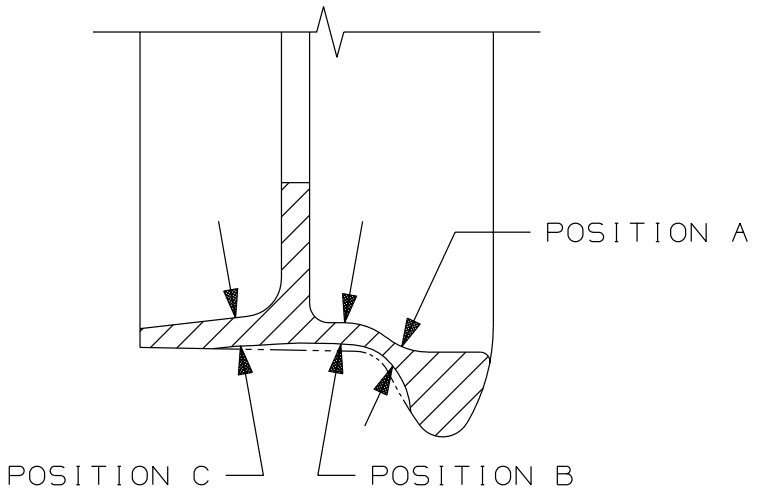
3. See Figure 4-3. Measure the wheel tread at positions "B" and "C" with the wheel caliper.

   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



## Guide Wheels

### 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.

## Pivot Bearings

The inner and outer pivot bearings on the rail pilot unit should be checked carefully at weekly intervals for wear. To check the bearings, the guide wheels must be in 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.

## Rubber Cord Replacement

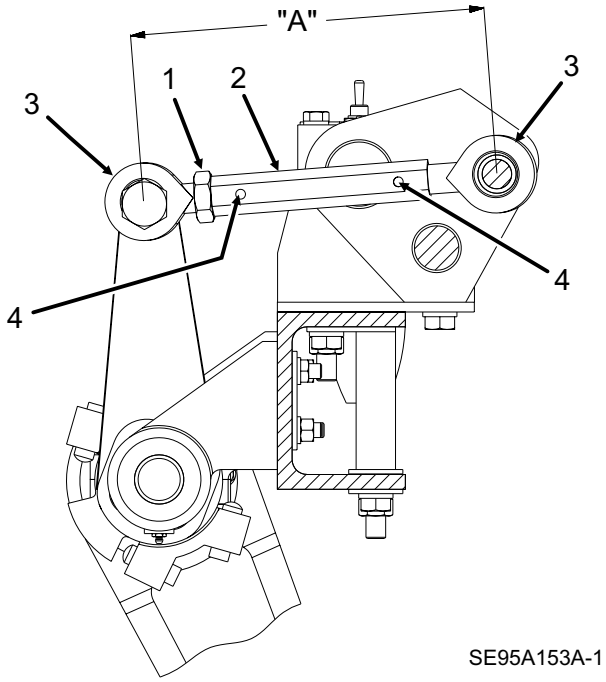
Dimension "A" of the adjusting link (2) should not exceed 9-3/8 inches (238 mm) or be less than 8-5/8 inches (219 mm).

If dimension "A" is greater than 9-3/8 inches (238 mm), it may be necessary to replace the rubber cords in the torque coupling. See Service Data Sheet no. 400

If dimension "A" is less than 8-5/8 inches (219 mm), there may be foreign material lodged in the torque coupling assembly. Disassemble and clean.

*Note: Adjusting link (2) must not be extended so that the threaded ends of either eye bolts (3) are screwed out past the indicator holes (4).*

FIGURE 4-4
LOAD ADJUSTING LINK




SE95A153A-1

## Bolt Torque Requirements

CAUTION

■ **CHECK ALL BOLTS AND NUTS PERIODICALLY, AND KEEP THEM TIGHTENED TO TORQUE SPECIFIED IN APPENDICES SECTION - 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 Appendices Section - Appendix A, for bolt torque requirements table and grade identification markings used by manufacturers.

# SECTION 5 - TROUBLESHOOTING
# TABLE OF CONTENTS

## Troubleshooting Guide Wheel Equipment

## Troubleshooting Guide Wheel Equipment

| PROBLEM | PROBABLE CAUSE | POSSIBLE REMEDY |
|---|---|---|
| Electric motor does not run, pulls down or stalls when lowering or raising guide wheels. | Components bent, broken, etc. | Replace components. |
| | Low voltage to electric motor. | Check switches and wiring to motor. Check for 12 volts at motor. |
| | Electric motor damaged. | Replace motor. |
| | Planetary drive gears damaged. | Repair or replace |
| | Foreign material (mud, slush, dirt, etc.) in torque coupler. | Clean. |
| | Pivot bearings are dirty and/or not lubricated. | Disassemble and clean. Lubricate. |
| Electric motor stalls before bell crank rotates over-center 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. |
| | Rail pilot unit wheel arm height and/or guide wheel load adjusted incorrectly. | Re-adjust. See Adjustment Section - Guide Wheel Equipment Alignment Procedure. |

## Troubleshooting Guide Wheel Equipment

| PROBLEM | PROBABLE CAUSE | POSSIBLE REMEDY |
|---|---|---|
| Electric motor rotates bell crank too easily over-center when locking or unlocking 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. |
| | Rail pilot 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. |
| | Guide wheel equipment bent, broken, etc. | Repair or replace components. |
| | Vehicle front tires out of alignment. | Check for pulling noticeably to the left or right when driven on the highway. Re-align front tires. |

## Troubleshooting Guide Wheel Equipment

| PROBLEM | PROBABLE CAUSE | POSSIBLE REMEDY |
|---|---|---|
| Vehicle derails. | Rail pilot units, vehicle axle(s), etc. not aligned with vehicle frame. | Check alignment. See Adjustment Section - Guide Wheel Equipment Alignment Procedure. |
| Vibration felt in the vehicle when traveling on track. | Rail pilot 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. |
| | Rail pilot 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. |
| | Rail pilot unit flanging hard to the right or left. | Re-align. See Adjustment Section - Guide Wheel Equipment Alignment Procedure. |

## Troubleshooting Guide Wheel Equipment

| PROBLEM | PROBABLE CAUSE | POSSIBLE REMEDY |
|---|---|---|
| Vibration felt in the vehicle when traveling on road. | Rail pilot 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. |
| | 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. |

## 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 - APPENDICES
# TABLE OF CONTENTS

## Appendix A - Conversion Tables

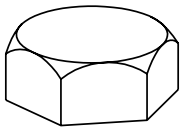
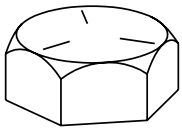
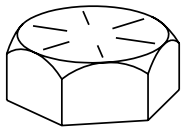


## Appendix B - Service Data Sheets

## Appendix A

FIGURE 6-1
BOLT TORQUE REQUIREMENTS TABLE
STANDARD-TYPE FASTENERS

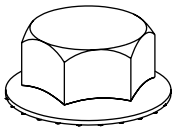
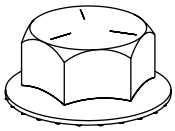
The torque values listed below are for standard-type fasteners only. The torque values listed are based on wet (lubricated) and dry conditions. The torque values for 1/4 and 5/16 inch size fasteners are listed in in-lbs torque only. The torque values for all other size fasteners are listed in ft-lbs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

| SAE Grade | 1 or 2 | | | | 5 | | | | 8 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fastener Standard SAE Grade Markings |  | | | |  | | | |  | | | |
| Fastener Body Size | Torque Wet | | Dry | | Torque Wet | | Dry | | Torque Wet | | Dry | |
| Inch Thrd | in-lb | | in-lb | | in-lb | | in-lb | | in-lb | | in-lb | |
| 1/4 - 20 | 49 | | 65 | | 75 | | 100 | | 107 | | 142 | |
| 1/4 - 28 | 56 | | 74 | | 86 | | 114 | | 122 | | 162 | |
| 5/16 - 18 | 103 | | 137 | | 157 | | 208 | | 220 | | 293 | |
| 5/16 - 24 | 113 | | 150 | | 173 | | 230 | | 244 | | 325 | |
| Fastener Body Size | Torque Wet | | Dry | | Torque Wet | | Dry | | Torque Wet | | Dry | |
| Inch Thrd | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) |
| 3/8 - 16 | 15 | (2.1) | 20 | (2.8) | 23 | (3.2) | 31 | (4.2) | 32 | (4.4) | 43 | (5.9) |
| 3/8 - 24 | 17 | (2.4) | 23 | (3.1) | 26 | (3.6) | 35 | (4.8) | 37 | (5.1) | 49 | (6.8) |
| 7/16 - 14 | 24 | (3.3) | 32 | (4.4) | 37 | (5.1) | 49 | (6.8) | 52 | (7.2) | 69 | (9.6) |
| 7/16 - 20 | 27 | (3.7) | 36 | (5.0) | 42 | (5.8) | 56 | (7.7) | 58 | (8.0) | 77 | (10.7) |
| 1/2 - 13 | 39 | (5.4) | 52 | (7.2) | 57 | (7.9) | 76 | (10.5) | 80 | (11.0) | 106 | (14.7) |
| 1/2 - 20 | 41 | (5.7) | 55 | (7.5) | 64 | (8.9) | 85 | (11.8) | 90 | (12.4) | 120 | (16.5) |
| 9/16 - 12 | 53 | (7.3) | 71 | (9.7) | 82 | (11.3) | 109 | (15.1) | 115 | (15.9) | 153 | (21.1) |
| 9/16 - 18 | 59 | (8.2) | 78 | (10.8) | 91 | (12.6) | 121 | (16.7) | 129 | (17.8) | 172 | (23.7) |
| 5/8 - 11 | 73 | (10.0) | 97 | (13.4) | 113 | (15.6) | 150 | (20.8) | 160 | (22.1) | 213 | (29.4) |
| 5/8 - 18 | 83 | (11.5) | 110 | (15.2) | 128 | (17.7) | 170 | (23.5) | 180 | (24.9) | 239 | (33.1) |
| 3/4 - 10 | 129 | (17.8) | 172 | (23.7) | 200 | (27.7) | 266 | (36.8) | 282 | (39.0) | 375 | (51.8) |
| 3/4 - 16 | 144 | (19.9) | 192 | (26.5) | 223 | (30.8) | 297 | (41.0) | 315 | (43.6) | 419 | (57.9) |
| 7/8 - 9 | 124 | (17.1) | 165 | (22.8) | 323 | (44.7) | 430 | (59.4) | 454 | (62.8) | 604 | (83.5) |
| 7/8 - 14 | 138 | (19.1) | 184 | (25.4) | 355 | (49.1) | 472 | (65.3) | 501 | (69.3) | 666 | (92.1) |
| 1 - 8 | 188 | (26.0) | 250 | (34.6) | 483 | (66.8) | 642 | (88.9) | 681 | (94.2) | 906 | (125.2) |
| 1 - 14 | 210 | (29.0) | 279 | (38.6) | 541 | (74.8) | 720 | (99.5) | 764 | (106.0) | 1,016 | (140.5) |
| 1-1/8 - 7 | 266 | (36.8) | 354 | (48.9) | 596 | (82.4) | 793 | (109.6) | 966 | (134.0) | 1,285 | (177.6) |
| 1-1/8 - 12 | 297 | (41.1) | 395 | (54.6) | 668 | (92.4) | 888 | (122.8) | 1,083 | (150.0) | 1,440 | (199.1) |
| 1-1/4 - 7 | 375 | (51.9) | 499 | (69.0) | 841 | (116.0) | 1,119 | (154.6) | 1,363 | (189.0) | 1,813 | (250.6) |
| 1-1/4 - 12 | 415 | (57.4) | 552 | (76.3) | 930 | (129.0) | 1,237 | (171.0) | 1,509 | (209.0) | 2,007 | (277.5) |
| 1-3/8 - 6 | 492 | (68.0) | 654 | (90.5) | 1,102 | (152.0) | 1,466 | (202.6) | 1,787 | (247.0) | 2,377 | (328.6) |
| 1-3/8 - 12 | 560 | (77.4) | 745 | (103.0) | 1,255 | (174.0) | 1,670 | (230.8) | 2,034 | (281.0) | 2,705 | (374.0) |
| 1-1/2 - 6 | 653 | (90.3) | 868 | (120.1) | 1,463 | (202.0) | 1,946 | (269.0) | 2,371 | (328.0) | 3,153 | (436.0) |
| 1-1/2 - 12 | 734 | (102.0) | 976 | (135.0) | 1,645 | (228.0) | 2,188 | (302.5) | 2,668 | (369.0) | 3,548 | (490.6) |

## Appendix A

FIGURE 6-2
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 size fasteners are listed in ft-lbs torque with metric equivalents in parentheses. Use lower grade torque values if bolt and nut have different SAE grades. Manufacturer's SAE grade markings may vary.

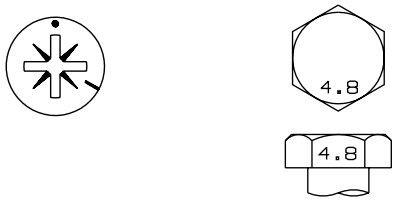
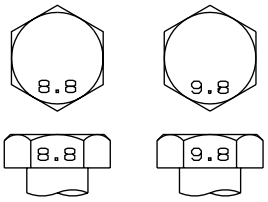
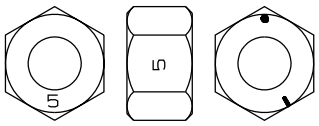
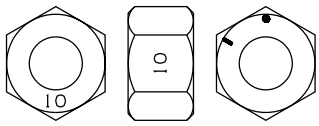
| **SAE Grade** | **1 or 2** | | | | **5** | | | |
|---|---|---|---|---|---|---|---|---|
| **Fastener Standard SAE Grade Markings** |  | | | |  | | | |
| **Fastener Body Size** | **Torque Wet** | | **Dry** | | **Torque Wet** | | **Dry** | |
| Inch Thrd | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) | ft-lb | (kg-m) |
| 1/4 - 20 | 8 | (1.1) | 11 | (1.5) | 11 | (1.5) | 15 | (2.1) |
| 1/4 - 28 | 9 | (1.2) | 12 | (1.7) | 12 | (1.7) | 16 | (2.2) |
| 5/16 - 18 | 13 | (1.8) | 17 | (2.4) | 20 | (2.8) | 27 | (3.7) |
| 5/16 - 24 | 13 | (1.8) | 17 | (2.4) | 32 | (4.4) | 43 | (5.9) |
| 3/8 - 16 | 23 | (3.2) | 31 | (4.3) | 40 | (5.5) | 53 | (7.3) |
| 3/8 - 24 | 25 | (3.5) | 33 | (4.6) | 43 | (5.9) | 57 | (7.9) |
| 7/16 - 14 | 38 | (5.3) | 51 | (7.1) | 55 | (7.6) | 73 | (10.1) |
| 7/16 - 20 | 40 | (5.5) | 53 | (7.5) | 60 | (8.3) | 80 | (11.1) |
| 1/2 - 13 | 60 | (8.3) | 80 | (11.1) | 95 | (13.1) | 127 | (17.6) |
| 1/2 - 20 | 65 | (9.0) | 87 | (12.0) | 100 | (13.8) | 133 | (18.4) |
| 9/16 - 12 | 78 | (10.8) | 104 | (14.4) | 140 | (19.4) | 187 | (25.9) |
| 9/16 - 18 | 85 | (11.8) | 113 | (15.6) | 150 | (20.7) | 200 | (27.7) |
| 5/8 - 11 | 125 | (17.3) | 167 | (23.1) | 190 | (26.3) | 253 | (35.0) |
| 5/8 - 18 | 135 | (18.7) | 180 | (24.9) | 220 | (30.4) | 293 | (40.5) |
| 3/4 - 10 | 225 | (31.1) | 300 | (41.2) | 350 | (48.4) | 467 | (64.6) |
| 3/4 - 16 | 250 | (34.6) | 333 | (46.1) | 400 | (55.3) | 533 | (73.7) |
| 7/8 - 9 | 350 | (48.4) | 467 | (64.6) | 550 | (76.1) | 733 | (101.4) |
| 7/8 - 14 | 375 | (51.9) | 500 | (69.2) | 600 | (83.0) | 800 | (110.6) |
| 1 - 8 | 480 | (66.4) | 640 | (88.5) | 750 | (103.7) | 1,000 | (138.3) |
| 1 - 14 | 500 | (69.2) | 666 | (92.1) | 800 | (110.6) | 1,066 | (147.4) |

## Appendix A

FIGURE 6-3
METRIC BOLT AND CAP SCREW TORQUE VALUES

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.

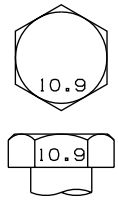
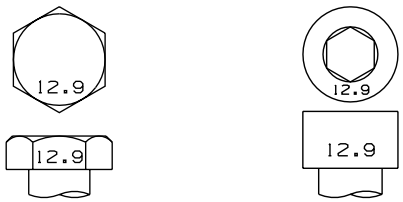
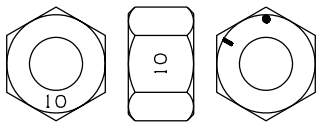
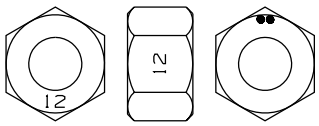
* Lubricated means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. Dry means plain or zinc plated without any lubrication.

| Property Class and Head Markings | 4.8  | 8.8 9.8  |
|---|---|---|
| Property Class and Nut Markings | 5  | 10  |

| 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 6-4
METRIC BOLT AND CAP SCREW TORQUE VALUES

| Property Class and Head Markings | 10.9   | 12.9   |
|---|---|---|
| Property Class and Nut Markings | 10   | 12   |

| 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 6-5
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 |

FIGURE 6-6
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 6-7
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 6-8
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 6-9
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 6-10
FAHRENHEIT TO CELSIUS (Centigrade) CONVERSION TABLE
°F MINUS 32, DIVIDED BY 1.8 EQUALS °C

| °F | °C | °F | °C | °F | °C | °F | °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 | 65.6 | 200 | 93.3 |

## Appendix A

FIGURE 6-11
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 | 0.3 | 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 6-12
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 |

# SECTION 7 - PARTS
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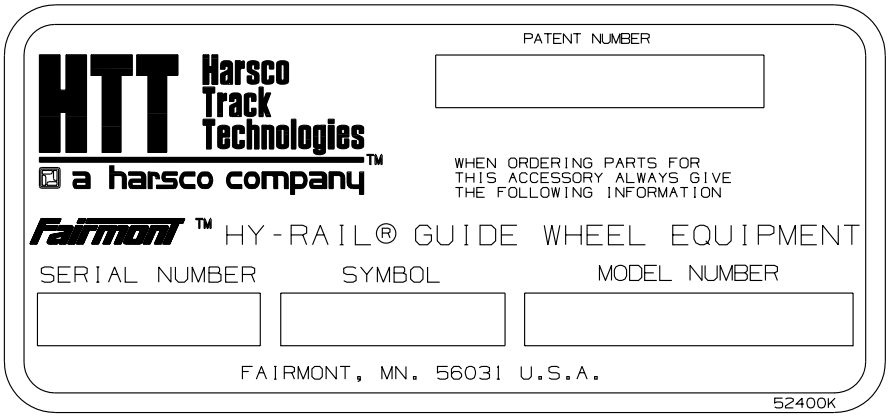
## TABLE OF CONTENTS

## TABLE OF CONTENTS

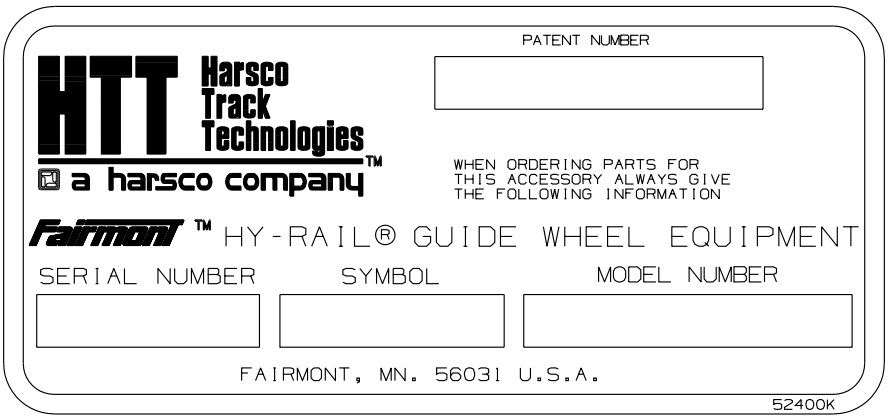
## Serial Numbers

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 rail pilot 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 RAIL PILOT UNIT SERIAL NUMBER TAG




REAR RAIL PILOT UNIT SERIAL NUMBER TAG



## Instructions For Ordering Parts

1. See Section 8 for the Vehicle Application charts.

2. Find the chart for 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™ products are designed to give high quality service and are manufactured from high grade material, by competent workmen under careful supervision. Harsco Track Technologies, Harsco Corporation 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, Harsco Corporation 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, Harsco Corporation 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, Harsco Corporation will not be liable for other loss, damage, or expense directly or indirectly arising from the use of its products, nor will Harsco Track Technologies, Harsco Corporation be liable for special, incidental or consequential damages.

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## Hazardous Material Disclaimer

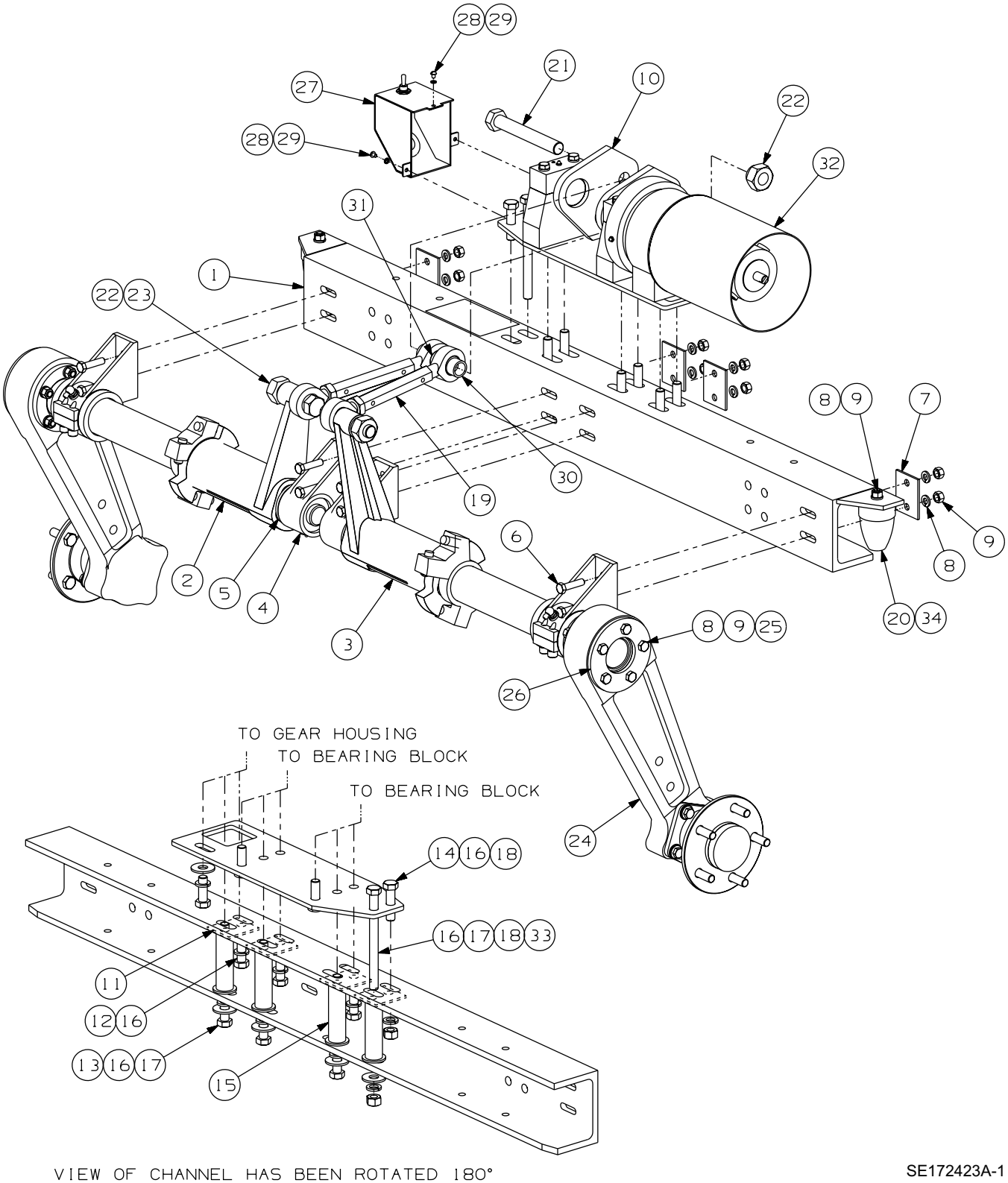
THE PARTS/ASSEMBLIES THAT ARE USED IN THIS PRODUCT ARE CLASSIFIED AS "ARTICLES" ACCORDING TO 29 CFR 1910.1200 (C). THEY ARE FORMED TO A SPECIFIC SHAPE OR DESIGN DURING MANUFACTURE, HAVE END USE FUNCTION DEPENDENT UPON THEIR SHAPE OR DESIGN, AND DO NOT RELEASE ANY HAZARDOUS CHEMICAL UNDER NORMAL CONDITIONS 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.

## 172481 RAIL PILOT UNITS

(Not Illustrated)

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 172481 | RAIL PILOT UNITS | 1 |
| 172423 | Rail Pilot Unit (see separate breakdown) | 2 |
| 101813K | Side Bar Adapter | 4 |
| 101816 | Side Bar Adapter Spacer, 1/16" | 8 |
| 101817 | Side Bar Adapter Spacer, 1/32" | 8 |
| 101818K | Bearing Shim, 1/16" (use as required for wheel alignment) | 10 |
| 181463 | SIDE BAR ADAPTER FASTENER KIT | 1 |
| F019742 | Cap Screw, 3/8-16 x 1-3/4" Hex Hd | 16 |
| F023111 | Hardened Washer | 16 |
| 058528 | Washer | 16 |
| F015922 | Elastic Stop Nut, 3/8"-16 | 16 |
| F018650 | Cap Screw, 1/2-13 x 1-1/2" Hex Hd | 12 |
| F013500 | Elastic Stop Nut, 1/2"-13 | 12 |
| 172431 | Hand Crank. | 1 |
| 140220 | Decal, Warning - Do Not Operate This Machine Before... | 3 |
| F018082 | Decal, Safety Instructions - Lock Front Wheels... | 1 |
| 171767 | Decal, Operating Instructions | 1 |
| 171760 | Decal, Operating Instructions | 2 |
| 155007 | Decal, HY-RAIL® Vehicle Completed By... | 1 |
| 171769 | Decal, HY-RAIL® Manual Actuation | 2 |
| 171706 | Decal, Highway - Rail | 2 |

## 172423 RAIL PILOT UNIT ASSEMBLY

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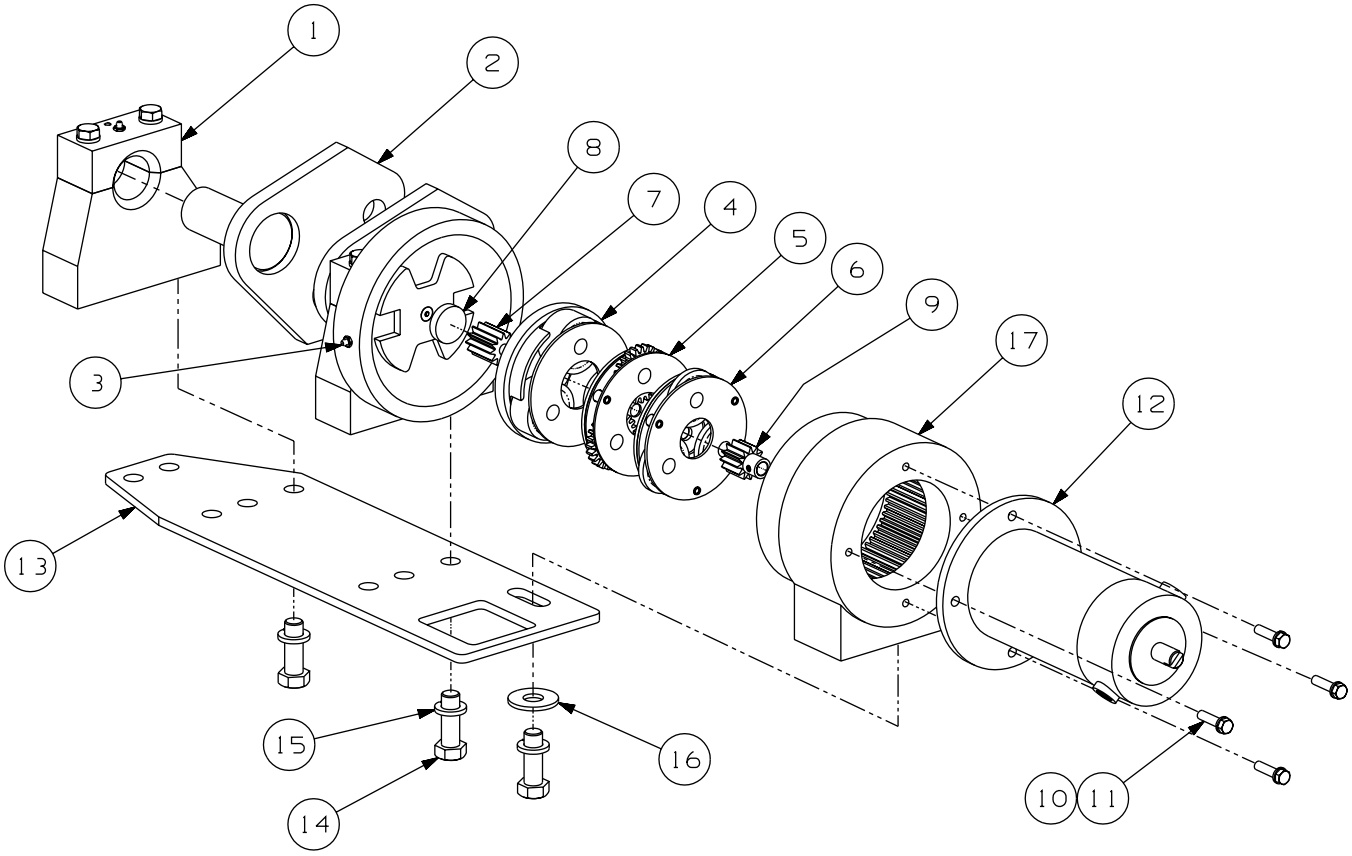
## 172423 RAIL PILOT UNIT ASSEMBLY

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 172423 | RAIL PILOT UNIT ASSEMBLY | 1 |
| 1 | 172426 | Cross Channel | 1 |
| 2 | 172433 | Coupling And Tube Assembly RF/LR (see separate breakdown) | 1 |
| 3 | 172434 | Coupling And Tube Assembly LF/RR (see separate breakdown) | 1 |
| 4 | 083119 | INNER PIVOT BEARING | 2 |
| 4a | F014262 | Grease Seal | 2 |
| 4b | F008014 | Grease Fitting, 1/4" Straight | 1 |
| 5 | 083121 | Thrust Washer | 2 |
| 6 | F016365 | Cap Screw, 3/8-24 x 1-1/2" GR 8 Hex Hd | 8 |
| 7 | 101799 | Bolt Strip | 4 |
| 8 | F001025 | SAE Lock Washer, 3/8" | 20 |
| 9 | F016820 | Hex Nut, 3/8"-24 | 20 |
| 10 | 175607 | Planetary And Motor Assembly (see separate breakdown) | 1 |
| 11 | 101802 | Bolt Strip | 4 |
| 12 | F001095 | Cap Screw, 1/2-13 x 1-3/4" GR 5 Hex Hd | 3 |
| 13 | F001538 | Cap Screw, 1/2-13 x 6" GR 5 Hex Hd. | 3 |
| 14 | F001442 | Cap Screw, 1/2-13 x 2" GR 5 Hex Hd. | 1 |
| 15 | 101803 | Spacer | 4 |
| 16 | F001075 | SAE Lock Washer, 1/2" | 8 |
| 17 | F001267 | Wrought Washer, 1/2". | 8 |
| 18 | F003598 | Hex Nut, 1/2"-13 GR 5 | 2 |
| 19 | 171087 | LINK ASSEMBLY | 2 |
| 19a | 172409 | Link | 1 |
| 19b | 171799 | Rod Eye, Left Hand Thread. | 1 |
| 19c | 171800 | Rod Eye, Right Hand Thread | 1 |
| 19d | F010972 | Hex Jam Nut, 3/4"-16 | 1 |
| 20 | F011732 | Rubber Bumper | 2 |
| 21 | F005081 | Cap Screw, 3/4-10 x 5-1/2" GR 5 Hex Hd | 1 |
| 22 | F013633 | Hex Elastic Stop Nut, 3/4"-10 | 3 |
| 23 | F008816 | Cap Screw, 3/4-10 x 3-1/2" GR 5 Hex Hd | 2 |
| 24 | 158378 | Wheel Arm Assembly (see separate breakdown). | 2 |
| 25 | F017427 | Cap Screw, 3/8-24 x 3-1/4" GR 8 Hex Hd | 10 |
| 26 | 157642 | Washer | 2 |
| 27 | 175608 | COVER ASSEMBLY. | 1 |
| 27a | 172424 | Switch | 1 |
| 27b | 172428 | Switch Boot | 1 |
| 27c | F014684 | Rubber Grommet. | 1 |
| 28 | F018077 | Machine Screw, 10-32 x 1/4" Rd Hd. | 3 |
| 29 | F009541 | SAE Lock Washer, #10. | 3 |
| 30 | 172456 | Spacer | 2 |
| 31 | 172457 | Spacer | 1 |
| 32 | 176677 | Motor Cover | 1 |
| 33 | F001525 | Cap Screw, 1/2-13 x 5-1/2" GR 5 Hex Hd | 1 |
| 34 | 188440 | Spacer | 2 |

## 175607 PLANETARY DRIVE AND MOTOR ASSEMBLY

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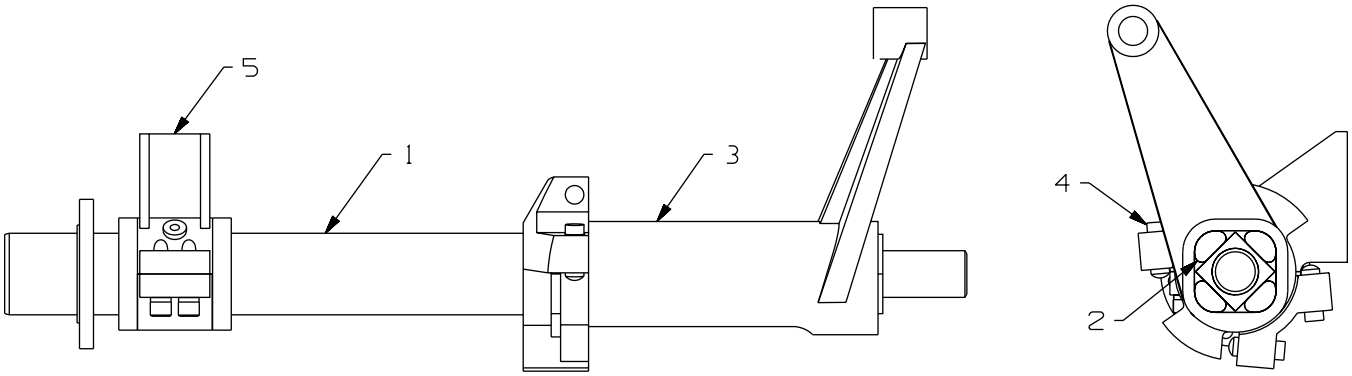
## 175607 PLANETARY DRIVE AND MOTOR ASSEMBLY

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 175607 | PLANETARY DRIVE AND MOTOR ASSEMBLY | 1 |
| 1 | 172421 | BEARING BLOCK ASSEMBLY | 2 |
| 1a | F009668 | Cap Screw, 3/8-16 x 2-1/4" GR 5 Hex Hd | 2 |
| 1b | F001025 | SAE Lock Washer, 3/8" | 2 |
| 1c | F008014 | Grease Fitting, 1/4" Straight | 1 |
| 2 | 171777 | Crankshaft | 1 |
| 3 | F008014 | Grease Fitting | 1 |
| 4 | 172411 | Planetary Gear | 1 |
| 5 | 180011 | Planetary Gear | 1 |
| 6 | 172410 | Planetary Gear | 1 |
| 7 | 180012 | Pinion Gear | 1 |
| 8 | 180762 | Spacer | 1 |
| 9 | 172416 | GEAR ASSEMBLY | 1 |
| 9a | 181467 | Set Screw, #10-32 x 3/8" Soc Cup Point | 1 |
| 10 | F009825 | Cap Screw, 1/4-20 x 1" Hex Hd | 4 |
| 11 | F009535 | Lock Washer, 1/4" | 4 |
| 12 | 176708 | Motor | 1 |
| 13 | 171773 | Plate | 1 |
| 14 | F001090 | Cap Screw, 1/2-13 x 1-1/2 GR 5 Hex Hd | 3 |
| 15 | F001075 | SAE Lock Washer, 1/2" | 3 |
| 16 | F001267 | Wrought Washer, 1/2" | 1 |
| 17 | 175638 | GEAR ASSEMBLY | 1 |
| 17a | 171716 | Gear Housing | 1 |
| 17b | 172413 | Ring Gear | 1 |
| 17c | F019881 | Dowel Pin, 1/4 x 1-1/2" | 2 |

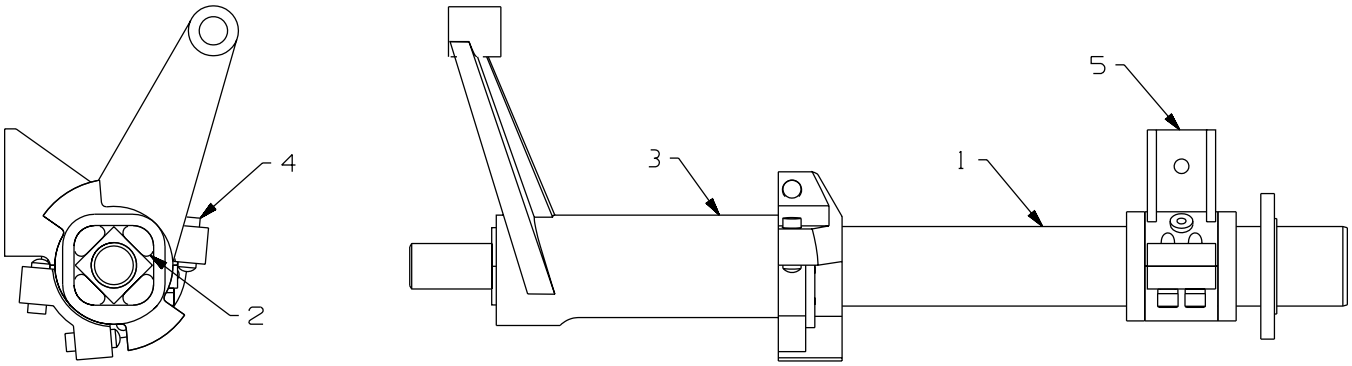
## 172433 COUPLING AND TUBE ASSEMBLY - RF/LR




SE172433A-1

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 172433 | COUPLING AND TUBE ASSEMBLY - RF/LR | 1 |
| 1 | 161655 | Tube And Shaft | 1 |
| 2 | 083085 | Rubber Cord | 4 |
| 3 | 171725 | Torque Coupling | 1 |
| 4 | F012772 | Set Screw, 1/2-13 x 1-1/2" Soc Hd Oval Point | 4 |
| 5 | 083106 | Outer Bearing | 1 |
| 5a | F013472 | Dust Seal | 1 |
| 5b | F010722 | Grease Fitting, 1/4" 90° | 1 |

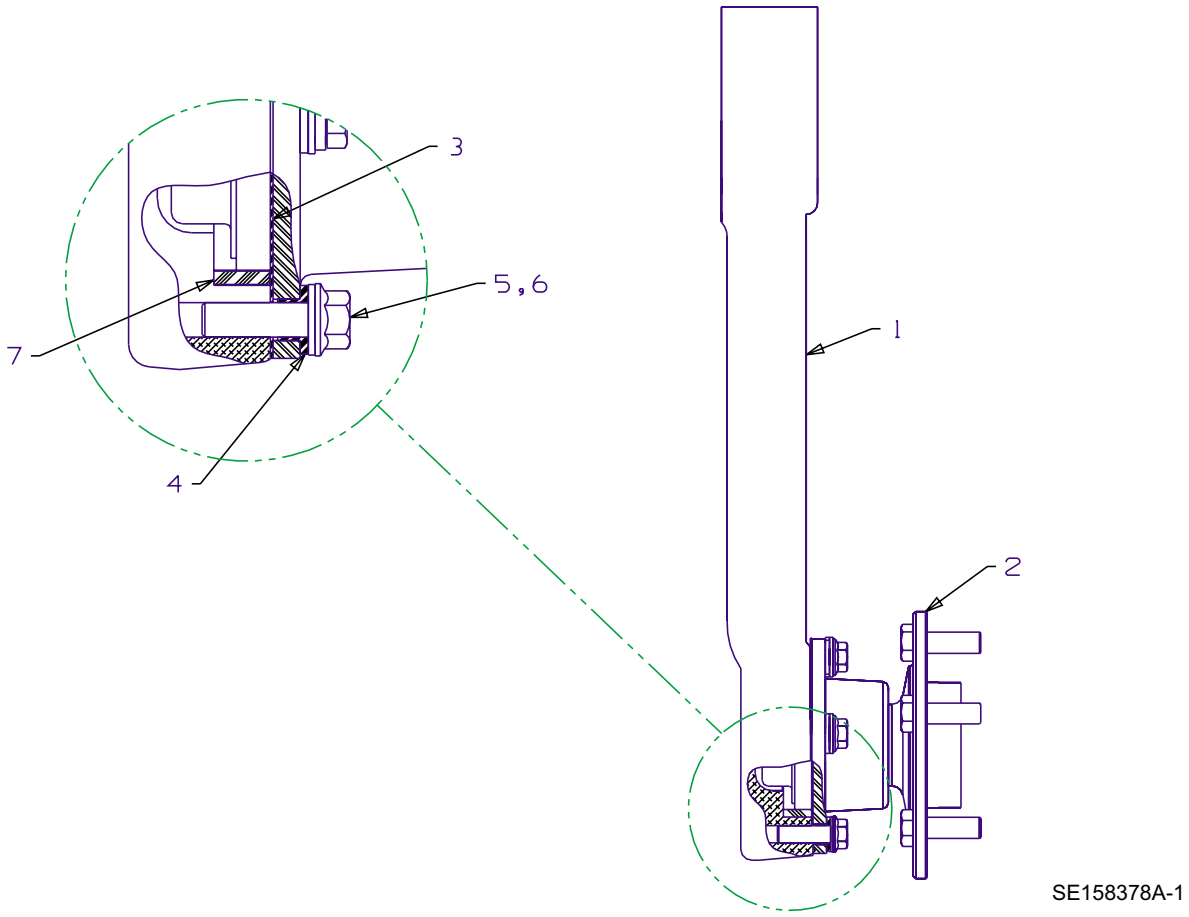
## 172434 COUPLING AND TUBE ASSEMBLY - LF/RR




SE172434A-1

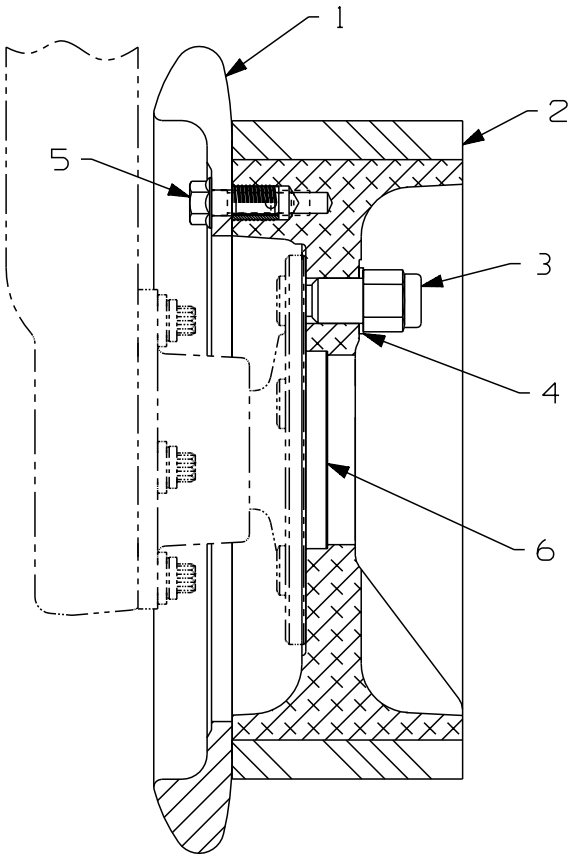
| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 172434 | COUPLING AND TUBE ASSEMBLY - LF/RR | 1 |
| 1 | 161655 | Tube And Shaft | 1 |
| 2 | 083085 | Rubber Cord | 4 |
| 3 | 171726 | Torque Coupling | 1 |
| 4 | F012772 | Set Screw, 1/2-13 x 1-1/2" Soc Hd Oval Point | 4 |
| 5 | 083106 | Outer Bearing | 1 |
| 5a | F013472 | Dust Seal | 1 |
| 5b | F010722 | Grease Fitting, 1/4" 90° | 1 |

## 158378 WHEEL ARM ASSEMBLY




| 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 |

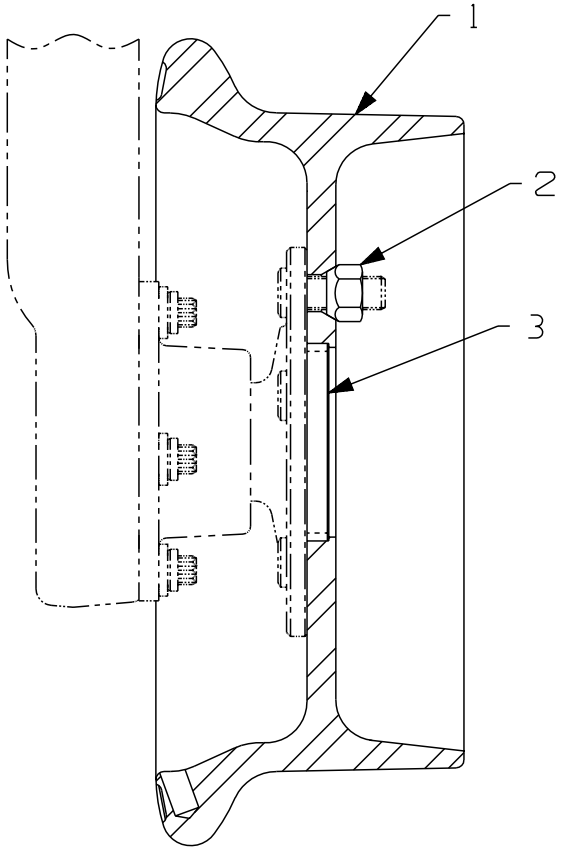
## 138093 RUBBER TREAD GROUP




SE020083A-1

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 138093 | RUBBER TREAD GROUP | 1 |
| 1 | 136133 | Flange | 1 |
| 2 | 137683 | Rubber Tread | 1 |
| 3 | F023472 | Lug Nut, M12 x 1.5 | 5 |
| 4 | F023457 | Washer, 11/16" | 5 |
| 5 | F023255 | Cap Screw, 3/8-16 x 1" Hex Flg Hd | 6 |
| 6 | 123795 | Tube | 1 |

## 138113 STEEL TREAD GROUP




SE020084A-1

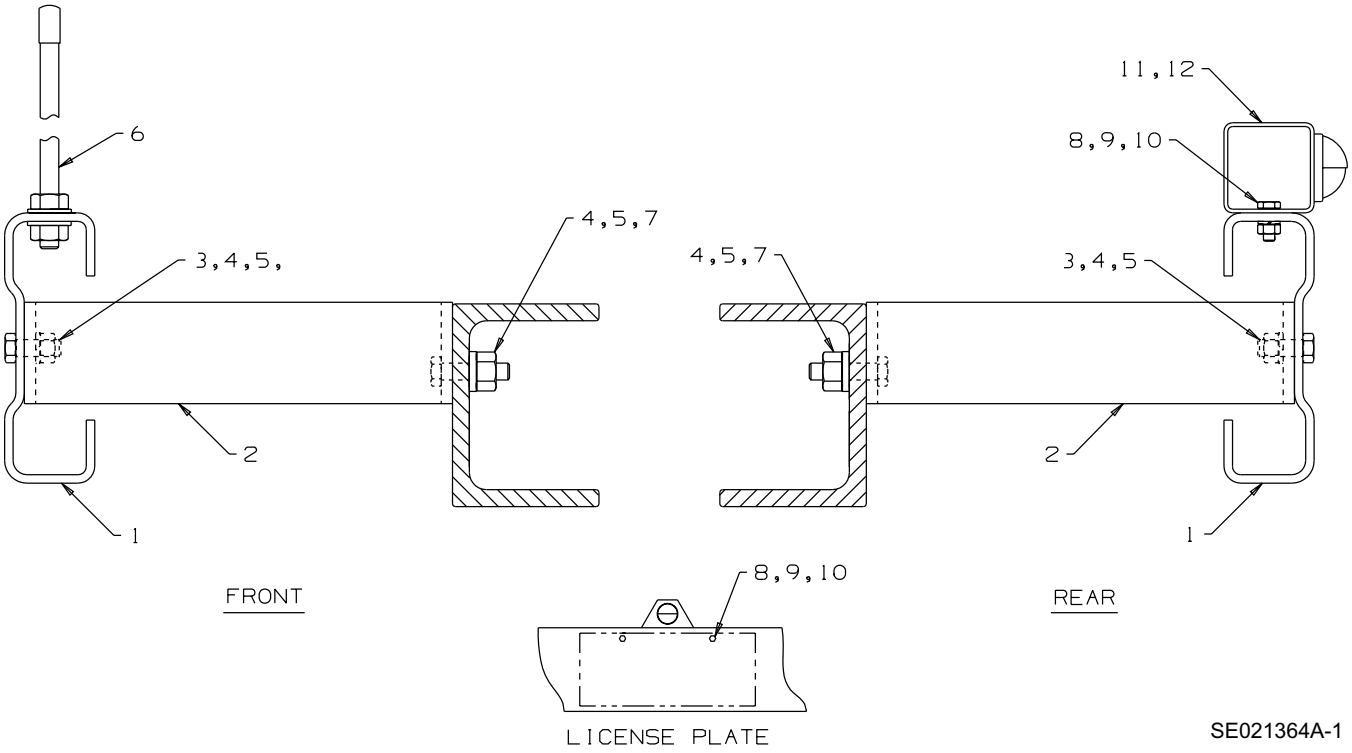
| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 138113 | STEEL TREAD GROUP | 1 |
| 1 | 136297 | Steel Tread | 1 |
| 2 | F019949K | Hex Cone Nut, M12 x 1.5 | 5 |
| 3 | 123795 | Tube | 1 |

7

## 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.

## 172459 BUMPER GROUP - FRONT AND REAR
## 172458 BUMPER GROUP - FRONT ONLY
## 172460 BUMPER GROUP - REAR ONLY




## 172459 BUMPER GROUP - FRONT AND REAR

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 172459 | BUMPER GROUP - FRONT AND REAR | 1 |
| 1 | 164510 | Bumper | 2 |
| 2 | 171702 | 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 | 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 |

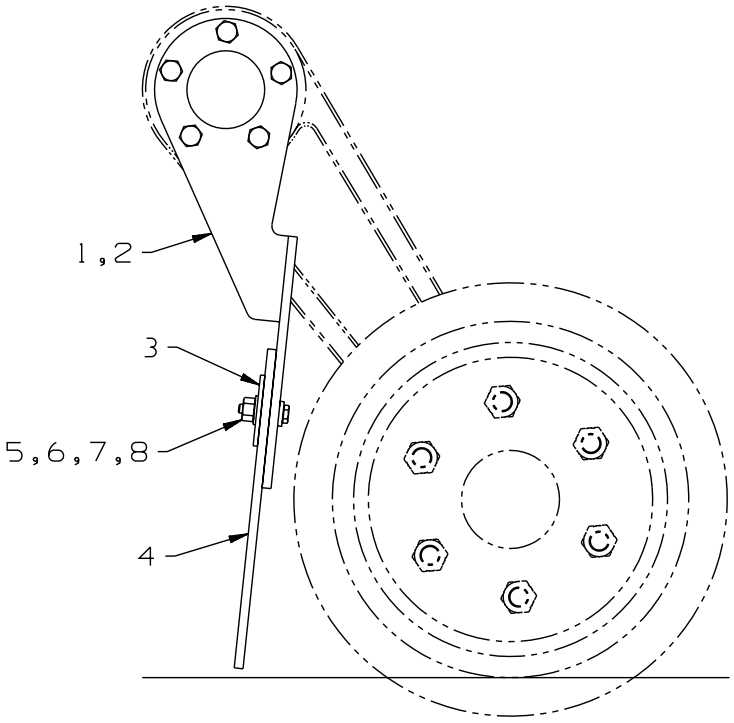
## 172458 BUMPER GROUP - FRONT ONLY

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 166253 | BUMPER GROUP - FRONT ONLY | 1 |
| 1 | 164510 | Bumper | 1 |
| 2 | 171702 | 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 |

## 172460 BUMPER GROUP - REAR ONLY

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 166252 | BUMPER GROUP - REAR ONLY | 1 |
| 1 | 164510 | Bumper | 1 |
| 2 | 171702 | 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 | 2 |
| 9 | F009535 | Lock Washer, 1/4" | 2 |
| 10 | F007022 | Hex Nut, 1/4"-20 | 2 |
| 11 | 107874 | License Light Bracket | 1 |
| 12 | F015664 | License Lamp | 1 |

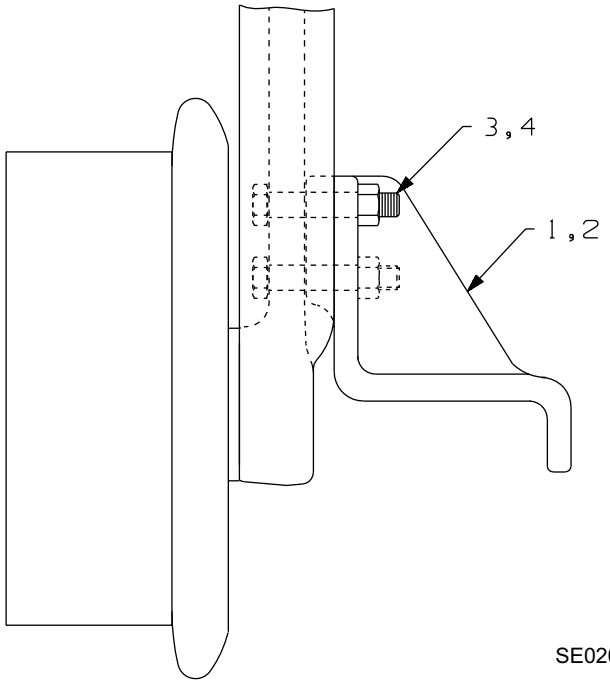
## 162321 RAIL SWEEP GROUP




SE020923A-1

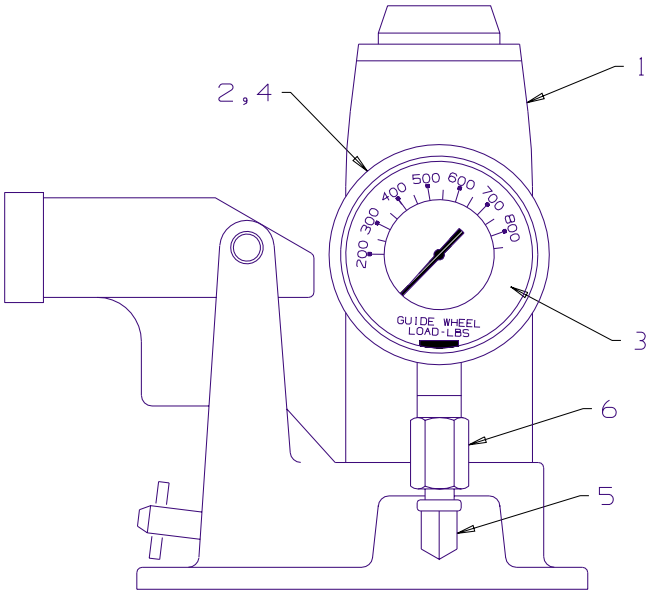
| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 162321 | RAIL SWEEP GROUP | 1 |
| 1 | 158355K | Bracket - LF/RR | 1 |
| 2 | 158356K | Bracket - RF/LR | 1 |
| 3 | 088525 | Link | 2 |
| 4 | 088524K | Rubber Sweep | 2 |
| 5 | F007020 | Hex Nut, 3/8"-16 | 4 |
| 6 | F001025 | SAE Lock Washer, 3/8" | 4 |
| 7 | F001115 | Wrought Washer, 3/8" | 4 |
| 8 | F001024 | Cap Screw, 3/8-16 x 1-1/2" Hex Hd | 4 |

## 137682 DERAIL SKID GROUP




| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 137682 | DERAIL SKIDS | 1 |
| 1 | 140100 | Derail Skid - LF/RR | 1 |
| 2 | 139613 | Derail Skid - RF/LR | 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 |

## 073527 WHEEL WEIGHING JACK




SE073527A-1

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| | 073527 | JACK ASSEMBLY | 1 |
| 1 | F025513 | Hydraulic Jack | 1 |
| 2 | F024256 | Gauge | 1 |
| 3 | 154383 | Decal, Gauge Face | 1 |
| 4 | 156051 | Decal, Warning - Misuse Of Product... | 1 |
| 5 | 146353 | 90° Elbow, 1/8 M NPT x 1/8 F NPT | 1 |
| 6 | F023088 | Adapter, 1/8 M NPT x 1/4 F NPT | 1 |

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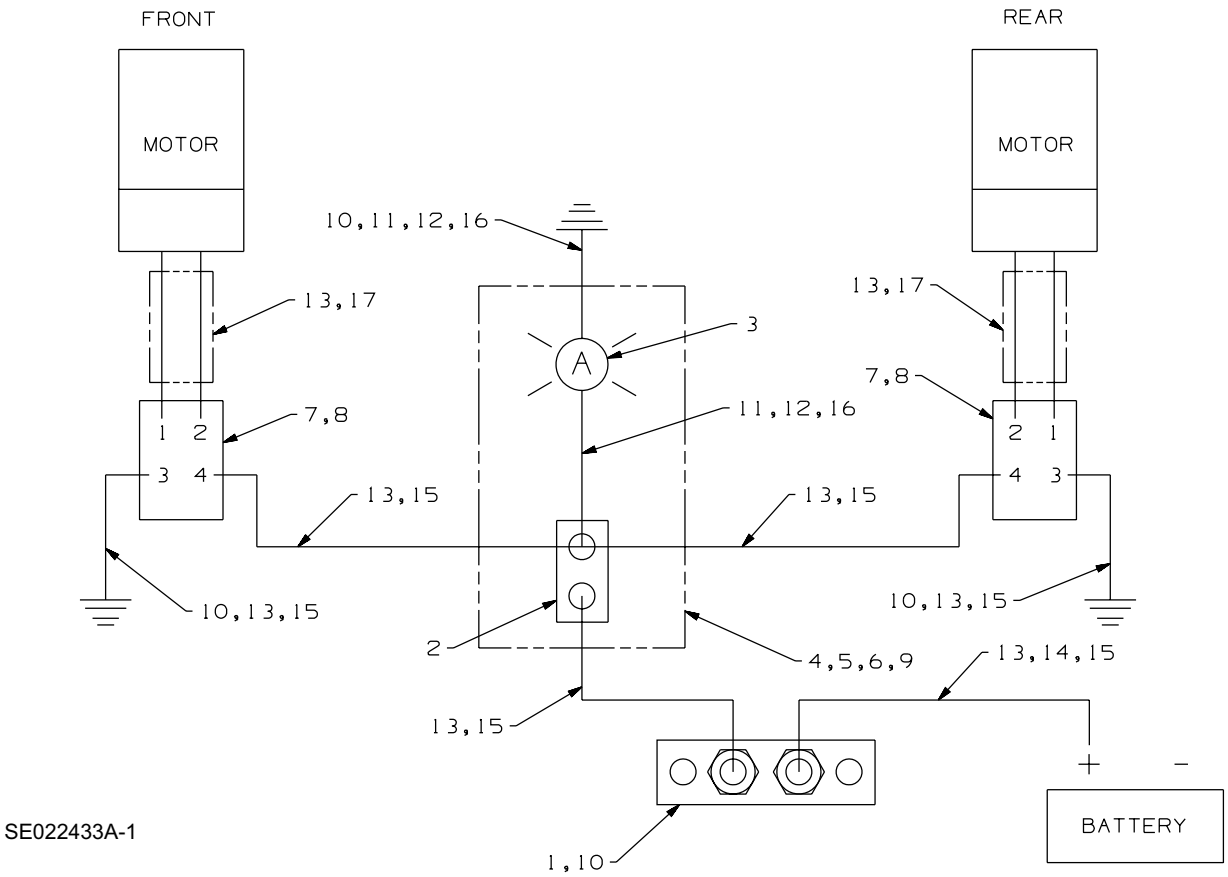
## 156020 STROBE LIGHT GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 156020 | STROBE LIGHT GROUP | 1 |
| F024799 | Strobe Light | 1 |
| F014868 | Switch | 1 |
| F040160 | Wire, 16 ga. | 120" |
| F040576 | Wire, 16 ga. | 120" |
| F009863 | Butt Connector | 2 |
| F024813 | Fuse, 1 amp | 1 |
| F017476 | Fused Line Connector | 1 |
| F024812 | Screw, #8 x 1/2" Self Tap | 3 |

## 176598 DECAL SERVICE GROUP

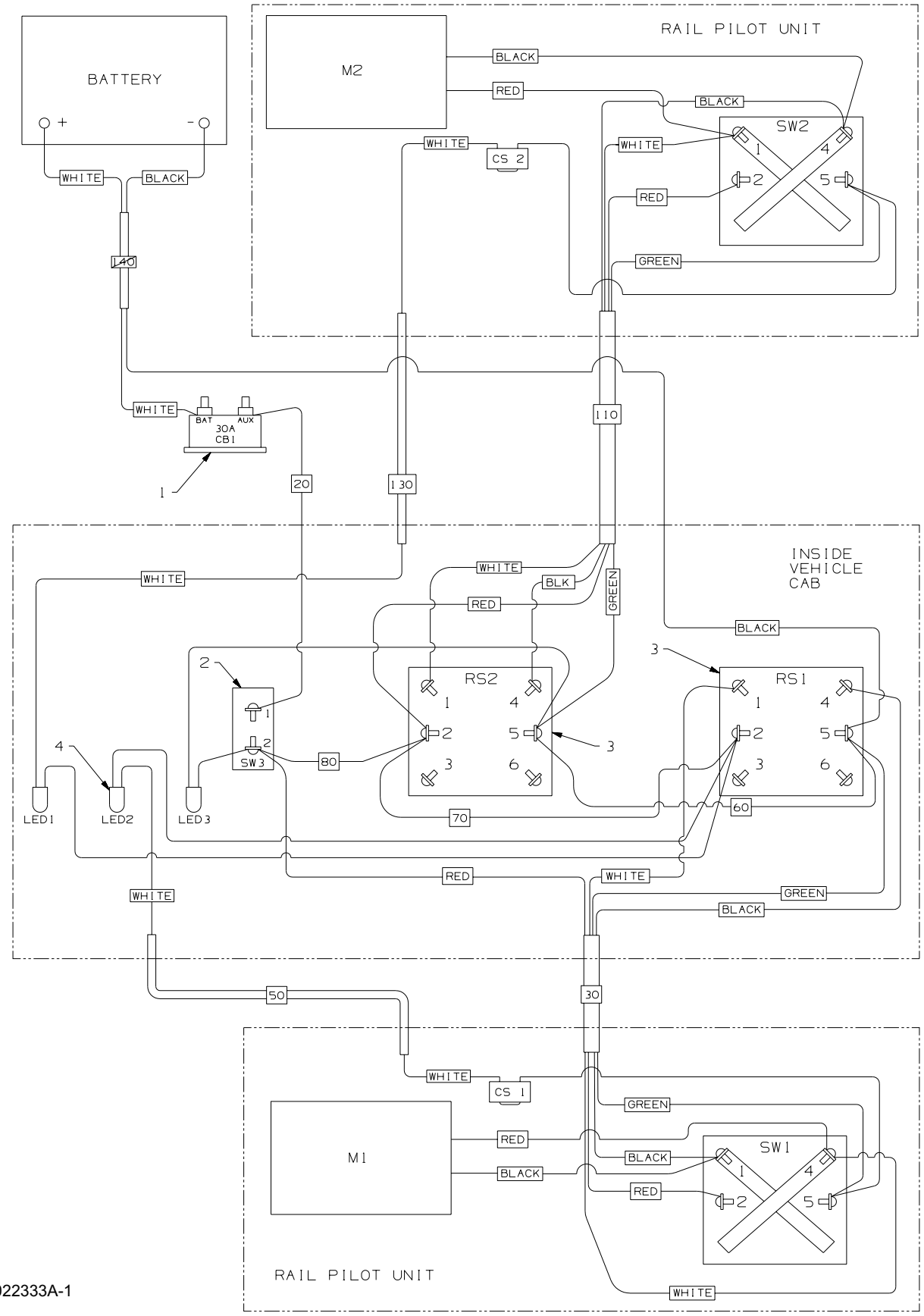
| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 176598 | DECAL SERVICE GROUP | 1 |
| F018082 | Decal, Safety Instructions - Lock Front Wheels... | 1 |
| 140220 | Decal, Warning - Do Not Operate This Machine Before... | 3 |
| 155007 | Decal, HY-RAIL® Vehicle Completed By... | 1 |
| 171706 | Decal, Highway - Rail | 2 |
| 171760 | Decal, Operating Instructions | 2 |
| 171767 | Decal, Operating Instructions | 1 |
| 171769 | Decal, HY-RAIL® Manual Actuation | 2 |

## 176681 WIRING APPLICATION




| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | F014406 | Circuit Breaker, 30 amp | 1 |
| 2 | 175238 | Switch | 1 |
| 3 | 175627 | Amber Light | 1 |
| 4 | 408513 | Mount Panel, End | 2 |
| 5 | 408514 | Mount Panel, Middle | 1 |
| 6 | 175590 | Decal, Pilot Unit Circuit - ON | 1 |
| 7 | 172424 | Switch | 1 |
| 8 | 172428 | Switch Boot | 1 |
| 9 | F007801 | Screw, #8 x 5/8" Rd Hd Self Tap | 2 |
| 10 | F009592 | Screw, #10 x 5/8" Self Tapping | 6 |
| 11 | F009863 | Butt Connector | 2 |
| 12 | F004320K | Ring Terminal, #10 | 2 |
| 13 | F018176 | Ring Terminal, #10 | 13 |
| 14 | F009038K | Ring Terminal, 3/8" | 1 |
| 15 | F009803 | Wire, #10 Red | 480" |
| 16 | F040160 | Wire, #16 Black | 24" |
| 17 | F020758 | Wire Shield | 72" |

## 175625 IN CAB HIGHWAY ACTUATION WIRING APPLICATION




SE022333A-1

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# 175625 IN CAB HIGHWAY ACTUATION WIRING APPLICATION

## WIRE CHART

| RUN NUMBER | WIRE PART NUMBER | WIRE | FROM | TERM. PART NUMBER | TO | TERM. PART NUMBER |
|---|---|---|---|---|---|---|
| 1 | F021916 | 140 (W) | BAT (+) | F041611 | CB1(-BAT) | F018176 |
| 2 | F009803 | 20 | CB1-AUX | F018176 | SW3-1 | F018200 |
| 3 | F021255 | 30 (RED) | SW3-2 | F018200 | SW1-2 | F018200 |
| 4 | F021255 | 30 (W) | RS1-1 | F018200 | SW1-4 | F018200 |
| 5 | ——— | ——— | M1 (RED) | ——— | SW1-4 | F018200 |
| 6 | ——— | ——— | M1 (BK) | ——— | SW1-1 | F018200 |
| 7 | F021255 | 30 (BK) | RS1-4 | F018200 | SW1-1 | F018200 |
| 8 | F021255 | 30 (G) | RS1-5 | F018200 | SW1-5 | F018200 |
| 9 | F012388 | 50 (W) | CS1 | F009863 | LED2 | F009863 |
| 10 | ——— | ——— | CS1 | ——— | SW1-5 | F018200 |
| 11 | F009803 | 60 (RED) | RS1-5 | F018200 | RS2-5 | F018200 |
| 12 | F009803 | 70 (RED) | RS1-2 | F018200 | RS2-2 | F018200 |
| 13 | F009803 | 80 (RED) | RS2-2 | F018200 | SW3-2 | F018200 |
| 14 | ——— | ——— | LED2 | ——— | RS1-2 | F022917 |
| 15 | ——— | ——— | LED3 | ——— | RS2-5 | F022917 |
| 16 | ——— | ——— | LED3 | ——— | SW3-2 | F022917 |
| 17 | F021255 | 110 (G) | RS2-5 | F018200 | SW2-5 | F018200 |
| 18 | F021255 | 110 (RED) | RS2-2 | F018200 | SW2-2 | F018200 |
| 19 | F021255 | 110 (BK) | RS2-4 | F018200 | SW2-4 | F018200 |
| 20 | F021255 | 110 (W) | RS2-1 | F018200 | SW2-1 | F018200 |
| 21 | ——— | ——— | M2 (BK) | ——— | SW2-4 | F018200 |
| 22 | ——— | ——— | M2 (R) | ——— | SW2-1 | F018200 |
| 23 | ——— | ——— | CS2 | ——— | SW2-5 | F022917 |
| 24 | F012388 | 130 (W) | CS2 | F009863 | LED1 | F009863 |
| 25 | ——— | ——— | LED1 | ——— | RS1-2 | F022917 |
| 26 | F021916 | 140 (BK) | RS1-5 | F018200 | BAT (-) | F041611 |

## WIRE CHART

| WIRE MARKER NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 140 | F021916 | 10 GA. 2 COND. (BLACK,WHITE) |
| 20 | F009803 | 10 GA. (RED) |
| 30 | F021255 | 10 GA. 4 COND. (RED,WHITE,BLACK,GREEN) |
| 50 | F012388 | 16 GA. 2 COND. (BLACK,WHITE) |
| 60 | F009803 | 10 GA. (RED) |
| 70 | F009803 | 10 GA. (RED) |
| 80 | F009803 | 10 GA. (RED) |
| 130 | F012388 | 16 GA. 2 COND. (BLACK,WHITE) |
| 110 | F021255 | 10 GA 4 COND (RED,WHITE,BLACK,GREEN) |

## SWITCHES

| COMPONENT | PART NO. | DESCRIPTION |
|---|---|---|
| RS1 | 175217 | ROCKER - 3 POSITION MOM |
| RS2 | 175217 | ROCKER - 3 POSITION MOM |
| SW1 | 172424 | TOGGLE - 3 POSITION MOM |
| SW2 | 172424 | TOGGLE - 3 POSITION MOM |
| SW3 | 175238 | ROCKER - 2 POSITION |
| CS1 | 172432 | 2 POSITION NO MOMENTARY |
| CS2 | 172432 | 2 POSITION NO MOMENTARY |

## LIGHTS

| COMPONENT | FUNCTION | PART NO. |
|---|---|---|
| LED 1 | FRONT RAIL GEAR INDICATOR (LOCKED) | 175627 |
| LED 2 | REAR RAIL GEAR INDICATOR (LOCKED) | 175627 |
| LED 3 | SYSTEM POWER "ON" | 175627 |

## WIRE TERMINALS

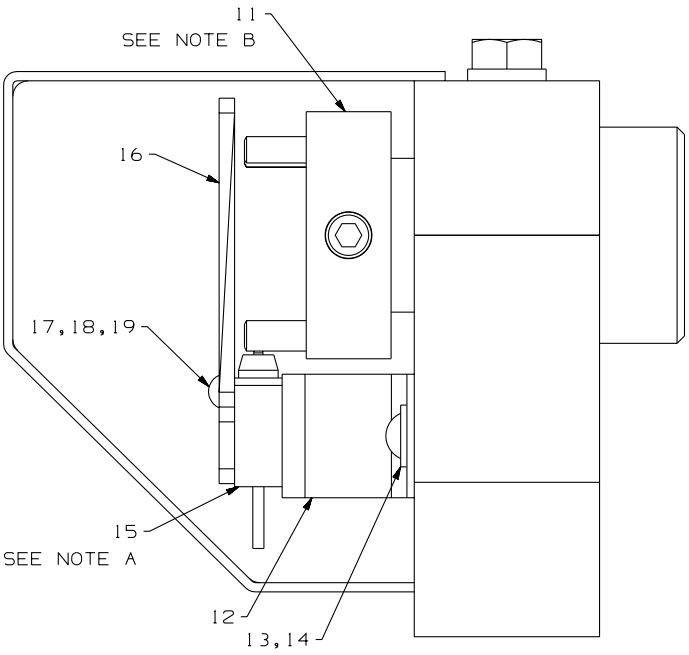
| PART NUMBER | DESCRIPTION |
|---|---|
| F018176 | INSUL. RING TERM. |
| F041611 | INSUL. RING TERM. |
| F018200 | INSUL. RING TERM. |
| F009863 | INSUL. SPLICE TERM. |
| F022917 | INSUL. RING TERM. |

## CIRCUIT BREAKERS

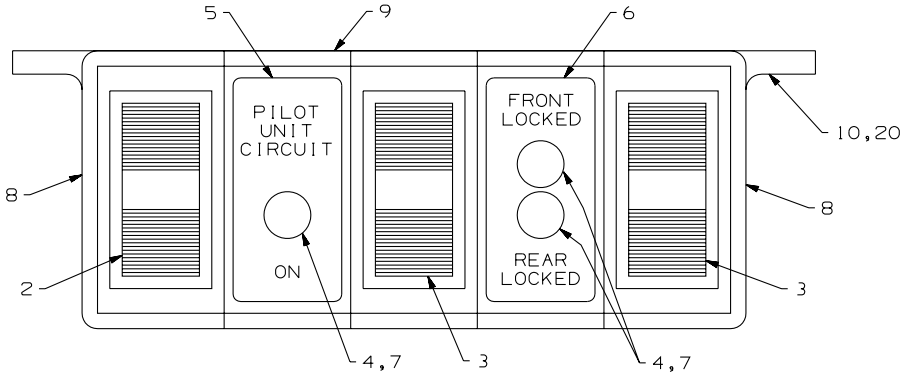
| COMPONENT | RATING | FUNCTION | PART NUMBER |
|---|---|---|---|
| CB1 | 30 AMP | POWER SOURCE | F014406 |

SE022333A-2

# 175625 IN CAB HIGHWAY ACTUATION WIRING APPLICATION




DETAIL ON RAIL PILOT UNIT




CONTROL CONSOLE IN VEHICLE CAB

NOTE A: ADJUST SWITCH UP OR DOWN SO IT IS ACTUATED BY ROLL PIN ON COLLAR.

NOTE B: LOOSEN SET SCREW AND ADJUST COLLAR ON SHAFT SO IT ACTUATES SWITCH WHEN RAIL PILOT UNIT IS FULLY RAISED AND ALSO WHEN RAIL PILOT UNIT IS FULLY LOWERED.

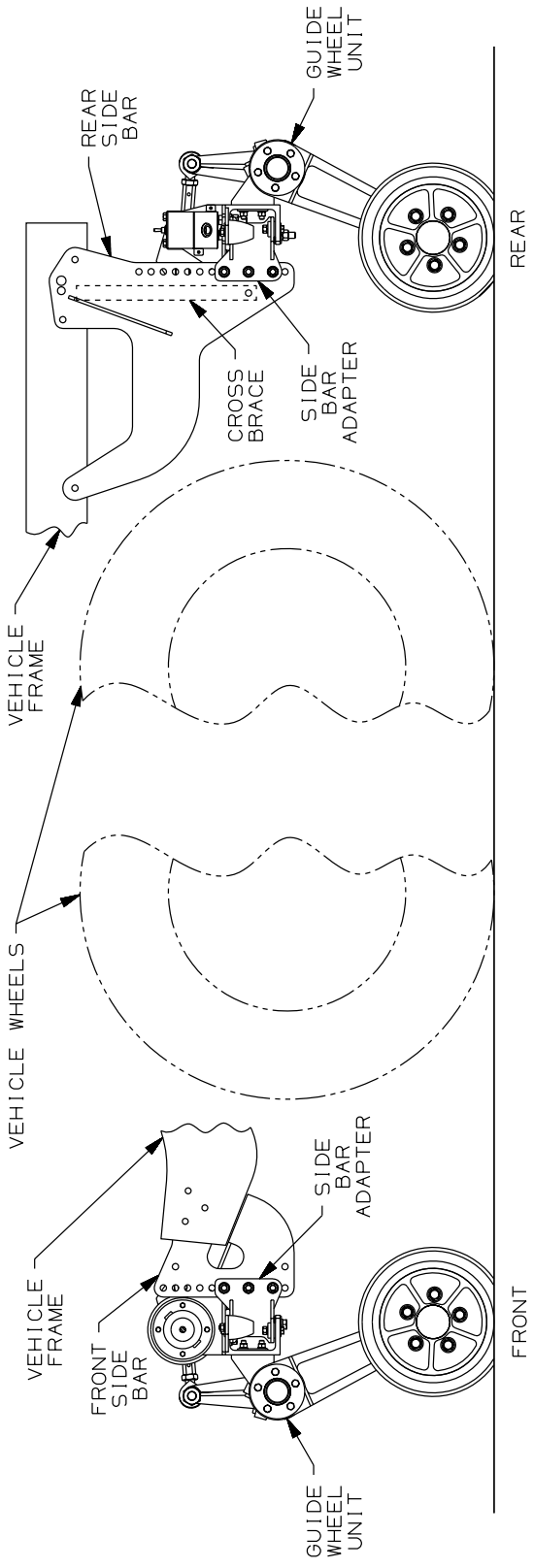
SE022333A-3

## 175625 IN CAB HIGHWAY ACTUATION WIRING APPLICATION

| ITEM | PART NO | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | F014406 | Circuit Breaker, 30 amp | 1 |
| 2 | 175238 | Switch | 1 |
| 3 | 175217 | Switch | 2 |
| 4 | 175627 | LED, Amber | 3 |
| 5 | 175590 | Decal, Pilot Unit Circuit | 1 |
| 6 | 175626 | Decal, Front Locked / Rear Locked | 1 |
| 7 | 175583 | Light Bracket | 2 |
| 8 | 408513 | Mount Panel, End | 2 |
| 9 | 408514 | Mount Panel, Middle | 3 |
| 10 | 175216 | Mounting Bracket | 1 |
| 11 | 171708 | Collar Assembly | 2 |
| 12 | 171697 | Switch Bracket | 2 |
| 13 | F018077 | Machine Screw, 10-32 x 1/4" Rd Hd | 4 |
| 14 | F009541 | SAE Lock Washer, #10 | 4 |
| 15 | 172432 | Switch | 2 |
| 16 | 171698 | Plate | 2 |
| 17 | F012914 | Machine Screw, #6-32 x 3/4" Rd Hd | 4 |
| 18 | F009719 | Hex Nut, #6-32 | 4 |
| 19 | F007413 | SAE Lock Washer, #6 | 4 |
| 20 | F023799 | Screw, 1/4-14 x 1" Self-Tap | 2 |
| 21 | F016958 | Grommet (use through firewall if required) | 1 |

## TYPICAL MOUNTING BRACKETS

This illustration shows typical mounting brackets that are common in most groups and rail pilot units, mounted on a vehicle. Mounting brackets and applications will vary from vehicle to vehicle. See Section 8, Vehicle Applications, to find the correct mounting bracket group applicable to your make, model and year of vehicle.




SE95A156A-1

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## FASTENER KITS FOR FRONT AND REAR BRACKET 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 |

## 158791 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 158791 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |

Parts For Front Mounting Brackets

| | | |
|---|---|---|
| 162441 | Side Bar, Left | 1 |
| 162442 | Side Bar, Right | 1 |
| F006383 | Cap Screw, 3/4-10 x 5" GR 5 Hex Hd | 4 |
| 700666075 | Hex Lock Nut, 3/4"-10 | 4 |
| 158801 | Brace | 1 |
| 134233 | Bar | 6 |
| 164513 | Bar | 2 |
| F003566 | Cap Screw, 5/8-11 x 1-1/2" GR 5 Hex Hd | 4 |
| F021924 | Hex Flg Nut, 5/8"-11 GR 5 Hex Hd | 4 |
| 168114 | Plate, Right | 1 |
| 168115 | Plate, Left | 1 |
| 168116 | Tube | 4 |
| F018861 | Cap Screw, 1/2-13 x 2-1/4" GR 8 Hex Hd | 6 |
| F014487 | Elastic Stop Nut, 1/2"-13 | 10 |
| F023887 | Cap Screw, M16 x 2.0 x 120 mm CL10.9 Hex Hd | 2 |
| 138400 | Tube | 2 |
| 022429 | Front Unit Application Drawing | |

Parts For Rear Mounting Brackets

| | | |
|---|---|---|
| 137381 | Side Bar | 1 |
| 137382 | Side Bar | 1 |
| 163635 | Brace End | 2 |
| 163634 | Brace End | 2 |
| F018861 | Cap Screw, 1/2-13 x 2-1/4" GR 8 Hex Hd | 4 |
| F018650 | Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd | 10 |
| F013500 | Elastic Stop Nut | 14 |
| F040637 | Cap Screw, 3/4-10 x 1-3/4" GR 8 Hex Hd | 2 |
| F013633 | Elastic Stop Nut, 3/4"-10 | 2 |
| 022430 | Rear Unit Application Drawing | |

## 159311 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 159311 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 159097 | Side Bar, Left | 1 |
| 159098 | Side Bar, Right | 1 |
| 158801 | Brace | 1 |
| 134233 | Spacer, .065" | 4 |
| 164513 | Spacer | 4 |
| 126002 | Sleeve | 2 |
| 159096 | Spacer | 4 |
| 022313 | Front Unit Application Drawing | |
| | Parts For Rear Mounting Brackets | |
| 129153 | Side Bar, Right | 1 |
| 129155 | Side Bar, Left | 1 |
| 163634 | Brace End | 2 |
| 163635 | Brace End | 2 |
| 022314 | Rear Unit Application Drawing | |

## 163169 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 163169 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 159638 | Side Bar, Right | 1 |
| 159642 | Side Bar, Left | 1 |
| 055954 | Shim, .060" | 12 |
| 163634 | Brace End | 1 |
| 163636 | Brace End | 1 |
| 022296 | Front Unit Application Drawing | |
| | Parts For Rear Mounting Brackets | |
| 137674 | Side Bar, Left | 1 |
| 137675 | Side Bar, Right | 1 |
| 163634 | Brace End | 2 |
| 163635 | Brace End | 2 |
| 022297 | Rear Unit Application Drawing | |

## 167879 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 167879 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 168269 | Side Bar, Right | 1 |
| 168268 | Side Bar, Left | 1 |
| 055954 | Spacer (use as required) | 12 |
| 163634 | Brace End | 1 |
| 163636 | Brace End | 1 |
| 022392 | Front Unit Application Drawing | |
| | Parts For Rear Mounting Brackets | |
| 168266 | Side Bar, Left | 1 |
| 168267 | Side Bar,- Right | 1 |
| 163634 | Brace End | 2 |
| 163635 | Brace End | 2 |
| 022393 | Rear Unit Application Drawing | |

## 169032 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 169032 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 168269 | Side Bar, Right | 1 |
| 168268 | Side Bar, Left | 1 |
| 055954 | Spacer (use as required) | 12 |
| 163634 | Brace End | 1 |
| 163636 | Brace End | 1 |
| 022392 | Front Unit Application Drawing | |
| | Parts For Rear Mounting Brackets | |
| 137674 | Side Bar, Left | 1 |
| 137675 | Side Bar, Right | 1 |
| 163634 | Brace End | 1 |
| 163635 | Brace End | 1 |
| 022393 | Rear Unit Application Drawing | |

## 172493 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 172493 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 172489 | Side Bar, Right | 1 |
| 172490 | Side Bar, Left | 1 |
| 055954 | Spacer (use as required) | 12 |
| 163634 | Brace End | 2 |
| 163636 | Brace End | 2 |
| 022369 | Front Unit Application Drawing | |
| | Parts For Rear Mounting Brackets | |
| 159916 | Side Bar, Left | 1 |
| 159915 | Side Bar, Right | 1 |
| 163634 | Brace End | 2 |
| 163636 | Brace End | 2 |
| 022370 | Rear Unit Application Drawing | |

## 174365 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 174365 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| Parts For Front Mounting Brackets | | |
| 159638 | Side Bar, Right | 1 |
| 159642 | Side Bar, Left | 1 |
| 163634 | Brace End | 1 |
| 163636 | Brace End | 1 |
| F023674 | Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd | 12 |
| F013500 | Elastic Stop Nut | 12 |
| F001267 | Wrought Washer, 1/2" | 14 |
| 022291 | Front Unit Application Drawing | |
| Parts For Rear Mounting Brackets | | |
| 137675 | Side Bar, Right | 1 |
| 137674 | Side Bar, Left | 1 |
| F019762 | Cap Screw, 5/8-11 x 1-1/2" GR 8 Hex Hd | 4 |
| F013500 | Elastic Stop Nut | 4 |
| F001267 | Wrought Washer, 1/2" | 8 |
| F019501 | Cap Screw, 5/8-11 x 1-3/4" Hex Hd | 4 |
| F012452 | Elastic Stop Nut, Hex Hd | 4 |
| F001121 | Washer | 4 |
| 163634 | Brace End | 1 |
| 163635 | Brace End | 1 |
| F013141k | Muffler Clamp | 1 |
| 022292 | Rear Unit Application Drawing | |

## 175207 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 175207 | MOUNTING BRACKET GROUP | 1 |
| 181460 | Fastener Kit (for front and rear bracket mounting) | 1 |

Parts For Front Mounting Brackets

| | | |
|---|---|---|
| 162441 | Side Bar, Left | 1 |
| 162442 | Side Bar, Right | 1 |
| 158801 | Brace | 1 |
| 134233 | Bar | 6 |
| 164513 | Bar | 2 |
| F019762 | Cap Screw, 5/8-11 x 1-1/2" GR 8 Hex Hd | 4 |
| F012452 | Elastic Stop Nut, 5/8" | 4 |
| 168114 | Plate | 1 |
| 168115 | Plate | 1 |
| 168116 | Tube | 4 |
| F020672 | Cap Screw, 3/4-10 x 5" GR 8 Hex Hd. | 4 |
| F013633 | Elastic Stop Nut, 3/4"-10. | 4 |
| 138400 | Tube | 2 |
| F023887 | Cap Screw, M16 x 2.0 x 120 mm CL10.9 Hex Hd | 2 |
| F018811 | Cap Screw, 1/2-13 x 2-1/2" GR 8 Hex Hd | 6 |
| F018650 | Cap Screw, 1/2-13 x 1-1/2" GR 8 Hex Hd | 4 |
| F013500 | Elastic Stop Nut | 10 |
| 022302 | Front Unit Application Drawing | |

Parts For Rear Mounting Brackets

| | | |
|---|---|---|
| 137381 | Side Bar, Right | 1 |
| 137382 | Side Bar, Left | 1 |
| F023674 | Cap Screw, 1/2-13 x 1-3/4" GR 8 Hex Hd | 8 |
| F013500 | Elastic Stop Nut | 8 |
| F001267 | Wrought Washer, 1/2". | 4 |
| F040637 | Cap Screw, 3/4-10 x 1-3/4" GR 8 Hex Hd | 2 |
| F013633 | Elastic Stop Nut, 3/4"-10. | 2 |
| 163634 | Brace End. | 2 |
| 163635 | Brace End. | 2 |
| 022303 | Rear Unit Application Drawing | |

## 175660 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 175660 | MOUNTING BRACKET GROUP | 1 |
| 181461 | Fastener Kit (for front and rear bracket mounting) | 1 |
| Parts For Front Mounting Brackets | | |
| 159638 | Side Bar Assembly Right | 1 |
| 159642 | Side Bar Assembly Left | 1 |
| 055954 | Bar | 12 |
| 163636 | Brace End | 1 |
| 163634 | Brace End | 1 |
| 022353 | Front Unit Application Drawing | |
| Parts For Rear Mounting Brackets | | |
| 175657 | Side Bar, Right | 1 |
| 175658 | Side Bar, Left | 1 |
| 163636 | Brace End | 1 |
| 163634 | Brace End | 1 |
| 022354 | Rear Unit Application Drawing | |

## 180024 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 180024 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |
| Parts For Front Mounting Brackets | | |
| 184495 | Side Bar, Left | 1 |
| 184141 | Side Bar, Right | 1 |
| 163636 | Brace End | 2 |
| 163634 | Brace End | 2 |
| 022782 | Front Unit Application Drawing | |
| Parts For Rear Mounting Brackets | | |
| 180018 | Side Bar, Right | 1 |
| 180022 | Side Bar, Left | 1 |
| 163635 | Brace End | 2 |
| 163634 | Brace End | 2 |
| 022781 | Rear Unit Application Drawing | |

## 180717 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 180717 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |
| Parts For Front Mounting Brackets | | |
| 184495 | Side Bar, Left & Right | 2 |
| 163636 | Brace End | 2 |
| 163634 | Brace End | 2 |
| 022782 | Front Unit Application Drawing | |
| Parts For Rear Mounting Brackets | | |
| 180748 | Side Bar, Right | 1 |
| 180749 | Side Bar, Left | 1 |
| 163635 | Brace End | 2 |
| 163634 | Brace End | 2 |
| 022780 | Rear Unit Application Drawing | |

## 181717 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 181717 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |
| Parts For Front Mounting Brackets | | |
| 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 |
| 022927 | Front Unit Application Drawing | |
| Parts For Rear Mounting Brackets | | |
| 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 |
| 022928 | Rear Unit Application Drawing | |

## 184433 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 184433 | MOUNTING BRACKET GROUP | 1 |
| 181462 | Fastener Kit (for front and rear bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 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 Mounting Brackets | |
| 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 bracket mounting) | 1 |
| | Parts For Front Mounting Brackets | |
| 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 Mounting Brackets | |
| 184474 | Side Bar, Right | 1 |
| 184475 | Side Bar, Left | 1 |
| 163635 | Brace End | 2 |
| 163634 | Brace End | 2 |
| 023047 | Rear Unit Application Drawing | |

## 186265 MOUNTING BRACKET GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 186265 | MOUNTING BRACKET GROUP | 1 |
| 187178 | Fastener Kit (for front and rear bracket mounting) | 1 |

Parts For Front Mounting Brackets

| | | |
|---|---|---|
| 184477 | Side Bar, Left | 1 |
| 184469 | Side Bar, Right | 1 |
| F001267 | Wrought Washer, 1/2" | 18 |
| F009425 | SAE Washer, 5/8" | 2 |
| 184480 | Bar | 4 |
| 184486 | Bracket Right | 1 |
| 184487 | Bracket Left | 1 |
| 184491 | Shim | 2 |
| 023046 | Front Unit Application Drawing | |

Parts For Rear Mounting Brackets

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

## 186268 MOUNTING BRACKET GROUP

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

Parts For Front Mounting Brackets

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

Parts For Rear Mounting Brackets

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

## 188627 MOUNTING BRACKET GROUP

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

Parts For Front Mounting Brackets

| | | |
|---|---|---|
| 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 |
| 023324 | Front Unit Application Drawing | |

Parts For Rear Mounting Brackets

| | | |
|---|---|---|
| 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 |
| 023325 | Rear Unit Application Drawing | |

## 137353 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 137353 | WHEEL MODIFICATION GROUP | 1 |
| 133505 | WHEEL, 19-1/2 x 6" Rim | 5 |
| 133504 | Decal, Ratings Represent... | 1 |
| 136141 | Decal, Wheel Nut Torque 120 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 133600 | Spacer, Rear Wheel, 7/16" | 2 |
| 137039 | Spacer, Front Wheel, 1/16" | 2 |
| F016868 | Wheel Nut, 9/16"-18 RH (1" Hex) | 32 |
| 137908 | Stop Bolt, Left Front Wheel | 1 |
| 137909 | Stop Bolt, Right Front Wheel | 1 |
| M007298 | Spring, Extension | 2 |
| F019582 | Clip | 2 |
| F001099 | Cap Screw, 5/16-18 x 1" Hex Hd | 2 |
| F001100 | SAE Lock Washer, 5/16" | 2 |
| F007021 | Hex Nut, 5/16"-18 | 2 |
| 137349 | Spring, Compression | 2 |
| 019997 | Wheel Modification Application Drawing | |

## 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 |
| 136141 | Decal, Wheel Nut Torque 120 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 133600 | Spacer, 7/16" Front Wheel | 2 |
| 137882 | Stop, Left Wheel | 1 |
| 137881 | Stop, Right Wheel | 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 | |

## 162451 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 162451 | WHEEL MODIFICATION GROUP | 1 |
| 137670 | WHEEL, 19-1/2 x 6-3/4" | 5 |
| 137671 | Decal, Ratings Represent... | 1 |
| 136141 | Decal, Wheel Nut Torque 120 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 133600 | Spacer, 7/16" Front Wheel | 2 |
| 164036 | Wheel Stud, Front Wheels | 16 |
| 162449 | Stop, Right Wheel | 1 |
| 162450 | Stop, Left Wheel | 1 |
| F016365 | Cap Screw, 3/8-24 x 1-1/2" Hex Hd | 4 |
| F015839 | Hex Lock Nut, 3/8"-24 | 4 |
| 159920 | Bar | 2 |
| F001115 | Wrought Washer, 3/8" | 4 |
| F001025 | SAE Lock Washer, 3/8" | 4 |
| 021265 | 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 |
| 179142 | Decal, Wheel Nut Torque... | 5 |
| 169329 | Decal, This Vehicle Is Equipped With... | 2 |
| 184106 | Hex Flange Nut | 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 | |

## 170050 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 170050 | WHEEL MODIFICATION GROUP | 1 |
| 137649 | WHEEL, 19-1/2 x 6" | 5 |
| 137648 | Decal, Ratings Represent... | 1 |
| 170774 | Decal, Wheel Nut Torque 140 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 170736 | Spacer, Front Wheel, 7/16" | 2 |
| 170735 | SPACER, REAR WHEEL, 1-1/4" | 2 |
| 178170 | Wheel Stud | 16 |
| 162432 | Decal, Warning: Studs In This Brake Drum... | 1 |
| 180015 | Stud | 16 |
| 179142 | Decal, Wheel Nut Torque... | 5 |
| 179141 | Hex Flange Nut | 32 |
| F017989 | Wheel Nut, 9/16"-18 RH | 16 |
| 060814 | Wheel Stop (weld on) | 2 |
| M007298 | Spring, Extension | 2 |
| F019582 | Clip | 2 |
| F001099 | Cap Screw, 5/16-18 x 1" Hex Hd | 2 |
| F001100 | SAE Lock Washer, 5/16" | 2 |
| F007021 | Hex Nut, 5/16"-18 | 2 |
| 021870 | Wheel Modification Application Drawing | |

## 170051 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 170051 | WHEEL MODIFICATION GROUP | 1 |
| 137649 | WHEEL, 19-1/2 x 6" | 5 |
| 137648 | Decal, Ratings Represent... | 1 |
| 170774 | Decal, Wheel Nut Torque 140 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 170736 | Spacer, Front Wheel, 7/16" | 2 |
| 170735 | SPACER, REAR WHEEL, 1-1/4" | 2 |
| 178170 | Wheel Stud | 16 |
| 162432 | Decal, Warning: Studs In This Brake Drum... | 1 |
| 180015 | Stud | 16 |
| 179142 | Decal, Wheel Nut Torque... | 5 |
| 179141 | Hex Flange Nut | 32 |
| F017989 | Wheel Nut, 9/16"-18 RH | 16 |
| 170390 | Wheel Stop (weld on) | 2 |
| M007298 | Spring, Extension | 2 |
| F019582 | Clip | 2 |
| F001099 | Cap Screw, 5/16-18 x 1" Hex Hd | 2 |
| F001100 | SAE Lock Washer, 5/16" | 2 |
| F007021 | Hex Nut, 5/16"-18 | 2 |
| 137349 | Spring, Compression | 2 |
| 021871 | Wheel Modification Application Drawing | |

## 172501 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 172501 | 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 |
| 184106 | Hex Flange Nut | 32 |
| 179142 | Decal, Wheel Nut Torque... | 5 |
| 169329 | Decal, This Vehicle Is Equipped With... | 2 |
| F025796 | Wheel Nut | 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 |
| 172498 | Bar | 2 |
| 021758 | Wheel Modification Application Drawing | |
| 022111 | Steering Stop Application Drawing | |

## 180025 WHEEL MODIFICATION GROUP

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 180025 | WHEEL MODIFICATION GROUP | 1 |
| 181498 | WHEEL, 19-1/2 x 6" | 5 |
| 181508 | Decal, Ratings Represent... | 1 |
| 136140 | Decal, Wheel Nut Torque 100 Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 022739 | Wheel Modification 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 |
| 181612 | WHEEL, 19-1/2 x 6" | 5 |
| 184150 | Decal, Ratings Represent... | 1 |
| 184075 | Decal, Wheel Nut Torque 175 Dry Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 186130 | Spacer | 2 |
| 184550 | Hex Flange Nut | 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 |
| 187235 | Bar | 2 |
| 187092 | Bar | 1 |
| F019742 | Cap Screw, 3/8-16 x 1-3/4" GR 8 Hex Hd | 2 |
| F011998 | Elastic Stop Nut, 3/8"-16 | 2 |
| F006471 | Cap Screw, 1/4-20 x 1-3/4" GR5 Hex Hd | 2 |
| 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 |
| 179142 | Decal, Wheel Nut Torque 180-200 Dry Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 184106 | Hex Flange Nut | 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 |
| 181612 | WHEEL 19-1/2 x 6" | 5 |
| 184150 | Decal, Ratings Represent... | 1 |
| 184075 | Decal, Wheel Nut Torque 175 Dry Foot Pounds | 1 |
| 161453 | Decal, Warning: When Wheel/Tire... | 1 |
| 186130 | Spacer | 2 |
| 184550 | Hex Flange Nut | 32 |
| 188436 | Wheel Stop | 1 |
| 188437 | Wheel Stop | 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 | |

## 121658 WHEEL HOUSING MODIFICATION GROUP - CHEVROLET AND GMC ONLY

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 121658 | WHEEL HOUSING MODIFICATION GROUP | 1 |
| 118074 | Sheet, 4 x 53" | 2 |
| 118075 | Sheet, 4 x 6-1/2" | 4 |
| F009602 | Self Tapping Screw, #10 x 1/2" Hex Flg Hd | 120 |
| F001118 | Cap Screw, 5/16-18 x 1-1/2" Carriage Hd | 6 |
| F007120 | Hex Grip Nut, 5/16"-18 | 6 |
| F022221 | Caulking | 1 |
| 017280 | Rear Wheel Housing Modification - Metal Floor | |
| 017281 | Rear Wheel Housing Modification - Wood Floor | |

## 121659 WHEEL HOUSING MODIFICATION GROUP - FORD ONLY

| PART NO | DESCRIPTION | QTY |
|---|---|---|
| 121659 | WHEEL HOUSING MODIFICATION GROUP | 1 |
| 118016 | Sheet, 4 x 15" | 2 |
| 118017 | Sheet, 4 x 17-1/2" | 4 |
| 118018 | Sheet, 1-1/2 x 6-1/2" | 4 |
| F009602 | Self Tapping Screw, #10 x 1/2" Hex Flg Hd | 120 |
| F022221 | Caulking | 1 |
| 017271 | Rear Wheel Housing Modification | |

# SECTION 8 - VEHICLE APPLICATIONS
# TABLE OF CONTENTS

| | 1997 CHEV/GMC K20753 4 X 4 EXTENDED CAB 8,600 GVWR | 1997 CHEV/GMC C20906 4 X 2 SUBURBAN 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 176597 | 175669 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 167879 | 175660 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 162451 |
| Wheel Housing Modification | ——— | 121658 |
| Application Drawing - Front | 022392 | 022353 |
| Application Drawing - Rear | 022393 | 022354 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1997 CHEV/GMC K20906 4 X 4 SUBURBAN 8,600 GVWR | 1997 CHEV/GMC K30903 4 X 4 REGULAR AND CHASSIS CAB WITH SRW 8,200 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 175683 | 174366 |
| Rail Pilot Unit - Front or Rear | 172423 | 174376 |
| Mounting Brackets | 172493 | 163169 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 172501 | 169031 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 022369 | 022296 |
| Application Drawing - Rear | 022370 | 022297 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

1997 CHEV/GMC
C30943 4 X 2
CREW AND
CHASSIS CAB
9,000 GVWR

REQUIRED GROUPS

HY-RAIL® Application . . . . . 174364
Rail Pilot Unit - Front or Rear . . . . . 172423
Mounting Brackets . . . . . 174365
Steering Lock . . . . . 169632
Wheel Modification . . . . . 159849
Wheel Housing Modification . . . . . 121658
Application Drawing - Front . . . . . 022291
Application Drawing - Rear . . . . . 022292

GUIDE WHEEL OPTIONS

Steel Tread . . . . . 138113
Rubber Tread . . . . . 138093

BUMPER GROUPS

Front and Rear With Sight Rods . . . . . 172459
Front Only With Sight Rods . . . . . 172458
Rear Only . . . . . 172460

ACCESSORY GROUP OPTIONS

* Rail Sweeps . . . . . 162321
* Derail Skids . . . . . 137682
Wheel Weighing Jack . . . . . 073527
* Roof Mount Strobe Light . . . . . 156020
In Cab Highway Actuation . . . . . 175625

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* Recommended Safety Option

| | 1998 CHEV/GMC K20753 4 X 4 EXTENDED CAB 8,600 GVWR | 1998 CHEV/GMC K20903 4 X 4 REGULAR AND CHASSIS CAB 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 176597 | 178201 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 167879 | 169032 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 169031 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 022392 | 022296 |
| Application Drawing - Rear | 022393 | 022297 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1998 CHEV/GMC C20906 4 X 2 SUBURBAN 8,600 GVWR | 1998 CHEV/GMC K20906 4 X 4 SUBURBAN 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 175669 | 175683 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 175660 | 172493 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 162451 | 172501 |
| Wheel Housing Modification | 121658 | ——— |
| Application Drawing - Front | 022291 | 022369 |
| Application Drawing - Rear | 022354 | 022370 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1998 CHEV/GMC K30903 4 X 4 REGULAR AND CHASSIS CAB WITH SRW 9,200 GVWR | 1998 CHEV/GMC C30943 4 X 2 CREW AND CHASSIS CAB 9,000 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 174366 | 174364 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 169032 | 163169 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 159849 |
| Wheel Housing Modification | ——— | 121658 |
| Application Drawing - Front | 022296 | 022291 |
| Application Drawing - Rear | 022297 | 022292 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 CHEV/GMC K20753 4 X 4 EXTENDED CAB 8,600 GVWR | 1999 CHEV/GMC K20903 4 X 4 REGULAR AND CHASSIS CAB 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 176597 | 178201 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 167879 | 169032 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 169031 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 022296 | 022296 |
| Application Drawing - Rear | 022393 | 022297 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 CHEV/GMC C20906 4 X 2 SUBURBAN 8,600 GVWR | 1999 CHEV/GMC K20906 4 X 4 SUBURBAN 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 175669 | 175683 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 175660 | 172493 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 162451 | 172501 |
| Wheel Housing Modification | 121658 | ——— |
| Application Drawing - Front | 022291 | 022369 |
| Application Drawing - Rear | 022354 | 022370 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 CHEV/GMC K30903 4 X 4 REGULAR AND CHASSIS CAB WITH SRW 9,200 GVWR | 1999 CHEV/GMC C30943 4 X 2 CREW CAB WITH SRW 9,000 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 174366 | 174364 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 169032 | 163169 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 159849 |
| Wheel Housing Modification | ——— | 121658 |
| Application Drawing - Front | 022296 | 022291 |
| Application Drawing - Rear | 022297 | 022297 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 CHEV/GMC C25753 4 X 2 EXTENDED CAB PICKUP WITH 6-1/2' BOX 7,200 GVWR | 2000 CHEV/GMC C25903 4 X 2 REGULAR PICKUP WITH 8' BOX 7,200 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 188384 | 188384 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 188627 | 188627 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 187299 | 187299 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 023324 | 023324 |
| Application Drawing - Rear | 023325 | 023325 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 2000 CHEV/GMC C25903 4 X 2 REGULAR CAB WITH 8' BOX 7,200 GVWR | 2000 CHEV/GMC C25953 4 X 2 EXTENDED CAB WITH 8' BOX 8,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 188384 | 188384 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 188627 | 188627 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 187299 | 187299 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 023324 | 023324 |
| Application Drawing - Rear | 023325 | 023325 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 CHEV/GMC K30903 4 X 4 CHASSIS CAB WITH SRW 9,200 GVWR | 2000 CHEV/GMC C30943 4 X 2 CREW CAB WITH SRW 9,000 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 174366 | 174364 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 169032 | 163169 |
| Steering Lock | 169632 | 169632 |
| Wheel Modification | 169031 | 159849 |
| Wheel Housing Modification | ——— | 121658 |
| Application Drawing - Front | 022296 | 022291 |
| Application Drawing - Rear | 022297 | 022297 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1997 FORD F250 HD 4 X 2 REGULAR CAB STYLESIDE 8,600 GVWR | 1997 FORD F250 HD 4 X 4 SUPER CAB STYLESIDE 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 175234 | 176664 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 159311 | 158791 |
| Steering Lock | 158687 | 158687 |
| Wheel Modification | 137353 | 170050 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 022313 | 022429 |
| Application Drawing - Rear | 022314 | 022430 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

1997 FORD
F350 4 X 4
CREW CAB
STYLESIDE
WITH SRW
9,200 GVWR

REQUIRED GROUPS

HY-RAIL® Application . . . . . 174395
Rail Pilot Unit - Front or Rear . . . . . 172423
Mounting Brackets . . . . . 175207
Steering Lock . . . . . 158687
Wheel Modification . . . . . 170051
Wheel Housing Modification . . . . . 121659
Application Drawing - Front . . . . . 022302
Application Drawing - Rear . . . . . 022303

GUIDE WHEEL OPTIONS

Steel Tread . . . . . 138113
Rubber Tread . . . . . 138093

BUMPER GROUPS

Front and Rear With Sight Rods . . . . . 172459
Front Only With Sight Rods . . . . . 172458
Rear Only . . . . . 172460

ACCESSORY GROUP OPTIONS

* Rail Sweeps . . . . . 162321
* Derail Skids . . . . . 137682
Wheel Weighing Jack . . . . . 073527
* Roof Mount Strobe Light . . . . . 156020
In Cab Highway Actuation . . . . . 175625

* Recommended Safety Option

| | 1998 FORD EXPEDITION 4 X 4 7,200 GVWR | 1998 FORD F150 4 X 2 REGULAR CAB STYLESIDE 6,000 / 6,550 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 180716 | 181690 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180717 | 181717 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180718 | 180718 |
| Wheel Housing Modification | ——— | ——— |
| Application Drawing - Front | 022782 | 022927 |
| Application Drawing - Rear | 022780 | 022928 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1998 FORD F250 LD 4 X 2 REGULAR CAB STYLESIDE 7,700 GVWR | 1998 FORD F250 LD 4 X 2 SUPER CAB STYLESIDE 7,500 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 180049 | 180049 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180024 | 180024 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180025 | 180025 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 022782 | 022782 |
| Application Drawing - Rear | 022781 | 022781 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1998 FORD F250 LD 4 X 4 REGULAR CAB STYLESIDE 7,700 GVWR | 1998 FORD F250 LD 4 X 4 SUPER CAB STYLESIDE 7,700 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 180049 | 180049 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180024 | 180024 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180025 | 180025 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 022782 | 022782 |
| Application Drawing - Rear | 022781 | 022781 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD EXPEDITION 4 X 4 7,200 GVWR | 1999 FORD F150 4 X 2 REGULAR CAB STYLESIDE 6,000 / 6,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 180716 | 181690 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180717 | 181717 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180718 | 180718 |
| Wheel Housing Modification | 121659 | ——— |
| Application Drawing - Front | 022782 | 022927 |
| Application Drawing - Rear | 022780 | 022928 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F250 LD 4 X 2 REGULAR CAB STYLESIDE 7,700 GVWR | 1999 FORD F250 LD 4 X 2 SUPER CAB STYLESIDE 7,700 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 180049 | 180049 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180024 | 180024 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180025 | 180025 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 022782 | 022782 |
| Application Drawing - Rear | 022781 | 022781 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD F250 LD 4 X 4 REGULAR CAB STYLESIDE 7,700 GVWR | 1999 FORD F250 LD 4 X 2 SUPER CAB STYLESIDE 7,700 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 180049 | 180049 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180024 | 180024 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180025 | 180025 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 022782 | 022782 |
| Application Drawing - Rear | 022781 | 022781 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F250 HD 4 X 2 REGULAR CAB PICKUP 8,800 GVWR | 1999 FORD F250 HD 4 X 2 SUPER CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184510 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184433 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023038 | 023038 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD F250 HD 4 X 2 CREW CAB PICKUP 8,800 GVWR | 1999 FORD F250 HD 4 X 4 REGULAR CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023038 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F250 HD 4 X 4 SUPER CAB PICKUP 8,800 GVWR | 1999 FORD F250 HD 4 X 4 CREW CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184514 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184459 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023047 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD F350 4 X 2 REGULAR CAB PICKUP WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 2 SUPER CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184510 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184433 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Wheel Housing Modification | ——— | 121659 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023038 | 023038 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F350 4 X 2 CREW CAB PICKUP WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 4 REGULAR CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023038 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD F350 4 X 4 SUPER CAB PICKUP WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 4 CREW CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 184514 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184459 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023047 | 023047 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F350 4 X 2 REGULAR CHASSIS CAB WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 2 SUPER CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 186275 | 186275 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 186268 | 186268 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023206 | 023206 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 1999 FORD F350 4 X 2 CREW CHASSIS CAB WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 4 REGULAR CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 186275 | 186274 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 186268 | 186265 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023206 | 023206 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 1999 FORD F350 4 X 4 SUPER CHASSIS CAB WITH SRW 9,900 GVWR | 1999 FORD F350 4 X 4 CREW CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 186274 | 186274 |
| Rail Pilot Unit - Front | 172423 | 172423 |
| Mounting Brackets | 186265 | 186265 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023206 | 023206 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 FORD EXPEDITION 4 X 4 7,200 GVWR | 2000 FORD F150 4 X 2 REGULAR CAB STYLESIDE 6,000 / 6,600 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 180716 | 181690 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 180717 | 181717 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 180718 | 180718 |
| Wheel Housing Modification | 121659 | ——— |
| Application Drawing - Front | 022782 | 022927 |
| Application Drawing - Rear | 022780 | 022928 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 2000 FORD F250 HD 4 X 2 REGULAR CAB PICKUP 8,800 GVWR | 2000 FORD F250 HD 4 X 2 SUPER CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184510 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184433 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023038 | 023038 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 FORD F250 HD 4 X 2 CREW CAB PICKUP 8,800 GVWR | 2000 FORD F250 HD 4 X 4 REGULAR CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023038 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 2000 FORD F250 HD 4 X 4 SUPER CAB PICKUP 8,800 GVWR | 2000 FORD F250 HD 4 X 4 CREW CAB PICKUP 8,800 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184514 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184459 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023047 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 FORD F350 4 X 2 REGULAR CAB PICKUP WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 2 SUPER CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184510 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184433 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023038 | 023038 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps | 162321 | 162321 |
| * Derail Skids | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

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| | 2000 FORD F350 4 X 2 CREW CAB PICKUP WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 4 REGULAR CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 184510 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184433 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023038 | 023047 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 FORD F350 4 X 4 SUPER CAB PICKUP WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 4 CREW CAB PICKUP WITH SRW 9,900 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 184514 | 184514 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 184459 | 184459 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Wheel Housing Modification | 121659 | 121659 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023047 | 023047 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 2000 FORD F350 4 X 2 REGULAR CHASSIS CAB WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 2 SUPER CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 186275 | 186275 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 186268 | 186268 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 184448 |
| Application Drawing - Front | 023037 | 023037 |
| Application Drawing - Rear | 023206 | 023206 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

| | 2000 FORD F350 4 X 2 CREW CHASSIS CAB WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 4 REGULAR CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| **REQUIRED GROUPS** | | |
| HY-RAIL® Application | 186275 | 186274 |
| Rail Pilot Unit - Front or Rear | 172423 | 172423 |
| Mounting Brackets | 186268 | 186265 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 184448 | 188439 |
| Application Drawing - Front | 023037 | 023046 |
| Application Drawing - Rear | 023206 | 023206 |
| **GUIDE WHEEL OPTIONS** | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| **BUMPER GROUPS** | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| **ACCESSORY GROUP OPTIONS** | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

* Recommended Safety Option

| | 2000 FORD F350 4 X 4 SUPER CHASSIS CAB WITH SRW 9,900 GVWR | 2000 FORD F350 4 X 4 CREW CHASSIS CAB WITH SRW 9,900 GVWR |
|---|---|---|
| REQUIRED GROUPS | | |
| HY-RAIL® Application | 186274 | 186274 |
| Rail Pilot Unit - Front | 172423 | 172423 |
| Mounting Brackets | 186265 | 186265 |
| Steering Lock | 181548 | 181548 |
| Wheel Modification | 188439 | 188439 |
| Application Drawing - Front | 023046 | 023046 |
| Application Drawing - Rear | 023206 | 023206 |
| GUIDE WHEEL OPTIONS | | |
| Steel Tread | 138113 | 138113 |
| Rubber Tread | 138093 | 138093 |
| BUMPER GROUPS | | |
| Front and Rear With Sight Rods | 172459 | 172459 |
| Front Only With Sight Rods | 172458 | 172458 |
| Rear Only | 172460 | 172460 |
| ACCESSORY GROUP OPTIONS | | |
| * Rail Sweeps - Front | 162321 | 162321 |
| * Derail Skids - Front | 137682 | 137682 |
| Wheel Weighing Jack | 073527 | 073527 |
| * Roof Mount Strobe Light | 156020 | 156020 |
| In Cab Highway Actuation | 175625 | 175625 |

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* Recommended Safety Option

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