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FLEETWOOD 2/23/04

ATTACHMENT 20

PART 4 OF 4

BOOK 2 OF 2

ALUMINUM WHEEL TECHNICAL INFORMATION

20. Provide an engineering drawing of representative wheel end assembly that incorporates an aluminum wheel.

RESPONSE #20

Fleetwood does not create or maintain supplier wheel end assembly drawings incorporating aluminum wheels.

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FLEETWOOD 2/23/04

ATTACHMENT 21

PART 4 OF 4

BOOK 2 OF 2

21. Provide a copy of the wheel mounting and wheel mounting nut torque procedure(s) used to install aluminum wheels onto subject vehicles.

If Fleetwood uses more than one wheel mounting and wheel mounting nut torque procedure for aluminum wheels installed in the vehicles listed in response to Request #1, provide a copy of each procedure and describe the vehicle configuration or other parameter that dictate when each procedure is to be used.

Include a copy of (A) the procedures used at the initial wheel mounting; (B) the procedures used for all torque, re-torque or torque checks performed on the wheel mounting nuts during and after the initial wheel mounting; (C) the procedures used for all re-torque or torque checks conducted immediately prior to, during, or after delivery of the vehicle to the dealer; (D) the recommended torque procedures and intervals that Fleetwood recommends that the delivering dealer perform prior to delivering a new vehicle to the purchaser: (E) the recommended torque procedures and intervals that Fleetwood recommends that the vehicle owner perform; (F) all other wheel mounting nut torque, retorque, or checking procedures issued or recommended by Fleetwood.

RESPONSE #21

Refer to response and attachments provided to question 17.

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FLEETWOOD 2/23/04

ATTACHMENT 22

PART 4 OF 4

BOOK 2 OF 2

22. Provide a copy of the manufacturing quality control plan, including frequency and method, that Fleetwood uses to assure the correct mounting of the aluminum wheel to the hub and for validating that the wheel mounting nuts have been correctly installed and torqued.

Describe how Fleetwood determined the (1) original and (2) all subsequent specified torque values for the wheel ends using aluminum wheels.

Identify all tests that have been conducted by Fleetwood, Fleetwood's supplier, and/or sub-contractors to validate the integrity and durability of the torque values specified.

RESPONSE #22

Refer to the Assembly Manual, pages AMR-01-A39 and AMR-28-A75 attached. See copy of Ready-To-Move (RTM) inspection sheet. See hard card validation notations. See individual Plant General Manager's response. Fleetwood relies on the wheel and axle supplier to recommend torque values.

22a. Assembly manual pages.

22b. Ready to move inspection sheet.

22c. Hard card.

22d. Plant Managers responses.

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FLEETWOOD 2/23/04

ATTACHMENT 22A

PART 4 OF 4

BOOK 2 OF 2

04-04		02-18-03	RR	AUG-12-02
04-06		03-17-03	RR	
04-07		04-14-03	RR	04/14/03 15:27:40

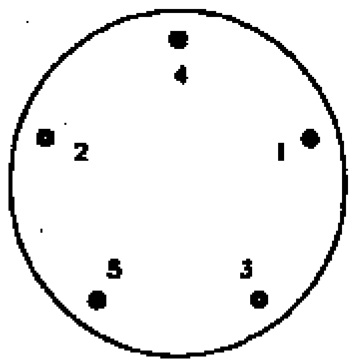
FLEETWOOD RECREATIONAL VEHICLE GROUP

AMR-28-A75 SHEET 1 OF 1

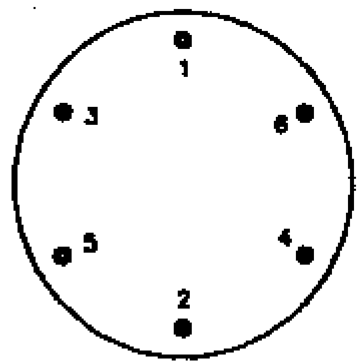
TT ASSEMBLY MANUAL – FINAL FINISH

WHEEL LUG NUT TORQUE PROCEDURE

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X4.5 [illegible]		13	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 14X5.5 [illegible]		14	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15 [illegible] AW	L01-0400	15	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15 [illegible] AW	L01-0361	15	M23-1014	90 - 100 FT/LBS
STEEL WHEEL-SPOKE 16 [illegible] AW	L01-1635	16	M23-1014	90 - 110 FT/LBS
WHEEL- ALUMINUM 15 [illegible]	L01-4005	15	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM 16X7 [illegible]	L01-4006	16	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15 [illegible]	L01-4008	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15 [illegible]	L01-4010	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 16 [illegible]	L01-4020	16	M23-0050	110 - 120 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

➡ 1. PLACE THE WHEEL ON THE WHEEL MOUNTING SURFACE. PLACE THE WHEEL LUG NUTS WITH ROUNDED END OF THE NUT TOWARD THE WHEEL. TIGHTEN EACH NUT BY HAND OR USE AN IMPACT WRENCH UNTIL THE WHEEL IS HELD AGAINST THE WHEEL MOUNTING SURFACE. LOWER THE TIRE TO THE GROUND AND TIGHTEN THE WHEEL LUG NUTS TO THE SPECIFIED TORQUE WITH A TORQUE WRENCH.

2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

➡ 3. ONCE WHEELS ARE INSTALLED CHECK THE TORQUE AGAIN AT 10, 25 AND 50 MILES.

B.O. RELEASE	DESCRIPTION	DATE	BY	SCALE 12" = 1'-0"	
04-06		03-17-03	GR	DRAWN DUPLAGED · DATE 02-14-04	
04-07		04-14-03	AR	[illegible]	
04-09		09-23-03	NR	FILE 06/23/03 10:54:13 [illegible]	

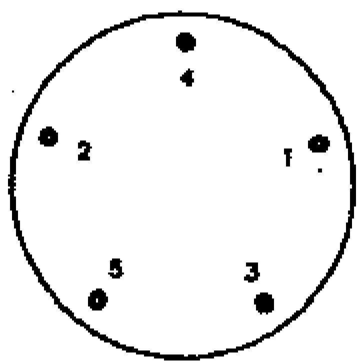
FLEETWOOD RECREATIONAL VEHICLE GROUP

AMR-01-A39 · SHEET 1 OF 1

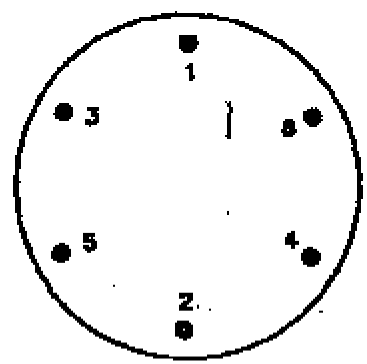
TITLE: TT ASSEMBLY MANUAL - CHASSIS

WHEEL LUG NUT TORQUE PROCEDURE

	WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
	STEEL WHEEL-SPOKE 13X4.5[illegible]		13	M23-1014	80 - 90 FT/LBS
	STEEL WHEEL-SPOKE 14X5.[illegible]		14	M23-1014	80 - 90 FT/LBS
	STEEL WHEEL-SPOKE 15[illegible] AW	L01-0400	15	M23-1014	80 - 90 FT/LBS
	STEEL WHEEL-SPOKE 1[illegible] AW	L01-0501	13	M23-1014	90 - 100 FT/LBS
	STEEL WHEEL-SPOKE 1[illegible] AW	L01-1635	16	M23-1914	90 - 110 FT/LBS
	WHEEL- ALUMINUM 15[illegible]	L01-4005	15	M23-0052	110 - 120 FT/LBS
	WHEEL- ALUMINUM 16X7[illegible]	L01-4006	16	M23-0052	110 - 120 FT/LBS
➡	WHEEL- 15[illegible] CHR/CARLISLE	L01-0799	15	M23-0053	85 - 95 FT/LBS
➡	WHEEL- 15[illegible] CHR/CARLISLE	L01-[illegible]	15	M23-0053	85 - 95 FT/LBS
➡	WHEEL- 16[illegible] CHR/CARLISLE	L01-[illegible]	16	M23-0053	85 - 95 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

1. PLACE THE WHEEL ON THE WHEEL MOUNTING SURFACE. PLACE THE WHEEL LUG NUTS WITH ROUNDED END OF THE NUT TOWARD THE WHEEL. TIGHTEN EACH NUT BY HAND OR USE AN IMPACT WRENCH UNTIL THE WHEEL IS HELD AGAINST THE WHEEL MOUNTING SURFACE. LOWER THE TIRE TO THE GROUND AND TIGHTEN THE WHEEL LUG NUTS TO THE SPECIFIED TORQUE WITH A TORQUE WRENCH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.
3. ONCE WHEELS ARE INSTALLED CHECK THE TORQUE AGAIN AT 10, 25 AND 50 MILES.

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FLEETWOOD 2/23/04

ATTACHMENT 22B

PART 4 OF 4

BOOK 2 OF 2

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

CHASSIS:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Proper slope on drain lines and lines secured at proper intervals
☐	☐	Heat shrink connectors on brake wire connection to axle
☐	☐	Brake wires routed and secured properly
☐	☐	Paint applied properly with good coverage
☐	☐	Chassis is square
☐	☐	Support over hangers welded properly
☐	☐	Wheels/tires free of paint overspray
☐	☐	Knife valves supported and at proper angle
☐	☐	Slide-out motor bracket secure/square

Pass	Fail	
☐	☐	Gas manifold line supported every four feet and 6 inches from end
☐	☐	Check cambering
☐	☐	Vehicle Identification Number (VIN) is correct
☐	☐	Correct Lug Nut Installed
☐	☐	Wheel Lug Nut Torque Check

DSF _____ Ft/Lbs Signed: _____
DSR _____ Ft/Lbs Signed: _____
RSF _____ Ft/Lbs Signed: _____
RSR _____ Ft/Lbs Signed: _____

FLOORS:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Floor ducts/vents free of debris
☐	☐	Closets grounds installed
☐	☐	Sealants properly applied
☐	☐	Plumbing holes in correct location, proper alignment with tanks
☐	☐	Floor protected
☐	☐	7-way cable correct length and wired properly
☐	☐	Plumbing routing holes are sealed
☐	☐	Floor decking is properly attached to floor structure

Pass	Fail	
☐	☐	Floor is set to level
☐	☐	Staples/screws flush with decking
☐	☐	Underbelly staples set flush
☐	☐	110/12v wires separated
☐	☐	Line taped or glued at register ducts
☐	☐	Brake amp draw test
☐	☐	Unit Cleaned
☐	☐	_____
☐	☐	_____

CABINET SET:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	All cabinets predrilled correctly and free of broken or split wood
☐	☐	All cabinets set square and secured at proper location
☐	☐	All cabinets are tight to one another and the floor
☐	☐	Cabinet staples set and nailed
☐	☐	All cabinets free of visible defects
☐	☐	Interior walls set straight and square
☐	☐	Bath door header flush with walls
☐	☐	Cabinet drawer supports secure
☐	☐	Cabinet tops covered

Pass	Fail	
☐	☐	Door and drawers are square to frame, clean and operational
☐	☐	All doors and drawers functional
☐	☐	Shelves are level
☐	☐	Cove moldings fit tight between cabinets
☐	☐	Plumbing thresholds flush to walls and floors
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

PLUMBING:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Water lines correctly installed and secured at 48" intervals
☐	☐	Drain plumbing properly installed including grade and support, secured and p-traps tight
☐	☐	LPG lines properly routed and secured at 48" intervals
☐	☐	Showerfurb properly installed, sealed and supported
☐	☐	Fresh water fill hose/vent line free of kinks and routed properly
☐	☐	Water pump installed in proper location and secured

Pass	Fail	
☐	☐	Water lines tight at risers
☐	☐	Toilet is flush to floor, squared to wall, secured & clean
☐	☐	No kinked or dented copper gas lines
☐	☐	Xinfo valves functional
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

SIDEWALLS

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Unit level before sidewalls are set
☐	☐	Sidewalls set in proper location at front and rear of unit
☐	☐	Rear section properly installed and tight to all cabinets
☐	☐	Front section properly installed and tight to all cabinets
☐	☐	All cabinets are flush to top of sidewall
☐	☐	All cabinets and interior walls tight to sidewall
☐	☐	Fiberglass free of defects (if applicable)

Pass	Fail	
☐	☐	Walls straight, plumb and aligned
☐	☐	Refer cabinet completely sealed
☐	☐	Slide out opening(s) square
☐	☐	Core molding set between walls and cabinets
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

HULLS:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Unit set level
☐	☐	Ceiling installed square to unit
☐	☐	All cabinets secured tight to ceiling
☐	☐	Ceiling cleaned and no debris
☐	☐	Ceiling panels are defect-free
☐	☐	A/C vents rotate freely

Pass	Fail	
☐	☐	No wrinkled edges on paneling
☐	☐	No split wood on overheads
☐	☐	Bath door is square and operates properly
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

ELECTRICAL:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	All wires properly routed and secured
☐	☐	Thermostat installed at proper height and correct location
☐	☐	Polarity is correct for all electrical receptacles
☐	☐	All grounds properly installed
☐	☐	All J-boxes are accessible
☐	☐	All access panels and wire covers properly and neatly installed
☐	☐	Panel box, converter, power cord properly installed to print and secured

Pass	Fail	
☐	☐	Wall plates straight and flush
☐	☐	Fixtures are secured and clean
☐	☐	OSB panels are flush with sidewalls
☐	☐	OSB joints are flush
☐	☐	OSB staples are set and flush
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

METAL: (If applicable)

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Clearance light holes drilled in proper locations
☐	☐	Metal sealed at pitchpans
☐	☐	Top yoder is rolled over OSB decking
☐	☐	All openings cleared of metal shavings
☐	☐	Insulation properly installed and tucked

Pass	Fail	
☐	☐	Metal free from defects of any kind
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

MOLDING:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	All exterior lighting properly sealed and installed
☐	☐	All screws installed straight in window garnishes
☐	☐	Entry door installed using proper installation method
☐	☐	Exterior graphics applied at correct locations & free of bubbles & wrinkles
☐	☐	Luggage doors installed straight and adjusted
☐	☐	Window garnish flush to sidewall
☐	☐	TV antenna centered in hole
☐	☐	Slide out functions and seals properly
☐	☐	Exterior of unit cleaned of excess sealer and putty tape

Pass	Fail	
☐	☐	All molding splices sealed
☐	☐	All molding straight
☐	☐	Windows are square and operational
☐	☐	Window screens fit and are not damaged
☐	☐	Awning location is correct
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

TOP MOLDING:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Rubber or T.P.O. roof installed correctly - free of debris, no fasteners showing, no bubbles, no wrinkles
☐	☐	Top molding installed tight to top and side of unit
☐	☐	Roof properly sealed - sealer free of air bubbles
☐	☐	Ladder installed straight and in proper location
☐	☐	Plumbing vents clear and covered properly
☐	☐	All excess sealant cleaned from unit

Pass	Fail	
☐	☐	All power vents properly installed - interior garnishes tight to ceiling
☐	☐	Roof inspected for cuts and sealant voids
☐	☐	Check refer vent is open and clear
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

FINAL:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Exterior refer door and drain tube installed properly
☐	☐	LPG tanks installed and lines properly routed and secured
☐	☐	All window treatments installed correctly, in proper location and functional
☐	☐	Water fill hose installed correctly and with proper slope
☐	☐	Refer compartment properly sealed
☐	☐	Tire pressures meet specifications
☐	☐	Shower/tub sealed properly
☐	☐	All wood molding properly installed and straight
☐	☐	Proper warning/information labels installed

Pass	Fail	
☐	☐	Dinette table tilts and functions
☐	☐	Doors and drawers aligned and functional
☐	☐	Sofa checked for operation
☐	☐	Monitor panel functional
☐	☐	All wall seams & border tape free of wrinkles, secured properly and straight
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

FINISH:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Hard card checked for correct options and filled out completely
☐	☐	Underside of unit checked for proper seal
☐	☐	Interior and exterior of unit clean
☐	☐	All loose load items in unit (remotes, keys, smoke alarm battery, sink stoppers, etc.)
☐	☐	Orange warranty packet complete and in unit
☐	☐	Correct Fleetwood Brand Owners Manual placed in unit
☐	☐	Lug nut torque checked and documented
☐	☐	Décor colors/patterns properly installed and matched per design specs

Pass	Fail	
☐	☐	Lino and cabinets free from defects from line damage
☐	☐	Entry door functions
☐	☐	Screen door functions
☐	☐	Awning functions
☐	☐	All squeak tape removed
☐	☐	Unit clean
☐	☐	Entry door grab handle secure
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

Serial # _____

RTS READY TO SHIP INSPECTION AND APPROVAL

Fit and Finish

Exterior Inspections

Pass	Fail		
☐	☐	1. Roof Covering	Installed with no wrinkles, cuts or visible fasteners or debris underneath. Sealant application is correct.
☐	☐	2. Graphics	Aligned and free of wrinkles, bubbles and other imperfections.
☐	☐	3. Chassis	Painted properly and free of drips, rust, scratches and dents.
☐	☐	4. Fiberglass/Sheetmetal	Clean and free from dents, scratches, overspray, discoloration, bubbles, waves or other imperfections
☐	☐	5. Windows and Doors	Windows, caps and moldings properly installed and sealed.

Interior Inspections

Pass	Fail		
☐	☐	6. Cabinet doors	Aligned, functionally latch and are free from defects.
☐	☐	7. Drawers/doors	Aligned, latch, operate smoothly and are free from defects.
☐	☐	8. Carpet, Lino, Deco Floor	Clean with no stains, discoloration, cuts, tears or other damage.
☐	☐	9. Interior Panels/Molding	Installed properly and free from defects.
☐	☐	10. Furniture	Furniture is functional and free from defects.

MANUFACTURING CENTER DYNAMIC INSPECTIONS

Pass	Fail			Pass	Fail		
☐	☐	11.	_____	☐	☐	14.	_____
☐	☐	12.	_____	☐	☐	15.	_____
☐	☐	13.	_____	☐	☐	16.	_____

Remarks: _____

_____

Functional

RTS FUNCTIONAL TESTS

Pass	Fail			Pass	Fail		
☐	☐		17. Slide-out cycle test and component inspections	☐	☐	*	21. Gas system test
☐	☐	*	18. Fresh Water System Test and Operational Inspection	☐	☐		22. Entry door functional test
☐	☐	*	19. 12 volt electrical test and operational inspection	☐	☐	*	23. Test equipment is functional and properly calibrated
☐	☐		20. Drain, waste and vent system test				

Remarks: _____

_____

DYNAMIC FUNCTIONAL TESTS BY MANUFACTURING CENTER

Pass	Fail		
☐	☐	23.	_____
☐	☐	24.	_____
☐	☐	25.	_____
☐	☐	26.	_____

Remarks: _____

_____

Final approval to Ship: (Legible Signature) _____

Date: (MM/DD/YY) _____

RTS SHIP READINESS

Pass	Fail	
☐	☐	1. RTM inspections are complete and remarks addressed.
☐	☐	2. RTS FM/Finish Interior/Exterior inspections completed and remarks addressed
☐	☐	3. Short parts released and completed. (See three-part memo.)
☐	☐	4. All RTS Functional Tests completed and remarks addressed.
☐	☐	5. Hard card is completed.
☐	☐	6. All options verified and match invoice.
☐	☐	7. All windows and vents are closed and latched.
☐	☐	8. All doors, drawers, furniture and "loose load" items secured for travel.
☐	☐	9. Keys are in unit.
☐	☐	10. The unit is clean with no visible damage inside and outside.

Remarks:

_____

_____

_____

_____

Authorization to Ship: (Legible Signature) _____

Date (MM/DD/YR) _____

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 22C

PART 4 OF 4

BOOK 2 OF 2

19
TION DATE RECEIVED AT PLANT

	MO	DAY

ER(S) _____

Printed in U.S.A.

Fold Line

GROUP LEADER INSPECTION AND ACCEPTANCE LEGIBLE SIGNATURE (NO initials)

		MO	DAY
CHASSIS			
FLOORS			
CAB SET			
PLUMBING			
SIDEWALLS			
HULL			
MANAGEMENT			
ELECTRICAL			
EXTERIOR SIDING			
MOLDING			
FINAL			
FINISH			
REWORK			
MANAGEMENT			

ELECTRICAL LINE TESTS: LEGIBLE SIGNATURE (NO initials)

		MO	DAY
120 V Dielectric			
120V Polarity			
120V Operation			
12V Dielectric Interior			
12V Dielectric Exterior			
12V Operation			

FINAL LINE TESTS: LEGIBLE SIGNATURE (NO initials)

		MO	DAY
12V Dielectric Exterior			
Gas (USA: 9" W.C.) (CSA: 10-14" W.C.)			
Water (30 psi max.)			
120V Dielectric			
120V Polarity			
120V Operation			
12V Dielectric Interior			
12V Operation			
Ground Continuity			
Ground Fault Trip			
12V Brake (amperage)			
Break Away Switch			
Lug Nut Torque			
Tire Pressure			
Monitor Panel			
Tank fill/Vent			
Pump/Cold Water			
Smoke Alarm			
LPG Leak Detector			
TV & Coaxial Cable			
CO Detector			
Exterior Light Operation			
Furnace Vent			
Winterize			

Test in bold box is Code Requirement (USA or CSA)

SERIAL NUMBER IDENTIFICATION/EQUIPMENT INFORMATION

PRINT ALL INFORMATION LEGIBLY

EQUIPMENT	SERIAL # ID	MAKE	MODEL
TIRE			
TIRE			
TIRE			
TIRE			
SPARE TIRE			
REFRIGERATOR			
RANGE/OVEN			
MICROWAVE			
WATER HEATER			
RADIO/STEREO			
FURNACE			
FURNACE #2			
ROOF AIR #1			
ROOF AIR #2			
CONVERTER			
WATER PUMP			
POWER JACK			
AXLE #1			
AXLE			
GENERATOR			
TOILET			
AWNING ROLLER			
AWNING HDWE.			
CENTER SUPPORT			
TELEVISION			
WASHER/DRYER			
SL/O MOTOR/MAIN			
SL/O MOTOR/SCRM			
SL/O MOTOR #3			

INCOMPLETE WORK OR MISSING PARTS: _____

_____

_____

_____

S-049 7/98 TT

Fold Line

INTERIOR

FINAL ACCEPTANCE:

Production Manager _____

Sales Manager _____

QUALITY CONTROL REMARKS

REWORK

INTERIOR	EXTERIOR

AL ACCEPTANCE: MM / DD / YR

Production Manager _____ Date _____

Sales Manager _____ Date _____

Fold Guide

PRODUCTION ORDER & QUALITY CONTROL CARD

CPSC MATTRESS RECORD KEEPING All mattresses or mattress pads used only for sleeping

ITEM	VENDOR	MATTRESS LOT # OR IDENTIFICATION # OR DATE RECEIVED AT PLANT
[redacted] MATTRESS		
SOFA BED MATTRESS		
BUNK MATTRESS		
BUNK MATTRESS		
COMBO BUNK PAD		

Dealer MODEL

COLOR VIN

QUALITY CONTROL TESTS

PLUMBING LINE TESTS: LEGIBLE SIGNATURE (NO INITIALS)

		MO	DAY
Gas Test (3 psi min.)			
Water (100 psi)			
Drain Flow			
Flood Level			

[redacted] TAG NUMBER _____

STATE TAG NUMBER(S) _____ PLAN APPROVAL NUMBER(S) _____

X-8-048 7/99 TT

Printed in U.S.A.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 22D

PART 4 OF 4

BOOK 2 OF 2

To: Towable Plant General Managers

From: Steve Hulst

Subject: Aluminum Wheels

Date: January 21, 2004

As most of you are aware, we are in the midst of a recall query by the NHTSA (National Highway Traffic Safety Administration) regarding Fleetwood's use of aluminum wheels on our products. To answer some of the questions posed by their board, I need information for every Towable plant. If you did not use aluminum wheels, please send me a memo stating that you did not use them.

For all plants that used these wheels, I need the following information as a minimum. Please provide any other relevant information.

- By what methods did your plant apply torque? Did the torque application method change through time? If so provide dates and details of all changes. If you have written/paper procedures please provide copies.
- What manufacturing process did your plant use to ensure torque was properly being applied? You may list your torque wrench specs here and your procedures to ensure it was used and it is calibrated. List any QC checks you used as they relate to the aluminum wheel installation. RTM comes to mind as an example of these checks.
- We also need to know the date produced and the serial number of the last unit built at your plant with aluminum wheels by product line.

It is very important that you provide accurate and complete information. You need to be sure that you know what took place at your facility and can confirm these items if requested. Prepare your response to this as something you would sign as an affidavit as to its accuracy.

If you have any questions, please give me a call.

Thanks

Steve Hulst
Director of Operations
Towable Group

MEMORANDUM

January 26, 2003

TO: Steve Hulst

FROM: Jim Croxton

SUBJECT: Aluminum Wheels

In answer to your memo "Aluminum Wheels" dated 1/21/04 Requesting information as to the use of aluminum wheels at our facility I have provided the answers to the following questions.

1. By what methods did your plant apply torque?
   a. Wheels were torqued in our chassis shop during initial installation by using an impact wrench equipped with an Accu- Torque wrench for the correct torque specified in the assembly manual page AMR- 01-A39.The wheels were then re-torqued in our Final Finish department with a Torque wrench set to the proper torque setting specified for the wheel being torqued according to the assembly manual.
   b. As requirements changed for the types of wheels being used our process was changed to using torque wrenches set at the correct setting for each type of wheel in both the chassis shop and the Final finish departments.
2. Did the torque application method change through time?
   a. Yes, our process changed to utilizing an impact wrench for the initial installation of the wheels and then torqueing the wheels with a torque wrench in chassis as well as the final finish department because of the different variations of torque required for all of the different wheels and types being used in our operation. This change took place Nov/02 with the implementation of new specifications, see attachment 1.
3. What manufacturing process did your plant use to insure torque was properly being applied?
   a. Our initial methods prior to the use of aluminum wheels consisted of using an impact wrench equipped with an Accu-torque wrench for the installation of wheels in the chassis department installing all wheels at 90 ft/lbs according to the assembly manual. Page AMR-01-A39.The wheels were then re-torqued in our Final Finish department with a torque wrench set at 90 ft/lbs. Per the assembly manual specifications. The torque wrench was spot welded to the correct setting so that it could not be changed to insure the proper torque. The torque wrench provides a clicking sound when the proper torque is achieved when applied to each lug nut.
   When we began using aluminum wheels in November 02 on Entry Plus products our processes changed when new specifications were issued from engineering requiring different torque specifications for aluminum wheels see attachment 1. Our process changed to installing wheels with an impact wrench and then torqueing each lug nut with a Torque wrench in chassis according to the new specifications and then retorqueing the lug nuts once again in our Final Finish

department according to the new specifications for each wheel type. This process changed torque specifications in January 03 again see attachment 2, AMR-28-A75 with the a new Design Change 5 that also added new lug nuts to be used with the import style wheel only.
The next change to the wheel specifications was issued April 03 see attachment 3 which added additional wheel types and torque specifications to be followed. This new specification sheet was added to the owner's manual at that time.
The assembly manual was updated in Design Change 4-13 as of 6/23/03, page AMR-01-A39 with further requirements that are in effect today for all wheel types being used. See attachment 4.

4. List any Q.C. checks you used as they relate to the aluminum wheel installation?
    a. The production card is used to insure that all wheels are torqued for each unit, listing the torque on each wheel and the signature of the associate responsible in the Final Finish department for completing the task. In addition the wheel torque readings are currently placed on the Ready To Move sheets that are also attached to the card listing the torque settings from the chassis shop. The RTM sheets have always been required that the wheel torques be checked and signed by the group leader responsible, however the form was not modified to list the torques on each wheel until April 03 as directed by division.

5. The last unit produced at our location was a Terry 295 2BDS Entry Plus, serial number 92289 on April 16,2003.

Memorandum jvb 02-055

DATE: October 31, 2002

TO: Distribution

FROM: Jim Bertoch

Subject: Aluminum Wheel Torque

Please be aware of the following wheel torque requirements.

Steel wheel torque requirements (If equipped):
13 inch wheel nut torque is 80-90 ft. lbs.
14 inch wheel nut torque is 80-90 ft. lbs.
15 inch wheel nut torque is 80-100 ft. lbs.
16 inch wheel nut torque is 80-100 ft. lbs.

Aluminum wheel from Imports:

15 inch wheel nut torque is 80-85 ft. lbs.
16 inch wheel nut torque is 80-85 ft. lbs.

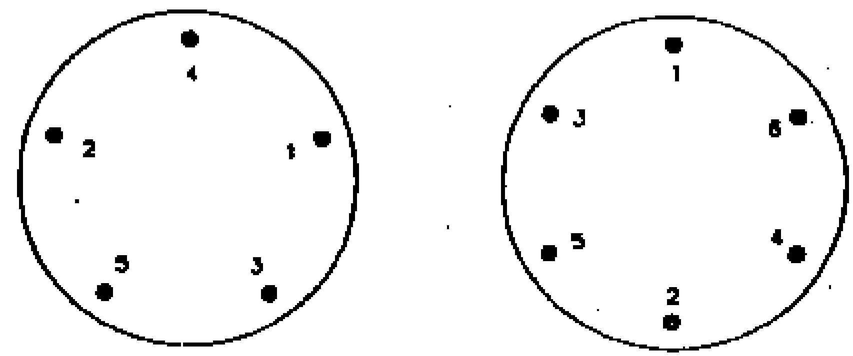
Aluminum wheel from Tredit:

15 inch wheel nut torque is 120-125 ft. lbs.
16 inch wheel nut torque is 120-125 ft. lbs.

Distribution Bob Wozniak, Larry Budica, Randy Most, Gary Beatty, Ron Robbins, Regional General Managers, Production Managers

D.C. RELEASE	DESCRIPTION	DATE	BY	SCALE: 12" = 1'-0"		FLEETWOOD RECREATIONAL VEHICLE GROUP	PART NO. AMR-28-A75
-				DRAWN: [illegible]	DATE: AUG-12-02		SHEET 1 OF 1
				PROJECT: [illegible]		TITLE: TT ASSEMBLY MANUAL - FINAL FINISH	
04-02		01-10-03	MB	PLOT: 01/10/03 [illegible]		WHEEL LUG NUT TORQUE PROCEDURE	

STEEL WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER
	L01-[illegible]	15	M23-1014
	L01-[illegible]	15	M23-1014
	L01-[illegible]	16	M23-1014
IMPORT ALUM. WHLS	L01-[illegible]	16	M23-[illegible]
	L01-[illegible]	16	M23-[illegible]
[illegible] ALUM. WHLS	L01-[illegible]	15	M23-[illegible]
	L01-[illegible]	15	M23-[illegible]
	L01-[illegible]	16	M23-[illegible]



FIVE LUG WHEEL SIX LUG WHEEL

TORQUE TO 110-120 FT/LBS

LUG TIGHTENING SEQUENCE

NOTES:

1. A TORQUE WRENCH MUST BE USED TO TIGHTEN THE LUG NUTS TO 120 FOOT POUNDS ON **ALL** TRAVEL TRAILERS AND 5TH WHEELS DO NOT TIGHTEN BY HAND OR USE AN IMPACT WRENCH IN FINAL FINISH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

Attachment [illegible]

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Attachment 3

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

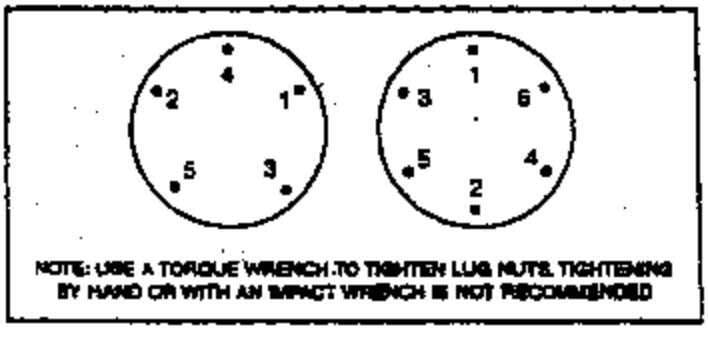
This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

This Owner's Manual Supplement contains information that was incorrect and or/incomplete in your Owner's Manual.

Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft/Lbs.
Steel Wheel 14 x 5.5 x 545 AW	Spoke	14	80 - 90 Ft/Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft/Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft/Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft/Lbs.
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft/Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft/Lbs.
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 Ft/Lbs.
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft/Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at 10, 25, and 50 miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

REVISION		DATE	BY	SCALE 12" = 1'-0"
04-06		[illegible]-03	RR	DIPLASED 02-14-94
04-07		[illegible] 14 03	RR	04om/009
04-09		[illegible] 21 03	RR	06/23/03 10:54:15 [illegible]

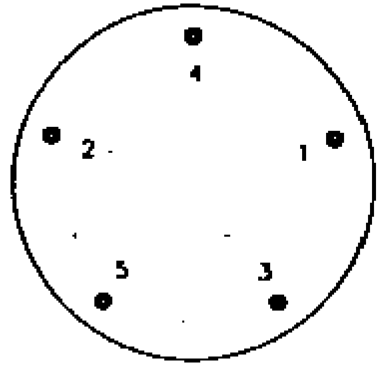
FLEETWOOD AMR-01-A39

RECREATIONAL VEHICLE GROUP

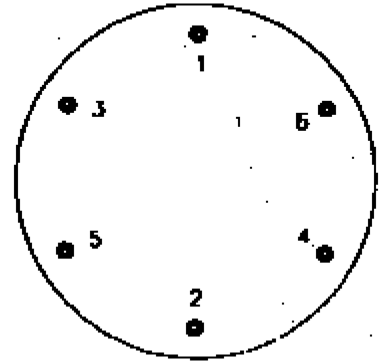
TT ASSEMBLY MANUAL - CHASSIS

WHEEL LUG NUT TORQUE PROCEDURE

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X4.5X545AW		13	M23-1014	[illegible] FT.LBS
STEEL WHEEL-SPOKE 14X5.5X545AW		14	M23-1014	[illegible] FT.LBS
STEEL WHEEL-SPOKE 15X5X545 AW	L01-0400	15	M23-1014	[illegible] FT.LBS
STEEL WHEEL-SPOKE 15X6X655 AW	L01-0561	15	M23-1014	90 100 FT-LBS
STEEL WHEEL-SPOKE 16X6X655 AW	L01-1635	16	M23-1014	90 110 FT-LBS
WHEEL- ALUMINUM 15X6X655	L01-4005	15	M23-0052	110 120 FT-LBS
WHEEL- ALUMINUM 16X7X655	L01-4006	16	M23-0052	110 [illegible] FT-LBS
➡ WHEEL- 15X6X545 CHR/CARLISLE	L01-0798	15	M23-0053	85 95 FT/LBS
➡ WHEEL- 15X6X655 CHR/CARLISLE	L01-0800	15	M23-0053	85 95 FT/LBS
➡ WHEEL- 16X6X655 CHR/CARLISLE	L01-0802	16	M23-0053	85 95 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

1. PLACE THE WHEEL ON THE WHEEL MOUNTING SURFACE. PLACE THE WHEEL LUG NUTS WITH ROUNDED END OF THE NUT TOWARD THE WHEEL. TIGHTEN EACH NUT BY HAND OR USE AN IMPACT WRENCH UNTIL THE WHEEL IS HELD AGAINST THE WHEEL MOUNTING SURFACE. LOWER THE TIRE TO THE GROUND AND TIGHTEN THE WHEEL LUG NUTS TO THE SPECIFIED TORQUE WITH A TORQUE WRENCH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.
3. ONCE WHEELS ARE INSTALLED CHECK THE TORQUE AGAIN AT 10, 25 AND 50 MILES.

FLEETWOOD.
Driven to Explore

FLEETWOOD CONTINUOUS 2 3 2 4 KAIZEN IMPROVEMENT PROCESS

February 6, 2004

To: Al Labelle

From: Greg Winkler

Re: Aluminum Wheel Torque Procedures

Al,

This memo is in response to the request by Steve Hulst for information regarding aluminum wheel torque procedures. I have the following information to submit.

Question one asked, "By what methods did your plant apply torque?" Torque was applied as directed in Assembly Manual AMR-01-A39 and AMR-28-A75 dated May 26, 1998. Torque was applied by the use of a torque stick and an air impact wrench in the Chassis/Floor departments. Final torque took place in the Final department using a torque wrench. Torque specifications for aluminum wheels were outlined in a memorandum from Jim Bertoch; jvb02-055 dated October 31, 2002. Jim Bertoch, jvb02-055D, again updated torque specification in a memorandum dated December 16, 2002. The Assembly Manual pages AMR-01-A39 and AMR-28-A75 were updated through design changes on March 17, 2003, April 14, 2003 and June 23, 2003.

Question two asked, "Did the torque application method change through time?" When installing aluminum wheels the method used was that described in Assembly Manual AMR-01-39 and AMR-28-A75, dated May 26, 1998. This method utilized an air impact wrench and torque stick in the Chassis/Floor department. Final tightening took place in the Final department using a torque wrench. Both the Pendleton and La Grande plants initiated and additional torque check in the Floor department as a precautionary measure after being made aware of wheels coming off of some Pride and Triumph units during transportation. Assembly Manual AMR-25-A75 was updated March 17, 2003 reflecting the additional step that we had been conducting at both facilities. Specific torque specifications changed as directed by Jim Bertoch memorandums, jvb 02-055 and jvb 02-055D, as noted above.

Question three asked, "What manufacturing process did your plant use to ensure torque was properly being applied?" Associates involved in torque application process were informed of the different torque specifications necessary for aluminum wheels as described in a memorandum by Jim Bertoch, jvb 02-055, dated October 31, 2003, and again informed by Jim Bertoch memorandum jvb 02-055D, dated December 16, 2002 as well as the Assembly Manual AMR01-A39 and AMR-28-A75. Floor department torque assurance was added to the RTM checklist, and Final department assurance was documented on the Production Order & Quality Control card.

The plants also provided information in the form of an Owner's Manual Supplement describing wheel lug nut torque information for steel and aluminum wheels in the Owner's Manual and also supplied this information to our transporters.

Torque wrenches are periodically inspected to ensure they are set at the proper tension. Damaged wrenches are sent out for repair and calibration. The La Grande facility uses a Snap On modelTE1751/2" Dial torque wrench on aluminum wheels. The Pendleton facility uses an Armstrong model 64-086, SS 4030192825, SS4030192999 and a Newton Meters model 5010873154.

Proper lug nut usage was specified in a memorandum by Brad Williams, dated April 15, 2003, and is also specified in Assembly Manual AMR-01-A39 and AMR-28-A75.

The last question requested the production date and serial number of the last unit produced with aluminum wheels by plant, by product line. For Plant 24 this would be unit number 82073 produced during the week of July 14, 2003. For Plant 23 Line 1 this would be unit number 08000 produced during the week of August 25, 2003. For Plant 23 Line 2 this would be unit number 07993 produced during the week of August 18,2003.

Greg Winkler

Williams, Brad

From: Hulst, Steve
Sent: Wednesday, January 28, 2004 4:58 PM
To: Williams, Brad
Subject: FW: Response for Aluminum Wheels

Brad, here is another response.

Steve

-----Original Message-----
From: Houck, Gene
Sent: Wednesday, January 28, 2004 7:27 AM
To: Hulst, Steve
Subject: FW: Response for Aluminum Wheels

Steve
This is the response to the aluminum wheel questions.
Gene

-----Original Message-----
From: Hovermale, Gale
Sent: Wednesday, January 28, 2004 10:20 AM
To: Houck, Gene
Subject: Response for Aluminum Wheels

Gene,
This is the information for Steve Hulst on units produced from Plant #28 with the Aluminum Wheel option. The following is a list with the questions that have been asked along with a response:

Q. - By what methods did your Plant apply torque?

A. - When installing the Aluminum wheels in Chassis Dept., we used a 'Torque Stick' rated at 80 ft.lbs. The final torque check was done in Final Dept. using a 'Ratchet Torque Wrench' set to 120 to 125 ft.lbs. This was established by a memo from Jim Bertoch on October 31, 2002, Memorandum - jvb 02-055. At that time we were using the Tredit aluminum wheels.

Q. - Did the torque application method change through time?

A. - No, we used the ratings form the above stated memorandum from Jim Bertoch.

Q. - What manufacturing process did your plant use to ensure torque was properly being applied?

A. - We used a 'Ratchet Torque Wrench' manufactured by Proto which we purchased from Boring-Smith. The wrench is rated 0 to 250 ft.lbs. with increment settings to achieve the 120 - 125 ft.lbs.rating torque needed. There are two QC checks that we use in our production process. The first being the sign off on the Production Card (X-S-049 3/97TT) in the Final Line Tests of the GROUP LEADER INSPECTION AND ACCEPTANCE Page. The second QC check is the RTM checklist that we use with the Production Card for each department. In the RTM for Final Dept. there is a Wheel Lug Nut Torque Check for each wheel on the unit. Attached is a copy of the RTM inspection sheet for the Final Dept.

Q. - What was the date produced and the serial number of the last unit built at your plant with aluminum wheels by product line?

A. - Level 1 (Entry) was produced on 7/01/03 which was a P290FK/E, serial # 2808041
Level 2 (Entry +) was produced on 7/16/03 which was a P360SB/E+, serial # 2808291
Level 3 (Mid +) was produced on 7/28/03 which was a W300FQ/M+, serial # 2808413.

After this unit we switched to a chrome type wheel on DC4-13. However there was some stock left so Materials ordered enough to make a set and was delivered on 9/02/03. We believe, through checking for that option, there was a unit produced on 9/12/03, which was a W300FQ/M+ (Level 3) with a serial number of 2809116.

Research for this project was completed with the assistance of John Rauch, Dennis Rhodes, Mike Kesecker, Dale Vanmeter, Karen Souders, Danny Youngblood, Dave Fischer, Daryl Brown, and Vanessa Youngblood.

Gale E Hovermale

MEMORANDUM

To: Steve Hulst

From: Tim Cash

Subject: Aluminum Wheels

Date: 2/4/04

Between September 2002 and September 2003 plant #29 produced a total of 43 Travel Trailers with Aluminum wheels. The following describes the process, techniques, and tools used:

- Chassis department uses a certified torque wrench supplied by Stanley Proto Industrial Tools, certified to + or – 2%. Units produced from Sept. 2002 through October 2002 (1 unit #2965634) were torqued at 80-100 ft. lbs. As of November 1, 2002 all Aluminum wheels supplied from Tredit were torqued at 120-125 ft. lbs. Per memo dated 10/31/02 from Jim Bertoch.
- The manufacturing process used at this facility to ensure torque was properly applied follows the guidelines established in the Assembly Manual (lug nut torque procedure) Squawk department is responsible for ensuring the proper torque of 120 ft. lbs. (Aluminum Wheels) is being applied with the use of an approved torque wrench and signing of production card upon verification. Effective 4/28/03 we implemented the revised Ready to Move (RTM) departmental inspection form which records wheel lug nut torque sign-off for each wheel by the associate performing this function (Chassis). The Production card also has a sign-off location for each wheel; this is verified and signed by an associate in the Squawks department prior to completion. All signatures (RTM / Prod. Card) are once again verified by Quality Control check sheet completed prior to shipment.
- In April 2003 all transporters were required to sign an acknowledgement of responsibility form addressing wheel nut torque and nut-tightening intervals (10, 25, and 50 miles). These signed acknowledgment forms are kept on file at the Manufacturing facility.
- Also in April 2003, per memo from Brad Williams we began including an Owner's Manual Supplement with each unit. (Wheel Lug Nut Torque Information)

The last units built at this facility with the Tredit Aluminum Wheels by Product Line are listed below:

Yr.	Prod.	Model	Dealer	Prod. Start	Run	Serial Number
04	325	W 270 FQS	Roseville RV	3/10/03	497	2966608
04	326	P 270 FQS	RCD Sales	9/11/03	715	2968146
04	327	T 320 DBHS	Marlin Ingram RV	7/25/03	664	2967785
04	346	P 255 RLDS	RCD Sales	8/12/03	679	2967947

Supporting documents mailed separately to you attention.

Thanks,

Tim Cash

To: Steve Hulst

From: #40 Plant General Manager

Subject: Aluminum Wheels
January 21, 2004

Date: February 5, 2004

As most of you are aware, we are in the midst of a recall query by the NHTSA (National Highway Traffic Safety Administration) regarding Fleetwood's use of aluminum wheels on our products. To answer some of the questions posed by their board, I need information for every Towable plant. If you did not use aluminum wheels, please send me a memo stating that you did not use them.

For all plants that used these wheels, I need the following information as a minimum. Please provide any other relevant information.

- By what methods did your plant apply torque? By the assembly manual.
  Did the torque application method change through time? Yes.
  If so provide dates and details of all changes. DC changes effective dates as follow: 2/7/03, 3/24/03, 4/25/03, 7/7/03. If you have written/paper procedures please provide copies. DC prints attached. We are also attaching related e-mails and documents communicating changes to the aluminum wheels, including service bulletin, owners manual instruction sheet, transporter responsibility/compliance, and a copy of the recall regarding torque.

- What manufacturing process did your plant use to ensure torque was properly being applied? Use of production hard card and RTM & RTS process. Each line equipped with micrometer torque wrench. You may list your torque wrench specs here and your procedures to ensure it was used and it is calibrated. During one of the torque verification request time frames, we bought a calibrator and verified the calibration of each torque wrench by verifying torque with each wrench. List any QC checks you used as they relate to the aluminum wheel installation. RTM comes to mind as an example of these checks. RTM & RTS sheets used along with production hard cards to verify torque has been checked, and is recorded on the document.

- We also need to know the date produced and the serial number of the last unit built at your plant with aluminum wheels by product line. The last unit produced with aluminum wheels was #40-01608, with the exception of the following specific units that were produced on line 1 & 2 where the aluminum wheels were used: #40-01656, 01693 & 01700 through 01705

It is very important that you provide accurate and complete information. You need to be sure that you know what took place at your facility and can confirm these items if requested. Prepare your response to this as something you would sign as an affidavit as to its accuracy.

If you have any questions, please give me a call.

Thanks

Steve Hulst
Director of Operations
Towable Group

To: Distribution

From: Steve Hulst

Subject: Aluminum Wheels

Date: April 21, 2003

Sirs,

As you know we have had concerns with Aluminum Wheels on our Towable products. We have taken steps to ensure the proper torque specifications are met both by our plants and by our transport services.

Additionally other groups are working hard to resolve any other issues there may be. Our compliance team and engineers are performing a number of tests, evaluations and analysis. We are in the process of identifying and hiring a wheel expert to help us evaluate our situation.

These concerns are of the highest priority with all involved. Please continue to ensure we torque all units as required, and I will keep you posted regarding all other research and developments.

Thanks for your support.

Steve

Distribution:

Jim Croxton	Al Labelle	Gene Houck	Tim Cash
Bill Bockoven	Brent Stiers	Ed Smart	Jack Savage
Bob Wozniak	Brad Williams	Charlie Reick	Dan Ryan
Bob Thompson	Pete Betancourt		

Memorandum

April 18, 2003

TO: All Plant General Managers

FROM: Peter Betancourt

SUBJECT: Transport Services Acknowledgement of Responsibility
Wheel Lug Nut Torque Requirements

RV Operations is requiring that all companies who transport our travel trailers and fifth wheel trailers comply with Fleetwood requirements for proper wheel nut torque and lug nut tightening procedures during delivery to our dealers.

Please refer to Brad Williams' memo forwarded on April 15, 2003 by Eldonna Munson, subject "Steel & Aluminum Wheel Lug Nut Torque Requirements." Confirm that each transport service delivering our units follow the requirements and have them sign the attached form. Retain the original in your files. This information should be reviewed with all current transporters. In addition, any transporter entering into future delivery agreements must be in compliance.

Due to the critical importance of this issue, we are asking that you acknowledge that you have read, understand and implemented these requirements. Please sign below and fax to 909-353-7805.

Peter Betancourt
Production Services
RV Group
909-351-3844
909-351-3604 (fax)

ACKNOWLEDGEMENT

Signed: Bill Bockover

Dated: 4/21/03

Memorandum jvb 02-055

DATE: October 31, 2002

TO: Distribution

FROM: Jim Bertoch

Subject: Aluminum Wheel Torque

Please be aware of the following wheel torque requirements.

Steel wheel torque requirements (if equipped):
13 inch wheel nut torque is 80-90 ft. lbs.
14 inch wheel nut torque is 80-90 ft. lbs.
15 inch wheel nut torque is 80-100 ft. lbs.
16 inch wheel nut torque is 80-100 ft. lbs.

Aluminum wheel from Imports:

15 inch wheel nut torque is 80-85 ft. lbs.
16 inch wheel nut torque is 80-85 ft. lbs.

Aluminum wheel from Truck:

15 inch wheel nut torque is 120-125 ft. lbs.
16 inch wheel nut torque is 120-125 ft. lbs.

Distribution: Bob Wozniak, Larry Budica, Randy Most, Gary Beatty, Ron Robbins, Regional General Managers, Production Managers

[redacted]: Nykamp, Rolf
Sent: Tuesday, November 26, 2002 11:16 AM
To: Schafer, Sharon; Techlea, Jim; Tatum, Pat; Alby Snyder; Gail Dooley; John Bridges; Kenneth Perryman; Luann Slayton; Tim Blume; Deanna Tyeskie; Jackie Sopciak; Jimmy Slayton; Kenneth Pruitt; Melanie Strube; Paul Christensen; Tracy Wilson
Cc: William Bookoven
Subject: FW: Aluminum Wheels

—Original Message—
From: Ryan, Dan
Sent: Tuesday, November 26, 2002 1:12 PM
To: Fetherstonhaugh, Ron; Good, Jim; Nykamp, Rolf; Rhodes, Dennis; Richardson, Ron; Sprock, Craig; Willard, Robert; Whitler, Greg
Cc: Beaty, Gary; Reick, Charlie; Wozniak, Bob
Subject: FW: Aluminum Wheels

If you have import wheels already on units on the ground or in-line, you do not need to change these out. However, please see the following note. We continue to put a full court press on this issue. Thank you.

Daniel L. Ryan
Director of Materials - RV Product Development
Fleetwood Enterprises, Inc.

[redacted]) 351-3566
(909) 712-6812 cell
(909) 353-7082 fax

—Original Message—
From: Ryan, Dan
Sent: Friday, November 22, 2002 5:01 PM
To: Fetherstonhaugh, Ron
Subject: RE: Aluminum Wheels

Please makes sure you check the torque on the import wheels before you ship. The import wheel torque is 80-85 ft-lbs (the Tredit is 120-125 ft-lbs). If you find you over-torqued the import wheel, you must change it before you ship. We are still in the investigation mode for the next 2-3 days and will have better direction. Once we have the direction, we will DC whatever changes are needed and ensure this is done property. I will call to discuss further, thanks Ron.

Daniel L. Ryan
Director of Materials - RV Product Development
Fleetwood Enterprises, Inc.

(909) 351-3566
(909) 712-6812 cell
(909) 353-7082 fax

[redacted]—Original Message—
From: Fetherstonhaugh, Ron
Sent: Friday, November 22, 2002 8:43 AM
To: Ryan, Dan

Cc: Fetherstonhaugh, Ron
Subject: RE: Aluminum Wheels

Dan;

We currently have Pride/Triumph coming from our Chassis manufacturer today and will be transporting them with what wheels and tires that we have available today. We expect to obtain the Tredit wheels by Wednesday next week which we will mount tires and convert the built chassis to the new wheels.. NO units will be shipped without the Tredit wheels.

Question; will someone be doing a maintenance DC to change from the current call up to Tredit wheel so as the system corrects and proper relief is obtained??

Ron...."

---Original Message---
From: Ryan, Dan
Sent: Thursday, November 21, 2002 2:53 PM
To: Fetherstonhaugh, Ron; Good, Jim; Nykamp, Rolf; Rhodes, Dennis; Richardson, Ron; Sprock, Craig; Willard, Robert; Winkler, Greg
Cc: Most, Randy; Beatty, Gary; Bartoch, Jim; Thompson, Bob; Reick, Charlie; tbell@tredtire.com; Wozniak, Bob; Bartoch, Jim; Budica, Larry; Hulet, Steve
Subject: RE: Aluminum Wheels

A precautionary decision has been made to move immediately from the imported aluminum wheel used on the for P-W-T and the Pride/Triumph, to Tredit Tire. Please begin ordering all requirements from Tredit immediately. Do not use the current inventories of import aluminum wheels at this time pending further direction.

Import wheel part numbers:
L01-4005 15" x 6" x 655
L01-4006 16" x 7" x 655

Tredit replacement part numbers
L01-4010 15" x 6" x 655 - replaces L01-4005
L01-4020 16" x 6" x 655 - replaces L01-4006

The L01-4020 from Tredit replaces the L01-4006 from Imports even though the width is 6" vs 7", this has been confirmed by Engineering and being acceptable. Tredit has been advised of this direction. Please direct any questions you may have to me, if you have an emergency please contact me on my cell phone (number below). I am requesting each plant respond back to confirm this direction. Thank you.

Daniel L. Ryan
Director of Materials - RV Product Development
Fleetwood Enterprises, Inc.

(909) 351-3566
(909) 712-6812 cell
(909) 353-7032 fax

---Original Message---
From: Beatty, Gary
Sent: Thursday, November 21, 2002 10:33 AM
To: Ryan, Dan; Bartoch, Jim; Thompson, Bob
Cc: Most, Randy
Subject: Aluminum Wheels

After a little research, here's what we have going on in the world of wheels:

Midline Plus and Pride/Triumph offer the Imports Aluminum wheels in two sizes- 15 x 6 x 655 and 16 x 7 x 655. These same sizes, with exception of wheel width (6"Tredit v/s 7"Imports) are available from Tredit and are currently offered in the Entry and Entry Plus. If we determine that the current Import Wheels need improvement, I would recommend that we put out a memo to the plants and have them buy all wheels from Tredit, providing they can

supply the required volume.

Gary

				12" = 1'-0"
				DRAWN: 01PLASED — DATE: AUG-12-02
04-02		01-10-03	MB	FILE: 01/10/03 10:13:00

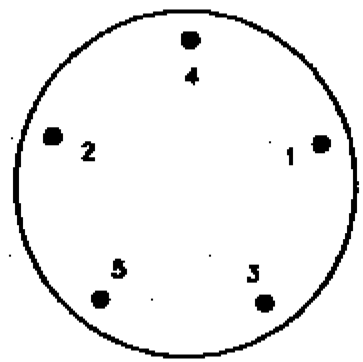
FLEETWOOD RECREATIONAL VEHICLE GROUP — AMR-28-A75 — SHEET 1 OF 1

TT ASSEMBLY MANUAL – FINAL FINISH

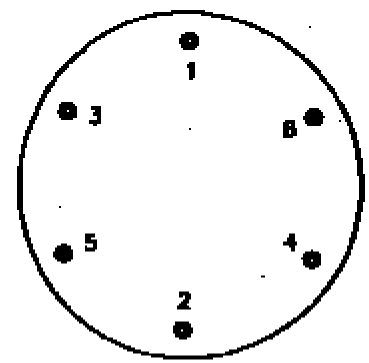
WHEEL LUG NUT TORQUE PROCEDURE

Assembly Manual DC-02
Start date 2-[illegible]-03

STEEL WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER
	LD1-[illegible]	13	[illegible]-1044
	LD1-[illegible]	15	[illegible]-1044
	LD1-1435	14	[illegible]
IMPORT ALUM. WHLS	LD1-[illegible]	15	[illegible]
	LD1-[illegible]	16	[illegible]
TREDIT ALUM. WHLS	LD1-[illegible]	15	[illegible]
	LD1-[illegible]	15	[illegible]
	LD1-[illegible]	16	[illegible]



FIVE LUG WHEEL



SIX LUG WHEEL

TORQUE TO 110–120 FT/LBS

LUG TIGHTENING SEQUENCE

NOTES:

1. A TORQUE WRENCH MUST BE USED TO TIGHTEN THE LUG NUTS TO 120 FOOT POUNDS ON ALL TRAVEL TRAILERS AND 5TH WHEELS. DO NOT TIGHTEN BY HAND OR USE AN IMPACT WRENCH IN FINAL FINISH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

04-03		02-04-03	RP	12" = 1'-0"	
04-04		02-21-03	RR		02-14-04
04-06		03-17-03	RR	03/17/03 13:41:25	

FLEETWOOD AMR-01-A39

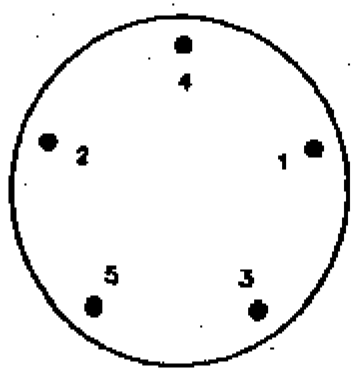
RECREATIONAL VEHICLE GROUP — SHEET 1 OF 1

TT ASSEMBLY MANUAL - CHASSIS

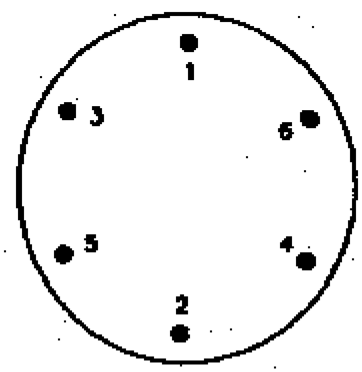
WHEEL LUG NUT TORQUE PROCEDURE

Assembly manual LC-06
Start date 3-29-03

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X4.5X545AW		13	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 14X5.5X545AW		14	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15X6X545 AW	L01-0400	15	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15X6X655 AW	L01-0541	15	M23-1014	80 - 100 FT/LBS
STEEL WHEEL-SPOKE 16X6X655 AW	L01-1835	16	M23-1014	90 - 110 FT/LBS
WHEEL- ALUMINUM 15X6X655	L01-4005	15	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM 16X7X655	L01-4006	16	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15X6X545	L01-4008	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15X6X655	L01-4018	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 16X6X655	L01-4020	16	M23-0050	110 - 120 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

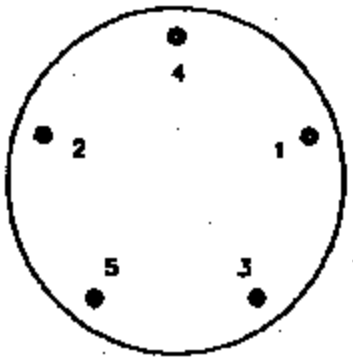
1. A TORQUE WRENCH MUST BE USED TO TIGHTEN THE LUG NUTS ON ALL TRAVEL TRAILERS AND 5TH WHEELS. DO NOT TIGHTEN BY HAND OR USE AN IMPACT WRENCH IN FINAL FINISH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

04-04		02-18-03	RR	12 = 1-0	
04-06		03-17-03	RR		
04-07		04-14-03	RR		

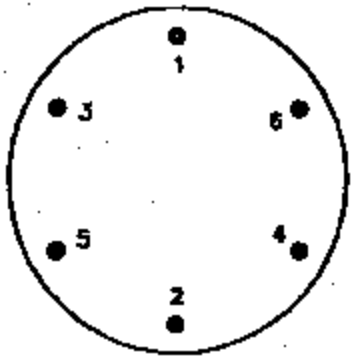
FLEETWOOD RV AMR-28-A75
RECREATIONAL VEHICLE GROUP | SHEET 1 OF 1
TT ASSEMBLY MANUAL – FINAL FINISH
WHEEL LUG NUT TORQUE PROCEDURE

SC-07 Assembly Manual
Effective date 4-25-03

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X6.5[illegible]		13	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 14X5.5[illegible]		14	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15[illegible]	L01-0400	15	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15[illegible]	L01-0561	15	M23-1014	90 - 100 FT/LBS
STEEL WHEEL-SPOKE 16[illegible]	L01-1635	16	M23-1014	90 - 110 FT/LBS
WHEEL- ALUMINUM 15[illegible]	L01-4005	15	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM 16X7[illegible]	L01-4006	16	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15[illegible]	L01-4006	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 15[illegible]	L01-4010	15	M23-0050	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD 16[illegible]	L01-4020	16	M23-0050	110 - 120 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

➡ 1. PLACE THE WHEEL ON THE WHEEL MOUNTING SURFACE. PLACE THE WHEEL LUG NUTS WITH ROUNDED END OF THE NUT TOWARD THE WHEEL. TIGHTEN EACH NUT BY HAND OR USE AN IMPACT WRENCH UNTIL THE WHEEL IS HELD AGAINST THE WHEEL MOUNTING SURFACE. LOWER THE TIRE TO THE GROUND AND TIGHTEN THE WHEEL LUG NUTS TO THE SPECIFIED TORQUE WITH A TORQUE WRENCH.

2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

➡ 3. ONCE WHEELS ARE INSTALLED CHECK THE TORQUE AGAIN AT 10, 25 AND 50 MILES.

D.C. RELEASE	DESCRIPTION	DATE	BY	SCALE: 12" = 1'-0"	
04-06		03-17-03	RR	DRAWN: DYPLASED / DATE: 02-14-04	
04-07		04-14-03	RR	[illegible]	
04-09		06-23-03	RR	PLOT: 06/23/03 [illegible]	

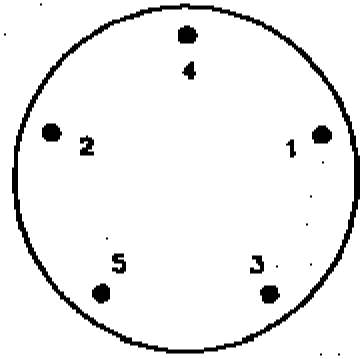
FLEETWOOD RECREATIONAL VEHICLE GROUP — DWG: AMR-01-A39 — SHEET 1 OF 1

TITLE: TT ASSEMBLY MANUAL - CHASSIS

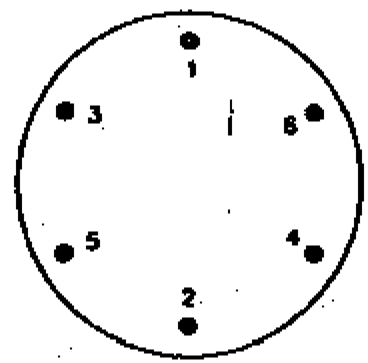
WHEEL LUG NUT TORQUE PROCEDURE

Assembly manual DC-09
Start date 7-7-03

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X4.5X545AW		13	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 14X5.5X545AW		14	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15X[illegible]545 AW	L01-0400	15	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 15X[illegible] AW	L01-0561	15	M23-1014	90 - 100 FT/LBS
STEEL WHEEL-SPOKE 16X[illegible] AW	L01-1636	16	M23-1014	90 - 110 FT/LBS
WHEEL- ALUMINUM 15X[illegible]	L01-4005	15	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM 16X7X[illegible]	L01-4006	16	M23-0052	110 - 120 FT/LBS
➡ WHEEL- 15X[illegible]545 CHR/CAMBLE	L01-0798	15	M23-0053	85 - 95 FT/LBS
➡ WHEEL- 15X[illegible] CHR/CAMBLE	L01-0800	15	M23-0053	85 - 95 FT/LBS
➡ WHEEL- 16X[illegible] CHR/CAMBLE	L01-0802	16	M23-0053	85 - 95 FT/LBS



FIVE LUG WHEEL



SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

1. PLACE THE WHEEL ON THE WHEEL MOUNTING SURFACE. PLACE THE WHEEL LUG NUTS WITH ROUNDED END OF THE NUT TOWARD THE WHEEL. TIGHTEN EACH NUT BY HAND OR USE AN IMPACT WRENCH UNTIL THE WHEEL IS HELD AGAINST THE WHEEL MOUNTING SURFACE. LOWER THE TIRE TO THE GROUND AND TIGHTEN THE WHEEL LUG NUTS TO THE SPECIFIED TORQUE WITH A TORQUE WRENCH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.
3. ONCE WHEELS ARE INSTALLED CHECK THE TORQUE AGAIN AT 10, 25 AND 50 MILES.

FLEETWOOD

Memorandum

April 15, 2003

TO: General Managers – Towable Group Plants

FROM: Brad Williams

SUBJECT: Steel and Aluminum Wheel Lug Nut Torque & Nut Tightening Intervals - Transporter Responsibility/Compliance

---

Please ensure your plant meets the requirements regarding correct nut wheel selection, nut tightening staging and sequencing, nut torque, and nut-tightening intervals.

WHEEL MOUNTING TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> ***Note:*** *Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

WHEEL NUT SELECTION

Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60 or 90 degrees). See applicable prints. Specific nuts match specific wheels.

NUT TIGHTENING, STAGING AND SEQUENCING

The procedure for attaching all steel and aluminum wheels is as follows:

1. Start all nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in specific sequence. (See bulletin)
3. The tightening of the fasteners should be done in stages. (See bulletin)
4. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram (see bulletin). This may change based on wheel manufacturer's recommendation.
5. Wheel nuts should be torqued before the first road use and after each wheel removal. Check and re-torque after the first 10, 25 and 50 miles or until torque has been established. Check periodically thereafter.

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> ***Note:*** *Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed Jon D. Bunch Date: 4-24-03

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> ***Note:** Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed ______________________ Date:

4-23-03

From: Manees, Eldonna

Sent: Thursday, April 24, 2003 1:29 PM

To: Bodkowen, William; Cash, Tim; Croxton, Jim; Houck, Gene; LaBelle, Al; Savage, Jack; Smart, Ed; Stiers, Brent; Blazo, Craig; Cote, Steve; Ewing, Rick; Hughes, Bill; Shrader, Brian; Sopcisak, Jackie

Cc: Williams, Brad; Olson, Robby; Hulst, Steve

Subject: Ready To Move Check List Revised

Attached is a revised Ready to Move (RTM) Department Inspection form. In the Chassis Department we have added checks for the correct lug nut installed, and space to record wheel lug nut torque foot/pounds.

Steve Hulst approved this change and Brad Williams has instructed that you begin using the revised from at the beginning of the fiscal year (Monday April 28, 2003).

Thank you.

Eldonna Manees
RV Group Service & Sales
Eldonna.Manees@Fleetwood.com

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

CHASSIS:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Proper slope on drain lines and lines secured at proper intervals
☐	☐	Heat shrink connectors on brake wire connection to axle
☐	☐	Brake wires routed and secured properly
☐	☐	Paint applied properly with good coverage
☐	☐	Chassis is square
☐	☐	Support over hangers welded properly
☐	☐	Wheels/tires free of paint overspray
☐	☐	Knife valves supported and at proper angle
☐	☐	Slide-out motor bracket secure/square

Pass	Fail	
☐	☐	Gas manifold line supported every four feet and 6 inches from end
☐	☐	Check cambering
☐	☐	Vehicle Identification Number (VIN) is correct
☐	☐	Correct Lug Nut Installed
☐	☐	Wheel Lug Nut Torque Check

DSF _____ Ft/Lbs Signed: _____
DSR _____ Ft/Lbs Signed: _____
PSF _____ Ft/Lbs Signed: _____
PSR _____ Ft/Lbs Signed: _____

FLOORS:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Floor ducts/vents free of debris
☐	☐	Chassis grounds installed
☐	☐	Sealants properly applied
☐	☐	Plumbing holes in correct location, proper alignment with tanks
☐	☐	Floor protected
☐	☐	7-way cable correct length and wired properly
☐	☐	Plumbing routing holes are sealed
☐	☐	Floor decking is properly attached to floor structure

Pass	Fail	
☐	☐	Floor is set to level
☐	☐	Staples/screws flush with decking
☐	☐	Underbelly staples set flush
☐	☐	110/12v wires separated
☐	☐	Lino taped or glued at register ducts
☐	☐	Brake amp draw test
☐	☐	Unit Cleaned
☐	☐	_____
☐	☐	_____

CABINET SET:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	All cabinets prefilled correctly and free of broken or split wood
☐	☐	All cabinets set square and secured at proper location
☐	☐	All cabinets are tight to one another and the floor
☐	☐	Cabinet staples set and putted
☐	☐	All cabinets free of visible defects
☐	☐	Interior walls set straight and square
☐	☐	Bath door header flush with walls
☐	☐	Cabinet drawer supports secure
☐	☐	Cabinet tops covered

Pass	Fail	
☐	☐	Door and drawers are square to frame, clean and operational
☐	☐	All doors and drawers functional
☐	☐	Shelves are level
☐	☐	Cove moldings fit tight between cabinets
☐	☐	Plumbing threshholds flush to walls and floors
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

PLUMBING:

Group Leader: _____
Date: _____

Pass	Fail		Pass	Fail	
☐	☐	Water lines correctly installed and secured at 48" intervals	☐	☐	Water lines tight at risers
☐	☐	Drain plumbing properly installed including grade and support, secured and p-traps tight	☐	☐	Toilet is flush to floor, squared to wall, secured & clean
☐	☐	LPG lines properly routed and secured at 48" intervals	☐	☐	No kinked or dented copper gas lines
☐	☐	Showerhab properly installed, sealed and supported	☐	☐	Knife valves functional
☐	☐	Fresh water fill hose/vent line free of kinks and routed properly	☐	☐	Unit cleaned
☐	☐	Water pump installed in proper location and secured	☐	☐	_____
			☐	☐	_____

SIDEWALLS

Group Leader: _____
Date: _____

Pass	Fail		Pass	Fail	
☐	☐	Unit level before sidewalls are set	☐	☐	Walls straight, plumb and aligned
☐	☐	Sidewalls set in proper location at front and rear of unit	☐	☐	Refer cabinet completely sealed
☐	☐	Rear section properly installed and tight to all cabinets	☐	☐	Slide out opening(s) square
☐	☐	Front section properly installed and tight to all cabinets	☐	☐	Cove molding set between walls and cabinets
☐	☐	All cabinets are flush to top of sidewall	☐	☐	Unit cleaned
☐	☐	All cabinets and interior walls tight to sidewall	☐	☐	_____
☐	☐	Fiberglass free of defects (if applicable)	☐	☐	_____

HULLS:

Group Leader: _____
Date: _____

Pass	Fail		Pass	Fail	
☐	☐	Unit set level	☐	☐	No wrinkled edges on paneling
☐	☐	Ceiling installed square to unit	☐	☐	No split wood on overheads
☐	☐	All cabinets secured tight to ceiling	☐	☐	Bath door is square and operates properly
☐	☐	Ceiling cleaned and no debris	☐	☐	Unit cleaned
☐	☐	Ceiling panels are defect-free	☐	☐	_____
☐	☐	A/C vents rotate freely	☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: ______________________

ELECTRICAL:

Group Leader: ______________
Date: ______________

Pass Fail
- ☐ ☐ All wires properly routed and secured
- ☐ ☐ Thermostat installed at proper height and correct location
- ☐ ☐ Polarity is correct for all electrical receptacles
- ☐ ☐ All grounds properly installed
- ☐ ☐ All J-boxes are accessible
- ☐ ☐ All access panels and wire covers properly and neatly installed
- ☐ ☐ Panel box, converter, power cord properly installed to print and secured

Pass Fail
- ☐ ☐ Wall plates straight and flush
- ☐ ☐ Fixtures are secured and clean
- ☐ ☐ OSB panels are flush with sidewalls
- ☐ ☐ OSB joints are flush
- ☐ ☐ OSB staples are set and flush
- ☐ ☐ Unit cleaned
- ☐ ☐ ______________________
- ☐ ☐ ______________________

METAL: (if applicable)

Group Leader: ______________
Date: ______________

Pass Fail
- ☐ ☐ Clearance light holes drilled in proper locations
- ☐ ☐ Metal sealed at pittsburgs
- ☐ ☐ Top yoder is rolled over OSB decking
- ☐ ☐ All openings cleaned of metal shavings
- ☐ ☐ Insulation properly installed and tucked

Pass Fail
- ☐ ☐ Metal free from defects of any kind
- ☐ ☐ Unit cleaned
- ☐ ☐ ______________________
- ☐ ☐ ______________________

MOLDING:

Group Leader: ______________
Date: ______________

Pass Fail
- ☐ ☐ All exterior lighting properly sealed and installed
- ☐ ☐ All screws installed straight in window garnishes
- ☐ ☐ Entry door installed using proper installation method
- ☐ ☐ Exterior graphics applied at correct locations & free of bubbles & wrinkles
- ☐ ☐ Luggage doors installed straight and adjusted
- ☐ ☐ Window garnish flush to sidewall
- ☐ ☐ TV antenna centered in hole
- ☐ ☐ Slide out functions and seals properly
- ☐ ☐ Exterior of unit cleaned of excess sealer and putty tape

Pass Fail
- ☐ ☐ All molding splices sealed
- ☐ ☐ All molding straight
- ☐ ☐ Windows are square and operational
- ☐ ☐ Window screens fit and are not damaged
- ☐ ☐ Awning location is correct
- ☐ ☐ Unit cleaned
- ☐ ☐ ______________________
- ☐ ☐ ______________________

Clearly describe corrective action required:

____

____

____

Rev. 6/2/03

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: _____

TOP MOLDING:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Rubber or T.P.O. roof installed correctly - free of debris, no fasteners showing, no bubbles, no wrinkles
☐	☐	Top molding installed tight to top and side of unit
☐	☐	Roof properly sealed - tester free of air bubbles
☐	☐	Ladder installed straight and in proper location
☐	☐	Plumbing vents clear and covered properly
☐	☐	All excess sealant cleaned from unit

Pass	Fail	
☐	☐	All power vents properly installed - interior garnishes tight to ceiling
☐	☐	Roof inspected for cuts and sealant voids
☐	☐	Check roller vent is open and clear
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

FINAL:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Exterior refer door and drain tube installed properly
☐	☐	LPG tanks installed and lines properly routed and secured
☐	☐	All window treatments installed correctly, in proper location and functional
☐	☐	Water fill hose installed correctly and with proper slope
☐	☐	Refer compartment properly sealed
☐	☐	Tire pressures meet specifications
☐	☐	Showerlub sealed properly
☐	☐	All wood molding properly installed and straight
☐	☐	Proper warning/information labels installed

Pass	Fail	
☐	☐	Dinette table fits and functions
☐	☐	Doors and drawers aligned and functional
☐	☐	Sofa checked for operation
☐	☐	Monitor panel functional
☐	☐	All wall seams & border tape free of wrinkles, secured properly and straight
☐	☐	Unit cleaned
☐	☐	_____
☐	☐	_____

FINISH:

Group Leader: _____
Date: _____

Pass	Fail	
☐	☐	Hard card checked for correct options and filled out completely
☐	☐	Underside of unit checked for proper seal
☐	☐	Interior and exterior of unit clean
☐	☐	All loose load items in unit (remotes, keys, smoke alarm battery, sink stoppers, etc.)
☐	☐	Orange warranty packet complete and in unit
☐	☐	Correct Fleetwood Brand Owners Manual placed in unit
☐	☐	Lug nut torque checked and documented
☐	☐	Décor colors/patterns properly installed and matched per design specs

Pass	Fail	
☐	☐	Line and cabinets free from defects from line damage
☐	☐	Entry door functions
☐	☐	Screen door functions
☐	☐	Awning functions
☐	☐	All squeak tape removed
☐	☐	Unit clean
☐	☐	Entry door grab handle secure
☐	☐	_____
☐	☐	_____

Clearly describe corrective action required:

_____

_____

_____

Serial # _____

RTS READY TO SHIP INSPECTION AND APPROVAL

Fit and Finish

Exterior Inspections

Pass	Fail		
☐	☐	1. Roof Covering	Installed with no wrinkles, cuts or debris trapped on or under materials. Sealant application is correct.
☐	☐	2. Graphics	Aligned and free of wrinkles, bubbles and other imperfections.
☐	☐	3. Chassis	Painted properly and free of debris, rust, scratches and dents.
☐	☐	4. Fiberglass/Sheetmetal	Clean and free from dents, scratches, overspray, discoloration, bubbles, waves or other imperfections.
☐	☐	5. Windows and Doors	Windows, doors and moldings properly installed and sealed.

Interior Inspections

Pass	Fail		
☐	☐	6. Cabinet doors	Aligned, functionally latch and are free from defects.
☐	☐	7. Drawers/doors	Aligned, latch, operate smoothly and are free from defects.
☐	☐	8. Carpet, Linc, Deco Floor	Clean with no stains, discoloration, cuts, tears or other damage.
☐	☐	9. Interior Panels/Molding	Installed properly and free from defects.
☐	☐	10. Furniture	Furniture is functional and free from defects.

MANUFACTURING CENTER DYNAMIC INSPECTIONS

Pass	Fail		Pass	Fail	
☐	☐	11. _____	☐	☐	14. _____
☐	☐	12. _____	☐	☐	15. _____
☐	☐	13. _____	☐	☐	16. _____

Remarks: _____

Functional

RTS FUNCTIONAL TESTS

Pass	Fail		Pass	Fail	
☐	☐	17. Slide-out cycle test and component inspections	☐	☐ *	21. Gas system test
☐	☐ *	18. Fresh Water System Test and Operational Inspection	☐	☐	22. Entry door functional test
☐	☐ *	19. 12 volt electrical test and operational inspection	☐	☐ *	23. Test equipment is functional and properly calibrated
☐	☐	20. Drain, waste and vent system test			

Remarks: _____

DYNAMIC FUNCTIONAL TESTS BY MANUFACTURING CENTER

Pass	Fail	
☐	☐	23. _____
☐	☐	24. _____
☐	☐	25. _____
☐	☐	26. _____

Remarks: _____

Final approval to Ship: (Legible Signature) _____

Date: (MM/DD/YY) _____

RTS SHIP READINESS

Pass	Fail	
☐	☐	1. RTM inspections are complete and remarks addressed.
☐	☐	2. RTS FB/Finish Interior/Exterior inspections completed and remarks addressed
☐	☐	3. Short parts reviewed and completed. (See three-part memo.)
☐	☐	4. All RTS Functional Tests completed and remarks addressed.
☐	☐	5. Hard card is completed.
☐	☐	6. All options verified and match invoice.
☐	☐	7. All windows and vents are closed and latched.
☐	☐	8. All doors, drawers, furniture and "loose load" items secured for travel.
☐	☐	9. Keys are in unit.
☐	☐	10. The unit is clean with no visible damage inside and outside.

Remarks:

_____

_____

_____

_____

Authorization to Ship: (Legible Signature) _____

Date (MM/DD/YR) _____

FLEETWOOD INFORMATION BULLETIN #SBT0113

INFORMATION BULLETIN: #SBT0113

YEAR AFFECTED:

PRODUCT(S) AFFECTED:

The purpose of this bulletin is to inform all Fleetwood dealers about information pertaining to all travel trailer and firth wheels. If you are contacted by a retail customer regarding this matter, refer to the information listed.

IMPORTANT INFORMATION RELATED TO WHEEL LUG NUT TORQUE

This bulletin includes the travel trailer and fifth wheel Owner's Manual Supplement related to wheel lug nut torque, tightening sequence and tightening intervals. The supplement can be referenced on the back page of this bulletin.

Additionally the following information should be referenced during the **Product Delivery Process** prior to retail delivery.

If you have any questions concerning this bulletin, contact your regional Fleetwood Towable factory service center.

"It is impossible to know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Accordingly anyone who uses a service procedure or tool must first assure that neither personal safety nor vehicle safety will be jeopardized by the selected service methods."

This bulletin is supplied for technical information only and is not an authorization for repairs.

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

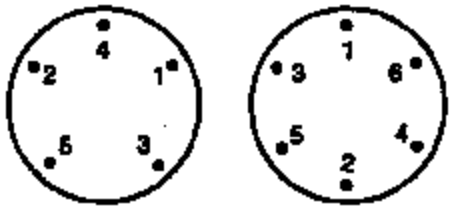
This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

This Owner's Manual Supplement contains information that was incorrect and or/incomplete in your Owner's Manual.

Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft./Lbs.
Steel Wheel 14 x 5.5 x 545 AW	Spoke	14	80 - 90 Ft./Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft./Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft./Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft./Lbs.
Aluminum Wheel 15 x 7 x 656	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 546	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft./Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at **10, 25, and 50** miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

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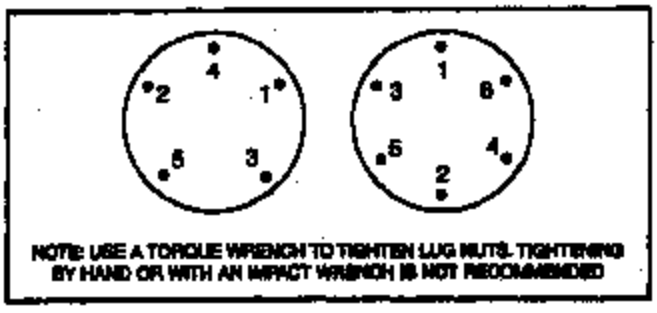
Steel Wheel 14 x 5.5 x 645 AW	Spoke	14	80 - 90 Ft./Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft./Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft./Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft./Lbs.
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft./Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at 10, 25, and 50 miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

⚠ WARNING

Wheel Lug Nut Torque and Lug Nut Tightening Intervals

1. The wheel lug nut torque and nut tightening intervals for steel and aluminum wheels are incorrect and incomplete in section 04, titled Wheel Lug Nut Torque of your Owner's Manual.
2. The Wheel Lug Nut Torque Supplement provides current and complete information.
3. Use the information contained within the provided Supplement to reduce the risk of wheel separation from your travel trailer or fifth wheel.
4. If you cannot locate this Wheel Lug Nut Torque Supplement or have any questions call 800-445-3307 and Fleetwood will assist you.

FLEETWOOD

Memorandum

April 15, 2003

TO: General Managers – Towable Group Plants

FROM: Brad Williams

SUBJECT: Steel and Aluminum Wheel Lug Nut Torque & Nut Tightening Intervals - Transporter Responsibility/Compliance

---

Please ensure your plant meets the requirements regarding correct rim wheel selection, nut tightening staging and sequencing, nut torque, and nut-tightening intervals.

WHEEL MOUNTING TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

WHEEL NUT SELECTION

Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60 or 90 degrees). See applicable prints. Specific nuts match specific wheels.

NUT TIGHTENING, STAGING AND SEQUENCING

The procedure for attaching all steel and aluminum wheels is as follows:

1. Start all nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in specific sequence. (See bulletin)
3. The tightening of the fasteners should be done in stages. (See bulletin)
4. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram (see bulletin). This may change based on wheel manufacturer's recommendation.
5. Wheel nuts should be torqued before the first road use and after each wheel removal. Check and re-torque after the first 10, 25 and 50 miles or until torque has been established. Check periodically thereafter.

NUT TIGHTENING INTERVALS

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely at the recommended odometer readings. They must check all wheel nuts with an approved torque wrench set at the proper torque and understand the proper intervals and sequence of tightening.

ADVISE TRANSPORT SERVICES

All transporters are required to meet this requirement, sign the attached form and maintain compliance with this requirement at all times.

TORQUE WRENCHES

All torque wrenches must be set to the correct torque requirements and be used correctly. Air driven impact guns should not be used in final finish.

COMPLIANCE

Be prepared to demonstrate your compliance to this requirement at any time.

Please call me if you have any questions.

Regards,

Brad Williams
Director of Service
Towable Group

Attachments

BW/em

TTS/BW03-010

C:
Bob Wozniak
Jim Bertoch
Steve Hulst
Dan Ryan
Bob Thompson
Dave Nelson
John Draheim
Charlie Reick
Chris Edgar
Ellen Tyler
Robby Olson
TT Service Managers
Larry Chandler
Chuck Wilkinson

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed_____ Date:

_____

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Wheel Lug Nut Torque Information
Steel and Aluminum Wheels

This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

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Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft./Lbs.
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Steel Wheel 15 x 6 x 545 AW	Spoke	15	80 - 90 Ft./Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft./Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft./Lbs.
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft./Lbs.
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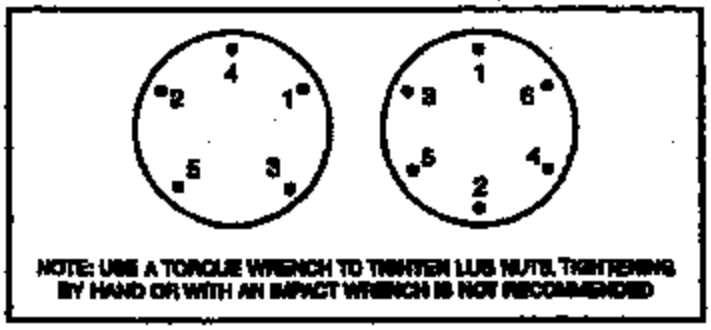
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft./Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals
Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at 10, 25, and 50 miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

ng

TION OR DATE RECEIVED AT PLANT

	MO	DAY

ER(S) ____________

Printed in U.S.A.

Fold Line

GROUP LEADER INSPECTION AND ACCEPTANCE LEGIBLE SIGNATURE (NO initials)

	LEGIBLE SIGNATURE (NO initials)	MO	DAY
CHASSIS			
FLOORS			
CAB SET			
PLUMBING			
SIDEWALLS			
HULL			
MANAGEMENT			
ELECTRICAL			
EXTERIOR SIDING			
MOLDING			
FINAL			
FINISH			
REWORK			
MANAGEMENT			

ELECTRICAL LINE TESTS: LEGIBLE SIGNATURE (NO initials)

	LEGIBLE SIGNATURE (NO initials)	MO	DAY
120 V Dielectric			
120V Polarity			
120V Operation			
12V Dielectric Interior			
12V Dielectric Exterior			
12V Operation			

FINAL LINE TESTS: LEGIBLE SIGNATURE (NO initials)

	LEGIBLE SIGNATURE (NO initials)	MO	DAY
12V Dielectric Exterior			
Gas (USA: 9" W.C.) (CSA: 10-14" W.C.)			
Water (30 psi max.)			
120V Dielectric			
120V Polarity			
120V Operation			
12V Dielectric Interior			
12V Operation			
Ground Continuity			
Ground Fault Trip			
12V Brake (amperage)			
Break Away Switch			
Lug Nut Torque			
Tire Pressure			
Monitor Panel			
Tank fill/Vent			
Pump/Cold Water			
Smoke Alarm			
LPG Leak Detector			
TV & Coaxial Cable			
CO Detector			
Exterior Light Operation			
Furnace Vent			
Winterize			

Test in bold box is Code Requirement (USA or CSA)

X-Q-000 7/00 TT

SERIAL NUMBER IDENTIFICATION/EQUIPMENT INFORMATION

PRINT ALL INFORMATION LEGIBLY

EQUIPMENT	SERIAL # ID	MAKE	MODEL
TIRE			
TIRE			
TIRE			
TIRE			
SPARE TIRE			
REFRIGERATOR			
RANGE/OVEN			
MICROWAVE			
WATER HEATER			
RADIO/STEREO			
FURNACE			
FURNACE #2			
ROOF AIR #1			
ROOF AIR #2			
CONVERTER			
WATER PUMP			
POWER JACK			
AXLE #1			
AXLE			
GENERATOR			
TOILET			
AWNING ROLLER			
AWNING HDWE.			
CENTER SUPPORT			
TELEVISION			
WASHER/DRYER			
SL/O MOTOR/MAIN			
SL/O MOTOR/BDRM			
SL/O MOTOR #3			

INCOMPLETE WORK OR MISSING PARTS: _____

_____

_____

_____

Fold Line

INTERIOR

FINAL ACCEPTANCE:

Production Manager _____

Sales Manager _____

QUALITY CONTROL REMARKS

REWORK

INTERIOR	EXTERIOR

AL ACCEPTANCE: MM / DD / YR

Production Manager _____ Date _____

Sales Manager _____ Date _____

Fold Guide

PRODUCTION ORDER & QUALITY CONTROL CARD

CPSC MATTRESS RECORD KEEPING All mattresses or mattress pads used only for sleeping

ITEM	VENDOR	MATTRESS LOT # OR IDENTIFICATION # OR DATE RECEIVED AT PLANT
D MATTRESS		
SOFA BED MATTRESS		
BUNK MATTRESS		
BUNK MATTRESS		
COMBO BUNK PAD		

Dealer MODEL

COLOR VIN

QUALITY CONTROL TESTS

PLUMBING LINE TESTS: LEGIBLE SIGNATURE (NO Initials)

		MO	DAY
Gas Test (3 psi min.)			
Water (100 psi)			
Drain Flow			
Flood Level			

TAG NUMBER _____

STATE TAG NUMBER(S) _____ PLAN APPROVAL NUMBER(S) _____

Bockoven, William

From: Bockoven, William
Sent: Monday, April 21, 2003 2:34 PM
To: Snyder, Alby; Nykamp, Rolf; Sopcisak, Jackie; Tatum, Pat
Cc: Powell, Rick; Techlas, Jim
Subject: FW: Alum wheels

fyi

-----Original Message-----
From: Hulst, Steve
Sent: Monday, April 21, 2003 11:39 AM
To: Bockoven, William; Cash, Tim; Croxton, Jim; Houck, Gene; LaBelle, Al; Savage, Jack; Smart, Ed; Stiers, Brent
Cc: Reick, Charlie; Wozniak, Bob; Williams, Brad; Thompson, Bob; Ryan, Dan; Betancourt, Peter
Subject: Alum wheels

Sirs,

Please see the attached and give me a call with any questions.

Steve

alum wheel memo 042103.doc

To: Distribution

From: Steve Hulst

Subject: Aluminum Wheels

Date: April 21, 2003

Sirs,

As you know we have had concerns with Aluminum Wheels on our Towable products. We have taken steps to ensure the proper torque specifications are met both by our plants and by our transport services.

Additionally other groups are working hard to resolve any other issues there may be. Our compliance team and engineers are performing a number of tests, evaluations and analysis. We are in the process of identifying and hiring a wheel expert to help us evaluate our situation.

These concerns are of the highest priority with all involved. Please continue to ensure we torque all units as required, and I will keep you posted regarding all other research and developments.

Thanks for your support.

Steve

Distribution:

Jim Croxton	Al Labelle	Gene Houck	Tim Cash
Bill Bockoven	Brent Stiers	Ed Smart	Jack Savage
Bob Wozniak	Brad Williams	Charlie Reick	Dan Ryan
Bob Thompson	Pete Betancourt		

November 19, 2003

MEMORANDUM

To: Distribution

From: Shelley Smith

Subject: IMPORTANT RECALL INFORMATION - CAMPAIGN # 31028

Attached for your records is a copy of the Fleetwood Voluntary Recall Information Package for units affected by Recall #31028 - Travel Trailer Aluminum Wheel Lug Nut Torque

What is the problem?	Certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels".
Units affected by this campaign include:	(see above)
Approximate number of units involved:	4933
Approximate number of units in Canada:	1500
Targeted campaign mailing dates:	**Dealer Letter:** November 19, 2003 **Customer Letter:** November 26, 2003

If you have any questions please contact me.

FLEETWOOD

ETWOOD ENTERPRISES, INC.
3000 Myers Street, P. O. Box 7638
Riverside California 92513-7638
(800) 445-3307 Fax (909) 383-7040

IMPORTANT RECALL INFORMATION #31028
November, 2003

Dear Valued Fleetwood Travel Trailer Customer:

This notice is sent to you in accordance with the requirements of the National Traffic Safety and Motor Vehicle Safety Act.

Fleetwood has decided that a defect which relates to motor vehicle safety exists in certain 2002 and 2003 model year Pride and Triumph conventional and fifth wheel travel trailers and 2004 model year Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers.

What is the problem? Specifically, certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels" that you need to know to safely tow your conventional or fifth wheel travel trailer. This matter is very important and requires your attention.

Proper wheel lug nut torque is very important for safe and dependable trailering. It is extremely important to apply and maintain proper wheel lug nut torque on conventional and fifth wheel travel trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and expressed as length times force. For example, a force of 120 pounds applied at the end of a wrench one foot long will yield 120 lbs/ft of torque. Torque wrenches are the only method to assure the proper amount of torque is being applied to a wheel lug nut.

! WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lug(s) and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control.

Loss of vehicle control may create a crash resulting in personal injury or death.

It is critical that the wheels of the conventional and fifth wheel travel trailers be properly torqued during the first 10, 25 and 50 miles of road operation. Settling of components during the first few miles of operation may cause the loosening of the wheel lug nuts.

Maintaining proper wheel lug nut torque is the owner's/user's responsibility.

What is the problem? (continued)

A torque wrench with required accuracy is available for approximately $50.00 at most automotive stores.

Before each trip be sure to tighten the wheel lug nuts following the proper tightening sequence to the specified torque. If you notice a wheel wobbling or hear a rattling sound coming from a wheel, one or more wheel lug nuts may have come loose. If you believe lug nuts may have come loose, safely stop the vehicle at the side of the road as soon as possible. Tighten all lug nuts to the specified torque. If you believe the lug threads of the wheel are damaged or faulty, get professional service assistance.

Do not tow the conventional or fifth wheel travel trailer with missing lug bolts, missing lug nuts or a damaged wheel.

A current wheel lug nut torque reference guide is enclosed along with this letter for your reference. Please refer to this guide to determine the required torque for your conventional or fifth wheel travel trailer wheel lug nuts, the proper wheel lug nut tightening sequence, the required wheel lug nut tightening intervals, and how to mount a wheel any time a wheel is replaced.

SPARE WHEEL

If equipped, your conventional or fifth wheel travel trailer may have an optional spare tire and wheel. The lug nuts specified for the optional steel spare wheel are different than the lug nuts for the optional "Aluminum Wheels". Lug nuts for the optional spare wheel were provided in your owner's information packet. Specific lug nuts match specific types of wheels. It is important to mount the spare wheel with the correct lug nuts, tighten to the specified torque, and continue to retorque at 10, 25 and 50 miles or until the recommended torque is established. Check torque periodically thereafter.

What will Fleetwood do?

With this letter we are providing a current wheel lug nut torque reference guide. Fleetwood recommends that you use this reference guide for achieving and maintaining proper wheel lug nut torque. If you have the "Aluminum Wheel" option, please contact your selling dealer or authorized Fleetwood Service Center if you have any questions or to have your wheel lug nuts torqued to the proper specifications. If your "Aluminum Wheel" has been damaged due to improper wheel lug nut torque, Fleetwood will replace your "Aluminum Wheel" at no cost to you. If damage to a lug(s) has occurred due to improper wheel lug nut torque, Fleetwood will repair at no cost to you. Fleetwood will also provide a one-time inspection and wheel torque if necessary, at no cost to you.

What should you do?

Maintaining proper wheel lug nut torque is the owner's/user's responsibility. Please use the enclosed wheel lug nut torque reference guide to achieve correct wheel lug nut specifications. Before each trip, be sure to check and tighten the wheel lug nuts if necessary to specified torque. If a wheel has been replaced check the torque at 10, 25 and 50 miles and periodically until the required torque is maintained at a constant value. Keep this wheel lug nut torque reference guide in your conventional or fifth wheel travel trailer owner's manual for easy reference.

If you have had this concern corrected previously, you may be eligible for reimbursement of your cost for the repair. For more information contact Fleetwood Owner Relations at (800) 445-3307.

What should you do? (continued)

When you deliver your travel trailer for repairs, your dealer will complete a Fleetwood Repair Order. Upon completion of the repair, please sign the Fleetwood Repair Order, fill out the enclosed, self-addressed *Vehicle Information Update Card* and return it to Fleetwood.

If you have changed your address or sold the conventional or fifth wheel travel trailer, please take a moment to provide the name and address of the person or dealership you sold it to on the enclosed *Vehicle Information Update Card* and return it to Fleetwood. That way we can update our records, and if necessary, notify the new owner using the information you provide.

Federal regulation requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

If you are unable to obtain the specified repair promptly and without charge, please contact:

Fleetwood Owner Relations Towable Group
P.O. Box 7638
Riverside, CA 92513-7638
(800) 445-3307

If you believe that the dealer and Fleetwood Enterprises, Inc., have failed or have been unable to remedy the defect without charge or within a reasonable period of time, you may submit a complaint to:

Administrator
National Highway Traffic Safety Administration
400 Seventh Street S.W.
Washington, DC 20590

Or call the toll-free Auto Safety Hotline at (888) 327-4236.

Fleetwood Enterprises, Inc., regrets any inconvenience this may cause you. We are taking these steps in the interest of your safety.

Sincerely,

Fleetwood Enterprises, Inc.

Brad Williams
Director of Service
RV Towable Group

FLEETWOOD ENTERPRISES, INC.
3030 Hyers Street, P. O. Box 7638
Riverside California 92513-7638
(800) 445-3307 Fax (909) 353-7040

IMPORTANT RECALL INFORMATION #31028

November, 2003

TO: ALL FLEETWOOD DEALER PRINCIPALS
SERVICE MANAGERS
PARTS MANAGERS

SUBJECT: PRODUCT RECALL #31028 ALUMINUM WHEEL LUG NUT TORQUE
2002 & 2003 Pride & Triumph Conventional & Fifth Wheel Travel Trailers and
2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer
Conventional & Fifth Wheel Travel Trailers

Fleetwood Enterprises, Inc., is requesting your assistance in conducting a voluntary recall notification campaign in accordance with the National Traffic Safety and Motor Vehicle Safety Act.

Fleetwood Enterprises, Inc., has decided that a safety defect relating to motor vehicle safety exists in certain 2002 and 2003 model year Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers built at our Pendleton, Oregon; La Grande, Oregon; Longview, Texas; Rialto, California; Crawfordsville, Indiana; Edgerton, Ohio; Campbellsville, Kentucky; Hancock, Maryland; and Lindsay, Ontario, Canada manufacturing plants. We are notifying owners in order to correct the problem. A copy of the letter sent to owners is enclosed for your information.

What is the problem?

Specifically, certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels" that you need to know to safely tow your conventional or fifth wheel travel trailer. This matter is very important and requires your attention.

Proper wheel lug nut torque is very important for safe and dependable trailering. It is extremely important to apply and maintain proper wheel lug nut torque on conventional and fifth wheel travel trailer axles.

WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lug(s) and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control.

Loss of vehicle control may create a crash resulting in personal injury or death.

What is the problem? continued

It is critical that the lug nuts of the conventional and fifth wheel travel trailers be properly torqued during the first 10, 25 and 50 miles of road operation. Settling of components during the first few miles of operation may cause the loosening of the wheel lug nuts.

Maintaining proper wheel lug nut torque is the owner's/user's responsibility.

SPARE WHEEL

If equipped, your conventional or fifth wheel travel trailer may have an optional spare tire and wheel. The lug nuts specified for the optional steel spare wheel are different than the lug nuts for the optional "Aluminum Wheels". Lug nuts for the optional spare wheel were provided in your owner's information packet. Specific lug nuts match specific types of wheels. It is important to mount the spare wheel with the correct lug nuts, tighten to the specified torque, and continue to retorque at 10, 25 and 50 miles or until the recommended torque is established. Check torque periodically thereafter.

What should you do?

With this letter we are providing a current wheel lug nut torque reference guide. Fleetwood recommends that you use this reference guide for achieving and maintaining proper wheel lug nut torque.

Customers with the "Aluminum Wheel" option have been advised to contact their selling dealer or an authorized Fleetwood Service Center to have wheel lug nuts torqued to the proper specifications. If damage to the "Aluminum Wheel" has occurred due to improper wheel lug nut torque, Fleetwood will replace the "Aluminum Wheel" at no cost to the customer. If damage to a lug(s) has occurred due to improper wheel lug nut torque, Fleetwood will repair at no cost to the customer.

Federal Law (Section 154 of the National Traffic and Motor Vehicle Safety Act of 1966) requires that:

If you have received a notice of recall or failure to comply from Fleetwood or any component manufacturer, you must repair or otherwise correct the defects on vehicles remaining in your inventory, according to the notification, before selling or leasing the vehicles. Any vehicle lessor receiving this recall notice must forward a copy of the notice to the lessee within ten days.

Should you perform this service for a customer or for a unit in your inventory, please submit a claim electronically through FDN or complete a ***Fleetwood Repair Order (Form X-SR-842).*** Once repairs are completed, have the customer sign the ***Fleetwood Repair Order*** and return it to your Regional Fleetwood Warranty Processing Center for payment. Please fill out the enclosed ***Vehicle Information Update Card*** and return it to Fleetwood. Customers will not be charged for these repairs. If you are contacted by the owner of a travel trailer with questions concerning this topic, please ask them to contact Fleetwood Owner Relations, Towable Group by calling (800) 445-3307.

You will be reimbursed in accordance with Product Recall #31028 by using the following flat rate code selection: (only one applies)

Flat Rate Code:

9126-11 .2 hr Inspected/Not Defective
9126-12 .3 hr. Inspected/Defective/Repaired
9126-13 .2 hr. Inspected/Defective/Owner Decline
9126-14 .2 hr. Inspected/Defective/Missing Parts
9126-15 .2 hr. Inspected/Defective/Need Tools
9126-16 .2 hr. Unable to Notify Customer
9126-17 .2 hr. Customer Unreachable

Please review this entire package with your parts and service staff to familiarize them with the step-by-step procedure.

Thank you for helping Fleetwood with its continuing efforts to maintain customer satisfaction. If you have any questions, please contact your regional Fleetwood Service Center.

Sincerely,

Fleetwood Enterprises, Inc.

Brad Williams
Director of Service
RV Towable Group

FLEETWOOD

PRODUCT RECALL SERVICE BULLETIN #31028

RECALL BULLETIN: #31028

YEAR(S) AFFECTED: 2002, 2003, 2004

PRODUCT(S) AFFECTED: All Travel Trailers and Fifth Wheels

MODEL(S) AFFECTED: All

SUBJECT: Wheel Lug Nut Torque

KEYWORDS: Lug Nuts, Wheels, Steel Wheel, Aluminum Wheels

ISSUE DATE: November 2003

The purpose of this bulletin is to inform all Fleetwood dealers about information pertaining to all travel trailer and fifth wheels. If you are contacted by a retail customer regarding this matter, refer to the information listed.

IMPORTANT INFORMATION RELATED TO WHEEL LUG NUT TORQUE

This bulletin includes the travel trailer and fifth wheel lug nut torque reference guide related to wheel lug nut torque, tightening sequence and tightening intervals. The reference guide can be referenced on the back page of this bulletin.

Additionally the following information should be referenced during the Product Delivery Process prior to retail delivery.

If you have any questions concerning this bulletin, contact your regional Fleetwood towable factory service center.

Federal Law (Section 154 of the National Traffic and Motor Vehicle Safety Act of 1966) requires that:

> ***If you have received a notice of recall or failure to comply from Fleetwood or any component manufacturer, you must repair or otherwise correct the defects on vehicles remaining in your inventory, according to the notification, before selling or leasing the vehicles. Any vehicle lessor receiving this recall notice must forward a copy of the notice to the lessee within ten days.***

> ***"It is impossible to know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Accordingly anyone who uses a service procedure or tool must first assure that neither personal safety nor vehicle safety will be jeopardized by the selected service methods."***
>
> ***This bulletin is supplied for technical information only and is not an authorization for repairs.***

FLEETWOOD TRAVEL TRAILER AND FIFTH WHEEL, WHEEL LUG NUT TORQUE REFERENCE GUIDE

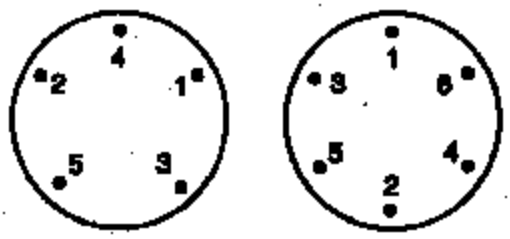
⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lugs, and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control. Loss of vehicle control may create a crash resulting in personal injury or death.

Steel and Aluminum Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 5&5	Spoke	13	80 - 90 ft-lbs
Steel Wheel 14 x 5.5 x 5&5	Spoke	14	80 - 90 ft-lbs
Steel Wheel 15 x 5 x 5&5	Spoke	15	80 - 90 ft-lbs
Steel Wheel 15 x 6 x 6&5	Spoke	15	90 - 100 ft-lbs
Steel Wheel 16 x 6 x 6&5	Spoke	16	90 - 110 ft-lbs
Aluminum Wheel 15 x 7 x 6&5	Spoke	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 7 x 6&5	Spoke	16	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 5&5	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 6&5	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 6 x 6&5	Modular	16	110 - 120 ft-lbs

WHEEL LUG NUT TIGHTENING SEQUENCE



NOTE: use a torque wrench to tighten lug nuts. Tightening by hand or with an impact wrench ***IS NOT*** recommended.

WHEEL LUG NUT TIGHTENING INTERVALS

Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary, to the specified torque. If a wheel has been removed or replaced, check the torque again at 10, 25 and 50 miles or until the recommended torque is established. Spare tires/wheels, if equipped, may require different wheel lug nuts.

February 3, 2004

MEMORANDUM

FLEETWOOD

To: Steve Hulst

From: Brent Stiers

Subject: Aluminum Wheels

When the '04 product was introduced with the aluminum wheel option, Lippert Components was installing axles and wheels prior to delivering the chassis to Plant #42. Lippert installed the lug nuts using an impact wrench with a 100 lbs/ft torque stick. The torque was later checked against/tightened to the proper specification in the Final department using a torque wrench. There is a Final torque check identified on the production card that was signed off by the individual signing the card. When the aluminum wheel option was introduced the torque specification for the Import wheel was 80-85 lbs/ft and 120-125 lbs/ft for the Treadit wheel.

Approximately 12/18/02 the wheel nut torque specification changed to 110-120 lbs/ft for all aluminum wheels. All other aspects of the process remained as described above.

On 04/17/03 and 04/18/03 the managers of the transport companies (Reliant Transportation and Bennet Transportation) we use signed the Transporter Acknowledgement of Responsibility concerning wheel nut torque specifications and the intervals at which torque must be checked during delivery.

Approximately 06/26/03 the Final department at Plant #42 began recording torque levels on the production card in addition to signing off the check as had previously been done.

Approximately 07/15/03 Lippert Components began delivering chassis to Plant #42 without axles and wheels installed. The Plant # 42 chassis department began installing the wheels using an impact wrench with a 100 lbs/ft torque stick. The process in the Final department did not change from that described previously.

The last unit built with the Treadit aluminum wheel was 4281427 and the last unit built with the Import aluminum wheel was 4281547.

Brent Stiers
Operations General Manager
Plant #42

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed Randy Lawson OPS Mgr. Date: 4/17/03

Reliant Transportation Services, Inc.

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> ***Note:*** *Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed Larry W Bennett Date: 4-18-03

Bennett

3/20/03

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

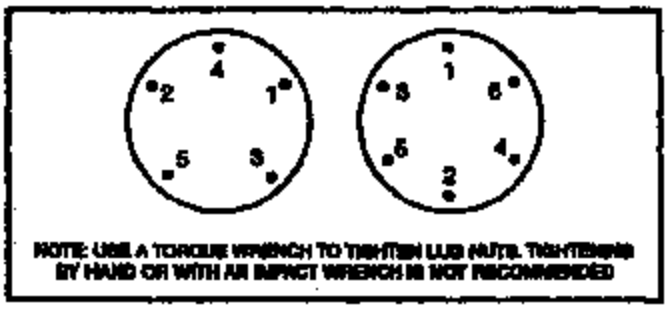
This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

This Owner's Manual Supplement contains information that was incorrect and or/incomplete in your Owner's Manual.

Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft/Lbs.
Steel Wheel 14 x 5.5 x 545 AW	Spoke	14	80 - 90 Ft/Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft/Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft/Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft/Lbs.
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft/Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft/Lbs.
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 Ft/Lbs.
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft/Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at 10, 25, and 50 miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

FLEETWOOD

Memorandum

April 15, 2003

TO: General Managers – Towable Group Plants

FROM: Brad Williams

SUBJECT: Steel and Aluminum Wheel Lug Nut Torque & Nut Tightening Intervals - Transporter Responsibility/Compliance

****

Please ensure your plant meets the requirements regarding correct nut wheel selection, nut tightening staging and sequencing, nut torque, and nut-tightening intervals.

WHEEL MOUNTING TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

WHEEL NUT SELECTION

Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60 or 90 degrees). See applicable prints. Specific nuts match specific wheels.

NUT TIGHTENING, STAGING AND SEQUENCING

The procedure for attaching all steel and aluminum wheels is as follows:

1. Start all nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in specific sequence. (See bulletin)
3. The tightening of the fasteners should be done in stages. (See bulletin)
4. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram (see bulletin). This may change based on wheel manufacturer's recommendation.
5. Wheel nuts should be torqued before the first road use and after each wheel removal. Check and re-torque after the first 10, 25 and 50 miles or until torque has been established. Check periodically thereafter.

NUT TIGHTENING INTERVALS

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely at the recommended odometer readings. They must check all wheel nuts with an approved torque wrench set at the proper torque and understand the proper intervals and sequence of tightening.

ADVISE TRANSPORT SERVICES

All transporters are required to meet this requirement, sign the attached form and maintain compliance with this requirement at all times.

TORQUE WRENCHES

All torque wrenches must be set to the correct torque requirements and be used correctly. Air driven impact guns should not be used in final finish.

COMPLIANCE

Be prepared to demonstrate your compliance to this requirement at any time.

Please call me if you have any questions.

Regards,

Brad Williams
Director of Service
Towable Group

Attachments

BW/em

TTS/BW03-010

C:

Bob Wozniak	Charlie Reick
Jim Bertoch	Chris Edgar
Steve Hulst	Ellen Tyler
Dan Ryan	Robby Olson
Bob Thompson	TT Service Managers
Dave Nelson	Larry Chandler
John Draheim	Chuck Wilkinson

GROUP LEADER INSPECTION AND ACCEPTANCE	LEGIBLE SIGNATURE (NO INITIALS)	MO	DAY
CHASSIS	[illegible]	06	24
FLOORS	[illegible]	6	25
CAB SET	Keith [illegible]	6	25
PLUMBING	Keith [illegible]	6	25
SIDEWALLS	Brian Moore	6	26
HULL	Brian Moore	6	26
MANAGEMENT	Richard [illegible]	6	26
ELECTRICAL	Tony Sandusky	6	26
EXTERIOR SIDING	[illegible]	6	26
UPPER MOLDING	Damon Howlett	6	26
LOWER MOLDING	Damon Howlett	6	26
FINAL	[illegible]	6	27
FINISH	[illegible]	6	27
REWORK	[illegible]	6	27
MANAGEMENT	Richard [illegible]	6	26

ELECTRICAL LINE TESTS:	LEGIBLE SIGNATURE (NO INITIALS)	MO	DAY
120 V Dielectric	Tony Sandusky	6	26
120V Polarity	Tony Sandusky / Damon Howlett	6	26
120V Operation	Tony Sandusky	6	26
12V Dielectric Interior	Tony Sandusky	6	26
12V Dielectric Exterior	Damon Howlett	6	26
12V Operation	Tony Sandusky	6	26

FINAL LINE TESTS:	LEGIBLE SIGNATURE (NO INITIALS)	MO	DAY
12V Dielectric Exterior	Gary Voorhis MT	6	27
Gas (8" W.C.)	[illegible]	6	27
Water (100 psi)	[illegible]	6	27
120V Dielectric	John King	6	27
120V Polarity	Gary Voorhis MT	6	27
120V Operation	John King	6	27
12V Dielectric Interior	John King	6	27
12V Operation	John King	6	27
Ground Continuity	Gary Voorhis MT	6	27
Ground Fault Trip	Gary Voorhis MT	6	27
12V Brake (amperage)	John King	6	27
Break Away Switch	Gary Voorhis MT	6	27
Lug Nut Torque	[illegible]	6	27
Tire Pressure	[illegible]	6	27
Monitor Panel	Gary Voorhis	6	27
Tank fill/Vent	[illegible]	6	27
Pump/Cold Water	John King	6	27
Smoke Alarm	[illegible]	6	27
LPG Leak Detector	Gary Voorhis	6	27
TV & Coaxial Cable	Gary Voorhis	6	27
CO Detector	NA		
Exterior Light Operation	John King	6	27
Furnace Vent	[illegible] Carpenter	6	27
Winterize	NA		

Fold Line

BRAND, MODEL & SERIAL NO.	COLOR	QTY
365PLUS	Bad	
w/101	Fat	
81252		

X-PR-16 6/01

C-

233 A/C 15M ✓

385 DESK CHAIR ✓

543 HEATED HOLDIN

547 HEATED WATER

571 ELECTRIC FIREI

589 LAMINATE TILE

QUALITY CONTROL TESTS

PLUMBING LINE TESTS: LEGIBLE SIGNATURE (NO initials)

Gas Test (3 psi min.)	1030 - 1040
Water (100 psi)	1030 - 1040
Drain Flow	1040 - 1050
Flood Level	1040 - 1050

RVIA TAG NUMBER 1166329

STATE TAG NUMBER(S) NA

X-S-043 7/00 TT

81252

SERIAL NUMBER EQUIPMENT INFORMATION

PRINT ALL INFORMATION LEGIBLY

EQUIPMENT	MAKE	MODEL	SERIAL NUMBER
AXLE	Dexter	[redacted]	1133010453
AXLE	Dexter		1133010452
TIRE	GoodYear		Plummer RV60
TIRE	↓		↓
TIRE			
TIRE			
SPARE TIRE			
TOILET	THETFORD	24810	0655
WATER PUMP	SHURFLO	2088-422-444	RU48-35926
CONVERTER	WFCO	WF-8875	25635844
RADIO/STEREO	Kenwood	SA-WRC50	DB3EB006768
REFRIGERATOR	Dometic	2852	31205138
RANGE/OVEN	Magic Chef	2432020ADB	10948419005
MICROWAVE	Magic Chef	MR1022E-BB	9MAU500742D
WATER HEATER	Atwood	GC10A-4E	9901 3082356
FURNACE	ATWOOD	8575	1760960
AWNING ROLLER	A&E	8340844.7K	32268802
AWNING HDWE.	A&E	8271004.401B	32292969
CENTER SUPPORT			
ROOF AIR #1	Coleman	8335B6704	060313879
ROOF AIR #2			
TELEVISION #1	Daewoo	DTQ-2735R	GT33D40838
TELEVISION #2			
VIDEO RECORDER			
VIDEO CONTROL			
SL/O MOTOR/MAIN	DATE CODE		U18-8R223
SL/O MOTOR/BDRM	DATE CODE		U4-8230
SL/O MOTOR #3	DATE CODE		030605 PART 6A
GENERATOR			
WASHER/DRYER			

LAMINATION DATE CODES

BRM S/O ______________

R/S WALL ______________ D/S WALL ______________

CEILING ______________ SLIDE-OUT ______________

LUG NUT TORQUE CHECK LEGIBLE SIGNATURE (NO INITIALS)

DSF 120 FT/LBS [signature]

DSR 120 FT/LBS [signature]

RSF 120 FT/LBS [signature]

RSR 120 FT/LBS [signature]

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: 81252

TOP MOLDING:

Group Leader: Danny Howlett
Date: 6-26-03

Pass	Fail	
☑	☐	Top molding installed tight to top and side of unit
☑	☐	Roof properly sealed - sealer free of air bubbles
☑	☐	Ladder installed straight and in proper location
☑	☐	Plumbing vents clear and covered properly
☑	☐	All excess sealant cleaned from unit

Pass	Fail	
☑	☐	All power vents properly installed - interior garnishes tight to ceiling
☑	☐	Roof inspected for cuts and sealant voids
☑	☐	Check refer vent is open and clear
☑	☐	Unit cleaned
☑	☐	Options checked on Hardcard
☐	☐	

FINAL:

Group Leader: Lee Todd
Date: 6-27-03

Pass	Fail	
☑	☐	Exterior refer door and drain tube installed properly
☑	☐	LPG tanks installed and lines properly routed and secured
☐	☐	All window treatments installed correctly, in proper location and functional
☑	☐	Water fill hose installed correctly and with proper slope
☑	☐	Refer compartment properly sealed
☑	☐	Tire pressures meet specifications
☑	☐	Shower/tub sealed properly
☑	☐	All wood molding properly installed and straight
☑	☐	Proper warning/information labels installed

Pass	Fail	
☐	☐	Dinette table fits and functions
☐	☐	Doors and drawers aligned and functional
☑	☐	Sofa checked for operation
☑	☐	Lug nut torque checked & documented
☑	☐	Options checked on Hardcard
☑	☐	Unit cleaned & excess putty wiped off
☐	☐	
☐	☐	

FINISH:

Group Leader: [signature]
Date: 6-27-03

Pass	Fail	
☑	☐	Hard card checked for correct options and filled out completely
☑	☐	Underside of unit checked for proper seal
☐	☐	Interior and exterior of unit clean
☐	☐	All loose load items in unit (remotes, keys, smoke alarm battery, sink stoppers, etc.)
☑	☐	Orange warranty packet complete and in unit
☑	☐	Correct Fleetwood Brand Owners Manual placed in unit
☑	☐	Slide out checked for operation & no daylight in or out
☑	☐	Décor colors/patterns properly installed and matched per design specs

Pass	Fail	
☑	☐	Line and cabinets free from defects from line damage
☑	☐	Entry door functions
☑	☐	Screen door functions
☑	☐	Awning functions
☑	☐	All squeak tape removed
☑	☐	Unit clean
☑	☐	Entry door grab handle secure
☑	☐	Monitor panel functional
☐	☐	

Clearly describe corrective action required:

FLEETWOOD

TOWABLE DIVISION
READY TO MOVE (RTM) DEPARTMENT INSPECTION

Serial #: 81252

CHASSIS:

Group Leader: [signature]
Date: 10/27/03

Pass	Fail	
☑	☐	Proper slope on drain lines and lines secured at proper intervals
☑	☐	Heat shrink connectors on brake wire connection to axle
☑	☐	Brake wires routed and secured properly
☑	☐	Paint applied properly with good coverage
☑	☐	Chassis is square
☑	☐	Support over hangers welded properly
☑	☐	Wheels/tires free of paint overspray
☑	☐	Knife valves supported and at proper angle
☑	☐	Slide-out motor bracket secure/square

Pass	Fail	
☑	☐	Gas manifold line supported every four feet and 6 inches from end
☑	☐	Check centering
☑	☐	Vehicle Identification Number (VIN) is correct
☑	☐	Correct Lug Nut Installed
☑	☐	Wheel Lug Nut Torque Check

DSF 100 Ft/Lbs Signed: [signature]
DSR 100 Ft/Lbs Signed: [signature]
RSF 100 Ft/Lbs Signed: [signature]
RSR 100 Ft/Lbs Signed: [signature]

FLOORS:

Group Leader: [signature]
Date: 6-25-03

Pass	Fail	
☑	☐	Floor ducts/vents free of debris
☑	☐	Chassis grounds installed
☑	☐	Sealants properly applied
☑	☐	Plumbing holes in correct location, proper alignment with tanks
☑	☐	Floor protected
☑	☐	7-way cable correct length and wired properly
☐	☐	Plumbing routing holes are sealed
☑	☐	Floor decking is properly attached to floor structure

Pass	Fail	
☑	☐	Floor is set to level
☑	☐	Staples/screws flush with decking
☑	☐	Underbelly staples set flush
☑	☐	110/12v wires separated
☑	☐	Lino taped or glued at register ducts
☑	☐	Options checked on Hardcard
☑	☐	Unit Cleaned
☐	☐	
☐	☐	

CABINET SET:

Group Leader: [signature]
Date: 6-25-03

Pass	Fail	
☑	☐	All cabinets prefilled correctly and free of broken or split wood
☑	☐	All cabinets set square and secured at proper location
☑	☐	All cabinets are tight to one another and the floor
☑	☐	Cabinet staples set and pulled
☑	☐	All cabinets free of visible defects
☑	☐	Interior walls set straight and square
☑	☐	Bath door header flush with walls
☑	☐	Cabinet drawer supports secure
☐	☐	Cabinet tops covered

Pass	Fail	
☐	☐	Door and drawers are square to frame, clean and operational
☐	☐	All doors and drawers functional
☑	☐	Shelves are level
☑	☐	Cove moldings fit tight between cabinets
☐	☐	Plumbing thresholds flush to walls and floors
☑	☐	Unit cleaned
☑	☐	Bath door flush with walls & gap even
☑	☐	Options checked on Hardcard

Clearly describe corrective action required:

Ray, Ted

From: Knight, Janet
Sent: Tuesday, January 27, 2004 7:19 AM
To: Hughes, Bill; Willard, Robert; Ray, Ted
Subject: alum. wheels

FYI

DC 13 - Entry and Entry+ (Tredit Tire)
Last serial number 61427

DC 14 - Mid+ (Continental imports)
Last serial number 61547

Thanks,
Janet Knight
Fleetwood Travel Trailers, IN-Plant 42
Phone (765) 361-2015 / Fax (765) 362-0735
Janet.Knight@Fleetwood.com

MEMORANDUM

TO: Steve Hulst
DATE: 22 January 2004
FROM: Ed Smart
SUBJECT: Aluminum Wheels

FLEETWOOD.

We do not use aluminum wheels here at Campbellsville Plant 60.

January 28, 2004

FEB 2 2004

To: *Steve Hulst*

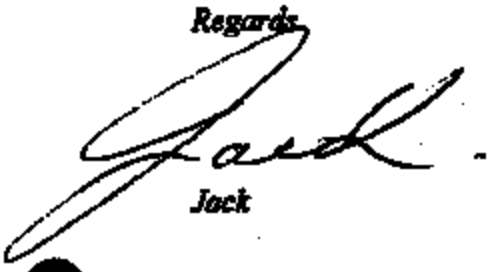
From: *Jack Savage*

Subject: *Aluminium Wheels*

As per your request are the responses and supporting documentation to the questions on your memo dated January 21, 2004.

If further information is required, please contact me.

Regards



Jack

Enclosures: 9

January 27, 2004

To: Jack Savage

From: Andy Donohue

Re: Aluminium Wheels

When we started with aluminium wheels we were using Lippert to mount our tires and rims. They used a 80 ft lb torque stick when installing the wheel nuts. We checked in the Final/Finish/Squawk department with a torque wrench to ensure there was at least 110 ft. lbs of torque. We did this by trying to turn the wheel nuts until the torque wrench clicked.

After a number of weeks we were told to go to 80 foot lbs of torque on aluminium rims. It was discovered that Lippert was over torquing the nuts on some units. They were instructed to back off on the torque and we would do the final torquing to 80 ft lbs on line.

In April we were instructed to go back to 115 ft. lbs of torque by means of a service bulletin from Robby Olson. Also we were advised by Brad Williams to mark the torque of all wheels on the Production Card. We did this in April.

We had been signing off the wheel lug torque on the Production Card and dating it but had not been recording the torque foot-pounds on the card.

The only Quality Check for the torque is the one on the Production Card.

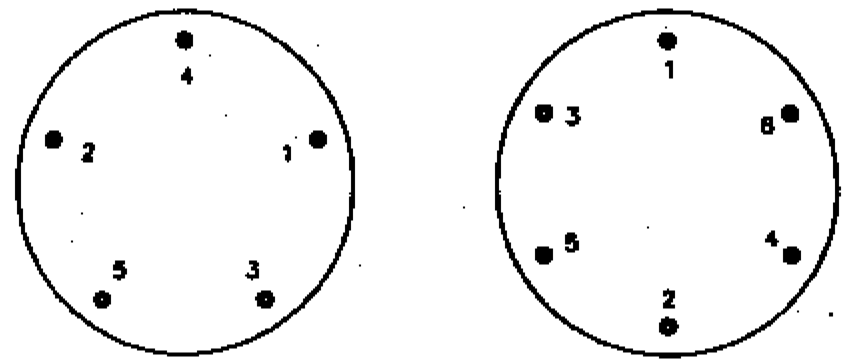
The torque wrench that we use is Master Craft – Pro Series, Part # 58-8654-0.

The 16" aluminium wheels (opt 722) were built to week ending 12/15/02 serial # 92182—30 5J

The 16" aluminium wheels (opt 718) were built to week ending 7/06/03, serial # 94861—2952BS

The 15" aluminium wheels (opt 712) were built to week ending 7/20/03, serial # 94908 – 275CKS.

D.C. NUMBER	DESCRIPTION	DATE	BY	SCALE 12" = 1'-0"		FLEETWOOD AMR-01-[illegible]39
				DRAWN 01PLARED · DATE 02-14-94		RECREATIONAL VEHICLE GROUP · SHEET [illegible] 1
				PROJECT 01[illegible]		TITLE TT ASSEMBLY MANUAL – CHASSIS
01-00		02/29/00	GS	PLOT 02/29/00 08:27:15 01[illegible]		WHEEL LUG NUT TORQUE PROCEDURE



FIVE LUG WHEEL

SIX LUG WHEEL

DO NOT EXCEED 120 FT/LBS

LUG TIGHTENING SEQUENCE

NOTES:

1. IN THE CHASSIS DEPARTMENT, AN IMPACT WRENCH MAY ONLY BE USED WITH AN "ACCU-TORQ STICK" (SEE NEW TOOL BULLETIN #49). WITH ACCU-TORQ THE LUG NUTS WILL BE TIGHTENED TO APPROXIMATELY 100 FT/LBS.
2. FINAL TIGHTENING TO 120 FT/LBS IS TO BE DONE IN FINAL, FINISH, OR RE-WORK AREA .

Memorandum jvb 02-068

DATE: October 31, 2002

TO: Distribution

FROM: Jim Berloch

Subject: Aluminum Wheel Torque

Please be aware of the following wheel torque requirements.

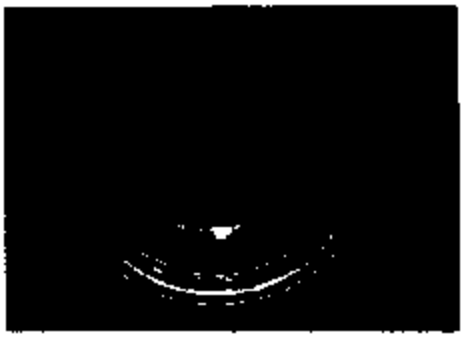
Steel wheel torque requirements (if equipped):
13 inch wheel nut torque is 80-90 ft. lbs.
14 inch wheel nut torque is 80-90 ft. lbs.
15 inch wheel nut torque is 80-100 ft. lbs.
16 inch wheel nut torque is 80-100 ft. lbs.

Aluminum wheel from Imports:

15 inch wheel nut torque is 80-85 ft. lbs.
16 inch wheel nut torque is 80-85 ft. lbs.

Aluminum wheel from Tredit:

15 inch wheel nut torque is 120-125 ft. lbs.
16 inch wheel nut torque is 120-125 ft. lbs.



Distribution: Bob Wozniak, Larry Budlos, Randy Most, Gary Beatty, Ron Robbins, Regional General Managers, Production Managers

Donohue, Andy

From: Cote, Steve
Sent: Wednesday, April 23, 2003 8:50 AM
To: Donohue, Andy
Subject: FW: Wheel Lug Nut Torque Owner's Manual Supplement

Andy,

When the labels arrive if you see them first let me know and if I see them first I will let you know.

Steve

-----Original Message-----
From: Olson, Robby
Sent: Tuesday, April 22, 2003 6:48 PM
To: Bill Hughes; Brian Shrader; Craig Blanz; Jackie Szpdanik; Rick Ewing; Robby Olson; Steve Cote
Cc: Williams, Brad
Subject: Wheel Lug Nut Torque Owner's Manual Supplement

To All TT Service Mangers

Subject: **Wheel Lug Nut Torque Owner's Manual Supplement**

Update:

All General Managers notified to have transporters sign off on a wheel torque requirement. Also a copy of the wheel torque supplement was sent. (4/14/03) Brad Williams issued

All 2002/2003 Pride and Triumph owners and dealers have been mailed to asking them to add manual cover labels and supplement insert into their owner's manuals. (This will be completed by 4/25/03)

Fleetwood **Information Bulletin SBT0113** will mail to all RV Dealers/Service Only Centers and Rental dealers. (This mailing will be complete by 4/28/03) 1500 mailers

All 2004 product that are in the yards will need to be inserted and a label added to the owner's manual. I Have already obtained from each production plant the beginning serial numbers, including pilots that have been produced. We will ship a supply of labels and supplements to each plant and ask that they supply us with the starting serial numbers that inserts and labels were inserted/ labels applied. From this point we will developed a unit data base of units that have already shipped and will notify only the customers/dealers with the aluminum wheel option. We will ask that they apply a owner's manual cover label and insert into their manual.

(estimated time frame to notify dealers/customers 7 days from supplement line insert date)

Approved documents:

Dealer Information Bulletin SBT0113

SBT0113.pdf

FLEETWOOD RV **Travel Trailer and Fifth Wheel Owner's Manual Supplement**

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

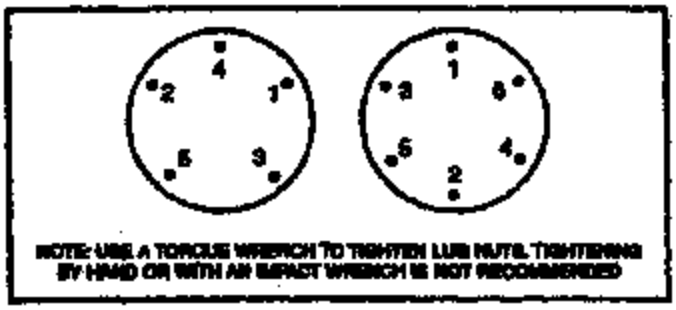
This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

This Owner's Manual Supplement contains information that was incorrect and or/incomplete in your Owner's Manual.

Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft./Lbs.
Steel Wheel 14 x 5.5 x 545 AW	Spoke	14	80 - 90 Ft./Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft./Lbs.
Steel Wheel 15 x 6 x 655 AW	Spoke	15	90 - 100 Ft./Lbs.
Steel Wheel 16 x 6 x 655 AW	Spoke	16	90 - 110 Ft./Lbs.
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 Ft./Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at 10, 25, and 50 miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

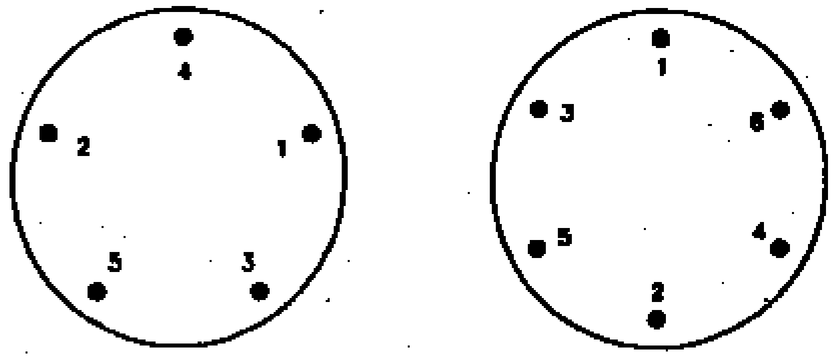
⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

04-02		04-28-03	RR	DRAWN: GIPLASER / DATE: AUG-12-02		RECREATIONAL VEHICLE GROUP / SHEET 1 OF 1
[illegible]04		02-18-03	RR	PROJECT: [illegible]		TITLE: TT ASSEMBLY MANUAL - FINAL [illegible]H
[illegible]06		03-17-03	RR	PLOT: 03/17/03 13:53:08 [illegible]		WHEEL LUG NUT TORQUE PROC[illegible]RE

WHEELS	PART NUMBER	SIZE	LUG NUT PART NUMBER	RECOMMEND TORQUE
STEEL WHEEL-SPOKE 13X4.5X545AW		13	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE 14X5.5X545AW		14	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE [illegible]545 AW	L01-0400	15	M23-1014	80 - 90 FT/LBS
STEEL WHEEL-SPOKE [illegible] AW	L01-0361	15	M23-1014	90 - 100 FT/LBS
STEEL WHEEL-SPOKE [illegible] AW	L01-1635	16	M23-1014	90 - 110 FT/LBS
WHEEL- ALUMINUM [illegible]	L01-4005	15	M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM [illegible]	L01-4000	16	⇐ M23-0052	110 - 120 FT/LBS
WHEEL- ALUMINUM MOD [illegible]545	L01-[illegible]	15	M23-0050	110 - 130 FT/LBS
WHEEL- ALUMINUM MOD [illegible]	L01-4010	16	M23-0050	110 - 130 FT/LBS
WHEEL- ALUMINUM MOD [illegible]	L01-4020	16	M23-0050	110 - 120 FT/LBS

4/7/03
Lippert to use
80 ft/lb torque stick
[illegible]



FIVE LUG WHEEL

SIX LUG WHEEL

LUG TIGHTENING SEQUENCE

NOTES:

1. A TORQUE WRENCH MUST BE USED TO TIGHTEN THE LUG NUTS ON ALL TRAVEL TRAILERS AND 5TH WHEELS.
   DO NOT TIGHTEN BY HAND OR USE AN IMPACT WRENCH IN FINAL FINISH.
2. FOLLOW THE APPROPRIATE SEQUENCE (FIVE OR SIX LUG WHEEL) FOR TIGHTENING THE LUG NUTS.

Donohue, Andy

From: Cote, Steve
Sent: Thursday, March 27, 2003 9:30 AM
To: Olson, Robby
Cc: Donohue, Andy
Subject: RE: Hard Card Torque Measurements

Robby,

We are faxing down the sheets but they are not filled in.
We apparently have only been signing the lug torque check off.
I will review with Andy Donohue our production manager.

Steve

-----Original Message-----
From: Olson, Robby
Sent: Tuesday, March 25, 2003 8:29 PM
To: Bill Hughes; Brian Shrader; Craig Blaso; Jackie Sopcisak; Nick Ewing; Robby Olson; Steve Cote
Cc: Williams, Brad
Subject: Hard Card Torque Measurements

Hello,

Please see the attached matrix related to wheel loss incidents. Brad would like all hard cards pulled and the back section with lug nut torque check measurements fax to use here at TT Div. No need to send the front of the card, just transfer the serial number from the front of the card to the top of back page of the card. Example attached. This information is really important in the wheel research
[redacted]fect gathering process.. Please respond as quickly as possible.

<< File: Aluminum Wheel Matrix.xls >>

Hard Card Samples:

2 Pages-reduce image to 25%

<< File: Hard Card Samples.tif >>

Any questions call me.

Robby

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 23

PART 4 OF 4

BOOK 2 OF 2

23. Describe all changes in the aluminum wheel mounting and wheel nut torque procedures listed in response to Request #21 for aluminum wheels, the date that he change was implemented, and the reason for the change.

RESPONSE #23

Please refer to Assembly Manual changes and referenced memos.

23a. Assembly Manual design changes

DC 4-00
4-02
4-04
4-06
4-07
4-09

23b. Memos: Jim Bertoch, Oct. 31, 2002 and Dec. 16, 2002; Brad Williams, Apr. 15, 2002

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 23A

PART 4 OF 4

BOOK 2 OF 2

Williams, Brad

From: Robbins, Ron
Sent: Thursday, January 22, 2004 7:56 AM
To: Williams, Brad
Subject: FW: AMR Wheel Lug Nut Torque Procedure

-----Original Message-----
From: Robbins, Ron
Sent: Wednesday, January 21, 2004 1:12 PM
To: Williams, Brad
Subject: FW: AMR Wheel Lug Nut Torque Procedure

-----Original Message-----
From: Robbins, Ron
Sent: Friday, January 16, 2004 8:55 AM
To: Williams, Brad
Subject: AMR Wheel Lug Nut Torque Procedure

Here's a list of AMR drawings per D.C. level and what was done for each D.C. change.

AMR-01-A39 & AMR-28-A75:

D.C. #4-00 - No aluminum wheels were offered at this time. (324 - WLD,PRL,TER ONLY) AUGUST 30, 2002
D.C. #4-02 - Aluminum wheels were introduced. Chart was added showing part numbers, wheel size and the lug nut part number per wheel used. There was no change to the notes or the torque (110-120 FT/LBS) to tighten the lug nuts. JANUARY 29, 2003
D.C. #4-04 - Expanded the chart to include (2) steel wheel descriptions and added the recommended torque per wheel used. FEBRUARY 21, 2003
D.C. #4-06 - There was a 'typo' on the chart for wheel L01-4006. The wheel size was calling out 15, it was changed to 16. MARCH 17, 2003
D.C. #4-07 - The notes were updated. APRIL 14, 2003
D.C. #4-09 - Chrome wheels were added to the chart. JUNE 23, 2003

Pride & Triumph was introduced to the 324 core package on September 5, 2003.

Hope this helps.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 23B

PART 4 OF 4

BOOK 2 OF 2

Attachment 1

Memorandum jvb 02-055

DATE: October 31, 2002

TO: Distribution

FROM: Jim Bartoch

Subject: Aluminum Wheel Torque

Please be aware of the following wheel torque requirements.

Steel wheel torque requirements (if equipped):
13 inch wheel nut torque is 80-90 ft. lbs.
14 inch wheel nut torque is 80-90 ft. lbs.
15 inch wheel nut torque is 80-100 ft. lbs.
16 inch wheel nut torque is 80-100 ft. lbs.

Aluminum wheel from imports:

15 inch wheel nut torque is 80-85 ft. lbs.
16 inch wheel nut torque is 80-85 ft. lbs.

Aluminum wheel from Tredit:

15 inch wheel nut torque is 120-125 ft. lbs.
16 inch wheel nut torque is 120-125 ft. lbs.

Distribution Bob Wozniak, Larry Budica, Randy Most, Gary Beatty, Ron Robbins, Regional General Managers, Production Managers

FLEETWOOD

Memorandum

April 15, 2003

TO: General Managers – Towable Group Plants

FROM: Brad Williams

SUBJECT: Steel and Aluminum Wheel Lug Nut Torque & Nut Tightening Intervals - Transporter Responsibility/Compliance

---

Please ensure your plant meets the requirements regarding correct nut wheel selection, nut tightening staging and sequencing, nut torque, and nut-tightening intervals.

WHEEL MOUNTING TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

WHEEL NUT SELECTION

Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60 or 90 degrees). See applicable prints. Specific nuts match specific wheels.

NUT TIGHTENING, STAGING AND SEQUENCING

The procedure for attaching all steel and aluminum wheels is as follows:

1. Start all nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in specific sequence. (See bulletin)
3. The tightening of the fasteners should be done in stages. (See bulletin)
4. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram (see bulletin). This may change based on wheel manufacturer's recommendation.
5. Wheel nuts should be torqued before the first road use and after each wheel removal. Check and re-torque after the first 10, 25 and 50 miles or until torque has been established. Check periodically thereafter.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 24

PART 4 OF 4

BOOK 2 OF 2

24. Describe all modifications or changes made by, or on behalf of, Fleetwood in the design, material composition, manufacture, quality control, supply, or installation of the subject components, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:
    a) The date or approximate date on which the modification or change was incorporated into vehicle production;
    b) A detailed description of the modification or change;
    c) The reason(s) for the modification or change;
    d) The part numbers (service and engineering) of the original component;
    e) The part number (service and engineering) of the modified component;
    f) Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
    g) When the modified component was made available as a service component; and,
    h) Whether the modified component can be interchanged with earlier production components.

    Also, provide the above information for any modification or change that Fleetwood is aware of which may be incorporated into vehicle production within the next 120 days.

RESPONSE #24

a) DC 2-02 introduces aluminum wheels as an option to the Pride and Triumph products.
b) Plants 65, 40 & 23 began installing aluminum wheels on Pride and Triumph products. Plant 65 was the first to put on the aluminum wheels in January, 2002.
c) Plants torque at 120 ft. lbs. January, 2002 – October, 2002.
   October 4, 2002, the Import supplier recommends 79.65 ft. lbs.
   October 31, 2002, Jim Bertoch issues a memo to the plants setting new torques, having them apply torque to 80 ft. lbs. on the Import wheel and 110-120 ft. lbs. on the Tredit wheel (Based on supplier recommendations).
   December 6, 2002 – Imports supplier increases torque requirements to 100 ft. lbs.
   December 16, 2002 – Jim Bertoch issues new torques on all aluminum wheels of 110 to 120 ft. lbs., and information to verify torque at 10, 25, 50 and 100 miles and to retorque as necessary.
   January 6, 2003 – After a road test to verify performance the Import aluminum wheel is reintroduced into production.
   May 6, 2003 – Importance of torque/retorque and supplement mailing made to dealers and retail customers.
   June 23, 2003 – Chrome plated steel wheels requirements added to Assembly Manual.
   September, 2003 – Aluminum wheels are replaced by chrome plated steel wheels as an option.
   October, 2003 – NHTSA Part 573 filed
   November, 2003 – Voluntary Safety Recall executed.
d) See part numbers supplied.
e) N/A
f) November 21, 2002, after 8 events reported, Dan Ryan issues a memo to the plants to move away from Import wheels to all Tredit brand wheels as a precautionary measure.
g) All parts involved, axles, wheels, lug nuts and studs are available through service.
h) N/A

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 25

PART 4 OF 4

BOOK 2 OF 2

FIELD RETURN INFORMATION

25. Provide a list that identifies (1) each of the reported wheel separation incidents that has occurred in vehicles identified in response to Request #1 whether the incident occurred in transit between Fleetwood and the selling dealer or after having been placed in service by the vehicle purchaser; (2) all of the wheel components (including but not limited to wheels, wheel mounting nuts, wheel mounting studs, hub, and brake drum or brake rotor) that have been returned to Fleetwood or to Fleetwood's suppliers, contractors, consultants, etc.; (3) the current location of the retained returned components (4) the name and phone numbers of the custodian of the retained components.

If no components were returned from a listed incident, so state. If components were returned and later scrapped, so state and provide the approximate date and location that the returned components were scrapped.

RESPONSE #25

1) This information has been provided in attachment 7a.
2) Please refer to attachment 25a.
3) The current location of all the returned components is at a Fleetwood Enterprises Building, at 3030 Myers St., Riverside, CA 92513.
4) Jim Bertoch – 909-351-3947.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 25A

PART 4 OF 4

BOOK 2 OF 2

ALUMINUM WHEEL REPORT

2/11/04

	Brand	Model YR	Mfg Date	Ship Date	DOF	Date Reported	Model	Serial Nbr	Wheel Qty	Wheel Make	Note
1	Pride	03	6/12/02	6/14/02	6/18/02	7/17/02	36 5L	40-96901	718	Import	
2	Pride	03	6/18/02	6/22/02	7/30/02	9/3/02	31 5G	40-96946	722	Import	(2) wheels
3	Triumph	03	6/14/02	6/20/02	9/16/02	9/16/02	31 5G	40-96936	722	Import	
4	Triumph	03	05/29/02	5/30/02	9/13/02	9/24/02	36 5L	40-96871	718	Import	Replaced w/Tredit
5	Pride	02	04/24/02	4/26/02	9/14/02	10/16/02	36 5L	66-89137	718	Import	
6	Triumph	03	04/26/02	7/19/02	8/31/02	11/15/02	36 5L	66-89141	718	Import	
7	Advantage AX6	04	11/15/02	11/16/02	N/A	11/17/02	366FL	15-90637	718	Import	Corp Proto
8	Triumph	04	11/19/02	11/20/02	12/6/02	11/21/02	33 5Z	23-06945	718	Import	
9	Pride	04	11/14/02	11/27/02	N/A	12/2/02	36 5L	23-06934	718	Import	
10	Triumph	04	11/18/02	11/23/02	N/A	12/3/02	33 5Z	23-06946	718	Import	(2) wheels
11	Pride	04	11/07/02	11/26/02	N/A	12/5/02	31 5G	23-06869	722	Import	
12	Triumph	02	04/24/02	4/26/02	11/22/02	12/18/02	36 5L	66-89138	718	Import	
13	Pride	03	09/06/02	9/6/02	12/19/02	12/30/02	36 5L	40-96869	718	Import	Wheel/Hub
14	Quantum AX6	04	01/29/03	1/29/03	2/10/03	2/17/03	36 5F	23-06299	718	Import	
15	Pride	04	2/25/03	2/28/03	N/A	3/6/03	335Z	23-06514	718	Import	Roadside Rear
16	Pride	04	10/28/02	1/9/03	1/15/03	3/11/03	365L	40-97934	718	Import	(1) Wheel Tire
17	Pride	04	11/20/02	11/23/02	12/4/02	3/21/03	32 G	23-06973	722	Import	(2) Roadside
18	Pride	04	1/9/03	1/16/03	1/20/03	3/24/03	31 5G	23-06202	722	Import	Lost 3 Stud/Nuts
19	Triumph	03	9/20/02	10/11/02	11/18/02	3/27/03	30 5J	23-06606	722	Import	3 Studs Sheared
20	Triumph	04	10/16/02	10/25/02	12/4/02	3/27/03	36 5L	23-06704	718	Import	3 Studs Sheared
21	* Advantage	04	12/0/02	12/21/02	1/11/03	4/1/03	300FQ	28-06978	712	Tredit	(1) Wheel -Tire
22	Quantum	04	4/4/03	4/8/03	N/A	4/8/03	2902B	15-92171	718	Tredit	Roadside Front
23	Triumph	04	4/4/03	4/9/03	4/26/03	4/8/03	365FL	40-96957	718	Import	(1)Whl-Roadside
24	Advantage AX6	04	3/25/03	4/5/03	N/A	4/9/03	366FL	40-96459	718	Import	(1) Wheel Tire
25	Advantage	04	3/8/03	4/9/03	N/A	4/13/03	365FL	23-06521	718	Tredit	(1) Wheel Tire
26	Regal	04	3/6/03	4/12/03	N/A	4/14/03	366FL	40-96344	718	Import	(1) Wheel Tire
27	Regal AX6	04	4/4/03	4/11/03	N/A	4/16/03	365FL	42-80813	718	Import	(1)Whl-Roadside
28	Regal	04	3/27/03	3/29/03	4/4/03	4/21/03	365FL	42-80784	718	Tredit	(2)Whl Roadside
29	Pride	03	9/5/02	9/5/02	3/28/03	4/23/03	36 5L	40-96952	718	Import	(1) Wheel Tire
30	Advantage AX6	04	4/16/03	4/21/03	4/30/03	5/1/03	366FL	40-96889	718	Import	(1) Wheel Tire
31	Regal AX6	04	12/12/02	1/11/03	4/16/03	5/2/03	300FQ	28-06965	712	Import	(1) 15" Wheel
32	Pride	04	11/14/02	11/27/02	N/A	5/8/03	365L	23-06933	718	Import	(1) Whl Roadside
33	Regal AX6	04	3/16/03	4/4/03	5/8/03	5/9/03	366FL	42-80746	718	Import	(2) Wheel -Tires
34	Regal AX6	04	1/21/03	1/25/03	4/15/03	5/9/03	365FL	23-06295	718	Import	(2) Whl Roadside

Import Wheels:
LD1-[redacted]

Tredit Wheel
LD1-4000 - [redacted]
LP1-4010 - [redacted]
LD1-[redacted]

*Added To Database

ALUMINUM WHEEL REPORT

2/11/04

	Brand	Model YR	Mfg Date	Ship Date	DOP	Date Reported	Model	Serial No#	Wheel Qty	Wheel Make	Note
29	Triumph	04	3/14/03	3/14/03	3/28/03	6/13/03	36 5L	23-09615	718	Import	(1) Dogside Rear
30	Quantum AX6	04	4/8/03	4/11/03	5/12/03	5/16/03	36 5L	65-99505	718	Import	(1) Alum Whl-Tire
31	Advantage AX6	04	4/11/03	4/24/03	5/14/03	5/19/03	306RL	26-07077	718	Import	(2) Whl Roadside
32	Pride	04	1/10/03	1/17/03	3/3/03	6/3/03	31 5G	23-09206	722	Import	(1) Roadside rear
33	Advantage	04	4/1/03	4/3/03	5/5/03	6/11/03	320DB	26-09656	712	Tredit	(1) alum wheel
40	Quantum	04	4/4/03	4/29/03	6/9/03	6/6/03	2952B	15-92173	712	Tredit	(1) Wheel-Prop Dam
41	* Regal AX6	04	1/14/03	1/25/03	6/12/03	6/19/03	300FQ	26-09116	712	Import	(1) Wheel -Tire
42	Pride	03	8/13/02	8/18/02	8/7/02	6/23/03	36 5L	40-99805	718	Import	(2) Wheel-Tires
43	Quantum	04	3/21/03	4/3/03	N/A	6/24/03	365FL	23-09696	718	Tredit	Lug Bolts Sheared
44	Triumph	04	2/27/03	2/28/03	3/15/03	6/25/03	33 5Z	23-09617	718	Import	(1) Wheel Tire
45	Quantum	04	4/7/03	4/12/03	6/23/03	7/2/03	2952B	15-92185	712	Tredit	(1) Wheel -Tire
46	Regal	04	1/9/03	1/11/03	6/30/03	7/2/03	255BH	65-92306	712	Tredit	(1) Wheel -Tire
47	Quantum	04	4/7/03	4/10/03	6/5/03	7/1/03	2952B	15-92181	712	Tredit	(1) Wheel -Tire
48	Quantum	04	4/7/03	4/10/03	6/5/03	7/7/03	2952B	15-92181	712	Tredit	(1) Wheel -Tire
49	Quantum AX6	04	7/11/03	7/15/03	N/A	7/17/03	365FL	65-94779	718	Import	(1) Wheel -Tire
50	Advantage	04	4/1/03	4/5/03	6/29/03	8/8/03	2952B	15-92134	712	Tredit	(1) Wheel -Tire
51	Regal	04	3/20/03	4/9/03	5/23/03	8/11/03	365FL	23-09527	718	Tredit	(1) Wheel -Tire
52	Regal	04	5/23/03	5/28/03	N/A	8/11/03	365FL	23-07135	718	Tredit	(1) Wheel -Tire
53	Regal AX6	04	2/11/03	2/11/03	4/8/03	9/19/03	365FL	23-09423	718	Import	(1) Wheel -Tire
54	Regal	04	7/9/03	7/16/03	8/5/03	9/12/03	330RL	42-81301	712	Tredit	(1) Wheel -Tire
55	* Advantage AX6	04	12/11/02	8/28/03	7/2/03	9/8/03	300FQ	40-99413	712	Tredit	(1) Wheel -Tire
56	Triumph	04	10/30/02	12/13/02	8/4/03	9/29/03	32 G	23-09560	722	Import	(1) Wheel -Tire
57	Advantage	04	4/15/03	4/17/03	6/4/03	11/19/03	2952B	15-92272	712	Tredit	(1) Wheel -Tire
58	Triumph	04	2/6/03	3/25/03	5/23/03	11/20/03	365L	23-09396	718	Import	(2) Wheel-Tires
59	Wilderness	04	4/15/03	4/15/03	5/22/03	12/10/03	300BH	24-81179	712	Tredit	(1) Wheel -Tire
60	Advantage	04	3/18/03	3/19/03	4/10/03	12/10/03	300BH	23-09532	712	Tredit	(1) Wheel -Tire
61	Quantum	04	5/6/03	5/7/03	9/15/03	12/10/03	2952B	23-09661	718	Import	(1) Wheel -Tire
62	Triumph	04	11/13/02	1/21/03	10/16/03	12/10/03	365L	23-09629	718	Import	(1) Wheel -Tire
63	Regal AX6	04	4/1/03	4/5/03	6/1/03	12/15/03	365FL	40-99513	718	Import	(1) Wheel -Tire
64	*Triumph	04	11/19/02	1/14/03	3/13/03	1/22/04	32G	23-09567	722	Import	(1) Wheel -Tire
65											

Import Wheels:
L01-[redacted]

Tredit Wheel
L01-[redacted]

*Painted T[redacted]

Retained Components

[redacted] Number of Unit:	2305929 655 Continental Imports wheel dated 12/19/03. Six unbroken studs.
Serial Number of Unit: Parts:	N/A Continental Imports Wheel
Serial Number of Unit: Parts:	N/A Tredit Tire Wheel
Serial Number of Unit: Parts:	4095571 Dexter 655 hub.
Serial Number of Unit: Parts:	N/A 3 Broken studs/5 unbroken studs
Serial Number of Unit: Parts:	2305898 Two Dexter axles, 4 wheels, 6 broken studs
Serial Number of Unit: Parts:	2305832 One wheel
Serial Number of Unit: Parts:	2451179 One wheel

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 26

PART 4 OF 4

BOOK 2 OF 2

26. Provide a copy of all inspection reports conducted by Fleetwood, Fleetwood's suppliers, and/or sub-contractors on returned wheel end components including but not limited to wheels, hubs, brake drums or rotors, wheel mounting studs and wheel mounting nuts listed in response to Request #25.

RESPONSE #26

Please refer to attachment 26a for copies of inspection reports.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 26A

PART 4 OF 4

BOOK 2 OF 2

REPORT NO. SRN 284009

OBSERVATIONS:

[1] Received (12) 007-122-00 studs, two of which were broken, returned from Fleetwood (Fig. 1). Markings on the heads of the broken studs indicate Vico as the supplier of the studs. No wheel information was received.

[2] Fracture analysis on the broken studs was not possible due to the damage the studs sustained (Fig. 2). The broken studs were selected for material testing.

[3] Hardness tests showed the studs to have an average hardness of 34 and 36 HRC, both of which are within tolerance per the drawing.

[4] Chemical analysis showed the studs to be the required SAE Grade 8 bolt material.

CONCLUSION:

[1] The broken studs were shown to meet the hardness and chemistry requirements. The cause of the failure could not be determined due to the damaged fracture surfaces.

DISCUSSION: ☐

RECOMMENDATIONS:

TESTED MATERIAL DISPOSITION:

RETURN TO ☐ ENGINEERING SERVICE ☐ PURCHASING ☐ DEXTER PLANT ☐ CUSTOMER ☐ VENDOR ☐ QUALITY

☐ SAVE IN THE LAB FOR _____ DAYS ☐ SCRAP

WRITTEN BY:

Aaron W. Wiley
LAB TECHNICIAN

Aug / 7 / 03
Date

APPROVALS:

DAVE VINCENT
LAB MANAGER

LUTZ KOLANO
PRODUCT ENGINEER

BILL DUNLAP
DIRECTOR OF ENGINEERING

Post-it® Fax Note 7671	Date 11/4/15	# of pages ▶ 21
To Jim Bertash	From Bill Dunlap	
Co./Dept. Fleetwood	Co. Dexter Axle	
Phone #	Phone #	
Fax #	Fax #	

Fig. 1: Shows the studs as received.

Fig. 2: Shows the two broken studs.

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated 8/5/2009
Date of Current Examination: 8/7/2009

Test Ref.No.: SRN 294009
Axle part 007-122-00
Stud A

Boron Disc YES [redacted]

Results:

Engineering Spec. N Grade 8

Element		Measured	X	Specified
Carbon	C	0.366		0.26 to 0.55
Silicon	Si	0.187		--
Manganese	Mn	0.765		--
Phosphorus	P	0.008		max. of= 0.03
Sulfur	S	0.008		max. of= 0.05
Chromium	Cr	0.043		--
Nickel	Ni	0.007		--
Molybdenum	Mo	0.196		--
Copper	Cu	0.069		--
Vanadium	V	0.0045		--
Lead	Pb	0.0000		--
Aluminum	Al	0.001		--
Boron	B	0.0032		--
Iron	Fe	98.31		--

AISI/SAE Grade: Substantially Grade 8 — Medium Carbon Alloy

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: _____ Reviewed by: _____

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In:H:\LAB...\294009
sheet= sheet A

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated: 8/5/2003
Date of Current Examination: 8/7/2003

Test Ref.No.: SRN 284009
Axle part: 007-122-00 Stud A

Boron Disc: YES [redacted]

Results:

Engineering Spec. N Grade 8

Element		Measured	x	Specified
Carbon	C	0.353		0.26 to 0.55
Silicon	Si	0.163		--
Manganese	Mn	0.761		--
Phosphorus	P	0.006		max. of= 0.03
Sulfur	S	0.009		max. of= 0.05
Chromium	Cr	0.048		--
Nickel	Ni	0.005		--
Molybdenum	Mo	0.197		--
Copper	Cu	0.069		--
Vanadium	V	0.0344		--
Lead	Pb	0.0000		--
Aluminum	Al	0.001		--
Boron	B	0.0002		--
Iron	Fe	99.33		--

AISI/SAE Grade: Substantially Grade 8 — Medium Carbon Alloy

ADDITIONAL COMMENTS

Data By: _____ Reviewed by: _____

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In:I:\LAB\...\284009
sheet= chem 8

REPORT NO. 1500256

OBSERVATIONS:

[1] Received five 007-122-00 studs returned from Fleetwood. Markings on the studs indicated that Cold Heading was the supplier of the studs. There was one stud fractured the other four studs appeared undamaged except for aluminum deposits smeared on the threads (Fig. 1 & 2).

[2] Fracture analysis showed the broken stud to have reverse bending fatigue cracking, which is usually an indication of low torque (Fig. 3). The fractured stud #1 and the undamaged stud #2 were selected for material analysis.

[3] Hardness test showed the two studs to have an average hardness of 37.5 HRC, which meets the hardness specified by the drawing.

[4] Chemical analysis showed the studs to be within the specifications for SAE Grade 8 fasteners as required by the drawing. See attached data sheets.

CONCLUSION:

[1] The stud broke as a result of reverse bending. Therefore, the cause of the failure was most likely due to low torque, as indicated by the fracture surface. The two studs meet material specifications for hardness and chemistry drawing specification.

DISCUSSION: ☐

TESTED MATERIAL DISPOSITION:

RETURN TO
- ☐ ENGINEERING
- ☐ SERVICE
- ☐ PURCHASING
- ☐ DEXTER PLANT
- ☐ CUSTOMER
- ☐ VENDOR
- ☐ QUALITY _____

☐ SAVE IN THE LAB FOR _____ DAYS ☐ SCRAP

WRITTEN BY:

PATRICK DVORAK
LAB TECHNICIAN

May/13/03
Date

APPROVAL:

DAVE VINCENT
LAB MANAGER

LUTZ KOLANO
PRODUCT ENGINEER

BILL DUNLAP
DIRECTOR OF ENGINEERING

5/13/03

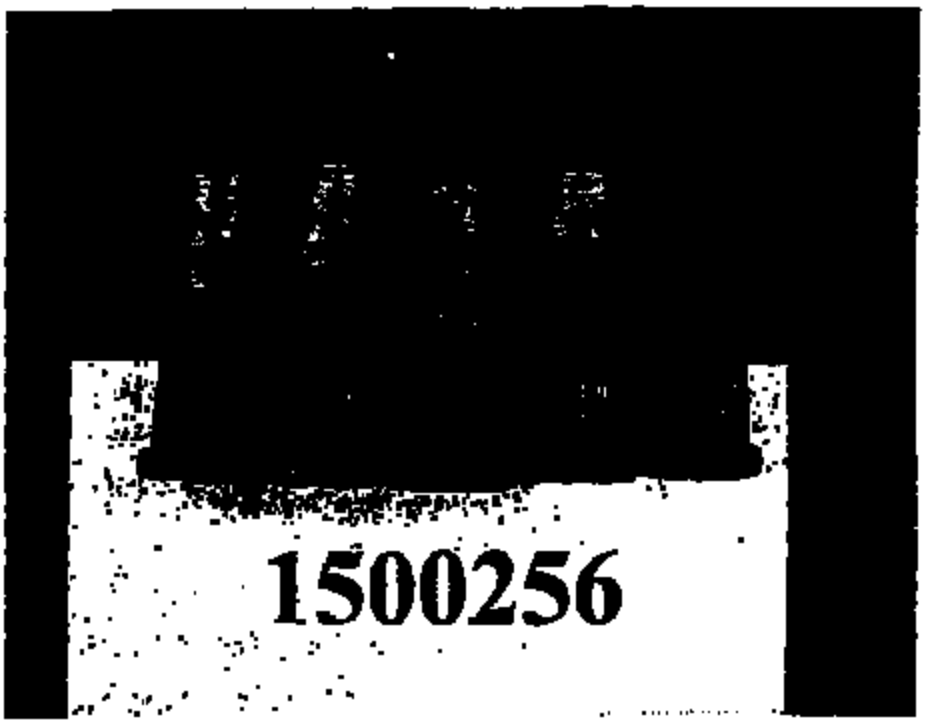


Fig. 1: Studs as received.

Fig. 2: Cold Heading identification for supplier.

Fig. 3: Fracture surface showing reverse bending.

DEXTER AXLE

ENGINEERING LAB DATA SHEET

REPORT NO.:	1500256	VENDOR:	Cold Heading
PROJECT NAME:	SRN	HEAT NO.:	
SUBJECT:	Rockwell Hardness	CUSTOMER:	Fleetwood
APPLICATION:	Studs	DATA BY:	Patrick Dvorak
PART NUMBER:	007-122-00	DATE:	5/8/03

Sample and Indentation #	Rockwell Hardness HRC				
Stud #1					
1	38				
2	37				
3	37				
Average	37.33				
Stud #2					
1	37				
2	38				
3	38				
Average	37.67				
Average of					
Both Studs:	37.50				

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated: 5/8/03
Date of Current Examination: 5/9/03
Test Ref.No.: 1500256
Axle part: Stud #1

Boron Disc: YES

Results:

Engineering Spec. Grade 8

Element		Measured	x	Specified
Carbon	C	0.32		0.28 to 0.55
Silicon	Si	0.14		--
Manganese	Mn	0.718		--
Phosphorus	P	0.009		max. of= 0.03
Sulfur	S	0.011		max. of= 0.05
Chromium	Cr	0.036		--
Nickel	Ni	0.01		--
Molybdenum	Mo	0.22		--
Copper	Cu	0.05		--
Vanadium	V	<.00005		--
Lead	Pb	<.00001		--
Aluminum	Al	0.0269		--
Boron	B	<.00015		--
Iron	Fe	98.46		--

AISI/SAE Grade: Substantially Grade 8 — Medium carbon Alloy

ADDITIONAL COMMENTS

Boron above 0.0005% will effect hardenability

Data By: Patrick Dvorak Reviewed by:

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In:H:\LAB\..\1500256
sheet= Chem. Data 1

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated: 5/5/03
Date of Current Examination: 5/6/03
Test Ref.No.: 1600256
Axle part: Stud #2

Boron Disc: YES

Results:

Engineering Spec. Grade 8

Element		Measured	x	Specified
Carbon	C	0.34		0.28 to 0.55
Silicon	Si	0.14		--
Manganese	Mn	0.714		--
Phosphorus	P	0.010		max. of= 0.03
Sulfur	S	0.012		max. of= 0.05
Chromium	Cr	0.040		--
Nickel	Ni	0.01		--
Molybdenum	Mo	0.22		--
Copper	Cu	0.08		--
Vanadium	V	<.00005		--
Lead	Pb	<.00001		--
Aluminum	Al	0.0272		--
Boron	B	0.001		--
Iron	Fe	98.42		--

AISI/SAE Grade: Substantially Grade 8 — Medium Carbon Alloy

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: Patrick Dvorak Reviewed by:

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In:H:\LAB\...\1600256
sheet= Chem. Data 5

REPORT NO. SRN 0416406

OBSERVATIONS:

1. Received four (4) 007-122-00 studs returned from Fleetwood (Fig. 1). All of the studs were broken off at the first thread. Markings on the studs indicated that Cold Heading was the supplier of the studs (Fig. 2).
2. Fracture analysis showed two of the studs to have reverse bending fatigue cracking, which is usually an indication of low torque (Fig. 3). The two studs A & B were selected for material analysis.
3. Hardness tests showed stud A to have an average hardness of 36 HRC and stud B 35 HRC, which is within the tolerance as specified per the drawing.
4. Chemical analysis showed the studs to be SAE Grade 8 bolt material as required by the drawing.

CONCLUSION:

1. The studs were shown to meet the requirements for hardness and chemistry. Therefore, the cause of the failure was most likely due to low torque, as indicated by the fracture surfaces.

DISCUSSION:

☐

TESTED MATERIAL DISPOSITION:

RETURN TO
- ☐ ENGINEERING SERVICE
- ☐ PURCHASING
- ☐ DEXTER PLANT
- ☐ CUSTOMER
- ☐ VENDOR
- ☐ QUALITY _____

☐ SAVE IN THE LAB FOR _____ DAYS ☐ SCRAP

WRITTEN BY:

PATRICK DVORAK
LAB TECHNICIAN

Jun / 24 / 03
Date

APPROVAL:

DAVE VINCENT
ENGINEERING LAB MANAGER

LUTZ KOLANO
PRODUCT ENGINEER

BILL DUNLAP
DIRECTOR OF ENGINEERING

6/25/03

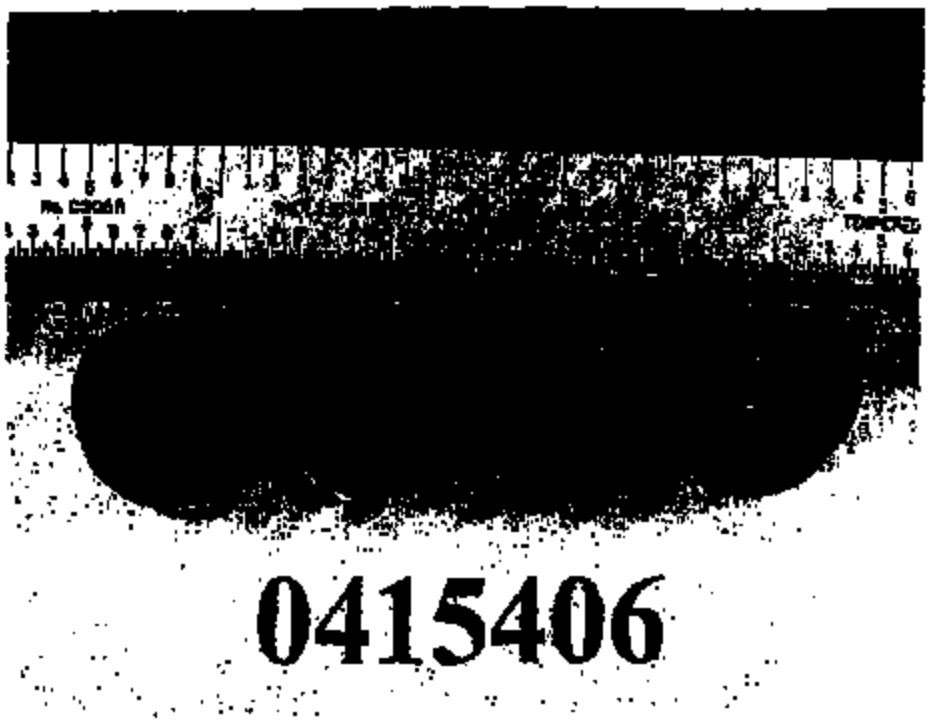


Fig. 1: Wheel studs as received.

Fig. 2: CH vendor identification of studs.

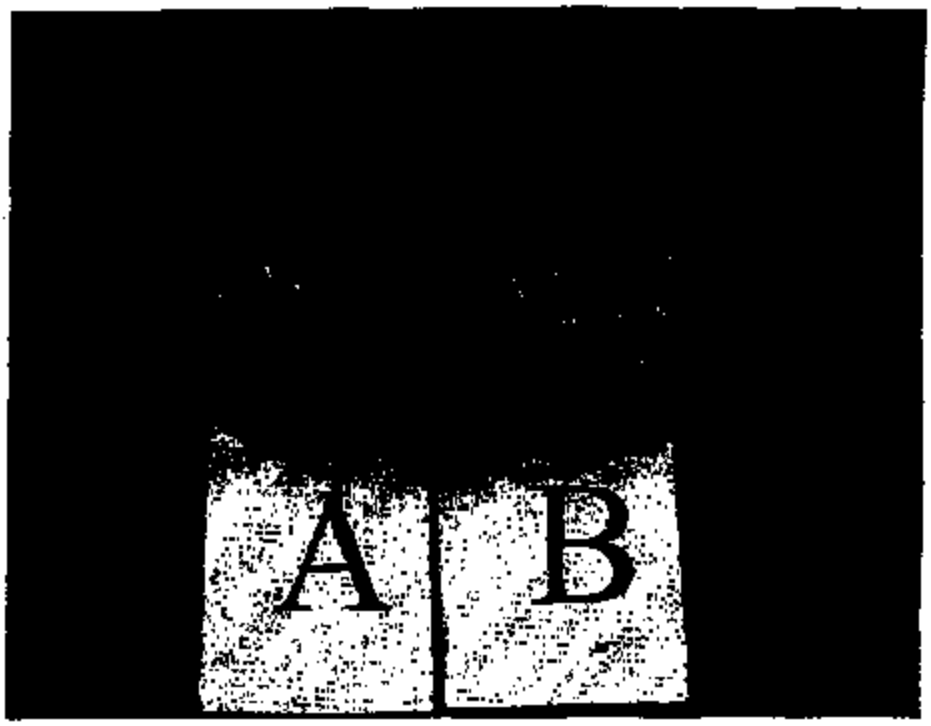


Fig. 3: Fracture of studs showing reverse fatigue bending.

DEXTER AXLE

ENGINEERING LAB DATA SHEET

Report No:	0415406	VENDOR:	Cold Heading
Project Name:	SRN	HEAT NO:	
Test Type:	Hardness	CUSTOMER:	Fleetwood
Part Number:	007-122-00	DATA BY:	Patrick Dvorak
Part Description:	1/2-20 stud	DATE:	6/24/03

Sample	First Reading	Second Reading	Third Reading	Average Reading	Comments
Stud A	36 HRC	36 HRC	36 HRC	36 HRC	Hardness spec: 33 to 39 HRC
Stud B	36 HRC	35 HRC	35 HRC	35 HRC	per the drawing

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated 6/24/03
Date of Current Examination: 6/24/03

Test Ref.No.: SRN 0415406
Axle part 0.316
Stud A

Boron Disc YES

Results:

Engineering Spec. N Grade 6

Element		Measured	x	Specified
Carbon	C	0.316		0.28 to 0.55
Silicon	Si	0.120		--
Manganese	Mn	0.737		--
Phosphorus	P	0.007		max. of= 0.03
Sulfur	S	0.009		max. of= 0.05
Chromium	Cr	0.056		--
Nickel	Ni	0.019		--
Molybdenum	Mo	0.213		--
Copper	Cu	0.059		--
Vanadium	V	0.0005		--
Lead	Pb	<.00001		--
Aluminum	Al	0.028		--
Boron	B	0.0046		--
Iron	Fe	98.49		--

AISI/BAE Grade: Substantially Grade 6 Medium Carbon Alloy

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: Patrick Dvorak Reviewed by:

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In\\LAB\...\0415406
sheet= sheet A

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated 8/24/03
Date of Current Examination: 8/24/03

Test Ref.No.: SRN 0415406
Axle part 007-122-00
Stud B

Boron Disc YES

Results:

Engineering Spec. N Grade 8

Element		Measured	x	Specified
Carbon	C	0.297		0.28 to 0.55
Silicon	Si	0.106		--
Manganese	Mn	0.735		--
Phosphorus	P	0.006		max. of= 0.03
Sulfur	S	0.010		max. of= 0.06
Chromium	Cr	0.056		--
Nickel	Ni	0.015		--
Molybdenum	Mo	0.212		--
Copper	Cu	0.054		--
Vanadium	V	0.0001		--
Lead	Pb	<.00001		--
Aluminum	Al	0.026		--
Boron	B	0.0053		--
Iron	Fe	98.48		--

AISI/SAE Grade: Substantially Grade 8 — Medium Carbon Alloy

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: Patrick Dvorak Reviewed by:

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
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File Stored in:H:\LAB\...\0415406
sheet= chem B

REPORT NO. 0413563

OBSERVATIONS:

[1] Received six 007-122 -00 studs broken at the first thread. Studs were marked grade 8 and also with a V indicating the vendor was Vigo. Fracture surfaces were damaged. See Fig. 1.

[2] Visual examination of the fracture surfaces indicates that two of the studs, 1 and 5, had reverse bending fatigue cracks with peripheral ratchet marks which is an indication of underlorque. These probably broke first. The other studs had peripheral ratchet marks. See Figs. 2 & 3.

[3] Two of the studs (1 & 5) that broke by reverse bending were tested for hardness and chemistry. Hardness ranged from 36 to 37 HRC and averaged 36.7 HRC. This is within the 33 to 39 HRC print specs. Both chemistries were within grade 5 ranges. See Hardness Data Sheet and Chem. Data Sheet.

[4]

CONCLUSION:

[1] Two of the studs broke by reverse bending fatigue cracks which is an indication of underlorque. The two studs tested meet material specifications for hardness and chemistry per the print.

DISCUSSION: ☐

RECOMMENDATIONS:

TESTED MATERIAL DISPOSITION:

RETURN TO
- ☐ ENGINEERING
- ☐ SERVICE
- ☐ PURCHASING
- ☐ DEXTER PLANT
- ☐ CUSTOMER
- ☐ VENDOR
- ☐ QUALITY
- ☐ SAVE IN THE LAB FOR _____ DAYS
- ☐ SCRAP

WRITTEN BY:

Brian Vint

BRIAN VINT
LAB TECHNICIAN

Oct / 17 / 02
Date

APPROVAL:

KI HO LEE
LAB MANAGER
1-10-02

Daniel W. Bard
DANIEL BARD
PRODUCT ENGINEER

10/18/02
BILL DUNLAP
DIRECTOR OF ENGINEERING

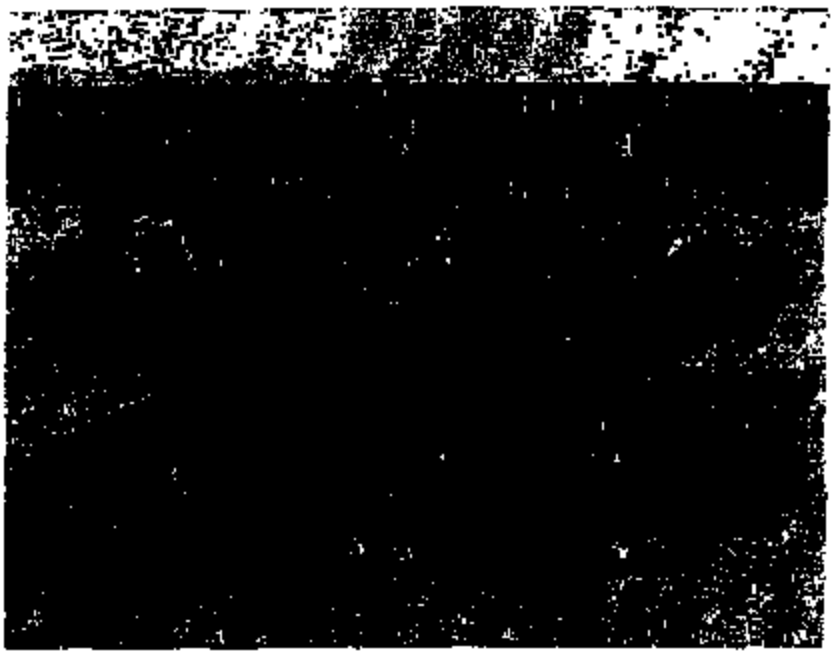

Fig. 1 Studs as received, 1 – 3 at bottom, 4 – 6 at top, left to right.

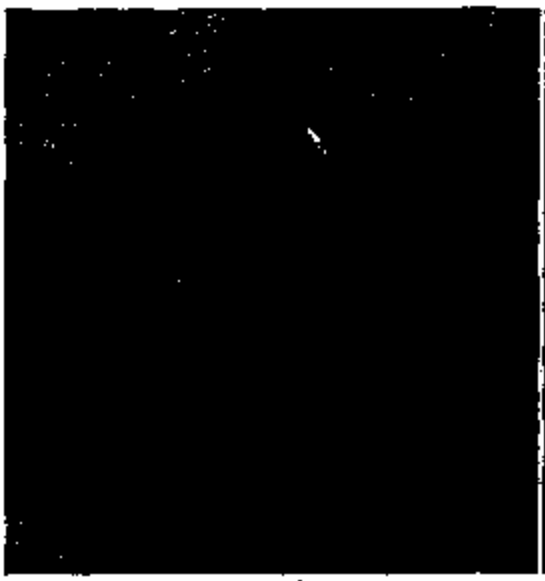

Fig. 2 Close-up of stud 1.

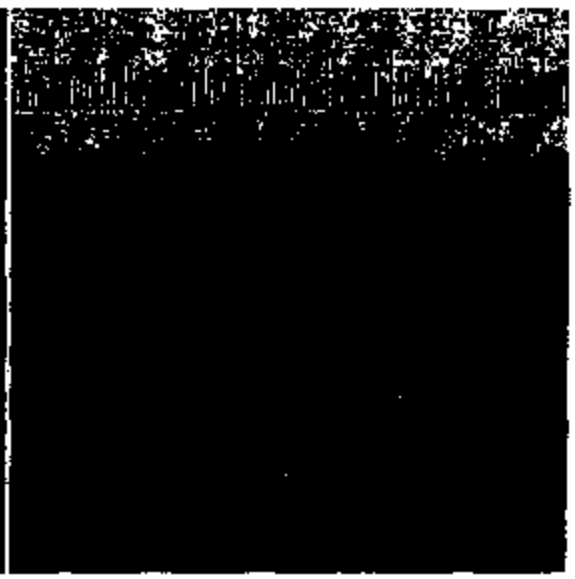

Fig. 3 Close-up of stud 5.

DEXTER AXLE

ENGINEERING LAB DATA SHEET

REPORT NO.:	0413553	VENDOR:	V (Vico)
PROJECT NAME:	SRN	HEAT NO.:	
SUBJECT:	Rockwell Hardness	CUSTOMER:	
APPLICATION:	Studs	DATA BY:	Brian Vint
PART NUMBER:	007-122-00	DATE:	7/17/02

Sample and Indentation #	Rockwell Hardness HRC				
Stud #1					
1	36				
2	37				
3	36				
Average	36.3				
Stud #6					
1	37				
2	37				
3	37				
Average	37.0				
Average of Both Studs:	36.7				

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated: 7/14/02
Date of Current Examination: 7/17/02

Test Ref.No.: 0413553
Axle part: Stud #1

Boron Disc: YES

Results:

Engineering Spec. Grade 8

Element		Measured	x	Specified
Carbon	C	0.37		0.28 to 0.55
Silicon	Si	0.23		--
Manganese	Mn	0.86		--
Phosphorus	P	0.009		max. of= 0.03
Sulfur	S	0.013		max. of= 0.05
Chromium	Cr	0.056		--
Nickel	Ni	0.02		--
Molybdenum	Mo	0.220		--
Copper	Cu	0.07		--
Vanadium	V	<0.00006		--
Lead	Pb	<.00001		--
Aluminum	Al	0.0172		--
Boron	B	0.0006		--
Iron	Fe	99.14		--
AISI/SAE Grade:		Medium Carbon Steel		Medium Carbon Steel

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: Patrick Dvorak Reviewed by: [signature]

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
3) *All information on this sheet must be complete.*
4) *Last Date of Spectrometer Calibration should be the Monday prior to the date of the test. Do not operate the Spectrometer if the Machine has not been Calibrated*

File Stored In:H:\LAB\...\0413553.xls
sheet= Chem. Data 1

DATA SHEET FOR SPECTROMETER ANALYSIS

DEXTER AXLE ENGINEERING LABORATORY DEXTER AXLE

CHEMICAL ANALYSIS DATA SHEET

Date Spectrometer Last Calibrated: 7/14/02
Date of Current Examination: 7/17/02

Test Ref.No.: 0413563
Axle part: Stud #5

Boron Disc: YES [redacted]

Results:

Engineering Spec. Grade 8

Element		Measured	X	Specified
Carbon	C	0.38		0.28 to 0.55
Silicon	Si	0.22		" "
Manganese	Mn	0.85		" "
Phosphorus	P	0.009		max. of= 0.03
Sulfur	S	0.013		max. of= 0.05
Chromium	Cr	0.06		" "
Nickel	Ni	0.01		" "
Molybdenum	Mo	0.217		" "
Copper	Cu	0.07		" "
Vanadium	V	<.00008		" "
Lead	Pb	<.00001		" "
Aluminum	Al	0.0169		" "
Boron	B	0.0029		" "
Iron	Fe	98.18		" "
AISI/SAE Grade:		Medium Carbon Steel		Medium Carbon Steel

ADDITIONAL COMMENTS

Boron above 0.0005% will affect hardenability

Data By: Patrick Dvorak Reviewed by: [signature]

Note: 1) *Attach Original Computer Printout with this Sheet and File in Spectrometer Test Log.*
2) *Composition measured is an average of 3 (three) readings. To be noted if otherwise.*
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File Stored in\LALAB...\0413563.xls
sheet= Chem. Data 5

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 27

PART 4 OF 4

BOOK 2 OF 2

27. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Fleetwood. For each such action, provide the following information:
(a) Action title or identifier;
(b) The actual or planned start date;
(c) The actual or expected end date;
(d) Brief summary of the subject an objective of the action;
(e) Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
(f) A brief summary of the findings and/or conclusions resulting from the action.

For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft, or final form. Organize the documents chronologically by action.

RESPONSE #27

Please refer to attachment 27a for requested summary and attachments of supporting documents.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 27A

PART 4 OF 4

BOOK 2 OF 2

Title or identifier:	Aluminum Wheels
Start date:	N/A
End date:	21-Nov-02
Summary:	Discussion of torque, lug nut taper, pitch circle diameter.
Responsible party:	Greenball
Summary of findings:	The lug taper is correct. Pitch circle diameter could contribute to torque loss.

Title or identifier:	Retention Problems with Aluminum Wheels
Start date:	N/A
End date:	Received by Fleetwood on 6-Dec-02
Summary:	1) Wheels are within tolerance. 2) Studs are within specifications and experienced reverse bending fatigue. 3) Reverse bending from wheel slippage after torque loss. 4) Manufacturing tolerances can contribute. 5) Contact pressure and friction coefficient may lead to wheel slippage in aluminum wheels.
Responsible party:	Dexter Axle Engineering
Summary of findings:	1) Possible alternative remedy is machining in a torque ring. 2) Use larger studs. 3) Change to 8 bolt pattern. 4) Use hub concentric wheel. None of the above relieves the user from the need to check lug nut torque.

Title or identifier:	Aluminum Wheel Torque Study
Start date:	N/A
End date:	07-Jan-03
Summary:	Mileage accumulation while following torque guidelines.
Responsible party:	Fleetwood Engineering
Summary of findings:	No torque loss was experienced.

Title or identifier:	Steel Wheel with Aluminum Lug Nuts
Start date:	N/A
End date:	23-Jan-03
Summary:	200 mile road test with improper lug nuts on steel wheels. To determine if lug nuts should be provided with steel spare on units with aluminum wheels.
Responsible part:	Fleetwood Engineering
Summary of findings:	Lug nuts for use with steel wheels should be provided with the spare tire.

Title or identifier:	Wheels
Start date:	N/A
End date:	23-Apr-03
Summary:	Coatings on hub and wheel leading to torque loss. Steel wheels are more forgiving than aluminum wheels.
Responsible party:	Dexter Axle
Summary of findings:	Aluminum wheels do not deflect as do steel wheels so all of the spring action is in the stud. The re-tightening of aluminum wheels is much more critical than steel wheels. Thicker aluminum wheels create higher bending moment on stud, leading to failure when slippage occurs.

Title or identifier:	Wheel coatings
Start date:	N/A
End date:	28-Apr-03
[redacted]mary:	Discussion of wheel coatings that may wear resulting in torque loss.
[redacted]nsible party:	Tredit Tire and Wheel
Summary of findings:	Inconclusive.

Title or identifier:	Contact Pressure of Wheels against Hub Face.
Start date:	N/A
End date:	30-May-03
Summary:	Using pressure paper and torquing wheels to max torque, the contact pressure and contact surface can be observed.
Responsible party:	Fleetwood Engineering
Summary of findings:	Steel wheels and modified aluminum wheel have greater contact pressure of small surface area.

Title or identifier:	Dexter Hub work with 54850 & 54860 aluminum wheels
Start date:	N/A
End date:	Received 23-Jun-03
Summary:	Check the design of the hub and wheel for compatibility.
Responsible party:	Yuan Feng Industrie Co., LTD
Summary of findings:	No design issues found. Possibly torque loss occurs as the paint wears away.

Title or identifier:	Aluminum wheel torque
Start date:	N/A
End date:	19-Sep-03
Summary:	Torque loss resulting in wheel loss. Testing of cargo trailers for torque loss.
Responsible party:	Tredit Tire and Wheel
Summary of findings:	A torque ring, or machined section on the back face of the wheel to create of 'spring -effect' in the wheel. Provide customers with proper torque information.

Title or identifier:	Torque vs. Rotation Angle
[redacted] date:	N/A
[redacted]:	31-Oct-03
[redacted]mary:	Comparing the rotation angle of the lug nut to the lb-ft of resulting torque for aluminum and steel wheels.
Responsible party:	Fleetwood Engineering
Summary of findings:	Aluminum wheels have a steep curve, tightening from 50 lb-ft to 125 lb-ft in less than 30 degrees. In comparison, steel wheels take 110 to 150 degrees to tighten from 50 lb-ft to 125 lb-ft.

Bertoch, Jim

From: Dickson, Michael
Sent: Thursday, November 21, 2002 2:30 PM
To: Bertoch, Jim
Cc: Daley, Pat
Subject: RE: Aluminum Wheels

Jim,

I received this e-mail in a very round-about fashion. Do you know anything more on this subject, i.e. what the cause of failure is?

In an effort to try and find the root cause of this problem, attached is the response from the factory regarding this problem. (I had inquired about a higher torque rating as a possible impact.)

Based on their experience, the wheel loose cause by following reasons:

- *Tight up (Torque)*

It's normal reason why the wheel loose. However, based on the Memorandum, we think the wheels should be tight OK.

Factory told me the 90 lbs & 120 lbs torque difference would not cause wheel loose if the wheel already tight up.

Especially, the wheel already pass the Cornering Test; it should approve the wheel is no problem to working under 90 lbs torque.

- *Taper (Lug nut contact area) & Lug Nut*

Lug nut contact area is not working properly will cause wheel loose.

Usually it's happen when lug head is not exactly 60 degree shape.

However, Fleetwood did offer a free lug nut sample before when we develop this wheel.

Please advise if use different lug nut right now; maybe it's a reason.

Factory also mention the lug contact area difference between Greenball & Tredit will not cause the wheel loose.

Large contact area not means working better. If fact, Ford & Nissan use wheels with smaller contact area.

- *P.C.D. (Pitch circle diameter)*

P.C.D. difference between hub stud & wheel also cause wheel loose.

Sometimes, wheel can be assemble on hub with small P.C.D. difference; and the problem will come out after high-speed running.

Please check the P.C.D. on hub stud.

Please advise if you have more questions.

Regards,

Received
December 6, 2002

August 1, 2002

Subject: Retention Problems with Aluminum Wheels

Background:

We have received reports of wheel loss incidents at several OEM locations. These incidents have occurred on trailers when using aluminum wheels. The failures are predominately found with the 655 or six bolt on 5.50" bolt circle mounting pattern. This pattern is used with 15" x 6" wheels and 16" x 6" wheels. The most common reason for the wheel separation appears to be fatigue failure of the wheel studs.

The wheels are manufactured by Enkei and are sold by Tredit Tire and Wheel. The axles are the standard design offered by Dexter Axle.

Discussion:

Dexter Axle has undertaken a project to discover why these aluminum wheels have such a tendency to cause fatigue failure of the studs while the steel wheels do not.

Design observations

The Dexter hub design features an annular ring of approximately 7.2" diameter. The hub barrel or nose is machined to 3.62" diameter. The six (6) ½" – 20 thread studs are grade 8 and are equally spaced on a 5.50" bolt circle. The true position requirements of the stud bores is .010" diameter. Six small pockets are cast in the mounting face to reduce weight and are positioned between each stud. The remaining surface provides adequate area for ring mount type steel wheels.

We have inspected exemplar aluminum wheels as well as wheels were reported to have separated from the hub in use. Using a CMM or coordinate measuring machine, we have found the stud hole positions and cone angles to be within the tolerances that are specified for steel wheels.

Possible failure causes

Physical examination of returned parts has shown that the fractured studs typically show signs of reverse bending fatigue with multiple fracture origins. The

distinctive features visible on the fracture faces are indicative of excessive stress and loss of clamp load which leads to slippage of the wheel against the mounting face of the hub. In all cases to date, the studs have been found to be within the specifications for Grade 8 fasteners.

When slippage occurs, it causes a bending stress in the studs which is additive to the tensile stress already present. This side loading condition is exacerbated by the aluminum wheel because of its' thicker cross section in the mounting area. The thick section places the contact point of the cone nuts approximately .12" farther outboard from the hub face than an equivalent steel wheel, thus increasing the bending moment on the stud.

When the wheel slips, the bending stress will be shared equally among each of the six studs if the studs are positioned with zero error. Since zero error is unlikely, we must consider alternative scenarios. If one of the studs is positioned outward to its maximum of .005" and the mating hole in the wheel is positioned at its maximum condition outward. That would effectively put this stud in position to bear more load when the wheel rotates to the six o'clock position if slippage occurs. Under such a condition, the combined stress may exceed the yield strength of the stud. Once the yield point is exceeded, fatigue failure is inevitable. Of course, the foregoing example is hypothetical. In reality, when slippage occurs, the side loads will be limited by the other studs each picking up a portion of the load. Because of the position tolerances allowed, it is conceivable that one or more of the studs can experience overstressing.

Another potential source of bending stress is the mismatch of the studs to the holes in the wheel. These small true position errors also cause bending stress in the studs. When the nuts are tightened, it is apparent that the wheel nut will bear against the closest side of the hole and as the torque increases, the stud will be forced to deflect slightly until the cone surface contact is sufficient for the torque to stabilize. This deflection or bending adds to the tensile stress already present in the stud.

These loading scenarios only deal with static loads. In actual use, a trailer wheel is subjected to dynamic loads as well. Each impact with potholes, uneven road shoulders, etc. will produce sudden spikes in the loads imposed on the studs if the clamp force has been compromised and the wheel is free to slip.

Additional contributing factors

The aluminum wheels have been designed with a flat mounting face. This flat surface bears directly against the flat mounting surface of the hub. Simple finite element analysis models confirm that the areas of highest contact pressure occur in small circular areas surrounding each of the studs. The contact pressure diminishes as the distance from the stud increases and is at its lowest level at the outer edge of the available contact area. In effect, the present system does not

take full advantage of the largest diameter contact point. It can be seen that the larger the contact area and the farther that contact point is from the axle of bending, the more stable the joint will be under a wider range of clamp forces.

The reason that the contact pressure is not evenly distributed at all points of the available area stems from the fact that the wheel section is not perfectly rigid. It is also suspected that aluminum wheels will slip with less nut torque loss than a steel wheel. In other words, an aluminum wheel might slip at a given clamp load while a steel will would not under the same clamp conditions. This is due to the lower friction coefficient of aluminum against cast iron. If this is indeed a factor, it helps explain why aluminum wheels seem to be more sensitive to wheel nut torque loss than their steel counterpart.

Possible remedies

1. Further investigation of the clamping problem has uncovered some alternative designs used by others for aluminum wheels. Some OEM's in the automotive industry specify a mounting face similar to the steel wheel where a Belleville washer effect is created by machining the face to form an inner and outer ring. The inner ring is machined on a lower plane than the outer ring, thus forming a large spring washer as the wheel section deflects under the clamp load. Counterbores around the studs form localized spring washers. These areas deflect individually under the clamp loads imposed by each nut and add to the resilience of the wheel/hub interface.

2. A change to 9/16"-18 studs will improve the situation by effectively lowering the stress level in the studs to provide a greater margin between operating stress and yield stress. wheel slippage still occurs

3. Changing the axle specification to utilize the 8 bolt on 6.5" bolt circle hub will also improve the design margin. torque loss & wheel slippage still occurs

4. Redesigning the system to be hub-centric or hub piloted should effectively reduce the bending stress in the studs and also reduce the tendency to loosen.

While these design alternatives may improve the current situation, I do not believe they will result in a system where there is no torque loss and the user can safely ignore the need to check and retighten the wheels.

William L. Dunlap
Director of Engineering
Dexter Axle Company

FLEETWOOD

MEMORANDUM

MH/PD 03-026

Date: January 7, 2003

To: Distribution

From: Larry Budica

Subject: **Aluminum Wheel Torque Study**

Ref: Mileage accumulation summary, copy attached

A test was conducted to determine if any aluminum wheel torque loss would be experienced on Fifth wheel trailers with extended mileage. Refer to summary sheet attached for details.

At specified intervals a torque wrench, set to 110 lb-ft, was used as a check/reference.

Results

No loss of torque was experienced on any of the wheels equipped (both Tredit and Imports).

If you have any questions / concerns, please advise.

Larry
/dh

Distribution:
Bob Thompson
Bob Wozniak
Jim Bertoch
Gary Beatty
Dan Ryan
Randy Most

Summary Sheet

Mileage Accumulation / Torque Check

Mileage	Accum.	Torque Check (@ 110 lb-ft)
40,024	0	
40,034	10	Right front (Imports) wheel, 2 lugs, slight movement
40,052	28	OK
40,083	59	OK (trailer disconnected)
40,095	59	- (trailer reconnected)
40,153	117	OK
40,192	156	OK
40,315	279	OK
40,357	321	OK
40,469	433	OK
40,577	541	OK
40,803	767	OK (trailer disconnected)
41,240	767	- (trailer reconnected)
41,691	1218	OK
41,936	1463	OK

Total mileage accumulated 1463 miles

Test Unit / Set-up

Towing vehicle – 1998 Dodge Ram pick-up

Towed vehicle – 2002 Pride 365L Fifth Wheel trailer

Left side wheel equipped – Tredit, aluminum

Right side wheel equipped – Imports, aluminum

Torque specification – 110 – 120 lb-ft torque range

Test Route (15 freeway)

Starting point – Riverside, CA

Intermediate – Ogden, UT

Ending point – Riverside, CA

Larry Budica
1/7/03

Sent January 29, 2002

Bertoch, Jim

From: Bertoch, Jim
To: Budica, Larry
Subject: Steel wheel with aluminum lugs (02-055)

To: Larry Budica
From: Jim Bertoch
Subject: Import and Tredit lug nuts on steel wheels

Test: The lug nuts were tightened to 110 lb-ft. Tredits on the road side, Imports on the door side.

Results:

Trip	Total	Notes
44	44	Not measurable
44	88	Not measurable
22	110	Not measurable
44	154	Some torque loss - estimated 10 degrees lug turn to return to 110 lb-ft
38	192	No torque loss

At 154 total miles the lugs needed an estimated 10 degrees turn to return to 110 lb-ft. On previous checks, torque los was not measurable, although some minor torque loss occurred on some of the lugs. At 192 miles no torque loss wa recorded.

Recommendations:

Lug nuts for use with steel wheels should be provided with the spare tire.

Bertoch, Jim

From: Dunlap, Bill [BDunlap@dexteraxle.com]
Sent: Wednesday, April 23, 2003 6:14 AM
To: Bertoch, Jim
Subject: RE: Wheels

Yes, coatings on the wheel/hub interface are a contributing factor to wheel loosening. This would apply to steel wheels as well, although to a lesser degree. Steel wheels are more forgiving because of the spring washer effect built into the center section. As the softer materials (coatings) and the small disparities such as machining finish roughness and subtle mis-matches of the cone seats are extruded or compressed, the deflection of the wheel center is able to compensate for part of this loss in thickness.

With the relatively solid cross section of the aluminum wheels, the only mechanism that can make up for the loss of the extruded material is the minute amount of stretch in the wheel studs. For this reason, the re-tightening process during the period when the wheel is being "seated in" is extremely critical.

Additionally, the thickner aluminum wheel imposes a greater bending moment on the wheel studs because the contact point of the nut seat is farther out from the hub face. If the torque level drops to a point where the clamp force is no longer capable of preventing slippage, the shifting of the wheel causes the studs to be deflected perpendicular to their axes. The stresses in the studs, under these deflecting conditions is sufficient to cause fatigue failure.

I would be able to share our design critieria with Greenball, but we would need them to sign a confidentiality agreement with first. Our recommended contact diameter is published in a product bulletin. Please see attachment.
<<pb263.PDF>>

Bill Dunlap
Director of Engineering
Dexter Axle Company

> -----Original Message-----
> From: Bertoch, Jim [SMTP:Jim.Bertoch@fleetwood.com]
> Sent: Tuesday, April 22, 2003 4:56 PM
> To: Dunlap, Bill
> Subject: Wheels
>
> Bill,
>
> I was hoping to get a little more advice on the torque loss issue with aluminum wheels. We have issued the re-torque information and proper torque requirements to our customers, dealers and plants. We are pursuing other possible contributory causes to torque loss and are working with our two wheel suppliers (Tredit and Greenball) to resolve issues. In dealing with the wheel manufacturers, several 'theories' have been presented. I was hoping to get your opinion of some of the following 'theories.'
>
> 1) Cast aluminum wheels are coated during the manufacturing process. If the coating is applied on the back face of the wheel, as it wears

away, could the wheel experience torque loss?
> 2) Could paint on the hub contribute in the same way?
>
> Also, Greenball would like to see the hub design and dimensions. Is there a way I could make it available to them?
>
> Thanks
> Jim Bertoch
>
>

Bertoch, Jim

From: Tim Ball [tball@treditire.com]
Sent: Monday, April 28, 2003 7:49 AM
To: Bertoch, Jim
Cc: Gagner, Rod
Subject: Re: Wheel coatings

Difficult question to answer. I'll do my best. All of the aluminum wheels we sell do have a clear coat finish. There are many different clear coat finishes available to manufacturers. All of our products have a baked powder of either polyester or acrylic. There are specifications as to the min./max. thickness of this coating. The typical application is to coat only the front of the wheel. However, the nature of electrostatic powder will result in some "overspray" on the back side of the wheel. this typically only covers the "rim" and not the machined back surface where the wheel meets the hub. To my knowledge, we have never had any issue with a wheel coming off that was in any attributed to clear coat on the back side. This does not however, eliminate that as a potential problem. The only way that I could imagine to determine if that was a problem would be through testing at either Smithers or Goal. I could look at a wheel but I am afraid that I could only give an opinion and not a conclusion. Theoretically, any substance between the wheel and hub face that is malleable could cause torque loss. I am not saying that that is the case with this wheel and only testing could prove if it is a factor. I hope this helps even though it is not conclusive. I'm in the office all week and would be happy to talk to you further if you need my help.

Tim

----- Original Message -----
From: "Bertoch, Jim" <Jim.Bertoch@fleetwood.com>
To: "Tim Ball" <tball@treditire.com>
Sent: Monday, April 28, 2003 9:13 AM
Subject: Wheel coatings

Tim,

We are researching an issue in wheel coatings with our Continental Imports wheel. It appears that cast aluminum wheels are coated with a clear coat of some kind. Do you know anything about this issue? Is it possible that the clear coat could be on the back face of the wheel and contribute to the torque loss issue?

Thanks
Jim Bertoch
Fleetwood RV Engineering

May 30, 2003

Coating Thickness:

Continental Imports White Steel Wheel

2 to 6 mils

Chrome Steel Wheel

3.5 to 6 mils

Steel Wheel With Powder Finish

5 to 6 mils

Pressure Measurement

Continental Imports Aluminum Wheel

7000 psi over a 1-1/8" x 3/4" square directly around each lug.

Old Style Tredit Wheel

7000 psi maximum 1/4" inside the lug pattern.
Pressure tapers off to 0 psi 1/4" outside lug.

New Style Tredit Wheel

15,000 psi next to lug.
Pressure tapers to zero outside lug circle.
Pressure over 3/4" x 2" area starting center of lug and going to outside of wheel.

White Steel Wheel

Two pressure rings 1/8" wide, 3/8" inside and outside lug circle.
Maximum pressure 18,000 psi near lug on outside ring.
Minimum pressure 2000 psi between lugs.

Chrome Steel Wheel

One pressure ring 1/8" wide, 1/2" outside lug circle.
Maximum pressure 18,000 psi near lug.
Minimum pressure 7000 psi between lugs.

Continental Import

Pressure = 2500 psi
Area = 3/4" x 1 3/8 - π(5/16)² = 1.57 in²

F = 11,000 lbs / Lug

Old Tredit

Pressure = Average of 4250 lbs
Area = 1" x 1 3/8" - π(4/16)² = 1.07 in²

F = 4540 lbs / Lug

New Tredit

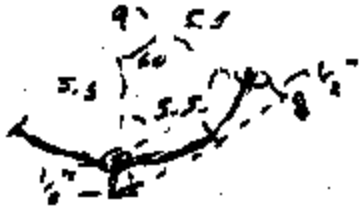
Pressure = 15,000 to 1400 = 8200 lbs
Area = 1/2" x 1 3/4" - π(5/16)²/2 = .722 in²

F = 5920 lbs / Lug

White Steel

Pressure = 12,000 psi
Area = 2(1/2" x 5 1/2) = 1.375 in²

F = 24,750 lbs

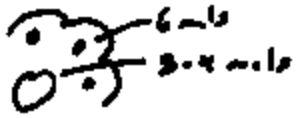


Chrome Steel

Pressure = 18,000 psi
Area = 2(1/8" x 6) = .75

F = 13,500 lbs

1) 656 hub 2 mils
2) 656 hub 2 mils
3) 5 lug Budlow 2 mils
4) 545 hub 2-3 mils
5) 545 hub 2-3 mils
6) 8 lug hub 3-6 mils



7) 545 hub 5 mils
9) 545 3-6 mils
9) 545 5-6 mils
10) 545 3-5 mils

wheel - white
2-6 mils

Chrome
~ 3.5 mils - 6 mil.

Powder 5-6 mils

Continental import

about ~ 7000 psi over 1½" x ¾" area around lug

Old Treadit

7000 psi max inside lug dw ½"
tapering to ~ 1200 psi 1" x 1½" area

New Treadit

15,400 + psi min next to lug
tapering to under 1000 toward outside of wheel
¾" x 2" right around lug

white steel ½" ring max near lug ~18,000 psi ¾" in & out of lug pattern
~3000 psi between lugs

chrome steel ½" ring ~ 18,000 psi outside lug pattern ½"
~ 7000 psi between lugs

7100 – 18,500

2) 76F 47%
old Tredit
110 16-56
7100 – 18,500 ft:

S31 [illegible]

3) 77F 45%
New Tredit
110 13-46
7100 – 18,500

S31 · [illegible]

4) 74 47

white steel

110 to 96

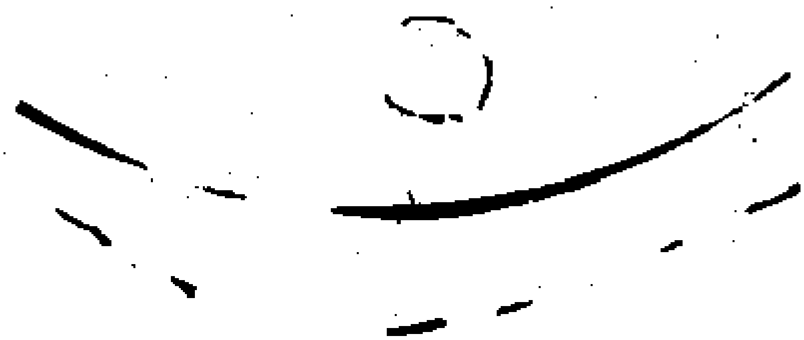
7100 - 18,500 psi

5) 74 F 47%

Chrome steel

95 to 86

7100 - 18,500 psi

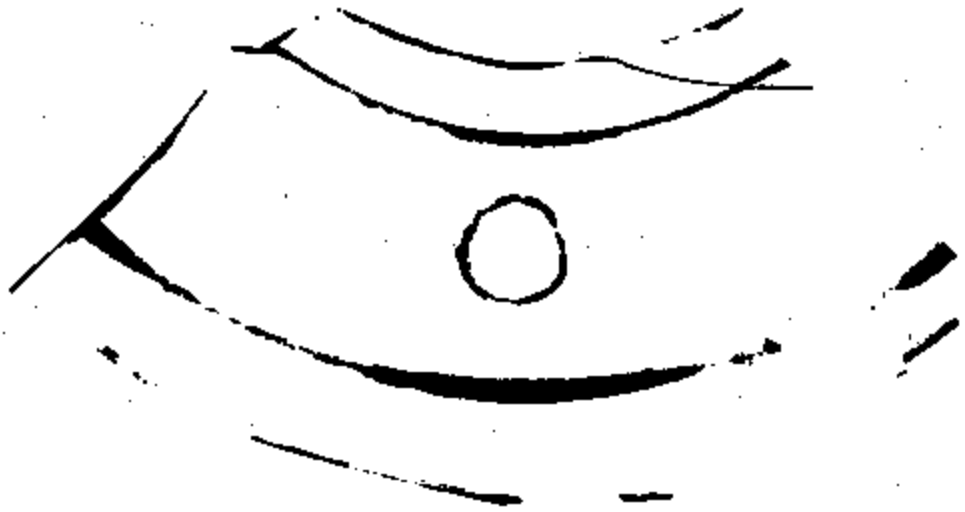


4) 74 47

white steel

110 is ft

1400 - 7100 psi



5) 74 F 47 Rc

Chrome Steel

95 is ft

1400 - 7100 psi

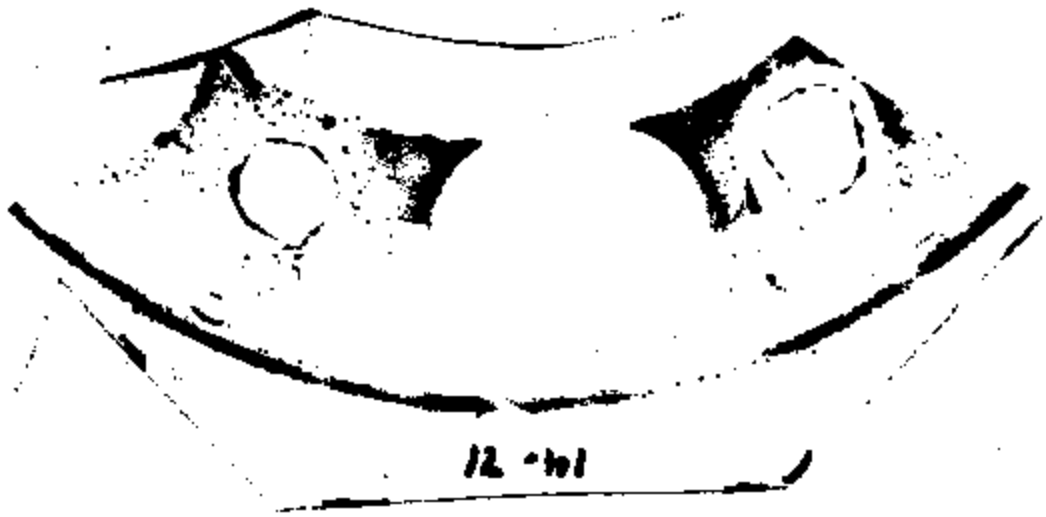
1400 - 7100

2) 76 F 47%

OLD Tread

110 H-56

~~Std~~ 1400 - 7100 psi



3) 77 F 45%

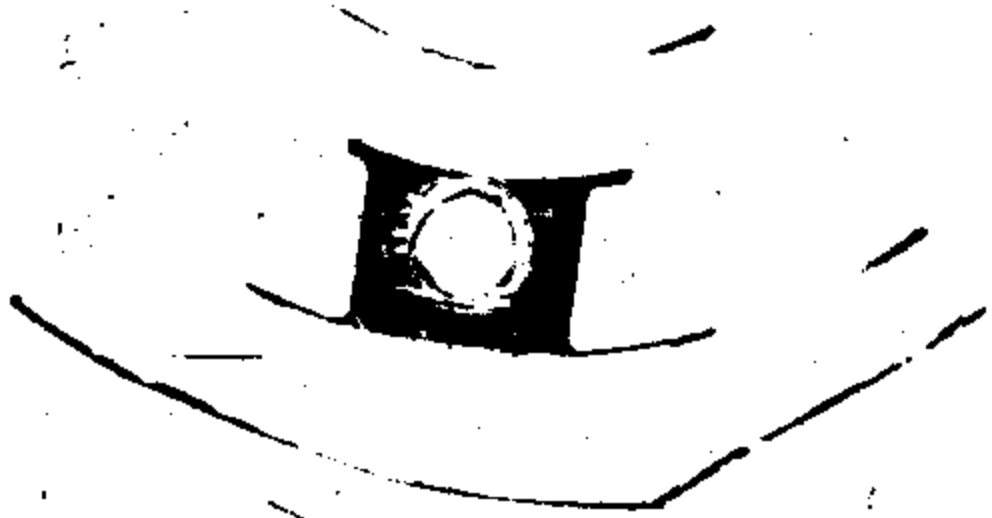
New Tread

110 H-56

~~11000-18,500~~

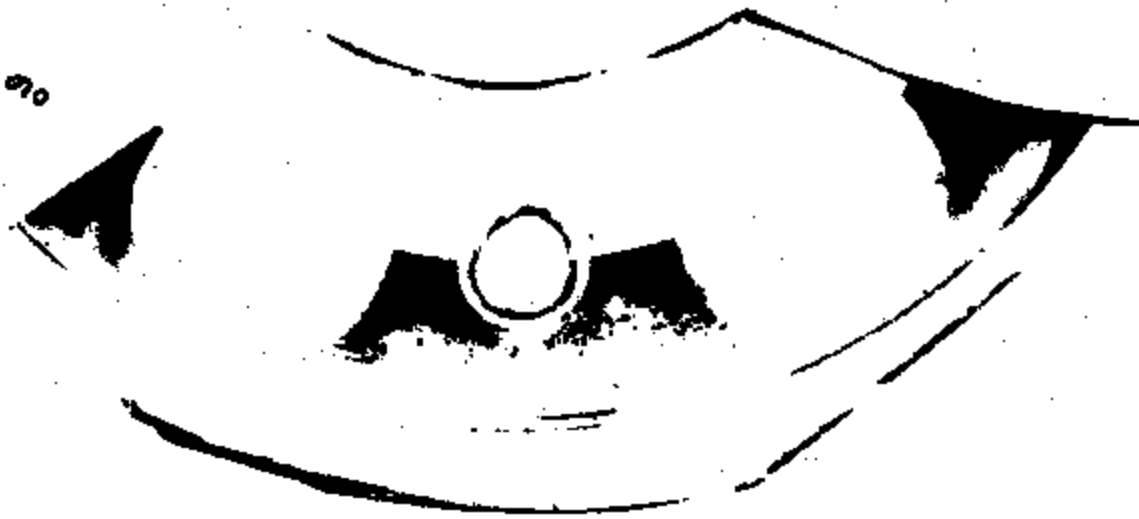
1400 - 7100 psi

1) 74F 46%
Conformal wheel
110 lb-ft
1400 -7100 psi



2) 74F 46%
Old Tredit
110 lb-ft
1400-7100 psi

3) 75F 95%
New Tredit
110 lb-ft
1400- 7100 psi



7/16" x 1 5/8"

1) 74F 46%
Continental
110 18-56
7100 - 18,500

2) 76F 47%
Old Tread
110 18-56
7100 - 18,500

3) 77F 45%
New Tread
110 18-56
7100 - 18,500

Received June 28, 2003

YUAN FENG INDUSTRILA CO., LTD
NO 3, Chang-Pin 1st Rd, Hsien-His Hsiang, Changhua Hsien, Taiwan, R.O.C.
Tel: 886-4-7582899 Fax: 886-4-7588511

FACSIMILE

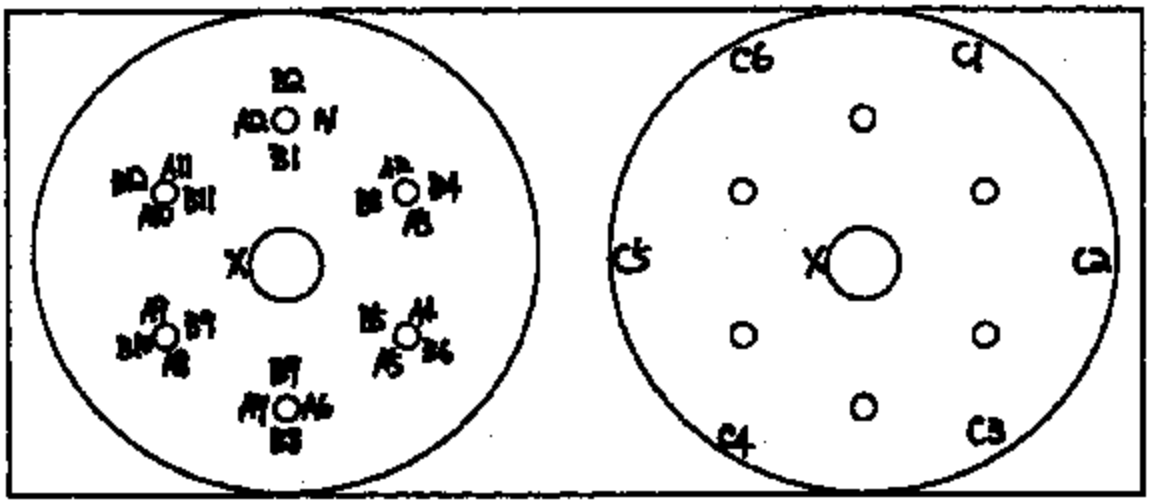
To: Fleetwood Enterprises Inc.
Attn: Mr. Lawrence Chao
CC: Greenball – Mr. Howard Chang

Topic: Dexter Hub work with 54850 & 54860 aluminum wheels

Dear Lawrence:

After we received 2 hub samples, 5 holes and 6 holes, we think the poor paint job on hub surface cause the wheel loose problem. The reasons explain as following:

- **Dexter Hub Surface Test:**
  We pick up 6 holes Dexter hub and use our 3D X-ray machine to check the hub surface (with paint). This test can help to identify how flat (or smooth) on the hub. We assume the point "X" (near the pilot hole) is ± 0.0000, and check other point on the hub surface.



Note:
A* = 10mm of right side and left side on each bolt hole.
B* = 10mm of inside and outside of each bolt hole.

C* = Edge of hub

The test data as following:

	1	2	3	4	5	6	7	8	9	10	11	12
A*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						

Based on above data, we have following resolute:

Test Point	Max. Data	Min. Data	Difference
A	0.0284mm	-0.0194mm	0.0478mm
B	0.0525mm	-0.0355mm	0.0880mm
C	0.1416mm	0.0309mm	0.17mm (Max.)

Based on above data, we sure the hub surface not flat because of poor paint job.

- **Attachment Test:**

The 2nd test we call attachment test. This test is helping to identity any designing problem between hub and wheel (see Attach-1).

We make two 3D drawing, one for hub and one for wheel, and put these 2 drawing together to see if any bolt hole can not touch with hub.

Based on the test report, it shows each bolt hole has no problem to work with Dexter hub (black area is attaching area between bolt hole and hub).

- **Conclusion:**

Based on the tests, no designing problem can be found on hub and wheel. We think the poor painting job on the hub surface cause the problem of wheel loose.

- **Suggestion:**

1. For the most of passenger factories, such as Nissan, Toyota, Ford, they are all asking no paint on the mount-face (for both hub and wheel). We are not sure it is also working with RV / Trailer industry.
2. Please check with Dexter if they can offer the hub without any paint. Please check your Motor Home line if Dexter also sale the painted hub to you.
3. Please try to use current hub for new road test as following:

3a:

Try to use paint thinner, or any way to take out the paint on the mount face.

3b:

Mount the wheels with hub, and run 50~100 miles. Record any lug nut loose.

3c:

If any lug nut loose found, please re-torque the wheel, and run 150~200 more miles. Record any lug nut loose.

If no lug nut loose on 1st 50~100 miles test (3b), we can sure the problem is from hub paint.

If no lug nut loose found after 150~200 miles test (3c), the problem may comes from hub paint and load capacity of chassis.

If lug nut still loose after 150~200 miles test (3c), we need to restudy any designing problem between hub and wheel.

Please advise if you still have any question.

Thanks.

Tredit Tire and Wheel Co., Inc.

Memo

To: Distribution

From: Tim Bell

CC: Terry O'Rourke

Date: ~~09/26/2003~~ 9/19/02

Re: Aluminum wheel torque

As most of you know we have been under some scrutiny with regard to our Enkei aluminum trailer wheels and their ability to retain torque over both short and long distances. We have had two customer complaints concerning this. Both customers have reported wheels falling off recent production trailers. The customers have claimed fifty wheels in two separate sizes. A large recreational trailer manufacturer reported failures using the 16X7, 6 on 5.5 Enkei wheel. A large cargo trailer manufacturer reported failures using 16X6 6 on 5.5 Enkei wheels. These problems have occurred over the last ninety days. Both customers use other size and bolt pattern Enkei wheels and have not reported any problems. Obviously, these reports concerned us. Tredit sells this product to a vast number of customers in various sizes and bolt patterns. We have used this product for three years and have had excellent performance and customer approval. To have a problem would pose both risk of injury as well as loss of business. Obviously, the potential for injury is our highest concern.

During our initial look at these problems, we focused on customer procedures for mounting and torquing of this product. We found numerous errors, inconsistencies and misapplied torque. Our first goal was to educate our customers in proper procedures. This has been accomplished at one of the manufacturers and audited at most other manufacturers that have not had any problems. We also requested assistance form Dexter engineering with specific help from Bill Dunlap, their chief engineer. Bill has spent numerous hours and resources analyzing the problem. He has performed virtually every test that Dexter feels would relate to torque retention. Fatigue testing, including rotary and radial, dimensional measurements and actual sled testing have been performed on all suspect wheels. Dexter's conclusions are available in a report (presented to our RV customer) and are available at your request. To paraphrase Dexter's' results may be inappropriate but necessary. Their conclusions are that although the products in question are significantly more prone to initial torque loss than comparable steel wheels they will retain torque if properly mounted and retorqued per Dexter's guidelines. Dexter confirmed this via all of their testing. They did offer recommendations for lessening the risk of early torque retention loss. The two specific recommendations are to manufacture the wheels hub centric and with a torque ring on the backside. Due to the varying sizes of hubs on both Dexter and other axle manufacturers, hub centricity is not feasible. The torque ring is an easy and simple modification done during the machining of aluminum wheels and has been implemented on all future production of Enkei product. Allow me to clearly state again that Dexter's conclusion was and is that if properly installed and torqued according to their recommendations the wheel, stud, nut and hub do perform as required and

that no torque loss occurs. They did clearly state that aluminum wheels are more susceptible to initial torque loss than steel and that that is an inherent quality of the aluminum product.

While Tredit fully acknowledges Dexter's, results and concurs with them we felt it mandatory to do our own testing in a real world setting. We secured two cargo trailers form a customer that is not experiencing any problems and utilized these trailers to perform torque retention on our current, past, future and competitors aluminum wheels. This manufacturer uses Dexter axles in an identical configuration to the manufacturer that has experienced problems. All tests were performed in the best manner that our admittedly non-engineering background could provide. Assemblies were all hand mounted to the trailer. Lug nuts were finger tightened and torque was applied using a metered torque wrench. The trailers were hauled using a vehicle equipped with electric brakes. Torque was measured at ten miles, 35 miles, 70 miles and in 25 mile, increments thereafter until all torque on all studs had stabilized for at least two consecutive checks. The trailers were hauled over highway and rural roads. Stop and go traffic as well as winding rough roads were utilized. In total 17 wheels were tested and over seven hundred miles were driven. Three Tredit employees including me documented all torque readings. The actual test data is available upon your request but is quite lengthy and is consequently not provided within this memo. Our conclusions are provided and they are as follows:

1. Current production Enkei aluminum wheels, 1508 6 on 5.5 bolt circle. All wheels maintained torque after 85 miles.

2. American Racing Equipment aluminum wheels, 1507, 6 on 5.5 bolt circle. All wheels maintained torque after 85 miles.

3. A competitors 15X8 aluminum wheel in a similar style to Enkeis albeit using steel inserts, 1508, 6 on 5.5 bolt circle. The wheel maintained torque after 85 miles.

4. Enkei aluminum wheels with a "torque" ring machined into the mounting pad, 1508, 6 on 5.5 bolt circle. All wheels maintained torque after 85 miles.

The "torque" ring wheels did show moderate yet significant improvement over the other products. It should be noted that these wheels also showed significantly less torque loss after 10 miles. All other wheels showed torque loss in very significant numbers after the first ten miles. With initial torque of 120 foot pounds we experienced as much as sixty- percent reduction on individual lugs. Where significant loss was encountered we remounted and retorqued to determine if a particular wheel would show comparable loss in an alternate axle position. In general, we saw more significant torque loss on the left/driver side of the trailer. This would theoretically be supported by the impact of centrifugal force on the right-handed threads of the stud/lug combination. Centrifugal force would work against the direction of the stud threads and could theoretically cause torque loss. We are inquiring as to the problems encountered and if knowledge is available as to axle location. In any case, as stated, all wheels, studs and lugs proved their ability to maintain torque after 85 miles provided they were installed correctly, torqued correctly and checked and retorqued after ten miles and again after 25 mile intervals.

Our company conclusions and recommendations are as follows:

1. Future Enkei product will be machined with a torque ring.

2. Any future Tredit aluminum wheels will have a torque ring.

3. Tredit will write and distribute an aluminum wheel torque and installation bulletin.

4. Tredit will request from all customers using our aluminum product that we are allowed to train their personnel in proper mounting and torquing procedures.

5. Tredit will continue to work with Dexter in hopes of, at some time, providing a hub centric wheel.

6. All future Tredit customers that request an aluminum wheel will be educated and trained on proper procedure of mounting and torquing. This will be done by our staff and audited in a manner not yet determined.

In conclusion, I want to make this perfectly clear. The Enkei wheels that we are selling and have sold are safe dependable products that will hold torque given proper procedures. This is very clear given the massive exposure we have with this product. As always, we will strive to make our products better thus our commitment to change the product, educate, and monitor our customer's installation procedures.

I realize that for many of us this has been a long and arduous task. Concerns over safety are of paramount interest to this company. I will personally sleep well and am thankful to all that participated in this study.

Williams, Brad

From: Tim Ball [tball@treditire.com]
Sent: Tuesday, March 25, 2003 1:31 PM
To: Williams, Brad
Subject: Re: As discussed on the phone

The original date was 9/19/02. Yes, all action items have been implemented.
Please call if I or any of our associates can be of any help. I would appreciate any feedback you can provide on your findings.

Thanks,
Tim
----- Original Message -----
From: "Williams, Brad" <brad.williams@fleetwood.com>
To: "Tim Ball" <tball@treditire.com>
Sent: Tuesday, March 25, 2003 4:13 PM
Subject: RE: As discussed on the phone

Tim:

Thanks for the letter and your feedback. What is the date that this letter
was originally written? You have already implemented your action items, right?

Brad

-----Original Message-----
From: Tim Ball [mailto:tball@treditire.com]
Sent: Tuesday, March 25, 2003 11:32 AM
To: Williams, Brad
Subject: As discussed on the phone

I trust that this will help. Please feel free to call with any questions or
comments.

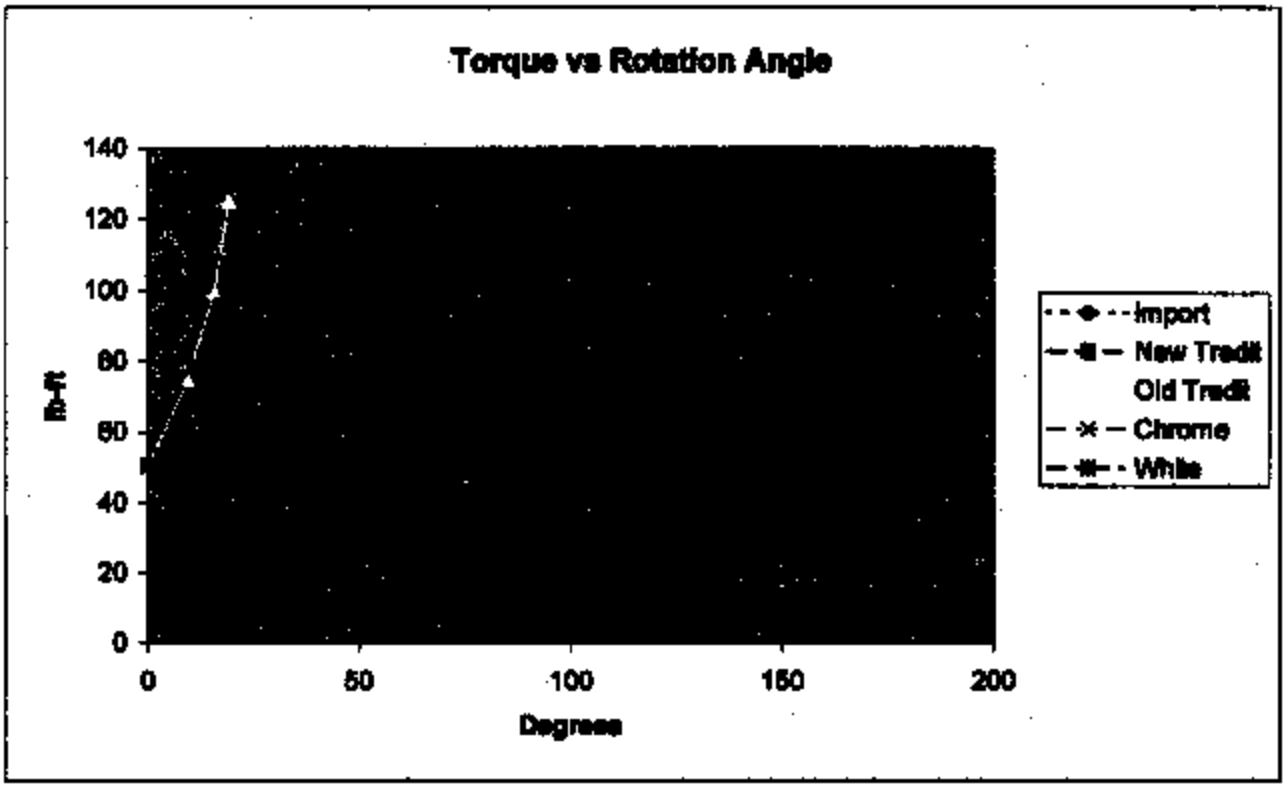
Tim

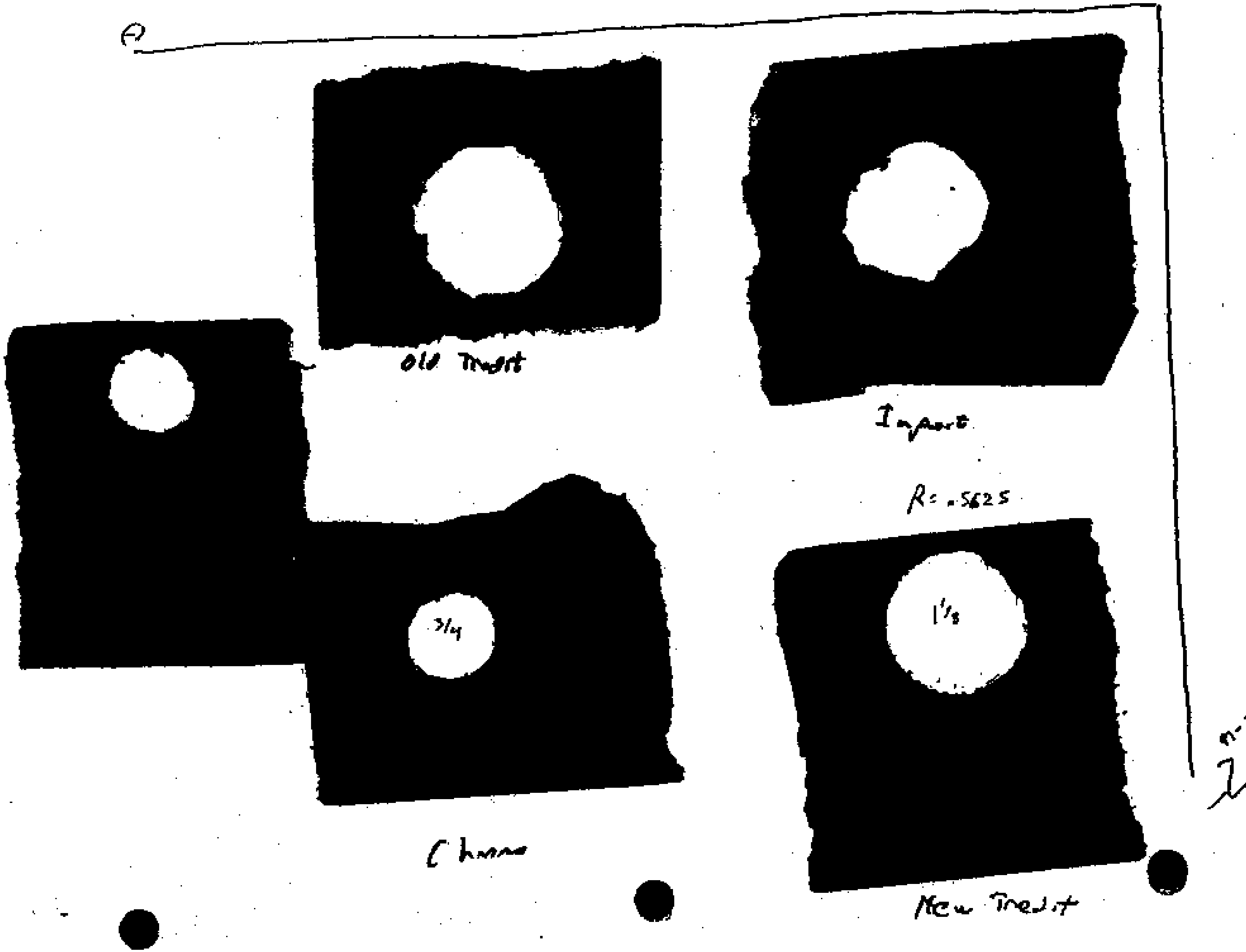
October 31, 2003

lb-ft	Import	New Tredit	Old Tredit	Chrome	White
50	0	0	0	0	0
75	0.09375	0.09375	0.09375	0.5	0.25
100	0.15625	0.1875	0.15625	1	0.6875
125	0.28125	0.28125	0.1875	1.5	1.09375

lb-ft	Import	New Tredit	Old Tredit	Chrome	White
50	0	0	0	0	0
75	9.549274	9.549274	9.549274	50.92946	25.46473
100	15.91546	19.09855	15.91546	101.8589	70.02801
125	28.64782	28.64782	19.09855	152.7884	111.4082

Chart 2





Old Insert
Import
R=.5625
3/4
1 1/8
New Insert

Title or identifier:	Torque Test Results
Start date:	N/A
End date:	15-Apr-03
Summary:	Predicted torque loss from paint loss.
Responsible party:	Fleetwood Engineering
Summary of findings:	Aluminum wheels experienced more torque loss due to loss of paint.

Title or identifier:	Wheel Chronology
Start date:	N/A
End date:	16-Dec-02
Summary:	Summary of wheel investigation up to December 16, 2002
Responsible party:	Fleetwood Engineering
Summary of findings:	N/A

Title or identifier:	Wheel Summary
Start date:	N/A
End date:	25-Jun-03
Summary:	Summary of findings up to June 26, 2003
Responsible party:	Fleetwood Engineering
Summary of findings:	Steel wheels are not an issue Aluminum wheel supplier supplied incorrect initial torque Tolerance of parts, paint thickness and material can affect torque. Steel wheels are more forgiving than aluminum wheels.

Bertoch, Jim

From: Bertoch, Jim
Sent: Tuesday, April 15, 2003 11:49 AM
To: Budlick, Larry; Wozniak, Bob
Subject: Torque test results

Torque test results:

The paint was measured at 0.0015 inches thick, which works out to about 10 degrees of movement to the lug nut.

All of the lugs were torqued. The position of the lug to be measured was marked. One lug was then backed off 10 degrees. The torque at the 10 degree mark was measured and recorded. The nut was returned to the original mark. The torque to return the nut to the original mark was recorded.

New Continental Import Wheel
The Continental Import wheel retained 50 ft-lbs. at 10 degrees back and had to go 4 degrees beyond the original mark to get back to 110 ft-lbs.

Test	Resultant Torque
1. The lug nut was torqued to 110 ft-lbs.	
2. The lug was backed off 10 degrees.	
3. The torque to 10 degrees before 110 ft-lbs. mark was measured.	50 ft-lbs.
4. Torque required to return the nut to the original 110 ft-lbs. mark.	90 ft-lbs.
5. Another 4 degrees to get back to 110 ft-lbs.	

Steel Wheel
The steel wheel retained the most torque, at 82.5 ft-lbs. when backed off 10 degrees. It returned to 97.5 ft-lbs. at the original 110 ft-lbs. mark but went another 8 degrees to get back up to 110 ft-lbs.

Test	Resultant Torque
1. The lug nut was torqued to 110 ft-lbs.	
2. The lug was backed of 10 degrees.	
3. The torque to 10 degrees before 110 ft-lbs. mark was measured.	82.5 ft-lbs.
4. Torque required to return the nut to the original 110 ft-lbs. mark.	97.5 ft-lbs.
5. Another 8 degrees to get back to 110 ft-lbs.	

Used Tredit – Old Version (several hundred miles on wheel)
The old style Tredit wheel had several hundred miles on it. It was at 66.25 ft-lbs. when backed off 10 degrees, but went over 110 ft-lbs. when returned to the original mark. It was the only wheel to perform in this manner.

Test	Resultant Torque
1. The lug nut was torqued to 110 ft-lbs.	
2. The lug was backed off 10 degrees.	
3. The torque to 10 degrees before 110 ft-lbs. mark was measured.	66.25 ft-lbs.
4. Torque required to return the nut to the original 110 ft-lbs. mark.	115 ft-lbs.

New Tredit – New Version with Machined Back Face
The new Tredit design was at 67.5 ft-lbs. when backed off 10 degrees. At the original 110 ft-lbs. mark it returned to 105 ft-lbs.

Test	Resultant Torque
1. The lug nut was torqued to 110 ft-lbs.	
2. The lug was backed off 10 degrees.	
3. The torque to 10 degrees before 110 ft-lbs. mark was measured.	67.5 ft-lbs.
4. Torque required to return the nut to the original 110 ft-lbs. mark.	105 ft-lbs.

Tracking:	Recipient	Read
	Budos, Larry	Read: 04/15/03 11:59 AM
	Wozniak, Bob	Read: 04/16/03 8:57 AM

Wheel Summary
June 25, 2003

Investigation Details:

Steel Wheels:

- Steel Wheel Historical Evidence:
  - Steel wheels have been used by Fleetwood trailers on the majority of units for several years.
  - Steel wheels have operated satisfactorily on Fleetwood trailers.
  - Historical evidence suggests that alternative steel wheels will perform acceptably.

Aluminum Wheels:

- Possible contributing factors leading to aluminum wheel torque loss:
  - Improper initial torque.
    - In October 2002, torque Specifications for imported aluminum wheels were verified through imports to be 79.65 lb-ft.
    - New information from imports reveals original torque data was incorrect. New data as shown below:

15" Wheels	100 lb-ft (90 lb-ft to 120 lb-ft)
16" Wheels	100 lb-ft (90 lb-ft to 120 lb-ft)

Stud/Wheel Interaction:

- Clamping load and wheel ductility:
  - As the nut is tightened, the stud begins to stretch like a spring. Like a spring the stud wants to contract back to its original position.
  - The more the stretch of the stud, the greater the force with which it wants to contract.
  - From the stress/strain curve (chart 1), we can see how this works. The chart shows the stress on the 'y' axis and the strain on the 'x' axis. The stress increases as the strain increases. Stress is a force over an area, and the cross sectional area of the stud effectively does not change, so the result is an increase in 'spring' force with an increase in torque.
  - The greater the torque, the greater the stretch of the stud and the greater the clamping force.
  - The wheel also has a spring effect, which is believed to impact the clamping force.
  - On steel wheels, the section of wheel around the stud does not touch the hub. This causes the steel wheel to deflect around the stud as the nut is tightened.
  - The steel wheel acts as a spring, in addition to the spring effect of the stud.
  - When using aluminum wheels the spring effect of the wheel is lost.
  - The aluminum wheel is much thicker, and the wheel surface is in direct contact with the hub around the stud.
  - In the case of aluminum, all of the spring effect is in the stud. The results can be seen in chart 2. Chart 2 is a degree of tighten versus torque.

- On aluminum wheels, torque increases rapidly with tightening angle, increasing 40 to 50 lb-ft with every 10 degrees of rotation. With steel, the torque increases 5 to 10 lb-ft with every 10 degrees of rotation.
- The nut moves up the stud a lot farther on steel wheels before the same clamping load is reached because of the added deflection of the wheel.

- Wheel ductility aluminum vs. steel:
  - Ultimate elongation ordinary structural steel = 30 – 40%
  - Ultimate elongation die cast aluminum = 2%
  - Ultimate elongation pure rolled aluminum = 5 – 35%

Dimensional tolerances:

- Hub tolerances vs. wheel tolerances.
  - Machined parts are not all dimensionally identical. Because they vary in accuracy, machines have built in tolerances.
  - Tolerances for machines generally have an upper and a lower limit.
  - Hub dimensions, stud locations and the bolt holes in wheels are built to a specified tolerance.
  - A wheel bolt hole may be at one extreme of the tolerance, and the stud location at the other.
  - The cone on the nut doesn't match the cone on the nut seat precisely. As the trailer moves, the surfaces begin to wear, causing the clamping force to slightly relax.
  - The more ductile steel wheels are forgiving. Chart 2 shows the degrees of tightening to reach 50, 75, 100 and 125 lb-ft of torque.
  - The aluminum wheels went from 50 to 120 lb-ft in less than 40 degrees.
  - The steel wheels, due to ductility, took over 100 degrees to go from 50 to 120 lb-ft.
  - This forgiveness compensates for the tolerance differences as the steel deforms to the proper shape upon initial tightening of the lug.

Coatings:

- Hub and wheel coatings:
  - It was discovered that 2 to 3 mils of paint is applied to each Dexter hub.
  - Observations of one incident revealed that the paint was worn away by the action of the surfaces while in motion.
  - About 2 mils will translate into 10 degrees of turn on a lug nut.
  - Testing revealed that 10 degrees can result in 40 to 50 lb-ft of loss in torque for aluminum wheels.
  - For steel wheels, it translates into about 5 to 10 lb-ft of torque loss. This is again due to the ductile nature of the steel wheels.
  - Many wheels have coatings. Wheel coatings can wear away just like the hub paint. The effect is the same as hub coatings.

Clamping Load:

- Clamping load measurements:
  - Existing white, proposed chrome and proposed painted steel wheels were measured for clamping load.
  - Tredit and Continental Imports aluminum wheels were measured for clamping load.
  - Measurements of the pressure between the wheel and the hub show aluminum wheels have less 'spring' force from the stud and wheel.
  - The spring force can be determined by multiplying the contact pressure by the contact surface area. The 'spring' force for aluminum was found to be

5,000 to 11,000 lbs. The steel wheels were found to have 13,000 lbs to 20,000+ lbs of 'spring' force.

Automobiles versus Trailers:

- Trailers place higher loads on wheels than automobiles;
  - Higher weights.
  - Higher center of gravity.
  - Higher turning loads because of a lack of steerable wheels.

Chart 1

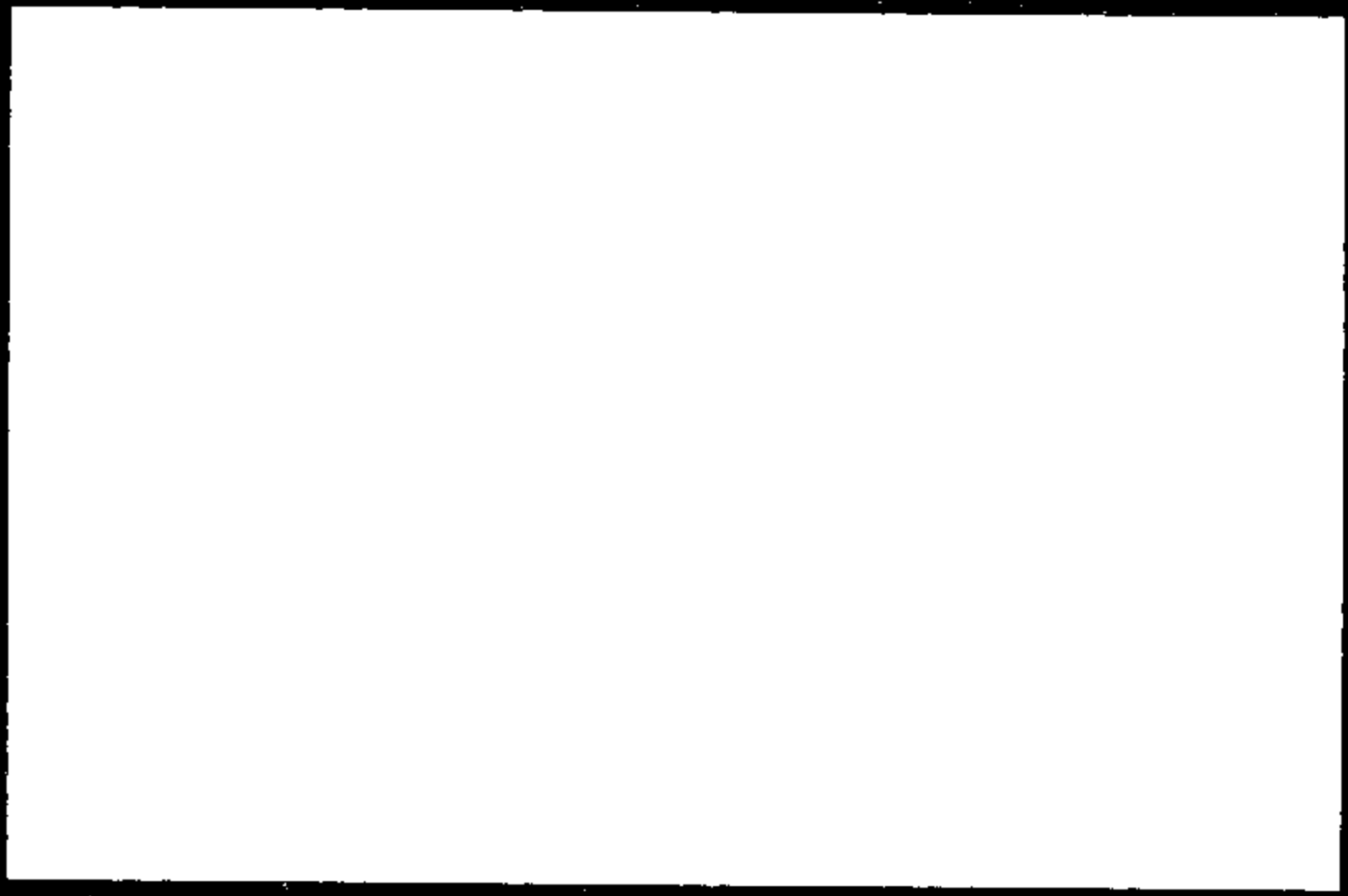
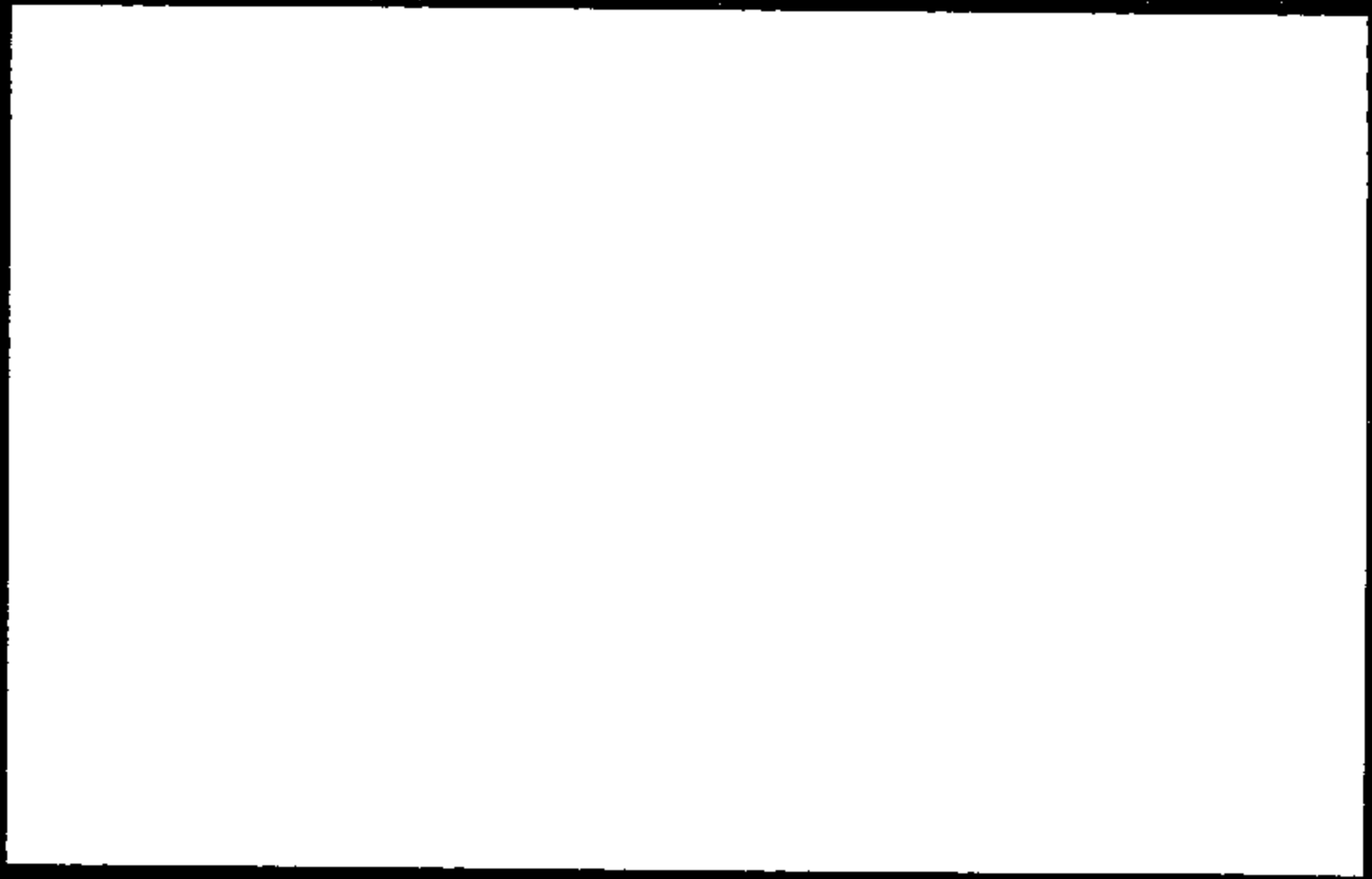


Chart 2



Memorandum jvb 02-065C

DATE: December 16, 2002

TO: Bob Wozniak

FROM: Jim Bertosh

Subject: Wheel Chronology [redacted]

Incidents:

Brand	Model	Serial #	Date Reported	Wheel	Plant
Triumph	366L	6589141	9/24/02	16x7x6H5 Import	65
Pride	366L	6589137	10/15/02	16x7x6H5 Import	65
Triumph	366L	4095671	11/15/02	16x7x6H5 Import	40
Wilderness	365FLTS	1590637	11/17/02	16x7x6H5 Import	Proto
Triumph	335Z	2305945	11/21/02	16x7x6H5 Import	23
Pride	366L	2305934	12/2/02	16x7x6H5 Import	23

Investigation:

- In October, torque Specifications for imported aluminum wheels are verified through imports to be 79.65 lb-ft.
- 2004 owners' manual updated to reflect torque information. Memo provided to plants reflecting proper torque specifications.
- November 17th incident involving shop unit. Tow-away driver complains of constantly having to re-torque wheels before wheel loss.
- Wheel, studs and lugs arrive from Pendleton for review end of November. Investigation of wheel, studs and nuts leads to understanding of possible torque loss.
- Information provided from Tredit and Dexter Axle confirms belief that torque loss is occurring due to improper torque and torque maintenance of wheels. Dexter and Tredit require checking/re-torque several times during an initial wheel break in period.
- December 2nd road test of shop unit verifies torque loss occurring. Wheel deforms away from nut leading to loss of contact pressure. Further road testing during week of December 9th yielded the same results. Road testing totaled 155 miles.
- New information from imports reveals original torque data was incorrect. New data as shown below:

  15" Wheels 100 lb-ft (90 lb-ft to 120 lb-ft)
  16" Wheels 100 lb-ft (90 lb-ft to 120 lb-ft)

- Further import requirement to re-torque at 10 miles, 35 miles and 60 miles during initial break in period.

- Tredit wheel torque requirements have not changed:

  15" Wheels 120 lb-ft (120 lb-ft to 125 lb-ft)
  16" Wheels 120 lb-ft (120 lb-ft to 125 lb-ft)

- Tredit recommended wheel torque check and re-torque schedule follow the Dexter recommendation at the first 10 miles, 25 miles and again at 50 miles.

- Possible contributing factors leading to torque loss:

  - Improper initial torque.
  - Improper lug vs. wheel contact angle.
  - Failure to periodically re-torque during break in period.

- Recommendations:

  - Plants, tow-away services, dealers and customers to be made aware of proper torque requirements.
  - Plants, tow-away services, dealers and customers informed of re-torque requirements during break in period.
  - Use the lug nuts specified/supplied by the wheel manufacturer for each wheel.
  - Ensure plant torque wrench accuracy.
  - Update owner's manual to reflect correct torque.

- Recommendations to be used for all aluminum wheel suppliers.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 28

PART 4 OF 4

BOOK 2 OF 2

. Describe the methods that Fleetwood used to deliver the subject vehicles to the respective selling dealer (i.e. are all subject vehicles shipped in a similar manner or are various shipping methods such as direct towing, rail, flat-bed trailer, etc. used?). Provide a copy of all analysis that Fleetwood has conducted to assess the effect of the delivery method on wheel separations that have occurred in the subject vehicles.

RESPONSE #28

All subject vehicles are delivered to their respective selling dealer using direct towing. Fleetwood is not aware of any studies, done to assess the effect of the delivery method used.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 29

PART 4 OF 4

BOOK 2 OF 2

NOTICES

29. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Fleetwood has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Fleetwood is planning to issue within the next 120 days.

RESPONSE #29

Please refer to attachment 29a.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 29A

PART 4 OF 4

BOOK 2 OF 2

FLEETWOOD

Memorandum

April 15, 2003

TO: General Managers – Towable Group Plants

FROM: Brad Williams

SUBJECT: Steel and Aluminum Wheel Lug Nut Torque & Nut Tightening Intervals - Transporter Responsibility/Compliance

---

Please ensure your plant meets the requirements regarding correct nut wheel selection, nut tightening staging and sequencing, nut torque, and nut-tightening intervals.

WHEEL MOUNTING TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.

WHEEL NUT SELECTION

Be sure to use only the fasteners matched to the cone angle of the wheel (usually 60 or 90 degrees). See applicable prints. Specific nuts match specific wheels.

NUT TIGHTENING, STAGING AND SEQUENCING

The procedure for attaching all steel and aluminum wheels is as follows:

1. Start all nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in specific sequence. (See bulletin)
3. The tightening of the fasteners should be done in stages. (See bulletin)
4. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram (see bulletin). This may change based on wheel manufacturer's recommendation.
5. Wheel nuts should be torqued before the first road use and after each wheel removal. Check and re-torque after the first 10, 25 and 50 miles or until torque has been established. Check periodically thereafter.

Memorandum jvb 02-055

DATE: October 31, 2002

TO: Distribution

FROM: Jim Bertosh

Subject: Aluminum Wheel Torque

Please be aware of the following wheel torque requirements.

Steel wheel torque requirements (if equipped):
13 inch wheel nut torque is 80-90 ft. lbs.
14 inch wheel nut torque is 80-90 ft. lbs.
15 inch wheel nut torque is 80-100 ft. lbs.
16 inch wheel nut torque is 80-100 ft. lbs.

Aluminum wheel from Imports:

15 inch wheel nut torque is 80-85 ft. lbs.
16 inch wheel nut torque is 80-85 ft. lbs.

Aluminum wheel from Tredit:

15 inch wheel nut torque is 120-125 ft. lbs.
16 inch wheel nut torque is 120-125 ft. lbs.

Distribution: Bob Wozniak, Larry Sudlow, Randy Most, Gary Beatty, Ron Robbins, Regional General Managers, Production Managers

TRANSPORTER ACKNOWLEDGEMENT OF RESPONSIBILITY

WHEEL NUT TORQUE AND NUT-TIGHTENING INTERVALS

It is extremely important to apply and maintain proper wheel mounting torque on trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

> *Note: Wheel nuts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard.*

All steel and aluminum wheels must be torqued at miles 10, 25 and 50 or until proper torque has been established. When a unit is new wheel nuts need time to seat against the wheel. Travel for the first time enroute to a dealership is critical. All transporters must stop safely and check all wheel nuts with an approved torque wrench set at the proper foot-pounds and understand the proper intervals and sequence of tightening.

See attached bulletin for torque specifications.

I have read and understand this requirement as a transporter for Fleetwood.

Signed _____ Date: 4-24-03

FLEETWOOD INFORMATION BULLETIN #SBT0113

The purpose of this bulletin is to inform all Fleetwood dealers about information pertaining to all travel trailer and firth wheels. If you are contacted by a retail customer regarding this matter, refer to the information listed.

IMPORTANT INFORMATION RELATED TO WHEEL LUG NUT TORQUE

This bulletin includes the travel trailer and fifth wheel Owner's Manual Supplement related to wheel lug nut torque, tightening sequence and tightening intervals. The supplement can be referenced on the back page of this bulletin.

Additionally the following information should be referenced during the Product Delivery Process prior to retail delivery.

If you have any questions concerning this bulletin, contact your regional Fleetwood Towable factory service center.

"It is impossible to know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Accordingly anyone who uses a service procedure or tool must first assure that neither personal safety nor vehicle safety will be jeopardized by the selected service methods."

This bulletin is supplied for technical information only and is not an authorization for repairs.

FLEETWOOD RV

Travel Trailer and Fifth Wheel Owner's Manual Supplement

Wheel Lug Nut Torque Information Steel and Aluminum Wheels

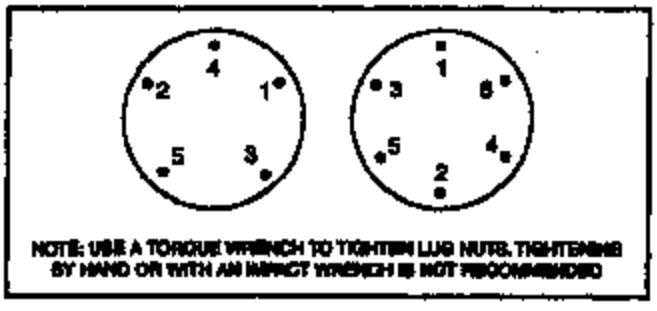
This Owner's Manual Supplement is to be used in conjunction with the Owner's Manual supplied with your travel trailer or fifth wheel.

This Owner's Manual Supplement contains information that was incorrect and or/incomplete in your Owner's Manual.

Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545 AW	Spoke	13	80 - 90 Ft./Lbs.
Steel Wheel 14 x 5.5 x 545 AW	Spoke	14	80 - 90 Ft./Lbs.
Steel Wheel 15 x 5 x 545 AW	Spoke	15	80 - 90 Ft./Lbs.
Steel Wheel 15 x 6 x 685 AW	Spoke	16	90 - 100 Ft./Lbs.
Steel Wheel 16 x 6 x 855 AW	Spoke	16	90 - 110 Ft./Lbs.
Aluminum Wheel 15 x 7 x 855	Spoke	15	110 - 120 Ft. Lbs.
Aluminum Wheel 16 x 7 x 855	Spoke	16	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 15 x 6 x 855	Modular	15	110 - 120 Ft./Lbs.
Aluminum Wheel 16 x 6 x 855	Modular	16	110 - 120 Ft./Lbs.

Wheel Lug Nut Tightening Sequence



NOTE: USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED

Wheel Lug Nut Tightening Intervals

Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary to the specified torque. If a wheel has been removed or replaced check the torque again at **10, 25, and 50** miles.

Mounting the Wheel

Place the wheel on the wheel mounting surface. Replace the wheel lug nuts with rounded end of the nut toward the wheel. Tighten each nut by hand until the wheel is held against the wheel mounting surface. Lower the tire to the ground and tighten the wheel lug nuts to the specified torque.

⚠ WARNING

If not properly tightened, loose lug nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage or loss could occur affecting the handling of your trailer.

⚠ WARNING

Wheel Lug Nut Torque and Lug Nut Tightening Intervals

1. The wheel lug nut torque and nut tightening intervals for steel and aluminum wheels are incorrect and incomplete in section 04, titled Wheel Lug Nut Torque of your Owner's Manual.
2. The Wheel Lug Nut Torque Supplement provides current and complete information.
3. Use the information contained within the provided Supplement to reduce the risk of wheel separation from your travel trailer or fifth wheel.
4. If you cannot locate the Wheel Lug Nut Torque Supplement or have any questions call 800-445-3307 and Fleetwood will assist you.

Donohue, Andy

From: Cole, Steve
Sent: Wednesday, April 23, 2003 8:50 AM
To: Donohue, Andy
Subject: FW: Wheel Lug Nut Torque Owner's Manual Supplement

Andy,

When the labels arrive if you see them first let me know and if I see them first I will let you know.

Steve

-----Original Message-----
From: Olson, Bobby
Sent: Tuesday, April 22, 2003 6:48 PM
To: Bill Hughes; Brian Snyder; Craig Sloan; Jackie Sopchak; Rick Ewing; Bobby Olson; Steve Cole
Cc: Williams, Brad
Subject: Wheel Lug Nut Torque Owner's Manual Supplement

To All TT Service Mangare

Subject: Wheel Lug Nut Torque Owner's Manual Supplement

Update:

All General Managers notified to have transporters sign off on a wheel torque requirement. Also a copy of the wheel torque supplement was sent. (4/14/03) Brad Williams issued

2002/2003 Pride and Triumph owners and dealers have been mailed to asking them to add manual cover labels and supplement insert into their owner's manuals. (This will be completed by 4/25/03)

Fleetwood Information Bulletin SBT0113 will mail to all RV Dealers/Service Only Centers and Rental dealers. (This mailing will be complete by 4/28/03) 1500 mailers

All 2004 product that are in the yards will need to be inserted and a label added to the owner's manual. I Have already obtained from each production plant the beginning serial numbers, including pilots that have been produced. We will ship a supply of labels and supplements to each plant and ask that they supply us with the starting serial numbers that inserts and labels were inserted/ labels applied. From this point we will developed a unit data base of units that have already shipped and will notify only the customers/dealers with the aluminum wheel option. We will ask that they apply a owner's manual cover label and insert into their manual.

(estimated time frame to notify dealers/customers 7 days from supplement line insert date)

Approved documents:

Dealer Information Bulletin SBT0113

SBT0113.pdf

FLEETWOOD ENTERPRISES, INC.
3030 Myers Street, P. O. Box 7638
Riverside California 92513-7638
(800) 445-3307 Fax (909) 353-7040

IMPORTANT RECALL INFORMATION #31028

November, 2003

TO: **ALL FLEETWOOD DEALER PRINCIPALS**
SERVICE MANAGERS
PARTS MANAGERS

SUBJECT: **PRODUCT RECALL #31028 ALUMINUM WHEEL LUG NUT TORQUE**
2002 & 2003 Pride & Triumph Conventional & Fifth Wheel Travel Trailers and
2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer
Conventional & Fifth Wheel Travel Trailers

Fleetwood Enterprises, Inc., is requesting your assistance in conducting a voluntary recall notification campaign in accordance with the National Traffic Safety and Motor Vehicle Safety Act.

Fleetwood Enterprises, Inc., has decided that a safety defect relating to motor vehicle safety exists in certain 2002 and 2003 model year Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers built at our Pendleton, Oregon; La Grande, Oregon; Longview, Texas; Rialto, California; Crawfordsville, Indiana; Edgerton, Ohio; Campbellsville, Kentucky; Hancock, Maryland; and Lindsay, Ontario, Canada manufacturing plants. We are notifying owners in order to correct the problem. A copy of the letter sent to owners is enclosed for your information.

What is the problem? Specifically, certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels" that you need to know to safely tow your conventional or fifth wheel travel trailer. This matter is very important and requires your attention.

Proper wheel lug nut torque is very important for safe and dependable trailering. It is extremely important to apply and maintain proper wheel lug nut torque on conventional and fifth wheel travel trailer axles.

⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lug(s) and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control.

Loss of vehicle control may create a crash resulting in personal injury or death.

What is the problem? continued

It is critical that the lug nuts of the conventional and fifth wheel travel trailers be properly torqued during the first 10, 25 and 50 miles of road operation. Settling of components during the first few miles of operation may cause the loosening of the wheel lug nuts.

Maintaining proper wheel lug nut torque is the owner's/user's responsibility.

SPARE WHEEL

If equipped, your conventional or fifth wheel travel trailer may have an optional spare tire and wheel. The lug nuts specified for the optional steel spare wheel are different than the lug nuts for the optional "Aluminum Wheels". Lug nuts for the optional spare wheel were provided in your owner's information packet. Specific lug nuts match specific types of wheels. It is important to mount the spare wheel with the correct lug nuts, tighten to the specified torque, and continue to retorque at 10, 25 and 50 miles or until the recommended torque is established. Check torque periodically thereafter.

What should you do?

With this letter we are providing a current wheel lug nut torque reference guide. Fleetwood recommends that you use this reference guide for achieving and maintaining proper wheel lug nut torque.

Customers with the "Aluminum Wheel" option have been advised to contact their selling dealer or an authorized Fleetwood Service Center to have wheel lug nuts torqued to the proper specifications. If damage to the "Aluminum Wheel" has occurred due to improper wheel lug nut torque, Fleetwood will replace the "Aluminum Wheel" at no cost to the customer. If damage to a lug(s) has occurred due to improper wheel lug nut torque, Fleetwood will repair at no cost to the customer.

Federal Law (Section 154 of the National Traffic and Motor Vehicle Safety Act of 1966) requires that:

If you have received a notice of recall or failure to comply from Fleetwood or any component manufacturer, you must repair or otherwise correct the defects on vehicles remaining in your inventory, according to the notification, before selling or leasing the vehicles. Any vehicle lessor receiving this recall notice must forward a copy of the notice to the lessee within ten days.

Should you perform this service for a customer or for a unit in your inventory, please submit a claim electronically through FDN or complete a ***Fleetwood Repair Order (Form X-SR-642).*** Once repairs are completed, have the customer sign the ***Fleetwood Repair Order*** and return it to your Regional Fleetwood Warranty Processing Center for payment. Please fill out the enclosed ***Vehicle Information Update Card*** and return it to Fleetwood. Customers will not be charged for these repairs. If you are contacted by the owner of a travel trailer with questions concerning this topic, please ask them to contact Fleetwood Owner Relations, Towable Group by calling (800) 445-3307.

You will be reimbursed in accordance with Product Recall #31028 by using the following flat rate code selection: (only one applies)

Flat Rate Code:

9126-11 .2 hr Inspected/Not Defective
9126-12 .3 hr. Inspected/Defective/Repaired
9126-13 .2 hr. Inspected/Defective/Owner Decline
9126-14 .2 hr. Inspected/Defective/Missing Parts
9126-15 .2 hr. Inspected/Defective/Need Tools
9126-16 .2 hr. Unable to Notify Customer
9126-17 .2 hr. Customer Unreachable

Please review this entire package with your parts and service staff to familiarize them with the step-by-step procedure.

Thank you for helping Fleetwood with its continuing efforts to maintain customer satisfaction. If you have any questions, please contact your regional Fleetwood Service Center.

Sincerely,

Fleetwood Enterprises, Inc.

Brad Williams

Brad Williams
Director of Service
RV Towable Group

FLEETWOOD

LEETWOOD ENTERPRISES, INC.
3030 Myers Street, P. O. Box 7638
Riverside California 92513-7638
(800) 445-3307 Fax (909) 353-7040

IMPORTANT RECALL INFORMATION #31028
November, 2003

Dear Valued Fleetwood Travel Trailer Customer:

This notice is sent to you in accordance with the requirements of the National Traffic Safety and Motor Vehicle Safety Act.

Fleetwood has decided that a defect which relates to motor vehicle safety exists in certain 2002 and 2003 model year Pride and Triumph conventional and fifth wheel travel trailers and 2004 model year Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers.

What is the problem? Specifically, certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels" that you need to know to safely tow your conventional or fifth wheel travel trailer. This matter is very important and requires your attention.

Proper wheel lug nut torque is very important for safe and dependable trailering. It is extremely important to apply and maintain proper wheel lug nut torque on conventional and fifth wheel travel trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and expressed as length times force. For example, a force of 120 pounds applied at the end of a wrench one foot long will yield 120 lbs/ft of torque. Torque wrenches are the only method to assure the proper amount of torque is being applied to a wheel lug nut.

⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lug(s) and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control.

Loss of vehicle control may create a crash resulting in personal injury or death.

It is critical that the wheels of the conventional and fifth wheel travel trailers be properly torqued during the first 10, 25 and 50 miles of road operation. Settling of components during the first few miles of operation may cause the loosening of the wheel lug nuts.

Maintaining proper wheel lug nut torque is the owner's/user's responsibility.

What is the problem? continued

A torque wrench with required accuracy is available for approximately $50.00 at most automotive stores.

Before each trip be sure to tighten the wheel lug nuts following the proper tightening sequence to the specified torque. If you notice a wheel wobbling or hear a rattling sound coming from a wheel, one or more wheel lug nuts may have come loose. If you believe lug nuts may have come loose, safely stop the vehicle at the side of the road as soon as possible. Tighten all lug nuts to the specified torque. If you believe the lug threads of the wheel are damaged or faulty, get professional service assistance.

Do not tow the conventional or fifth wheel travel trailer with missing lug bolts, missing lug nuts or a damaged wheel.

A current wheel lug nut torque reference guide is enclosed along with this letter for your reference. Please refer to this guide to determine the required torque for your conventional or fifth wheel travel trailer wheel lug nuts, the proper wheel lug nut tightening sequence, the required wheel lug nut tightening intervals, and how to mount a wheel any time a wheel is replaced.

SPARE WHEEL

If equipped, your conventional or fifth wheel travel trailer may have an optional spare tire and wheel. The lug nuts specified for the optional steel spare wheel are different than the lug nuts for the optional "Aluminum Wheels". Lug nuts for the optional spare wheel were provided in your owner's information packet. Specific lug nuts match specific types of wheels. It is important to mount the spare wheel with the correct lug nuts, tighten to the specified torque, and continue to retorque at 10, 25 and 50 miles or until the recommended torque is established. Check torque periodically thereafter.

What will Fleetwood do?

With this letter we are providing a current wheel lug nut torque reference guide. Fleetwood recommends that you use this reference guide for achieving and maintaining proper wheel lug nut torque. If you have the "Aluminum Wheel" option, please contact your selling dealer or authorized Fleetwood Service Center if you have any questions or to have your wheel lug nuts torqued to the proper specifications. If your "Aluminum Wheel" has been damaged due to improper wheel lug nut torque, Fleetwood will replace your "Aluminum Wheel" at no cost to you. If damage to a lug(s) has occurred due to improper wheel lug nut torque, Fleetwood will repair at no cost to you. Fleetwood will also provide a one-time inspection and wheel torque if necessary, at no cost to you.

What should you do?

Maintaining proper wheel lug nut torque is the owner's/user's responsibility. Please use the enclosed wheel lug nut torque reference guide to achieve correct wheel lug nut specifications. Before each trip, be sure to check and tighten the wheel lug nuts if necessary to specified torque. If a wheel has been replaced check the torque at 10, 25 and 50 miles and periodically until the required torque is maintained at a constant value. Keep this wheel lug nut torque reference guide in your conventional or fifth wheel travel trailer owner's manual for easy reference.

If you have had this concern corrected previously, you may be eligible for reimbursement of your cost for the repair. For more information contact Fleetwood Owner Relations at (800) 445-3307.

What should you do? Continued

When you deliver your travel trailer for repairs, your dealer will complete a Fleetwood Repair Order. Upon completion of the repair, please sign the Fleetwood Repair Order, fill out the enclosed, self-addressed ***Vehicle Information Update Card*** and return it to Fleetwood.

If you have changed your address or sold the conventional or fifth wheel travel trailer, please take a moment to provide the name and address of the person or dealership you sold it to on the enclosed ***Vehicle Information Update Card*** and return it to Fleetwood. That way we can update our records, and if necessary, notify the new owner using the information you provide.

Federal regulation requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

If you are unable to obtain the specified repair promptly and without charge, please contact:

Fleetwood Owner Relations Towable Group
P.O. Box 7638
Riverside, CA 92513-7638
(800) 445-3307

If you believe that the dealer and Fleetwood Enterprises, Inc., have failed or have been unable to remedy the defect without charge or within a reasonable period of time, you may submit a complaint to:

Administrator
National Highway Traffic Safety Administration
400 Seventh Street S.W.
Washington, DC 20590

Or call the toll-free Auto Safety Hotline at (888) 327-4236.

Fleetwood Enterprises, Inc., regrets any inconvenience this may cause you. We are taking these steps in the interest of your safety.

Sincerely,

Fleetwood Enterprises, Inc.

Brad Williams
Director of Service
RV Towable Group

FLEETWOOD TRAVEL TRAILER AND FIFTH WHEEL, WHEEL LUG NUT TORQUE REFERENCE GUIDE

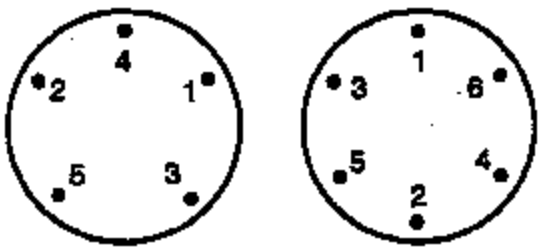
⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lugs, and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control. Loss of vehicle control may create a crash resulting in personal injury or death.

Steel and Aluminum Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545	Spoke	13	80 - 90 ft-lbs
Steel Wheel 14 x 5.5 x 545	Spoke	14	80 - 90 ft-lbs
Steel Wheel 15 x 5 x 545	Spoke	15	80 - 90 ft-lbs
Steel Wheel 15 x 6 x 655	Spoke	15	90 - 100 ft-lbs
Steel Wheel 16 x 6 x 655	Spoke	16	90 - 110 ft-lbs
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 ft-lbs

WHEEL LUG NUT TIGHTENING SEQUENCE



NOTE: use a torque wrench to tighten lug nuts. Tightening by hand or with an impact wrench ***IS NOT*** recommended.

WHEEL LUG NUT TIGHTENING INTERVALS

Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary, to the specified torque. If a wheel has been removed or replaced, check the torque again at **10**, **25** and **50** miles or until the recommended torque is established. Spare tires/wheels, if equipped, may require different wheel lug nuts.

FLEETWOOD ENTERPRISES, INC.
3030 Myers Street, P. O. Box 7638
Riverside California 92513-7638
(800) 445-3307 Fax (909) 353-7040

IMPORTANT RECALL INFORMATION #31028

(This is a follow-up to an earlier communication)

January, 2004

Dear Valued Fleetwood Travel Trailer Customer:

This notice is sent to you in accordance with the requirements of the National Traffic Safety and Motor Vehicle Safety Act.

Fleetwood has decided that a defect which relates to motor vehicle safety exists in certain 2002 and 2003 model year Pride and Triumph conventional and fifth wheel travel trailers and 2004 model year Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers.

What is the problem? Specifically, certain 2002 and 2003 Pride and Triumph conventional and fifth wheel travel trailers and 2004 Pride, Triumph, Prowler, Wilderness, Terry, Mallard and Pioneer conventional and fifth wheel travel trailers may not have had the proper wheel lug nut torque applied for the optional "Aluminum Wheel" before leaving the manufacturing plant. Additionally, the owner's manual may not contain the correct torque requirements for the "Aluminum Wheels" that you need to know to safely tow your conventional or fifth wheel travel trailer. This matter is very important and requires your attention.

Proper wheel lug nut torque is very important for safe and dependable trailering. It is extremely important to apply and maintain proper wheel lug nut torque on conventional and fifth wheel travel trailer axles. Torque is a measure of the amount of tightening applied to a fastener (nut) and expressed as length times force. For example, a force of 120 pounds applied at the end of a wrench one foot long will yield 120 lbs/ft of torque. Torque wrenches are the only method to assure the proper amount of torque is being applied to a wheel lug nut.

⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lug(s) and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control.

Loss of vehicle control may create a crash resulting in personal injury or death.

It is critical that the wheels of the conventional and fifth wheel travel trailers be properly torqued during the first 10, 25 and 50 miles of road operation. Settling of components during the first few miles of operation may cause the loosening of the wheel lug nuts.

Maintaining proper wheel lug nut torque is the owner's/user's responsibility.

What is the problem? continued

A torque wrench with required accuracy is available for approximately $50.00 at most automotive stores.

Before each trip be sure to tighten the wheel lug nuts following the proper tightening sequence to the specified torque. If you notice a wheel wobbling or hear a rattling sound coming from a wheel, one or more wheel lug nuts may have come loose. If you believe lug nuts may have come loose, safely stop the vehicle at the side of the road as soon as possible. Tighten all lug nuts to the specified torque. If you believe the lug threads of the wheel are damaged or faulty, get professional service assistance.

Do not tow the conventional or fifth wheel travel trailer with missing lug bolts, missing lug nuts or a damaged wheel.

A current wheel lug nut torque reference guide is enclosed along with this letter for your reference. Please refer to this guide to determine the required torque for your conventional or fifth wheel travel trailer wheel lug nuts, the proper wheel lug nut tightening sequence, the required wheel lug nut tightening intervals, and how to mount a wheel any time a wheel is replaced.

SPARE WHEEL

If equipped, your conventional or fifth wheel travel trailer may have an optional spare tire and wheel. The lug nuts specified for the optional steel spare wheel are different than the lug nuts for the optional "Aluminum Wheels". Lug nuts for the optional spare wheel were provided in your owner's information packet. Specific lug nuts match specific types of wheels. It is important to mount the spare wheel with the correct lug nuts, tighten to the specified torque, and continue to retorque at 10, 25 and 50 miles or until the recommended torque is established. Check torque periodically thereafter.

What will Fleetwood do?

With this letter we are providing a current wheel lug nut torque reference guide. Fleetwood recommends that you use this reference guide for achieving and maintaining proper wheel lug nut torque. If you have the "Aluminum Wheel" option, please contact your selling dealer or authorized Fleetwood Service Center if you have any questions or to have your wheel lug nuts torqued to the proper specifications. If your "Aluminum Wheel" has been damaged due to improper wheel lug nut torque, Fleetwood will replace your "Aluminum Wheel" at no cost to you. If damage to a lug(s) has occurred due to improper wheel lug nut torque, Fleetwood will repair at no cost to you. Fleetwood will also provide a one-time inspection and wheel torque if necessary, at no cost to you.

What should you do?

Maintaining proper wheel lug nut torque is the owner's/user's responsibility. Please use the enclosed wheel lug nut torque reference guide to achieve correct wheel lug nut specifications. Before each trip, be sure to check and tighten the wheel lug nuts if necessary to specified torque. If a wheel has been replaced check the torque at 10, 25 and 50 miles and periodically until the required torque is maintained at a constant value. Keep this wheel lug nut torque reference guide in your conventional or fifth wheel travel trailer owner's manual for easy reference.

If you have had this concern corrected previously, you may be eligible for reimbursement of your cost for the repair. For more information contact Fleetwood Owner Relations at (800) 445-3307.

What should you do? continued

When you deliver your travel trailer for repairs, your dealer will complete a Fleetwood Repair Order. Upon completion of the repair, please sign the Fleetwood Repair Order, fill out the enclosed, self-addressed ***Vehicle Information Update Card*** and return it to Fleetwood.

If you have changed your address or sold the conventional or fifth wheel travel trailer, please take a moment to provide the name and address of the person or dealership you sold it to on the enclosed ***Vehicle Information Update Card*** and return it to Fleetwood. That way we can update our records, and if necessary, notify the new owner using the information you provide.

Federal regulation requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

If you are unable to obtain the specified repair promptly and without charge, please contact:

Fleetwood Owner Relations Towable Group
P.O. Box 7638
Riverside, CA 92513-7638
(800) 445-3307

If you believe that the dealer and Fleetwood Enterprises, Inc., have failed or have been unable to remedy the defect without charge or within a reasonable period of time, you may submit a complaint to:

Administrator
National Highway Traffic Safety Administration
400 Seventh Street S.W.
Washington, DC 20590

Or call the toll-free Auto Safety Hotline at (888) 327-4236.

Fleetwood Enterprises, Inc., regrets any inconvenience this may cause you. We are taking these steps in the interest of your safety.

Sincerely,

Fleetwood Enterprises, Inc.

Brad Williams

Brad Williams
Director of Service
RV Towable Group

FLEETWOOD TRAVEL TRAILER AND FIFTH WHEEL, WHEEL LUG NUT TORQUE REFERENCE GUIDE

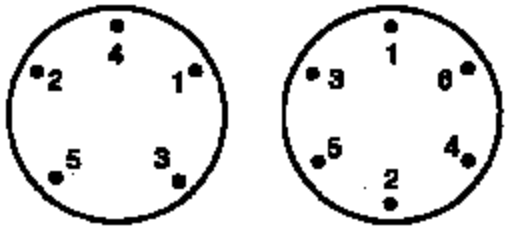
⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lugs, and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control. Loss of vehicle control may create a crash resulting in personal injury or death.

Steel and Aluminum Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 5&6	Spoke	13	80 - 90 ft-lbs
Steel Wheel 14 x 5.5 x 5&6	Spoke	14	80 - 90 ft-lbs
Steel Wheel 15 x 5 x 5&6	Spoke	15	80 - 90 ft-lbs
Steel Wheel 15 x 6 x 8&5	Spoke	15	90 - 100 ft-lbs
Steel Wheel 16 x 6 x 8&5	Spoke	16	90 - 110 ft-lbs
Aluminum Wheel 15 x 7 x 8&5	Spoke	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 7 x 8&5	Spoke	16	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 5&6	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 8&5	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 6 x 8&5	Modular	16	110 - 120 ft-lbs

WHEEL LUG NUT TIGHTENING SEQUENCE



NOTE: use a torque wrench to tighten lug nuts. Tightening by hand or with an impact wrench ***IS NOT*** recommended.

WHEEL LUG NUT TIGHTENING INTERVALS

Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary, to the specified torque. If a wheel has been removed or replaced, check the torque again at **10**, **25** and **50** miles or until the recommended torque is established. Spare tires/wheels, if equipped, may require different wheel lug nuts.

FLEETWOOD

PRODUCT RECALL SERVICE BULLETIN #31028

RECALL BULLETIN: #31028

YEAR(S) AFFECTED: 2002, 2003, 2004

PRODUCT(S) AFFECTED: All Travel Trailers and Fifth Wheels

MODEL(S) AFFECTED: All

SUBJECT: Wheel Lug Nut Torque

KEYWORDS: Lug Nuts, Wheels, Steel Wheel, Aluminum Wheels

ISSUE DATE: November 2003

The purpose of this bulletin is to inform all Fleetwood dealers about information pertaining to all travel trailer and fifth wheels. If you are contacted by a retail customer regarding this matter, refer to the information listed.

IMPORTANT INFORMATION RELATED TO WHEEL LUG NUT TORQUE

This bulletin includes the travel trailer and fifth wheel lug nut torque reference guide related to wheel lug nut torque, tightening sequence and tightening intervals. The reference guide can be referenced on the back page of this bulletin.

Additionally the following information should be referenced during the **Product Delivery Process** prior to retail delivery.

If you have any questions concerning this bulletin, contact your regional Fleetwood towable factory service center.

Federal Law (Section 154 of the National Traffic and Motor Vehicle Safety Act of 1966) requires that:

> *If you have received a notice of recall or failure to comply from Fleetwood or any component manufacturer, you must repair or otherwise correct the defects on vehicles remaining in your inventory, according to the notification, before selling or leasing the vehicles. Any vehicle lessor receiving this recall notice must forward a copy of the notice to the lessee within ten days.*

> *"It is impossible to know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Accordingly anyone who uses a service procedure or tool must first assure that neither personal safety nor vehicle safety will be jeopardized by the selected service methods."*
>
> *This bulletin is supplied for technical information only and is not an authorization for repairs.*

FLEETWOOD TRAVEL TRAILER AND FIFTH WHEEL, WHEEL LUG NUT TORQUE REFERENCE GUIDE

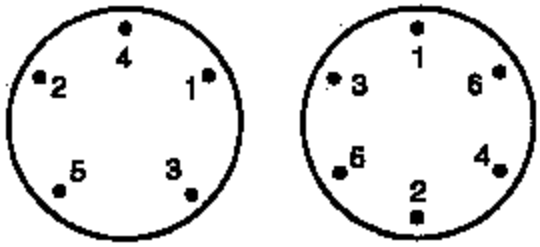
⚠ WARNING

Wheel lug nuts must be applied and maintained at the proper torque levels to prevent loose wheels, damaged/broken lugs, and separation of wheels from the axle. Separation of a wheel in transit may create a significant road hazard and may also result in loss of vehicle control. Loss of vehicle control may create a crash resulting in personal injury or death.

Steel and Aluminum Wheel Lug Nut Torque Specifications

WHEELS	TYPE	SIZE	RECOMMEND TORQUE
Steel Wheel 13 x 4.5 x 545	Spoke	13	80 - 90 ft-lbs
Steel Wheel 14 x 5.5 x 545	Spoke	14	80 - 90 ft-lbs
Steel Wheel 15 x 5 x 545	Spoke	15	80 - 90 ft-lbs
Steel Wheel 15 x 6 x 655	Spoke	15	90 - 100 ft-lbs
Steel Wheel 16 x 6 x 655	Spoke	16	90 - 110 ft-lbs
Aluminum Wheel 15 x 7 x 655	Spoke	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 7 x 655	Spoke	16	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 545	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 15 x 6 x 655	Modular	15	110 - 120 ft-lbs
Aluminum Wheel 16 x 6 x 655	Modular	16	110 - 120 ft-lbs

WHEEL LUG NUT TIGHTENING SEQUENCE



NOTE: use a torque wrench to tighten lug nuts. Tightening by hand or with an impact wrench ***IS NOT*** recommended.

WHEEL LUG NUT TIGHTENING INTERVALS

Steel and Aluminum Wheels

Before each trip, be sure to check and tighten the wheel lug nuts if necessary, to the specified torque. If a wheel has been removed or replaced, check the torque again at **10, 25 and 50** miles or until the recommended torque is established. Spare tires/wheels, if equipped, may require different wheel lug nuts.

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FLEETWOOD 2/23/04

ATTACHMENT 30

PART 4 OF 4

BOOK 2 OF 2

CHRONOLOGY

30. Provide a chronology of all events leading up to and explain in detail all bases on which Fleetwood decided to file its Part 573 Report. Describe in detail the procedures followed and actions taken by Fleetwood in reaching the decision that there was a defect and state the date on which anyone in Fleetwood first recognized that the subject defect likely existed. If the decision to submit a 573 Report was made after a presentation to a committee or other Fleetwood organizational unit, identify that committee/unit and all of its members, and state the date on which the responsible person (identify) decided to present the matter involving the subject defect to the committee and the data or dates on which the issue of the subject defect was brought before the committee. Separately identify the individual(s) responsible for making the formal Fleetwood corporate decision that the subject defect exists.

Produce a copy of all documents that are relevant to the above Request #30.

RESPONSE #30

The decision to file a Fleetwood Part 573 Report was made in October 2003 at the request of NHTSA engineer Tom Bowman. After a series of phone conversations between Mr. Bowman and Fleetwood Director of Engineering and Product Compliance, Robert Wozniak, from October 20-24, Fleetwood determined a possible cause of the wheel lug nut torque loss could be improper torque applied at the manufacturing facilities. Since additional events occurred after the initial mailing, Fleetwood decided to initiate a recall campaign because of its belief customers would be more likely to respond to a recall versus a product notification.

On October 27, Robert Wozniak discussed with Donald Lee of the Legal Department, Steve Hulst, Director of Towable Operations, and Robert Thompson, Vice President of Product Development, the recommendation to conduct a voluntary recall campaign. The group agreed based on the additional events and the belief customers would respond to the second notification with urgency, especially with the bright red "Safety Recall Notice" markings on the exterior of the envelope.

On October 28, Robert Wozniak discussed with Chris Braun, Senior Vice President of the RV Group the recommendation to conduct a voluntary recall campaign. Mr. Braun is the individual assigned responsible for making the formal Fleetwood decision that the subject defect exists. Mr. Braun gave his approval to proceed with the recall campaign.

On October 29, the Part 573 Report was filed with NHTSA and the recall campaign was conducted.

For a chronology of events, please refer to attachments to Responses 24, 25, 27, 29, and 30a, summaries and included relevant documents provided.

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FLEETWOOD 2/23/04

ATTACHMENT 30A

PART 4 OF 4

BOOK 2 OF 2

ALUMINUM WHEEL CHRONOLOGICAL SUMMARY

Jan. 20, 2002	Lindsay #65 is first plant to build Pride and Triumph units
Feb. 28, 2002	DC 2-02 introduces new 365L model to the Pride and Triumph products. Introduces new option #712 (15" aluminum wheel) and option #718 (16" aluminum wheel). The import aluminum wheel is not available until April 1, 2002.
#1 July 17, 2002 '03 Pride 365L	First aluminum wheel loss event. 40-95801. Studs sheared while customer was in transit. Sheared studs were sent to Dexter axle for evaluation. Event reported to Corporate on a Unit Safety Evaluation Report.
#2 Sept. 3, 2002 '03 Pride 315G	Second aluminum wheel loss event. 40-95946. Dealer reported customer was traveling when all of the studs sheared. Event reported to Corporate on a Unit Safety Evaluation Report.
#3 Sept. 16, 2002 Triumph 315G	Third wheel loss event reported. 40-95936. Dealer reported that customer sheared studs and lost a wheel. Event reported to Corporate on a Unit Safety Evaluation Report.
#4 Sept. 24, 2002 '03 Triumph 365L	Fourth wheel loss event. 40-95671. Reported to Division
Oct. 4, 2002	Phil Woods sends Import wheel torque data to Gary Beatty. Torque maximum for aluminum wheels was 79.65 lb. Ft.
#5 Oct. 15, 2002 Oct. 31, 2002	'03 Pride 365L- 65-89137 event. Jim Bertoch issues memo to plants for all steel and aluminum wheels.
#6. Nov. 15, 2002	'03 Triumph 365L – 65-89141
#7 Nov. 17, 2002	'04 Advantage 365FL 15-90837 (proto to Louisville)
#8. Nov 21, 2002	'04 Triumph 335Z – 23-05945
Nov. 21, 2002	Imports confirms 80 lb. Torque
Nov. 21, 2002	Dan Ryan issues memo to move immediately from the Import aluminum wheel to the Tredit aluminum wheel.
Nov. 21, 2002	Plants contacted and reminded to torque properly, have transporters torque properly, report all information on events-to-date, check test equipment for proper operation and calibration. – Brad Williams
Nov. 21, 2002	Jim Bertoch checks lug nut usage with plant #40 (Longview)

Nov. 21, 2002	Brad Williams asks Plant Service Managers to record serial numbers of wheel substitutions from Import to Tredit.
Nov. 25, 2002	Bob Wozniak asks for event parts to be sent to Corporate. Rick Ewing e-mails efforts to send parts.
Dec. 4, 2002	Rick Ewing (#24 LaGrande) writes e-mail about some recent events on three Pride/Triumph units.
Dec. 5, 2002	Jim Bertoch sends e-mail to Wozniak re: Aluminum Wheels
Dec. 6, 2002	Imports issues new torque as a result of e-mail from Greenball. New torque is now 100 lbs.
Dec. 10, 2002	Michael Dixon sends memo to Jim Bertoch on steel wheel torque.
Dec. 11, 2002	Bill Hughes notes that torque sticker on steel wheels does not agree with 2004 Owner's Manual.
Dec. 16, 2002:	Jim Bertoch issues memo regarding torque and lug nut requirements.
Dec. 19, 2002	Anne Chen restates torque to be 100 lb-ft. for Import aluminum wheel.
Dec. 19, 2002	Bob Wozniak sends e-mail regarding Jim Bertoch's torque requirements to be 110 lb-ft to 120 lb-ft. 10, 25, 50, 100 miles retorque.
Dec. 19, 2002	Memo from Greenball Corp, Howard Chang, specifying Import torque specs at steel and alloy to be 100 lbs.-ft.
Jan. 2, 2003:	Bill Hughes (#42) e-mails Brad Williams about information not being correct in Owner's Manual regarding torque specifications.
Jan. 2, 2003:	Robby Olson responds stating we are planning a mailing to customers and dealers to correct the information in the Owner's Manual.
Jan. 6, 2003:	Bob Wozniak e-mail- approves use of import wheels based on Larry Budica's Test. 1400 miles and no significant torque loss.
Jan. 7, 2003:	Larry Budica summarizes his torque study on unit taken on trip with both aluminum wheels. No significant torque loss.
Jan. 9, 2003:	Robby sends e-mail to Brian Shrader about updating 2004 Owner's Manuals.

Feb. 11, 2003:	Howard Chang sends memo to Continental Imports. Sending new torque requirements for import aluminum wheels. Says that aluminum wheels are no problem under 110-120 lb. range.
Feb. 21, 2003:	Expanded the Assembly Manual chart to include (2) steel wheel descriptions and added recommendation.
Mar. 5, 2003:	Shelly Smith memo to Don Lee asking for customer/dealer letter review. Note: Attached letters were changed, label process was considered too difficult for customer and plant to understand. In the meantime, we learned more about the importance of re-torquing. We felt we need to provide more information.
Mar. 7, 2003:	Meeting Notice – Aluminum wheels from Brad Williams.
Mar. 12. 2003:	Greenball's Howard Chang addresses torque and errors on documents.
Mar. 17, 2003:	Typo correction Assembly Manual chart – wheel size.
Mar. 19, 2003:	Brad Williams called Bill Dunlap at Dexter – Notes. Dexter acknowledged awareness of aluminum retention issues.
Mar. 19, 2003:	Bill Dunlap sent his Aug. 1, 2002 memo to Brad Williams addressing aluminum wheel retention.
Mar. 19, 2003:	Brad Williams called Marc West at Jayco – Notes from call. Jayco has had similar issues.
Mar. 19, 2003:	Marc West (Jayco) faxed Brad Williams the NHTSA pre-departure checklist for trailering. Retorquing is 2nd thing NHTSA recommends.
Mar. 21, 2003:	Brad Williams draft to plants- Steel and aluminum wheel nut torque and nut tightening intervals. Given to Bob Wozniak for approval.
Mar. 21, 2003:	Aluminum Wheel Retention Action Plan written by Brad Williams and Robby Olson.
Mar. 25, 2003:	Brad Williams called Tim Ball – Notes. Tredit is aware of aluminum retention issues.
Mar. 25, 2003:	Memo from Tim Ball (Tredit) addressing aluminum wheel torque.
April 14, 2003:	Revision to Assembly Manual pages AMR-28-A75 and AMR-01-A39. The notes were updated regarding mounting, sequence, and intervals.
April 15, 2003:	Memo from Brad Williams to plants on lug nut torque/nut tightening intervals, transporter responsibility and compliance.

April 16, 2003:	Brad recommends discontinuing use of import aluminum wheel to Materials Group. Dan Ryan wanted to research the information further.
April 16, 2003:	Notes from April 16 meeting with Materials. Materials did not accept Brad's recommendation.
April 16, 2003:	Phil Nussear reports wheel event from the field.
April 16, 2003	Brad Williams e-mail to GM's/Sales/Service regarding action taken to address aluminum wheel retention.
April 17, 2003:	Tim Ball (Tredit) writes to Rod Gagner and summarizes Tredit's communications and activities to-date.
April 17, 2003	Documented note to get wheel expert involved. Bob Wozniak asks legal group to contact wheel expert.
April 18, 2003:	Memo to General Managers from Pete Betancourt – torque process acknowledgement. GM's signatures.
April 21, 2003:	Torque specs from Tredit approving 110 ft lbs to 120 ft. lbs.
April 21, 2003:	Tim Ball to Rod Gagner outlining torque re-check schedule.
April 21, 2003:	Steve Hulst memo to distribution addressing action on aluminum wheels.
April 22, 2003:	Robby Olson summary notes on notifications and dates.
April 22, 2003:	Robby Olson's memo to Service Managers - discussion on notification to customers and dealers.
April. 22, 2003:	RTM/RTS plant inspection sheets updated with chassis torque check notation and signoff.
April. 23, 2003:	Bob Wozniak sends copy of Trailer Life article to Steve Hulst that discusses proper lug nut tightening techniques ensuring towing safety. March 1996.
May 1, 2003:	Instructions to plants regarding supplements, labels and Owner's Manual from Robby Olson.
May 3, 2003:	Robby Olson mailing summary.
May 9, 2003:	Voice mail note to Dan Ryan from Brad Williams asking for decision on recommendation.

May 28, 2003	Aluminum wheel presentation to GM's by Brad Williams outlining summary of events and what action is being taken.
May 29, 2003:	Towable Group GM Meeting Agenda.
May 30, 2003:	Jim Baehmann – Aluminum wheel replacement memo to Sales showing chrome plated steel wheels.
June 6, 2003:	Competitive usage analysis. Sharon Latham, Customer Service Rep., called other trailer manufacturers to see if they use aluminum wheels and the brand of wheel.
June 12, 2003:	Dan Ryan to John Drahsim – Move to chrome plated steel wheels.
June 23, 2003:	Chrome wheels added to Assembly manual chart.
Sept. 5, 2003:	Pride/Triumph introduced to the 324 core package as level 4.
Oct. 1, 2003:	Tom Bowman of (NHTSA) contacts Fleetwood.
Oct. 1, 2003:	E-mail Steve Mitchell to Robby Olson.
Oct. 6, 2003:	Notes from Tom Bowman (NHTSA) call.
Oct. 2003	Graph of event manufacturing dates.
Oct. 13, 2003:	E-mail to Bob Wozniak from Brad Williams asking for 30 days to research requested informal data.
Oct. 17, 2003:	Request from Tom Bowman.
Oct. 24, 2003:	Brad Williams's response to Tom Bowman's informal request.
Oct. 29, 2003:	Notification to NHTSA PART 573.
Nov. 6, 2003:	Notes on recall recommendations from Tom Bowman.
Nov. 6, 2003:	New recall letter drafted
Nov. 13, 2003	Transport Canada Notification.
Nov. 19, 2003	First Mailing Dealer – Recall.
Nov. 19, 2003	Canada First Mailing Dealer – Recall.
Nov. 21, 2003:	ODI Resume.
Nov. 26, 2003	First Mailing Customer – Recall.

Nov. 26, 2003: Canada First Mailing Customer – Recall.

Dec. '03: Executing recall with customers/dealers.

Dec. 2, 2003: Tredit sends Enkei wheel testing timeline.

Dec. '03: Discussions with Don Cox.

Dec. '03 Wheels from events being returned.

Dec. 10, 2003: Terry O'Rourke to Rod Gagner. Enkei test.

Dec. 12, 2003: Shelly provided Brad Williams PDI form and hard card for motor homes. they are torquing correctly.

Dec. 15, 2003: RV.NET Website examined showing aluminum wheel retention comments from other manufacturer's customers.

Dec. 18, 2003: Plants asked to provide date and serial number of when they discontinued using aluminum wheels.
Plants asked to provide torque specs noted on hard card of units involved to date.

Discontinued Summary:

Plant 15	April 2003
Plant 28	August 2003
Plant 65	July 2003
Plant 23	July 2003
Plant 40	August 2003
Plant 42	August 2003

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FLEETWOOD 2/23/04

ATTACHMENT 31

PART 4 OF 4

BOOK 2 OF 2

31. Provide a chronology of all events leading up to and explain in detail all bases on which Fleetwood decided to issue its dealer and customer notifications in April and May 2003. Describe in detail the procedures followed and actions taken by Fleetwood in reaching the decision to issue the notifications. If the decision to issue the notifications was made after presentation to a committee or other Fleetwood organizational unit, identify that committee/unit and all of its members, and state the date on which the responsible person (identify) decided to present the matter to the committee and the date or dates on which the matter was brought before the committee. Separately identify the individual(s) responsible for making the formal Fleetwood corporate decision to issue the notifications.

Produce a copy of all documents that are relevant to the above Request #31.

RESPONSE #31

In approximately January, 2002, Fleetwood introduced an aluminum wheel option for certain of its travel trailers.

In approximately July, 2002, Fleetwood received a first report of an aluminum wheel separation. By November, 2002, Fleetwood was aware of five reported wheel separation events and moved immediately to discontinue use of what it believed to be the incident aluminum wheels. Seven plant management teams involving up to ten manufacturing facilities were notified and requested to review all wheel torque application processes, to check equipment for proper operation and calibrations, to report all known wheel separation events to date, and to document and forward all available parts involved to Corporate headquarters for evaluation.

During December, 2002, Fleetwood received notification from wheel manufacturer Greenball Corporation that torque specifications should be 100 ft.-lbs. instead of 80 ft.-lbs.

During January, 2003, Fleetwood continues investigation of field events, and requests additional confirmation from wheel manufacturer that torque specifications are correct. Fleetwood continues to conduct its own analysis, including road tests.

During February and March, 2003, Fleetwood received additional information from wheel manufacturer that aluminum wheel torque could be 110-120 ft.-lbs.

In March, 2003, Fleetwood decides to conduct a field notification campaign based on a similar Ford Motor Company field notification campaign. Fleetwood's decision was based on its belief the information given in its owner's manual was incorrect.

For a chronology of events, please refer to attachments to Responses 24, 25, 27, 29, 30, chronological summaries and included relevant documents provided.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 32

PART 4 OF 4

BOOK 2 OF 2

32. Provide a chronology of all events and explain in detail any investigation that Fleetwood undertook in regard to each type of complaint information described in information Request #7. Describe in detail the procedures followed and actions taken by Fleetwood in receiving and investigating the complaint information. If there was an engineering group or organizational unit that reviewed and investigated the complaint information, then identify that group/unit and all of its members, and state the date on which the group/unit began its review and investigation. Explain the process of how the group/unit reached each decision to take action in regard to the complaint information, and the date on which each action was taken. If the decisions to take action were made by another individual or committee, then identify that individual or committee, and the date or dates on which each decision was brought before the individual or committee.

Produce a copy of all documents that are relevant to the above Request #32.

RESPONSE #32

Please refer to responses and attachments to responses 24, 25, 27, 29, 30, 31.

RQ03-009

FLEETWOOD 2/23/04

ATTACHMENT 33

PART 4 OF 4

BOOK 2 OF 2

FLEETWOOD. DATE 9/23/04 Nº 61242

SHIPPING REQUEST

FROM: DEPT. RV Eng COST CENTER NUMBER 354

REQUESTED BY: Bob Wozniak PERSONAL PKG.

Please Print All Information

QUANTITY	CONTENTS	SHIP TO (COMPLETE ADDRESS)
4	3 ring Binders	ATTN: Tom Bowman
	containing Fleetwood's	COMPANY: National Highway Traffic Safety Administration
	Response to NHTSA	STREET: 400 Seventh St. S.W.
	RQ 03-009	SUITE:
		CITY: Washington, D.C.
		STATE: ZIP: 20590

SPECIAL INSTRUCTIONS

DATE SHIPPED VIA SHIPPING CLERK

857.3.028 9/95 White/Distribution Services Yellow/Return to requestor Pink/Packing slip Goldenrod/Requestor's copy

FLEETWOOD. DATE 9/23/04

NO. 61244

SHIPPING REQUEST

FROM: DEPT. RV Eng COST CENTER NUMBER 354

REQUESTED BY: Bob Wozniak PERSONAL PKG.

Please Print All Information

QUANTITY	CONTENTS	SHIP TO (COMPLETE ADDRESS)
2	Aluminum Wheels	ATTN: Tom Bowman
2 sets	lug nuts	COMPANY: National Highway Traffic Safety Administration
1	rotor	STREET: 400 Seventh St. S.W.
		SUITE:
	Fleetwood's Response	CITY: Washington, D.C.
	To NHTSA RQ03-009	STATE: ZIP: 20590

SPECIAL INSTRUCTIONS

DATE SHIPPED VIA SHIPPING CLERK

857.3.028 9/95 White/Distribution Services Yellow/Return to requester Pink/Packing slip Goldenrod/Requester's copy

33. Provide a chronology of all events and explain in detail any investigation that Fleetwood undertook in regard to each type of warranty information described in information Request #9. Describe in detail the procedures followed and actions taken by Fleetwood in receiving and investigating the warranty information. Describe the procedures in place to receive warranty information. If there was an engineering group or organizational unit that reviewed and investigated the warranty information, then identify that group/unit and all of its members, and state the date on which the group/unit began its review and investigation. Explain the process of how the group/unit reach each decision to take action in regard to the warranty information, and the date on which each action was taken. If the decisions to take action were made by another individual or committee, then identify that individual or committee, and the date or dates on which each decision was brought before the individual or committee.

Produce a copy of all documents that are relevant to the above Request #33.

RESPONSE #33

Please refer to responses and attachments to responses 24, 25, 27, 29, 30, 31.