TABLE OF CONTENTS

CHAPTER 1 - VEHICLE AND AXLE-LOAD SCALES	
OBJECTIVES	1-1
GENERAL CONSIDERATIONS	1-1
APPLICATIONS AND DESIGN	1-2
MAJOR COMPONENTS OF VEHICLE AND AXLE-LOAD SCALES	1-3
Foundation	1-4
Approaches	1-5
Load-Receiving Elements	1-5
Weighing Elements	1-6
Indicating Elements	1-10
Recording Elements	1-18
SUMMARY	1-19
CHAPTER 2 - PREPARATION FOR A SCALE EXAMINATION	
OBJECTIVES	2-1
GENERAL CONSIDERATIONS	2-1
Purpose of Device Inspection	2-1
Impact of the Packers and Stockyards Act	2-2
Legal and Technical Requirements	2-3
Structure of a Field Examination	2-3
TEST EQUIPMENT	2-3
Equipment List	2-3
Reference Materials	2-4
Test Weights	2-4
Tags, Seals, and Seal Press	2-8
Safety Equipment	2-8
RECORD KEEPING	2-8
ENTERING A COMMERCIAL ESTABLISHMENT	2-9
Right of Entry	2-9
Identification of Scales to be Inspected	2-10
Inspection Checklist	2-10
SUMMARY	2-12

Page

CHAPTER 3 - INSPECTION	
OBJECTIVES	3-1
GENERAL CONSIDERATIONS	3-2
ZERO-LOAD BALANCE AS FOUND	3-4
Weighbeam Scales	3-6
Dial Scales	3-7
Electronic Digital Indicating Scales	3-7
MARKING	3-9
Basic Identification Information	3-14
Not Built for Purpose Devices, Software Base	3-15
Remanufactured Devices	3-16
Indicating Element Separate	3-17
Weighing/Load-Receiving Elements	3-19
Other Equipment or Device	3-20
Load Cell with COC	3-21
Additional Marking Requirements	3-22
Recording and Verification of Markings	3-23
DETERMINING THE SUITABILITY OF SYSTEM COMPONENTS	3-27
INDICATING AND RECORDING ELEMENTS	3-30
Accuracy Class	3-30
Scale Division: Value (d) and Number (n)	3-32
Multi-interval and Multiple Range Devices	3-35
Rounding	3-26
Manual Weight Entries	3-37
Tare Division Value and Tare Mechanism	3-38
Appropriateness of Design	3-38
General	3-38
Weighbeams	3-42
Poises	3-44
Dials and Balance Indicators	3-46
Damping Means	3-48
Suitability	3-49
Customer Readability - if applicable	3-55
Adjustable Components	3-56
Provision for Sealing	3-56
INSTALLATION	3-59
WEIGHING AND LOAD-RECEIVING ELEMENTS	3-62
Design	3-62
Access	3-64
APPROACHES	3-64
MAINTENANCE, USE, AND ENVIRONMENTAL FACTORS	3-66
ASSISTANCE	3-71
SUMMARY	3-71

Page

	Page
CHAPTER 4 - PRETEST DETERMINATIONS	-
OBJECTIVES	4-1
GENERAL CONSIDERATIONS	4-2
APPLICABLE REQUIREMENTS	4-2
TOLERANCE VALUES	4-4
Maintenance Tolerance Values	4-5
Acceptance Tolerance Values	4-6
Decreasing Load Tolerances	4-6
Agreement of Indications	4-6
Tolerances on Shift Tests	4-8
Repeatability	4-9
Sensitivity Requirement (SR)	4-9
Discrimination	4-11
Maximum and Minimum Test Loads	4-12
Substitution Test	4-13
Strain Load Test	4-14
CONSTRUCTING A TOLERANCE WORKSHEET	4-15
Sample Tolerance Worksheets	4-16
SUMMARY	4-33
CHAPTER 5 - TEST NOTES	
OBJECTIVES	5-1
INTRODUCTION	5-1
SETTING UP THE SCALE FOR TOLERANCE TESTING	5-2
REPEATABILITY	5-2
AGREEMENT OF INDICATIONS AND RECORDED REPRESENTATIONS	5-2
ZERO-LOAD BALANCE CHANGE	5-3
ZONE OF UNCERTAINTY AND WIDTH OF ZERO	5-4
OPERATION OF SPECIAL FEATURES	5-4
SUMMARY	5-5
CHAPTER 6 - TEST	
OBJECTIVES	6-1
GENERAL CONSIDERATIONS	6-1
SENSITIVITY REQUIREMENT (SR) AT ZERO-LOAD (BEAM SCALES ONLY)	6-2
INCREASING-LOAD AND SHIFT TESTS	6-3
Increasing-Load and Shift Tests for Beam Scales	6-6
Increasing-Load and Shift Tests for Dial Scales	6-7
Increasing-Load and Shift Tests for Electronic Digital	
Indicating Scales	6-7
RFI/EMI TEST	6-8
DECREASING-LOAD TEST (AUTOMATIC-INDICATING SCALES ONLY)	6-10
STRAIN-LOAD TEST SENIETIVITY REQUIREMENT (SD) AT MAXIMUM TEST LOAD	6-11
SENSITIVITY REQUIREMENT (SR) AT MAXIMUM TEST LOAD	£ 11
(BEAM SCALES ONLY) DISCRIMINATION	6-11
DISCRIMINATION	6-12

DISCRIMINATION	6-12
For Analog Automatic-Indicating Scales	6-13
For Digital Automatic-Indicating Scales	6-13

	Page
TEST OF AUTOMATIC ZERO-SETTING MECHANISM (ELECTRONIC	-
INDICATING ONLY)	6-15
TEST OF TARE AUTO-CLEAR (ELECTRONIC INDICATING ONLY)	6-15
TEST OF SEMI-AUTOMATIC ZERO-SETTING MECHANISM (AUTOMATIC	
INDICATING ONLY)	6-16
TEST OF PRINTER INTERFACED WITH ELECTRONIC INDICATING ELEMENT	6-17
OVER-CAPACITY TEST (IF PRACTICAL)	6-17
ZERO-LOAD BALANCE CHANGE	6-17
COUNTERPOISE WEIGHTS TEST	6-18
SUMMARY	6-18
CHAPTER 7 - POST-TEST TASKS	
OBJECTIVES	7-1
EVALUATION	7-1
DETERMINATION OF COMPLIANCE ACTION	7-2
NOTIFYING THE OWNER OR OPERATOR	7-3
MARKING THE DEVICE	7-4
REPORT FORMS AND RECORDKEEPING	7-4
SUMMARY	7-4

APPENDIX A — EXAMINATION PROCEDURE OUTLINES (EPOs)