NUMBER: B090R1075-0

DATE: MAY 25, 1990

SUPERSEDES: 90-148C-00

SERVICE BULLETIN

Effective Serial Number: All Units - Chance Rides, Inc.
All Units - Chance Manufacturing Co., Inc.

Chance Rides, Inc. SPECIFICALLY DISCLAIMS ANY LIABILITY for losses associated with rides produced by Chance Manufacturing Company, Inc.

Ride: All Rides

Subject: Replacement and torque requirements for functional load carrying capscrews

Capscrews used by CHANCE RIDES, INC. are classified as functional load carrying capscrews if:

- They are used as tension members in the erection or operation of a ride

  and/or

- They are required to resist shear through friction-type connections in the erection or operation of a ride

Capscrews are selected with consideration to grade, size and quantity, using joint capacities based on tightness torques of 60% of rated yield and group joint efficiency of 62.5%.

TORQUE REQUIREMENTS

Capscrews must be tightened to the torque values listed in the Torque Chart. These values were selected to produce a tightening torque range of 60% to 70% of proof load, when tightened with a hardened washer under the locknut or capscrew head (whichever is accessible for tightening). When the capscrew is tightened from the head end, apply anti-seize lubricant to the shank of the capscrew. When the threads are lubricated, use 10% less torque to tighten the capscrew.

DO NOT TIGHTEN CAPSCREWS OVER THE RECOMMENDED TORQUE. This can damage the capscrew, due to variances in coefficients of friction and torque wrench accuracy.

Always use a torque wrench. It is impossible to accurately measure the tightness of a capscrew by other methods. Torque wrenches must checked for accuracy twice each operating season.

CAPSCREW GRADES

CHANCE RIDES, INC. uses only Grade 5 or better capscrews and Grade 8 locknuts, with A325 hardened washers for functional loads. The Grade Markings Chart shows the capscrew markings to be found on Chance rides. The manufacturers identification symbols must be present on all functional load carrying capscrews.

CHANCE RIDES, INC. requires the use of cold-formed hex head capscrews with rolled threads. Hex bolts and hot-formed hex head capscrews are not recommended because they may machined threads, and can have die seams along the shank.

NEVER REPLACE CAPSCREWS OR LOCKNUTS WITH PARTS OF A LESS **GRADE, OR OF DIFFERENT LENGTHS THAN THOSE SHOWN IN THE CHANCE PARTS CATALOG.**

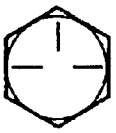
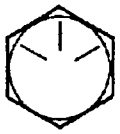
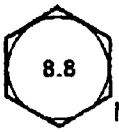
REPLACEMENT OF CAPSCREWS AND LOCKNUTS

When permanently installed capscrews and locknuts are disassembled for repair or adjustment, they must be replaced if they have been in service over five (5) years, or corrosion, or other damage requires over-torquing for removal. If a torque wrench is not used to measure excessive removal torques, the capscrews and locknuts must be replaced.

Capscrews and locknuts which are frequently disassembled for portability must be replaced each operating season. If the capscrews and locknuts become damaged, corroded or require excessive torque for removal, they must be replaced. If a torque wrench is not used to measure excessive removal torques, the capscrews and locknuts must be replaced.

GRADE MARKINGS
For Functional Load Carrying Capscrews

Manufacturer's identification symbols must be present on all capscrews

Correct markings	Examples of unacceptable markings
SAE J429 Grade 5 Medium carbon 81,000 yield 	 Grade 5.1 Low carbon  Grade 5.2 Low carbon martensitic
ASTM A325 Type 1 Medium carbon Longer shank and shorter thread length than Grade 5 81,000 yield 	
ASTM A325 Type 1 Medium carbon Longer shank and shorter thread length than Grade 5 81,000 yield 	ASTM A325 Type 2 Low carbon martensitic
SAE J429 Grade 8 Medium carbon 130,000 yield 	 ISO R898 Class 8.8 Medium carbon 92,000 yield 
ASTM A490 Alloy steel Longer shank and shorter thread length than Grade 8 130,000 yield 	 ISO R898 Class 10.9 Alloy steel 130,000 yield 

Torque Chart

TORQUES FOR FUNCTIONAL LOAD CARRYING COLD FINISHED HEX HEAD CAPSCREWS WITH DRY ROLLED THREADS, USED WITH LOCKNUTS (SEE NOTE 3), AND TIGHTENED WITH AN ASTM A325 HARDENED WASHER UNDER THE CAPSCREW OR LOCKNUT HEAD (WHICHEVER IS ACCESSIBLE FOR TIGHTENING).

THIS TORQUE RANGE WILL DEVELOP 60% TO 70% OF PROOF LOAD.

REFER TO REPLACEMENT OF CAPSCREWS AND LOCKNUTS FOR CONDITIONS REQUIRING REPLACEMENT

SIZE (DIAMETER) - Threads per Inch	Torque Range in foot-pounds (see notes 1, 2 and 4) with locknut and hardened washer	
	SAE J429 Grade 5 ASTM A325	SAE J429 Grade 8 ASTM A490
1/4 - 20 1/4 -28	5-6 6-7	7-8 8-10
5/16 - 18 5/16 - 24	11-13 12-15	15-18 17-21
3/8 - 16 3/8 - 24	19-24 22-27	27-33 31-38
7/16 - 14 7/16 - 20	30-35 35-40	45-55 50-60
1/2 - 13 1/2 - 20	30-35 35-40	45-55 50-60
5/8 - 11 5/8 - 18	95-115 105-130	130-160 150-180
3/4 - 10 3/4 - 16	165-200 185-225	235-285 260-320
7/8 - 9 7/8 - 14	270-325 295-360	380-460 415-505
1 - 8 1 - 14	400-490 440-535	565-690 620-755
1 1/8 - 7 1 1/8 - 12	495-600 555-675	800-975 900-1095
1 1/4 - 7 1 1/4 - 12	700-850 775-940	1135-1380 1255-1525
1 1/2 - 6 1 1/2 - 12	1215-1480 1370-1660	1975-2390 2220-2700

NOTES:
1. Use anti-seize lubricant on capscrew shank when tightened from head end.
2. Use 10% less torque when anti-seize or other lubricant is used on threads.
3. Use same torque range for holes tapped in steel.
4. Use these torque values unless otherwise specified.