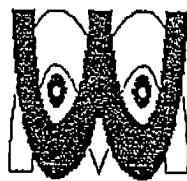


MFG: WISDOM COMPANY  
NAME: CAROUSEL

*Type: Non-Kiddie*

# CAROUSEL

## *Operation and Maintenance Manual*



WMI

Industries, Ltd.

P.O. Box 5000  
Sterling, CO 80751  
303-522-7515

# CAROUSEL SPECIFICATIONS

## SIZE SET UP:

DIAMETER.....36'6"  
HEIGHT.....20'  
NUMBER OF HORSES.....30  
NUMBER OF CHARIOTS.....2  
ELECTRICAL REQUIREMENTS  
220 3 PHASE.....15 KW  
NUMBER OF LIGHTS  
60 VOLT 3 WATT.....1780  
120 VOLT 10 WATT.....264  
MOTOR SIZE.....5 HP  
RIDE RPM.....5.1  
CAPACITY  
ADULTS.....36  
CHILDREN.....36

## SIZE PACKAGED FOR TRANSPORT

WIDTH.....8'6"  
LENGTH.....3/4"  
HEIGHT.....13'6"  
WEIGHT.....32,000

# ASSEMBLY INSTRUCTIONS FOR THE CAROUSEL

1. Select an appropriate site according to the set-up and area requirements drawing.
2. Raise work platforms on sides of trailer and install braces.
3. Extend the four telescoping arms on centerpole into down position then pin and insert R-clip.
4. Place the four leg stands under the ends of the centerpole legs.
5. Screw down the four centerpole leg jackstands until they are snug on the leg stands.
6. Loosen but do not remove the two centerpole hold down bolts in the middle of the centerpole.
7. Screw down the front jackstands on centerpole structure (closest to trailer) so that canopy sweeps tilt upward two or three inches.
8. Remove the two hanging scenery cross brackets over the top of the hanging scenery.
9. Remove the two sweep transport rods that hold the end of the outside sweeps on the air supported rack.
10. Let the air out of the air bags for the sweep support. The valve is located on the passenger side of the trailer under the gooseneck.
11. Unhook the two safety chains from the ends of the outside sweeps.
12. Unfold canopy sweeps from both sides at the same time. Use a platform rod to pull on the outside sweeps.
13. After canopy is completely unfolded place turnbuckles into turnbuckle receivers at the top and bottom of the sweep truss. Tighten until you can install the two center sweep pins.
14. Unpin last cresting from the side of the sweep and swing into place. Pin the cresting to the opposite sweep with two pins.
15. Lower the light bar to the brackets on the side of the sweeps.
16. Insert crank into coupling receiver and pin the end of box.
17. Raise the end of the crank until you can swing out the end of the short and long spreaders.
18. Lower the crank into the saddles on the spreaders.

19. Turn ride to swing out the next spreaders. Repeat steps 15 through 18 until all of the spreaders are open.
20. Lay canvas cable in hook on the end of the canopy sweep. Turn ride and hook the cable on each sweep until the end of the cable and the end of the turnbuckle are hooked together. Tighten cable.
21. Remove the two tie down bolts that hold the centerpole to the rear of the trailer.
22. Raise centerpole high enough to clear the alignment plates on the trailer.

NOTE:

IT IS BEST TO TIP THE CENTERPOLE BACK SLIGHTLY TO GIVE EXTRA CLEARANCE TO THE SCENERY ON TOP OF THE TRAILER.

23. Pull trailer forward four feet to provide greater access room on top of trailer.
24. Install the twelve medallions or lions heads on the end of the sweeps.
25. Hang lower centerpole hanging scenery under the cranks.
26. Pin the lower end of the scenery together.
27. The upper centerpole hanging scenery can be placed on top of the lower scenery and lean out until it rests on the tab on the sweep truss.
28. Plug in the lights on the hanging scenery.
29. Place canvas pole over stud located on top of centerpole structure.
30. Fold out the canvas on top of the sweeps.
31. Fasten the bail ring together on the center of the canvas.
32. Hook the block and tackle to bail ring and lift about 2 feet.
33. Lace the two halves of the canopy canvas together.
34. Attach snap rings on outside edge of canvas to the canvas cable that runs around perimeter of canopy.

WARNING:

BE CAREFUL WHILE YOU ARE SPREADING THE CANVAS. IF YOU TURN THE RIDE THE CANVAS CAN GET CAUGHT IN THE CRANKS AND TEAR THE CANVAS.

35. Pull up the canvas part way.

36. Install quarterpoles by inserting long pin through the eye in the canopy canvas then while pushing up on the canvas insert the opposite pin into the corresponding hole in the sweep.
37. Tie off the quarter poles to the sweep with the rope that is attached to the canvas.
38. Pull the canvas up until it is tight and tie off.
39. Pull trailer forward from under the sweeps and canopy of the ride.
40. Level the centerpole.
41. Install the two outrigger legs to the front and back side of the centerpole and snug them up.
42. Install the leg braces between the outrigger legs.
43. Hang the inside scenery. Start with the band organ panel and the door panel. Hang them on the sides of the screw jacks on the centerpole legs.
44. Install the "S" shaped piece of rod in the end of the front and back outrigger leg.
45. Hang the four other lower scenery panels.
46. Install the inside scenery upper slopping panels and pin in place.
47. Lower the lower side doors on the trailer.
48. Hook the platform rods under the sweeps. The outside rod hook points toward the center and the inside platform rod hook points out.

NOTE:

THERE ARE TWO RODS WITH AN EXTRA BRACKET ATTACHED FOR THE SWAY ROD. THEY MUST BE PLACED ON THE INSIDE OF THE PLATFORM NEXT TO THE SWEEP WITH THE EXTRA EAR FOR THE SWAY ROD.

49. Slide out the platforms and hang them on the platform rods. Be sure to hang the two platforms for the chariots under the sweeps without the cranks.
50. Install the two sway rods. They hook to the sweep with the extra ear inside the platform rod hook. They go diagonally across to the next platform rod hook where the chariot sits.
51. Install the sides of the chariot into the holes in the two platforms.
52. Hook the chariot seat between the chariot sides.
53. Safety key the four pins for each chariot that stick through the platform deck.
54. Hang the horses.

55. Install the safety pin under each horse rod hook as you install the horses.
56. Install the telescopes. Swing the horse forward or back to be able to slide the telescope up from the bottom.
57. Line up the notches on the bottom of the telescope and the pivot stub in the telescope pocket mounted in the platform.
58. Push down on the telescope and turn 1/4 turn until the telescope goes into the notches.
59. Install all horses as above.

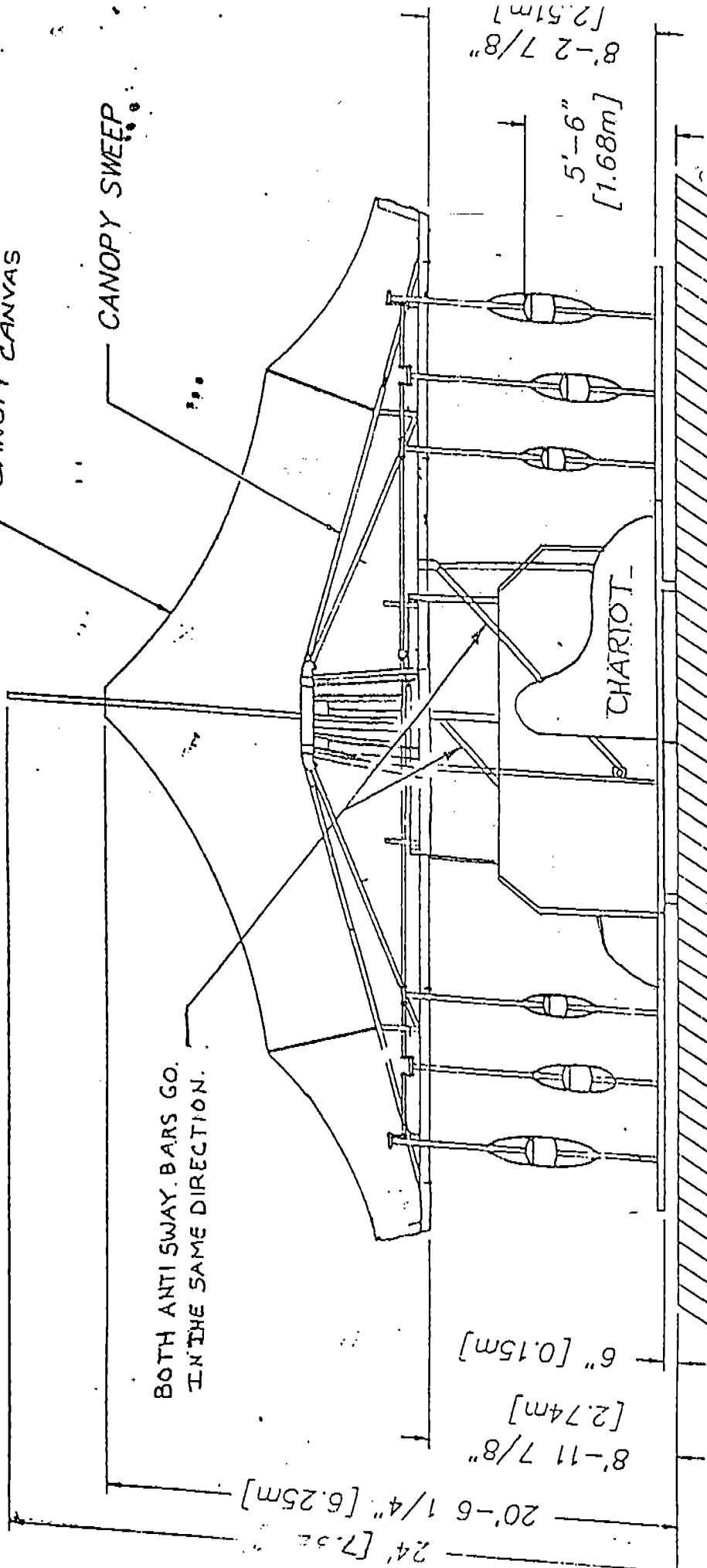
---

### TEST RUN THE RIDE.

---

To tear down the ride reverse the assembly procedure.

Be sure to turn on the air to the air support system for the top sweeps before moving on the road. The air pressure should be set for 40-50 PSI.



# CAROUSEL DAILY INSPECTION CHECKLIST

Check that the cranks are pinned into the box on the stub shaft next to the bevel gears.

Check that the lock collars on each side of each horse rod hook are tight.

Check that the telescopes are in the pockets.

Check the bevel gear for broken teeth or objects in the teeth that will break the teeth on the gear.

Check that the motor brake is working and stops the ride smoothly.

Check that the ride starts smoothly.

Check that the horses are not loose on the poles.

Check that the chariot is pinned under the floor.

Check that the chariot seat is hooked to both sides.

Check that the platforms are down completely into the platform support hook.

Check the platforms for uneven edges at the seams.

Check that all of the lower hanging scenery is hooked on the pins and is pinned

Check the upper hanging scenery that it is behind the tabs on the sweeps.

Check that the ride turns the proper direction.

Run the ride and listen for unusual noises indicating a part that might be catching as the horses go up and down.



## OPERATION OF THE CAROUSEL

Turn on the main power.

Check that all horses are safety pinned to the crank.

Check that the crank is pinned into the stub shaft box next to the bevel gears.

Check that the ride rotates in the proper direction.

Check that the ride starts and stops smoothly.

Check the platform for loose objects or cords that someone may trip on.

Run ride through several cycles before loading passengers.

Load passengers.

Take tickets.

Press the start button.

If a passenger wants to hold a small child on the horse they must stand to the inside of the horse.

Passengers in the chariots must be seated at all times while the ride is running.

Do not allow anyone to jump on or off of the ride while it is turning.

Do not allow anyone to change horses while the ride is turning.

To stop the ride press the stop button.

**STOP THE RIDE IMMEDIATELY IF A PASSENGER IS MOVING ON THE PLATFORM.**

# CAROUSEL MAINTENANCE GUIDELINES

## MAIN BEARING

Grease main centerpole bearing weekly with 1 to 2 shots of grease in each of the four grease zerks.

## CRANK BEARINGS

Grease with one shot of grease monthly.

## CRANK SADDLE PLASTIC BEARINGS

One to two drops of machine oil when they are squeaking.

## HORSE ROD SADDLE PLASTIC BEARINGS

One to two drops of machine oil when they are squeaking.

## TELESCOPE SLEEVE

Wipe a little machine oil on the plastic sleeve when you set up the ride.

## TELESCOPE POCKET

Put a little grease on each tab that sticks out on the inside of the telescope pocket.

## MOTOR BRAKE ADJUSTMENT

Remove the motor fan cover from the end of the motor. Remove the two allen head cap screws from the end of the motor shaft. Turn fan center hub in one quarter turn to increase the braking or out one quarter turn to reduce the braking. Reinstall allen head cap screws. Replace fan cover.

## MAIN DRIVE GEAR

Spray an open gear lubrication grease on the gears as the ride turns. Once a week is usually enough.

## MOTOR SOFT START

Remove the cover from the motor soft start. Adjust the acceleration time and the torque to give the ride a smooth start.

## BEVEL GEAR LUBRICATION

Spray an open gear lubrication onto the gears. Try to use as little as possible to prevent wear on the gears.

## BEVEL GEAR ADJUSTMENT

If the horses are flopping at the top of the crank stroke the bevel gears need to be adjusted. Loosen the two bolts on the crank bearing and add or remove a sham from under the bearing. Tighten the bolts. If a finer adjustment is needed loosen the lock collar on the crank bearing and slide the shaft in and out to eliminate the slack. If the gear is too tight the teeth on the sprocket will wear.

## COMMENTATOR BRUSHES

Check the commentator brushes in the centerpole for wear each week. If the ring is black from arcing the brushes will need to be adjusted or replaced.

## SAFETY REQUIREMENTS

The key to safety is well trained and supervised employees. Make certain that all employees know how the ride operates. The employees should have a good attitude towards safety and common sense.

### REMEMBER, SAFETY MUST ALWAYS COME BEFORE REVENUE.

Do not neglect the employee's safety. Before starting the ride, be certain there are no personnel inside the fences or on the ride structure. Be certain all electricity is turned off whenever an employee might come into contact with electrical connections or components. Safety helmets should be worn by all personnel when erecting or disassembling a ride.

### GENERAL SAFETY GUIDELINES

The following is a list of a few general rules which should be adhered to by everyone. Remember that in the long run, the key to a safe and successful operation is to have well-trained and well supervised employees.

1. All work must be done by competent, qualified mechanics capable of understanding the function of the parts and their proper installation.
2. Inspect the ride each day of operation to determine that no portion of the ride is damaged, omitted, or worn in such a manner that it is unsafe, or that unsafe conditions may develop.
3. Perform manufacturer's recommended maintenance procedures at intervals and in the manner specified by the Operation and Maintenance Manual, in the following general areas.
  - a) Lubrication
  - b) Air, hydraulic, and electrical systems
  - c) Torquing of bolts
  - d) Wear of bolted or pinned joints
  - e) Adjustment and care of mechanical components such as; brakes, clutches and air compressors
  - f) Passenger securing devices
  - g) All parts are present and installed
  - h) Operating and emergency controls
  - i) Factory installed safety devices
4. Study each job carefully to determine all hazards so that necessary safeguards can be taken.
5. Examine safety devices, tools, ladders, etc. before they are used to make sure they are in good condition.
6. Use the proper tool or equipment for each job. Ground all hand electric power tools before use unless the manufacturer advises otherwise.

7. Wear close fitting comfortable clothing when working on or close to mechanical apparatus or live electrical circuits. Avoid finger rings, jewelry, or other articles which may be caught in moving parts or come in contact with electrical circuits.
8. Protect your eyes by wearing approved safety glasses or goggles.
9. Wear hard hats at all times. When working in elevated areas, use a safety belt.
10. Where work is to be performed is hazardous, such as live electrical circuits, at least two men should work together.
11. If guards must be removed from equipment, make sure they are replaced before leaving the job.
12. Clean up each job and dispose of surplus materials.
13. Keep a record of parts replaced and date of replacement. Inform the manufacturer of any replacement requirements that are frequent or cause unsafe conditions.
14. Make modifications and additions as outlined in the manufacturer's Service and Safety Bulletins.

## OPERATOR RESPONSIBILITIES

1. **HANDICAPPED PERSONS** - Persons who are physically handicapped must not be allowed to ride violent or fast moving rides. If the management of the amusement area allow handicapped to ride certain slow rides, the operator must ensure that the handicapped person is under the full control of an adult person who will ride with them and provide supervision during the ride.
2. **PROHIBITED PASSENGERS** - Operators should not allow a passenger on the ride who cannot be properly secured due to his size or if there is a malfunction to the securing device. Similarly, they must refuse service to a pregnant woman, or a passenger who is visibly ill, or under the influence of alcohol or drugs.
3. **CLEARANCE PRECAUTION** - Before operating the ride, it is important to ensure that there are no personnel around the ride structure or any exposed electrical components or other areas where there could be a risk of injury.
4. **ON-DUTY ATTENTION** - Insist that each operator remain in full control of the operating controls during operation of the ride with complete attention to the ride and passengers. Under no circumstances should the operator leave his or her position while the ride is in operation.  
  
If it does become necessary for the operator to leave his post at the controls, he must turn the ride off completely to ensure it does not accidentally start and injure passengers or staff.
5. **INSPECTION/CHECK LIST** - Operators must inspect the ride and complete a General Check List before each day's operation.
6. **DAILY WARM-UP** - The operator must always run the ride through several cycles before the first passengers are loaded. This warm-up without passengers is necessary to make sure the ride is safe and there are no problems mechanically not detected previously.
7. **PRECAUTIONS BEFORE AND DURING THE RIDE** - Never start the ride unless the operator or assistant is facing the ride and is in a position to observe the whole area because:
  - Patrons have been known to jump fences.
  - Patrons have been known to try to change positions while the ride is running.
  - Patrons have been known to "skylark" causing their own safety and that of others to be put in jeopardy.
  - The operator's assistant may wish to make a last minute adjustment and be put in a dangerous position when the operator puts the ride in motion.
8. **SMOKING** - Smoking is not allowed in the GRAVITRON. This includes the operator as well as the passengers.

9. **LOOSE ITEMS** - The area inside the Gravitron must be clear of any items that can fly out to the edge of the ride when it gets up to speed.
10. **FOOD AND DRINK** - It is recommended that no food or drink be allowed onto the ride.

## OPERATOR SELECTION AND INSTRUCTION

1. Select competent, mature operators, capable of understanding the function and use of amusement rides and their control.
2. Instruct each operator fully in the proper use and function of the ride he is to supervise, including:
  - a) Controls and procedures for normal and emergency operation.
  - b) Manufacturer's recommended maximum speed and load.
  - c) Manufacturer's recommended length of ride time and frequency of repeat rides.
  - d) Any foreseeable misuse of the ride as determined by the manufacturer or owner, or by special conditions such as weather, location or crowds.
  - e) Each operator must have immediate availability of a Manufacturer's Operation Manual for the ride he supervises.
3. Require each operator to inspect the ride he supervises, each day of the operation.
  - a) Determine that no portion of the ride is damaged, omitted or worn in such a manner that it is unsafe or that it may develop into an unsafe condition.
  - b) Report any irregularities to the superintendent or owner.
  - c) Do not operate the ride if any irregularities are found until such condition has been corrected.
4. Instruct the operator to allow no passengers to ride who are visibly ill, or under the influence of drugs or alcohol.
5. Instruct operators and attendants on the proper methods of securing passengers in the ride. Do not allow a passenger to board a ride if he cannot be properly secured because of his size or because there is a malfunction of the securing device.

**STOP the ride immediately if any passenger is observed moving from their seat, turning upside down, or behaving dangerously.**
6. Advise the operator against starting or operating the ride while any person (passenger, spectator, or employee) is in an endangered or unsafe position on the ride, or within the ride area.
7. Insist that each operator remain in full control of the operating controls during operation of the ride, and gives his full attention to the ride and its passengers.
8. Instruct the operator to let no other person, other than another trained operator, operate the controls of the ride, except those portions of the ride that are specifically designed to be controlled by the passenger.

9. Advise the operator that factory-installed safety devices are not to be tampered with or removed.
10. Advise the operator of owner/supervisor procedures for assisting ill or injured passengers.
11. Instruct operators and attendants that patrons are required to secure all articles, such as keys, change, eye glasses, etc., which may become loose while riding.



## BOLT TIGHTENING

**CAUTION:** Torque values are given for steel bolts and steel nuts screwed into threaded holes in steel. Be certain threaded parts are not aluminum, brass, or other soft alloys.

### BOLT TORQUE CHART

Bolt Size Grade 5	Max Torque	Recommended Torque Reusable Bolt	Recommended Torque Permanent Bolt
U.N.C.	ft. lbs.	f. lbs.	ft. lbs.
3/8	27	24	26-28
1/2	66	55	60-66
5/8	130	95	125-130
3/4	230	180	220-230
7/8	370	290	360-370
1	560	480	540-560

Maximum torque listed is 65% proof load of bolt.

**NOTE:** It is important to note the necessity of lightly oiling bolt before use as outlined above.

### TORQUE METHODS (No torque wrench)

#### LEVERAGE METHOD

The average 200-225 lb. mechanic, while standing on his feet, can apply a steady pull with his good arm (right arm if right handed, etc.) of between 100 and 110 lbs. This pull is obtained without bracing his feet or free hand against any solid object such as a work bench or the machinery being worked on.

If a torque of any given value is desired, it becomes a simple matter of leverage. If the mechanic in question is tightening a 7/8" UNC thread bolt which recommends 520 ft. lbs. of torque, this value can be reached by using a heavy duty socket wrench and slipping a 5 ft. length of pipe over the handle of the wrench.

Thus if the mechanic can exert a 100 lb. pull, 5 feet times 100 lbs. would equal 500 ft. lbs. Any other torque desired can be reached by simply dividing the desired torque value by approximately 110 to determine the length of the pipe or "cheater" bar that is needed.

## TURN OF THE NUT METHOD

This method applies only to bolts with UNC threads. If the bolt is shorter than eight times its diameter, tighten the nut until the pieces being joined are snugged up. Put a reference mark on the nut or socket wrench being used and tighten the nut, while preventing the bolt from turning, until the nut has been turned an additional  $1/2$  of a turn. If the bolt is longer than eight times its diameter, proceed as above but tighten the nut  $3/4$  of a turn. This will apply a preload to the bolt that will be very close to the same value that would be achieved if a torque wrench had been used.

## PNEUMATIC TIRES ON AMUSEMENT DEVICES AND SUPPORT VEHICLES

- \* It is strongly recommended to carry a quality spare tire and wheel for every type you have in operation, and inflated to pressure.
- \* Check pressures regularly on all tires in operation and maintain to manufacturer's recommendations.
- \* Unless unavoidable, it is strongly recommended that repairs or the fitting of new tires to rims be carried out by experts at recognized tire dealers using correct equipment.

### \*\*\*\*CAUTION\*\*\*\*

Respect the potential power and explosive force of air under pressure. Serious accidents have resulted from lack of awareness of the explosive potential of compressed air. Respect it as you would DYNAMITE.

The following pages of guidelines, safety precautions and procedures of tire changing are included to make all operators aware of the dangers that can be encountered by neglecting the care and safety in handling tires and compressed air.

## TIRE SAFETY - MOUNTING/DEMOUNTING

The following guidelines and safety procedures are intended to be used for reference only. Procedures will vary for different tire mounting equipment and different types of rims. If at any time an uncertainty exists about the method of assembly or component parts or use of equipment, consult specific equipment manuals.

The following precautions apply generally for all types of tires. In addition, each section emphasizes specific precautions for each particular type of tire.

### **\*\*\*\*WARNING\*\*\*\***

**FAILURE TO OBSERVE THE PRECAUTIONS OUTLINED IN THIS SECTION MAY RESULT IN FAULTY POSITIONING OF THE TIRE AND/OR RIM PARTS, CAUSING THE ASSEMBLY TO BURST WITH EXPLOSIVE FORCE SUFFICIENT TO CAUSE SERIOUS PHYSICAL INJURY OR DEATH.**

### **CORRECT PROCEDURES - Do it this way.**

1. Make sure that all rims are in good condition for use - not damaged, dented, or deformed.
2. Remove valve core and exhaust all air from the tire (or tires in the case of a dual assembly) before demounting. Probe the valve stem with a wire as a final check to make sure the valve is not plugged. Do not stand in front of a valve opening as dirt particles may be blown into your eyes.
3. Block vehicle in a positive manner so it cannot roll forward or backward after it is jacked up.
4. Place large hardwood blocks under the jack, regardless of how hard or firm the ground appears.
5. Place safety jacks, or crib up with blocks at an appropriate place under the vehicle, in case the jack slips.
6. Check rim diameter to be sure it exactly matches the rim diameter molded on the tire. If rim is multiple piece, check component parts to see if they are made by the same manufacturer.
7. Clean and inspect used rim parts thoroughly.
8. Use new tubes and new flaps in new tires.
9. Inspect inside of tire for loose cords, cuts, penetrating objects, or other carcass damage. Scrap tires that are beyond simple repair. Remove dirt, debris, and liquids from the inside of tire before tube is installed.
10. Lubricate with approved rubber lubricant, such as thin vegetable oil soap solution.

11. Use a clip on chuck and extension hose with remote control valve and pressure gauge, long enough to allow you to stand to one side, not in front of the assembly, during inflation.
12. Center tire properly on rim before inflating.
13. Secure lock wheel down, or place assembly in safety cage or portable safety device before attempting to inflate tire to seat beads.
14. Check for proper flange and lock ring seating.
15. Adjust air pressure to manufacturer's recommended cold operating pressure, after beads have been seated.
16. Inspect valve cores or proper air retention. Replace damaged or leaky cores.

#### FAULTY PROCEDURES - Do not do it this way.

1. Don't work on tire and rim assemblies until you have reviewed safety practices and procedures.
2. Don't loosen lug nuts on duals until all air is exhausted from both tires. A broken or cracked rim pat under pressure could blow apart and seriously injure or kill if lugs are removed before air is exhausted.
3. Don't ever apply heat or do repair work on an inflated tire, rim, and wheel assembly. Heat can increase air pressure to a level sufficient to burst the tire or rim.
4. Don't re-inflate a tire that has been run flat or seriously under-inflated without demounting the tire and checking the tire and tube for damage.
5. Don't mix rim parts of different manufacturers unless such use is approved by those manufacturers.
6. Don't attempt, under any circumstances, to rework, weld, heat, or braze rim parts. Replace damaged parts with the same size, type, and make.
7. Don't reuse tubes or flaps that have buckled or creased.
8. Don't use a tube in a tire larger or smaller than that for which the tube was designed.
9. Don't inflate beyond recommended bead seating pressure. Don't stand over tire when inflating.
10. Don't transport fully inflated tires mounted on multi-piece rims. Inflate only enough (10-15 PSI) to keep rim parts in place. Inflate tires to correct operating pressure only after tire

